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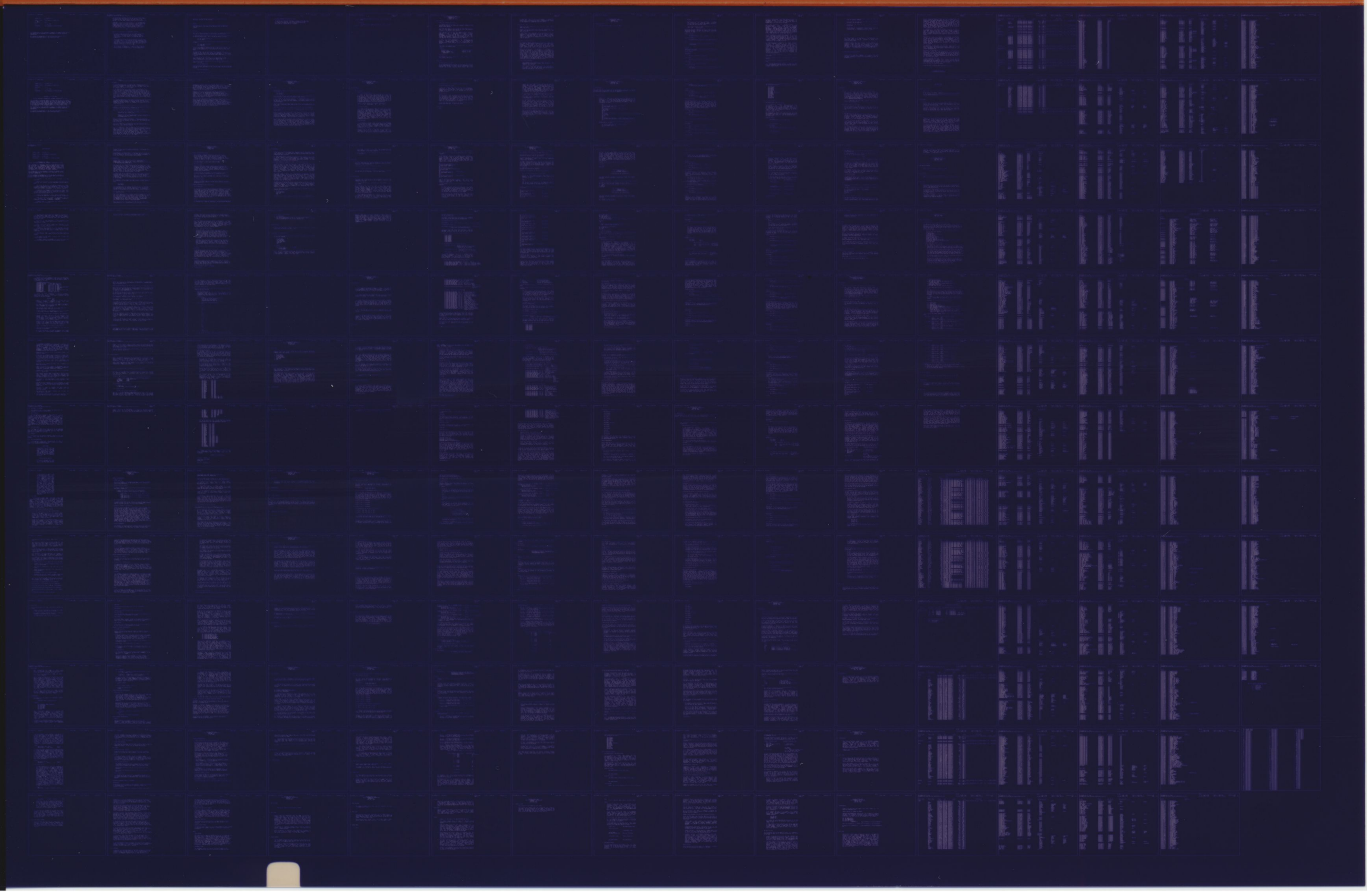

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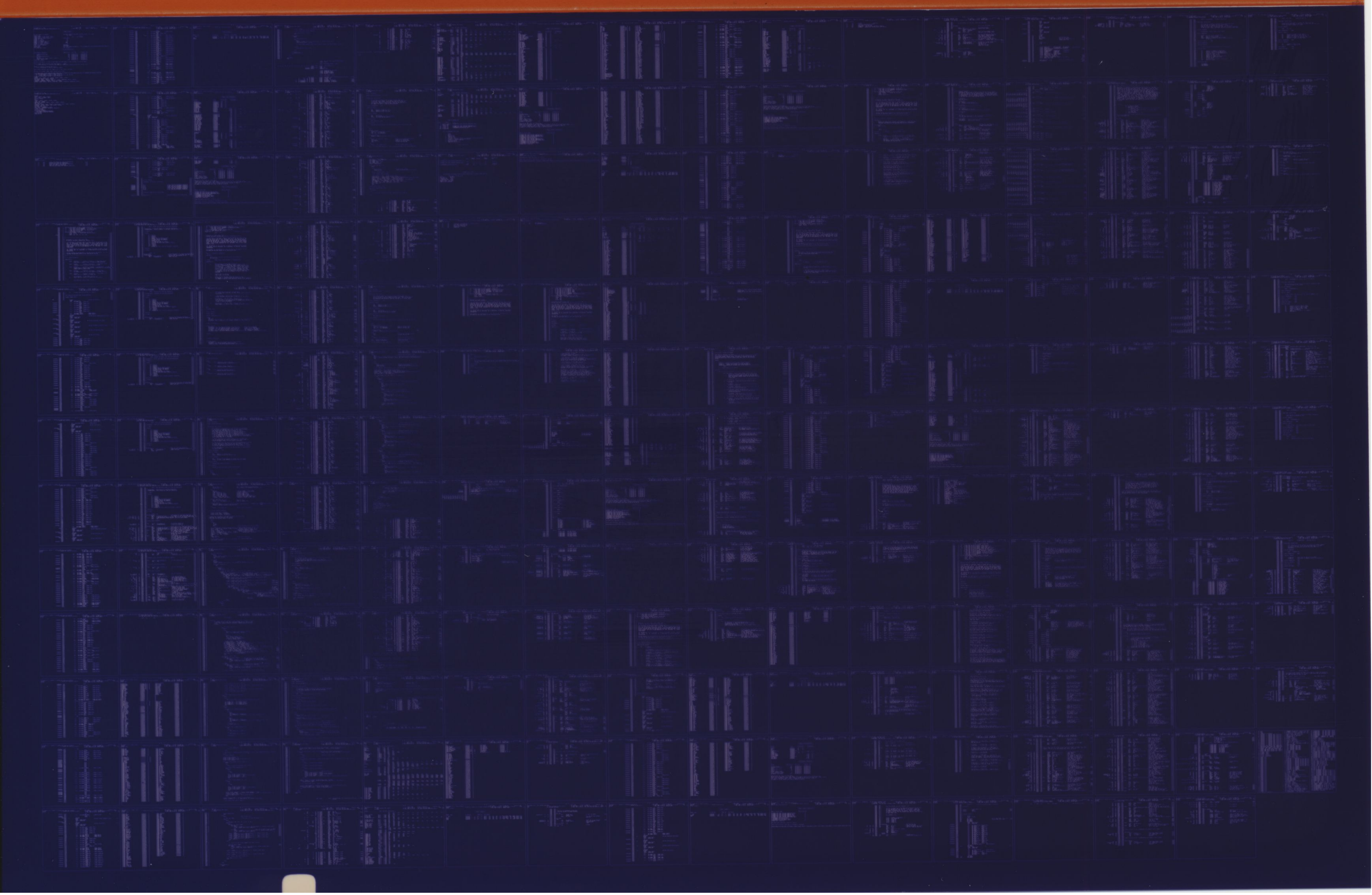

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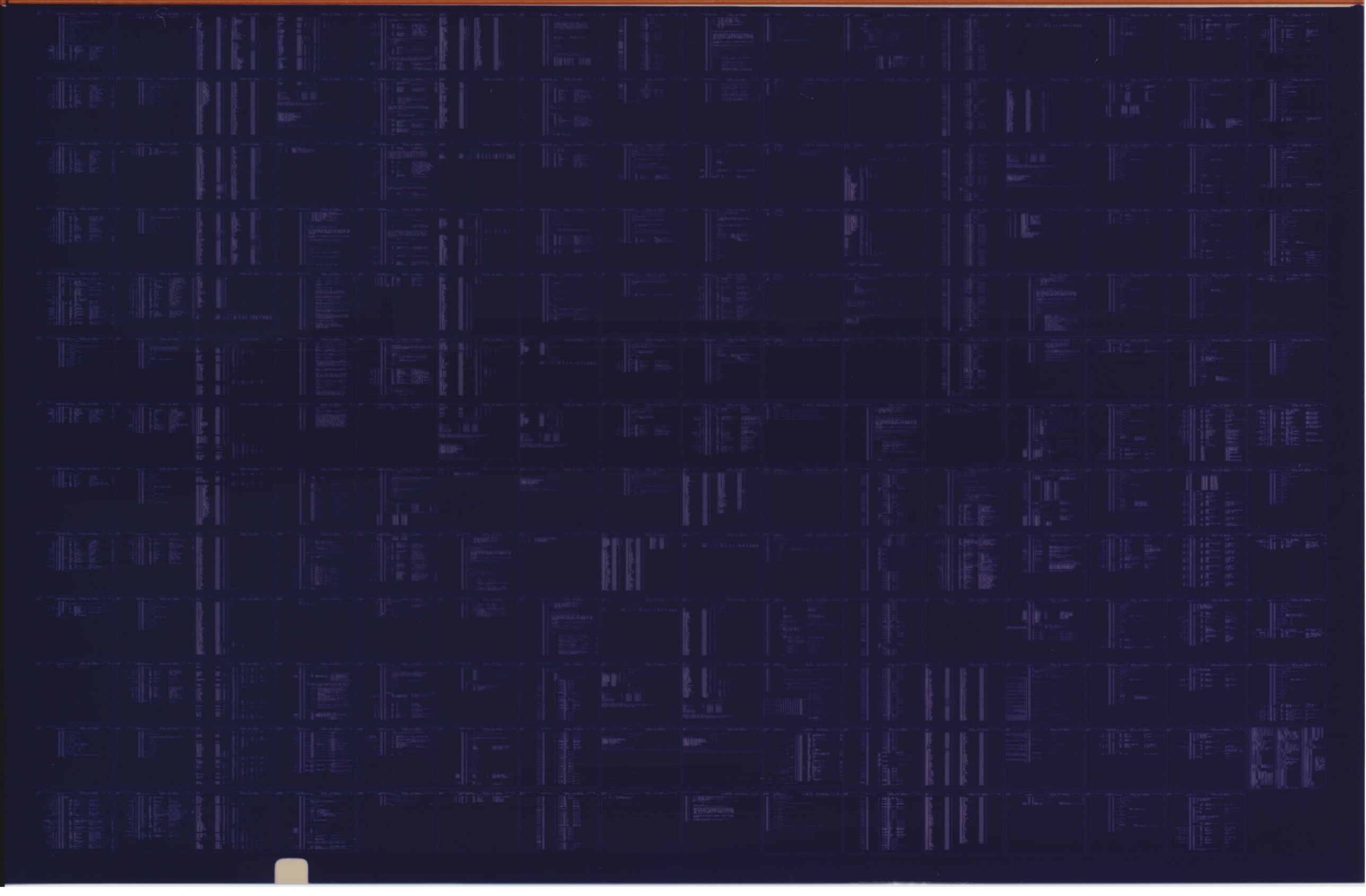

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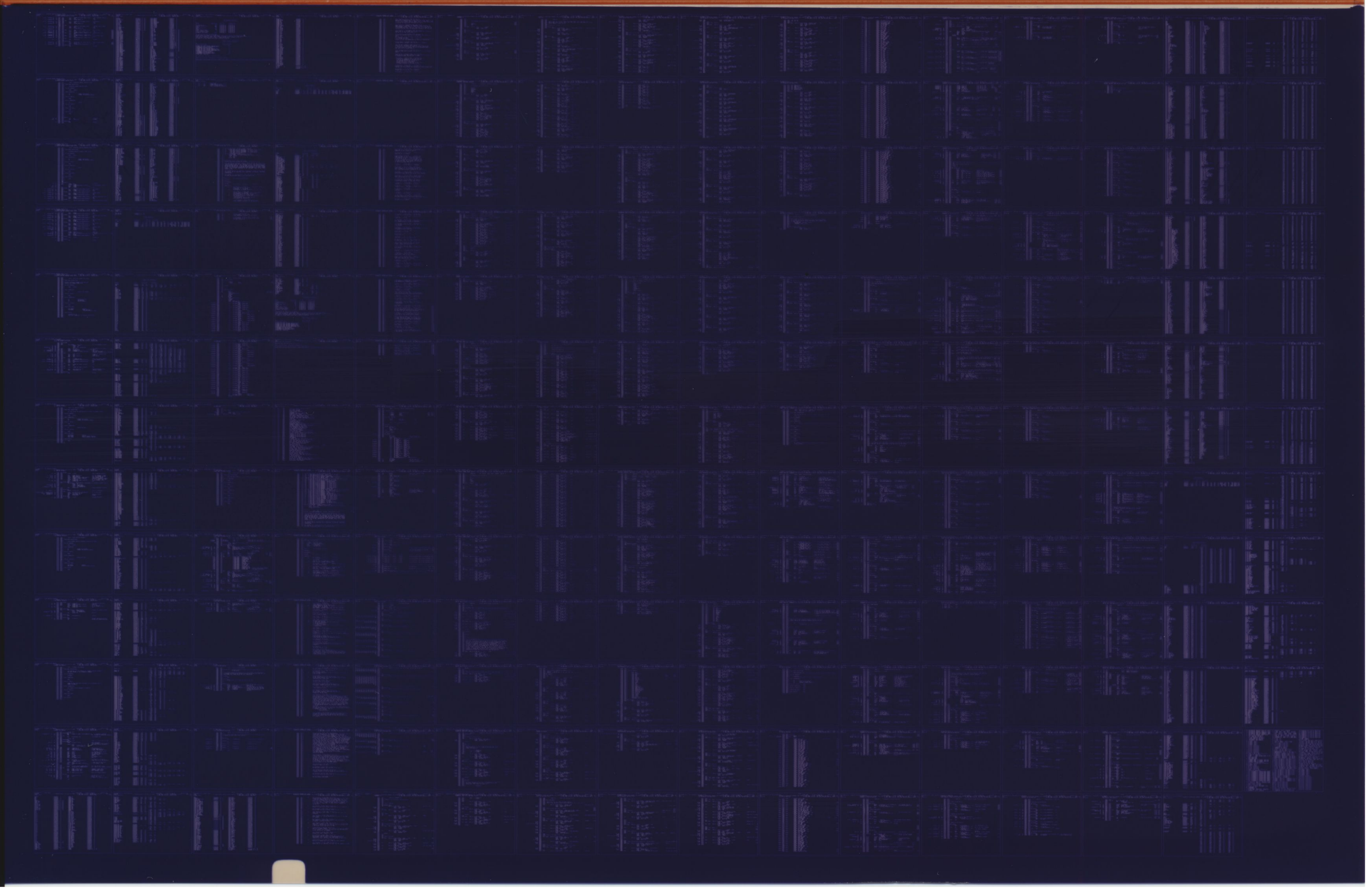

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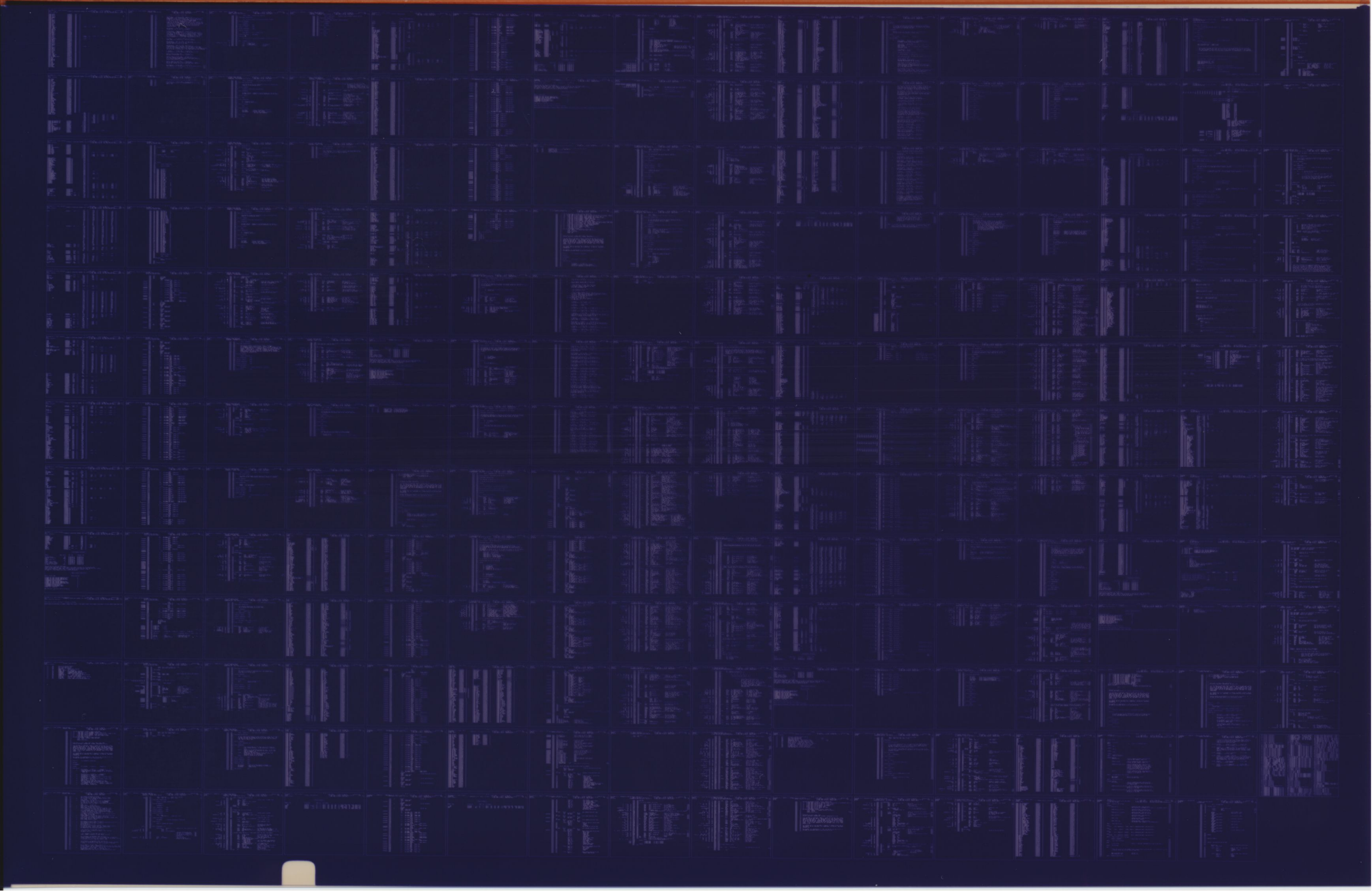

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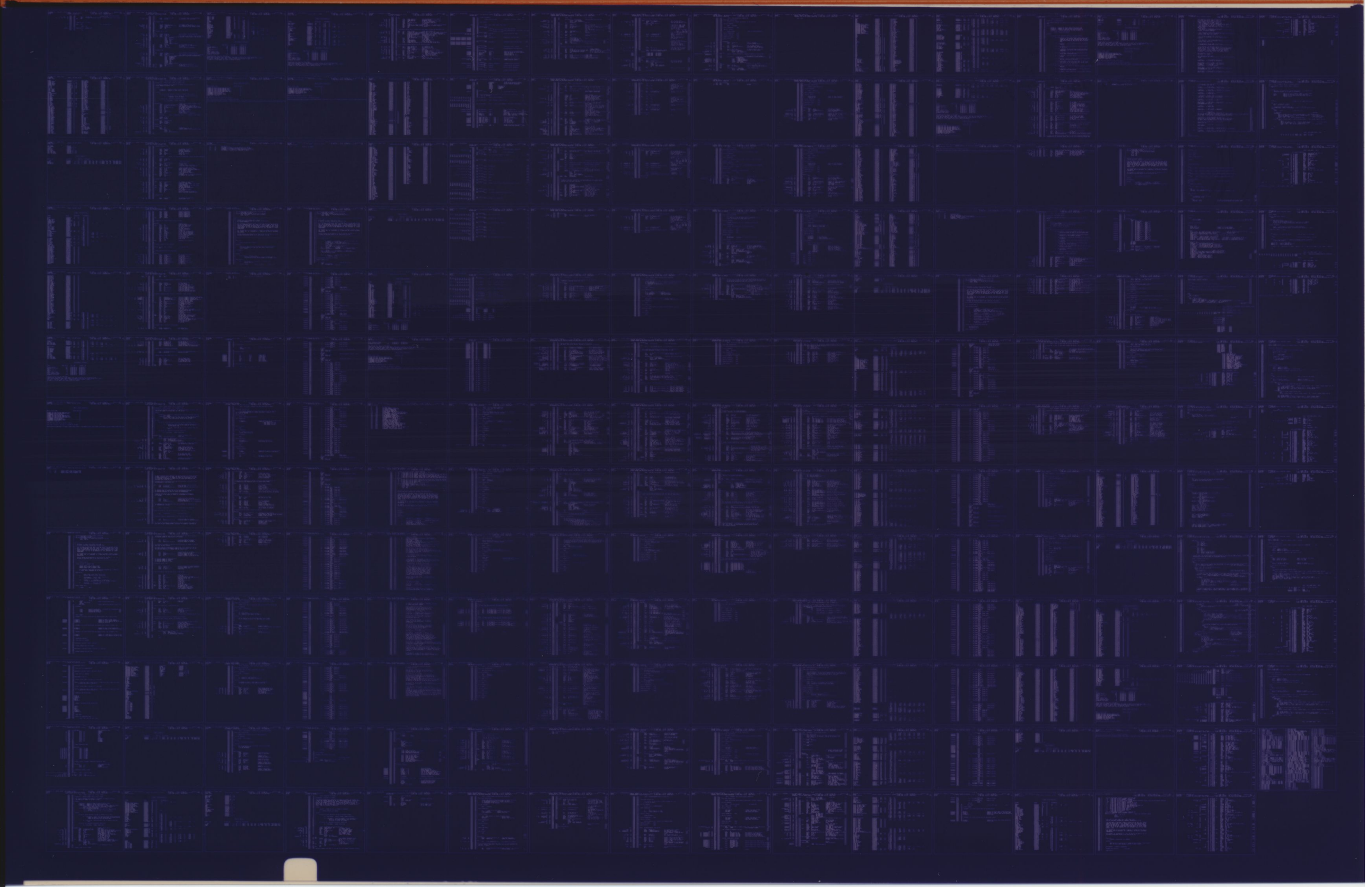

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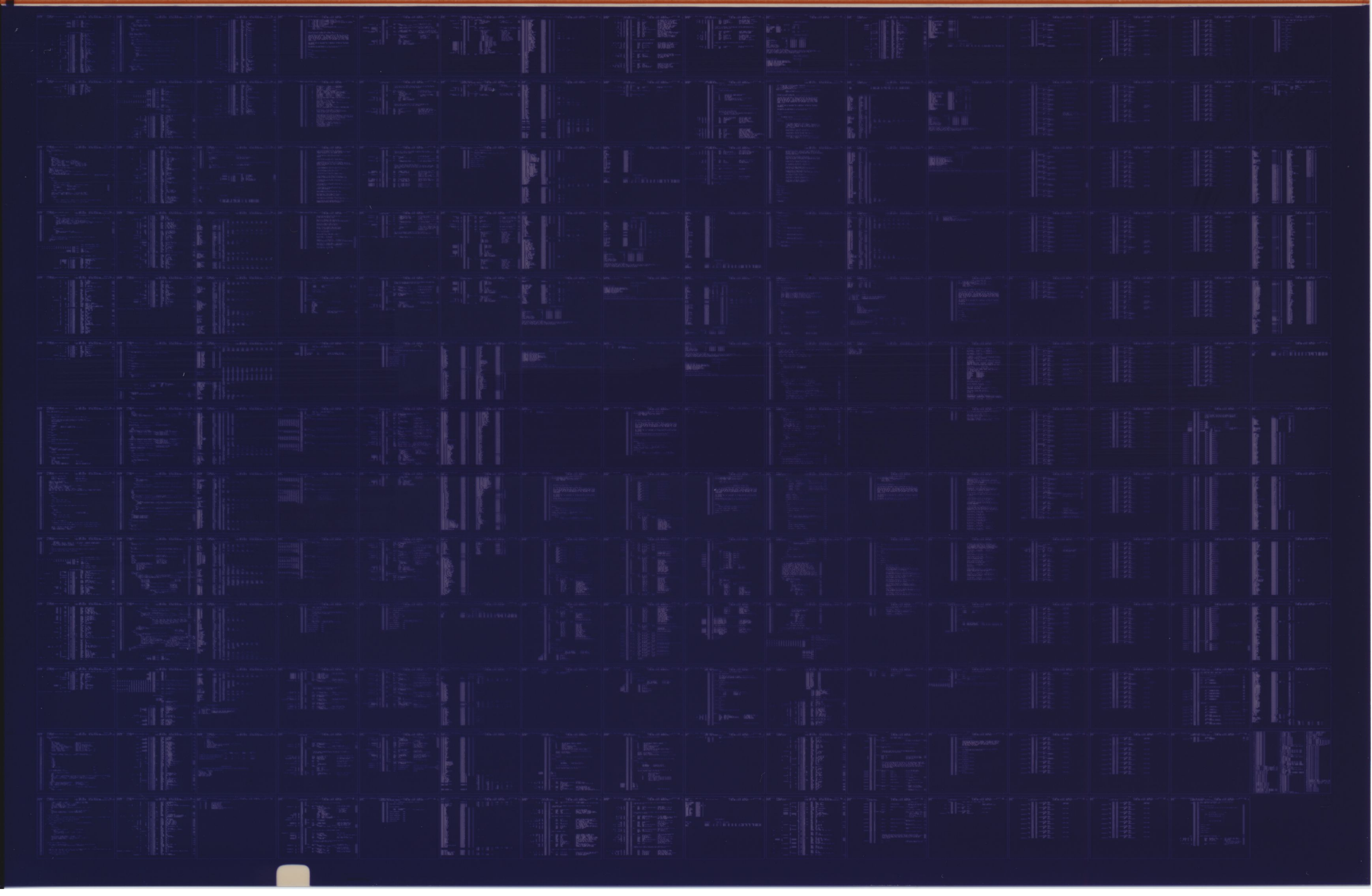

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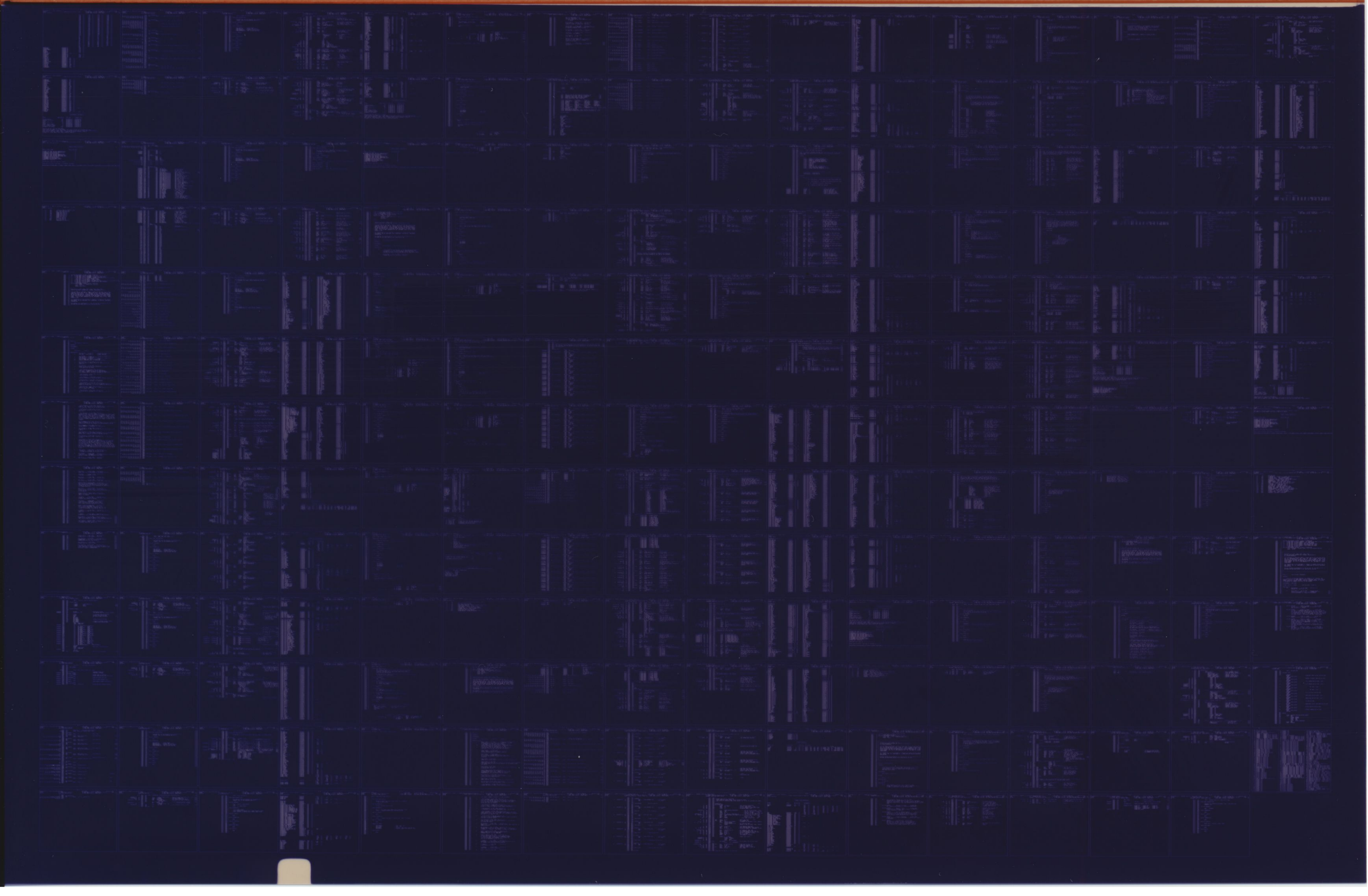

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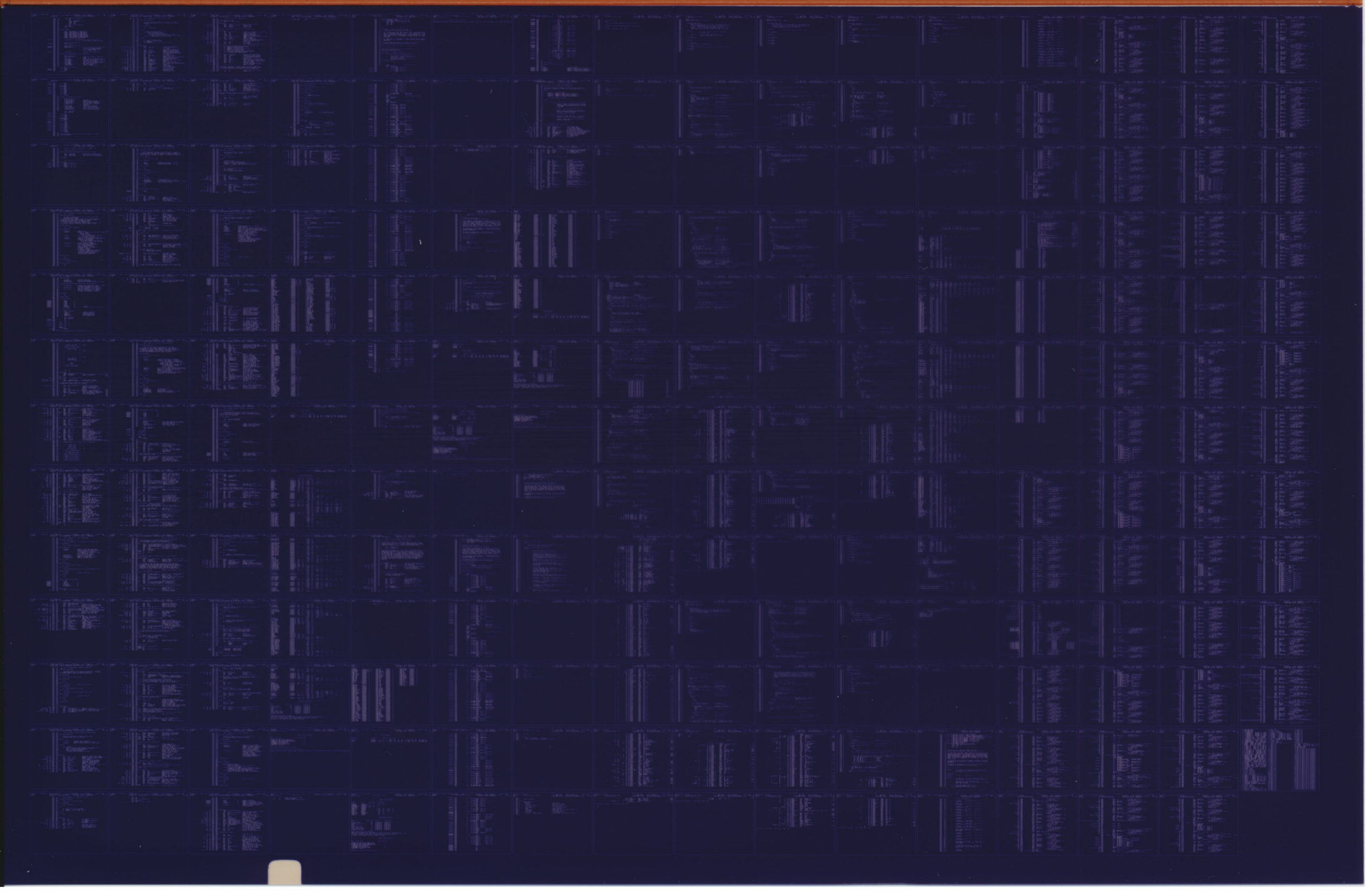

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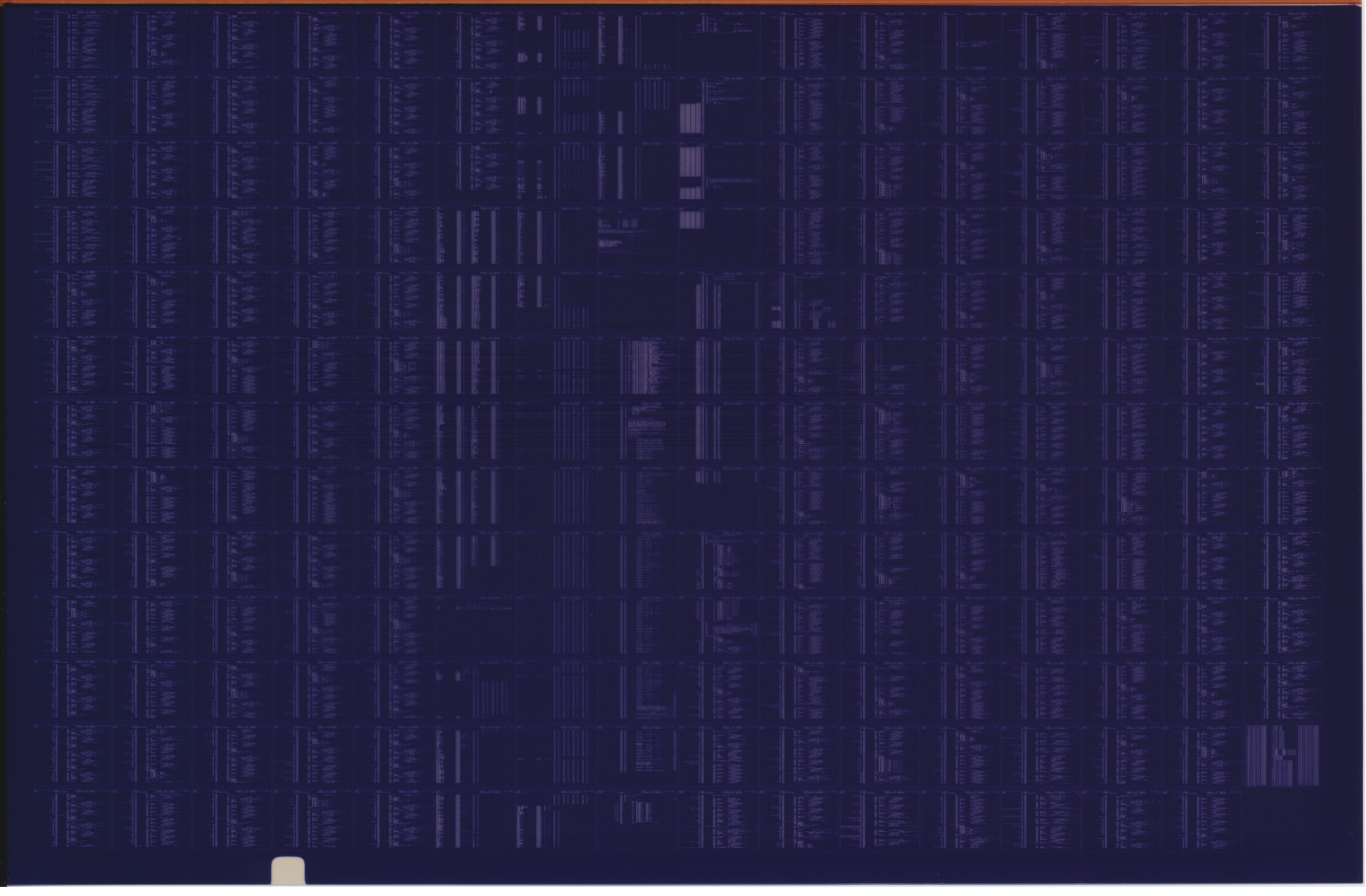

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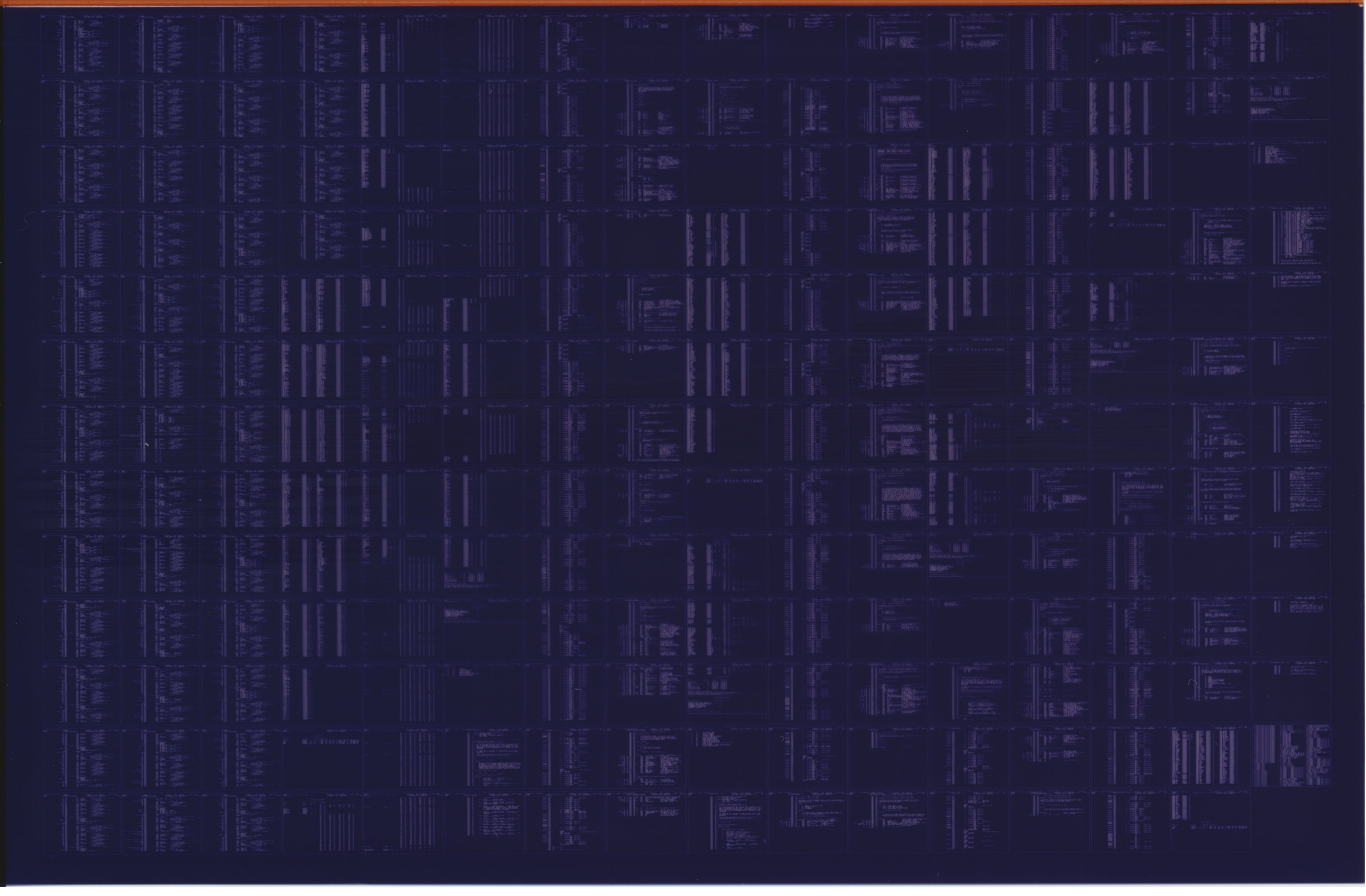

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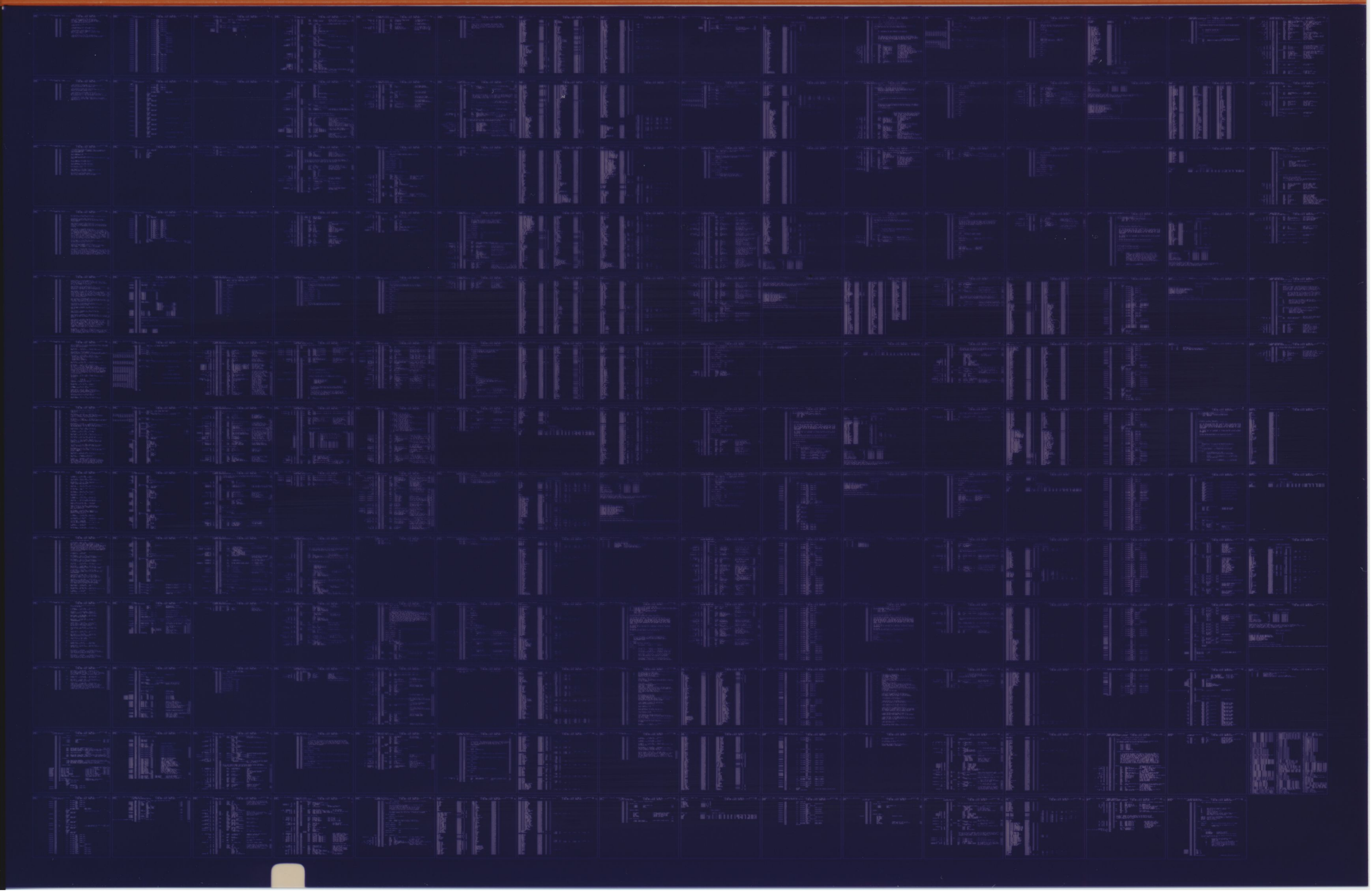

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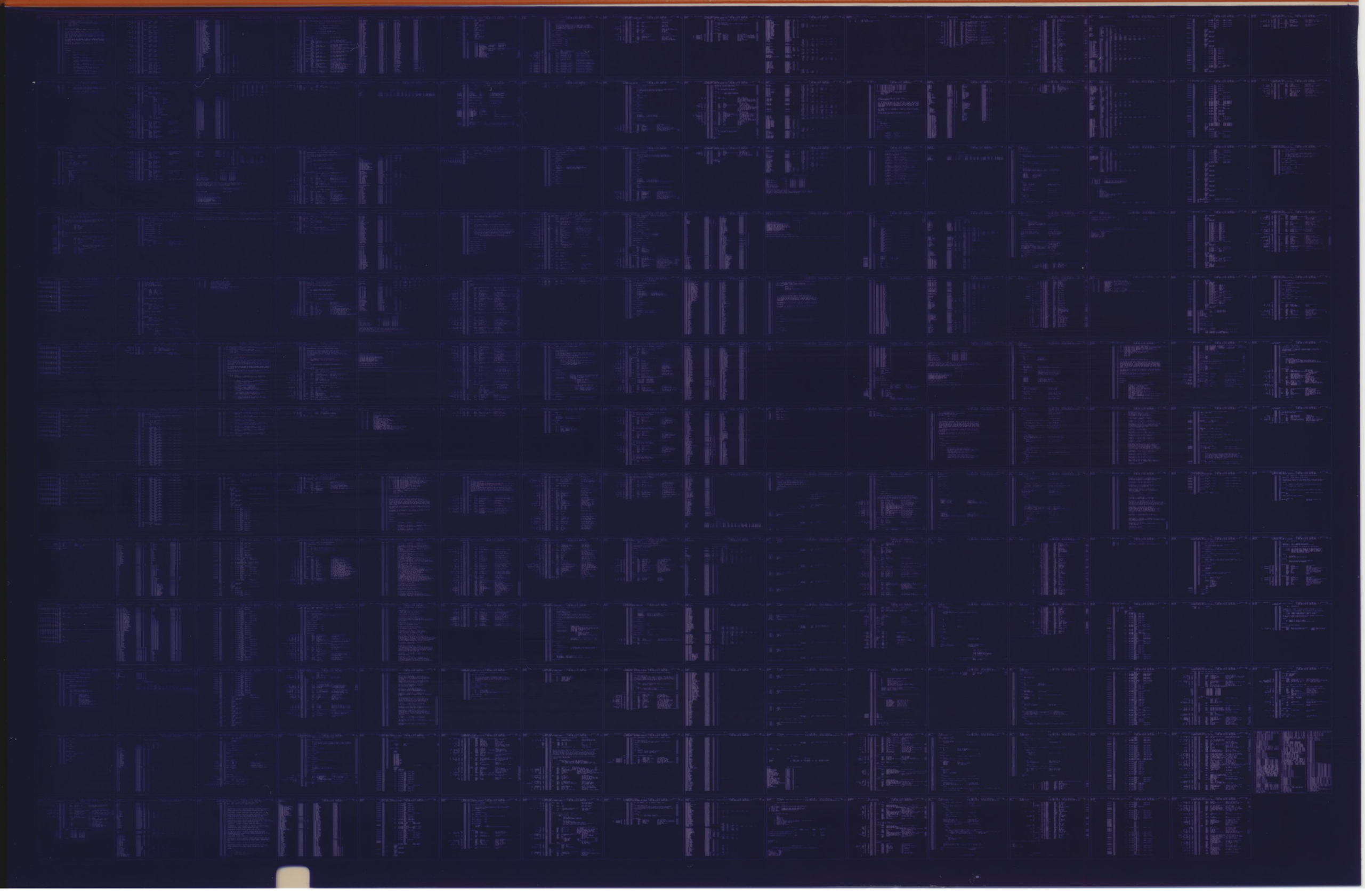

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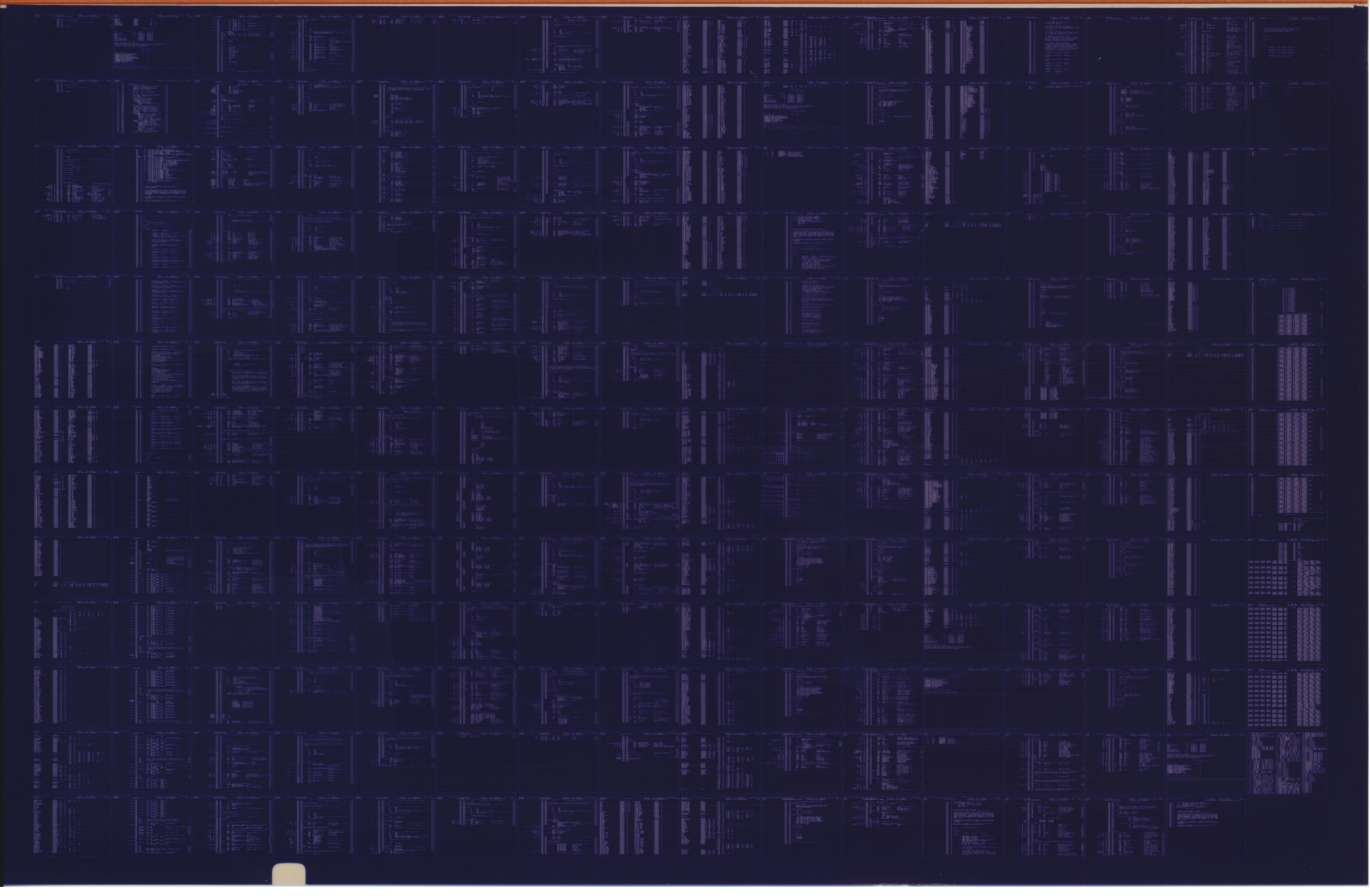

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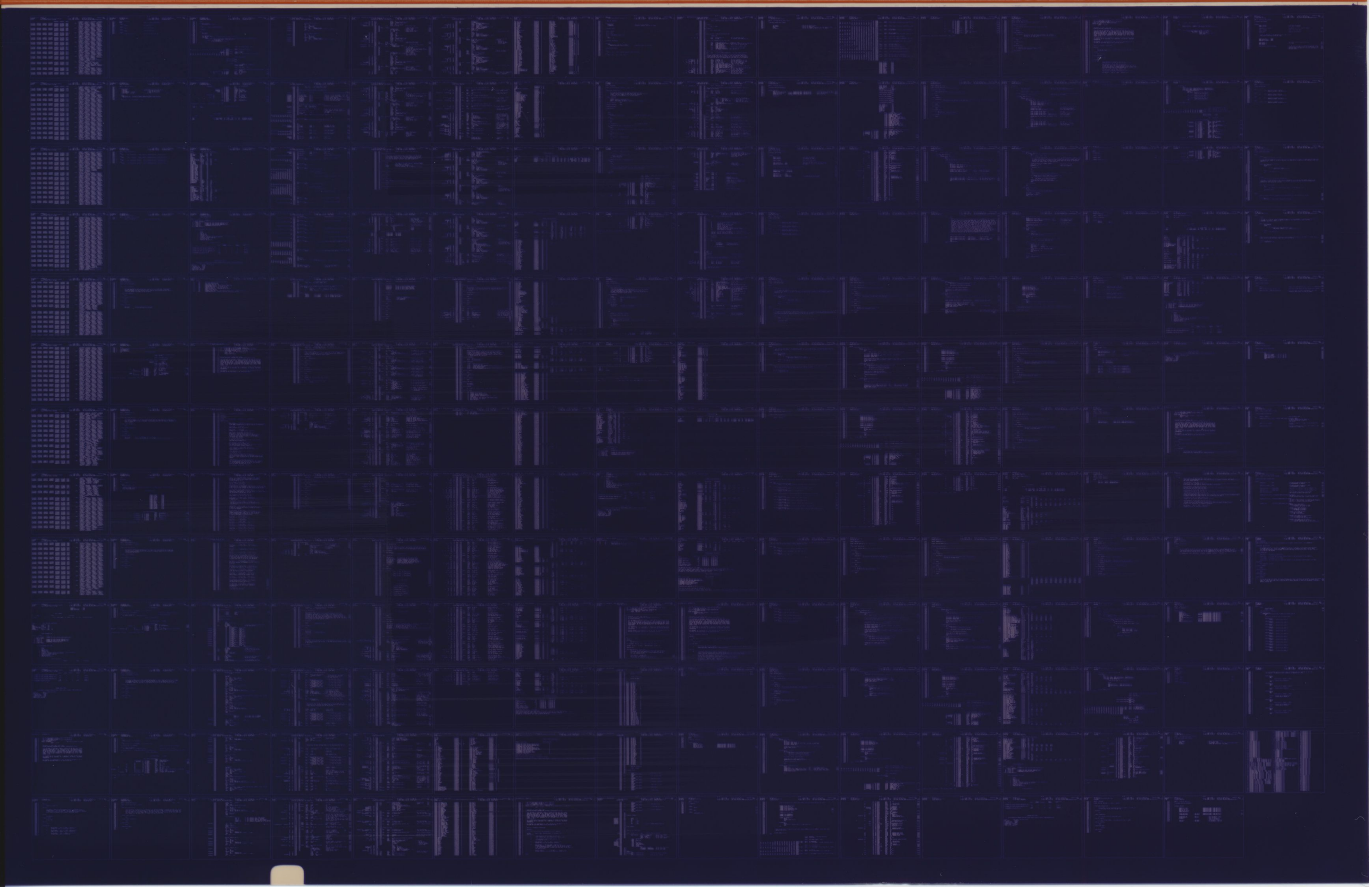

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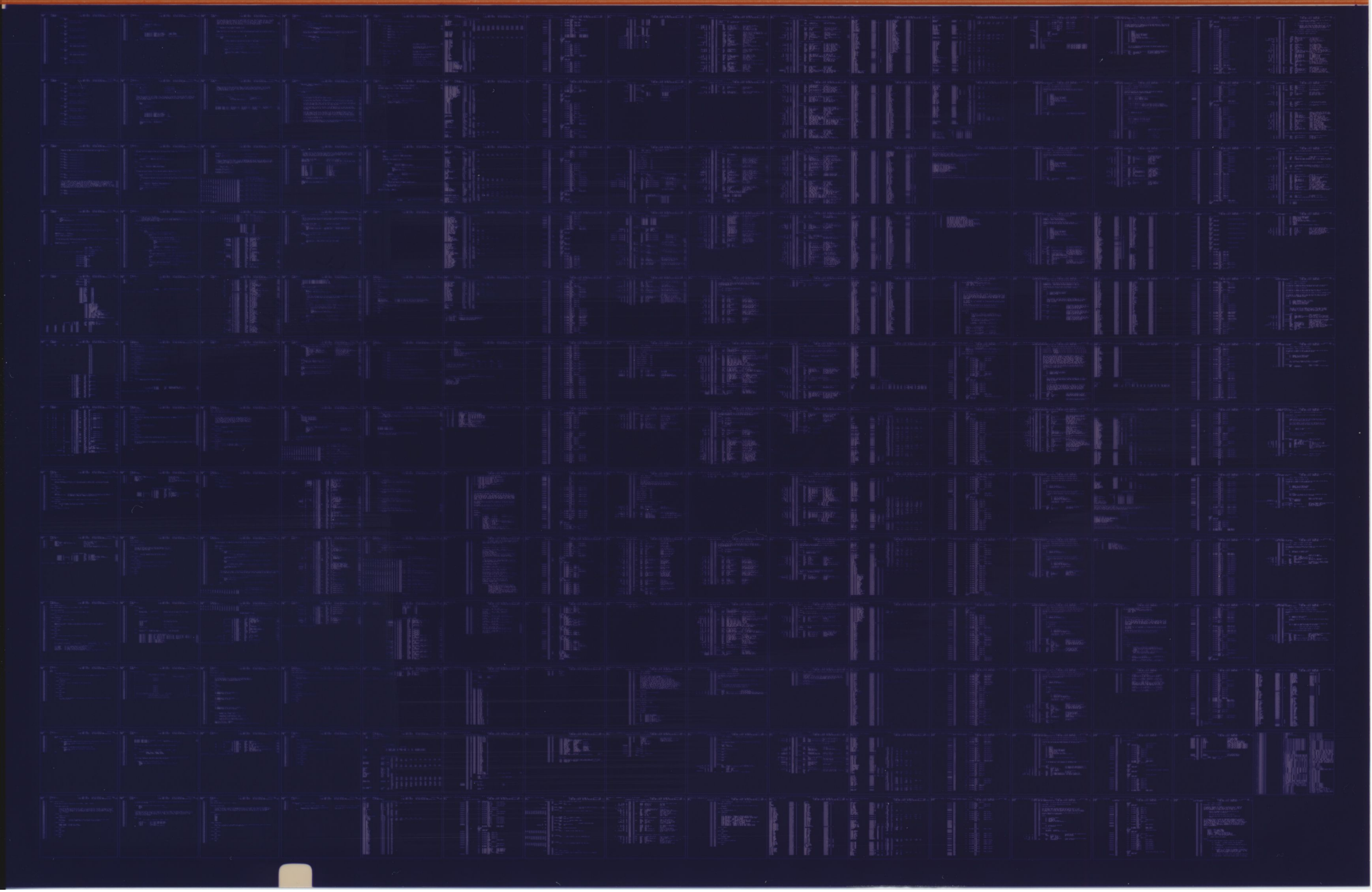

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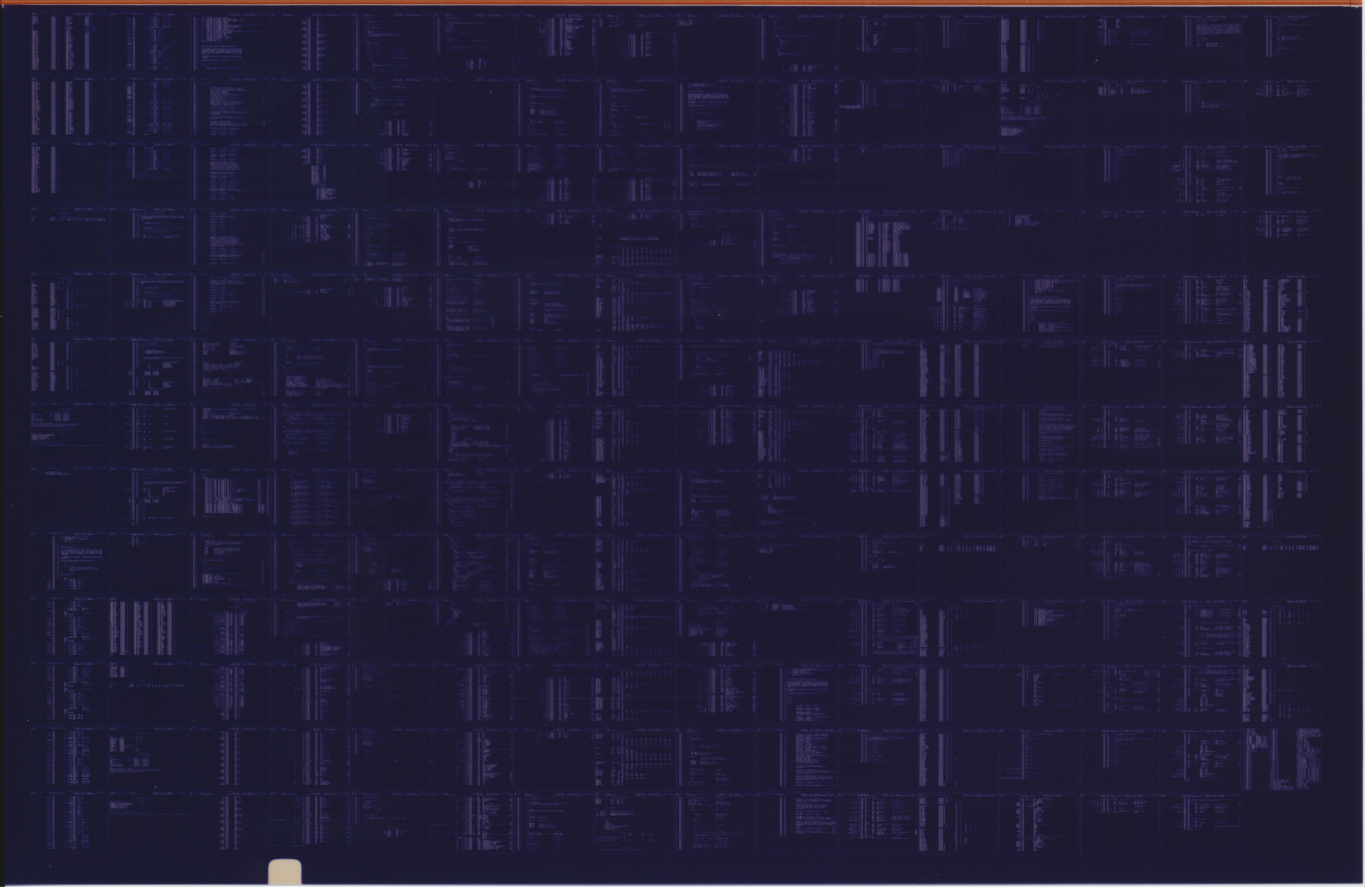

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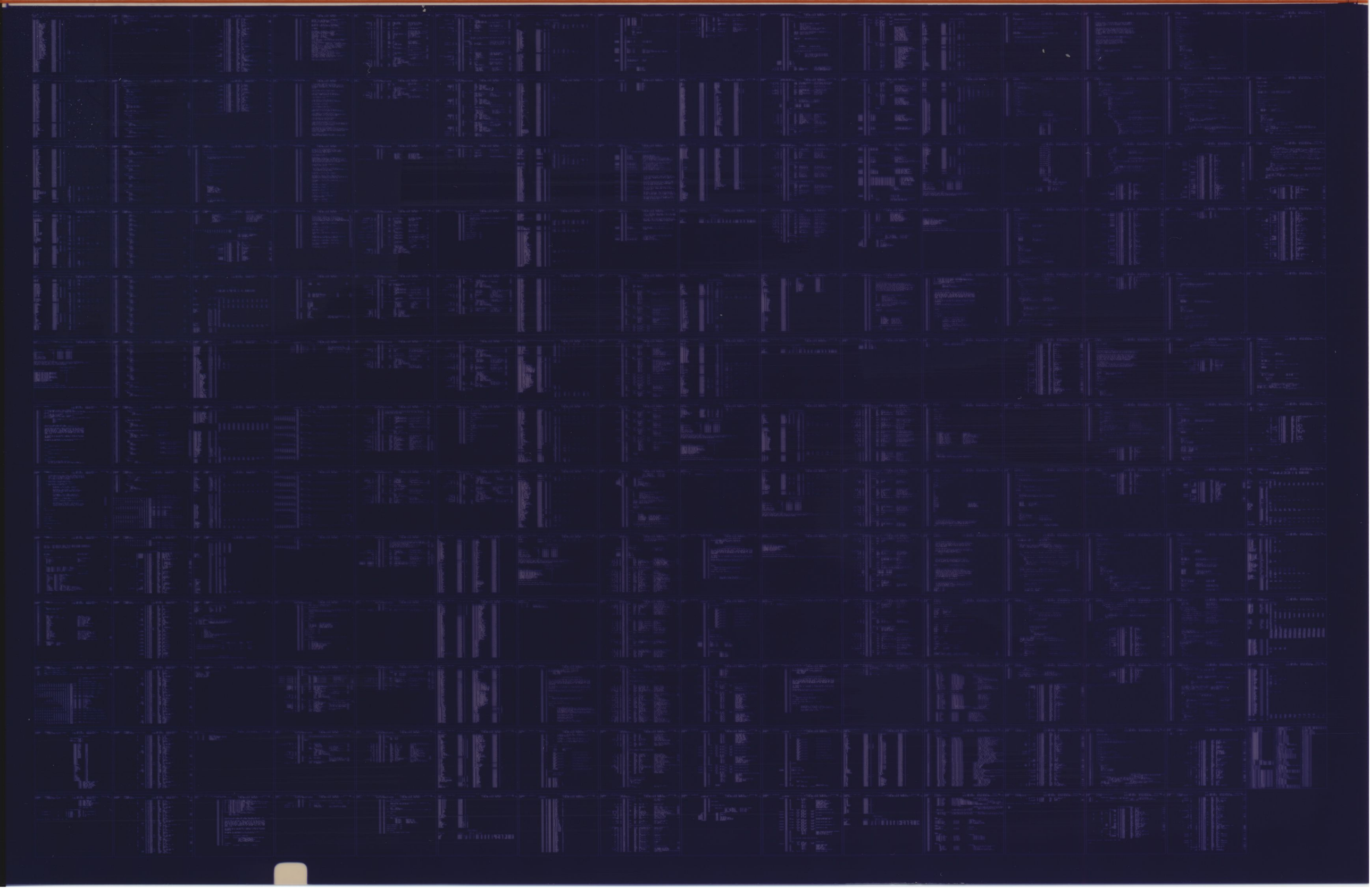

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PRODUCT ID: ZZ-ECSAA-10.11

PRODUCT TITLE: VAX Diagnostic Supervisor

DECO/DEPO: 10.11

DATE: 11-JUL-1988

DEPARTMENT: VAX DIAGNOSTIC SYSTEM SOFTWARE

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IDENTIFICATION

PRODUCT CODE: ZZ-ECSAA-10.11

PRODUCT TITLE: VAX DIAGNOSTIC SUPERVISOR

PRODUCT DATE: 21-MAR-1988

DEPARTMENT: VAX DIAGNOSTIC SYSTEMS SOFTWARE

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Diagnostic Supervisor release notes V5.3

A buffer in show device was increased to 256 characters.

Channel services was fixed to disable interrupts before releasing the vectors and the INVALIDATE function made to work.

SET MM ON, SET MM OFF, and SHOW MM commands were added to enable and disable memory management. At the same time DS$MMON and DS$MMOFF were modified to prevent the program from disabling memory management if the operator enabled it.

SYS$SETIMR and SYS$CANTIM were enhanced to change mode to kernel before doing MTPR's or disabling interrupts. This resolved some problems caused by interrupting programs that had set the processor mode to user.

Cleanup was enhanced to reset memory management and re-initialize the SCB after the program cleanup is complete.

Dummy entry points were added to $DS_DSSDEF and the entry vectors to accomodate SYS$LKWSET, SYS$SETAST, SYS$SETPRI, SYS$SETRWM, SYS$ULKPAG, SYS$ULWSET.

SYS$FAO used in stand-alone was modified to fix problems with !*? directives.

The known device data base was updated to include DL11, LP25, RX02, RX211, TM78, TS04, TS11, TU58, and TU78 support. The descriptor for KA780 has changed, the optional arguments are now G-floating, H-floating, WCS last address, and accelerator type.

An error is now generated if the processor type specified in the system identification register is not 1, indicating an 11/780.

Error text and status codes are returned if the supervisor is run from a command file. The next release will support running in batch.

DS$LOAD has been enhanced to allow programs to read parts of files indicated by the starting block number argument. The name of the console storage device is now always CSan.

The count of loops on subtests has been fixed to correctly reflect the number of passes thru the specified subtest.

The logout for SBI WRITE timeouts now includes the timeout address register.

The ABORT command and DS$ABORT now reset the stacks and reset the processor mode before doing program cleanup.

Diagnostic Supervisor release notes V5.4

Release 5.4 of the diagnostic supervisor has been made. ESSAA.EXE 5.4;214 and ECSAA.EXE 5.4;121 represent 11/780 and 11/750 supervisors. Relevent files can be found on PROTO 3 in Tewksbury as follows:

```
SYS$LIBRARY:DIAG.MLB;611
[DS]ESSAA.EXE;214     11/780 STAR supervisor
[DS]ECSAA.EXE;121     11/750 COMET supervisor
[DS]EVQDB.EXE         QIO driver for RP04,5,6
[DS]EVQDL.EXE         QIO driver for RL02
[DS]EVQDR.EXE         QIO driver for RM80,RP07,RM03,RM05
[DS]EVQDM.EXE         QIO driver for RK06,RK07
[DS]EVQXF.EXE         QIO driver for DR780
[DS]EVQTM.EXE         QIO driver for TM03/TE16,TU77,TU45
[DS]EVQTS.EXE         QIO driver for TS11
[DS]DIAGBOOT.EXE      Secondary Bootstrap
```

Please use these components in testing programs. Needless to say if any problems are encountered please report them to me immediately so their solutions can be included in the next release.

Release notes

- Support for drivers was upgraded to reflect VMS 2.0 interface changes. Loadable drivers have been re-released to reflect Release 2.0 of VMS.

- The supervisor can be run from a VMS command proceedure. When the supervisor is running under VMS it uses RMS to access SYS$INPUT and SYS$OUTPUT.

- Bug fixed to remove supervisor error when supervisor is started again after interrupting a script.

- The APT interface will now generate an error if no PTEXT is found when a process PTEXT command is given.

- A buffer in show device was increased to 256 characters.

- Internal processor registers can be examined with EXAMINE Pxx, where xx is a register number in the current radix. If only the decimal values are available Try EX P%D127 to get register ^X7F. Internal registers can be changed with the DEPOSIT command.

- Channel services was fixed to disable interrupts before releasing the vectors and the INVALIDATE function made to work. Also SETMAP now sets and clears all map registers and allows all to be used for transfers.

- Support was added for the RL02 as a boot device.

- Time conversion routines were changed to fix loss of precision in hundredths.

- SET MM ON, SET MM OFF, and SHOW MM commands were added to enable and disable memory management. At the same

time DS$MMON and DS$MMOFF were modified to prevent the program from disabling memory management if the operator enabled it. Also the return code in R0 now indicates the previous state of memory management and an error return if DS$MMOFF was trying to disable memory management and the operator had enabled it. If memory management is enabled the stack for each mode is write protected against lower access modes.

- DS$ASKSTR now returns 0 in R1 if the default answer was given to a query.

- SYS$SETIMR and SYS$CANTIM were enhanced to change mode to kernel before doing MTPR's or disabling interrupts. This resolved some problems caused by interrupting programs that had set the processor mode to user.

- Cleanup was enhanced to reset memory management and re-initialize the SCB after the program cleanup is complete.

- Corrected errors induced when more the 2 megabyte of memory was present.

- Dummy entry points were added to $DS_DSSDEF and the entry vectors to accomodate SYS$LKWSET, SYS$SETAST, SYS$SETPRI, SYS$SETRWM, SYS$ULKPAG, SYS$ULWSET.

- SYS$FAO used in stand-alone was modified to fix problems with !*? directives.

- The known device data base was updated to include DL11, LP25, RX02, RX211, TM78, TS04, TS11, TU58, and TU78 support. The descriptor for KA780 has changed, the optional arguments are now G-floating, H-floating, WCS last address, and accelerator type.

- An warning is now generated if the processor type specified in the system identification register is not correct.

- DS$LOAD has been enhanced to allow programs to read parts of files indicated by the starting block number argument. The name of the console storage device is now always CSan.

- The count of loops on subtests has been fixed to correctly reflect the number of passes thru the specified subtest.

- The logout for SBI WRITE timeouts now includes the timeout address register.

- The processor mode and and all stacks and registers are now reset before the users cleanup code is executed.

1.0 BUFFERED I/O SUPPORT

The supervisor now includes support for QIO drivers using buffered I/O (such as line printers).

2.0 HELP FACILITY

The new Supervisor includes a HELP facility. It is invoked via the "HELP" command. In general it is identical functionally with the VMS HELP command. Additionally, it supports gathering HELP on diagnostics via typing the diagnostic code (ES, EV, EC pre-fix followed by diagnostic name, as "EVRAA", etc.) as the first keyword after HELP (e.g., "HELP EVRAA"). In standalone mode the HELP command will function off of any load media (including magtape and console media). In user mode however, it will not function from magtape or the console media, as these are not fully supported by VMS RMS (see below, description of Supervisor RMS).

3.0 LOAD AND SCRIPT

The Supervisor LOAD (which loads files for the commands RUN and LOAD as well as for diagnostics via the $DS_LOAD service call) and SCRIPT file handling services have been modified to use RMS file services.

4.0 MAGTAPE

The supervisor now supports magtape (TM03 only) as load media. TS-11 and TU-78 will be supported in a future release.

5.0 RMS IMPLEMENTATION

The diagnostic supervisor implementation of RMS is similar to the VMS implementation, but is specifically adapted to the standalone DS environment.

DISCLAIMER

Since there are currently no diagnostics which use RMS services, we can not guarantee 100% functionality of RMS code, though we have attempted thorough QA testing. However, services within the Supervisor which use RMS will function correctly.

Console Device Naming

Previous to release 6.0, due to a file name-handling loophole in the file load routine,

it was possible to specify the console device as "CS:". This is not consistent with Supervisor convention, which requires complete device names (i.e., "DMA0:" not "DM:" even if only one RK06/07 is attached). In Version 6.0, "CS:" will not function on COMET (11/730); it will fail when the TU58 driver attempts to access a non-existent drive. The solution is that full device names MUST be typed. In future versions of the Supervisor, this naming "loophole" will be closed, and omitting the controller letter or drive number in the console device specification will return an illegal device error (RMS$_DEV).

5.1 User Mode

To consistently support RMS in user mode (where RMS calls are passed through to VMS), the Supervisor SET LOAD command will function correctly in user mode (as will SHOW LOAD). This is done by translating or reassigning SYS$DISK for device names, and via an RMS housekeeping routine to alter default directory. The Supervisor exit handling routine will restore the original values: however for this to occur, the Supervisor must be terminated either by ^Z or by a ^Y, EXIT sequence. If the (VMS) STOP command is used, the original default directory is not (and CAN not be) restored.

5.2 Differences Between DS RMS And VMS RMS

Supervisor RMS functionality not duplicated by VMS:

- Supervisor RMS supports files on the console media (floppy or TU-58). These files are in RT-11 format, but the Supervisor RMS $GET facility will provide file records as if the file were an ODS CR-attribute, variable length record file. The FAB's RFM field (FAB$B_RFM) will have the value 4.

- Random by RFA (record's file address) access is supported for magtape as well as for conventionally random-access devices. VMS does NOT support magtape random access. In general, random file access should not be used by any level 2 diagnostic, since if the load device is magtape, the function is unsupported in user mode.

VMS RMS functionality not duplicated by Supervisor:

- The Supervisor does not support NAM blocks in any form.

- The Supervisor supports only one form of XAB (the FHC XAB, returning file header characteristics). Any other XAB in the FAB's XAB chain will be ignored, though no error will result. This is because the information is not meaningfull in the diagnostic environment.

- In the FHC XAB, the LRL (longest actual record length) field is not supported. It is meaningful only for ODS files in any case. It will be set to maximum record length always.

- Only sequential files are supported. An attempt to open a file with INDEX or RELATIVE organization results in error RMS$_ORG (illegal file organization).

- Only READ-type functions are supported, since the supervisor does not support write access to any media. To be specific, the functions which the Supervisor RMS package implements is:

  1. $OPEN (access a file on media and initialize FAB)

  2. $CONNECT (Define a record stream for access to a file, initialize RAB)

  3. $GET (Copy a record within the file to a user buffer)

  4. $READ (Unformatted read from file, beginning on block boundary)

  5. $DISCONNECT (Close out a record stream)

  6. $CLOSE (Close out any record streams associated with FAB, and de-access file attached to FAB)

- The bits in the FOP and ROP fields are not significant, except for the BIO bit in the ROP field (specifying block I/O via the $READ call).

- Asynchronous file operations are not supported.

- RMS operations to the terminal are not supported.

- A user may have up to three files open simultaneously.

- Multibuffering and multiblocking are not supported.

- Random access by key or record number is not supported.

- The RAB TMO (time out) field is ignored.

6.0 BUG FIXES

The following Supervisor "bugs" have been fixed for the 6.0 release:

- Channel services incorrectly calculated the number of map registers required for a transfer.
- The operator request routine incorrectly defaulted parameters when prompting was disabled.
- The COMET machine check log-out was incorrect.

1.0 BUG FIXES

- BUG: "EXAMINE PSL" with "/WORD" or "/BYTE" would use only low-order bits of PSL, but the high-order fields would still be decoded and typed as 0.

  FIX: PSL is now unaffected by "/WORD" and "/BYTE"; it is always longword.

- BUG: Previous to Version 6.0, the console storage device could be specified by "CS:". This is at odds with Supervisor convention which requires full device name given in attach command. It results from an accidental "loophole" in that only the first two characters were checked, and an unspecified unit number was converted to 0. In Version 6.0, the unit number conversion was (also accidentally) removed, and using the "CS:" form to Version 6.0 causes a device error on COMET (the STAR console load routine does not use unit number) when the TU58 attempts to access a non-existant (negative) unit.

  FIX: The "CS:" short form is no longer allowed. It will result in an "invalid or illegal device" RMS error (RMS$_DEV) during name parsing. You must type the full device name (e.g., "CSA0:").

2.0 ENHANCEMENTS

- The Supervisor now supports a DIRECTORY command. The format is:

  ```
  DIRECTORY [device:][[directory]]
  ```

  Examples:

  ```
  DS> DIRECTORY DBB3:[SYSMAINT]
  DS> DIR MTA0:
  DS> DIR CSA0:
  DS> DIR [DS]
  DS> DIR DBB3:
  DS> DIR
  ```

  Device and directory default to the current load path (original default is "<load device>:[SYSMAINT]" or last SET LOAD specification). All load media are supported. The format is identical to the standard default VMS directory format. There are no qualifiers. Only file name and version (if applicable, i.e., not on RT-11 media) are typed, and there is no provision for typing dates, sizes, etc.

- To support the AUTOSIZER program, the supervisor's ATTACH command processor has been made externally callable. The entry point is DS$ATTACH

(cmdline,[prompt]) where cmdline is the address of a string descriptor for the ATTACH command to be parsed, and prompt is the address of a descriptor for a buffer (MUST be at least 1 byte long if prompt is given!) to receive the ASCIC text with which to prompt the operator if the command line is incomplete or incorrect (on error, the prompt string is set, and the cmdline descriptor length is decreased to include only the correct part of the input line). The prompt argument is optional and in general is useless except within the Supervisor.

Format:

```
$DS_ATTACH (cmd, [pmt])          ! Bliss
$DS_ATTACH_x    cmd, [pmt]       ; Macro
```

o The Supervisor HELP routine has been made callable, to allow programs implementing a conversation mode to include a HELP command. You pass the address of a descriptor of a command string; this string is just what you'd type on a Supervisor HELP command line, except leave out the "HELP" keyword. You can access the program's usual HELP file (preferable) by prefixing whatever keys the operator types with the program name. Keep in mind that HELP will fiddle with the adapter and controller, etc., in the path to the load device.

Format:

```
$DS_HELP (keylst)                ! Bliss
$DS_HELP_x      keylst           ; Macro
```

o User control of ^C

. In some diagnostics, it may be necessary to call DS services which do implicit "$DS_BREAK" calls during sections of code which must not be interrupted by "^C". To solve this problem, new functionality has been added to the $DS_CNTRLC service. A second argument, DISABL, has been implemented. The value of this argument defaults to "0", and the DS$CNTRLC routine accepts argment lists of only one argument to maintain compatibility with currently released diagnostics. If the low bit (bit 0) of DISABL is SET, ^C will be ignored by the Supervisor. If a user ^C handler is set, it will not be called, nor will the Supervisor itself take any special action beyond setting it's ^C flag bit. Note that if ^C recognition is disabled, and a ^C character is typed, the ^C will be honored as soon as ^C recognition is re-enabled. Therefore, the ^C is effectively postponed beyond the non-interruptable segment of code, but is not lost.

Format:

```
$DS_CNTRLC ([astadr], [disabl]) ! Bliss
```

```
$DS_CNTRLC      [astadr], [disabl]      ; Macro
```

. Previously, the user ^C handler routine had no value. Now, the user handler has the option of telling the Supervisor to handle the ^C normally even though there was a user handler defined. To do this, the user's handler should return a failure status code (R0 bit 0 clear). If the user handler returns a success code, the Supervisor will do nothing further.

o It is possible for messages to be typed out asynchronously, by AST routines for example. This typeout may occur while the operator is keying in commands and/or data. In such a circumstance, VMS will retype the input line automatically (as if a ^R had been typed), but the Supervisor would just let the line "dangle". Now, the Supervisor will perform the "^R"

3.0 NEW LOAD DEVICE SUPPORT

o Supervisor RMS (and therefore all Supervisor file utilities including HELP, DIRECTORY, DS$LOAD, RUN, and LOAD) now will function with the TS-11/TS-04 tape drive sub-system. This addition is transparent to users of the utilities, syntax and programming-wise.

- A user control-C handler returning failure status under APT would cause the Control-C to be ignored, since status information was cleared before the user routine was CALLed. This has been fixed by deferring the status clear.

- DIRECTORY - due to an inconsistency in string descriptor handling, access violations could occur during DIRECTORY depending on previous stack contents. Specifically, if a HELP command with keywords was entered previously, DIRECTORY would fail, but would succeed if HELP without any keywords was typed. The problem has been fixed.

NOTE

Addition to directions for DIRECTORY command:

1) In order to get a directory in user mode, the target device must be mounted (do NOT use the /FOREIGN qualifier!). You can not get a directory from the console device in user mode, since VMS RMS does not support it.

2) The target device must be attached before you can get a directory of it. This applies in both standalone AND user modes. This is due to the fact that the Supervisor does not enforce device naming conventions, and therefore requires access to a Ptable to figure out what type of directory structure it is accessing.

3) The directory command will not work on ODS structure level 1 disks in standalone. (This is a bug, and will be corrected in a future version of the Supervisor!)

1.0 BUG FIXES

- If the COMET supervisor is loaded from a Massbus device, it currently attaches the load MBA as RH0, irregardless of the actual unit number. In version 6.3, this has been fixed, and it will attach the correct unit number.

- In the $DS_DEVTYP macro, under certain circumstances the supervisor could be fooled into thinking that a device name string was part of a Ptable descriptor when it actually was only a name. This is because it looks 5 bytes beond the end of the string for a byte 80(x), and if the byte IS 80, the supervisor thinks it is a Ptable descriptor. This has been fixed by adding a null byte to the end of the DEVTYP string list. This does not affect any diagnostic already assembled as it is transparent to both diagnostic and supervisor, occuring only within the library DIAG.

- For the $DS_ABORT macro, there was a difference in syntax between the MACRO and BLISS forms, as BLISS required 'PROGRAM' while MACRO would accept PROGRAM or program. BLISS will now accept PROGRAM and program, as well as 'PROGRAM' for compatibility with older versions.

- The $DS_WAITMS macro has been fixed so it will work correctly.

- The DV11 is now ATTACH-able. Previously the Supervisor knew of the device but would not allow ATTACH-ing it.

- RMS fixes (to match VMS RMS functionality more closely):

  - When $GET returns RMS$_RTB, the RAB$L_STV field will contain the full record size.

  - $READ will return the block number read in the first longword of the RFA (RAB$L_RFA0). The byte offset of the RFA (RFA$W_RFA4) is 0.

- SBI silo register dump (11/780 only). Due to an incorrect assumption as to instruction context in indexed addressing mode, the wrong field was decoded for function ID. This problem has been corrected.

- A fix to DS$WAITUS to promote more correct and consistent behaviour. This involves ensuring that the interrupt and error bits in the timer CSR are cleared.

- It is now legal for a section name to include the characters "$" and "_". Previously, they could be used in a diagnostic section name definition, but the Supervisor /SECTION qualifier (RUN and START commands) would not recognize them as legal. The Supervisor will now accept these characters. In conjunction with this, the function code CLI$K_SYMBOL has been added to the $DS_CLIDEF macro, and may be used by any diagnostic. This code causes PARSE to recognize a string composed of the characters "A" to "Z", "a" to "z", "0" to "9", "$", and "_".

- In standalone, the $SETPRT service would return an incorrect

address vector. The start address would be 1FF hex, due to a reversal of operands in a BICL3 instruction. The address will now be correct.

o In standalone, the $DS_RELBUF (or $CNTREG) would fail with an ERRSUP (Supervisor fatal error) if the page geing released was in P1 or SYS space and had been modified with memory management on (M bit set in PTE). V6.3 corrects this problem.

2.0 ENHANCEMENTS

o Several QIO driver service entry points have been added to support level 2R to level 2 conversion: IOC$ALLOSPT, EXE$MAXACMODE, and EXE$READLOCK. These entry points are defined in the DIAG.MLB $DS_QIOVEC macro.

o Previous to V6.3, it was possible to attach a device to any of the predefined "main buses" recognised by the supervisor. Now, an error message will result if the main bus name does not match the CPU type; for example, if a device is attached to an SBI on a COMET processor the error message is "there is no SBI on this type processor." Also, two new "main bus" names have been defined. These can be used on any VAX implementation. They are PHAD (for "Physical Address Decoder") and HUB.

o The $DS_SETVEC macro (DS$SETVEC routine) now allows setting the processor mode in which an interrupt will be handled, without changing the handler address. To do this, set the SRVADR argument to 0, and use the CODE argument as usual. Bits 2 to 31 of the SCB vector will be unchanged, but bits 0 and 1 will still be set to CODE.

o New commands. These support customer service and manufacturing in using terminals narrower than 132 columns, without losing data.

- SET WIDTH n
- SHOW WIDTH

These commands will be accepted and carried out in user mode, but will have no effect on terminal characteristics (use VMS SET TERMINAL/WIDTH=n before running Supervisor). In standalone, a newline is forced when the cursor (printhead) passes column n.

o In user mode (only), the Supervisor will accept subdirectories in file specifications.

o HELP FILE: Where possible, I have included standard (fixed) CSR and vector addresses in the DEVICE portion of EVSAA.HLP. Also, the lines which used to read "Device:" now read "Description:" to avoid possible confusion over actual names. Finally, the recommended generic names have been brought into agreement with the "MASTER LIST OF PDP-11/VAX-11 DEVICE NAME CONVENTIONS" maintained by Kerby Altmann of VMS Development.

o Beginning with V6.3, the Supervisor .DOC file will contain a concatination of all release note files (from V5.3 on). This

will allow easier reference to warnings on use of Supervisor features, as well as tracking enhancements/bug fixes.

1.0 BUG FIXES

- QIO driver entry points IOC$ALLOSPT, EXE$MAXACMODE, and EXE$READLOCK, which were supposed to have appeared in version 6.3, somehow didn't. They are present in 6.4.

- ECSAA attached MASSbus load device incorrectly. This has been fixed.

- Most bits of the 11/750 UBI register are undefined, specified as MBZ (Must Be Zero) but are actually unpredictable. This is confusing in the output of a $DS_SHOWCHAN call. Therefore, the Supervisor will now mask out these undefined bits.

- The $SETPRT system service (standalone) would not work if the caller was not already in Kernel mode. Version 6.4 will do a CHMK to insure kernel mode privilege for the routine.

- The byte context PRVPRT output argument of $SETPRT was being written as a longword. Version 6.4 will write it as a byte.

- The diagnostic cleanup code was not called when a loop on subtest terminated. This has been fixed.

- If a range of tests were used with the /SUBTEST qualifier, the diagnostic would loop on the first subtest with the specified number, irregardless of which test it was in. Now, it will only loop on the correctly numbered subtest in the last test number given.

- The VMS console device non-interrupt I/O drivers have been incorporated into the Diagnostic Supervisor. This means console reads which fail due to media bad spots will be re-tried. (This is more of an enhancement, but is listed under bugs because Manufacturing has complained of trouble with console bad spots under APT control).

- The bliss diagnostic library (DIAG.L32) had several bugs in it, including incorrect macros for $DS_$INITIALIZE and $DS_$STRING, many errors in %ERROR statements to point out bad macro useage, and incorrect compilation of $DS_PRINTSIG macro. These have all been fixed.

- A bug in $DS_SETVEC prevented setting the mode in which a 'soft-vectored' exception was handled. Soft vectored exceptions include BPT and T-bit traps. This problem has been fixed.

2.0 ENHANCEMENTS

- FIELD definitions for all Ptable types known to the Supervisor have been added to the Bliss library (DIAG.L32). They can be used via the $DS_HPODEF macro; for example, "$DS_HPODEF ($DS_DZ11_DEF)" allows

access to the basic Ptable fields, plus the fields of the DZ11 Ptable. Also, literals representing the length of these Ptables have been added. There are no FIELD definitions for Ptables which have no device dependent fields.

- Correct spelling of many Supervisor messages, and change to mixed case for greater legibility.

3.0 MISCILLANEOUS

- Note: The $SETAST system service (as documented in the VMS System Service manual) is supported by the Supervisor in standalone. It was added in version 5.4 for Supervisor internal use and was not documented. It may be used by level 2 and 3 programs freely.

- Note: The Diagnostic Design Guide is in error over the PRINT ($DS_PRINTX, $DS_PRINTB, $DS_PRINTF) format argument. It should be counted ascii (ASCIC) not ASCID.

3.1 Previously Undocumented Gems Of Wisdom: Linking Diagnostics

- Bliss-32 => If a diagnostic is written entirely in Bliss-32, without any Macro-32 modules, the diagnostic must be linked with a DS.STB file defining Diagnostic Supervisor entry points (for system services, etc.).

  DS.STB can be created easily from the following Macro-32 source:

```
        .TITLE  DS.STB  Symbol table to link with BLISS modules
        .LIBRARY        'SYS$LIBRARY:DIAG'
        $DS_DSADEF      GLOBAL
        $DS_DSSDEF      GLOBAL
        .END
```

  And assembled/linked as follows:

```
        $ MACRO DS
        $ LINK/SYMBOL_TABLE=DS/NOEXECUTABLE DS
```

  Link <diag> as such:

```
        $ LINK <qualifiers> <diag>+DS.STB
```

- Macro-32 => The $DS_BGNMOD and $DS_ENDMOD macros use a label called $M0 for checking. The $DS_BGNMOD macro defines "$M0 == 0", and the $DS_ENDMOD defines "$M0 == $M0 + 1". Therefore, a missing $DS_BGNMOD macro will cause an "undefined symbol" error at assembly time in that

module, and a missing $DS_ENDMOD will cause a "multiply defined global" error at link time, due to the fact that correct module(s) define $M0 as 1 and modules missing $DS_ENDMOD macros define $M0 as 0.

RELEASE NOTES FOR
VAX-11 DIAGNOSTIC SUPERVISOR
VERSION 6.5
4-DEC-1981

A. GENERAL ENCHANCEMENTS

1. UNIBUS Mapping

The entire UNIBUS is now mapped, instead of just the I/O pages. This allows diagnostics to get UNIBUS NXM errors instead of access violation errors.

2. Channel Services status

By popular demand, channel services has been enhanced to return additional information:

- o UNIBUS NXM errors reported by bit CHS$M_BUSNXM
- o MASSbus writecheck errors reported by three bits:
  - a. CHS$M_CHNDPE is set if either of the other two are set:
  - b. CHS$M_MBAWCKLWR is set if the MASSbus write check lower bit is set.
  - c. CHS$M_MBAWCKUPR is set if the MASSbus write check upper bit is set.

3. APT troubleshooting

To enable troubleshooting of diagnostic problems under APT, the hardware context will not be initialized when an ABORT command code is received from APT, if errors have occurred.

4. Automatic diagnosis assistance

There are several programs (including APT, RD, and EVXBB) which act as operators to VDS. Currently, this process requires parsing of the VDS ASCII output. With Version 6.5, VDS is growing to make the task of automated diagnosis easier: A new flag has been implemented, called BINARY. When this flag is set, VDS will output a binary 'type byte' as the first byte of every message (including prompts and diagnostic PRINTS). This type byte will indicate the message class (e.g., command error, program start, harderror, etc.) The type codes are defined in macro $DS_TYPECODE in DIAG.MLB and DIAG.L32. Currently, the implementation is incomplete. Most messages for this release will have a type code of 0 (ds$k_type_general). Only prompts, program sequence messages (start, first_pass, end, etc.), and command messages will generate meaningfull type codes. The BINARY flag is off by default, and is not turned on by SET FLAGS ALL (or turned off by CLEAR FLAGS ALL).

5. DEVICE UNIQUENESS

The concept of a unique device has been altered. Previously two devices with the same name were considered the same, and could not be ATTACHed at the same time. To support network nodes

(which may be accessible through several different network adapters), TWO DEVICES WITH THE SAME NAME BUT DIFFERENT LINKS ARE NOW CONSIDERED DIFFERENT. This means that a device attached to the wrong adapter can not be 'edited' by re-attaching it. The new DEATTACH command gives the ability to correct any ATTACH errors.

6. Error messages

All error messages (ERRHARD, ERRSOFT, ERRDEV, ERRSYS, and "Software detected error") now include a trailing "End of error" line heralded by "********". This makes it easier to separate errors and assorted intervening text on printouts. It was particularly devised in conjunction with the BINARY flag (see item 4 in this section), and has its own unique type code.

B. COMMAND ENHANCEMENTS/ADDITIONS

1. New Qualifier /BRIEF

This qualifier can be used on the SHOW DEVICE and SHOW SELECT commands. It will cause only the device name and type fields to be printed.

2. New qualifier /ADAPTER=name

This qualifier can be used on the DEATTACH, SELECT, DESELECT, and SHOW DEVICE commands. It will limit the command to devices attached to the adapter with device name 'name'. E.g., for select, "SELECT/ADAPTER=DW0 ALL" will cause all devices attached to DW0 (but not devices attached in turn to those devices) to be selected for test. The special adapter name "HUB" is recognised, but not "SBI", "CMI", etc.

3. DEATTACH

This command reverses the ATTACH command for a device. It can be used to remove incorrectly attached devices. The /ADAPTER=name qualifier is REQUIRED on this command. Since Ptables are linked in a tree structure, it makes no sense to de-attach a device which has other devices attached to it, unless those devices are also de-attached. Therefore, the DEATTACH command will recursively "seek and destroy" all lower level devices for each device it de-attaches. E.g., if DW0 has devices DMA and TTA attached to it, TTA has device TTA0 attached to it and DMA has DMA0 attached to it, typing "DEATTACH/ADAPTER=HUB DW0" will cause DW0, DMA, TTA, DMA0, and TTA0 to be de-attached. a message will be typed for each as it is de-attached. (note that the message order may appear strange, since the de-attach routine does a post-order search).

4. EXIT

In on-line mode, this command will execute a VMS $EXIT system service to terminate the VDS image. In standalone, it will do a HALT after re-initializing the machine (a console CONTINUE will return to VDS command mode, however).

5. SHOW BASE

   Displays the current base value. (as in "SET BASE").

6. SHOW DEFAULT

   Displays the current default radix and data size.

7. SHOW SECTIONS

   Lists the SECTION names supported by the current diagnostic. An error results if no diagnostic is loaded.

8. SHOW STATUS

   Prints the name, revision, current time, error count, section, pass count, test, subtest, and PC for a CNTRL/C'd diagnostic. If there is not a running diagnostic, an error is typed.

9. SHOW SUPPORT

   Prints the list of devices supported by the current diagnostic. An error results if no diagnostic is loaded.

C. GENERAL CLI/PARSE ENHANCEMENTS

1. New PARSE features

   Special function codes have been added to PARSE to improve command parsing for the VDS CLI (they can also be used by diagnostics):

   o CLI$K_EOL: Accepts a string consisting of blanks (any number of spaces and/or tabs; including none of either) followed by either end of line (no more characters in string) or a "!" character (comment delimiter). It will call the action routine and branch through the miss label, as appropriate.

   o CLI$K_SLASH: Accepts blanks, followed by the character "/" followed by blanks.

   o CLI$L_COMMA: Like CLI$K_SLASH, but expects a "," instead of a "/".

   o CLI$K_VALUE: like CLI$K_SLASH, but expects either an "=" or a ":" instead of a "/". "=" and ":" are exactly equivalent (as in VMS DCL).

2. CLI improvements:

   o CLI uses the features listed above to make command syntax more flexible. For example, the qualifier "/PASSES:1" is the same as " / PASSES = 1".

   o The old CLI had two error messages: "Illegal command" and "Ambiguous command"; both of which were usually rather ambiguous themselves. The latter has been replaced by "Incomplete command" and the rules for generating each have

been tightened:

a. A command is illegal if something unexpected is found. E.g., the command "XYZZY".

b. A command is incomplete if something expected is NOT found. E.g., "CLEAR" lacking any arguments.

Furthermore, both error messages include some information on what was in error. "Illegal command" displays the command line UP THROUGH THE FIRST ILLEGAL CHARACTER. "Incomplete command" displays up to where the expected data should have been. E.g., the command "XYZZY" results in:

```
?? Illegal command
   \X\
```

while the command "CLEAR" results in:

```
?? Incomplete command line
   \CLEAR\
```

D. PTABLE DESCRIPTOR ENHANCEMENTS

1. New directives

o Previously, to request logical (yes/no) data, it was necessary to use the $DS_$STRING directive, supplying prompt, "NO", and "YES" strings. I have implemented the new directive $DS_$LOGICAL. It's only argument is the prompt string. This saves program space, and also allows ABBREVIATION of the words "Yes" and "No". All Ptable descriptors within VDS which require "Yes/No" input have been modified to use this directive.

o Value translation can now be accomplished by the directive $DS_$CASE. The argument is a list of "case_pairs"s. The current VALUE register is compared to the first value of each pair until a match is found; the second value of that pair becomes the new VALUE, and the case directive is exited. VALUE is not altered if no match is found.

Bliss-32:

```
$ds_$case (<1,%x'FFF'>, <2,%x'1CE0'>)
```

MACRO-32

```
$ds_$case <<1,<^xFFF>><2,<^x1CE0>>>
```

E. MISCELLANEOUS ENHANCEMENTS

1. VERIFY

VDS now supports a mechanism similar to the VMS "SET [NO]VERIFY". The flag VERIFY can be set or cleared via "SET FLAG VERIFY" or "CLEAR FLAG VERIFY". When the flag is set, commands read from VDS scripts are echoed to the console. When the flag

is clear, command lines are not echoed. This does not affect error or information messages, and has no effect unless commands are being processed from a VDS SCRIPT file : commands read from a VMS command file are considered by VDS to be coming from the console!

!!The flag is CLEAR by default!!

2. MIXED CASE MESSAGES

Many messages throughout VDS have been altered from all caps to mixed case. We feel that this is much easier to read, as well as appearing "warmer", in the line of "human engineering".

F. BUG FIXES

1. Ptable descriptor location

A bug has existed which could cause errors when a program's DEVTYP list existed but had 0 elements. This has been fixed.

2. ATTACH

It is now possible to CNTRL/C out of an ATTACH prompt. Furthermore, ATTACH will not attempt to prompt a SCRIPT or APT for a missing or invalid parameter: the command will be aborted. From a SCRIPT, the error "Prompt not found" is generated. From APT mode, a "Software detected error" is generated.

3. Fixes to DIAG.L32 macros

- $DS_ENDMOD malfunctioned when a module did not contain tests (incorrectly setting an overlayed PSECT which at runtime should contain highest test number). This has been fixed.
- $DS_HPO_DECL has been fixed to correctly accept multiple arguments.
- $DS_$STRING and $DS_$INITIALIZE did not function properly. Now they will.

4. Event flag services

All standalone event flag services have been re-written to correspond to the VMS services. The $SETEF and $CLREF services will return SS$_WASSET or SS$_WASCLR when they should, as will $READEF.

G AUTOMATED DIAGNOSTIC QUALITY ASSURANCE

G.1 Background

Enhancements have been made to the Diagnostic Supervisor to enable it to automatically perform Quality Assurance checks on diagnostic programs.

This version of the Supervisor performs the Normal Start check

(Section 3.1 in the "VAX Diagnostic Quality Assurance Checklist"), the Multiple Pass check (Section 3.2), the Loop on Test check (Section 3.7), and the Run Backwards check (Section 3.5). Other sections in the checklist will be added to the Supervisor as time and resources permit.

The Normal Start check does the following: saves the current setting of the Supervisor flags; turns on the TRACE flag; turns off the following flags: BELL, IE1, IE2, IE3, IES, LOOP, OPER, PROMPT, QUICK, and SEARCH; performs a normal start of the diagnostic program, running all the tests in the specified section; turns the TRACE flag off; and either stops when a QA error is detected or proceeds to the next check.

The types of errors that the Normal Start check will detect are asking for operator input when the no-default flag is set (in the $DS_ASK macro) and reporting a diagnostic error via one of the $DS_ERR macros. When a QA error is detected, the Supervisor will print out information that should help the diagnostic engineer determine why the program failed QA. Then, an overall error summary table is printed, the Supervisor flags are restored to their previous settings, and the diagnostic is aborted.

If the Normal Start check succeeds, the Multiple Pass check is performed. This check performs a number of passes of the diagnostic program. The current setting of the QAMULTIPLEPASS flag is the number of passes that will be executed (see Section G.4). The types of QA errors that can occur are the same as those in the Normal Start check.

If the Multiple Pass check succeeds, the Loop on Test check is executed. This check runs each test QATESTLOOPS times (see Section G.4). Assuming a diagnostic has tests 1, 2, and 3, and QATESTLOOPS has been set to 4, this check will run the initialization code, followed by tests 1, 1, 1, 1, 2, 2, 2, 2, 3, 3, 3, and 3. The types of QA errors that can occur are the same as those in the Normal Start check.

If the Loop on Test check succeeds, the Run Backwards test is executed. This check runs the tests in reverse order. If a diagnostic contained tests 1, 2, 3, and 4, this check would execute the initialization code followed by test 4, test 3, test 2, and then test 1. The types of QA errors that can occur are the same as those in the Normal Start check.

If the Run Backwards check succeeds, the overall error summary table is printed, a line is printed saying that the program passed Auto-QA, the Supervisor flags are restored to their previous settings, and the diagnostic is aborted.

G.2 START/QA

A new qualifier has been added to the START command. If the START command contains the /QA qualifier, QA will be performed on the currently loaded diagnostic program. If the /QA qualifier is present, the /PASSES, /SUBTEST, and the /TEST qualifiers are

ignored. The /SECTION qualifier may be used to run QA on a particular section in the program.

G.3 RUN/QA

The /QA qualifier has also been added to the RUN command. It functions exactly the same as the /QA qualifier on the START command.

G.4 QA Flags

There are five new Supervisor flags that will affect QA. However, only two of these are used in the current implementation.

The QAMULTIPLEPASS flag controls how many passes are performed in the Multiple Pass check. This flag may be set as follows:

```
DS> SET QAMULTIPLEPASS 10
DS> SET QAM 3
```

In addition, the current setting of the flag may be printed as follows:

```
DS> SHOW QAMULTIPLEPASS
DS> SHOW QAM
```

Note that the QAMULTIPLEPASS flag may be abbreviated to QAM. The initial (and default) setting for this flag is 10. That is, 10 passes of the diagnostic will be executed in the Multiple Pass check.

The QATESTLOOPS flag controls now many times each test is executed in the Loop on Test check. For example, if a diagnostic program contains three tests and QATESTLOOPS equals 2, this check will first execute the initialization code, then tests 1, 1, 2, 2, 3, and 3.

This flag may be SET and SHOWn in the same manner as the QAMULTIPLEPASS flag. This flag may be abbreviated to QAT. The initial (and default) setting for this flag is 100.

Also, the following command will set all the QA flags to their default settings:

```
DS> SET QADEFAULTS
```

QADEFAULTS may be abbreviated to QAD. To show the default settings (not the current settings) of the five QA flags, the following may be used:

```
DS> SHOW QADEFAULTS
```

G.5 Modifications Necessary For QA

Diagnostic programs wishing to undergo QA must call the $DS_ENDPASS macro in the initialization code. This is necessary for the internal Supervisor sequencing of QA checks. The branch macros discussed in the "Design Specification for Automatic Quality Assurance for Diagnostic Programs" need not be used in the diagnostics for this version of QA.

Because of the way the Supervisor works, the code executed in the diagnostic's initialization code when pass0 is true (in conjunction with the $DS_BPASS0 or $DS_BNPASS0 macros) will be done only once. It is done at the start of the Normal Start check. Also, the cleanup section will be done only once. It is done at the conclusion of the Normal Start check (before the Multiple Pass check is started).

Thus, the whole QA sequence of checks may be thought of as executing the diagnostic a number-of-passes times, with different things happening in different passes. That is, one pass is executed for the Normal Start check, then QAMULTIPLEPASS passes are executed in the Multiple Pass check, then one pass is executed in the Loop on Test check (with the tests executing more than once), and then one pass is executed for the Run Backwards check (with the tests being run in reverse order).

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 6.7 03-May-1982

A. GENERAL ENCHANCEMENTS/NOTES

1. This release is almost identical to the Version 6.6 VDS which was released in the previous cycle. However, due to technical difficulties, particularly due to the support of VMS V2-style QIO interface in standalone, while linking VDS under V3 of VMS, it was not possible to release version 6.6 VDS for 11/780 and 11/750 processors.

   This release (6.7) includes all three processors; ENSAA (11/730), ECSAA (11/750), and ESSAA (11/780).

2. VMS V3a support

   Support of VMS V3a includes support for the new system directory structure, where [SYS0.SYSMAINT] replaces the old [SYSMAINT] directory. Earlier versions of VDS will not operate correctly with a 'rooted' SYSMAINT directory. This support requires DIAGBOOT.EXE V4, which was released with the previous release cycle.

   A side-effect of the support of rooted systems is that VDS now fully supports subdirectories in standalone mode.

   NOTE that while VDS 6.7 supports the directory structure of VMS V3a, it is linked under VMS V2.5, and so will run under VMS V2.5 or V3a.

3. New Device support

   VDS V6.7 includes support for the UDA-50 UNIBUS to SI disk adapter/controller, and for the RA- series disk drives which can attach to it.

B. COMMAND ENHANCEMENTS/ADDITIONS/FIXES

1. SELECT/DESELECT

   In version 6.5, the SELECT and DESELECT commands did not handle the new definitions of 'device uniqueness' correctly. If the device name specified was attached to more than one adapter, the commands would simply act upon the first such device found (unless the /Adapter qualifier was used). Since the SELECT command affects the order in which device names are searched, this often meant that it was impossible to DESELECT the device which had been SELECTed; yet no error message was given. Now, such a situation will result in an error message saying that the /Adapter qualifier must be used.

2. HELP

   In the process of major restructuring of the VDS command parser for version 6.5, a bug was inserted in the parsing of the HELP

command. Specifically, any command line which began with 'H' was taken as a HELP command; for example, a 'SHOW' command mis-typed as 'HSOW' was interpreted as if 'HELP SOW' had been typed. This has been fixed for VDS 6.6.

3. SHOW MEMORY

This new command displays the layout of VDS memory. In default mode, the start and end addresses of the diagnostic, VDS, and dynamic memory (used by VDS) are typed, as well as the physical memory size of the system, in both HEX and DECIMAL radix. There are several qualifiers to this command. Note that you can not use these qualifiers prior to the MEMORY keyword. E.g., 'SHOW MEMORY/ALL' but not 'SHOW/ALL MEMORY'.

a. /MAP : same as default mode

b. /DATA_STRUCTURE : shows internal VDS data structure addresses, including all stacks, page tables, SCB, and various simulated VMS data structures (PCB, PHB, etc.). knowing the addresses of these data structures can be usefull in debugging. Note that the memory layout in on-line mode is quite different than in standalone; in on-line mode, none of the aforementioned data structures are present within VDS memory space, and will not be displayed.

c. /BUFFER : Show available space for diagnostic buffers, both above and below VDS (this command is not meaningfull when no diagnostic is loaded). Note that since on-line mode allocates buffer space above VDS via $FXPREG as it is requested, /BUFFER on-line will not show space above VDS.

c. /ALL : Combine /Map, /Data_Structure, and /Buffer

4. DIRECTORY

The DIRECTORY command has been enhanced. Previously, it would accept as arguments only the device and directory parts of a filespec, and would take only one level of directory in standalone mode. Now, you can specify the filename, type, and version fields of the filespec; additionally, both the filename and type fields may include both "*" and "%" wildcards (with the same meaning as under VMS). Furthermore, subdirectory specification is now legal in standalone as well as on-line.

5. SUMMARY

The SUMMARY command has been enhanced. Whether or not the diagnostic program contains summary code, VDS will generate a header containing the name of the diagnostic and a summary of all HARD, SOFT, DEVICE, SYSTEM, and SUPERVISOR DETECTED errors which occurred during the run.

C. AUTOMATED DIAGNOSTIC QUALITY ASSURANCE

1. Introduction

These sections will explain what functionality I have added to the Automatic Quality Assurance enhancement to the Diagnostic Supervisor, and what problems I have fixed since the 6.5 version of the Supervisor. Note that when I speak of versions of QA or versions of the Diagnostic Supervisor, I am actually speaking of the same thing.

2. Additional Functionality

The following gives the two new QA checks that have been added to the 6.6 version:

a. Loop On Subtest check:
This check performs a loop on every subtest in the diagnostic. The number of loops is user-controlled via the QASUBTESTLOOPS Supervisor flag. The following is an example of how this check works:

Assumptions:
Diagnostic EXXXX contains two tests.
Test one has three subtests.
Test two has two subtests.
QASUBTESTLOOPS has been SET to 3.

Order of Execution (Test#.Subtest#):
1.1
1.1
1.1

1.1
1.2
1.2
1.2

1.1
1.2
1.3
1.3
1.3

1.1
1.2
1.3
2.1
2.1
2.1

2.1
2.2
2.2
2.2

2.1
2.2
End of Pass

In the above, the blank lines represent places where QA

internally aborts the diagnostic and restarts it so as to start looping on the next subtest. The ENDPASS routine is only executed at the very end of the check. However, the initialization code and the cleanup code are both executed once for each of the above groupings.

b. Error Phase One check:
This QA check forces as many error reports as possible to be printed. This is a way of insuring that the parameters passed to the error routines are correctly coded, as well as allowing the user to check the format of the error messages. The following lists some points that must be considered when writing a diagnostic that will be QA'ed using Auto-QA:

i. Any error call that was not forced (i.e., was not preceeded by a branch macro in which QA forced the branch to change sense) will be treated as a QA error, resulting in termination of Auto-QA.

ii. No two branch macros should occur in sequence without an intervening error macro call. That is, the sequence should always be one branch macro followed by one error macro call.

iii. No branch macros should occur in a subroutine. Branch macros in subroutines may cause QA to go into an infinite loop and print error reports ad infinitum! This may be fixed in a later version of QA.

iv. The branch macros for use in MACRO diagnostic modules are listed below. For an explanation of the parameters, see Revision 1.1 of the "Functional Specification for Automatic Quality Assurance for Diagnostic Programs" memo. Contact Jack Stansbury (TW/F18) for a copy of this memo.

```
$DS_BLSS        ADR, NUM
$DS_BLSSU       ADR, NUM
$DS_BLEQ        ADR, NUM
$DS_BLEQU       ADR, NUM
$DS_BEQL        ADR, NUM
$DS_BEQLU       ADR, NUM
$DS_BGEQ        ADR, NUM
$DS_BGEQU       ADR, NUM
$DS_BGTR        ADR, NUM
$DS_BGTRU       ADR, NUM
$DS_BGTRU       ADR, NUM
$DS_BNEQ        ADR, NUM
$DS_BNEQU       ADR, NUM
$DS_BVS         ADR, NUM
$DS_BVC         ADR, NUM
$DS_BCS         ADR, NUM
$DS_BCC         ADR, NUM
$DS_BBS         POS, BASE, ADR, NUM
$DS_BBC         POS, BASE, ADR, NUM
$DS_BBSS        POS, BASE, ADR, NUM
```

```
$DS_BBSC        POS, BASE, ADR, NUM
$DS_BBCS        POS, BASE, ADR, NUM
$DS_BBCC        POS, BASE, ADR, NUM
$DS_BBCCI       POS, BASE, ADR, NUM
$DS_BBSSI       POS, BASE, ADR, NUM
$DS_BLBS        SRC, ADR, NUM
$DS_BLBC        SRC, ADR, NUM
$DS_BERROR      ADR, NUM
$DS_BNERROR     ADR, NUM
```

v. The branch macros for use in BLISS diagnostic modules are as follows (note that the BCS, BCC, BVS, and BVC branch macros are not implementable in BLISS):

```
$DS_BLSS    (VAL, NUM)
$DS_BLSSU   (VAL, NUM)
$DS_BLEQ    (VAL, NUM)
$DS_BLEQU   (VAL, NUM)
$DS_BEQL    (VAL, NUM)
$DS_BEQLU   (VAL, NUM)
$DS_BGEQ    (VAL, NUM)
$DS_BGEQU   (VAL, NUM)
$DS_BGTR    (VAL, NUM)
$DS_BGTRU   (VAL, NUM)
$DS_BGTRU   (VAL, NUM)
$DS_BNEQ    (VAL, NUM)
$DS_BNEQU   (VAL, NUM)
$DS_BBS     (POS, BASE, NUM)
$DS_BBC     (POS, BASE, NUM)
$DS_BBSS    (POS, BASE, NUM)
$DS_BBSC    (POS, BASE, NUM)
$DS_BBCS    (POS, BASE, NUM)
$DS_BBCC    (POS, BASE, NUM)
$DS_BBCCI   (POS, BASE, NUM)
$DS_BBSSI   (POS, BASE, NUM)
$DS_BLBS    (SRC, NUM)
$DS_BLBC    (SRC, NUM)
$DS_BERROR  (VAL, NUM)
$DS_BNERROR (VAL, NUM)
```

After all the errors are forced, a table is printed that summarizes the error numbers. This is the Forced-Error Summary table. This table looks like the following:

```
                    Summary of Forced-Errors
                    ------------------------

Test  X1   Subtest  Y1
--------   ----------
aaaaa-bbbb ccccc-dddd ...
mmmmm-nnnn ...

Test  X2   Subtest  Y2
--------   ----------
```

```
AAAAA-BBBB CCCCC-DDDD EEEEE-FFFF GGGGG-HHHH ...
MMMMM-NNNN OOOOO-PPPP QQQQQ-RRRR ...
...
```

The error numbers are printed in a test/subtest order, with the error numbers sorted within each test/subtest.

The Xi and Yi are the test and subtest numbers, respectively. The 'aaaa', 'cccc', ..., 'AAAA', 'CCCC', etc. are the error numbers that are passed to the $DS_ERRxxxx macro.

The 'bbbb', 'dddd', ..., 'BBBB', 'DDDD', etc. are the number of times that error was forced. This number should be one except in those cases where the same error number is used more than once in one subtest.

If the diagnostic runs on a subset of the total number of tests in the DEFAULT section (by using the /TEST qualifier), the Overall Error Summary table will not be printed.

However, if the /TEST qualifier is not used, the Overall Error Summary table will be printed. This table gives the number of errors that occurred in each QA check. For the 6.6 version of the Supervisor, these numbers should be either all zeroes (in which case a line is printed saying the program passed Auto-QA), or else there will be at most one error (since Auto-QA is aborted upon detection of a single QA error).

3. Auto-QA Problems in the 6.5 Version

The following is a list of problems with QA that were discovered in the 6.5 version of the Supervisor:

a. The Halt-On-Error flag was not cleared before starting QA. I had meant to clear all the Supervisor flags when QA started, and then restore them when QA ended. However, I forgot this one flag. Although it probably will not cause any problems in the 6.5 version, it would have caused problems in this new version.

b. If a previously-started diagnostic is running, a Control-C is typed, and then a CONTINUE Supervisor command is executed, Auto-QA will start behaving strangely (it will set the number of passes to 0, and start executing forever).

c. The cleanup code in the diagnostic was executed at the end of the first QA check, the Normal Start check. After executing the cleanup code, QA caused the diagnostic to continue running by starting the Multiple Pass check. That is, the /QA qualifier on the START or RUN commands cause the following to happen:

   i. The diagnostic is started and executes one pass.

This means it executes the initialization code (doing the pass-zero things, such as allocating buffers and assigning channels), then executes all the tests in the appropriate section (the DEFAULT section by default).

ii. Then, after executing the last test in that section, the Supervisor calls the initialization code again. This time, the pass-zero things will not be done and the ENDPASS routine will be called.

iii. The ENDPASS routine calls the diagnostic's cleanup code (where the buffers are usually deallocated and channels deassigned).

iv. Normally at this point (i.e., when NOT under control of QA), the Supervisor would return to command mode. However, QA will cause the ENDPASS routine to set the number of passes to QAMULTIPLEPASS (settable via a "SET QAMULTIPLEPASS" DS command) and start the Multiple Pass QA check.

v. This causes test one to execute again. Note that the initialization code is NOT executed in between the Normal Start check and Multiple Pass check. Thus, the buffers that were deallocated at the end of the Normal Start check (in the cleanup code) are no longer available to the diagnostic in the Multiple Pass check. This was causing several diagnostics (including the Cluster Exerciser) to fail.

d. The branch macros (i.e., $DS_BERROR, $DS_BLBS, $DS_BBS, $DS_BNEQ, etc.) will destroy the contents of R0. This happens because the branch macros expand into a Supervisor service routine, which is executed with a CALLS instruction. Since R0 is never saved across CALL instructions, the contents can not be guaranteed upon return from this routine.

e. The register values that are printed out when a QA error is detected are incomplete. That is, at most three of the registers are correct, with the others having a default value of zero. This led to some confusion.

f. The /TEST qualifier was ignored on the START or RUN commands when used in conjunction with the /QA qualifier.

g. The /SECTION qualifier did not work properly when used in conjunction with the /QA qualifier. The DEFAULT section is the only section that can be run when using the /QA qualifier.

4. Fixes to the Above Problems

The following describes the status of the above problems:

a. The HALT flag is now cleared when QA is running. As with the other Supervisor flags (e.g., IE1, IE2, IE3, TRACE, BELL, etc.), it is restored to its previous state (i.e., to the same setting it had before the START or RUN command was executed) after QA finishes.

b. A Control-C will now cause the diagnostic currently being QA'ed to be aborted only if Control-C has NOT been disabled by the diagnostic. That is, if the diagnostic has disabled C's, C's will be ignored when running under QA. If the diagnostic has not disabled C's, (they are enabled by default), the Supervisor will gain control (before the diagnostic's Control-C handler) and will abort the diagnostic. Note that a CONTINUE Supervisor command in this context will not work.

c. The way the QA check routines execute the diagnostic has been fundamentally changed. Whereas before the sequence of checks could be thought of as executing a variable number of passes of the diagnostic, the sequence is now like STARTing the diagnostic a fixed number of times (the number of times depends on the number of QA checks).

For example, ASSUMING (note that even though there is none, this has been suggested as an enhancement) there was a new qualifier on the START (and RUN) command that would allow one to select which particular QA check routine to execute (such as /QA=NORMAL_START to execute ONLY the Normal Start QA check on the diagnostic), then the sequence of checks can now be thought of as being:

```
DS> START/QA=NORMAL_START
DS> START/QA=MULTIPLE_PASS
DS> START/QA=LOOP_ON_TEST
DS> START/QA=LOOP_ON_SUBTEST
DS> START/QA=RUN_BACKWARDS
DS> START/QA=ERROR_PHASE_ONE
```

That is, the diagnostic program is reSTARTed at the beginning of each QA check and executes as though a normal START Supervisor command had been executed. This implies that the initialization code is always done at the beginning of each check routine, then all the tests execute (a varying number of times depending on which QA check is executing), then the ENDPASS routine is executed causing the cleanup code to execute, and then the next QA check routine performs the same way. This new implementation should alleviate the deallocation problems encountered by several people.

d. The implementation of the branch macros has changed somewhat. Some diagnostic engineers felt that the $DS_BERROR and $DS_BNERROR macros should NOT alter the contents of R0 both when QA is not running, and when QA is running but not forcing errors (as happens in the Error Phase One QA check). In this version of the Supervisor and of the DIAG library, the $DS_BERROR and $DS_BNERROR macros will alter the contents of R0 only

when QA is running and forcing errors.

For branch macros other than $DS_BERROR and $DS_BNERROR, the contents of R0 may change across the branch macro call. The main reason an exception was made in the case of the above two macros is that they existed prior to the QA enhancement and did not alter the contents of R0. Therefore, to be compatible with old diagnostics, it was felt that this should not change. However, with the new branch macros, R0 will change only in the low bit position (i.e., it may change from a one to a zero, or vice-versa). Note that this bit may change even when the /QA qualifier is not being used (i.e., in normal running of the diagnostic).

e. The register values printed out when a QA error is detected are now correct. The values printed are the values at the time of the call to the Supervisor Service routine that produced the QA error (e.g., a $DS_ERRHARD call).

f. The /TEST qualifier is no longer ignored when used in conjunction with the /QA qualifier. This allows one to run QA on a particular test in a diagnostic, or on a range of tests. However, if the /TEST qualifier is used, the Overall Error Summary table is not printed (see later section).

g. The /SECTION qualifier is still essentially ignored. This will be fixed in the next version of the Supervisor.

D. DIAGBOOT (DIAGNOSTIC SECONDARY BOOTSTRAP PROGRAM)

(DIAGBOOT has not changed from release 6.6 to 6.7 of VDS; this section is included for the convenience of those who have not seen the 6.6 release notes).

DIAGBOOT is loaded by VMB when a BOOT command is issued with register 5 bit 4 set. DIAGBOOT will sense the type of processor (11/780, 11/750, or 11/730) and load the appropriate VDS image (ESSAA, ECSAA, or ENSAA respectively). This new version of DIAGBOOT (version 4) supports the new VMS rooted systems (the old [SYSMAINT] becomes [SYS0.SYSMAINT], or [SYS1.SYSMAINT], etc.). The high nibble (bits 28 to 31) of R5 at boot time represent the hex digit which should be converted to ASCII and appended to the root directory name 'SYS'; this allows system root directories of 'SYS0' to 'SYSF' to co-exist on the same disk pack.

This new version of DIAGBOOT also allows the VDS image being booted to be non-contiguous. With previous versions of DIAGBOOT, VDS had to be contiguous.

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 6.8 6-Jul-1982

A. GENERAL ENCHANCEMENTS

1. ATTACH enforces device naming conventions

An additional Ptable descriptor statement ($DS_$NAME; see VAX-11 Diagnostic Design Guide, chapter 17 for information) allows VDS to verify the names given to devices when they are attached. For example, when an RK07 is ATTACHed, it must have a name of the generic format 'ggan', where 'gg' is the device generic prefix, 'DM', 'a' is the controller letter of the RK611, and 'n' is the unit number. Previously, VDS imposed no constraints on device names other than on whether a unit number was allowed, and on the magnitude of the unit number if allowed.

Because this is new functionality, and some old SCRIPTS or even diagnostics may not function under these new constraints (e.g., scripts which ATTACH an RK07 as 'DM0'), new commands have been implemented which will enable and disable this functionality under operator control. The commands are:

- o SET ENFORCE : This command enables enforcement of device name enforcement. It is the default condition when VDS starts, EXCEPT when running under APT.

- o CLEAR ENFORCE : This command disables enforcement of device name enforcment. It will cause VDS to behave as it did prior to this enhancement. CLEAR ENFORCE is the default condition when VDS is run under control of APT.

****NOTE****
These commands are intended only for EMERGENCY use. You should fix your script files and/or diagnostic programs immediately to conform to the device naming conventions.

2. AUTOSIZER (EVSBA) changes

The autosizer (EVSBA V1.4) has been modified to generate the correct names for V6.8 of the Diagnostic Supervisor. The entire attach command line generated for each device is described in a separated document.

3. $DS_ERRPREP_x [num], [unit], [msgadr], [prlink], [p1--6]

A new error message facility has been added to the Supervisor

for detecting device preparation errors. You should use this macro after detecting a device preparation error (e.g. disk not spinning) instead of another error message facility. The parameter list is the same as for the other error macros and is fully described in section 8.7 of the Vax-11 Diagnostic Design Guide (EK-1VAXD-TM-002).

B. GENERAL BUG FIXES

1. KERNEL STACK NOT VALID ABORTS

Previously, VDS allocated only 3 pages for KERNEL mode stack. In certain commands, notably a directory of an ODS stuctured disk (standalone only, with MM ON), these 3 pages could be overflowed, resulting in a KERNEL STACK NOT VALID ABORT, due to the page below the kernel stack being marked 'no access' to catch stack overflows. To minimize the chances of this sort of behavior, the kernel stack has been expanded to 10 pages for V6.8. This problem can not occur in on-line mode (under VMS).

2. TM03/TE16/TU45/TU77

The problem with not being able to access magtapes on this controller through the Supervisor has been solved in this released.

3. MACHINE CHECK LOGOUT

The machine check logout for the 11/780 (ESSAA) has been changed to show the error summary register in addition to the other parameters.

C. NOTES

1. TM78 SUPPORT

VDS theoretically supports MAGTAPE devices as file load devices. Currently, the only Magtape devices supported are TM03 and TS11 controllers. This release includes the beginnings of TM78 (TU78 drive) support: however, due to a lack of standalone hardware, it is not debugged or supported. This note is just to warn those who may try a file command (DIRECTORY, HELP, LOAD, RUN) from a TM78 magtape, or who look at the VDS map listing and see 'TFBTDRIVR' (which is the VDS TM78 readonly driver) that the TM78 code is undebugged and probably will not work as-is. However, TM78 support will be completed as soon as possible, and documented in a future release.

2. INTERRUPT STACK

The INTERRUPT stack size has be increased 4 pages so the priviledge exerciser can print out errors without failing.

3. CUSTOMER RUNNABLE DIAGNOSTICS (CRD)

The Supervisor has been enhanced to support CRD AUTO TEST on the 11/730 machine. For more information on CRD, see the "Nebula Customer Runnable Diagnostics Functional Specification" DTM-82-001-01, document.

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 6.9 8-Nov-1982

1.0 BUG FIXES

- The following sequence of commands caused a "?? Translation not valid Fault ..." :

  ```
  DS> SET MM ON
  DS> ATTACH ...
  ```

  This occurred only in standalone mode, and only if a program had not been previously loaded with a supervisor LOAD command.

- A "^Z", typed at the console terminal in stand-alone mode, echoed garbage as a non-printing character. It has been fixed so that it now imitates the supervisor EXIT command, and returns control to the console program.

- The following error message appears when any file services (such as LOAD, RUN, DIRECTORY, HELP, and script files) are attempted with an RL11/RL02:

  %RMS-F-DEV, bad device, or inappropriate device type (R0=000184C4)

  This is a bug only in version 6.8 in standalone mode, and is fixed in version 6.9.

- Also, only in version 6.8 and only for the 11/750, there is a bug which prevents the supervisor from loading large files from the console TU58 tape cartridge. Some small files could be loaded. Typically, the tape cartridge indicator light would remain lit for an excessively long time, and eventually the supervisor would respond with an error message. This is fixed in version 6.9.

- New versions of VMS which modify the system service transfer vector table experienced a problem running the supervisor in on-line mode. This occurred because the supervisor copied three pages of system service vectors for its own use, but the transfer vectors had been modified to branch into a fourth page. In order to accomodate other possible modifications to the VMS system service transfer vectors, the supervisor's transfer table was modified to jump directly to the actual VMS system service transfer vector table.

2.0 ENHANCEMENTS

- Support for the TM78/TU78 magnetic tape device as a file load device is now functional. This means that commands such as DIRECTORY, HELP, LOAD, and RUN, will now work when the TU78 is ATTACHed and a SET LOAD command has been executed.

- The SHOW MEMORY/BUFFER command has been enhanced to show the amount of buffer space in use by the diagnostic. The command displays the amounts in use in P0, P1, and S0 space (the number of pages in use). Previously, only the available buffer space was displayed. The SHOW MEMORY/ALL also displays this information.

- CUSTOMER RUNNABLE DIAGNOSTICS (CRD): VAX-11/730 MENU TEST

  The VAX Diagnostic Supervisor now supports VAX-11/730 MENU TEST (CRD MENU) as part of the CRD Package. CRD MENU is an off-line Menu-driven test feature of CRD. The purpose of CRD MENU is to provide the customer, or inexperienced operator, stand-alone VAX Diagnostic test capability for the VAX-11/730 'base' system package and, in particular, for VAX-11/730 Add-on options. CRD MENU, therefore, represents a complementary test package to VAX-11/730 AUTO TEST (see DTM-82-001-01 Nebula CRD Auto Test Functional Specification).

  CRD MENU, when invoked, will automatically determine CRD MENU supported hardware on the system and satisfy the necessary software requirements required for executing VAX Diagnostics. Through the Menu interface, the operator may select and test one supported hardware unit for test, or with the 'Test All' mode feature, select and test all supported system hardware. CRD MENU, therefore, provides full functional verification and fault isolation to the subsystem level of the system.

  CRD MENU is invoked by VAX-11/730 Console Command (typing 'T/M' to console prompt), at the successful completion of VAX-11/730 AUTO TEST (invoked by typing 'T' to console prompt), or from VAX Diagnostic Supervisor Command Level (typing 'CRD' to VDS CLI command prompt). However, the 'CRD' Supervisor command is not supported for use in Supervisor command files.

  Four new Supervisor commands have been added for CRD MENU Test. The commands are as follows:

  ```
  SET CRD/TRACE
  CLEAR CRD/TRACE
  SHOW CRD
  CRD
  ```

  The functions of these commands are explained in the ENSAB.DOC file.

For additional information:

- see ENSAB.DOC
- see the Functional Specification for VAX-11/730 MENU TEST
- Type "HELP ENSAB MENU" to VDS CLI Command prompt (this requires that the ENSAB.HLP file be on the load device).

3.0 MISCELLANEOUS

- A bug in the $D1_ERR_L MACRO in DIAG, which caused an invalid conditional directive, has been fixed.

4.0 KNOWN BUGS AND DEFICIENCIES

- The following commands will cause an error message if a comment follows the command:

```
SET ENFORCE
CLEAR ENFORCE
SET CRD/TRACE
CLEAR CRD/TRACE
SHOW CRD
CRD
```

For example,

```
DS> SET ENFORCE           ! Comment
?? Illegal command
   \SET ENFORCE           ! C\
```

All of the above commands except the 'CRD' command will still perform their correct function even though the Supervisor responds with "?? Illegal command". NOTE: the 'CRD' command will FAIL if the command is followed by a comment on the same line.

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 6.10 3-Jan-1982

1.0 BUG FIXES

- The 6.9 VDS bug concerning comments on the following Supervisor commands has been fixed. All of the following commands now accept comments after the command:
  - SET ENFORCE
  - CLEAR ENFORCE
  - SET CRD/TRACE
  - CLEAR CRD/TRACE
  - SHOW CRD
  - CRD

2.0 ENHANCEMENTS

- Support for the TM80 magnetic tape device as a file load device is now functional. This means that commands such as DIRECTORY, HELP, LOAD, and RUN, will now work when the TU80 is ATTACHed and a SET LOAD command has been executed.

- A new supervisor service call, which loads the COMET PCS microcode and patch bits, has been added. The service is called by a supervisor macro, $DS_LOADPCS_x ($DS_LOADPCS_DEF, $DS_LOADPCS_G, $DS_LOADPCS_L, and $DS_LOADPCS_S for MACRO and $DS_LOADPCS for BLISS), with no arguments. The service returns DS$_NORMAL if the service is completed successfully, and DS$_NOPCS if PCS is not available on this CPU. Currently, the only diagnostic program which uses this call is ECKAX. This release does not contain PCS microcode which affects any instructions. It merely restores the PCS to a known state. If the CPU attempts to execute any of the PCS microcode, an error message will be printed out.

3.0 MISCELLANEOUS

-

4.0 KNOWN BUGS AND DEFICIENCIES

- o

RELEASE NOTES FOR
VAX-11 DIAGNOSTIC SUPERVISOR
VERSION 6.11
23-May-1983

1.0 BUG FIXES

- Implementation of Control-Z recognition in standalone mode was done incorrectly and has been removed, although no symptoms have been discovered.

2.0 ENHANCEMENTS

1. VDS 6.11 supports booting and file loading from HSC50 on CI780.

3.0 MISCELLANEOUS

2. The device name for booting from the RP07 disk will now be DRan and not DBan.

3. The driver for the TM78/TU78 was changed to have a longer delay between accesses of the ATTENTION register during the wait for command completion to prevent spurious operations caused by false signals. The driver was enhanced to work with tapes written at 6250 b.p.i and be usable on drives other that number 0.

-

4.0 KNOWN BUGS AND DEFICIENCIES

-

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 6.12 21-Jul-1983

1.0 NEW FEATURES

- The SET WIDTH command has been changed to work in online mode. The default is the same as for standalone mode, 80 characters.

- The SET PAGE command has been added to freeze terminal output after a specified number of lines. The user is then prompted for more output. The default value is zero, which indicates that no paging will be done. In order to determine a maximum value for a video terminal such that no terminal output will be lost, subtract 2 from the number of lines capable of being displayed at one time by the terminal. Two is the number of lines taken by the prompt message. Thus, for a VT100 with a 24 line screen, SET PAGE 22, will print the maximum amount of lines without any being lost.

- A change has been made so that a person creating a script can force the answer to a prompting question to be fetched from the user terminal instead of from the script. If, in the script, a prompting message is followed by "" instead of the answer to the prompt, then the vds will print that prompt on the terminal and wait for a response to be typed. then the vds will continue executing the script. full documentation on this feature will be available in the next version of the vax-11 diagnostic design guide.

- the rc11 p-table descriptor has been added, so that aztec is now supported with p-table descriptors for the rc11, rc25, and rcf25.

- a new vds service has been added, called $dsGetterm. this service, "get terminal characteristics", can be used in both standalone and user mode to obtain characteristics about the user terminal. you can determine the terminal type, whether it is a video or hardcopy terminal, other information. full documentation on this feature will be available in the next version of the vax-11 diagnostic design guide.

2.0 BUG FIXES

- A problem with ECKAX hanging has been fixed. The CLRVEC routine was changed to reset the clock vector before resetting the clock. This compensates for the TOK hardware bug on 11/750s, which caused interrupts once in a blue moon when resetting the clock.

- $DSPRINT macros now return an error status. SS$NORMAL, SS$BUFFEROVF, or SS$BADPARAM will be returned.

- $DSINLOOP will return DS$NORMAL or DS$ERROR, instead of just setting or clear the low bit of R0.

3.0 MISCELLANEOUS

- LCN Low Cost Nebula will be supported with ENSAA diagnostic Supervisor.

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 6.13 21-Nov-1983

1.0 NEW FEATURES

o

This is the first Diagnostic Supervisor to be linked under version 3 of VMS. Therefore it will not function correctly under those systems running version 2 or earlier versions of VMS.

o

The method of attaching the load path to the CI network has been modified to allow access to a user specified disk on the HSC50 controller. An example of the attach command lines for the 11/780 follows:

```
DS> ATTACH CI780 HUB PAA0 14 5 4
DS> ATTACH CI_NODE PAA0 CIA10 HSC50 10
DS> DISK CIA10 HSC50$DUA1
```

Please note the addition an extra attach command line for DISK and the new form of the generic name. The name must be of the form 'name$DUannn' where 'name' is any alphanumeric string 1 to 6 characters long, and the '$DU' is required. The controller, 'a', is usually 'A' and 'nnn' is the disk unit number.

o A "SET MEMORY n" command has been added which allows the operator to change the amount of total physical memory available to the supervisor and diagnostic programs. This feature is useful when it is desired to verify that a diagnostic program and the supervisor will run in a smaller amount of memory than is actually available on the system.

The unit of measurement for "n" is pages. The value of "n" must be greater than or equal to zero, but less than the last value specified for total available physical memory. Total available physical memory may be reset to the actual available physical memory by using a value of zero for "n". A value greater than the actual available physical memory will be accepted but not used.

The command will not be accepted in user mode. Also note that any devices attached or selected will be deselected and deattached after performing the command.

o An "INITPCS" command has been added. When this command is executed, the supervisor searches for the PCS750.BIN file on the console TU58. If it is found, the supervisor onboard image of the PCS750.BIN is

overwritten with the image found on the TU58. Otherwise, the supervisor onboard image remains the same. Then, the PCS is reloaded with the current PCS image.

This command will be useful when the supervisor being run does not contain the latest PCS750.BIN file, but the file is available on the console TU58. The command is not accepted when running the supervisor under VMS, and will only be accepted when running on an 11/750.

Also, this supervisor contains version CMT098 of PCS microcode patches.

2.0 BUG FIXES

- A bug in the $DS_EXIT TEST macro, which caused an "[aborted]" message to be printed if TRACE was set and the low bit in R0 was clear, has been fixed. Now, the "[aborted]" message will only appear if the program does a $DS_ABORT TEST

3.0 MISCELLANEOUS

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 6.14 20-Feb-1984

1 NEW FEATURES

- New device support is provided for DMZ32.

2 BUG FIXES

- Several supervisor BOOTDRIVRs use the TODR to perform a timeout function. For the 11/750, the TODR remains at zero if the battery backup has failed, and the system has been powered off. Thus, the TODR in this case was not able to perform the timeout function correctly. However, the BOOTDRIVRs were written so that the code would always appear to succeed. This has been fixed by writing a 1 into the TODR (which starts the clock ticking) if the battery backup has failed and the system was powered down. This may fix some of the 'unkown error' problems with supervisor file services for 11/750s.

- The problem of terminal output from a user's control-C handler being suppressed has been fixed. This bug occurred only in standalone mode.

- When a diagnostic is aborted, the supervisor attempts to print out a user PC. When run under VMS, sometimes a PC in VMS system space was printed. This has been fixed.

3 MISCELLANEOUS

- The SET MEMORY command has been enhanced so that ptables for the console load device and the boot path devices are saved. Previously, all ptables were lost.

- The format of supervisor messages which inform the user that an interrupt, trap, or exception has occurred, has been changed to state that the interrupt, exception or trap occurred through an SCB vector rather than just a vector. For example,

?? Reserved/privileged instruction Fault through SCB
vector: 10(X)

instead of,

?? Reserved/privileged instruction Fault through
vector: 10(X)

RELEASE NOTES FOR
VAX-11 DIAGNOSTIC SUPERVISOR
VERSION 7.0
18-Jul-1984

1 NEW FEATURES

o VMS V4 support

1. Long file name support.

Long filename support has been added to this version of VDS. A full file specification will have the capability for the filename and filetype each to have up to 39 characters maximum. The version number can have up to 5 characters. The directory names can have up to 39 characters and up to 7 nested sub-directories, each with up to 39 characters. The device names can have up to 15 characters and overall the full file specification is not to exceed 252 characters including punctuation.

```
EXAMPLE: DEVICE:[DIRECTORY]FILENAME.TYPE;VERSION
           15    39.39.etc    39     39     5
```

2. Long device names.

Support code has been added to allow for device names up to 15 characters. VDS will scan 'device name' line for the long device name format. If found VDS will dynamically add device name buffer space to the Ptable,otherwise device names of the format 'ggan' will be handled as before. In both cases, ,the quadword descriptor ,HP$Q_DEVICE, will contain the length and string address of the device name and HP$T_DEVICE will contain the device name with the format of 'ggan'. The new device name format will be as follows: 'name$ggan',the total combination of which must not exceed 15 characters.

3. DIRECTORY/WIDE

In order to display long filenames, the DIRECTORY command now has a /WIDE switch, which causes one filename per line to be printed. A DIRECTORY command without the /WIDE switch will display filenames in four 20-character columns, but for filenames longer than 20 characters, truncation will occur.

4. The value of the symbols IPL$_TIMER and $IPL_SYNCH is changed from 7 to 8 in VMS V4 library LIB. The supervisor, however, will continue to use the old value (7), because of possible conflicts between QIO services

and timer services. In order that diagnostics are encouraged to use the old value, the $IPLDEF macro has been included in the DIAG libraries.

5. This supervisor is not supported on versions of VMS prior to version 4.

2 BUG FIXES

- The $DS_CI_NODE ptable has been changed so that a response of KL10 to the Node_type question produces a value of 6 and a response of CINT a value of 7.

- Some internal supervisor errors of the form:

    ?? Software detected error in ...

  were causing the supervisor to hang in the middle of printing out the rest of this message. This has been fixed.

3 MISCELLANEOUS

- The supervisor now displays a legal statement at boot time regarding the right to use of the diagnostic supervisor and diagnostic programs.

    Two new VDS services, $DS_MOUNT and $DS_DISMOUNT, have been added.

- As of VMS Version 4, you cannot issue a VMS MOUNT command before running the VDS. If you do, and if the device's p-table indicates that the device should be allocated, then the VDS SELECT command will fail. This failure occurs because the SELECT command will try to allocate the device, but you cannot allocate a device that has already been mounted (in VMS V3 you could, if the device had been mounted by you and not someone else).

    Any diagnostic programs that require a device to be allocated AND mounted before it is tested will not work with this release. We know of only one such diagnostic, EVRMD. We are in the process of correcting the problem. The correction will be in a future release.

- When the supervisor is run in online mode (under VMS), the default load path has been changed to be equivalent to SYS$SYSROOT:[SYSMAINT]. Previously, a bug in the supervisor caused the default load device to be the translated value of SYS$DISK from the process name table rather than from the system name table. Normally, SYS$SYSROOT:[SYSMAINT] is the equivalent of SYS$MAINTENANCE, and the supervisor will be changed in some future release to fully translate SYS$MAINTENANCE.

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 7.1 18-Jul-1984

1 NEW FEATURES

- A new VDS macro has been added to return the size of physical memory, expressed in number of pages. The macro is called DS$MEMSIZE and it accepts one argument, the address of a storage location that will receive the memory size.

- A new VDS command has been added which will print the number and name of the tests in the currently loaded diagnostic program. The command is called SHOW TESTS.

- A new qualifiers has been added to the SELECT command: /NOALLOCATE. When this qualifier is used the device selected will not be allocated to the VDS user. This parameter should be used when selecting a device that is already allocated to another user. Also, the SHOW DEVICES and SHOW SELECT will display the allocation status of the devices for your current process.

- The TU81 magtape is now fully supported as a load device. You can now do operation with tapes at 1600 bpi and 6250 bpi.

- A new naming convention which allows name of the form $m$ggan is now permitted for generic names when you do ATTACH commands. The '$' signs are required and the allocation class 'm' must be a decimal number between 1 and 255. The 'gg' is the normal name with 'a' the controller and 'n' the unit number if required.

2 BUG FIXES

o

A flaw in the operation of the EXAMINE command has been corrected. The fix involved incorrect parsing of an EXAMINE of storage locations 'A' and 'F', which were being confused with the registers AP and FP. The EXAMINE command now works as it should.

o

If the TODR contained a value less than ^X10000000, the supervisor was not recalibrating its software clock from the TODR. This has been fixed by writing the value ^X10000000 to the TODR if the TODR contained less than ^X10000000. Thus, the supervisor will set the TODR at supervisor boot time to ^X10000000 if the TODR contained less than ^X10000000 (^X10000000 is the bias added to the current time of day so that powerfails where the battery back-up also fails can be detected.)

This bug may have caused the supervisor's software time count to become inaccurate when diagnostic programs, which used many $DS_WAITUS or $HIBER calls, were run when the battery back-up had failed.

o Corrected memory data and write bus timeout interrupts were not being forced to use the interrupt stack for the 11/750. This release forces those interrupts to use the interrupt stack. No known symptom had been reported.

o

The command SET PROMPT works properly now as it had not in the past.

3 KNOWN BUGS AND DEFICIENCIES

o

If the 11/750 diagnostic supervisor is booted from a non-console device (a disk), the supervisor is started with cache turned off. This will cause some diagnostic programs, which use supervisor timing services (such as $DS_WAITUS or $DS_WAITMS), to fail in bizarre ways. Therefore, we recommend that you either boot the supervisor from the console TU58, or boot from a disk and then turn on cache with the following supervisor command:

```
DS> DEPOSIT P25 0
```

This will be fixed in the next release of the diagnostic supervisor.

RELEASE NOTES FOR
VAX-11 DIAGNOSTIC SUPERVISOR
VERSION 8.0
Jan. 7, 1985

1 ANNOUNCING A NEW SUPERVISOR, EDSAA, TO SUPPORT THE VAX-8600!

1.1 New Features Include:

o Dual SBI system, SBIA0 and SBIA1, that must be attached to the hub, which is an ABUS, for the 8600. MBA, UBA and CI adapters are then attached to either SBIA0(SI0), or SBIA1(SI1).

For example, ATTACH SBIA HUB SI0
ATTACH SBIA HUB SI1

Then any adapter is attached to either SI0 or SI1.

With a dual SBI configuration on the 8600, it is possible to have a maximum of 8 Unibus's, 4 on each SBI. To accomodate this situation, changes were made to the DW780 Ptable macro. The number of units was changed to accept 8 maximum. Since 3 bits are needed to specify attaching of DW0-DW7, and the DW780 macro only stores the lower two bits of _DRIVE into the _DVA field, the Unibus address space translates as follows: (using a CSR of 760000)

Unibus 0 and 4 = 2013E000

Unibus 1 and 5 = 2017E000

Unibus 2 and 6 = 201BE000

Unibus 3 and 7 = 201FE000

The recommended way of attaching 8 DW780'S:

for SBIA 0, DW0, DW1, DW2, or DW3,

for SBIA 1, DW4, DW5, DW6, or DW7.

WARNING: DW0 and DW4 should not be attached to the same SBIA since they translate to the same Unibus address space. Likewise for DW1 and 5, DW2 and 6, and DW3 and 7.

o Support for the Environmental Monitoring Module, EMM, is included in this supervisor. If any alerts are received from the EMM module from a power supply, temperature sensor, or air blower, the VDS will report a message on the console and

then resume operation.

o This supervisor also supports control from a remote terminal. To make a remote connection, the terminal control switch of the CPU must be set to REMOTE, and a modem must be connected to the rear async-panel port. Then the user can dial-up the cpu and remote connection will occur. You may dial up at any time, either before booting the supervisor, or while the supervisor is up and running.

  Note that terminal input from local or remote consoles will be echoed on both! Thus, if you are using the remote terminal, you can send messages to a user at the local terminal, and vice versa, by prefixing the message with a "!", which indicates a comment line to the supervisor's command parser.

  Also note that command input from both console terminals is not separated by the diagnostic supervisor, so if both users type a command at the same time, the diagnostic supervisor will see a garbled command and report that an illegal command was typed.

1.2 New Features

1. The "delete" key for video console terminals will now do a backspace, space, backspace sequence, which results in erasure of the previous character.

1.3 Bug Fixes

1. Previously, the DIRECTORY command returned "Total of 0 files." when used on the console storage device and a filename or wildcarded filename was specified as an argument. This has been partially fixed, such that if you specify a filename + extension, or a wildcard filename + extension, or a filename + wildcard extension, or some other combination, the desired result will be correct. Note that not all combinations of wildcarding work, and that this is only a problem for the console storage device.

2. Previously, when the 11/750 supervisor was booted from a non-console disk, it came up with cache turned off (VMB was turning it off). The supervisor now turns the cache on when it is booted or started from 10000.

3. If you turned memory management on (SET MM ON), a RUN or START command occasionally would fail with an "Interrupt stack not valid" halt code (04). This would have occurred most on the slower VAXes (11/730). This has been fixed.

1.4 Known Bugs And Deficiencies

1. When running the supervisor in the on-line mode (under VMS), the supervisor's default load device/directory is set to the first equivalence value returned for the SYS$SYSROOT logical name, plus the string [SYSMAINT]. Normally, this will equate to the system disk plus [SYS0.SYSMAINT], e.g. DRA0:[SYS0.SYSMAINT]. If you have arranged diagnostics in a search list structure, you can SET LOAD to a logical name which is equivalent to the desired search list. For example,

```
SET LOAD SYS$MAINTENANCE:
```

RELEASE NOTES FOR
VAX-11 DIAGNOSTIC SUPERVISOR
VERSION 8.1
Mar. 31, 1985

1 ANNOUNCING A NEW SUPERVISOR, EDSAA, TO SUPPORT THE VAX-8600!

1.1 New Features Include:

o Dual SBI system, SBIA0 and SBIA1, that must be attached to the hub, which is an ABUS, for the 8600. MBA, UBA and CI adapters are then attached to either SBIA0(SI0), or SBIA1(SI1).

For example, ATTACH SBIA HUB SI0
ATTACH SBIA HUB SI1

Then any adapter is attached to either SI0 or SI1.

With a dual SBI configuration on the 8600, it is possible to have a maximum of 8 Unibus's, 4 on each SBI. To accomodate this situation, changes were made to the DW780 Ptable macro. The number of units was changed to accept 8 maximum. Since 3 bits are needed to specify attaching of DW0-DW7, and the DW780 macro only stores the lower two bits of _DRIVE into the _DVA field, the Unibus address space translates as follows: (using a CSR of 760000)

Unibus 0 and 4 = 2013E000

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Unibus 2 and 6 = 201BE000

Unibus 3 and 7 = 201FE000

The recommended way of attaching 8 DW780'S:

for SBIA 0, DW0, DW1, DW2, or DW3,

for SBIA 1, DW4, DW5, DW6, or DW7.

WARNING: DW0 and DW4 should not be attached to the same SBIA since they translate to the same Unibus address space. Likewise for DW1 and 5, DW2 and 6, and DW3 and 7.

o Support for the Environmental Monitoring Module, EMM, is included in this supervisor. If any alerts are received from the EMM module from a power supply, temperature sensor, or air blower, the VDS will report a message on the console and

then resume operation.

o This supervisor can be booted and controlled from a remote terminal. To make a remote connection, the terminal control switch of the CPU must be set to REMOTE, and a modem must be connected to the rear async-panel port. Then the user can dial-up the cpu and remote connection will occur. The supervisor can be booted from the remote terminal by the usual commands. If the supervisor has already been booted from the CTY, make the remote connection, type "^P" from the remote terminal, then "CONT".

Note that terminal input from local or remote consoles will be echoed on both! Thus, if you are using the remote terminal, you can send messages to a user at the local terminal, and vice versa, by prefixing the message with a "!", which indicates a comment line to the supervisor's command parser.

Also note that command input from both console terminals is not separated by the diagnostic supervisor, so if both users type a command at the same time, the diagnostic supervisor will see a garbled command and report that an illegal command was typed.

1.2 New Features

1. Several new p-tables have been added. They are: DHU11, DHV11, DR11C, DX20, TU70, and TU72.

2. The number of terminals that can be attached has been increased from 8 to 255 to better support LAT configurations.

1.3 Bug Fixes

1. The /NOALLOCATE switch has been fixed to modify the complete list of devices specified, not just the first device in the list.

2. Previously, when SET P was entered, the supervisor would assume that this was short for SET PROMPT. This is an ambiguity however, since there is also a SET PAGE command. Now, more than just the leading P must be entered to make the command unique.

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 8.2 June 24, 1985

1 NEW FEATURES

1. The number of UNA11 units that can be attached has been increased from 1 to 8.

2 BUG FIXES

1. When booting from a disk connected to an HSC50 which is connected to a CI780 or CI750, the ptable for the CI750/CI780 would sometimes contain the incorrect values for BR and slot number. This has been fixed.

2. When booting from a CI750 disk, the CI750 ptable (PAa0) device name may have been incorrect. This has been fixed.

3 KNOWN BUGS

1. None.

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 8.3 September 23, 1985

1. NEW FEATURES:

1. /BASE and /NOBASE Qualifiers:

The /NOBASE qualifier allows zero to be used in the address calculation for the given command, instead of the default base address.

The /BASE:temp_base allows a temporary base address to be used in the address calculation for the given command, instead of the default base address.

These new qualifiers affect the commands which use the base address set by the SET BASE command: DEPOSIT, EXAMINE, SET BREAKPOINT, and CLEAR BREAKPOINT.(q(_.PARAGRAPH On SET, and CLEAR BREAKPOINT, the /NOBASE qualifier can be abbreviated to /N. For EXAMINE and DEPOSIT, /NOBASE can be abbreviated to /NO, thus keeping /N as the abbreviation for /NEXT:n.

On SET, and CLEAR BREAKPOINT, the /BASE:temp_base qualifier can be abbreviated to /B. For EXAMINE and DEPOSIT, /BASE:temp_base can be abbreviated to /BA:temp_base, thus keeping /B as the abbreviation for /BYTE.

These qualifiers may be placed anywhere on the command line after the command name.

EXAMPLE:

```
SET BASE 100                        ! Sets Default Base.
DEPOSIT /BASE:200 44 555            ! Address is 244.
EXAMINE /NOBASE 244                 ! Address is 244.
   00000244:     555
```

2. New Ptables:

New Ptables have been added for: LN03, LA210, VT61, VT71, VT131, and VT132.

2. Bug Fixes:

1. Console Boot Driver HALT:

If an attempt was made to load a file from the console device when mapping is enabled, the VDS would halt in the console boot driver in the routine DO_MAPPING where physical to virtual mapping would occur, but is not

implemented yet. This problem has been corrected.

2. Online as Subprocess Hang:

   A bug was fixed that was causing the Diagnostic Supervisor to hang when run on-line as a sub-process, communicating via a mailbox. Additionally, the SET WIDTH command will return an error message when run with a mailbox as output.

3. HSC Failover:

   VMB uses bits <15:08> and <07:00> to test for failover to an "alternate" HSC. Diagboot and the Diag Super expect the low byte [<7:0>] to be the "first try" HSC, but VMB uses the second byte [<15:08>] as the "first try" HSC, if the second byte is NON ZERO. If there is a non-zero value in the second byte in R2, the Diag Super will not load, run or get directories in Sysmaint.

   The problem has been resolved by having VDS use the method that VMB uses, as described above.

3. Known Bugs:

   1. NONE.

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 9.0 Dec. 23, 1985

1. Announcing a new supervisor, EBSAA, to support the VAX-8200!

   This version, 9.0, contains the 8200 supervisor. Support includes:

   o A new processor (device type KA820) which contains 4 SLU's (Serial Line Units), a new backplane interconnect called the VAXBI, and a UNIBUS adapter (device type DWBUA) and a BI to SDI adapter (device type KDB50). The KDB50 is used to interface to RA60, RA80, RA81, and RA82 type disks. Since the VAXBI is known as the HUB, these adapters are attached as follows:

```
DS>
DS> ATTACH KA820 HUB KA0   ! cpu
K-bytes of Main Memory? 1024
BI Node Number (HEX)? B
DS>
DS> ATTACH SLU KA0 TCA0
Serial Line Externally Wrapped? Yes
Baud Rate? 9600
DS>
DS> ATTACH DWBUA HUB DW0   ! UNIBUS adapter
BI Node Number (HEX)? 2
B? 4
DS>
DS> ATTACH KDB50 HUB DUA   ! KDB50 adapter
BI Node Number (HEX)? 7
B? 5
```

   o Customer Runnable Diagnostics are not supported on the 8200. The console boot command: T/M, which would ordinarily start CRD in Menu mode, boots the Vax Diagnostic Supervisor.

   o The $DS_CHANNEL service has been enhanced to support BI adapters.

   - The INITA function supports the BUA and the KDB50. It also accepts as an optional argument, time, which is the number of ten-milliseconds to wait for the BI node self-test to complete. If the time argument is not specified, a default of 100 milliseconds is used for the BUA, and 10 seconds for the KDB50.

   - There are two new functions, SELF_TEST and STOP, which are used only for BI adapters. SELF_TEST will initiate the self-test for any BI adapter. This function also accepts the time argument (default is 10 seconds).

The STOP function stops a BI adapter from issuing any more BI transactions.

- The STATUS and ENINT functions accept a new argument (bistsadr) which specifies the address of a quadword which returns the BIIC CSR and the BIIC BER.

- The MACRO-32 format is now:

  $DS_CHANNEL_x, unit, func, [vecadr], [stsadr], [time], [bistsadr]

- The BLISS-32 format is:

```
$DS_CHANNEL (UNIT=unit, FUNC=func, [VECADR=vecadr], [STSADR=stsadr],
                [TIME=time], [BISTSADR=bistsadr]);
```

- Two new return codes have been defined: DS$_BIIC indicates that the BIIC self-test has failed, and DS$_NODE indicates that the BI node self-test failed.

- In addition to the following fields in status-1,

```
CHS$V_SYSERR
CHS$V_CHNERR
CHS$V_DEVERR
CHS$V_PGMERR
CHS$V_DEVBUS
CHS$V_PGMHDE
CHS$V_BUSPDN
CHS$V_BUSNXM,
```

the following new bits have been defined:

```
CHS$V_UIE - Bit 28 - UNIBUS Interlock Error; set if a
                     DATO(B) does not follow a DATIP
                     transaction on the UNIBUS.

CHS$V_BADBDP - Bit 29 - Bad Buffered Data Path; set if
                        data path 6 or 7 is selected.

CHS$V_BADPAR - Bit 30 - Set if RAM parity error occurred.
```

- The bistsadr argument points to a quadword which contains 2 longwords. The first is the BIIC Control and Status Register. The second is the BIIC Bus Error Register. Bit definitions are defined by the $BIICDEF macro. Bit definitions are as follows:

```
BIIC CSR:  BIIC Control and Status Register

BIIC$V_NODE_ID,BIIC$S_NODE_ID - Bits 0-3 - Node ID
BIIC$V_ARBCNTL,BIIC$S_ARBCNTL - Bits 4-5 - Arbitration Mode
BIIC$V_SEIE,BIIC$M_SEIE - Bit 6 - Soft Error Interrupt Enable
BIIC$V_HEIE,BIIC$M_HEIE - Bit 7 - Hard Error Interrupt Enable
BIIC$V_UWP,BIIC$M_UWP - Bit 8 - Unlock Write Pending
```

```
BIIC$V_SST,BIIC$M_SST - Bit 10 - Start Self_Test
BIIC$V_STS,BIIC$M_STS - Bit 11 - Self-Test Status
BIIC$V_BROKE,BIIC$M_BROKE - Bit 12 - Broke
BIIC$V_INIT,BIIC$M_INIT - Bit 13 - Init
BIIC$V_SES,BIIC$M_SES - Bit 14 - Soft Error Summary
BIIC$V_HES,BIIC$M_HES - Bit 15 - Hard Error Summary
BIIC$V_BIICTYPE,BIIC$S_BIICTYPE - Bits 16-23 - BIIC Interface
                                               Type
BIIC$V_BIICREVN,BIIC$S_BIICREVN - Bits 24-31 - BIIC Interface
                                               Revision

BIIC BER:  BIIC Bus Error Register

BIIC$V_NPE,BIIC$M_NPE - Bit 0 - Null Bus Parity Error
BIIC$V_CRD,BIIC$M_CRD - Bit 1 - Corrected Read Data
BIIC$V_IPE,BIIC$M_IPE - Bit 2 - ID Parity Error
BIIC$V_UPEN,BIIC$M_UPEN - Bit 3 - User Parity Enable
BIIC$V_ICE,BIIC$M_ICE - Bit 16 - Illegal Confirmation Error
BIIC$V_NEX,BIIC$M_NEX - Bit 17 - Non-Existent Address
BIIC$V_BTO,BIIC$M_BTO - Bit 18 - Bus Timeout
BIIC$V_STO,BIIC$M_STO - Bit 19 - Stall Timeout
BIIC$V_RTO,BIIC$M_RTO - Bit 20 - Retry Timeout
BIIC$V_RDS,BIIC$M_RDS - Bit 21 - Read Data Substitute
BIIC$V_SPE,BIIC$M_SPE - Bit 22 - Slave Parity Error
BIIC$V_CPE,BIIC$M_CPE - Bit 23 - Command Parity Error
BIIC$V_IVE,BIIC$M_IVE - Bit 24 - IDENT Vector Error
BIIC$V_TDF,BIIC$M_TDF - Bit 25 - Transmitter During Fault
BIIC$V_ISE,BIIC$M_ISE - Bit 26 - Interlock Sequence Error
BIIC$V_MPE,BIIC$M_MPE - Bit 27 - Master Parity Error
BIIC$V_CTE,BIIC$M_CTE - Bit 28 - Control Transmit Error
BIIC$V_MTCE,BIIC$M_MTCE - Bit 29 - Master Loopback Error
BIIC$V_NMR,BIIC$M_NMR - Bit 30 - NOACK to multi-responder
                                 command Received
```

- The message which is printed when an unexpected interrupt occurs from a BI adapter (SCB vectors 100 - 1FC) has been changed to include the BI node number, and the contents of that node's Bus Error Register with a bit-to-text translation.

- When a machine check stack frame is printed, if the BI ERROR bit (4) in the machine check typecode longword is set, the cpu's Bus Error Register is also included.

- The duration of the boot process may vary because it runs self-test on all adapters on the system except the cpu and memory.

2. Vax Diagnostic Supervisor Support for the 8650.

EDSAA has been updated to include support for the 8650. The 8650 represents a 44% speed improvement over the 8600, plus larger 32 M memory boards.

3. Vax Diagnostic Supervisor Support under ULTRIX.

   o Standalone ULTRIX is fully supported in all Supervisors linked now. Any disk for which VDS supports the ODS file structure is automatically supported for ULTRIX. Operation is the same except for the following changes made for the DIRECTORY, LOAD, SET LOAD and RUN commands. ALL VDS COMMAND MAY BE UPPER OR LOWER CASE LETTERS.

   o Legal filename for VDS ULTRIX directories and files can include the symbols A-z, 0-9,. , and * or % for wildcard matching.

   o BOOTING VDS SYSTEMS:

     Booting is the same as now except that your default directory will be ddan:(0,p)field unless the directory value is found in the RPB$T_FILE file of the RPB in which case that will be used. The exception to this is the 11/750 system. The command 'B/60000010' is used instead of 'B/10' in order to set the partition to '6'.

     For the 11750 you use "B/60000010" and that boots the device selected by the switch on the front panel. For the 8200 you use "B/R5:60000010". The boot cmd files for the 11/730 has a "D RB 60000010" command in it which does a deposit to R11 to boot VDS. The 11/780/785 boot cmd files have a "D R11 60000010" command in them to boot VDS under ULTRIX.

   o SET LOAD:

     To run from an ULTRIX disk you did not boot from you will have to issue a SET LOAD command of the form ddan:(0,p)directory. The parentheses and enclosed information are required if you are currently running from an ODS disk. The '0' is a ULTRIX unit number which is not currently implemented and therefore set to 0. The p is a partition number and is generally set to 6 for partition 'G'. The 'directory' value is generally set to 'field' for diagnostics but can be any values (for examples, usr, WORD, field/user/source). The '/' is a delimiter and is use to separate directory names. If you are currently in ULTRIX mode, you can return to the VMS compatible mode by giving a SET LOAD with ddan:[name] where the brackets and directory are required to change over. Once in ULTRIX mode any of the following are valid:

     SET LOAD ddan:(0,p)field/user
     SET LOAD (0,p)field/user

SET LOAD field/user

If a device or '(0,p)' is not specified they are not changed.

o DIRECTORY:

The directory command has several items to note. Assume you have the files evdba.exe and evkab.hlp in the directory DMA0:(0,6)field If you enter DIRECTORY you will get:

evkab.exe evkab.hlp

total of 2 files.

As output. If you do a SET LOAD to field/evkab.exe and then enter the DIRECTORY command you will get

evkab.exe

total of 1 files.

The system will automatically check if the last link given is a valid directory and if not will back up to the previous link and assume you are looking for one particular file which it finds. This is what you would also get if your directory was 'field' and you entered any of the following:

DIRECTORY evkab.exe
DIRECTORY field/evkab.exe
DIRECTORY (0,6)field/evkab.exe
DIRECTORY DMA0:(0,6)field/evkab.exe

Wildcard are support as for ODS disks, but you should be aware that NO DEFAULTS ARE ASSUMED. An ULTRIX file spec does not have the required format of a VMS type file. You will have to enter the name and extension with either actual or wildcard values. The wildcard name may be any combination of upper or lower case letters. The results from a DIRECTORY command will yield all matching files without regards to upper or lower case letters.

o LOAD or RUN:

These commands work similar as before. If you specify a directory link with the file name, you must give the entire string of links. For example if your file eckam.exe is in DMA0:(0,6)field/usr/word directory, and you have done a SET LOAD to this, the command LOAD word/eckam.exe will not work. Any of the following commands will work.

LOAD eckam.exe

```
LOAD field/usr/word/eckam.exe
LOAD (0,6)field/usr/word/eckam.exe
LOAD DMA0:(0,6)field/usr/word/eckam.exe
```

The same format is valid for RUN also.

o RMS protocols:

ULTRIX files do not have a structure like VMS files. However support has been added to make all the old commands be compatible. Sequential and Random (by RFA) access is supported.

1. $OPEN

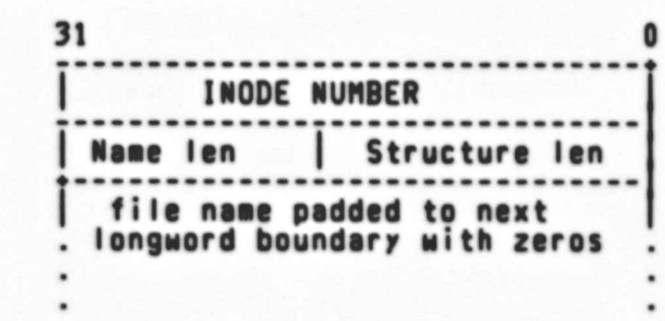
   If you do an $OPEN on a file with the last 4 characters of its $FAB DNM set to .dir (letters any case) the file you get will be the directory the file is in unless it is a directory is which case you will get it.

2. $READ

   This will read in the file to the location you specified. You will have to do any necessary file structure interpretation.

3. $GET

   If the opened file has the last 4 characters of its $FAB DNM set to .hlp or to the length of the line. If the opened file has the last 4 characters of its $FAB DNM set to .dir (letters any case) this will yield a 'record' of the form:



   If anything else is specified for DNM you will get 512 bytes or remaining bytes in the files and you interpret the structure.

This information is subject to change for compatibility with the online support and updates to ULTRIX. Welcome to the world of ULTRIX.

4. A new supervisor service, $DS_PRINTREV has been added.

The Print Revision Level service may be used in diagnostic programs that test devices for which a hardware, firmware, and/or patch revision level is accessible to the program. Such programs may want to indicate whether the device's revision levels are compatible with the revision levels expected by the program.

This service will:

- Compare actual and expected device revision levels specified by the diagnostic program
- Display a message indicating the device's revision level (hardware firmware, or patch), and also indicating whether the revision levels being compared are hardware levels, firmware levels, or patch levels. A module number may be printed, and hardware revision numbers may be converted to a letter code.
- Cause the hardware revision level, firmware revision level and/or patch level to be included in all error messages (generated via $DS_ERRxxxx macros) that are subsequently displayed for the unit in question.

If the device being tested has a software-readable hardware, firmware, or patch level, the $DS_PRINTREV service should be called for each selected device. This call(s) should be made in the "pass 0" section of the initialization code.

If the device has all three (hardware, firmware, and patch) revision types, then the service should be called three times for each selected device; once to report the hardware revision, once for the firmware revision, and once for the patch level. For each logical unit, $DS_PRINTREV can be called four times for each type of revision level. For example, it would be desirable to call $DS_PRINTREV twice for hardware revision levels if a logical unit was a 2-board device, and each board had an associated hardware revision level.

When called, the service will (at the programmer's option) immediately display a message indicating the actual revision level and/or messages indicating whether the actual revision level matches the revision level expected by the diagnostic program. One of the following messages may be printed. (DEVNAME will be replaced by the generic name of the unit in question.)

```
      Hardware revision level of DEVNAME (T1002):    ******
      Hardware revision level of DEVNAME (T1002) is less than that expected by
      diagnostic program.
            Hardware revision level:                 ******
            Revision level expected by program:      ******

      Hardware revision level of DEVNAME (T1002) is equal to that expected by
      diagnostic program.
            Hardware revision level:                 ******
            Revision level expected by program:      ******

      Hardware revision level of DEVNAME (T1002) is greater than that expected by
      diagnostic program.
            Hardware revision level:                 ******
            Revision level expected by program:      ******
      If firmware or patch levels are being reported, the word
      "hardware" in the messages will be replaced with the word
      "firmware" or "patch".

      If the modulenum argument has been passed, the module number
      will be printed for the hardware, firmware, and patch
      messages associated with that module number. If the number
      is not passed, it will not appear in the above messages.

      Each time an error service is called ($DS_ERRxxxx) for a unit
      for which the $DS_PRINTREV macro has been called, the
      hardware revision level, and/or firmware revision level
      and/or patch level will be displayed as part of the error
      message. The message will be displayed AFTER all of the
      error text has been printed. It will be inhibited if the IE1
      flag is set. The format of this display will be:
      ******  program title          program rev. ******
      Pass #, test #, subtest #, error #, date
      Hard error while testing DEVNAME:  text

            text

      Revision level(s) for DEVNAME:
            (T1002): Hardware = X; Firmware = X; Patch = X;
            (T1003): Hardware = Y; Firmware = Y; Patch = Y;

      ****** End of hard error number # ******

      (If any of the levels or the module number are not being
      reported, they will not appear in the revision level
      message.)

MACRO-32 Format:

      $DS_PRINTREV_x log_unit, actual_rev, expected_rev, rev_type,
                           [printmask], [prlink], [modulenum]
```

BLISS Format:

```
$DS_PRINTREV   (LOG_UNIT=log_unit, ACTUAL_UNIT=actual_rev,
                EXPECTED_REV=expected_rev, REV_TYPE=rev_type,
                [PRINTMASK=printmask], [PRLINK=prlink],
                [MODULENUM=modulenum]);
```

log_unit

Logical unit number of device whose revision level is to be checked.

actual_rev

Longword containing the actual hardware, firmware, or patch revision level for the device whose logical unit number is specified with the "logunit" parameter. See note 4. (The diagnostic program determines this value by accessing the hardware.)

expected_rev

Longword containing the hardware, firmware, or patch revision level which was expected by the diagnostic program. See note 4. (This value is placed in the diagnostic program at compilation time.)

rev_type

Longword mask indicating the type of revision code (hardware, firmware, or patch) being compared. Bit definitions are:

- Bit 0 - PRVV_HWREV,PRVM_HWREV - Set this bit to indicate a hardware revision level.
- Bit 1 - PRVV_FWREV,PRVM_FWREV - Set this bit to indicate a firmware revision level.
- Bit 2 - PRVV_PREV,PRVM_PREV - Set this bit to indicate a patch level.

(Only one bit should be set per service call.)

printmask

Longword mask used to control $DS_PRINTREV functions. Bit definitions are:

- Bit 0 - PRMSK$V_LSS,PRMSK$M_LSS - if set, inhibits message that would normally be displayed if the actual revision is less than expected.

- Bit 1 - PRMSK$V_EQL,PRMSK$M_EQL - if set, inhibits message that would normally be displayed if the actual revision is equal to that expected.

- Bit 2 - PRMSK$V_GTR,PRMSK$M_GTR - if set, inhibits message that would normally be displayed if the actual revision is greater than expected.

- Bit 3 - PRMSK$V_ALWAYS,PRMSK$M_ALWAYS - if set, displays the message which lists only the actual revision level.

- Bit 4 - PRMSK$V_TRANSL,PRMSK$M_TRANSL - if set, will convert a hardware revision number to a letter code which represents the functional revision as defined by DEC STD 012. Setting this bit will not result in conversion for firmware or patch revisions. The conversion pattern is shown in table 1. See note 6.

Table 1: Revision Number to Letter Conversion

Field contents [bits <n:0>]	Functional Rev.
0.....0000	pre-release
0.....0001	A
0.....0010	B
0.....0011	C
.	.
.	.
0....11010	Z
0....11011	AA
0....11100	AB
0....11101	AC
.	.
.	.
0...110100	AZ
0...110101	BA
.	.
.	.
0..1001110	BZ
.	.
.	.
1010111110	ZZ

For example, if only bits 1 and 2 are set then a message will be displayed only if the actual revision is less than that expected by the program.

By default, bits 0, 1, 2, 3, and 4 are clear, in which case no conversion will be performed on revision numbers. In addition, a message will be displayed stating whether the actual revision is greater than, less than, or equal to the revision expected by the program. Inhibiting messages does not affect the inclusion of the hardware, firmware or patch revision levels in error messages generated by $DS_ERRxxxx macros.

prlink

Address of a message routine. This optional routine will have the same format as an error reporting routine used with a $DS_ERRxxxx macro. That is, the routine should be delineated with $DS_BGNMESSAGE and $DS_ENDMESSAGE macros and should use $DS_PRINTB and $DS_PRINTX macros for displaying text.

modulenum

Address of a counted ASCII string which represents the unique module number for a board (e.g. "T1002"). If you supply this argument for a hardware revision, then you must supply the same argument for any firmware or patch revision associated with that module.

Notes:

1. Symbols are defined by the $DS_PRINTREV_DEF macro.

2. This macro should only be used for devices having software-accessible hardware, firmware, or patch revision numbers.

3. Some programmer's may want the text displayed only in certain circumstances. For example, perhaps it is the concensus of a particular program's users that the text only be displayed if the actual revision level is lower than that expected by the diagnostic program. In such a case, the "printmask" parameter may be used to inhibit one or more of the possible warning messages.

4. The format of the revision level is irrelevant, but the values passed via the "actual_rev" and "expected_rev" parameters must be in the same format. The service will perform an unsigned comparison of the two values to determine which message to display. Revision numbers will be displayed as unsigned decimal values unless conversion to a letter code is desired.

5. This macro should be used to determine whether current versions of diagnostics are incompatible with old hardware. Since new diagnostics may only run on hardware above a certain revision level, the diagnostic should only set bits 1 and 2 in printmask. This causes a message to be displayed only if the actual revision level is less than that expected by the program.

6. Normally, the hardware revision level should be converted to the corresponding functional revision letter code by setting bit 4 in printmask.

7. If you do not set bit 2 in printmask, a misleading message may result if the actual hardware, firmware, or patch levels were updated without a corresponding change to the diagnostic's expected revision levels.

5. Additions & Fixes.

1. Support has been added for new devices: RD52, RD53, RA82, and LUA11.

2. Channel service for DSINT was returning SS$_NORMAL when DSINT was documented as returning DS$_NORMAL. This has been corrected.

3. A new control flag, AskPrompt, has been added in order to support the new Automated Test and Verification system, SAVES/AVS. When this flag is set, a special prompt, "ASK>", is appended to the user's prompt which was specified for any of the $DSASKxxxx macros. The flag is clear by default.

6. Known Bugs and Deficiencies:

1. The console command language uses the device names CSA1 and CSA2 for the console floppy drives. The supervisor, however, always refers to drive CSA1 as CSA0. Furthermore, although the supervisor can be booted from either floppy drive, files can only be accessed from CSA1. This will be fixed in a future release.

2. When the supervisor is booted, it attempts to automatically ATTACH all of the devices in the boot path. In order to do this, a certain amount of sizing must be done in order to determine the controller letter and drive number of the device name for the disk which was booted from. If you have more than one UDA50 configured on the system, or a combination of UDA50s and KDB50s, and you boot from a disk other than a disk which is connected to the adapter with the lowest node id, the controller letter portion of the device name will not agree with the controller letter assigned by the autosizer.

3. Ultrix mode problems:

1. Some commands are recognized in upper case only. All commands are recognized in upper case, so this is the temporary work-around.

2. Ultrix differentiates between upper and lower case in file names. The VDS maintains this distinction. Therefore, the case of each letter must be correct in order for the VDS to find the file.

3. The Ultrix file system does not support file version numbers as does VMS. Like-wise, the VDS does not support version numbers when referencing Ultrix file systems. Version numbers are sometimes created by the DECnet-Ultrix dcp command. Any files with version numbers must be renamed. Under Ultrix, this is done with the mv command; specifying the file name in single quotes for it to accept the version number. For example: mv 'ECSAA.EXE;1' ecsaa.exe.

4. All scripts run by the VDS must have their file names in upper case. For example, ATT.COM, not att.com.

5. When specifying a file name to the VDS, the complete file name must be specified. For example, @ATT.COM or RUN evsba.exe.

6. If a non-system disk is being used as the load device, that disk must have file systems on both the a and g partitions, with the files wanted in the g partition's file system. No links have to exist between these file systems, however. A file system is created with the Ultrix newfs command. Care must be used, as this command is similar to the VMS INITIALIZE command and will destroy data on the disk.

7. The VDS INITPCS command does not work.

8. When specifying command modifiers, they must be placed on the command verb and not on the file name. For example, use RUN/TEST:3:4 evkab.exe, not RUN evkab.exe/TEST:3:4. The / used to indicate a command modifier to the VDS is also used in Ultrix as part of a file specification.

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 9.1 Jan 20,1986

1. Announcing a new supervisor, EZSAA, to support the VAX-8800!

This version, 9.1, contains the 8800 supervisor

o NAUTILUS I/O consists of the new corporate interconnects: BI,NI,SI,CI and will have 4 I/O channels.

The NAUTILUS NMI-BI (NBI) adapter interfaces the NAUTILUS Memory Interconnect (NMI) bus to two backplane Interconnect (BI)busses.

The NBI is partitioned into three main sections,the NMI port,NBI transaction buffer and two BI users ports,the first two sections are contained on an extended hex module mounted in the cpu backplane (NBIA). Each BI user port is contained on a BI Eurocard (NBIB) located in the BI backplane.

Any NAUTILUS will have a maximum of 2 NBIA's,permitting a maximum of 4 seperate BI channels.

EZSAA has also support for the following adapters:

- BUA, a unibus adapter,device type DWBUA
- BLA, BI to LESI adapter,device type DWBLA. This adapter is primarily intended for TAPE interface on NAUTILUS systems.
- BCI, CI to BI computer interconnect,device type CIBCI.
- BDA, BI to SDI adapter,device type KDB50 The BDA is the primary disk controller for NAUTILUS and will provide the pathway to SI based disks only.

The NMI is known as the HUB,these adapters are attached as follows:

```
DS>
DS> ATTACH KA880 HUB KA0            ! cpu
PRIMARY ? YES
DS>
DS> ATTACH NBIA HUB NBIA0           ! NBI adapter
LOGICAL ADAPTER # 0
DS>
DS> ATTACH NBIB NBIA0 NBIB0         ! NBI adapter
BI # ? 0
```

```
BI Node Number (HEX) ? 2
DS>
DS> ATTACH NBIB NBIA0 NBIB1          ! NBI adapter
BI # ? 1
BI Node Number (HEX) ? 3
DS>
DS>
DS> ATTACH NBIA HUB NBIA1            ! NBI adapter
LOGICAL ADAPTER # 1
DS>
DS> ATTACH NBIB NBIA1 NBIB2          ! NBI adapter
BI # ? 0
BI Node Number (HEX) ? 0
DS>
DS> ATTACH NBIB NBIA1 NBIB3          ! NBI adapter
BI # ? 1
BI Node Number (HEX) ? 1
DS>
DS>
DS> ATTACH DWBUA NBIB0 DW0           ! BUA adapter
BI Node Number (HEX) ? 5
BR ? 4
DS>
DS> ATTACH DWBLA NBIB0 BLA0          ! BLA adapter
BI Node Number (HEX) ? 6
DS>
DS> ATTACH CIBCI NBIB0 PAA0          ! BCI adapter
BI Node Number (HEX) ? 7
BR ? 5
CI Node ? 2
DS>
DS> ATTACH KDB50 NBIB0 DUA ! BDA adapter
BI Node Numbe (HEX) 8
BR ? 6
DS>
```

The LOGICAL ADAPTER #,BI # and the BI Node Number are not arbitrary values, but are based upon the NAUTILUS system I/O configuration, these values are used by the supervisor to construct the device address for each NBIA and BI node that is attached and therefore must be known at attach time.

However,the adapter's drive numbers don't require that restriction,but, because of Vax Diagnostic Supervisor convention,it is advisable that these numbers are assigned in a sequential order.

o Prior to the loading of diagnostics,a console ASSIGN command must be issued ,this will associate the logical name CSA1 with the winchester RD disk. This ASSIGN command can be done prior to the booting of the supervisor or as described below if the supervisor has already been booted.

```
DS> ^p                      ; back to console mode
>>> halt                    ; halt the processor
>>> assign csa1 dw1:        ; do the assign command
>>> continue                ; back to supervisor control
DS> load EVXXX              ; proceed to load diagnostic
```

o Customer Runnable Diagnostics are not supported on the 8800.

o The $DS_CHANNEL service has been enhanced to support BI adapters.

- The INITA function supports the BUA and the KDB50. It also accepts as an optional argument, time, which is the number of ten-milliseconds to wait for the BI node self-test to complete. If the time argument is not specified, a default of 320 milliseconds is used for the BUA, and 10 seconds for the KDB50.

- There are two new functions, SELF_TEST and STOP, which are used only for BI adapters. SELF_TEST will initiate the self-test for any BI adapter. This function also accepts the time argument (default is 10 seconds).

  The STOP function stops a BI adapter from issuing any more BI transactions.

- The STATUS and ENINT functions accept a new argument (bistsadr) which specifies the address of a quadword which returns the BIIC CSR and the BIIC BER.

- The MACRO-32 format is now:

  ```
  $DS_CHANNEL_x, unit, func, [vecadr], [stsadr], [time],
                 [bistsadr]
  ```

- The BLISS-32 format is:

  ```
  $DS_CHANNEL (UNIT=unit, FUNC=func, [VECADR=vecadr], [STSADR=
               stsadr], [TIME=time], [BISTSADR=bistsadr]);
  ```

- Two new return codes have been defined: DS$_BIIC indicates that the BIIC self-test has failed, and DS$_NODE indicates that the BI node self-test failed.

- In addition to the following fields in status-1,

  ```
  CHS$V_SYSERR
  CHS$V_CHNERR
  CHS$V_DEVERR
  CHS$V_PGMERR
  CHS$V_DEVBUS
  CHS$V_PGMHDE
  CHS$V_BUSPDN
  ```

CHS$V_BUSNXM,

the following new bits have been defined:

CHS$V_UIE - Bit 28 - UNIBUS Interlock Error; set if a DATO(B) does not follow a DATIP transaction on the UNIBUS.

CHS$V_BADBDP - Bit 29 - Bad Buffered Data Path; set if data path 6 or 7 is selected.

CHS$V_BADPAR - Bit 30 - Set if RAM parity error occurred.

- The bistsadr argument points to a quadword which contains 2 longwords. The first is the BIIC Control and Status Register. The second is the BIIC Bus Error Register. Bit definitions are defined by the $BIICDEF macro. Bit definitions are as follows:

BIIC CSR: BIIC Control and Status Register

BIIC$V_NODE_ID,BIIC$S_NODE_ID - Bits 0-3 - Node ID
BIIC$V_ARBCNTL,BIIC$S_ARBCNTL - Bits 4-5 - Arbitration Mode
BIIC$V_SEIE,BIIC$M_SEIE - Bit 6 - Soft Error Interrupt Enable
BIIC$V_HEIE,BIIC$M_HEIE - Bit 7 - Hard Error Interrupt Enable
BIIC$V_UWP,BIIC$M_UWP - Bit 8 - Unlock Write Pending
BIIC$V_SST,BIIC$M_SST - Bit 10 - Start Self_Test
BIIC$V_STS,BIIC$M_STS - Bit 11 - Self-Test Status
BIIC$V_BROKE,BIIC$M_BROKE - Bit 12 - Broke
BIIC$V_INIT,BIIC$M_INIT - Bit 13 - Init
BIIC$V_SES,BIIC$M_SES - Bit 14 - Soft Error Summary
BIIC$V_HES,BIIC$M_HES - Bit 15 - Hard Error Summary
BIIC$V_BIICTYPE,BIIC$S_BIICTYPE - Bits 16-23 - BIIC Interface Type
BIIC$V_BIICREVN,BIIC$S_BIICREVN - Bits 24-31 - BIIC Interface Revision

BIIC BER: BIIC Bus Error Register

BIIC$V_NPE,BIIC$M_NPE - Bit 0 - Null Bus Parity Error
BIIC$V_CRD,BIIC$M_CRD - Bit 1 - Corrected Read Data
BIIC$V_IPE,BIIC$M_IPE - Bit 2 - ID Parity Error
BIIC$V_UPEN,BIIC$M_UPEN - Bit 3 - User Parity Enable
BIIC$V_ICE,BIIC$M_ICE - Bit 16 - Illegal Confirmation Error
BIIC$V_NEX,BIIC$M_NEX - Bit 17 - Non-Existent Address
BIIC$V_BTO,BIIC$M_BTO - Bit 18 - Bus Timeout
BIIC$V_STO,BIIC$M_STO - Bit 19 - Stall Timeout
BIIC$V_RTO,BIIC$M_RTO - Bit 20 - Retry Timeout
BIIC$V_RDS,BIIC$M_RDS - Bit 21 - Read Data Substitute

```
BIIC$V_SPE,BIIC$M_SPE - Bit 22 - Slave Parity Error
BIIC$V_CPE,BIIC$M_CPE - Bit 23 - Command Parity Error
BIIC$V_IVE,BIIC$M_IVE - Bit 24 - IDENT Vector Error
BIIC$V_TDF,BIIC$M_TDF - Bit 25 - Transmitter During Fault
BIIC$V_ISE,BIIC$M_ISE - Bit 26 - Interlock Sequence Error
BIIC$V_MPE,BIIC$M_MPE - Bit 27 - Master Parity Error
BIIC$V_CTE,BIIC$M_CTE - Bit 28 - Control Transmit Error
BIIC$V_MTCE,BIIC$M_MTCE - Bit 29 - Master Loopback Error
BIIC$V_NMR,BIIC$M_NMR - Bit 30 - NOACK to multi-responder
                                 command Received
```

2. A new supervisor service, $DS_PRINTREV has been added.

   The Print Revision Level service may be used in diagnostic programs that test devices for which a hardware, firmware, and/or patch revision level is accessible to the program. Such programs may want to indicate whether the device's revision levels are compatible with the revision levels expected by the program.

   This service will:

   - Compare actual and expected device revision levels specified by the diagnostic program
   - Display a message indicating the device's revision level (hardware firmware, or patch), and also indicating whether the revision levels being compared are hardware levels, firmware levels, or patch levels. A module number may be printed, and hardware revision numbers may be converted to a letter code.
   - Cause the hardware revision level, firmware revision level and/or patch level to be included in all error messages (generated via $DS_ERRxxxx macros) that are subsequently displayed for the unit in question.

   If the device being tested has a software-readable hardware, firmware, or patch level, the $DS_PRINTREV service should be called for each selected device. This call(s) should be made in the "pass 0" section of the initialization code.

   If the device has all three (hardware, firmware, and patch) revision types, then the service should be called three times for each selected device; once to report the hardware revision, once for the firmware revision, and once for the patch level. For each logical unit, $DS_PRINTREV can be called four times for each type of revision level. For example, it would be desirable to call $DS_PRINTREV twice for hardware revision levels if a logical unit was a 2-board device, and each board had an associated hardware revision level.

When called, the service will (at the programmer's option) immediately display a message indicating the actual revision level and/or messages indicating whether the actual revision level matches the revision level expected by the diagnostic program. One of the following messages may be printed. (DEVNAME will be replaced by the generic name of the unit in question.)

```
Hardware revision level of DEVNAME (T1002):    ******
Hardware revision level of DEVNAME (T1002) is less than that expected
by diagnostic program.
       Hardware revision level:                ******
       Revision level expected by program:     ******

Hardware revision level of DEVNAME (T1002) is equal to that expected
by diagnostic program.
       Hardware revision level:                ******
       Revision level expected by program:     ******

Hardware revision level of DEVNAME (T1002) is greater than that
expected by diagnostic program.
       Hardware revision level:                ******
       Revision level expected by program:     ******
```

If firmware or patch levels are being reported, the word "hardware" in the messages will be replaced with the word "firmware" or "patch".

If the modulenum argument has been passed, the module number will be printed for the hardware, firmware, and patch messages associated with that module number. If the number is not passed, it will not appear in the above messages.

Each time an error service is called ($DS_ERRxxxx) for a unit for which the $DS_PRINTREV macro has been called, the hardware revision level, and/or firmware revision level and/or patch level will be displayed as part of the error message. The message will be displayed AFTER all of the error text has been printed. It will be inhibited if the IE1 flag is set. The format of this display will be:

```
******  program title          program rev. ******
Pass #, test #, subtest #, error #, date
Hard error while testing DEVNAME:  text

       text

Revision level(s) for DEVNAME:
       (T1002): Hardware = X; Firmware = X; Patch = X;
       (T1003): Hardware = Y; Firmware = Y; Patch = Y;

****** End of hard error number # ******
```

(If any of the levels or the module number are not being reported, they will not appear in the revision level message.)

MACRO-32 Format:

```
$DS_PRINTREV_x log_unit, actual_rev, expected_rev, rev_type,
                        [printmask], [prlink], [modulenum]
```

BLISS Format:

```
$DS_PRINTREV   (LOG_UNIT=log_unit, ACTUAL_UNIT=actual_rev,
                        EXPECTED_REV=expected_rev, REV_TYPE=rev_type,
                        [PRINTMASK=printmask], [PRLINK=prlink],
                        [MODULENUM=modulenum]);
```

log_unit

Logical unit number of device whose revision level is to be checked.

actual_rev

Longword containing the actual hardware, firmware, or patch revision level for the device whose logical unit number is specified with the "logunit" parameter. See note 4. (The diagnostic program determines this value by accessing the hardware.)

expected_rev

Longword containing the hardware, firmware, or patch revision level which was expected by the diagnostic program. See note 4. (This value is placed in the diagnostic program at compilation time.)

rev_type

Longword mask indicating the type of revision code (hardware, firmware, or patch) being compared. Bit definitions are:

- Bit 0 - PRVV_HWREV,PRVM_HWREV - Set this bit to indicate a hardware revision level.
- Bit 1 - PRVV_FWREV,PRVM_FWREV - Set this bit to indicate a firmware revision level.
- Bit 2 - PRVV_PREV,PRVM_PREV - Set this bit to indicate a patch level.

(Only one bit should be set per service call.)

printmask

Longword mask used to control $DS_PRINTREV functions. Bit definitions are:

- Bit 0 - PRMSK$V_LSS,PRMSK$M_LSS - if set, inhibits message that would normally be displayed if the actual revision is less than expected.
- Bit 1 - PRMSK$V_EQL,PRMSK$M_EQL - if set, inhibits message that would normally be displayed if the actual revision is equal to that expected.
- Bit 2 - PRMSK$V_GTR,PRMSK$M_GTR - if set, inhibits message that would normally be displayed if the actual revision is greater than expected.
- Bit 3 - PRMSK$V_ALWAYS,PRMSK$M_ALWAYS - if set, displays the message which lists only the actual revision level.
- Bit 4 - PRMSK$V_TRANSL,PRMSK$M_TRANSL - if set, will convert a hardware revision number to a letter code which represents the functional revision as defined by DEC STD 012. Setting this bit will not result in conversion for firmware or patch revisions. The conversion pattern is shown in table 1. See note 6.

Table 1: Revision Number to Letter Conversion

Field contents [bits <n:0>]	Functional Rev.
0.....0000	pre-release
0.....0001	A
0.....0010	B
0.....0011	C
.	.
.	.
0....11010	Z
0....11011	AA
0....11100	AB
0....11101	AC
.	.
.	.
0...110100	AZ
0...110101	BA
.	.
.	.
0..1001110	BZ
.	.
.	.
1010111110	ZZ

For example, if only bits 1 and 2 are set then a message will be displayed only if the actual revision is less than that expected by the program.

By default, bits 0, 1, 2, 3, and 4 are clear, in which case no conversion will be performed on revision numbers. In addition, a message will be displayed stating whether the actual revision is greater than, less than, or equal to the revision expected by the program. Inhibiting messages does not affect the inclusion of the hardware, firmware or patch revision levels in error messages generated by $DS_ERRxxxx macros.

prlink

Address of a message routine. This optional routine will have the same format as an error reporting routine used with a $DS_ERRxxxx macro. That is, the routine should be delineated with $DS_BGNMESSAGE and $DS_ENDMESSAGE macros and should use $DS_PRINTB and $DS_PRINTX macros for displaying text.

modulenum

Address of a counted ASCII string which represents the unique module number for a board (e.g. "T1002"). If you supply this argument for a hardware revision, then you must supply the same argument for any firmware or patch revision associated with that module.

Notes:

1. Symbols are defined by the $DS_PRINTREV_DEF macro.

2. This macro should only be used for devices having software-accessible hardware, firmware, or patch revision numbers.

3. Some programmer's may want the text displayed only in certain circumstances. For example, perhaps it is the concensus of a particular program's users that the text only be displayed if the actual revision level is lower than that expected by the diagnostic program. In such a case, the "printmask" parameter may be used to inhibit one or more of the possible warning messages.

4. The format of the revision level is irrelevant, but the values passed via the "actual_rev" and "expected_rev" parameters must be in the same format. The service will perform an unsigned comparison of the two values to determine which message to display. Revision numbers will be displayed as unsigned decimal values unless conversion to a letter code is desired.

5. This macro should be used to determine whether current versions of diagnostics are incompatible with old hardware. Since new diagnostics may only run on hardware above a certain revision level, the diagnostic should only set bits 1 and 2 in printmask. This causes a message to be displayed only if the actual revision level is less than that expected by the program.

6. Normally, the hardware revision level should be converted to the corresponding functional revision letter code by setting bit 4 in printmask.

7. If you do not set bit 2 in printmask, a misleading message may result if the actual hardware, firmware, or patch levels were updated without a corresponding change to the diagnostic's expected revision levels.

3. Known Bugs and Deficiencies: The console command language uses the device names CSA1 and CSA2 for the console floppy drives. The Supervisor,however,always refers to either drive as CSA0.

RELEASE NOTES FOR
VAX-11 DIAGNOSTIC SUPERVISOR
VERSION 9.2
March 25,1986

1. EZSAA-9.2-292

   - The p-table for the KA850 has been added .

   - This version has support code for attaching the floppies, CSA1,CSA2 and the winchester RD disk,CSA3. Upon boot of the supervisor the default disk will be CSA3,the winchester RD disk. I/O can be done from any of the afor-mentioned devices after doing a SET LOAD to that particular device.

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 9.3 April 4,1986

1. EZSAA-9.3-305

   o This version has support for the DMB32

RELEASE NOTES FOR
VAX-11 DIAGNOSTIC SUPERVISOR
VERSION 10.0
April 30, 1986

1 ENHANCEMENTS

This version, 10.0, contains only the 8200/8300 supervisor. Support includes booting the supervisor on the attached processor, running of multiprocessor diagnostics, and new BI adapters.

1.1 New BI Adapters

1. DWBLA - This adapter is a combination of a DWBUA and LESI controller. TU81 tape drives and RC25/RC25F disk drives are connected to it. Note that the TU81 is attached directly to the DWBLA, while the RC25 and RCF25 must be attached to a LESI which in turn must be attached to the DWBLA. They are attached as follows:

```
DS>
DS> ATTACH DWBLA HUB BLA0 ! BLA adapter
BI Node Number (HEX) ? 6
DS>
DS> ATTACH TU81 BLA0 MUA0 ! TU81 tape drive
CSR? 774500
VECTOR? 260
BR? 5
DS>
DS> ATTACH LESI BLA0 DAA  ! LESI controller (part of the DWBLA)
IP? 774500
Vector? 260
BR? 5
DS>
DS> ATTACH RC25 DAA DAA0  ! AZTEC removable disk drive
DS> ATTACH RCF25 DAA DAA1 ! AZTEC fixed head disk drive
DS>
```

2. DMB32 - This is a synchronous/asynchronous multiplexer. It is attached as follows:

```
DS> ATTACH DMB32 HUB TXA  ! DMB32 adapter
BI Node Number (HEX)? 3
DS>
```

1.2 New Features For The 8300 Systems.

o Attached processor (AP) support. Allows running the VDS on the AP. A new command, BOOT node (where node = node number of AP), allows the Supervisor to execute on the AP. The primary processor (PP) continues to run in order to provide console I/O (both terminal and floppy), but it does not execute any diagnostics. The Supervisor operates on the AP as it would on the PP. To return control to the PP, use the EXIT command. WARNING: Before any transition between the AP and the PP, ensure that the diagnostic has completed or has been ABORTed.

EXAMPLE of running the VDS on an AP (node F):

```
>>>b csa1

0 . . 3 4 . . 7 . 8 9 A . . . . F
00600000

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Reserved.


DIAGNOSTIC SUPERVISOR. ZZ-EBSAA-10.0-618 28-APR-1986 17:09:36

DS> !VDS is running on the Primary Processor (PP).
DS> !We now issue the BOOT command to start the Attached Processor
    !(AP).
DS> BOOT F
S 0001F420

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DS> !The AP is now running.
DS> !ATTACH and SELECT the AP.
```

```
DS> ATTACH KA820 HUB KAF 6144 F
DS> SELECT KAF
DS> !Run a diagnostic.
DS> RUN EVKAB
.. Program: ZZ-EVKAB, VAX Basic Inst's Exrczr, revision 3.4, 161
tests, at 17:19:08.68.

Testing:
_KAF

.. End of run, 0 errors detected, pass count is 1,
   time is 28-APR-1986 17:19:57.13

DS> !Diagnostic is finished.
DS> !Stop the AP.
DS> EXIT

 *** AP has stopped ***

DIAGNOSTIC SUPERVISOR.  ZZ-EBSAA-10.0-618  28-APR-1986 17:09:36

DS> !The VDS is running on the PP again.
DS>
```

o VAX Diagnostic Supervisor support for multi-processor diagnostics.

* Multiprocessor Concepts:

  A few diagnostic programs are designed to run concurrently on multiple processors. In a multiprocessing environment, you boot the VDS in one of the processors. The processor running the VDS is called the primary processor. If you load and start a multiprocessing diagnostic program, it will cause one or more of the other processors to execute code simultaneously with the primary processor. These other processors are called attached processors. New services have been added to the VAX Diagnostic Supervisor to support multi-processor diagnostics.

* VDS in a Multiprocessor Environment:

  This section describes the VDS features that facilitate the execution of diagnostic programs on multiprocessor systems.

  General Concepts

  In a multiprocessor environment, the processor used to boot the VDS is called the "primary processor". All other processors are called "attached processors". Labeling processors as primary and attached is just a software definition and does not imply any particular hardware configuration. "Attached" processors bear no

relation to the VDS ATTACH command.

When the VDS is booted, it always assumes there is only one processor.

When operating on a multiprocessor system, there is one copy of the VDS software. Control portions of the VDS, such as the command line interpreter and the command dispatcher, are executed only by the primary processor. Some portions of the code, such as system services and exception handlers, may be executed by any processor.

It is assumed that a common memory is shared by all processors.

Diagnostic programs are loaded by and initially executed by the primary processor. A diagnostic program may consist of one or more secondary portions that can be executed by one or more attached processors. In this document, the code executing in the primary processor is referred to as the "primary process". Code executing in an attached processor is called an "attached process".

* Attaching and Selecting Attached Processors:

If a diagnostic program is to use more than one processor, ATTACH commands must be used to describe each processor. You specify which processors to test by ATTACHing and SELECTing them. The diagnostic program calls the $DS_GPHARD service to find out which processors to use.

* Multiprocessing Macros:

The VDS provides the following system services for use in multiprocessor environments:

- $DS_BOOTATTACHED boots an attached processor and leaves the processor in an execution loop called an "idle loop", which is a "JMP" instruction.

- $DS_BGNATTACHED and $DS_ENDATTACHED delineate the code to be executed in an attached processor.

- $DS_STARTATTACHED causes an attached processor to begin executing at a specified address. The code to be executed must be delimited by the $DS_BGNATTACHED and $_ENDATTACHED macros. When execution of this code is complete, the processor is automatically returned to its idle loop.

- $DS_HALTATTACHED halts an attached processor.

- $DS_SHOWIDLE indicates which attached processors are currently executing "idle loops".

- A new value for the $DS_EXIT argument, ATTACHED, lets you exit from the currently attached process. You must locate the $DS_EXIT macro between the $DS_BGNATTACHED and $DS_ENDATTACHED macros.

* Executing in an Attached Processor:

In order for a diagnostic program to execute an attached process, the following steps must occur:

- The attached processor must be booted using the $DS_BOOTATTACHED service.

- The code to be executed must be loaded either by including the code within the source file of the code executing in the primary or by including it in a separate file. If you use a separate file, you must:

  a Call the $DS_GETBUF service to allocate memory space for the attached process.

  a Use the $DS_LOAD service or RMS services to load the file into the space assigned by the $DS_GETBUF service.

- The $DS_STARTATTACHED service passes the attached processor the address where the code begins. In the case where the attached process is loaded into a buffer, the address is the same as the buffer itself.

- The attached process begin executing; VDS system services may be called.

You must repeat the process for each attached processor.

* Using System Services;

Most system services may be called from code executing in attached processors. These services provide an interlocking mechanism, transparent to the diagnostic program, that assures that only one processor executes the service routine at a time. If two or more processors often issue calls to the same service, a large amount of system time may be spent waiting for one processor to finish with the service so that the other one can use it. If two or more processors are locked out of a service because it is in use, the next processor to be serviced is completely arbitrary, as there is no enqueueing of service requests.

The following services may not be called from code

executing in an attached processor:

$DS_ASKxxxx

$DS_CHANNEL

$DS_CLRVEC

$DS_ERRxxx

$DS_INITSCB

$DS_LOAD

$DS_MMON, $DS_MMOFF

$DS_PARSE

$DS_PRINTx

$DS_SETMAP

$SETIMR

$DS_SETVEC

$DS_WAITMS

Additionally, the $DS_MMON and $DS_MMOFF may not be called from code executing in the primary processor after an attached processor has been booted (with the $DS_BOOTATTACHED service).

* Memory Management:

Memory mapping for all processors is identical. Any code within the VDS that alters the page tables alters the tables for each processor because there is one set of page tables for all processors. Page table base registers for each processor simply point to the same places.

However, consider the following scenario:

- o You run a diagnostic program that creates attached processes.
- o Execution of the diagnostic program is stopped by control-C, a breakpoint, or an exception condition.
- o You issue either a SET MM ON or SET MM OFF command and then issue the CONTINUE command.

In this scenario, the state of memory management in the primary processor changes when you issue the SET MM

command. The state of memory management in the attached processors, however, does not change until you issue the CONTINUE command.

If each processor executes $DS_GETBUF macros, $DS_RELBUF cannot be used to separately release buffers allocated to each processor because $DS_RELBUF deallocates the last allocated blocks no matter who requested them. All $DS_GETBUF and $DS_RELBUF calls should be made by the primary process. Alternately, you can use a globally-referenced location to track total buffer allocation. Then you can issue one $DS_RELBUF call to deallocate all allocated space at once.

* Timing:

The only timing service available is the $DS_WAITUS. Any other timing scheme must be designed by the user.

It is important to note that only one $DS_WAITUS request may be serviced at any time. If one processor, for example, requests a $DS_WAITUS service and the $DS_WAITUS service routine is already in use by another processor, the requesting processor is forced (by the VDS) to wait until the service routine has completed its execution for the first processor.

The result will be that the actual amount of time the second processor has to wait could be considerably longer than the actual wait time requested. Be aware that if more than one processor is waiting for service, it is arbitrary as to which is serviced first, as there is no enqueueing of requests.

* The SCB:

Each processor has its own SCB that is initialized when the processor is bootstrapped. All SCBs are initialized as follows:

- All vectors in the first half page of the SCB point to the proper exception handlers. Note that all handlers are the same for each processor.

- The rest of the SCB (the device interrupt vector area) points to the VDS's unexpected interrupt handler. Only the primary processor, however, receives device interrupts (See the section entitled, "Input/Output").

The $DS_SETVEC, $DS_CLRVEC, and $DS_INITSCB services can only be called by the primary process. If an attached process wants to modify its SCB, it must do so directly. The SCB base address is returned by the $DS_BOOTATTACHED service.

* Input/Output:

  Only the primary processor may receive device interrupts. (For some processor types, this is a hardware restriction, for others, it is not. For consistency's sake, VDS implementation is the same for all processor types.)

  The $DS_CHANNEL service may be called only by the primary processor.

  Device interrupt service routines only execute in the primary processor and are considered a part of the main program. The main program may notify an attached process that an interrupt has been received by setting an event flag or by delivering an interprocessor interrupt to the attached processor.

  It is important to remember that the $DS_CHANNEL service only allows one device interrupt service routine in use at a time. Therefore if several devices are to be active at once, they must all be serviced by the same interrupt service routine. (The routine can determine which device caused the most recent interrupt, since the vector address is passed to the routine.)

* ASTs:

  Only the primary processor can execute a service that provides AST delivery. (These services, for level 3 programs, include $SETIMR, $DS_CNTRLC, and, indirectly, $DS_WAITMS.) AST requests from all processors are enqueued into a common AST queue.

* Interprocessor Interrupts:

  Diagnostic programs may implement interprocessor communication by using interprocessor interrupts. Diagnostic programs wishing to make use of interprocessor interrupts may modify the SCBs of the various processors so that the IP interrupt vector points to an interrupt service routine specified by the program.

  The VDS does not use interprocessor interrupts.

* Exceptions and Unexpected Interrupts:

  The SCB of each processor is initialized so that exceptions vector into VDS condition handlers that provide interlocking. The last chance handler stops program execution on all processors, no matter which processor "trapped out". The primary processor re-enters VDS CLI and issues the DS> prompt. All attached processors re-enter their idle loops.

Diagnostic programs can override the VDS last chance handler by specifying their own condition handlers.

Unexpected device interrupts are fielded by the primary processor. The primary processor's unexpected interrupt handler reports the interrupt to the user and re-enters VDS CLI, issuing the DS> prompt. All attached processors are forced to re-enter their idle loops.

* Control-Cs:

You can return to the VDS CLI and the DS> prompt by typing control-C. Attached processors return to their idle loops the next time they call the $DS_BREAK service.

As is currently the case, a diagnostic program may declare its own control-C handler to take precedence over the VDS control-C handler.

* Communication Between the Main and Attached Processes:

Since the VDS does not provide specific services to facilitate communication between the attached processes and the primary process, you can use any of the following techniques:

- o Event Flags - Very useful for passing status information between the primary and various attached processes. The $SETEF, $CLREF, $READEF, $WAITFR, $WFLAND, and $WFLOR services may all be used by any process.

- o Interprocessor Interrupts - Available for use by the diagnostic program; you may design any scheme you wish for making use of interprocessor interrupts.

- o Common "mailbox" - You can specify a common data area in which to pass information back and forth between the main process and the attached processes.

- o Dispatch vectors - Attached processes can call routines in the main process via dispatch vectors, stored in a table in the main process, that point to the routines. If these vectors are assigned to absolute addresses, then attached processes not linked with the main process can reference them. (If the code for attached processes is linked with the main process, dispatch vectors are unnecessary, since addressing references may be relative and can be resolved at link time.)

* Restrictions:

The following restrictions apply to diagnostic programs using the multiprocessing features of the VDS:

- As with single processor systems, code executing in attached processors must periodically call the $DS_BREAK service. THIS RULE IS VERY IMPORTANT, as breakpoints, control-C's, and exception handling depend upon this rule being followed.

- With the exception of $DS_BGNATTACHED and $DS_ENDATTACHED, code executing in attached processors may not use any of the program structure macros. (These macros include $DS_BGNTEST, $DS_ENDTEST, $DS_BGNSUB, $DS_ENDSUB, and the macros $DS_HEADER and $DS_DISPATCH that define such data structures as the diagnostic header and the dispatch table, respectively.) All initialization and clean-up code, looping, and error reporting must be contained within code executed by the primary processor.

- The load image for a diagnostic program may not be larger than approximately 63.5 Kbytes. If the total size of the code to be executed by the primary and all attached processes exceeds the maximum, you have to store the code for attached processors in separate loadable images. (Refer to the section entitled "Executing in an Attached Processor".)

- As stated previously, requests for system services are not enqueued (except in the case of ASTs). Therefore if several attached processes are simultaneously requesting the same service, there is no way to determine which process will be serviced next. It is assumed (but not guaranteed by the software) that all requests will eventually be serviced. All services have an interlocking mechanism, so that the next processor to execute the service is the first one to reference the interlocking flag after the service is released (by the previous processor.)

- Only the primary processor can receive device interrupts.

- Use the standard methods for declaring condition handlers.

- All multi-processor diagnostics must run in Kernel mode.

- It is recommended that the diagnostic clean-up code call the $DS_HALTATTACHED service in order that each Attached Processor that was bootattached be placed in a known, static state.

- Code executing in an attached processor may not call the following services:

  $DS_ASKxxxx
  $DS_CHANNEL
  $DS_CLRVEC
  $DS_ERRxxx
  $DS_INITSCB
  $DS_LOAD
  $DS_MMON, $DS_MMOFF
  $DS_PARSE
  $DS_PRINTx
  $DS_SETVEC
  $SETIMR
  $DS_SETMAP
  $DS_WAITMS

* Multi-processor Macros:

  - $DS_BGNATTACHED, $DS_ENDATTACHED

    In a diagnostic program that tests multiple processors, use the $DS_BGNATTACHED and $DS_ENDATTACHED macros to delineate code that is to be executed in an attached processor. These macros are used whether the code is included in the loadable image of the main diagnostic program or it is a separate loadable image.

    $DS_BGNATTACHED indicates the beginning of the code and creates a label that can be used with the $DS_STARTATTACHED service. The $DS_ENDATTACHED macro generates code that will send the processor back to its idle loop.

    MACRO-32 Format:

```
$DS_BGNATTACHED routine_name, mask
        .
        .
        .
$DS_ENDATTACHED
```

    BLISS-32 Format:

```
$DS_BGNATTACHED (ROUTINE_NAME=routine_name);
        .
        .
        .
$DS_ENDATTACHED;
```

    routine_name

    Labels the routine and points to its first instruction.

mask
List of register names used in the entry mask.

Notes:

1. You can include code that is contained in an attached process in any number of separate executable files. The code in each file, however, must be position-independent. You can only have one attached process, delimited by one set of $DS_BGNATTACHED and $DS_ENDATTACHED macros, per file.

2. If you want to place the code in a separate image, request a buffer using the $DS_GETBUF service, load the image into the buffer, and use the address of the buffer as the "start_addr" argument for the $DS_STARTATTACHED macro.

3. You can enter the code using a CALL instruction.

4. It is recommended that you place data structures for the code in a separate psect. If you must include the data structures

   in the same psect as the code, place them (data structures) after the code and end the executable section with a $DS_EXIT macro as shown:

```
.psect data                 $DS_BGNATTACHED RTN2
        .                           .
<data structures>                   .
        .                   <executable code>
        .                           .
.psect code                         .
$DS_BGNATTACHED RTN1        $DS_EXIT ATTACHED
        .                           .
        .                           .
<executable code>           <data structures>
        .                           .
        .                           .
        .
$DS_ENDATTACHED             $DS_ENDATTACHED
```

o $DS_BOOTATTACHED

In a multiprocessing environment, use the Boot Attached CPU system service to bootstrap an attached processor on a multiprocessor system. It will perform the following functions for the target processor:

1. Halt the processor, if it is not currently halted.

2. Perform all initialization necessary to enable the processor to execute code, including initializing stacks, memory management registers, the SCB, and the interval clock.

3. Cause the processor to begin executing an idle loop ("JMP ." instruction).

After you call the $DS_BOOTATTACHED, you can use the $DS_STARTATTACHED service to cause the attached processor to leave its idle loop and begin executing a section of code.

MACRO-32 Format:

```
$DS_BOOTATTACHED_x unit, scb_addr
```

BLISS-32 Format:

```
$DS_BOOTATTACHED (UNIT=unit, SCB_ADDR=scb_addr);
```

unit

Logical unit number of the processor to be bootstrapped.

scb_addr

Address of the longword to receive the SCB address of the target processor.

Return Status:

DS$_NORMAL

Service successfully completed.

DS$_ILLUNIT

The specified logical unit number is too large.

DS$_INVCPU

Can't boot specified processor.

DS$_MEM_ALLOC_ERR

Could not allocate memory for attached processor's SCB and stacks.

DS$_INIT_FAIL
Attached processor did not return prompt from Control P or Initialize. (VAX 8200 only)

Examples:

MACRO-32 Example:

```
$DS_BOOTATTACHED_S      LOG_UNIT, PROC2_SCB
```

BLISS-32 Example:

```
$DS_BOOTATTACHED (UNIT = .LOG_UNIT, SCB_ADDR =
                  PROC2_SCB);
```

o $DS_HALTATTACHED

Use the Halt Attached CPU system service to stop program execution in an attached processor or a multiprocessor environment. In order to use this service, you must bootstrap the processor with the $DS_BOOTATTACHED service. This service should be used in the clean-up code of a multi-processor diagnostic to place each Attached Processor that was bootattached into a known, static state.

MACRO-32 Format:

```
$DS__HALTATTACHED__x unit
```

BLISS-32 Format:

```
$DS__HALTATTACHED (UNIT=unit);
```

unit

Logical unit number of the CPU to be halted.

Return Status:

DS$_NORMAL

Service successfully completed.

DS$_ILLUNIT

The specified logical unit number is too large.

DS$_INVCPU

The specified processor is the primary processor.

DS$_INIT_FAIL

The processor failed to send console prompt only).

Notes:

1. In order to restart a halted processor, you must reboot using the $DS_BOOTATTACHED service and then use the $DS_STARTATTACHED service.

Examples:

MACRO-32 Example:

```
$DS__HALTATTACHED__S    LOG_UNIT
```

BLISS-32 Example:

```
$DS__HALTATTACHED (UNIT = .LOG_UNIT);
```

o $DS_SHOWIDLE

In a multiprocessor environment, use the Show Idle Processors service to determine which attached processors are currently executing their "idle loops". Attached processors are placed in their idle loops when:

1. The $DS_BOOTATTACHED service has completed bootstrapping the processor.

2. An attached process, delimited by the $DS_BGNATTACHED and $DS_ENDATTACHED macros, finishes executing.

3. A multiprocessor diagnostic program is stopped by a control-C or an exception.

MACRO-32 Format:

```
$DS_SHOWIDLE_x  bitmap
```

BLISS-32 Format:

```
$DS_SHOWIDLE (BITMAP=bitmap);
```

bitmap

Address of the longword to receive a bitmap indicating which attached processors are currently executing their idle loops. There are 32 bits (0 through 31); each bit corresponding to a logical unit number. You need to look at the bits that correspond

to logical unit numbers actually associated with attached processors. (See Note 1.)

Return Status:

DS$_NORMAL

Service successfully completed.

Notes:

1. One method for using this service is to create a bit mask. Each time you issue a $DS_GPHARD call and receive the address of a p-table for an attached processor, set the bit in the mask corresponding to the logical unit number for that p-table. When you call the $DS_SHOWIDLE service, test only the bits that are set in the mask you created.

Examples:

MACRO-32 Example:

```
IDLE_MASK:      .LONG 0
IDLE_PROC:      .LONG 0

                .
                .
        $DS_SHOWIDLE_S (IDLE_PROC)  ; Get idling
                                    ; processors.
        CMPL    IDLE_MASK,IDLE_PROC ; All idling?
        BEQL    300$                ; Yes, branch.
                .
                .
```

BLISS-32 Example:

```
                .
                .
$DS_SHOWIDLE (BITMAP=IDLE_PROC); ! Get idling
                                 ! processors.
IF (.IDLE_MASK NEQ .IDLE_PROC)   ! If not idling
THEN                             ! then...
                .
                .
```

o $DS_STARTATTACHED

In a multiprocessor environment, you can use the Start Attached CPU system service to cause an attached processor to begin executing a section of code. Before you can use this service, you must bootstrap the specified processor with the $DS_BOOTATTACHED service.

You must delimit the section of code to be executed with the $DS_BGNATTACHED and $DS_ENDATTACHED program structure macros. The service, in conjunction with these macros, causes the specified processor to leave the idle loop that was created by the $DS_BOOTATTACHED service and jump to the code delimited by the macros. When it finishes executing, the processor re-enters the idle loop. (Refer to the description of the $DS_BGNATTACHED and $DS_ENDATTACHED macros for details.)

MACRO-32 Format:

```
$DS_STARTATTACHED_x unit, start_addr
```

BLISS-32 Format:

```
$DS_STARTATTACHED (UNIT=unit, START_ADDR=start_addr);
```

unit

Logical unit number of the processor to be bootstrapped.

start_addr

Address of the code to be executed in the attached processor. This argument must be the address of the code generated by a $DS_BGNATTACHED macro.

Return Status:

DS$_NORMAL

Service successfully completed.

DS$_ILLUNIT

The specified logical unit number is too large.

DS$_INVCPU

Can't start the specified processor. May mean the processor doesn't exist or the processor was not executing its idle loop (see $DS_BOOTATTACHED).

Examples:

MACRO-32 Example:

```
.
.
.
```

```
                $DS_BGNATTACHED ROUTINE1
                        .
                        .
                        .
                $DS_ENDATTACHED
                        .
                        .
                        .
                $DS_STARTATTACHED_S     LOG_UNIT, ROUTINE1
```

BLISS-32 Example:

```
                        .
                        .
                        .
                $DS_BGNATTACHED (ROUTINE_NAME=ROUTINE1);
                        .
                        .
                        .
                $DS_ENDATTACHED;
                        .
                        .
                        .
                $DS_STARTATTACHED (UNIT = .LOG_UNIT,
                                   START_ADDR=ROUTINE1);
```

2 KNOWN BUGS AND DEFICIENCIES

1. Version 9.0 has a bug whereby depositing into an Internal Processor Register at the Diagnostic Supervisor prompt will yield incorrect results. Version 10.0 fixes this problem.

2. The bug in version 9.0 which prevented the diagnostic supervisor from being booted from a CIBCI disk has been fixed. Previously a machine check would result.

3. In version 9.0, the supervisor was inadvertently clearing the BROKE bit for memory adapters at boot time, if the adapter had previously set the BROKE bit. This has been fixed.

4. In version 9.0, after an ULTRIX system had previously been running, an "Unexpected BI bus error interrupt" would occur while running EBUCA. This has been fixed.

RELEASE NOTES FOR
VAX-11 DIAGNOSTIC SUPERVISOR
VERSION 10.1
April 4, 1986

1 ENHANCEMENTS

This version, 10.1, contains only the 8500/8700/8800 supervisor. Support includes running of multiprocessor diagnostics.

1.1 Multiprocessing

- VAX Diagnostic Supervisor support for multi-processor diagnostics.

  * Multiprocessor Concepts:

    A few diagnostic programs are designed to run concurrently on multiple processors. In a multiprocessing environment, you boot the VDS in one of the processors. The processor running the VDS is called the primary processor. If you load and start a multiprocessing diagnostic program, it will cause one or more of the other processors to execute code simultaneously with the primary processor. These other processors are called attached processors. New services have been added to the VAX Diagnostic Supervisor to support multi-processor diagnostics.

* VDS in a Multiprocessor Environment:

  This section describes the VDS features that facilitate the execution of diagnostic programs on multiprocessor systems.

  General Concepts

  In a multiprocessor environment, the processor used to boot the VDS is called the "primary processor". All other processors are called "attached processors". Labeling processors as primary and attached is just a software definition and does not imply any particular hardware configuration. "Attached" processors bear no relation to the VDS ATTACH command.

  When the VDS is booted, it always assumes there is only one processor.

When operating on a multiprocessor system, there is one copy of the VDS software. Control portions of the VDS, such as the command line interpreter and the command dispatcher, are executed only by the primary processor. Some portions of the code, such as system services and exception handlers, may be executed by any processor.

It is assumed that a common memory is shared by all processors.

Diagnostic programs are loaded by and initially executed by the primary processor. A diagnostic program may consist of one or more secondary portions that can be executed by one or more attached processors. In this document, the code executing in the primary processor is referred to as the "primary process". Code executing in an attached processor is called an "attached process".

* Attaching and Selecting Attached Processors:

  If a diagnostic program is to use more than one processor, ATTACH commands must be used to describe each processor. You specify which processors to test by ATTACHing and SELECTing them. The diagnostic program calls the $DS_GPHARD service to find out which processors to use.

* Multiprocessing Macros:

  The VDS provides the following system services for use in multiprocessor environments:

  - $DS_BOOTATTACHED boots an attached processor and leaves the processor in an execution loop called an "idle loop", which is a "JMP" instruction.

  - $DS_BGNATTACHED and $DS_ENDATTACHED delineate the code to be executed in an attached processor.

  - $DS_STARTATTACHED causes an attached processor to begin executing at a specified address. The code to be executed must be delimited by the $DS_BGNATTACHED and $_ENDATTACHED macros. When execution of this code is complete, the processor is automatically returned to its idle loop.

  - $DS_HALTATTACHED halts an attached processor.

  - $DS_SHOWIDLE indicates which attached processors are currently executing "idle loops".

  - A new value for the $DS_EXIT argument, ATTACHED, lets you exit from the currently attached process. You must locate the $DS_EXIT macro between the $DS_BGNATTACHED and $DS_ENDATTACHED macros.

* Executing in an Attached Processor:

  In order for a diagnostic program to execute an attached process, the following steps must occur:

  - The attached processor must be booted using the $DS_BOOTATTACHED service.
  - The code to be executed must be loaded either by including the code within the source file of the code executing in the primary or by including it in a separate file. If you use a separate file, you must:
    - Call the $DS_GETBUF service to allocate memory space for the attached process.
    - Use the $DS_LOAD service or RMS services to load the file into the space assigned by the $DS_GETBUF service.
  - The $DS_STARTATTACHED service passes the attached processor the address where the code begins. In the case where the attached process is loaded into a buffer, the address is the same as the buffer itself.
  - The attached process begin executing; VDS system services may be called.

  You must repeat the process for each attached processor.

* Using System Services;

  Most system services may be called from code executing in attached processors. These services provide an interlocking mechanism, transparent to the diagnostic program, that assures that only one processor executes the service routine at a time. If two or more processors often issue calls to the same service, a large amount of system time may be spent waiting for one processor to finish with the service so that the other one can use it. If two or more processors are locked out of a service because it is in use, the next processor to be serviced is completely arbitrary, as there is no enqueueing of service requests.

  The following services may not be called from code executing in an attached processor:

  $DS_ASKxxxx

  $DS_CHANNEL

$DS_CLRVEC

$DS_ERRxxx

$DS_INITSCB

$DS_LOAD

$DS_MMON, $DS_MMOFF

$DS_PARSE

$DS_PRINTx

$DS_SETMAP

$SETIMR

$DS_SETVEC

$DS_WAITMS

Additionally, the $DS_MMON and $DS_MMOFF may not be called from code executing in the primary processor after an attached processor has been booted (with the $DS_BOOTATTACHED service).

* Memory Management:

Memory mapping for all processors is identical. Any code within the VDS that alters the page tables alters the tables for each processor because there is one set of page tables for all processors. Page table base registers for each processor simply point to the same places.

However, consider the following scenario:

o You run a diagnostic program that creates attached processes.

o Execution of the diagnostic program is stopped by control-C, a breakpoint, or an exception condition.

o You issue either a SET MM ON or SET MM OFF command and then issue the CONTINUE command.

In this scenario, the state of memory management in the primary processor changes when you issue the SET MM command. The state of memory management in the attached processors, however, does not change until you issue the CONTINUE command.

If each processor executes $DS_GETBUF macros, $DS_RELBUF cannot be used to separately release buffers allocated to

each processor because $DS_RELBUF deallocates the last allocated blocks no matter who requested them. All $DS_GETBUF and $DS_RELBUF calls should be made by the primary process. Alternately, you can use a globally-referenced location to track total buffer allocation. Then you can issue one $DS_RELBUF call to deallocate all allocated space at once.

* Timing:

  The only timing service available to an Attached Processor is the $DS_WAITUS. Any other timing scheme must be designed by the user.

  It is important to note that only one $DS_WAITUS request may be serviced at any time. If one processor, for example, requests a $DS_WAITUS service and the $DS_WAITUS service routine is already in use by another processor, the requesting processor is forced (by the VDS) to wait until the service routine has completed its execution for the first processor.

  The result will be that the actual amount of time the second processor has to wait could be considerably longer than the actual wait time requested. Be aware that if more than one processor is waiting for service, it is arbitrary as to which is serviced first, as there is no enqueueing of requests.

* The SCB:

  Each processor has its own SCB that is initialized when the processor is bootstrapped. All SCBs are initialized as follows:

  o All vectors in the first half page of the SCB point to the proper exception handlers. Note that all handlers are the same for each processor.

  o The rest of the SCB (the device interrupt vector area) points to the VDS's unexpected interrupt handler. Only the primary processor, however, receives device interrupts (See the section entitled, "Input/Output").

  The $DS_SETVEC, $DS_CLRVEC, and $DS_INITSCB services can only be called by the primary process. If an attached process wants to modify its SCB, it must do so directly. The SCB base address is returned by the $DS_BOOTATTACHED service.

* Input/Output:

Only the primary processor may receive device interrupts. (For some processor types, this is a hardware restriction, for others, it is not. For consistency's sake, VDS implementation is the same for all processor types.)

The $DS_CHANNEL service may be called only by the primary processor.

Device interrupt service routines only execute in the primary processor and are considered a part of the main program. The main program may notify an attached process that an interrupt has been received by setting an event flag or by delivering an interprocessor interrupt to the attached processor.

It is important to remember that the $DS_CHANNEL service only allows one device interrupt service routine in use at a time. Therefore if several devices are to be active at once, they must all be serviced by the same interrupt service routine. (The routine can determine which device caused the most recent interrupt, since the vector address is passed to the routine.)

* ASTs:

Only the primary processor can execute a service that provides AST delivery. (These services, for level 3 programs, include $SETIMR, $DS_CNTRLC, and, indirectly, $DS_WAITMS.) AST requests from all processors are enqueued into a common AST queue.

* Interprocessor Interrupts:

Diagnostic programs may implement interprocessor communication by using interprocessor interrupts. Diagnostic programs wishing to make use of interprocessor interrupts may modify the SCBs of the various processors so that the IP interrupt vector points to an interrupt service routine specified by the program.

The VDS does not use interprocessor interrupts.

* Exceptions and Unexpected Interrupts:

The SCB of each processor is initialized so that exceptions vector into VDS condition handlers that provide interlocking. The last chance handler stops program execution on all processors, no matter which processor "trapped out". The primary processor re-enters VDS CLI and issues the DS> prompt. All attached processors re-enter their idle loops.

Diagnostic programs can override the VDS last chance handler by specifying their own condition handlers.

Unexpected device interrupts are fielded by the primary processor. The primary processor's unexpected interrupt handler reports the interrupt to the user and re-enters VDS CLI, issuing the DS> prompt. All attached processors are forced to re-enter their idle loops.

* Control-Cs:

  You can return to the VDS CLI and the DS> prompt by typing control-C. Attached processors return to their idle loops the next time they call the $DS_BREAK service.

  As is currently the case, a diagnostic program may declare its own control-C handler to take precedence over the VDS control-C handler.

* Communication Between the Main and Attached Processes:

  Since the VDS does not provide specific services to facilitate communication between the attached processes and the primary process, you can use any of the following techniques:

  o Event Flags - Very useful for passing status information between the primary and various attached processes. The $SETEF, $CLREF, $READEF, $WAITFR, $WFLAND, and $WFLOR services may all be used by any process.

  o Interprocessor Interrupts - Available for use by the diagnostic program; you may design any scheme you wish for making use of interprocessor interrupts.

  o Common "mailbox" - You can specify a common data area in which to pass information back and forth between the main process and the attached processes.

  o Dispatch vectors - Attached processes can call routines in the main process via dispatch vectors, stored in a table in the main process, that point to the routines. If these vectors are assigned to absolute addresses, then attached processes not linked with the main process can reference them. (If the code for attached processes is linked with the main process, dispatch vectors are unnecessary, since addressing references may be relative and can be resolved at link time.)

* Restrictions:

  The following restrictions apply to diagnostic programs using the multiprocessing features of the VDS:

- As with single processor systems, code executing in attached processors must periodically call the $DS_BREAK service. THIS RULE IS VERY IMPORTANT, as breakpoints, control-C's, and exception handling depend upon this rule being followed.

- With the exception of $DS_BGNATTACHED and $DS_ENDATTACHED, code executing in attached processors may not use any of the program structure macros. (These macros include $DS_BGNTEST, $DS_ENDTEST, $DS_BGNSUB, $DS_ENDSUB, and the macros $DS_HEADER and $DS_DISPATCH that define such data structures as the diagnostic header and the dispatch table, respectively.) All initialization and clean-up code, looping, and error reporting must be contained within code executed by the primary processor.

- The load image for a diagnostic program may not be larger than approximately 63.5 Kbytes. If the total size of the code to be executed by the primary and all attached processes exceeds the maximum, you have to store the code for attached processors in separate loadable images. (Refer to the section entitled "Executing in an Attached Processor".)

- As stated previously, requests for system services are not enqueued (except in the case of ASTs). Therefore if several attached processes are simultaneously requesting the same service, there is no way to determine which process will be serviced next. It is assumed (but not guaranteed by the software) that all requests will eventually be serviced. All services have an interlocking mechanism, so that the next processor to execute the service is the first one to reference the interlocking flag after the service is released (by the previous processor.)

- Only the primary processor can receive device interrupts.

- Use the standard methods for declaring condition handlers.

- All multi-processor diagnostics must run in Kernel mode.

- It is recommended that the diagnostic clean-up code call the $DS_HALTATTACHED service in order that each Attached Processor that was bootattached be placed in a known, static state.

- Code executing in an attached processor may not call the following services:

  $DS_ASKxxxx
  $DS_CHANNEL
  $DS_CLRVEC
  $DS_ERRxxx
  $DS_INITSCB
  $DS_LOAD
  $DS_MMON, $DS_MMOFF
  $DS_PARSE
  $DS_PRINTx
  $DS_SETVEC
  $SETIMR
  $DS_SETMAP
  $DS_WAITMS

* Multi-processor Macros:

  - $DS_BGNATTACHED, $DS_ENDATTACHED

    In a diagnostic program that tests multiple processors, use the $DS_BGNATTACHED and $DS_ENDATTACHED macros to delineate code that is to be executed in an attached processor. These macros are used whether the code is included in the loadable image of the main diagnostic program or it is a separate loadable image.

    $DS_BGNATTACHED indicates the beginning of the code and creates a label that can be used with the $DS_STARTATTACHED service. The $DS_ENDATTACHED macro generates code that will send the processor back to its idle loop.

    MACRO-32 Format:

```
$DS_BGNATTACHED routine_name, mask
        .
        .
        .
$DS_ENDATTACHED
```

    BLISS-32 Format:

```
$DS_BGNATTACHED (ROUTINE_NAME=routine_name);
        .
        .
        .
$DS_ENDATTACHED;
```

routine_name

Labels the routine and points to its first instruction.

mask

List of register names used in the entry mask.

Notes:

1. You can include code that is contained in an attached process in any number of separate executable files. The code in each file, however, must be position-independent. You can only have one attached process, delimited by one set of $DS_BGNATTACHED and $DS_ENDATTACHED macros, per file.

2. If you want to place the code in a separate image, request a buffer using the $DS_GETBUF service, load the image into the buffer, and use the address of the buffer as the "start_addr" argument for the $DS_STARTATTACHED macro.

3. You can enter the code using a CALL instruction.

4. It is recommended that you place data structures for the code in a separate psect. If you must include the data structures

   in the same psect as the code, place them (data structures) after the code and end the executable section with a $DS_EXIT macro as shown:

```
.psect data                 $DS_BGNATTACHED RTN2
        .                           .
<data structures>                   .
        .                   <executable code>
        .                           .
.psect code                         .
$DS_BGNATTACHED RTN1        $DS_EXIT ATTACHED
        .                           .
        .                           .
<executable code>           <data structures>
        .                           .
        .                           .
        .                           .
$DS_ENDATTACHED             $DS_ENDATTACHED
```

o $DS_BOOTATTACHED

In a multiprocessing environment, use the Boot Attached CPU system service to bootstrap an attached processor on a multiprocessor system. It will perform the following functions for the target processor:

1. Halt the processor, if it is not currently halted.

2. Perform all initialization necessary to enable the processor to execute code, including initializing stacks, memory management registers, the SCB, and the interval clock.

3. Cause the processor to begin executing an idle loop ("JMP ." instruction).

After you call the $DS_BOOTATTACHED, you can use the $DS_STARTATTACHED service to cause the attached processor to leave its idle loop and begin executing a section of code.

MACRO-32 Format:

```
$DS_BOOTATTACHED_x unit, scb_addr
```

BLISS-32 Format:

```
$DS_BOOTATTACHED (UNIT=unit, SCB_ADDR=scb_addr);
```

unit

Logical unit number of the processor to be bootstrapped.

scb_addr

Address of the longword to receive the SCB address of the target processor.

Return Status:

DS$_NORMAL

Service successfully completed.

DS$_ILLUNIT

The specified logical unit number is too large.

DS$_INVCPU

Can't boot specified processor.

DS$_MEM_ALLOC_ERR

Could not allocate memory for attached processor's SCB and stacks.

DS$_INIT_FAIL
Attached processor did not return prompt from Control P or Initialize. (VAX 8200 only)

Examples:

MACRO-32 Example:

```
$DS_BOOTATTACHED_S      LOG_UNIT, PROC2_SCB
```

BLISS-32 Example:

```
$DS_BOOTATTACHED (UNIT = .LOG_UNIT, SCB_ADDR =
                  PROC2_SCB);
```

o $DS_HALTATTACHED

Use the Halt Attached CPU system service to stop program execution in an attached processor or a multiprocessor environment. In order to use this service, you must bootstrap the processor with the $DS_BOOTATTACHED service. This service should be used in the clean-up code of a multi-processor diagnostic to place each Attached Processor that was bootattached into a known, static state.

MACRO-32 Format:

```
$DS__HALTATTACHED__x unit
```

BLISS-32 Format:

```
$DS__HALTATTACHED (UNIT=unit);
```

unit

Logical unit number of the CPU to be halted.

Return Status:

DS$_NORMAL

Service successfully completed.

DS$_ILLUNIT

The specified logical unit number is too large.

DS$_INVCPU

The specified processor is the primary processor.

DS$_INIT_FAIL

The processor failed to send console prompt
only).

Notes:

1. In order to restart a halted processor, you must reboot using the $DS_BOOTATTACHED service and then use the $DS_STARTATTACHED service.

Examples:

MACRO-32 Example:

```
$DS__HALTATTACHED__S    LOG_UNIT
```

BLISS-32 Example:

```
$DS__HALTATTACHED (UNIT = .LOG_UNIT);
```

o $DS_SHOWIDLE

In a multiprocessor environment, use the Show Idle Processors service to determine which attached processors are currently executing their "idle loops". Attached processors are placed in their idle loops when:

1. The $DS_BOOTATTACHED service has completed bootstrapping the processor.

2. An attached process, delimited by the $DS_BGNATTACHED and $DS_ENDATTACHED macros, finishes executing.

3. A multiprocessor diagnostic program is stopped by a control-C or an exception.

MACRO-32 Format:

```
$DS_SHOWIDLE_x  bitmap
```

BLISS-32 Format:

```
$DS_SHOWIDLE (BITMAP=bitmap);
```

bitmap

Address of the longword to receive a bitmap indicating which attached processors are currently executing their idle loops. There are 32 bits (0 through 31); each bit corresponding to a logical unit number. You need to look at the bits that correspond to logical unit numbers actually associated with attached processors. (See Note 1.)

Return Status:

DS$_NORMAL

Service successfully completed.

Notes:

1. One method for using this service is to create a bit mask. Each time you issue a $DS_GPHARD call and receive the address of a p-table for an attached processor, set the bit in the mask corresponding to the logical unit number for that p-table. When you call the $DS_SHOWIDLE service, test only the bits that are set in the mask you created.

Examples:

MACRO-32 Example:

```
IDLE_MASK:      .LONG 0
IDLE_PROC:      .LONG 0

                .
                .
        $DS_SHOWIDLE_S (IDLE_PROC)  ; Get idling
                                    ; processors.
        CMPL    IDLE_MASK,IDLE_PROC ; All idling?
        BEQL    300$                ; Yes, branch.
                .
                .
```

BLISS-32 Example:

```
                .
                .
        $DS_SHOWIDLE (BITMAP=IDLE_PROC); ! Get idling
                                         ! processors.
        IF (.IDLE_MASK NEQ .IDLE_PROC)   ! If not idling
        THEN                             ! then...
                .
                .
```

o $DS_STARTATTACHED

In a multiprocessor environment, you can use the Start Attached CPU system service to cause an attached processor to begin executing a section of code. Before you can use this service, you must bootstrap the specified processor with the $DS_BOOTATTACHED service.

You must delimit the section of code to be executed with the $DS_BGNATTACHED and $DS_ENDATTACHED program structure macros. The service, in conjunction with these macros, causes the specified processor to leave the idle loop that was created by the $DS_BOOTATTACHED service and jump to the code delimited by the macros. When it finishes executing, the processor re-enters the idle loop. (Refer to the description of the $DS_BGNATTACHED and $DS_ENDATTACHED macros for details.)

MACRO-32 Format:

```
$DS_STARTATTACHED_x unit, start_addr
```

BLISS-32 Format:

```
$DS_STARTATTACHED (UNIT=unit, START_ADDR=start_addr);
```

unit

Logical unit number of the processor to be bootstrapped.

start_addr

Address of the code to be executed in the attached processor. This argument must be the address of the code generated by a $DS_BGNATTACHED macro.

Return Status:

DS$_NORMAL

Service successfully completed.

DS$_ILLUNIT

The specified logical unit number is too large.

DS$_INVCPU

Can't start the specified processor. May mean the processor doesn't exist or the processor was not executing its idle loop (see $DS_BOOTATTACHED).

Examples:

MACRO-32 Example:

```
        .
        .
        .
    $DS_BGNATTACHED ROUTINE1
        .
        .
        .
    $DS_ENDATTACHED
        .
        .
        .
    $DS_STARTATTACHED_S     LOG_UNIT, ROUTINE1
```

BLISS-32 Example:

```
        .
        .
        .
    $DS_BGNATTACHED (ROUTINE_NAME=ROUTINE1);
        .
        .
        .
    $DS_ENDATTACHED;
        .
        .
        .
    $DS_STARTATTACHED (UNIT = .LOG_UNIT,
                       START_ADDR=ROUTINE1);
```

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 10.2 June 23, 1986

1 ENHANCEMENTS

* A new qualifier has been added to the START and RUN commands:

/TIME=[dddd-][hh:mm:ss.cc]

Indicates the length of time which the diagnostic program will run before execution is stopped. When the time limit expires, the diagnostic program's clean-up code is executed.

In the standalone mode, the amount of time which the program will run is the same as real time. When running under VMS, the program will run for the specified amount of cpu time rather than elapsed time.

If you also specify a number of passes to be run, the diagnostic program will stop when either the specified number of passes have been run, or the specified amount of execution time has elapsed, whichever occurs first.

If the diagnostic program's execution is interrupted by a Control-C and a CONTINUE command is typed, the diagnostic program will continue to execute for a period of time equal to the original time specified in the START or RUN command minus the time for which the diagnostic has already executed.

If the TIME qualifier is not used, or a value of zero is specified, the diagnostic program will not have a time limit placed upon its execution.

The rules for specifying a time value follow the VMS rules for specifying a delta time. The variable fields are as follows:

Field	Meaning
dddd	Number of days, 24-hour units (0 through 9999)
hh	Number of hours (0 through 23)
mm	Number of minutes (0 through 59)
ss	Number of seconds (0 through 59)
cc	Number of hundredths of seconds (0 through 99)

When you specify a time value, you can truncate the time field. You can also omit any of the variable fields, as long as you supply the punctuation marks.

When any field is omitted from a delta time value, the system supplies a value of zero for the field.

Examples:

Time Specification	Result
3-	3 days from now (72 hours)
1	1 hour from now
:20	20 minutes from now
2-:20	2 days and 20 minutes from now
::35	35 seconds from now

Notes:

1. This qualifier should not be used when the HALT flag is set, or when setting breakpoints.

2. The accuracy of this feature can be affected by the design of a diagnostic program. The diagnostic supervisor checks for an expired time limit whenever it checks for control-Cs. Since diagnostic programs are required to call a system service which checks for control-Cs at least every 3 seconds, the actual runtime should not deviate by more than 3 seconds from the desired runtime.

* Multiprocessor Enhancements

  o Breakpoints

    You can optionally set breakpoints in the code to be executed in attached processors. Whenever a breakpoint is reached by any processor, all processors are placed in their idle loops (except for the primary processor, which enters VDS command mode). Typing a CONTINUE command causes all processors to continue from the point they were stopped. Typing a NEXT command executes the next instruction only if the breakpoint was executed by the primary processor, so that you can only single step through code being executed in the primary processor.

    You can set one or more breakpoints on an Attached or Primary Processor but not both (no mixed bpt's).

    In addition, to be assured of hitting breakpoints in an Attached Processor, test code must be synchronized between the Primary and Attached CPU's such that if the Attached processor hits a breakpoint, the Primary processor would be able to report that breakpoint by

issuing periodic calls (at least every three seconds) to the $DSBREAK service.

One simple method of accomplishing this is shown in the following test structure. Of course, other methods for synchronization using the $DSBREAK service may exist.

```
Primary Processor code          Attached Processor Code
----------------------          -----------------------
    Set flag
    Start Attached Processor -----> BGNATTACHED
5$: BBC flag 10$                    Execute test code
    $DS_BREAK                               .
    BRB 5$                                  .
                                    $DS_BREAK
                                    Clear Flag
10$: Continue                               Here the Attached could
                                    wait for another flag from
                                    the Primary to continue.
```

In this structure the attached can hit any breakpoint set between the BGNATTACHED and the clearing of the flag. The Primary processor needs to loop on $DS_BREAK to be able to report an Ap breakpoint or condition and also to respond to control-C's. A sort of stop/go flag mechanism can be designed for the Primary and Attached to execute sections of test code where the Ap can perform a test, perhaps write results, and then signal the Primary, then the primary can continue and perhaps start another section of test code. It is important that $DS_BREAK 's be called from both the Primary and Attached Processors.

When an Attached Processor hits a breakpoint, the PC of the Primary Processor (that detected the breakpoint) will point to the instruction following the $DSBREAK service that resulted in the Ap BPT message.

o Mp Diagnostic Users

If a diagnostic program not using the multiprocessor features of the VDS is executed under the new version of the VDS, the user will see no differences from current versions of the VDS. There will be two differences that a user will see when executing a program designed to run on multiple processors.

1. He/she will have to attach each processor he/she desires to be executed by the diagnostic program. However, this process is identical to the attaching sequences that are currently necessary for attaching any device before testing it.

2. In order to examine or deposit into the general purpose registers (GPRs) or internal processor registers (IPRs) of an attached processor, the user must specify the generic name of the processor (used in the ATTACH command) to indicate which processor's registers are to be examined or deposited into.

   It will not be possible to examine registers in an attached processor unless a diagnostic program has previously called the $DS_BOOTATTACHED service to boot that processor, and that attached processor has hit a breakpoint.

   A new command, SET CPU, will be added. This command will change the default processor referenced by the EXAMINE and DEPOSIT commands. For example, the command sequence

```
SET CPU KA1
EXAMINE R5
DEPOSIT R3 4
```

   will cause R5 to be examined and the value "4" to be deposited into R3 of the processor whose logical unit number is KA1.

   To keep track of which registers are being examined or deposited to, another new command called SHOW CPU has been added. Typing a SHOW CPU will indicate either PRIMARY or the generic name of the Ap used in the Attach sequence.

o Mp Restrictions

  The following restrictions apply to users of diagnostic programs which make use of the multiprocessing facilities of the VDS:

  1. It will not be possible to use the VDS EXAMINE and DEPOSIT commands to examine or deposit into the IPRs of an attached processor unless that processor has previously been booted with the $DS_BOOTATTACHED service, and that processor has hit a breakpoint.

  2. The NEXT command (single-stepping) cannot be used for code executing in an attached processor. If it is desirable to single-step the Ap, then the user should deposit a halt at the point you wish to single-step the Ap, and set a breakpoint in the Primary Processor at a convenient place, such as after calling the $DS_STARTATTACHED service. When you start the test and hit the Ap halt instruction, you can then use console commands to single-step the Ap.

3. The PC of an attached processor cannot be modified with the DEPOSIT command.

4. Only the PSW portion of the PSL in an attached processor can be examined.

5. Breakpoints can only be set for one processor at-at-time.

6. The PC will not be indicated when continuing from a multiprocessor diagnostic since more that one processor may be resuming execution of code.

2 BUG FIXES

- For 8200 systems, if the VALID bit in the WATCH chip CSR was clear (due to a bad battery, for instance), the supervisor would not boot up. Instead it would halt. This has been fixed.

- A problem with starting selftest on BI adapters on SCORPIO systems has been fixed. Previously, on some occasions, when selftest was attempted on a KDB50 adapter, a BI cycle was being truncated, resulting in ICE, RDS, or corrupted memory. This could happen to any BI adapter. The symptom was seen while running EVRLF.

3 KNOWN BUGS AND DEFICIENCIES

- If you control-C an mp diagnostic and then start and control-C a SHOW MEM command for example, the next CONTINUE command will result in a continuation of the mp diagnostic.

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 10.4 December 22,1986

1 ENHANCEMENTS

* Support for logical names and search lists in USER mode

  o VMS logical names and searchlist logical names are allowed to represent file specifications. If the equivalence string of the logical name includes only part of a directory specification, it will be concatenated with the supervisor's default directory. For example, if SYS$SYSROOT is equivalent to 1DUS0:[SYS3.], and you specify SYS$SYSROOT:[SYSMAINT], the resulting filespec will be 1DUS0:[SYS3.SYSMAINT].

  o This is supported for all VDS commands and services involving file operations.

* DIRECTORY command in USER mode

  o Previous versions of VDS required that you ATTACH a device before doing a DIRECTORY of that device. It is not necessary to ATTACH the device in Version 10.4 of VDS.

* USER mode default load path

  o The VDS now sets its initial default load path to the logical name SYS$MAINTENANCE. SYS$MAINTENANCE should be defined in the system logical name table to the disk and directory which contains the system's diagnostic programs. If it is not defined, see your system manager, or define it in your process's name table.

  o In order to change the default load path, use the SET LOAD command as before. You may use DCL to define an equivalence string for SYS$MAINTENANCE in your process logical name table in order to change the VDS's initial default load path.

  o The VDS sets the default disk and directory by redefining the SYS$DISK logical name with the $CRELOG system service, and changing the default directory with the $SETDDIR service. Thus, if you attempt to SET LOAD to SYS$DISK, the VDS will redefine the logical SYS$DISK to be equivalent to itself, and file services will fail.

* Volume Shadowing

  o The VDS now supports booting and loading diagnostics from a VMS shadow set.

  o In order to boot VDS from a shadow set, R3 should be set up for VMB in the following format:



  The virtual unit number corresponds to the unit number assigned to the shadow set. The member unit can be the physical drive number of any member of the shadow set. It is used by VMB and SYSBOOT during booting in case access via the shadow set virtual number fails. The VDS itself only attempts file services via the shadow set virtual number.

  For example, to boot from a shadowed set known as DUS19, which contains members DUA2 and DUA9, and use DUA9 as the boot path in case booting via the shadow set virtual number fails, load R3 as follows:

```
>>> D/G 3 80130009
```

  o The device naming convention for a shadowed disk is HSC50$DUSnnn, where nnn is the shadow set virtual unit number between 0 and 255. This is in contrast to a non-shadowed HSC50 disk which has a device name format of HSC50$DUAnnn.

* BCA

  o The BCA, BI to CI Adapter, is now supported in a boot and load path.

  o The BCA is ATTACHed with device type CIBCA, as follows:

```
DS> ATTACH CIBCA HUB PAA0   ! BCA adapter
BI Node Number? 6
BR? 4
CI Node? 2
DS>
```

* Global Section Support for VSDP

  o The VDS now maps part of its control region into a global section, in order that VSDP can examine pass count, test number, subtest number, etc. The global section is only

established when the VDS is being run from a mailbox, and does not affect the operation of the supervisor or diagnostic programs.

2 BUG FIXES

* In command mode, the DELETE key was not being processed correctly by the supervisor in standalone mode on video terminals. The symptom would appear when a command was typed, and the user tried to erase the command by typing the delete key. Although the screen appeared correct, the VDS's internal command buffer was not being cleared, and the originally typed command would be executed. This has been fixed.

* When a SHOW MEMORY/BUFFER command was given just after a program had called $DS_RELBUF and no buffers had been allocated, the VDS displayed a negative number of pages allocated. This has been fixed.

* If memory management had previously been turned on via a $DS_MMON call, a SHOW MM command would not indicate that memory management was on. This has been fixed.

* In user mode, an access control violation occurred as a result of a DIRECTORY command to a disk whose device name did not conform to the ggan or name$ggan format. This has been fixed.

3 KNOWN BUGS AND DEFICIENCIES

1. If memory management is turned on with the SET MM ON command, and file access to an HSC50 disk is attempted, you may experience file read errors on 86xx machines. The message you may see is:

   %RMS-F-RER, file read error (R0=0001C0F4)

   or the file access may cause the VDS to hang.

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 10.5, EZSAA only January 26, 1987

1 ENHANCEMENTS

* Support for logical names and search lists in USER mode

  o VMS logical names and searchlist logical names are allowed to represent file specifications. If the equivalence string of the logical name includes only part of a directory specification, it will be concatenated with the supervisor's default directory. For example, if SYS$SYSROOT is equivalent to 1DUS0:[SYS3.], and you specify SYS$SYSROOT:[SYSMAINT], the resulting filespec will be 1DUS0:[SYS3.SYSMAINT].

  o This is supported for all VDS commands and services involving file operations.

* DIRECTORY command in USER mode

  o Previous versions of VDS required that you ATTACH a device before doing a DIRECTORY of that device. It is not necessary to ATTACH the device in Version 10.4 of VDS.

* USER mode default load path

  o The VDS now sets its initial default load path to the logical name SYS$MAINTENANCE. SYS$MAINTENANCE should be defined in the system logical name table to the disk and directory which contains the system's diagnostic programs. If it is not defined, see your system manager, or define it in your process's name table.

  o In order to change the default load path, use the SET LOAD command as before. You may use DCL to define an equivalence string for SYS$MAINTENANCE in your process logical name table in order to change the VDS's initial default load path.

  o The VDS sets the default disk and directory by redefining the SYS$DISK logical name with the $CRELOG system service, and changing the default directory with the $SETDDIR service. Thus, if you attempt to SET LOAD to SYS$DISK, the VDS will redefine the logical SYS$DISK to be equivalent to itself, and file services will fail.

* Volume Shadowing

  o The VDS now supports booting and loading diagnostics from a VMS shadow set.

  o In order to boot VDS from a shadow set, R3 should be set up for VMB in the following format:



    The virtual unit number corresponds to the unit number assigned to the shadow set. The member unit can be the physical drive number of any member of the shadow set. It is used by VMB and SYSBOOT during booting in case access via the shadow set virtual number fails. The VDS itself only attempts file services via the shadow set virtual number.

    For example, to boot from a shadowed set known as DUS19, which contains members DUA2 and DUA9, and use DUA9 as the boot path in case booting via the shadow set virtual number fails, load R3 as follows:

```
>>> D/G 3 80130009
```

  o The device naming convention for a shadowed disk is HSC50$DUSnnn, where nnn is the shadow set virtual unit number between 0 and 255. This is in contrast to a non-shadowed HSC50 disk which has a device name format of HSC50$DUAnnn.

* BCA

  o The BCA, BI to CI Adapter, is now supported in a boot and load path.

  o The BCA is ATTACHed with device type CIBCA, as follows:

```
DS> ATTACH NBIA HUB NBIA0          ! NBI adapter
LOGICAL ADAPTER # 0
DS>
DS> ATTACH NBIB NBIA0 NBIB0        ! NBI adapter
BI # ? 0
BI Node Number (HEX) ? 2
DS>
DS> ATTACH CIBCA NBIB0 PAA0        ! BCA adapter
BI Node Number (HEX) ? 6
BR? 4
CI Node? 2
DS>
```

* Global Section Support for VSDP

  o The VDS now maps part of its control region into a global section, in order that VSDP can examine pass count, test number, subtest number, etc. The global section is only established when the VDS is being run from a mailbox, and does not affect the operation of the supervisor or diagnostic programs.

* Multiprocessor Enhancements

  o Breakpoints

    You can optionally set breakpoints in the code to be executed in attached processors. Whenever a breakpoint is reached by any processor, all processors are placed in their idle loops (except for the primary processor, which enters VDS command mode). Typing a CONTINUE command causes all processors to continue from the point they were stopped. Typing a NEXT command executes the next instruction only if the breakpoint was executed by the primary processor, so that you can only single step through code being executed in the primary processor.

    You can set one or more breakpoints on an Attached or Primary Processor but not both (no mixed bpt's).

    In addition, to be assured of hitting breakpoints in an Attached Processor, test code must be synchronized between the Primary and Attached CPU's such that if the Attached processor hits a breakpoint, the Primary processor would be able to report that breakpoint by issuing periodic calls (at least every three seconds) to the $DS_BREAK service.

    One simple method of accomplishing this is shown in the following test structure. Of course, other methods for synchronization using the $DS_BREAK service may exist.

```
Primary Processor code          Attached Processor Code
----------------------          -----------------------
    Set flag
    Start Attached Processor -----> BGNATTACHED
5$: BBC flag 10$                Execute test code
    $DS_BREAK                             .
    BRB 5$                                .
                                $DS_BREAK
                                Clear Flag
10$: Continue                         Here the Attached could
                                wait for another flag from
                                the Primary to continue.
```

    In this structure the attached can hit any breakpoint set between the BGNATTACHED and the clearing of the flag.

The Primary processor needs to loop on $DS_BREAK to be able to report an Ap breakpoint or condition and also to respond to control-C's. A sort of stop/go flag mechanism can be designed for the Primary and Attached to execute sections of test code where the Ap can perform a test, perhaps write results, and then signal the Primary, then the primary can continue and perhaps start another section of test code. It is important that $DS_BREAK 's be called from both the Primary and Attached Processors.

When an Attached Processor hits a breakpoint, the PC of the Primary Processor (that detected the breakpoint) will point to the instruction following the $DS_BREAK service that resulted in the Ap BPT message.

o Mp Diagnostic Users

If a diagnostic program not using the multiprocessor features of the VDS is executed under the new version of the VDS, the user will see no differences from current versions of the VDS. There will be two differences that a user will see when executing a program designed to run on multiple processors.

1. He/she will have to attach each processor he/she desires to be executed by the diagnostic program. However, this process is identical to the attaching sequences that are currently necessary for attaching any device before testing it.

2. In order to examine or deposit into the general purpose registers (GPRs) or internal processor registers (IPRs) of an attached processor, the user must specify the generic name of the processor (used in the ATTACH command) to indicate which processor's registers are to be examined or deposited into.

   It will not be possible to examine registers in an attached processor unless a diagnostic program has previously called the $DS_BOOTATTACHED service to boot that processor, and that attached processor has hit a breakpoint.

   A new command, SET CPU, will be added. This command will change the default processor referenced by the EXAMINE and DEPOSIT commands. For example, the command sequence

```
SET CPU KA1
EXAMINE R5
DEPOSIT R3 4
```

   will cause R5 to be examined and the value "4" to be deposited into R3 of the processor whose logical unit number is KA1.

To keep track of which registers are being examined or deposited to, another new command called SHOW CPU has been added. Typing a SHOW CPU will indicate either PRIMARY or the generic name of the Ap used in the Attach sequence.

- Mp Restrictions

  The following restrictions apply to users of diagnostic programs which make use of the multiprocessing facilities of the VDS:

  1. It will not be possible to use the VDS EXAMINE and DEPOSIT commands to examine or deposit into the IPRs of an attached processor unless that processor has previously been booted with the $DS_BOOTATTACHED service, and that processor has hit a breakpoint.

  2. The NEXT command (single-stepping) cannot be used for code executing in an attached processor. If it is desirable to single-step the Ap, then the user should deposit a halt at the point you wish to single-step the Ap, and set a breakpoint in the Primary Processor at a convenient place, such as after calling the $DS_STARTATTACHED service. When you start the test and hit the Ap halt instruction, you can then use console commands to single-step the Ap.

  3. The PC of an attached processor cannot be modified with the DEPOSIT command.

  4. Only the PSW portion of the PSL in an attached processor can be examined.

  5. Breakpoints can only be set for one processor at a time.

  6. The PC will not be indicated when continuing from a multiprocessor diagnostic since more that one processor may be resuming execution of code.

2 BUG FIXES

* In standalone mode, the time stamp in some VDS messages was appearing as "Jan. 1, 1986 0:0:0" even though the correct time and date would appear in other messages. This has been fixed.

* In command mode, the DELETE key was not being processed correctly by the supervisor in standalone mode on video terminals. The symptom would appear when a command was typed, and the user tried to erase the command by typing the delete key. Although the screen appeared correct, the VDS's internal command buffer was not being cleared, and the originally typed command would be executed. This has been fixed.

* When a SHOW MEMORY/BUFFER command was given just after a program had called $DS_RELBUF and no buffers had been allocated, the VDS displayed a negative number of pages allocated. This has been fixed.

* If memory management had previously been turned on via a $DS_MMON call, a SHOW MM command would not indicate that memory management was on. This has been fixed.

* In user mode, an access control violation occurred as a result of a DIRECTORY command to a disk whose device name did not conform to the ggan or name$ggan format. This has been fixed.

* When booting from an HSC disk connected to a CIBCI or CIBCA, the CI_NODE ptable contained the incorrect value in the functionality field (HP$L_CI_FUNC) and the CI node field (HP$B_CI_NODE). No symptom was reported other than a SHOW DEVICE command displaying the wrong information for the CI node. This has been fixed.

* If you control-C an mp diagnostic and then start and control-C a SHOW MEM command for example, the next CONTINUE command will result in a continuation of the mp diagnostic.

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 10.6, EBSAA only Jan. 29, 1987

1 ENHANCEMENTS

* This version provides support for the 8250/8350 systems. These systems contain faster cpus than the original 8200/8300 systems. The VDS which supports the new systems is EBSAA.EXE. Note that the processor is still ATTACHed with device type KA820 for the 8250/8350 systems. The only services which are affected are the $DS_WAITMS and $DS_WAITUS, and these have been adjusted to account for the increased processor speed.

RELEASE NOTES FOR VAX-11 DIAGNOSTIC SUPERVISOR VERSION 10.7 March 23, 1987

1 ENHANCEMENTS

* This version provides support for the 8250/8350 systems. These systems contain faster cpus than the original 8200/8300 systems. The VDS which supports the new systems is EBSAA.EXE. Note that the processor is still ATTACHed with device type KA820 for the 8250/8350 systems. The only services which are affected are the $DS_WAITMS and $DS_WAITUS, and these have been adjusted to account for the increased processor speed.

* Ptables have been added for the LG01, LG02, and LG03 lineprinters.

2 BUG FIXES

* A bit field in the SBIA SILO register was being reported by the 86xx EDSAA.EXE as "Reserved" when it contained a value of 6. This occurred when the VDS interpreted SILO information after receiving SBIA Fault Interrupts. This has been corrected to report "Interrupt Summary Read".

* When a VDS command, which involved accessing a file, was executed while running under VMS, and the file was protected, VDS would report "Unknown error". This has been changed to report "Insufficient privilege or file protection violation".

* When using the VDS NEXT command to single step over an instruction which had a breakpoint set, the VDS display after the next command would show the 03 (BREAKPOINT) opcode instead of the original opcode. This has been fixed so that the "real" opcode is displayed.

RELEASE NOTES FOR VAX DIAGNOSTIC SUPERVISOR VERSION 10.8 June 22, 1987

1 ENHANCEMENTS

* Ptables and boot and load support have been added for the RA70 non-removable disk.

* Added ptables for DEBNA and DEBNK.

* Updated SHOW BREAKPOINT display and the breakpoint message (primary and attached processor) which is displayed when a breakpoint is reached, to include the base address and offset which were used when setting the breakpoint. For example,

```
DS> SET BASE 9010
DS> SET BREAKPOINT E
DS> SHOW BREAKPOINT
Breakpoints located at:
                0000901E(X)     (Base=00009010(X) Offset=0000000E(X))
```

when the breakpoint is reached the following will be displayed:

```
Breakpoint at: 0000901E(X)     (Base=00009010(X) Offset=0000000E(X))
DS>
```

2 BUG FIXES

* When a zero value was passed for one of the $DS_LOAD parameters (FILE, DEFAULT, ADDRESS, RETLEN, or RETREC), an access violation would occur when VDS tried to access the location with memory management turned on in the standalone mode, or when running under VMS. The supervisor was then changed so that the $DS_LOAD service checked these parameters for zero, and returned an error code if so. Unfortunately, this change caused several diagnostics to fail by not allowing them to load files (usually microcode) into memory. So far, EVMAE and EVDFD are known to experience this problem. This problem exists in VDS versions 10.0 (EBSAA prerelease), 10.1 (EZSAA prerelease), 10.2 (release 25 and 26), 10.4 (rel. 27), 10.5 (EZSAA prerelease), 10.6 (EBSAA 8250 prerelease) and 10.7 (rel. 28).

Some of these diagnostic programs were not affected by the access violation because they do not run under VMS or in standalone with memory management turned on. So that these diagnostic programs do not have to be rereleased, the VDS will no longer return an error code when a parameter of zero is passed. For those programs which are required to run with memory management enabled, the access violations should be caught by developers when executing the QA checklist in the section which requires memory management to be enabled. Those diagnostics should be fixed.

* If a breakpoint in a diagnostic program was reached after a $DS_SETVEC macro had been performed to capture the machine check (04), translation not valid (24), access violation (20), or reserved operand (18) vectors, any EXAMINE or DEPOSIT command which resulted in one of these faults would cause control to pass to the diagnostic program's exception handler.

  This has been fixed by changing the EXAMINE and DEPOSIT commands to reset these vectors in the system control block for the duration of the EXAMINE or DEPOSIT command. A side effect of this change is that if the VDS EXAMINE command is used to EXAMINE these SCB vectors in this scenario, the normal VDS SCB vectors will be returned. To examine the vectors as set by the diagnostic program, use the console EXAMINE command.

* The parameter generic-name for DEATTACH command MUST be specified now. DEATTACH command also takes 'ALL' as a keyword parameter to de-attach all devices attached to the link, excluding the link itself. VDS User's Guide will be updated correspondingly.

* Previously, if the VDS was booted from a disk connected to an HSC50, you could not load diagnostics from a different disk/HSC50 (one other than an HSC50 specified as the failover path in R2 at boot time) by ATTACHing and setting the default load path to it. The VDS would still try to access the disk via the primary or failover HSC50 path which was specified in R2. This has been fixed.

* A hanging problem which was amplified by Rev 22E console program appeared in EZSAA while running in a script file involving a lots of terminal I/O. EZSAA console modules CONSOLE8800 and CSDUBTDRV are modified to catch a missing XON sent from console to resume from holding data.

* Fixed the bug in supporting DHB32.

* Fixed the bug in booting VDS from KDB50 and UDA50.

RELEASE NOTES FOR
VAX DIAGNOSTIC SUPERVISOR

VERSION 10.9
Sep. 21, 1987

1 NEW DEVICE SUPPORT

* Added ptable descriptor for RV20.

* Bliss support for DHB32. Added Bliss definitions for DHB32 in Bliss DIAG library so that any diagnostic written in Bliss can use those definitions.

2 ENHANCEMENTS

* In the past, a boot device, either DWBUA, KDB50, CIBCI, or KFBTA, had to be selftested again after the initialization done by its device driver in VMB. This redundancy has been eliminated in a BI system.

* Boot and load support for 2nd console RX50 drive on 82xx/83xx systems. Previously, VDS could be booted from one console RX50 drive called CSA0 only. Now, an operator can have the options of booting VDS from either CSA1 or CSA2.

3 BUG FIXES

* When a device is specified without a colon for the 'SET LOAD' command, a colon will be automatically postfixed to the device name. Prior to the fix, a VDS command 'SET LOAD DBA2', for example, appeared to succeed, but did not change the default to device DBA2 because it did not actually recognize DBA2 as a device without a postfixed colon.

* A directory specification for 'SET LOAD' command was not parsed the same way as by VMS. For example, VDS did not take 'SET LOAD RELD$1:[28]' as a legal command while 'SET DEFAULT RELD$1:[28]' is perfectly fine with VMS. This was because VDS treated a number in a directory specification as an octal format of UIC, which invalidated a number with digits higher than seven. VDS is now made consistent with VMS by generalizing any number as alphanumeric format of either a UIC or a name of a directory.

* VDS used to reject a device with unit number 255. For example, a VDS attach command 'ATTACH RA80 HUB DUA255' would cause an error message of 'Unit number too big or not allowed'. This was due to an error in treating a maximum unit number. It has been fixed.

RELEASE NOTES FOR
VAX DIAGNOSTIC SUPERVISOR
VERSION 10.10
Dec. 21, 1987

1 NEW SYSTEM SUPPORT

2 NEW DEVICE SUPPORT

* Added ptables for DEBNA, DEBNT and LANCE.

3 ENHANCEMENTS

* Supervisor onboard image PCS750.BIN has been upgraded to Rev. 99.

4 BUG FIXES

* $DS_ASKSTR macro could not be used by BLISS source because R1 containing returned pointer could not be easily referenced by caller. The register can now be referenced by BLISS source with Linkage-Declarations.

* Encountered a 'Reserved/privileged instruction fault' while attempting to do a 'SHOW MEM/DAT' after running EVKAE. It has been soloved by checking for proper mode before accessing privileged register.

* The bug occasionally causing access violation during 'DIRECTORY' command in online mode has been fixed. This problem has existed since VDS Ver. 10.3. Its PC at error is somewhere near address 00026000.

RELEASE NOTES FOR

VAX DIAGNOSTIC SUPERVISOR
VERSION 10.11
Mar. 21, 1988

1 NEW SYSTEM SUPPORT

* Announcement for the support of LYNX system.

The VAXstation 8000 (LYNX) is the newest member of the VAXstation family. It is a high performance, 3D, full color workstation developed jointly by Digital and Evans & Sutherland Corp. It offers the fastest vector drawing speed in the industry, over 500,000 3D vectors per second.

All VAXstation 8000 systems include the following hardware:

- Custom Under Desk Pedestal
- VAX 8250 CPU
- 16 Mbyte Memory
- TK50 Tape Drive and Control
- Ethernet Control
- RD54 disk and Control
- Graphics Subsystem, 58 planes
- VR290 Color Monitor
- Peripheral Repeater Box-graphic input devices multiplexer
- 8 Knob Dial Box with programmable LEDs
- VSXXX-AA Mouse

VDS MEDIA AND BOOT SPECIFICATION

a) VDS (EBSAA Rev. 10.11) can now be booted from a TK50 cassette tape driver on LYNX. The controller for TK50 is DEBNK. Load support for a TK50 is also added so that we can load a file or get a directory of file(s) from a TK50 under control of EBSAA.

To create a bootable TK50 cassette tape, first copy VMB.EXE that supports TK50 booting to the tape. This must be the first file on the tape for the system boot roms to read it in. For fast booting copy DIAGBOOT.EXE next followed by EBSAA.EXE. These are the minimal files required for booting from the tape.

For optimum speed of access, the files should be copied to the tape in the order they will be read.

Because of a format restriction in VMB.EXE and DIAGBOOT.EXE, these files and EBSAA.EXE must be copied in the block size of 512 bytes and the remaining files can be copied in a bigger block size to gain faster operation of the TK50.

The steps for making a bootable tape follow:

1) Initialize the tape.
2) MOUNT/BLOCK_SIZE=512
   COPY VMB.EXE,DIAGBOOT.EXE,EBSAA.EXE MUL6:
3) The tape will have to be dismounted now
   DISMOUNT/NOUNLOAD
4) Mount the tape with a bigger block size (e.g.)
   MOUNT/BLOCK_SIZE=16384
5) Now copy rest of your files to the tape.

If your tape does not have to be bootable, then skip steps 2 and 3.

b) VDS (EBSAA Rev. 10.11) can now be booted from a RD52, RD53 or RD54 Winchester hard disk on LYNX. The controller for the Winchester hard disk is KFBTA. Load support for the Winchester hard disk is also added so that we can load a file or get a directory of file(s) from the Winchester hard disk under control of EBSAA.

To create a bootable Winchester hard disk, we should copy VMB.EXE, DIAGBOOT.EXE and EBSAA.EXE to the disk in File-11 format.

The steps for making a bootable disk follow:

1) $ ALLOC DUan:
2) $ INIT DUan:
3) $ MOUNT/OVER=ID DUan:
4) $ CREATE/DIR DUan:[SYSMAINT]
5) $ COPY VMB.EXE, DIAGBOOT.EXE, EBSAA.EXE DUan:[SYSMAINT]
6) $ COPY DIAGNOSTIC.NAME DUan:[SYSMAINT]
7) $ MCR WRITEBOOT
   Target system device (and boot file if not VMB.EXE): <retn>
   Enter VBN of boot file code (default is 1): <retn>
   Enter load address of primary bootstrap in HEX
   (default is 200): <retn>

Added ptables for DEBNA, DEBNK, KFBTA, LANCE, TK50, RD52, RD53, and RD54.

For DEBNA: Description: DEBNA BI Network Adapter
Link: HUB
Generic name: ETa
Additional information: BI Node Number (HEX)? [hex 0-F]

For DEBNK: Description: DEBNK Cartridge Tape Controller
Link: HUB
Generic name: ETa
Additional information: BI Node Number (HEX)? [hex 0-F]

For KFBTA: Description: KFBTA BI Disk Adapter
Link: HUB
Generic name: DUa
Additional information: BI Node Number (HEX)? [hex 0-F]

```
        For LANCE: Description:   Local Area Network Comm Ethernet
                   Link:          ETa
                   Generic name:  ETan

        For TK50:  Description:   TK50 Tape Drive and Cartridge
                   Link:          ETa
                   Generic name:  MUan

        For RD52:  Description:   RD52 Winchester hard disk
                   Link:          DUa
                   Generic name:  DUaxx

        For RD53:  Description:   RD53 Winchester hard disk
                   Link:          DUa
                   Generic name:  DUaxx

        For RD54   Description:   RD54 Winchester hard disk
                   Link:          DUa
                   Generic name:  DUaxx

    *  Announcement for the de-support of VAX 11/730 and VAX  11/725
       systems.
          a) The VDS which support VAX 11/730 and VAX 11/725 (ENSAA) will no
             longer be distributed in general releases.
          b) Bug fixes to ENSAA, version 10.10, which was archived in release
             31, will be done as needed.


2  NEW DEVICE SUPPORT

    *  Boot and load supports have been added for disk driver RA90.


3  ENHANCEMENTS

    *  Enhanced VDS ptable descriptors, ptables, and  VDS  internals
       to  support  high  unit  number  which  has  to  be in a word
       allocation.


4  BUG FIXES

    *  The old data structure in macro $DS_PRINTREV  was  statically
       set  up for up to 4 logical units.  However, there is no such
       limitation documented in the VAX Diagnostic Design Guide.  We
       have  modified  the  macro  to  dynamically allocate one data
```

block for each logical unit and allow each device unit to have up to four modules (boards). Therefore, the limitation to the number of logical units in $DS_PRINTREV will be consistent with the number of ptables (128) we can have at one time. In addition, the macro has been enhanced to give warning message to an user and return error status in register R0 in case of improper use.

* On a Nautilus system, examining non-existent I/O addresses would get 0's returned and set the NEX bit in bus error register instead of the message "No response/invalid operation at: xxxxxxxx". This is because a Nautilus system will not generate a hardware machine check for accessing non-existent I/O address, which in turn results an error message. New codes have been added to detect the NEX bit set and simulate the result of a machine check.

* When using START/TIME=xx:xx:xx.xx, if the user types a C and continues, the diagnostic used to run infinitely. This is now fixed for all VDS's.

Object Module Synopsis

Module Name	Ident	Bytes	File	Creation Date	Creator
KERNEL	10.10-41	7378	[DS.LOCAL.RELEASE.WORK]KERNEL.OBJ;1	21-MAR-1988 17:54	VAX/VMS Macro V04-00
ACPFDT	6.1-3	251	[DS.LOCAL.RELEASE.WORK]ACPFDT.OBJ;1	21-MAR-1988 17:45	VAX/VMS Macro V04-00
ANSI	7.0-7	2482	[DS.LOCAL.RELEASE.WORK]ANSI.OBJ;1	21-Mar-1988 17:45	VAX Bliss-32 V4.4-838
APBOOT	7.0-0	91	[DS.LOCAL.RELEASE.WORK]APBOOT.OBJ;1	21-MAR-1988 18:02	VAX/VMS Macro V04-00
APT	10	505	[DS.LOCAL.RELEASE.WORK]APT.OBJ;1	21-MAR-1988 17:45	VAX/VMS Macro V04-00
ASSIGN	8.3-3	306	[DS.LOCAL.RELEASE.WORK]ASSIGN.OBJ;1	21-MAR-1988 17:45	VAX/VMS Macro V04-00
ASTCON	7.0-2	44	[DS.LOCAL.RELEASE.WORK]ASTCON.OBJ;1	21-MAR-1988 17:45	VAX/VMS Macro V04-00
ASTDEL	6.7-7	436	[DS.LOCAL.RELEASE.WORK]ASTDEL.OBJ;1	21-MAR-1988 17:46	VAX/VMS Macro V04-00
ATTACH	10.10-9	5807	[DS.LOCAL.RELEASE.WORK]ATTACH.OBJ;1	21-MAR-1988 17:46	VAX/VMS Macro V04-00
BOOTDRIVR	10.0-28	770	BOOTDRIVR.OBJ;1	21-MAR-1988 17:46	VAX/VMS Macro V04-00
BOOTIO	6.12-2	84	[DS.LOCAL.RELEASE.WORK]BOOTIO.OBJ;1	21-MAR-1988 17:46	VAX/VMS Macro V04-00
BUFCTL	5.4-3	100	[DS.LOCAL.RELEASE.WORK]BUFCTL.OBJ;1	21-MAR-1988 17:46	VAX/VMS Macro V04-00
BUFFER	10.2-10	286	[DS.LOCAL.RELEASE.WORK]BUFFER.OBJ;1	21-MAR-1988 17:46	VAX/VMS Macro V04-00
CALLFRAME	01-01	464	CALLFRAME.OBJ;1	21-Mar-1988 17:46	VAX Bliss-32 V4.4-838
CANCEL	05-04	265	[DS.LOCAL.RELEASE.WORK]CANCEL.OBJ;1	21-MAR-1988 17:47	VAX/VMS Macro V04-00
CHAN750	07-12	2880	[DS.LOCAL.RELEASE.WORK]CHAN750.OBJ;1	21-MAR-1988 18:02	VAX/VMS Macro V04-00
CHMK	10-09	260	[DS.LOCAL.RELEASE.WORK]CHMK.OBJ;1	21-MAR-1988 17:47	VAX/VMS Macro V04-00
CLI	10.11-30	8660	[DS.LOCAL.RELEASE.WORK]CLI.OBJ;1	21-MAR-1988 17:47	VAX/VMS Macro V04-00
CLOCK	10-11.5	1249	[DS.LOCAL.RELEASE.WORK]CLOCK.OBJ;1	21-MAR-1988 17:48	VAX/VMS Macro V04-00
COMDRVSUB	06.01	245	COMDRVSUB.OBJ;1	21-MAR-1988 17:48	VAX/VMS Macro V04-00
CONFIG	10.10-45	3103	[DS.LOCAL.RELEASE.WORK]CONFIG.OBJ;1	21-MAR-1988 17:48	VAX/VMS Macro V04-00
CONSOLE	09-35	2082	[DS.LOCAL.RELEASE.WORK]CONSOLE.OBJ;1	21-MAR-1988 18:03	VAX/VMS Macro V04-00
CRDDUMMY	10-0	250	CRDDUMMY.OBJ;1	21-Mar-1988 18:03	VAX Bliss-32 V4.4-838
CSDDBTDRV	06-12	649	CSDDBTDRV.OBJ;1	21-MAR-1988 18:03	VAX/VMS Macro V04-00
DSVECS	01-10	112	[DS.LOCAL.RELEASE.WORK]DSVECS.OBJ;1	21-MAR-1988 17:51	VAX/VMS Macro V04-00
CVRTIM	V02-04	1062	[DS.LOCAL.RELEASE.WORK]CVRTIM.OBJ;1	21-MAR-1988 17:49	VAX/VMS Macro V04-00
CVTFILNAM	06-02	214	CVTFILNAM.OBJ;1	21-MAR-1988 17:49	VAX/VMS Macro V04-00
DASSGN	05-02	189	[DS.LOCAL.RELEASE.WORK]DASSGN.OBJ;1	21-MAR-1988 17:49	VAX/VMS Macro V04-00
DEBUG	10.11-11	5808	[DS.LOCAL.RELEASE.WORK]DEBUG.OBJ;1	21-MAR-1988 17:49	VAX/VMS Macro V04-00
DEVALC	05-05	353	[DS.LOCAL.RELEASE.WORK]DEVALC.OBJ;1	21-MAR-1988 17:49	VAX/VMS Macro V04-00
DEVICE	06-01	175	[DS.LOCAL.RELEASE.WORK]DEVICE.OBJ;1	21-MAR-1988 17:50	VAX/VMS Macro V04-00
DIRECTORY	10.10-13	5627	DIRECTORY.OBJ;1	21-Mar-1988 17:50	VAX Bliss-32 V4.4-838
DISPAT	10.11-6	2320	[DS.LOCAL.RELEASE.WORK]DISPAT.OBJ;1	21-MAR-1988 17:50	VAX/VMS Macro V04-00
DLBTDRIVR	V02-002	312	DLBTDRIVR.OBJ;1	21-MAR-1988 17:50	VAX/VMS Macro V04-00
DMBTDRIVR	V02-002	315	DMBTDRIVR.OBJ;1	21-MAR-1988 17:50	VAX/VMS Macro V04-00
DRINT	V01	29	[DS.LOCAL.RELEASE.WORK]DRINT.OBJ;1	21-MAR-1988 17:50	VAX/VMS Macro V04-00
DSLOAD	10.8-12	941	[DS.LOCAL.RELEASE.WORK]DSLOAD.OBJ;1	21-Mar-1988 17:50	VAX Bliss-32 V4.4-838
ENTRY	10-43	3057	[DS.LOCAL.RELEASE.WORK]ENTRY.OBJ;1	21-MAR-1988 18:03	VAX/VMS Macro V04-00
ERROR	10.11-8	4072	[DS.LOCAL.RELEASE.WORK]ERROR.OBJ;1	21-MAR-1988 17:51	VAX/VMS Macro V04-00
EVENT	06-01	241	[DS.LOCAL.RELEASE.WORK]EVENT.OBJ;1	21-Mar-1988 17:51	VAX Bliss-32 V4.4-838
EXCEPT	07-34	4148	[DS.LOCAL.RELEASE.WORK]EXCEPT.OBJ;1	21-MAR-1988 17:51	VAX/VMS Macro V04-00
FAO	03-02	865	[DS.LOCAL.RELEASE.WORK]FAO.OBJ;1	21-MAR-1988 17:51	VAX/VMS Macro V04-00
FLAGS	07-14	601	[DS.LOCAL.RELEASE.WORK]FLAGS.OBJ;1	21-MAR-1988 17:52	VAX/VMS Macro V04-00
FILEREAD	10-03	2137	FILEREAD.OBJ;1	21-MAR-1988 17:51	VAX/VMS Macro V04-00
FRKCTL	06-03	102	[DS.LOCAL.RELEASE.WORK]FRKCTL.OBJ;1	21-MAR-1988 17:52	VAX/VMS Macro V04-00
GETTIM	01	26	[DS.LOCAL.RELEASE.WORK]GETTIM.OBJ;1	21-MAR-1988 17:52	VAX/VMS Macro V04-00
GTCHAN	02-01	136	[DS.LOCAL.RELEASE.WORK]GTCHAN.OBJ;1	21-MAR-1988 17:52	VAX/VMS Macro V04-00
HELP	10.10-2	2762	[DS.LOCAL.RELEASE.WORK]HELP.OBJ;1	21-Mar-1988 17:52	VAX Bliss-32 V4.4-838
IOBASE	10.11-57	14678	[DS.LOCAL.RELEASE.WORK]IOBASE.OBJ;1	21-MAR-1988 17:52	VAX/VMS Macro V04-00

Module Name	Ident	Bytes	File	Creation Date	Creator
IOPOST	05-04	979	[DS.LOCAL.RELEASE.WORK]IOPOST.OBJ;1	21-MAR-1988 17:53	VAX/VMS Macro V04-00
IOSNPG	06-04	770	[DS.LOCAL.RELEASE.WORK]IOSNPG.OBJ;1	21-MAR-1988 17:54	VAX/VMS Macro V04-00
IOSPGD	05-02	402	[DS.LOCAL.RELEASE.WORK]IOSPGD.OBJ;1	21-MAR-1988 17:54	VAX/VMS Macro V04-00
IOSRAM	05-02	373	[DS.LOCAL.RELEASE.WORK]IOSRAM.OBJ;1	21-MAR-1988 17:54	VAX/VMS Macro V04-00
LOAD	10.9-03	862	[DS.LOCAL.RELEASE.WORK]LOAD.OBJ;1	21-MAR-1988 17:54	VAX/VMS Macro V04-00
LOOP	07-19	815	[DS.LOCAL.RELEASE.WORK]LOOP.OBJ;1	21-MAR-1988 17:55	VAX/VMS Macro V04-00
LODMAP	05-02	255	[DS.LOCAL.RELEASE.WORK]LODMAP.OBJ;1	21-MAR-1988 17:54	VAX/VMS Macro V04-00
MBBTDRIVR	V02-004	443	MBBTDRIVR.OBJ;1	21-MAR-1988 18:03	VAX/VMS Macro V04-00
MCHK750	02-09	1778	[DS.LOCAL.RELEASE.WORK]MCHK750.OBJ;1	21-MAR-1988 18:03	VAX/VMS Macro V04-00
MBAINT	01	180	[DS.LOCAL.RELEASE.WORK]MBAINT.OBJ;1	21-MAR-1988 17:55	VAX/VMS Macro V04-00
MEMALC	07-09	826	[DS.LOCAL.RELEASE.WORK]MEMALC.OBJ;1	21-MAR-1988 17:55	VAX/VMS Macro V04-00
MEMMGT	10.11-9	2628	[DS.LOCAL.RELEASE.WORK]MEMMGT.OBJ;1	21-MAR-1988 17:55	VAX/VMS Macro V04-00
MPDUMMY	8.0	64	[DS.LOCAL.RELEASE.WORK]MPDUMMY.OBJ;1	21-Mar-1988 18:03	VAX Bliss-32 V4.4-838
ODS	01-04	972	[DS.LOCAL.RELEASE.WORK]ODS.OBJ;1	21-Mar-1988 17:56	VAX Bliss-32 V4.4-838
ONLY750	10.10-4	1555	[DS.LOCAL.RELEASE.WORK]ONLY750.OBJ;1	21-MAR-1988 18:04	VAX/VMS Macro V04-00
PABTDRIVR	10.10-29	6600	PABTDRIVR.OBJ;1	21-MAR-1988 17:57	VAX/VMS Macro V04-00
PARAM	9.1-17	1717	[DS.LOCAL.RELEASE.WORK]PARAM.OBJ;1	21-MAR-1988 17:57	VAX/VMS Macro V04-00
PARSE	07-20	1446	[DS.LOCAL.RELEASE.WORK]PARSE.OBJ;1	21-MAR-1988 17:57	VAX/VMS Macro V04-00
PCSDATA	06-01	11272	[DS.LOCAL.RELEASE.WORK]PCSDATA.OBJ;1	21-Mar-1988 18:04	VAX Bliss-32 V4.4-838
PCSLOAD750	06-03	349	PCSLOAD750.OBJ;1	21-Mar-1988 18:04	VAX Bliss-32 V4.4-838
PRINT	10.11-3	4243	[DS.LOCAL.RELEASE.WORK]PRINT.OBJ;1	21-MAR-1988 17:57	VAX/VMS Macro V04-00
PROBE	01-05	189	[DS.LOCAL.RELEASE.WORK]PROBE.OBJ;1	21-Mar-1988 17:58	VAX Bliss-32 V4.4-838
PUBTDRIVR	10.10-2	768	PUBTDRIVR.OBJ;1	21-MAR-1988 17:58	VAX/VMS Macro V04-00
QACHECKS	10.10-02	2107	QACHECKS.OBJ;1	21-Mar-1988 17:58	VAX Bliss-32 V4.4-838
QAFLAGS	6.6-04	484	[DS.LOCAL.RELEASE.WORK]QAFLAGS.OBJ;1	21-Mar-1988 17:58	VAX Bliss-32 V4.4-838
QAMAIN	1-08	2807	[DS.LOCAL.RELEASE.WORK]QAMAIN.OBJ;1	21-Mar-1988 17:58	VAX Bliss-32 V4.4-838
QIO	09-28	3247	[DS.LOCAL.RELEASE.WORK]QIO.OBJ;1	21-MAR-1988 17:58	VAX/VMS Macro V04-00
QIOFDT	05-03	479	[DS.LOCAL.RELEASE.WORK]QIOFDT.OBJ;1	21-MAR-1988 17:59	VAX/VMS Macro V04-00
QIOREQ	01-02	564	[DS.LOCAL.RELEASE.WORK]QIOREQ.OBJ;1	21-MAR-1988 17:59	VAX/VMS Macro V04-00
RELOCDRV	01	164	RELOCDRV.OBJ;1	21-MAR-1988 17:59	VAX/VMS Macro V04-00
RMS	10.11-23	3942	[DS.LOCAL.RELEASE.WORK]RMS.OBJ;1	21-Mar-1988 17:59	VAX Bliss-32 V4.4-838
RT11	01-04	835	[DS.LOCAL.RELEASE.WORK]RT11.OBJ;1	21-Mar-1988 17:59	VAX Bliss-32 V4.4-838
SCB	07-34	1132	[DS.LOCAL.RELEASE.WORK]SCB.OBJ;1	21-MAR-1988 17:59	VAX/VMS Macro V04-00
SCRIPT	10-27	1877	[DS.LOCAL.RELEASE.WORK]SCRIPT.OBJ;1	21-MAR-1988 18:00	VAX/VMS Macro V04-00
SHOWMEMORY	10.10-3	2290	SHOWMEMORY.OBJ;1	21-Mar-1988 18:00	VAX Bliss-32 V4.4-838
START	10.11-12	2426	[DS.LOCAL.RELEASE.WORK]START.OBJ;1	21-MAR-1988 18:00	VAX/VMS Macro V04-00
TFBTDRIVR	6-05	749	TFBTDRIVR.OBJ;1	21-MAR-1988 18:04	VAX/VMS Macro V04-00
TMBTDRIVR	01-02	346	TMBTDRIVR.OBJ;1	21-MAR-1988 18:04	VAX/VMS Macro V04-00
TSBTDRIVR	V01-02	522	TSBTDRIVR.OBJ;1	21-MAR-1988 18:00	VAX/VMS Macro V04-00
MUBTDRIVR	06-12	1019	MUBTDRIVR.OBJ;1	21-MAR-1988 17:56	VAX/VMS Macro V04-00
ULTRIX	01-05	3201	[DS.LOCAL.RELEASE.WORK]ULTRIX.OBJ;1	21-Mar-1988 18:00	VAX Bliss-32 V4.4-838
UNWIND	01-1	297	[DS.LOCAL.RELEASE.WORK]UNWIND.OBJ;1	21-MAR-1988 18:00	VAX/VMS Macro V04-00
.MAIN.	10.11	110	VER_ECSAA.OBJ;2	22-MAR-1988 11:32	VAX/VMS Macro V04-00
VMSDUMMY	05-02	30	VMSDUMMY.OBJ;1	21-MAR-1988 18:01	VAX/VMS Macro V04-00
SYS$IODEF	X-1	0	SYS$COMMON:[SYSLIB]STARLET.OLB;8	22-MAY-1987 19:42	VAX/VMS Macro V04-00
LIB$CVT_ATB	X-1	122	SYS$COMMON:[SYSLIB]STARLET.OLB;8	22-MAY-1987 21:58	VAX/VMS Macro V04-00
LIB$SIGNAL	X-1	220	SYS$COMMON:[SYSLIB]STARLET.OLB;8	22-MAY-1987 19:57	VAX/VMS Macro V04-00
SYS$PRDEF	X-1	0	SYS$COMMON:[SYSLIB]STARLET.OLB;8	22-MAY-1987 20:24	VAX/VMS Macro V04-00
SYS$SSDEF	X-1	0	SYS$COMMON:[SYSLIB]STARLET.OLB;8	22-MAY-1987 20:48	VAX/VMS Macro V04-00
SYS$P1_VECTOR	X-5M3	0	SYS$COMMON:[SYSLIB]STARLET.OLB;8	22-MAY-1987 20:10	VAX/VMS Macro V04-00

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                                        +-------------------------+
                                        ! Image Section Synopsis !
                                        +-------------------------+

   Cluster       Type Pages   Base Addr  Disk VBN PFC Protection and Paging      Global Sec. Name   Match     Majorid   Minorid
   -------       ---- -----   ---------  -------- --- ---------------------      ----------------   -----     -------   -------

DEFAULT_CLUSTER    0    96    00010000          2   0 READ ONLY
                   0    20    0001C000         98   0 READ WRITE   COPY ON REF
                   0   151    0001E800        118   0 READ ONLY
                   0    44    00031600        269   0 READ WRITE   COPY ON REF
                   0     1    00036E00        313   0 READ WRITE   FIXUP VECTORS
                 253    20    7FFFD800          0   0 READ WRITE DEMAND ZERO


         Key for special characters above:
               +-------------------+
               ! R  - Relocatable !
               ! P  - Protected   !
               +-------------------+
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Program Section Synopsis

Psect Name	Module Name	Base	End	Length	Align	Attributes
$BASE		00010000	00010B27	00000B28 (2856.)	QUAD 3	NOPIC,USR,CON,REL,LCL, SHR,NOEXE, RD,NOWRT,NOVEC
	ENTRY	00010000	00010B27	00000B28 (2856.)	QUAD 3	
DATA		00010B40	0001BFE5	0000B4A6 (46246.)	2 ** 5	NOPIC,USR,CON,REL,LCL, SHR,NOEXE, RD,NOWRT,NOVEC
	KERNEL	00010B40	00010CEE	000001AF (431.)	BYTE 0	
	ANSI	00010CF0	00010D07	00000018 (24.)	LONG 2	
	APBOOT	00010D08	00010D42	0000003B (59.)	LONG 2	
	APT	00010D44	00010D68	00000025 (37.)	LONG 2	
	ASTDEL	00010D6C	00010D7E	00000013 (19.)	LONG 2	
	ATTACH	00010D80	0001113C	000003BD (957.)	LONG 2	
	CALLFRAME	00011140	00011220	000000E1 (225.)	LONG 2	
	CHAN750	00011224	0001146A	00000247 (583.)	LONG 2	
	CHMK	0001146C	00011470	00000005 (5.)	LONG 2	
	CLI	00011471	000123E8	00000F78 (3960.)	BYTE 0	
	CLOCK	000123E9	000123EE	00000006 (6.)	BYTE 0	
	CONFIG	000123F0	0001248F	000000A0 (160.)	LONG 2	
	CONSOLE	00012490	000126B5	00000226 (550.)	LONG 2	
	CRDDUMMY	000126B8	000126EB	00000034 (52.)	LONG 2	
	DEBUG	000126EC	00012A1E	00000333 (819.)	BYTE 0	
	DEVICE	00012A1F	00012A25	00000007 (7.)	BYTE 0	
	DIRECTORY	00012A28	00012D40	00000319 (793.)	LONG 2	
	DISPAT	00012D44	00013040	000002FD (765.)	LONG 2	
	DSLOAD	00013044	000130A3	00000060 (96.)	LONG 2	
	ENTRY	000130A8	00013137	00000090 (144.)	QUAD 3	
	ERROR	00013138	00013AAF	00000978 (2424.)	BYTE 0	
	EXCEPT	00013AB0	0001425C	000007AD (1965.)	LONG 2	
	FAO	00014260	0001429C	0000003D (61.)	LONG 2	
	FLAGS	0001429D	00014385	000000E9 (233.)	BYTE 0	
	HELP	00014388	0001443B	000000B4 (180.)	LONG 2	
	IOBASE	0001443C	00017745	0000330A (13066.)	BYTE 0	
	IOPOST	00017748	00017758	00000011 (17.)	LONG 2	
	LOAD	00017759	000177BC	00000064 (100.)	BYTE 0	
	LOOP	000177BD	00017860	000000A4 (164.)	BYTE 0	
	MCHK750	00017861	00017CA0	00000440 (1088.)	BYTE 0	
	MEMALC	00017CA1	00017CBC	0000001C (28.)	BYTE 0	
	MEMMGT	00017CC0	00017CFD	0000003E (62.)	LONG 2	
	PARAM	00017CFE	00017E3A	0000013D (317.)	BYTE 0	
	PCSDATA	00017E3C	0001AA43	00002C08 (11272.)	LONG 2	
	PCSLOAD750	0001AA44	0001AA89	00000046 (70.)	LONG 2	
	PRINT	0001AA8A	0001AA99	00000010 (16.)	BYTE 0	
	QACHECKS	0001AA9C	0001AE36	0000039B (923.)	LONG 2	
	QAFLAGS	0001AE38	0001AEDE	000000A7 (167.)	LONG 2	
	QAMAIN	0001AEE0	0001B366	00000487 (1159.)	LONG 2	
	QIO	0001B368	0001B46A	00000103 (259.)	LONG 2	
	RMS	0001B46C	0001B8AB	00000440 (1088.)	LONG 2	
	SCB	0001B8AC	0001B8AF	00000004 (4.)	LONG 2	
	SCRIPT	0001B8B0	0001B920	00000071 (113.)	BYTE 0	
	SHOWMEMORY	0001B924	0001BCB5	00000392 (914.)	LONG 2	

Psect Name	Module Name	Base	End	Length	Align	Attributes
DATA		00010B40	0001BFE5	0000B4A6 (46246.)	2 ** 5	NOPIC,USR,CON,REL,LCL, SHR,NOEXE, RD,NOWRT,NOVEC
	START	0001BCB6	0001BF51	0000029C (668.)	BYTE 0	
	TSBTDRIVR	0001BF60	0001BF7F	00000020 (32.)	2 ** 5	
	.MAIN.	0001BF80	0001BFE5	00000066 (102.)	LONG 2	
$GLOBAL$		0001C000	0001C003	00000004 (4.)	LONG 2	NOPIC,USR,CON,REL,LCL,NOSHR,NOEXE, RD, WRT,NOVEC
	MPDUMMY	0001C000	0001C003	00000004 (4.)	LONG 2	
WORK		0001C004	0001E7A7	000027A4 (10148.)	LONG 2	NOPIC,USR,CON,REL,LCL,NOSHR,NOEXE, RD, WRT,NOVEC
	KERNEL	0001C004	0001CBE5	00000BE2 (3042.)	LONG 2	
	APBOOT	0001CBE8	0001CBEF	00000008 (8.)	LONG 2	
	ATTACH	0001CBF0	0001CBFF	00000010 (16.)	LONG 2	
	BUFFER	0001CC00	0001CC1F	00000020 (32.)	LONG 2	
	CHAN750	0001CC20	0001CD08	000000E9 (233.)	LONG 2	
	CHMK	0001CD0C	0001CD13	00000008 (8.)	LONG 2	
	CLI	0001CD14	0001D199	00000486 (1158.)	LONG 2	
	CLOCK	0001D19C	0001D207	0000006C (108.)	LONG 2	
	CONFIG	0001D208	0001D208	00000001 (1.)	LONG 2	
	CONSOLE	0001D20C	0001D213	00000008 (8.)	LONG 2	
	CRDDUMMY	0001D214	0001D21B	00000008 (8.)	LONG 2	
	DSVECS	0001D21C	0001D28B	00000070 (112.)	LONG 2	
	DEBUG	0001D28C	0001D48D	00000202 (514.)	LONG 2	
	DIRECTORY	0001D490	0001D84C	000003BD (957.)	LONG 2	
	DISPAT	0001D850	0001D85B	0000000C (12.)	LONG 2	
	DSLOAD	0001D85C	0001D897	0000003C (60.)	LONG 2	
	ERROR	0001D898	0001D8D7	00000040 (64.)	LONG 2	
	EXCEPT	0001D8D8	0001D8EF	00000018 (24.)	LONG 2	
	HELP	0001D8F0	0001D91D	0000002E (46.)	LONG 2	
	IOBASE	0001D920	0001DF53	00000634 (1588.)	LONG 2	
	LOAD	0001DF54	0001DFAB	00000058 (88.)	LONG 2	
	MEMALC	0001DFAC	0001DFC7	0000001C (28.)	LONG 2	
	MEMMGT	0001DFC8	0001DFE4	0000001D (29.)	LONG 2	
	PARAM	0001DFE5	0001DFE8	00000004 (4.)	BYTE 0	
	PARSE	0001DFEC	0001E043	00000058 (88.)	LONG 2	
	PCSLOAD750	0001E044	0001E04B	00000008 (8.)	LONG 2	
	PRINT	0001E04C	0001E557	0000050C (1292.)	LONG 2	
	QACHECKS	0001E558	0001E559	00000002 (2.)	LONG 2	
	QAFLAGS	0001E55C	0001E561	00000006 (6.)	LONG 2	
	QAMAIN	0001E564	0001E598	00000035 (53.)	LONG 2	
	QIO	0001E59C	0001E5A9	0000000E (14.)	LONG 2	
	RMS	0001E5AC	0001E5BB	00000010 (16.)	LONG 2	
	SCB	0001E5BC	0001E60C	00000051 (81.)	LONG 2	
	SCRIPT	0001E610	0001E6E4	000000D5 (213.)	LONG 2	
	SHOWMEMORY	0001E6E8	0001E6EF	00000008 (8.)	LONG 2	
	START	0001E6F0	0001E70B	0000001C (28.)	LONG 2	
	ULTRIX	0001E70C	0001E7A7	0000009C (156.)	LONG 2	
$CODE$		0001E800	0001E83B	0000003C (60.)	LONG 2	NOPIC,USR,CON,REL,LCL,NOSHR, EXE, RD,NOWRT,NOVEC
	MPDUMMY	0001E800	0001E83B	0000003C (60.)	LONG 2	
CODE		0001E83C	0003145A	00012C1F (76831.)	LONG 2	NOPIC,USR,CON,REL,LCL, SHR, EXE, RD,NOWRT,NOVEC
	KERNEL	0001E83C	0001F77C	00000F41 (3905.)	LONG 2	

Psect Name	Module Name	Base	End	Length		Align	Attributes
CODE		0001E83C	0003145A	00012C1F	(76831.)	LONG 2	NOPIC,USR,CON,REL,LCL, SHR, EXE, RD,NOWRT,NOVEC
	ANSI	0001F780	00020119	0000099A	(2458.)	LONG 2	
	APBOOT	0002011C	00020133	00000018	(24.)	LONG 2	
	APT	00020134	00020307	000001D4	(468.)	LONG 2	
	ASTCON	00020308	00020333	0000002C	(44.)	LONG 2	
	ASTDEL	00020334	000204D4	000001A1	(417.)	LONG 2	
	ATTACH	000204D8	000217B9	000012E2	(4834.)	LONG 2	
	BOOTIO	000217BC	0002180F	00000054	(84.)	LONG 2	
	BUFFER	00021810	0002190D	000000FE	(254.)	BYTE 0	
	CALLFRAME	00021910	000219FE	000000EF	(239.)	LONG 2	
	CHAN750	00021A00	0002220F	00000810	(2064.)	LONG 2	
	CHMK	00022210	00022306	000000F7	(247.)	LONG 2	
	CLI	00022307	000230DC	00000DD6	(3542.)	BYTE 0	
	CLOCK	000230E0	0002354E	0000046F	(1135.)	LONG 2	
	CONFIG	00023550	000240CD	00000B7E	(2942.)	LONG 2	
	CONSOLE	000240D0	000246C3	000005F4	(1524.)	LONG 2	
	CRDDUMMY	000246C4	00024781	000000BE	(190.)	LONG 2	
	CVTFILNAM	00024784	00024859	000000D6	(214.)	LONG 2	
	DEBUG	0002485A	000259D4	0000117B	(4475.)	BYTE 0	
	DEVICE	000259D5	00025A7C	000000A8	(168.)	BYTE 0	
	DIRECTORY	00025A80	000269A4	00000F25	(3877.)	LONG 2	
	DISPAT	000269A8	00026FAE	00000607	(1543.)	LONG 2	
	DSLOAD	00026FB0	000272C0	00000311	(785.)	LONG 2	
	ENTRY	000272C1	000272F9	00000039	(57.)	BYTE 0	
	ERROR	000272FA	00027929	00000630	(1584.)	BYTE 0	
	EVENT	0002792C	00027A1C	000000F1	(241.)	LONG 2	
	EXCEPT	00027A20	0002828E	0000086F	(2159.)	LONG 2	
	FAO	00028290	000285B3	00000324	(804.)	LONG 2	
	FLAGS	000285B4	00028723	00000170	(368.)	BYTE 0	
	FILEREAD	00028724	00028F7C	00000859	(2137.)	LONG 2	
	HELP	00028F80	00029967	000009E8	(2536.)	LONG 2	
	IOPOST	00029968	00029D29	000003C2	(962.)	LONG 2	
	LOAD	00029D2A	00029FCB	000002A2	(674.)	BYTE 0	
	LOOP	00029FCC	0002A256	0000028B	(651.)	BYTE 0	
	MCHK750	0002A258	0002A509	000002B2	(690.)	LONG 2	
	MEMALC	0002A50A	0002A80B	00000302	(770.)	BYTE 0	
	MEMMGT	0002A80C	0002B1F4	000009E9	(2537.)	LONG 2	
	ODS	0002B1F8	0002B5C3	000003CC	(972.)	LONG 2	
	PARAM	0002B5C4	0002BB37	00000574	(1396.)	LONG 2	
	PARSE	0002BB38	0002C085	0000054E	(1358.)	BYTE 0	
	PCSLOAD750	0002C088	0002C196	0000010F	(271.)	LONG 2	
	PRINT	0002C197	0002CD0D	00000B77	(2935.)	BYTE 0	
	QACHECKS	0002CD10	0002D1AD	0000049E	(1182.)	LONG 2	
	QAFLAGS	0002D1B0	0002D2E6	00000137	(311.)	LONG 2	
	QAMAIN	0002D2E8	0002D922	0000063B	(1595.)	LONG 2	
	QIO	0002D924	0002E4C1	00000B9E	(2974.)	LONG 2	
	RMS	0002E4C4	0002EFD9	00000B16	(2838.)	LONG 2	
	RT11	0002EFDC	0002F31E	00000343	(835.)	LONG 2	
	SCB	0002F320	0002F623	00000304	(772.)	LONG 2	
	SCRIPT	0002F624	0002FC32	0000060F	(1551.)	BYTE 0	
	SHOWMEMORY	0002FC34	0003018B	00000558	(1368.)	LONG 2	
	START	0003018C	0003084D	000006C2	(1730.)	BYTE 0	

Psect Name	Module Name	Base	End	Length	Align	Attributes
CODE		0001E83C	0003145A	00012C1F (76831.)	LONG 2	NOPIC,USR,CON,REL,LCL, SHR, EXE, RD,NOWRT,NOVEC
	ULTRIX	00030850	00031434	00000BE5 (3045.)	LONG 2	
	.MAIN.	00031435	0003143C	00000008 (8.)	BYTE 0	
	VMSDUMMY	0003143D	0003145A	0000001E (30.)	BYTE 0	
_LIB$CODE		0003145C	000315B3	00000158 (344.)	LONG 2	PIC,USR,CON,REL,LCL, SHR, EXE, RD,NOWRT,NOVEC
	LIB$CVT_ATB	0003145C	000314D5	0000007A (122.)	LONG 2	
	LIB$SIGNAL	000314D8	000315B3	000000DC (220.)	LONG 2	
$SCB		00031600	000316FF	00000100 (256.)	PAGE 9	NOPIC,USR,CON,REL,LCL, SHR, EXE, RD, WRT,NOVEC
	SCB	00031600	000316FF	00000100 (256.)	PAGE 9	
BOOTDRIVR_1		00031700	0003198C	0000028D (653.)	LONG 2	NOPIC,USR,CON,REL,LCL,NOSHR, EXE, RD, WRT,NOVEC
	BOOTDRIVR	00031700	0003198C	0000028D (653.)	LONG 2	
BOOTDRIVR_2		00031A00	000349E2	00002FE3 (12259.)	PAGE 9	NOPIC,USR,CON,REL,LCL,NOSHR, EXE, RD, WRT,NOVEC
	CSDDBTDRV	00031A00	00031C70	00000271 (625.)	BYTE 0	
	DLBTDRIVR	00031C71	00031D90	00000120 (288.)	BYTE 0	
	DMBTDRIVR	00031D91	00031EB3	00000123 (291.)	BYTE 0	
	MBBTDRIVR	00031EB4	00032056	000001A3 (419.)	BYTE 0	
	PABTDRIVR	00032057	00033A06	000019B0 (6576.)	BYTE 0	
	PUBTDRIVR	00033C00	00033EE7	000002E8 (744.)	PAGE 9	
	TFBTDRIVR	00033EE8	000341BC	000002D5 (725.)	BYTE 0	
	TMBTDRIVR	000341BD	000342FE	00000142 (322.)	BYTE 0	
	TSBTDRIVR	000342FF	000344D0	000001D2 (466.)	BYTE 0	
	MUBTDRIVR	00034600	000349E2	000003E3 (995.)	PAGE 9	
BOOTDRIVR_3		000349E3	000349E3	00000000 (0.)	BYTE 0	NOPIC,USR,CON,REL,LCL,NOSHR, EXE, RD, WRT,NOVEC
	BOOTDRIVR	000349E3	000349E3	00000000 (0.)	BYTE 0	
BOOTDRIVR_4		000349E3	00034AD2	000000F0 (240.)	BYTE 0	NOPIC,USR,CON,REL,LCL,NOSHR, EXE, RD, WRT,NOVEC
	CSDDBTDRV	000349E3	000349FA	00000018 (24.)	BYTE 0	
	DLBTDRIVR	000349FB	00034A12	00000018 (24.)	BYTE 0	
	DMBTDRIVR	00034A13	00034A2A	00000018 (24.)	BYTE 0	
	MBBTDRIVR	00034A2B	00034A42	00000018 (24.)	BYTE 0	
	PABTDRIVR	00034A43	00034A5A	00000018 (24.)	BYTE 0	
	PUBTDRIVR	00034A5B	00034A72	00000018 (24.)	BYTE 0	
	TFBTDRIVR	00034A73	00034A8A	00000018 (24.)	BYTE 0	
	TMBTDRIVR	00034A8B	00034AA2	00000018 (24.)	BYTE 0	
	TSBTDRIVR	00034AA3	00034ABA	00000018 (24.)	BYTE 0	
	MUBTDRIVR	00034ABB	00034AD2	00000018 (24.)	BYTE 0	
BOOTDRIVR_5		00034AD3	00034AD6	00000004 (4.)	BYTE 0	NOPIC,USR,CON,REL,LCL,NOSHR, EXE, RD, WRT,NOVEC
	BOOTDRIVR	00034AD3	00034AD6	00000004 (4.)	BYTE 0	
BOOTDRIVR_6		00034AD7	00034B47	00000071 (113.)	BYTE 0	NOPIC,USR,CON,REL,LCL,NOSHR, EXE, RD, WRT,NOVEC
	BOOTDRIVR	00034AD7	00034B47	00000071 (113.)	BYTE 0	
SEP		00034B48	00036BF4	000020AD (8365.)	LONG 2	NOPIC,USR,CON,REL,LCL, SHR, EXE, RD, WRT,NOVEC
	ACPFDT	00034B48	00034C42	000000FB (251.)	LONG 2	
	ASSIGN	00034C44	00034D75	00000132 (306.)	LONG 2	
	BUFCTL	00034D78	00034DDB	00000064 (100.)	LONG 2	

Psect Name	Module Name	Base	End	Length	Align	Attributes
SEP		00034B48	00036BF4	000020AD (8365.)	LONG 2	NOPIC,USR,CON,REL,LCL, SHR, EXE, RD, WRT,NOVEC
	CANCEL	00034DDC	00034EE4	00000109 (265.)	LONG 2	
	CHAN750	00034EE8	00034EE8	00000000 (0.)	LONG 2	
	COMDRVSUB	00034EE8	00034FDC	000000F5 (245.)	LONG 2	
	CVRTIM	00034FE0	00035405	00000426 (1062.)	LONG 2	
	DASSGN	00035408	000354C4	000000BD (189.)	LONG 2	
	DEVALC	000354C8	00035628	00000161 (353.)	LONG 2	
	DRINT	0003562C	00035648	0000001D (29.)	LONG 2	
	FRKCTL	0003564C	000356B1	00000066 (102.)	LONG 2	
	GETTIM	000356B4	000356CD	0000001A (26.)	LONG 2	
	GTCHAN	000356D0	00035757	00000088 (136.)	LONG 2	
	IOBASE	00035758	0003576F	00000018 (24.)	LONG 2	
	IOSNPG	00035770	00035A71	00000302 (770.)	LONG 2	
	IOSPGD	00035A74	00035C05	00000192 (402.)	LONG 2	
	IOSRAM	00035C08	00035D7C	00000175 (373.)	LONG 2	
	LODMAP	00035D80	00035E7E	000000FF (255.)	LONG 2	
	MBAINT	00035E80	00035F33	000000B4 (180.)	LONG 2	
	ONLY750	00035F34	0003653E	0000060B (1547.)	LONG 2	
	PROBE	00036540	000365FC	000000BD (189.)	LONG 2	
	QIOFDT	00036600	000367DE	000001DF (479.)	LONG 2	
	QIOREQ	000367E0	00036A13	00000234 (564.)	LONG 2	
	RELOCDRV	00036A14	00036AB7	000000A4 (164.)	LONG 2	
	SCB	00036AB8	00036ACA	00000013 (19.)	LONG 2	
	UNWIND	00036ACC	00036BF4	00000129 (297.)	LONG 2	
Y$EXEPAGED		00036BF5	00036BF5	00000000 (0.)	BYTE 0	NOPIC,USR,CON,REL,LCL,NOSHR, EXE, RD, WRT,NOVEC
	ASTCON	00036BF5	00036BF5	00000000 (0.)	BYTE 0	
_LAST		00036C00	00036C07	00000008 (8.)	PAGE 9	NOPIC,USR,CON,REL,LCL,NOSHR, EXE, RD, WRT,NOVEC
	ONLY750	00036C00	00036C07	00000008 (8.)	PAGE 9	

Symbol Cross Reference

Symbol	Value	Defined By	Referenced By ...		
AAT_ARITH	00013C1B-R	EXCEPT	MCHK750		
ACC$HANDLER	000365B8-R	PROBE			
ACP$ACCESS	00034B48-R	ACPFDT	ENTRY		
ACP$ACCESSNET	00034B48-R	ACPFDT			
ACP$DEACCESS	00034B53-R	ACPFDT	ENTRY		
ACP$MODIFY	00034B5E-R	ACPFDT	ENTRY		
ACP$MOUNT	00034B69-R	ACPFDT	ENTRY		
ACP$READBLK	00034B74-R	ACPFDT	ENTRY		
ACP$WRITEBLK	00034B91-R	ACPFDT	ENTRY		
ACT_CONT	00022662-R	CLI			
ACT_DEFAULT_DBG	00022675-R	CLI	START		
ACT_NO_ALLOC	000227DF-R	CLI			
ADDR_128	0001E04C-R	PRINT	ERROR		
ANSI$CACHEVBN	0001FD59-R	ANSI			
ANSI$CLOSE	0001FD28-R	ANSI			
ANSI$GET	0001FF1F-R	ANSI			
ANSI$OPEN	0001F780-R	ANSI	RMS		
ANSI$READ	0001FE5E-R	ANSI			
AP$B_PROMPT_BUFFER_COUNT	00000000		WK-KERNEL		
AP$B_PROMPT_COUNT	00000000		WK-KERNEL		
AP$GK_NO_PROMPT	00000003	APBOOT			
AP$GK_PROMPT	00000001	APBOOT			
AP$GK_PROMPT_WITH_STATUS	00000002	APBOOT			
AP$GK_REQ_CONSRX	00000001	APBOOT			
AP$GR_SHARED_DATA	0001CBEC-R	APBOOT	KERNEL		
AP$GW_AP_NODES	0001CBEA-R	APBOOT			
AP$GW_DATA	0001CBE8-R	APBOOT	CHMK	CLI	KERNEL
AP$I_PROMPT_CHECK	00000000		WK-KERNEL		
AP$_REQ_CONSRX	00000000	KERNEL			
AP$_REQ_RXCDVEC	00000001	KERNEL			
APSLMNE	0001292F-R	DEBUG	EXCEPT	MCHK750	
APT	0001E915-R	KERNEL	ENTRY		
APT_COM	00020134-R	APT	CLI		
APT_DONE	000202F9-R	APT			
APT_MSG	000202F0-R	APT	CLI	ERROR	MCHK750
AX_BUFF	00036C00-R	ONLY750	KERNEL	SHOWMEMORY	
BDA_MAPREGS	00000000		WK-BOOTDRIVR		
BD_INIT	00000000		WK-CONFIG		
BEGIN	0001F0A9-R	KERNEL	CLI	DISPAT	DSVECS
			LOAD	LOOP	SCRIPT
			START		
BEGIN_BLISS	0001F0A9-R	KERNEL	CRDDUMMY	DIRECTORY	SHOWMEMORY
BEGIN_TIME	0001E6F8-R	START	KERNEL		
BIN_TIME	0001E6F0-R	START	CLI	KERNEL	
BI_BER_BIT	00000000		WK-EXCEPT		
BOO$AL_VECTOR	00031700-R	BOOTDRIVR	DIRECTORY	RMS	
BOO$DRIVER	0003198D-R	BOOTDRIVR			
BOO$GB_UMR_DP	00031738-R	BOOTDRIVR			
BOO$GL_UCODE	00031728-R	BOOTDRIVR			

Symbol	Value	Defined By	Referenced By ...		
BOO$GL_UMR_DIS	00031724-R	BOOTDRIVR			
BOO$GL_UMR_TMPL	00031734-R	BOOTDRIVR			
BOO$IMAGE_ATT	000217DC-R	BOOTIO			
BOO$MAP	000318A8-R	BOOTDRIVR			
BOO$QIO	00031750-R	BOOTDRIVR	ANSI	DIRECTORY	ODS
			RT11	ULTRIX	
BOO$RESELECT	00034AD7-R	BOOTDRIVR			
BOO$SELECT	00034AD7-R	BOOTDRIVR	DIRECTORY	RMS	
BOOT	0001E83C-R	KERNEL	ENTRY		
BOOT$A_CCA	0001C88D-R	KERNEL	WK-MEMMGT		
BOOT$L_ADP	0001C869-R	KERNEL	CONFIG		
BOOT$L_CSR	0001C86D-R	KERNEL	CONFIG		
BOOT$L_DEVTYP	0001C881-R	KERNEL	CONFIG		
BOOT$L_R1	0001C875-R	KERNEL	CONFIG		
BOOT$L_R2	0001C879-R	KERNEL	CONFIG	WK-PABTDRIVR	
BOOT$L_R5	0001C87D-R	KERNEL			
BOOT$L_SCORPIO_R3	0001C885-R	KERNEL			
BOOT$L_UNIT	0001C871-R	KERNEL	CONFIG		
BPTCODE	00000003	DEBUG			
BPTMAX	0000000F	DEBUG	EXCEPT		
BREAKUP_FILE	0002BF59-R	PARSE	DIRECTORY	LOAD	RMS
BUG$CHECK	0002E03A-R	QIO	FRKCTL	IOPOST	IOSNPG
			IOSRAM	LODMAP	MBAINT
			MEMALC	ONLY750	QIOREQ
CDB$BLOCK	0001CC20-R	CHAN750			
CHECK_CSR1	00024E3A-R	DEBUG			
CHECK_NEX_BIT	00024DE5-R	DEBUG			
CHR$MCHK	0002A258-R	MCHK750	EXCEPT		
CLEAR_LOOP_BACK_BIT	00024EE8-R	DEBUG			
CLEAR_NEX_BIT	00024DBC-R	DEBUG			
CLI_ACTION	00022444-R	CLI	APT		
CLK$K_TCR0	00000000		WK-SCB		
CLK$RE_INIT	000234F7-R	CLOCK	CSDDBTDRV	KERNEL	SCB
			SCRIPT		
CMK$APBOOT	0002011C-R	APBOOT	CHMK	CLI	
CMK$ASTEXIT	000222CC-R	CHMK	ASTDEL		
CMK$CANTIM	00023266-R	CLOCK	CHMK		
CMK$HIBER	00023238-R	CLOCK	CHMK		
CMK$INITSCB	0002F346-R	SCB	CHMK		
CMK$MMENABLE	0002AF5C-R	MEMMGT	CHMK		
CMK$RCONSOLE	00024202-R	CONSOLE	CHMK	KERNEL	ONLY750
CMK$REFRESH	0001F1B7-R	KERNEL	CHMK		
CMK$SETIMR	00023307-R	CLOCK	CHMK		
CMK$SETIPL	0002F586-R	SCB	CHMK		
CMK$SETPRT	0002AF9B-R	MEMMGT	CHMK		
CMK$SGIPR	0002581A-R	DEBUG	CHMK	CLI	KERNEL
			SHOWMEMORY		
CMK$TCONSOLE	000243BE-R	CONSOLE	CHMK	ONLY750	
COM$DELATTNAST	00034EE8-R	COMDRVSUB	ENTRY		
COM$DRVDEALMEM	00034F5B-R	COMDRVSUB	ENTRY		
COM$FLUSHATTNS	00034F1B-R	COMDRVSUB	ENTRY		
COM$POST	00034F4B-R	COMDRVSUB	ENTRY		

Symbol	Value	Defined By	Referenced By ...		
COM$SETATTNAST	00034F80-R	COMDRVSUB	ENTRY		
COMMAND_TREE	00011711-R	CLI	APT		
COND_DEBUG	0002524B-R	DEBUG	EXCEPT	KERNEL	
COND_HANDLR	00027A20-R	EXCEPT	KERNEL		
CONSOLEAAA_FLAGS	00000000		WK-QIO		
CRD$EXPREG	0002AC9B-R	MEMMGT			
CRD$GL_CRD_COMMAND_DEBUG	0001D220-R	DSVECS	CLI		
CRD$K_CRD_INITIALIZATION	00000000	KERNEL			
CRD$K_DS_CONTROL_C	00000001	KERNEL			
CRD$K_DS_FLAGS	00000000	KERNEL			
CRD$K_HOOK_POINT	00000000	KERNEL			
CRD$K_LAST_ACCESS_CODE	00000002	KERNEL			
CRD$K_LAST_DS_VARIABLE	00000002	KERNEL			
CRD$K_LAST_FUNCTION	00000002	KERNEL			
CRD$K_LAST_HOOK_POINT	00000001	KERNEL			
CRD$K_READ	00000000	KERNEL			
CRD$K_TYPECODE	00000001	KERNEL			
CRD$K_WRITE	00000001	KERNEL			
CTL$GL_CCB	0001C431-R	KERNEL			
CTL$GL_CCBBASE	0001C831-R	KERNEL	ASSIGN	IOPOST	IOSPGD
CTL$GW_CHINDX	0001B3A2-R	QIO	IOSPGD		
CTL$GW_NMIOCH	0001B3A0-R	QIO	IOSPGD		
CVT$T_MBAMAP	0001CC74-R	CHAN750	PRINT		
CVT$T_MBASR	0001CC70-R	CHAN750	PRINT		
CVT$T_UBADPR	0001CC78-R	CHAN750	PRINT		
CVT$T_UBAMAP	0001CC7C-R	CHAN750	PRINT		
DATETABLE	00034FE0-R	CVRTIM			
DBG_ADDR_RTN	0001D459-R	DEBUG			
DEBUG$GB_FLAGS	0001D28C-R	DEBUG	CLI	EXCEPT	
DEBUG_HI	0001D465-R	DEBUG	MEMMGT	SHOWMEMORY	
DEBUG_LO	0001D461-R	DEBUG	MEMMGT	SHOWMEMORY	
DEBUG_THE_SUCKER	0001E557-R	PRINT	SCRIPT		
DEF$C_BKSTP_LEN	00000011	RMS	DIRECTORY		
DEF$C_ULTRIX_LEN	0000000F	RMS	DIRECTORY		
DEF$Q_BACKSTOP	0001B46C-R	RMS	DIRECTORY		
DEF$Q_DEV	00035F8C-R	ONLY750	DIRECTORY RMS	KERNEL	LOAD
DEF$Q_DIR	00035FB2-R	ONLY750	DIRECTORY RMS	KERNEL	LOAD
DEF$Q_ULTRIX	0001B47D-R	RMS	DIRECTORY		
DEV$M_DMT	00200000	SYS$IODEF	DASSGN		
DEV$M_FOR	01000000	SYS$IODEF	DASSGN		
DEV$M_MNT	00080000	SYS$IODEF	DASSGN		
DEV$M_RCK	40000000	SYS$IODEF	DASSGN		
DEV$M_SWL	02000000	SYS$IODEF	DASSGN		
DEV$M_WCK	80000000	SYS$IODEF	DASSGN		
DEV$V_ALL	00000017	SYS$IODEF	DASSGN		
DEV$V_DMT	00000015	SYS$IODEF	DASSGN		
DEV$V_FOD	0000000E	SYS$IODEF	ASSIGN	QIOREQ	
DEV$V_FOR	00000018	SYS$IODEF	DASSGN	QIOREQ	
DEV$V_MBX	00000014	SYS$IODEF	ASSIGN		
DEV$V_MNT	00000013	SYS$IODEF	QIOREQ		

Symbol	Value	Defined By	Referenced By ...		
DEV$V_NET	0000000D	SYS$IODEF	ASSIGN		
DEV$V_SHR	00000010	SYS$IODEF	ASSIGN		
DEV$V_SPL	00000006	SYS$IODEF	ASSIGN	QIOREQ	
DEV$V_SQD	00000005	SYS$IODEF	IOPOST		
DIAG_FILE_NAME	0001DF55-R	LOAD	DEBUG		
DIR_FLAGS	0001D84C-R	DIRECTORY	PABTDRIVR		
DIR_V_CMM	00000000	DIRECTORY	PABTDRIVR		
DIR_V_DRVCLR	00000001	DIRECTORY	PABTDRIVR		
DISPATCH	000269A8-R	DISPAT	START		
DR$INITIAL	00035643-R	DRINT	QIO		
DR$INT	0003562C-R	DRINT	QIO		
DS$AA_BPTADDR	0001D2A0-R	DEBUG	ERROR	EXCEPT	LOOP
DS$AA_BPTBASE	0001D2E0-R	DEBUG			
DS$ABORT	00010020-R	ENTRY	EXCEPT	PARAM	SCRIPT
DS$ABORTWAIT	00010070-R	ENTRY			
DS$AB_BPTINST	0001D28D-R	DEBUG	ERROR	LOOP	
DS$AL_DS_DISPATCH_VECTORS	0001D224-R	DSVECS			
DS$AQ_SSEND	000107FF-R	ENTRY	KERNEL		
DS$AQ_SYSSRV	00010200-R	ENTRY	KERNEL	MEMMGT	
DS$ASKADR	00010090-R	ENTRY			
DS$ASKDATA	00010080-R	ENTRY			
DS$ASKLGCL	00010098-R	ENTRY			
DS$ASKSTR	000100A0-R	ENTRY			
DS$ASKVLD	00010088-R	ENTRY			
DS$ATTACH	000101A8-R	ENTRY	DSVECS		
DS$AX_ARB	00036E74-R	ONLY750	KERNEL	SHOWMEMORY	
DS$AX_JIB	00036E00-R	ONLY750	KERNEL	SHOWMEMORY	
DS$AX_SOFTPCB	00036EEC-R	ONLY750	ASSIGN	ASTCON	CANCEL
			CHMK	DASSGN	DEVALC
			EVENT	KERNEL	QIOREQ
			SHOWMEMORY		
DS$A_PRGBGN	00000200	KERNEL	APT	CLI	LOAD
			MEMMGT	SHOWMEMORY	
DS$BGNSUB	00010030-R	ENTRY			
DS$BRANCH	000100A8-R	ENTRY			
DS$BREAK	00010058-R	ENTRY	QIO		
DS$CANWAIT	00010070-R	ENTRY	CLOCK		
DS$CHANNEL	00010180-R	ENTRY	CONFIG	PROBE	
DS$CKLOOP	00010040-R	ENTRY			
DS$CLI	00022307-R	CLI	DEBUG	EXCEPT	KERNEL
			MCHK750	SCRIPT	
DS$CLRVEC	00010168-R	ENTRY	CHAN750	SCRIPT	START
DS$CNTRLC	00010078-R	ENTRY	ATTACH	CRDDUMMY	DIRECTORY
			DISPAT	KERNEL	QAMAIN
DS$CVTREG	000100B0-R	ENTRY	CHAN750	DEBUG	EXCEPT
			FLAGS	MCHK750	
DS$DOSUMMARY	00010028-R	ENTRY			
DS$ENDPASS	00010010-R	ENTRY			
DS$ENDSUB	00010038-R	ENTRY			
DS$ENTRY	00031435-R	.MAIN.			
DS$ERRDEV	000100C8-R	ENTRY			
DS$ERRHARD	000100D0-R	ENTRY			

Symbol	Value	Defined By	Referenced By ...		
DS$ERRPREP	00010108-R	ENTRY			
DS$ERRSOFT	000100D8-R	ENTRY			
DS$ERRSYS	000100C0-R	ENTRY			
DS$ESCAPE	00010050-R	ENTRY			
DS$FAB_INPUT	0001C070-R	KERNEL			
DS$FAB_OUTPUT	0001C104-R	KERNEL			
DS$FREEDBGSYM	000101B8-R	ENTRY			
DS$GA_ALLOCATED	0001DB4C-R	IOBASE			
DS$GA_ALLOCATES	0001D934-R	IOBASE	ATTACH		
DS$GA_BREAKVEC	0001E5C1-R	SCB	EXCEPT		
DS$GA_BUFPTR	0001C8F1-R	KERNEL			
DS$GA_CHKLPPC	0001C8D1-R	KERNEL	DISPAT	ERROR	LOOP
DS$GA_CHMKVEC	0001E5BD-R	SCB	CHMK		
DS$GA_CRD_DS_INTERFACE	0001D228-R	DSVECS	CLI SCRIPT	KERNEL	PRINT
DS$GA_DS_CTRL_C_FIRST	0001C198-R	KERNEL	CLI QAMAIN	CRDDUMMY	DSVECS
DS$GA_DS_CTRL_C_SECOND	0001C19C-R	KERNEL	CLI	CRDDUMMY	DSVECS
DS$GA_LASTADR	0001C899-R	KERNEL	MEMALC	MEMMGT	SHOWMEMORY
DS$GA_LOOPADR	0001C8D5-R	KERNEL	LOOP		
DS$GA_PATCH_BIT	00017E44-R	WK-PCSDATA	PCSLOAD750		
DS$GA_PATCH_UWD	00018244-R	WK-PCSDATA	PCSLOAD750		
DS$GA_PTABLE	0001DD50-R	IOBASE	ATTACH KERNEL	DEVICE	DSVECS
DS$GA_PTDESC	0001443C-R	IOBASE	ATTACH	DSVECS	
DS$GA_SELECTED	0001D948-R	IOBASE	CONFIG	DEVICE	
DS$GA_SELECTS	0001D920-R	IOBASE	ATTACH	DEVICE	KERNEL
DS$GA_SOFTINT	0001E5CD-R	SCB	CLOCK		
DS$GA_SUPPORT_TABLE	0001B65C-R	RMS			
DS$GA_TBITVEC	0001E5C5-R	SCB	EXCEPT		
DS$GA_USER_ERROR_TEXT	0001D240-R	DSVECS	ERROR		
DS$GB_BYTEBUF	0001C8F5-R	KERNEL			
DS$GB_CI_INIT	0003205B-R	PABTDRIVR	WK-RMS		
DS$GB_INHIBIT_NAMING	0001C8F7-R	KERNEL	ATTACH	CLI	
DS$GB_KDB50_INIT	00000000		WK-RMS		
DS$GB_MM_ENB	0001DFE4-R	MEMMGT	CLI	DISPAT	KERNEL
DS$GB_PB_INIT	00000000		WK-RMS		
DS$GB_PRIMARY_CPU_IDENTIFIER	00035F3C-R	ONLY750	CLOCK	DEBUG	EXCEPT
DS$GB_QIOACT	0001E6E4-R	SCRIPT	PRINT		
DS$GB_STOPPING_THE_TIMER	0001E5BC-R	SCB	CLOCK		
DS$GB_SYSTYPE	0001C410-R	KERNEL	CONSOLE RMS	DIRECTORY	MEMMGT
DS$GB_TYPECODE	0001C8F6-R	KERNEL	DISPAT MCHK750 START	ERROR PRINT	EXCEPT SHOWMEMORY
DS$GB_UDA50_INIT	00033CE4-R	PUBTDRIVR	WK-RMS		
DS$GB_VDS_DEBUG	0001E557-R	PRINT			
DS$GB_WIDTH	0001D20E-R	CONSOLE	PRINT	QAMAIN	
DS$GETADDRESS	00010090-R	ENTRY			
DS$GETBUF	00010120-R	ENTRY			
DS$GETDATA	00010080-R	ENTRY			
DS$GETLOGICAL	00010098-R	ENTRY			

Symbol	Value	Defined By	Referenced By ...		
DS$GETSTRING	000100A0-R	ENTRY			
DS$GETTERM	000101C8-R	ENTRY			
DS$GETVIELD	00010088-R	ENTRY			
DS$GK_SID	02000000	ONLY750	ERROR	KERNEL	PARAM
			QIO	START	
DS$GK_SUPPORT_TABLE_ROWS	00000025	RMS			
DS$GK_USOVR	000000C0	ONLY750	CLOCK		
DS$GL_ACTUAL_MEMSIZE	0001DFDC-R	MEMMGT			
DS$GL_BUFCNT	0001CC08-R	BUFFER	KERNEL	MEMMGT	SHOWMEMORY
DS$GL_BUFLEN	0001C8ED-R	KERNEL	PARAM	PRINT	
DS$GL_CLIBASE	0001CD14-R	CLI	APT	ATTACH	CONFIG
			DEBUG	DIRECTORY	DISPAT
			KERNEL	LOAD	PARSE
			QACHECKS	QAMAIN	SCRIPT
			START		
DS$GL_CRD_DEBUG	0001D254-R	DSVECS	CLI		
DS$GL_CRD_FLAGS	0001D21C-R	DSVECS	ATTACH	CONSOLE	CRDDUMMY
DS$GL_DEVERR_COUNT	0001C8B5-R	KERNEL	DISPAT	ERROR	
DS$GL_EFC0	0001C891-R	KERNEL	FLAGS		
DS$GL_EFC1	0001C895-R	KERNEL			
DS$GL_ERRCNT	0001C8A5-R	KERNEL	DISPAT	ERROR	LOOP
DS$GL_ERRSUP_COUNT	0001C8BD-R	KERNEL	DISPAT	ERROR	
DS$GL_FLAGS	0001C89D-R	KERNEL	APT	ATTACH	CALLFRAME
			CLI	CLOCK	CONSOLE
			CRDDUMMY	CSDDBTDRV	DISPAT
			DSLOAD	DSVECS	ERROR
			EXCEPT	LOAD	LOOP
			MCHK750	MEMMGT	PRINT
			QIO	SCB	SCRIPT
			SHOWMEMORY	START	
DS$GL_FSTTEST	0001C8C5-R	KERNEL	DISPAT	QACHECKS	QAMAIN
			START		
DS$GL_HARDERR_COUNT	0001C8A9-R	KERNEL	DISPAT	ERROR	
DS$GL_IPR_VALUE	0001E6EC-R	SHOWMEMORY	DEBUG		
DS$GL_LOOKASIDE	0001DFBC-R	MEMALC	SHOWMEMORY		
DS$GL_LSTTEST	0001C8C9-R	KERNEL	DISPAT	LOOP	QACHECKS
			QAMAIN	START	
DS$GL_MEMSIZE	0001DFD8-R	MEMMGT	DEBUG	MEMALC	SHOWMEMORY
DS$GL_NUMTEST	0001C8C1-R	KERNEL	START		
DS$GL_PAGE	0001E285-R	PRINT			
DS$GL_PCBVEC	0001C835-R	KERNEL	ENTRY		
DS$GL_PREPERR_COUNT	0001C8AD-R	KERNEL	ERROR		
DS$GL_RADIX	0001C8E5-R	KERNEL	DEBUG	PARSE	
DS$GL_RUNTIM	0001C8D9-R	KERNEL			
DS$GL_SET_MEMSIZE	0001DFE0-R	MEMMGT	SHOWMEMORY		
DS$GL_SIZE	0001C8E9-R	KERNEL			
DS$GL_SOFTERR_COUNT	0001C8B1-R	KERNEL	DISPAT	ERROR	
DS$GL_SUBTEST	0001C8CD-R	KERNEL	DISPAT	LOOP	QACHECKS
			START		
DS$GL_SYSERR_COUNT	0001C8B9-R	KERNEL	DISPAT	ERROR	
DS$GL_TERMCHAR	0001CB87-R	KERNEL	CONSOLE		
DS$GL_TIMESEC	0001C8DD-R	KERNEL			

Symbol	Value	Defined By	Referenced By ...		
DS$GL_WAITIM	0001C8E1-R	KERNEL			
DS$GPHARD	00010018-R	ENTRY	CHAN750	CLI	DEVICE
			ERROR	PRINT	QIO
			START		
DS$GQ_BUFQWD	0001C8ED-R	KERNEL			
DS$GQ_CURYEAR	0001D1A4-R	CLOCK	KERNEL		
DS$GQ_DAYTIM	0001BF80-R	.MAIN.	KERNEL		
DS$GQ_EFL	0001C891-R	KERNEL	EVENT		
DS$GQ_PHYADR	0001CC00-R	BUFFER	MEMMGT		
DS$GQ_TESTID	0001D8A0-R	ERROR	START		
DS$GT_ASCIBUF	0001C8F8-R	KERNEL			
DS$GT_BUFFER	0001C907-R	KERNEL	PRINT	SCRIPT	
DS$GT_COPYEAR	0001C032-R	KERNEL			
DS$GT_COPYRIGHT	0001C004-R	KERNEL			
DS$GT_LEGAL	00010BAE-R	KERNEL			
DS$GT_LEGAL_END	0001C051-R	KERNEL			
DS$GT_NEWYEAR	0001D1AC-R	CLOCK	KERNEL		
DS$GT_PROMPT	0001BFE1-R	.MAIN.	APT	CLI	KERNEL
			SCRIPT		
DS$GT_START	0001BF9F-R	.MAIN.	KERNEL		
DS$GT_STRBUF	0001CB07-R	KERNEL	FLAGS	PARAM	
DS$GT_VALPHA	0002BD56-R	PARSE			
DS$GT_VALPHANUM	0002BD68-R	PARSE			
DS$GT_VDS_VERSION	0001BFD6-R	.MAIN.	ERROR		
DS$GT_VFILE	0002BD7A-R	PARSE			
DS$GT_VHEX	0002BDDB-R	PARSE			
DS$GT_VSPACE	0002BD8C-R	PARSE			
DS$GT_VSYMBOL	0002BD44-R	PARSE			
DS$GW_TTIN	0001C8A1-R	KERNEL	PRINT	SCRIPT	
DS$GW_TTOUT	0001C8A3-R	KERNEL	CONSOLE	ERROR	EXCEPT
			PRINT	SCRIPT	
DS$HELP	000101B0-R	ENTRY			
DS$INITSCB	00010170-R	ENTRY	DISPAT	KERNEL	
DS$INLOOP	00010048-R	ENTRY			
DS$K_ASCIBUF	0000000F	KERNEL			
DS$K_BBC	0000001D	DISPAT			
DS$K_BBCC	00000021	DISPAT			
DS$K_BBCCI	00000023	DISPAT			
DS$K_BBCS	0000001F	DISPAT			
DS$K_BBS	0000001C	DISPAT			
DS$K_BBSC	00000020	DISPAT			
DS$K_BBSS	0000001E	DISPAT			
DS$K_BBSSI	00000022	DISPAT			
DS$K_BCC_M	0000001B	DISPAT			
DS$K_BCS_M	0000001A	DISPAT			
DS$K_BEQLU_B	00000005	DISPAT			
DS$K_BEQLU_M	00000011	DISPAT			
DS$K_BEQL_B	00000004	DISPAT			
DS$K_BEQL_M	00000010	DISPAT			
DS$K_BERROR	00000026	DISPAT			
DS$K_BGEQU_B	00000007	DISPAT			
DS$K_BGEQU_M	00000013	DISPAT			

Symbol	Value	Defined By	Referenced By ...		
DS$K_BGEQ_B	00000006	DISPAT			
DS$K_BGEQ_M	00000012	DISPAT			
DS$K_BGTRU_B	00000009	DISPAT			
DS$K_BGTRU_M	00000015	DISPAT			
DS$K_BGTR_B	00000008	DISPAT			
DS$K_BGTR_M	00000014	DISPAT			
DS$K_BLBC	00000025	DISPAT			
DS$K_BLBS	00000024	DISPAT			
DS$K_BLEQU_B	00000003	DISPAT			
DS$K_BLEQU_M	0000000F	DISPAT			
DS$K_BLEQ_B	00000002	DISPAT			
DS$K_BLEQ_M	0000000E	DISPAT			
DS$K_BLSSU_B	00000001	DISPAT			
DS$K_BLSSU_M	0000000D	DISPAT			
DS$K_BLSS_B	00000000	DISPAT			
DS$K_BLSS_M	0000000C	DISPAT			
DS$K_BNEQU_B	0000000B	DISPAT			
DS$K_BNEQU_M	00000017	DISPAT			
DS$K_BNEQ_B	0000000A	DISPAT			
DS$K_BNEQ_M	00000016	DISPAT			
DS$K_BNERROR	00000027	DISPAT			
DS$K_BUFSIZ	00000200	KERNEL	PRINT	SCRIPT	
DS$K_BVC_M	00000019	DISPAT			
DS$K_BVS_M	00000018	DISPAT			
DS$K_CCB	00000040	KERNEL	QIO		
DS$K_NYSIZ	00000014	CLOCK	KERNEL		
DS$K_PRGSIZ	0000F800	KERNEL	APT	LOAD	MEMMGT
DS$K_SSSIZE	00000600	ENTRY	KERNEL		
DS$K_STRBUF	00000080	KERNEL	FLAGS	PARAM	
DS$LOAD	00010198-R	ENTRY	PCSLOAD750	QIO	SCRIPT
DS$LOADPCS	000101C0-R	ENTRY	KERNEL		
DS$L_USERCNTRLC	0001C1A0-R	KERNEL	CLI	CRDDUMMY	
DS$MAPDBGBLOCK	00010118-R	ENTRY			
DS$MEMSIZE	000101D8-R	ENTRY			
DS$MMOFF	00010158-R	ENTRY			
DS$MMON	00010150-R	ENTRY			
DS$M_TODR_ACTIVE	00000000		WK-QIO		
DS$PARSE	000100B8-R	ENTRY			
DS$PRINTB	000100E0-R	ENTRY	CHAN750		
DS$PRINTF	000100F0-R	ENTRY	APBOOT	ATTACH	DEBUG
			DEVICE	DIRECTORY	DSLOAD
			HELP	QACHECKS	QAFLAGS
			QAMAIN	SHOWMEMORY	START
DS$PRINTS	000100F8-R	ENTRY			
DS$PRINTSIG	00010100-R	ENTRY			
DS$PRINTX	000100E8-R	ENTRY			
DS$PROBE	000101A0-R	ENTRY			
DS$RAB_INPUT	0001C0C0-R	KERNEL	SCRIPT		
DS$RAB_OUTPUT	0001C154-R	KERNEL	PRINT	SCRIPT	
DS$RELBUF	00010128-R	ENTRY			
DS$SERVICE_DISPATCHER	000101D0-R	ENTRY	CVRTIM	DEBUG	EXCEPT
			MEMALC		

Symbol	Value	Defined By	Referenced By ...		
DS$SETIPL	00010178-R	ENTRY			
DS$SETMAP	00010188-R	ENTRY			
DS$SETPRIEXV	00010110-R	ENTRY			
DS$SETVEC	00010160-R	ENTRY	CHAN750		
DS$SHOCHAN	00010190-R	ENTRY			
DS$SHOWCHAN	00010190-R	ENTRY			
DS$SOFTIPL5	0001EB00-R	KERNEL	SCB		
DS$SRVDISP_TABLE	000130E0-R	ENTRY			
DS$SUMMARY	00010028-R	ENTRY	DISPAT	LOOP	
DS$USERMODE	0001EB0B-R	KERNEL	.MAIN.		
DS$WAITMS	00010060-R	ENTRY			
DS$WAITUS	00010068-R	ENTRY	CLOCK	CONFIG	ONLY750
			PABTDRIVR		
DSA$M_DFLTFLGS	00003000	KERNEL	FLAGS		
DSI$ABORT	00030635-R	START	KERNEL		
DSI$CHANNEL_VEC	000221A0-R	CHAN750	SCB		
DSI$TIMER	00023404-R	CLOCK	SCB		
DSI$TIMSRV	00023380-R	CLOCK	SCB		
DSP$CONFIG_ADP	00036034-R	ONLY750	CONFIG		
DSP$CONFIG_LOAD	00023591-R	CONFIG			
DSP$GEN_PTABLES	00025A07-R	DEVICE	START		
DSP$REMOVEBREAK	00025197-R	DEBUG			
DSP$SHOWMBA	00021E28-R	CHAN750			
DSP$SHOWUBI	00021E39-R	CHAN750			
DSR$ALLOCATE_PSEUDO_RPB	0002E4C4-R	RMS	CONFIG	DIRECTORY	
DSR$CHECKLOAD	0002FC34-R	SHOWMEMORY	CALLFRAME	DISPAT	MEMMGT
DSR$CHECK_AUTOTEST_OFF_SET	0001F750-R	KERNEL	CRDDUMMY	DSVECS	ERROR
DSR$CHECK_MENUTEST_OFF_SET	0001F72C-R	KERNEL	CRDDUMMY	DSVECS	ERROR
DSR$COMPLETION	0002789E-R	ERROR	ATTACH	CLI	DEBUG
			DIRECTORY	LOAD	PCSLOAD750
			QIO	SCRIPT	
DSR$DEALLOCATE_PSEUDO_RPB	0002E53F-R	RMS	CONFIG	DIRECTORY	
DSR$FAULT_CLEAR	0002A424-R	MCHK750	EXCEPT	SCB	
DSR$FIND_USER_PC	000219CF-R	CALLFRAME	DISPAT	EXCEPT	START
DSR$IFLOADDEV	00029E81-R	LOAD	ATTACH		
DSR$KEY_EQUAL	000297E4-R	HELP	DIRECTORY		
DSR$LOAD_CRD	000246C4-R	CRDDUMMY	CLI	KERNEL	
DSR$MMENABLE	0002AF49-R	MEMMGT	DISPAT	SHOWMEMORY	
DSR$ONLY_CONSOLE_CONFIG	000364C7-R	ONLY750	CONFIG		
DSR$RESTORE_CRD_VECTORS	0002471D-R	CRDDUMMY	KERNEL		
DSR$SETIMR_INI	000232A1-R	CLOCK	KERNEL	MEMMGT	
DSR$UNLOAD_CRD	0002471A-R	CRDDUMMY	CLI	KERNEL	
DSV$ATTACH	000204D8-R	ATTACH	CLI		
DSV$DEATTACH	00021122-R	ATTACH	CLI		
DSV$DEBUG	0002585F-R	DEBUG	CLI	START	
DSV$DESELECT	000213CA-R	ATTACH	CLI		
DSV$DIRECTORY	0002697C-R	DIRECTORY	CLI		
DSV$EXIT	0001F62C-R	KERNEL	CLI	DSVECS	
DSV$INITPCS	0002C144-R	PCSLOAD750	CLI		
DSV$LOAD	00029EAC-R	LOAD	CLI		
DSV$RUN	00029EAB-R	LOAD	CLI		
DSV$SELECT	000211EA-R	ATTACH	CLI		

Symbol	Value	Defined By	Referenced By ...		
DSV$SETLOAD	00029D2A-R	LOAD	CLI	CONFIG	KERNEL
DSV$SETPAGE	0002C197-R	PRINT	CLI		
DSV$SHOWDEVICE	00021090-R	ATTACH	CLI	QAMAIN	
DSV$SHOWDEVICEB	00021089-R	ATTACH	CLI		
DSV$SHOWLOAD	00029E61-R	LOAD	CLI		
DSV$SHOWMEMORY	0002FC53-R	SHOWMEMORY	CLI		
DSV$SHOWPAGE	0002C1BE-R	PRINT	CLI		
DSV$SHOWSELECT	000210F1-R	ATTACH	CLI	QAMAIN	
DSV$SHOWSELECTB	000210EA-R	ATTACH	CLI		
DSV$SHOWTESTS	00030790-R	START	CLI		
DSX$ABORT	0003060B-R	START	ENTRY	QACHECKS	QAMAIN
DSX$ATTACH	000205E2-R	ATTACH	ENTRY		
DSX$BGNSUB	00029FE1-R	LOOP	ENTRY		
DSX$BOOTATTACHED	0001E806-R	MPDUMMY	ENTRY		
DSX$BRANCH	0002D2E8-R	QAMAIN	ENTRY		
DSX$CANWAIT	000230E0-R	CLOCK	ENTRY		
DSX$CHANNEL	00021A00-R	CHAN750	ENTRY		
DSX$CHECK_SUPPORT	0002E552-R	RMS			
DSX$CKLOOP	0002A1F0-R	LOOP	ENTRY		
DSX$CLRVEC	0002F4C6-R	SCB	ENTRY		
DSX$CNTRLC	0001F601-R	KERNEL	ENTRY		
DSX$CVTREG	0002CB52-R	PRINT	ENTRY		
DSX$DEALLOCATE	0002CB1F-R	PRINT	DISPAT		
DSX$DIRECTORY	00026647-R	DIRECTORY			
DSX$DOSUMMARY	00026E56-R	DISPAT	ENTRY		
DSX$ENDPASS	00026C60-R	DISPAT	ENTRY		
DSX$ENDSUB	0002A07F-R	LOOP	ENTRY		
DSX$ERRDEV	0002736F-R	ERROR	ENTRY		
DSX$ERRHARD	00027321-R	ERROR	ENTRY		
DSX$ERRPREP	00027348-R	ERROR	ENTRY		
DSX$ERRSOFT	000272FA-R	ERROR	ENTRY		
DSX$ERRSYS	0002739D-R	ERROR	ENTRY		
DSX$ESCAPE	00029FCC-R	LOOP	ENTRY		
DSX$FREEDBGSYM	0002B117-R	MEMMGT	ENTRY		
DSX$GETADDRESS	0002B6BA-R	PARAM	ENTRY		
DSX$GETBUF	0002181B-R	BUFFER	ENTRY		
DSX$GETDATA	0002B5C4-R	PARAM	ENTRY		
DSX$GETLOGICAL	0002B713-R	PARAM	ENTRY		
DSX$GETSTRING	0002B833-R	PARAM	ENTRY		
DSX$GETSYSBUF	00021810-R	BUFFER	WK-ENTRY		
DSX$GETTERM	0001F76F-R	KERNEL	ENTRY		
DSX$GETVIELD	0002B649-R	PARAM	ENTRY		
DSX$GPHARD	000259D5-R	DEVICE	ENTRY		
DSX$HALTATTACHED	0001E812-R	MPDUMMY	ENTRY		
DSX$HELP	00028F80-R	HELP	CLI	ENTRY	
DSX$INITSCB	0002F320-R	SCB	ENTRY		
DSX$INLOOP	0002A230-R	LOOP	ENTRY		
DSX$LOAD	00026FB0-R	DSLOAD	DEBUG	ENTRY	LOAD
DSX$LOADPCS	0002C088-R	PCSLOAD750	ENTRY		
DSX$MAPDBGBLOCK	0002B0C9-R	MEMMGT	ENTRY		
DSX$MEMSIZE	0002A7EA-R	MEMALC	ENTRY		
DSX$MMOFF	0002AF23-R	MEMMGT	CLI	ENTRY	

Symbol	Value	Defined By	Referenced By ...		
DSX$MMON	0002AF09-R	MEMMGT	CLI	ENTRY	
DSX$PARSE	0002BB3F-R	PARSE	ENTRY		
DSX$PPSCB	0002012A-R	APBOOT	ENTRY		
DSX$PRINT	0002C46A-R	PRINT	ATTACH	CALLFRAME	CLI
			CONSOLE	CRDDUMMY	DISPAT
			DSVECS	ERROR	FLAGS
			KERNEL	LOAD	LOOP
			MCHK750	MEMMGT	PARAM
			QIO	SCRIPT	START
DSX$PRINTB	0002C4D2-R	PRINT	ENTRY	EXCEPT	
DSX$PRINTF	0002C4EA-R	PRINT	ENTRY	LOAD	
DSX$PRINTI	0002C4FF-R	PRINT	DEBUG	EXCEPT	KERNEL
			PCSLOAD750		
DSX$PRINTREV	0002C639-R	PRINT	ENTRY		
DSX$PRINTS	0002C4B8-R	PRINT	ENTRY		
DSX$PRINTSIG	00027B68-R	EXCEPT	ENTRY		
DSX$PRINTSIGI	00027B7A-R	EXCEPT			
DSX$PRINTX	0002C4C5-R	PRINT	ENTRY	EXCEPT	
DSX$PROBE	00036540-R	PROBE	ENTRY		
DSX$RELBUF	0002188B-R	BUFFER	ENTRY		
DSX$RELSYSBUF	00021883-R	BUFFER	WK-ENTRY		
DSX$SERVICE_DISPATCHER	000272C1-R	ENTRY			
DSX$SETIPL	0002F56A-R	SCB	ENTRY		
DSX$SETMAP	00021BAC-R	CHAN750	ENTRY		
DSX$SETPRIEXV	00028252-R	EXCEPT	ENTRY		
DSX$SETVEC	0002F3E7-R	SCB	ENTRY		
DSX$SHOWCHAN	00021E4A-R	CHAN750	ENTRY		
DSX$SHOWIDLE	0001E818-R	MPDUMMY	ENTRY		
DSX$STARTATTACHED	0001E80C-R	MPDUMMY	ENTRY		
DSX$SUPERPARSE	0002BB38-R	PARSE	APT	CLI	
DSX$TYPE_OUT	0002C1DE-R	PRINT	SCRIPT		
DSX$WAITMS	00023109-R	CLOCK	ENTRY		
DSX$WAITUS	00023194-R	CLOCK	ENTRY		
DSX$WAITUS_USOVR	000231AF-R	CLOCK			
DSX$_CLEAR_INTERLOCK	0001E839-R	MPDUMMY	WK-ENTRY		
DSX$_INTERLOCK_TEST	0001E800-R	MPDUMMY	WK-ENTRY		
DSX$_SET_INTERLOCK	0001E836-R	MPDUMMY	WK-ENTRY		
DS_CLEANUP	00026D7A-R	DISPAT	CLI	CRDDUMMY	DIRECTORY
			KERNEL	LOAD	LOOP
			SHOWMEMORY	START	
DS_ERRSUP	00027771-R	ERROR	APT	ASTDEL	ATTACH
			CHMK	CLI	CLOCK
			CONFIG	DEVICE	DISPAT
			ENTRY	EXCEPT	IOPOST
			KERNEL	LOOP	MEMALC
			MEMMGT	ONLY750	QIO
			SCRIPT		
DS_GETLINE	0002F805-R	SCRIPT	PARAM		
DS_SUPERLINE	0002F7FE-R	SCRIPT	ATTACH	CLI	
DS_TESTID	00027705-R	ERROR	START		
DUE_TIME	0001E708-R	START	KERNEL		
DUMP_SELF	00000000		WK-CLI		

Symbol	Value	Defined By	Referenced By ...
DX20$B_DRIVE	00000032	IOBASE	
DX20$K_LEN	00000033	IOBASE	
DYN$C_ACB	00000002	QIO	
DYN$C_ADP	00000001	QIO	
DYN$C_AQB	00000003	QIO	
DYN$C_BRDCST	0000001A	QIO	
DYN$C_BUFIO	00000013	QIO	
DYN$C_CEB	00000004	QIO	
DYN$C_CRB	00000005	QIO	
DYN$C_CXB	0000001B	QIO	
DYN$C_DDB	00000006	QIO	
DYN$C_DPT	0000001E	QIO	
DYN$C_EXTGSD	00000028	QIO	
DYN$C_FCB	00000007	QIO	
DYN$C_FRK	00000008	QIO	
DYN$C_GSD	00000015	QIO	
DYN$C_IDB	00000009	QIO	
DYN$C_IRP	0000000A	QIO	
DYN$C_IRPE	0000002C	QIO	
DYN$C_JIB	0000002F	QIO	
DYN$C_JPB	0000001F	QIO	
DYN$C_KFH	00000026	QIO	
DYN$C_KFI	00000018	QIO	
DYN$C_LOG	0000000B	QIO	
DYN$C_MBX	0000002B	QIO	
DYN$C_MTL	00000019	QIO	
DYN$C_MVL	00000016	QIO	
DYN$C_NDB	0000001C	QIO	
DYN$C_NET	00000017	QIO	
DYN$C_PBH	00000020	QIO	
DYN$C_PCB	0000000C	QIO	
DYN$C_PDB	00000021	QIO	
DYN$C_PFL	00000023	QIO	
DYN$C_PIB	00000022	QIO	
DYN$C_PQB	0000000D	QIO	
DYN$C_PTR	00000025	QIO	
DYN$C_RBM	00000031	QIO	
DYN$C_RVT	0000000E	QIO	
DYN$C_RVX	00000027	QIO	
DYN$C_SFT	00000024	QIO	
DYN$C_SHB	0000002A	QIO	
DYN$C_SHMCEB	0000002E	QIO	
DYN$C_SHMGSD	00000029	QIO	
DYN$C_SHRBUFIO	00000080	QIO	
DYN$C_SLAVCEB	0000002D	QIO	
DYN$C_SPECIAL	00000080	QIO	
DYN$C_SSB	0000001D	QIO	
DYN$C_TQE	0000000F	QIO	
DYN$C_TWP	00000030	QIO	
DYN$C_TYPAHD	00000014	QIO	
DYN$C_UCB	00000010	QIO	
DYN$C_VCA	00000032	QIO	

Symbol	Value	Defined By	Referenced By ...		
DYN$C_VCB	00000011	QIO			
DYN$C_WCB	00000012	QIO			
END_SIZE	0001D49A-R	DIRECTORY	ULTRIX		
ERL$DEVICERR	0003143F-R	VMSDUMMY	ENTRY		
ERL$DEVICTMO	0003143F-R	VMSDUMMY	ENTRY		
ERL$RELEASEMB	0003143F-R	VMSDUMMY	ENTRY	IOSNPG	
ESTKPTR	0003A000-R	ONLY750	EXCEPT	KERNEL	MEMMGT
			SHOWMEMORY		
ET$INIT	00000000		WK-CONFIG		
EXE$ABORTIO	0003697A-R	QIOREQ	ACPFDT	COMDRVSUB	ENTRY
			QIOFDT		
EXE$ACVIOLAT	00027F74-R	EXCEPT			
EXE$ALLOC	000354D2-R	DEVALC	ENTRY		
EXE$ALLOCATE	0002A5E8-R	MEMALC			
EXE$ALLOCBUF	0002A50A-R	MEMALC	COMDRVSUB	ENTRY	QIOREQ
EXE$ALLOCCEB	0002A50E-R	MEMALC			
EXE$ALLOCIRP	0002A51B-R	MEMALC	ENTRY	QIOREQ	
EXE$ALLOCJIB	0002A512-R	MEMALC			
EXE$ALLOCPCB	0002A51F-R	MEMALC			
EXE$ALLOCPQB	0002A527-R	MEMALC			
EXE$ALLOCTQE	0002A530-R	MEMALC	CLOCK		
EXE$ALONONPAGED	0002A56A-R	MEMALC	ATTACH	CANCEL	CONFIG
			DSVECS	ENTRY	ODS
			ONLY750	PRINT	QAMAIN
			QIO	RMS	SCRIPT
			ULTRIX		
EXE$ALTQUEPKT	000369A5-R	QIOREQ	ENTRY		
EXE$ASCTIM	00035045-R	CVRTIM	ENTRY		
EXE$ASSIGN	00034C48-R	ASSIGN	ENTRY		
EXE$BINTIM	000350E6-R	CVRTIM	ENTRY		
EXE$BREAK	00027F9C-R	EXCEPT			
EXE$BUFFRQUOTA	00031440-R	VMSDUMMY	ENTRY		
EXE$BUFQUOPRC	00031440-R	VMSDUMMY	ENTRY		
EXE$CANCEL	00034DE3-R	CANCEL	ENTRY		
EXE$CANTIM	0002324E-R	CLOCK	ENTRY		
EXE$CARRIAGE	00036797-R	QIOFDT	ENTRY		
EXE$CLREF	00027965-R	EVENT	ENTRY		
EXE$CNTREG	0002ADD3-R	MEMMGT	ENTRY		
EXE$DALLOC	0003556E-R	DEVALC			
EXE$DASSGN	00035412-R	DASSGN	ENTRY		
EXE$DEALLOCATE	0002A699-R	MEMALC			
EXE$DEANONPAGED	0002A610-R	MEMALC	ASTDEL	ATTACH	CLOCK
			COMDRVSUB	CONFIG	DASSGN
			DSVECS	ENTRY	IOPOST
			ONLY750	PRINT	QAMAIN
			QIO	QIOFDT	RMS
			SCRIPT		
EXE$EXPREG	0002ACB8-R	MEMMGT	ENTRY		
EXE$FAO	00028290-R	FAO	ENTRY		
EXE$FAOL	00028298-R	FAO	ENTRY		
EXE$FINISHIO	00036989-R	QIOREQ	ENTRY	IOSRAM	QIOFDT
EXE$FINISHIOC	00036987-R	QIOREQ	ACPFDT	ENTRY	

Symbol	Value	Defined By	Referenced By ...		
EXE$FORK	00035651-R	FRKCTL	COMDRVSUB	ENTRY	
EXE$FORKDSPTH	00035670-R	FRKCTL	QIO	SCB	
EXE$GB_CPUDATA	0003173A-R	BOOTDRIVR			
EXE$GB_CPUTYPE	00031739-R	BOOTDRIVR	CONFIG	CSDDBTDRV	DISPAT
			EXCEPT	KERNEL	SCB
EXE$GETTIM	000356B4-R	GETTIM	ENTRY		
EXE$GL_ABSTIM	00010810-R	ENTRY	CLOCK	IOSNPG	
EXE$GL_PWRDONE	0001B36C-R	QIO			
EXE$GL_SCB	0001E5C9-R	SCB			
EXE$GL_SPLITADR	0001DFB8-R	MEMALC	SHOWMEMORY		
EXE$GL_TENUSEC	0003173E-R	BOOTDRIVR	KERNEL	MUBTDRIVR	PABTDRIVR
			PUBTDRIVR		
EXE$GL_UBDELAY	00031742-R	BOOTDRIVR	KERNEL	MUBTDRIVR	PABTDRIVR
			PUBTDRIVR		
EXE$GL_UMR_PHY	00031748-R	BOOTDRIVR			
EXE$GL_UMR_VIR	0003174C-R	BOOTDRIVR			
EXE$GQ_SYSTIME	00010B00-R	ENTRY	CLOCK	CVRTIM	GETTIM
			IOSNPG	KERNEL	
EXE$GTCHAN	000356D0-R	GTCHAN	ENTRY		
EXE$HIBER	00023215-R	CLOCK	ENTRY		
EXE$INSERTIRP	000369FD-R	QIOREQ	ENTRY		
EXE$INSIOQ	000369E2-R	QIOREQ	ENTRY	IOPOST	
EXE$INSTIMQ	000232C0-R	CLOCK			
EXE$IOFORK	0003564C-R	FRKCTL	ENTRY		
EXE$MAXACMODE	0002E02B-R	QIO	ASSIGN	COMDRVSUB	DEVALC
			ENTRY		
EXE$MODIFY	0003660C-R	QIOFDT	ENTRY		
EXE$MODIFYLOCK	00036644-R	QIOFDT	ENTRY		
EXE$MODIFYLOCKR	00036647-R	QIOFDT	ENTRY		
EXE$NUMTIM	000352DC-R	CVRTIM	ENTRY		
EXE$ONEPARM	00036600-R	QIOFDT	ENTRY		
EXE$PWRTIMCHK	0002E44D-R	QIO	ENTRY		
EXE$QIO	0002D924-R	QIO	ENTRY		
EXE$QIOACPPKT	000369C7-R	QIOREQ	CANCEL		
EXE$QIODRVPKT	000369A1-R	QIOREQ	ACPFDT	ENTRY	QIOFDT
EXE$QIORETURN	000369D9-R	QIOREQ	ENTRY		
EXE$READ	00036612-R	QIOFDT	ENTRY		
EXE$READCHK	000366CE-R	QIOFDT	ENTRY		
EXE$READCHKR	000366E2-R	QIOFDT	ENTRY		
EXE$READEF	00027992-R	EVENT	ENTRY		
EXE$READLOCK	0003663E-R	QIOFDT	ACPFDT	ENTRY	
EXE$READLOCKR	00036651-R	QIOFDT	ENTRY		
EXE$REFLECT	00028087-R	EXCEPT			
EXE$ROPRAND	00027F64-R	EXCEPT			
EXE$SENSEMODE	0003676F-R	QIOFDT	ENTRY		
EXE$SETAST	00020308-R	ASTCON	ENTRY	VMSDUMMY	
EXE$SETCHAR	00036741-R	QIOFDT	ENTRY		
EXE$SETEF	0002794B-R	EVENT	ENTRY		
EXE$SETIMR	000232F2-R	CLOCK	ENTRY		
EXE$SETMODE	0003675F-R	QIOFDT	ENTRY		
EXE$SETPRT	0002AF86-R	MEMMGT	ENTRY		
EXE$SNDEVMSG	0003143F-R	VMSDUMMY	ENTRY		

Symbol	Value	Defined By	Referenced By ...		
EXE$TBIT	00028030-R	EXCEPT			
EXE$UNWIND	00036ACC-R	UNWIND	ENTRY		
EXE$WAITFR	000279B6-R	EVENT	ENTRY		
EXE$WAKE	000230FB-R	CLOCK	ENTRY		
EXE$WFLAND	000279F4-R	EVENT	ENTRY		
EXE$WFLOR	000279D3-R	EVENT	ENTRY		
EXE$WRITE	0003661B-R	QIOFDT	ENTRY		
EXE$WRITECHK	000366D4-R	QIOFDT	ENTRY		
EXE$WRITECHKR	0003670C-R	QIOFDT	ENTRY		
EXE$WRITELOCK	00036641-R	QIOFDT	ACPFDT	ENTRY	
EXE$WRITELOCKR	00036658-R	QIOFDT	ENTRY		
EXE$ZEROPARM	00036606-R	QIOFDT	ENTRY		
EXE_ACCVIO	00027F74-R	EXCEPT	SCB		
EXE_ARITH	00027F90-R	EXCEPT	SCB		
EXE_BREAK	00027F9C-R	EXCEPT	SCB		
EXE_CHME	00028068-R	EXCEPT	SCB		
EXE_CHMK	00028060-R	EXCEPT			
EXE_CHMS	00028070-R	EXCEPT	SCB		
EXE_CHMU	00028078-R	EXCEPT	SCB		
EXE_CMODKRNL	00022210-R	CHMK	SCB		
EXE_COMPAT	00027F88-R	EXCEPT	SCB		
EXE_KRNLSTK	00027F3C-R	EXCEPT	SCB		
EXE_MCHK	00027F1C-R	EXCEPT	SCB		
EXE_OPCCUS	00027F5C-R	EXCEPT	SCB		
EXE_OPCDEC	00027F54-R	EXCEPT	SCB		
EXE_POWER	00027F48-R	EXCEPT	SCB		
EXE_RADRMOD	00027F6C-R	EXCEPT	SCB		
EXE_ROPRAND	00027F64-R	EXCEPT	SCB		
EXE_TBIT	00028030-R	EXCEPT	SCB		
EXE_TRANSL	00027F7C-R	EXCEPT	SCB		
EXE_UNEXPINT	00028056-R	EXCEPT	MCHK750	SCB	
FETCH_LONG	00036389-R	ONLY750			
FETCH_STORE	00025623-R	DEBUG	ONLY750		
FETCH_STOR_PREG	00025830-R	DEBUG			
FIL$CACHE_INIT	00028836-R	FILEREAD			
FIL$CACHE_TRUNC	000288AA-R	FILEREAD			
FIL$CVTFILNAM	00024784-R	CVTFILNAM	FILEREAD	RMS	RT11
FIL$C_DIR_SIZE	00000024	FILEREAD			
FIL$C_SIZE	00000218	FILEREAD			
FIL$FINDFILID	00028A15-R	FILEREAD			
FIL$GQ_CACHE	00000000		WK-FILEREAD		
FIL$GT_DDDEV	00017767-R	LOAD	WK-FILEREAD		
FIL$GT_DDSTRING	00017768-R	LOAD	FILEREAD		
FIL$GT_TOPSYS	00000000		WK-FILEREAD		
FIL$MOUNT	00028981-R	FILEREAD			
FIL$OPENFILE	00028730-R	FILEREAD	ODS		
FIL$RDCHKFILHDR	00028D1E-R	FILEREAD			
FIL$RDWRTLBN	000217BC-R	BOOTIO	FILEREAD		
FIL$READVBN	00028DFD-R	FILEREAD	ODS		
FIL$STATBLK	00028EB6-R	FILEREAD			
FIL$WRITEVBN	00028DF6-R	FILEREAD			
FIND_USERPC	00027EC0-R	EXCEPT			

Symbol	Value	Defined By	Referenced By ...		
FIRMEXIST$T	0001E24C-R	PRINT			
FMTBPT	00012771-R	DEBUG			
FMT_BER	00000000		WK-EXCEPT		
GET_BLOCK_LENGTH	000200EC-R	ANSI	ANSI		
GET_TIME	0001F4D6-R	KERNEL	START		
GT_MENU_ERROR	00011667-R	CLI	KERNEL		
HARDEXIST$T	0001E250-R	PRINT			
HDW_CLOCK_SET	000364C5-R	ONLY750	KERNEL		
HELPINFO	0001D8F0-R	HELP	CLI		
HP$B_CPU_ID	0000004F	IOBASE			
HP$B_DHB32_NODE_ID	00000032	IOBASE			
HP$B_DMB32_NODE_ID	00000032	IOBASE			
HP$B_DX20_DRIVE	00000032	IOBASE			
HP$C_NAMELEN	00000014	ATTACH			
HP$K_DHB32_LEN	00000033	IOBASE			
HP$K_DMB32_LEN	00000033	IOBASE			
HP$K_DX20_LEN	00000033	IOBASE			
HP$K_TU70_LEN	00000032	IOBASE			
HP$K_TU72_LEN	00000032	IOBASE			
HP$L_KAA_SLOT	0000004B	IOBASE			
HPE$C_EPB_SIZE	0000001A	ATTACH	CONFIG	ONLY750	
HSC50_BOOT	0001248F-R	CONFIG	PABTDRIVR		
IMAGE_HEADER	0001C20C-R	KERNEL	DEBUG	DSLOAD	LOAD
IMAGE_HEADER_END	0001C40C-R	KERNEL	DSLOAD	LOAD	
INI$BRK	0001EAFE-R	KERNEL	CLI		
INI$LOAD_DEVICE	00023550-R	CONFIG	KERNEL	SHOWMEMORY	
INI$PTABLE	00021577-R	ATTACH	KERNEL	SHOWMEMORY	
INI$RDONLY	0002B1F4-R	MEMMGT			
INI$WRITABLE	0002B1F4-R	MEMMGT			
INIT_CONTEXT	0001F0C6-R	KERNEL	CLI	DIRECTORY	DISPAT
			LOAD	LOOP	SCRIPT
			START		
INS$PTABLE	00021722-R	ATTACH	CONFIG	ONLY750	
INT_CMD	0002A43C-R	MCHK750			
INT_WBTO	0002A450-R	MCHK750			
IO$GQ_PHYSICAL	00035F41-R	ONLY750	MEMMGT	PROBE	
IO$M_CANCTRLO	00000040	SYS$IODEF	EXCEPT		
IO$M_CTRLCAST	00000100	SYS$IODEF	KERNEL	PRINT	
IO$M_FCODE	0000003F	SYS$IODEF	QIOREQ		
IO$M_NOW	00000040	SYS$IODEF	KERNEL		
IO$M_TRMNOECHO	00001000	SYS$IODEF	PRINT		
IO$TESTCSR_L	0003642D-R	ONLY750	QIO		
IO$TESTCSR_W	0003644C-R	ONLY750	QIO		
IO$V_CANCTRLO	00000006	SYS$IODEF	CONSOLE		
IO$_LOGICAL	0000002F	SYS$IODEF	QIOREQ		
IO$_PHYSICAL	0000001F	SYS$IODEF	QIOREQ		
IO$_READLBLK	00000021	SYS$IODEF	QIOREQ		
IO$_READPROMPT	00000037	SYS$IODEF	CONSOLE	SCRIPT	
IO$_READVBLK	00000031	SYS$IODEF	KERNEL	PRINT	QIOREQ
			SCRIPT		
IO$_SENSEMODE	00000027	SYS$IODEF	CONSOLE		
IO$_SETMODE	00000023	SYS$IODEF	CONSOLE	KERNEL	PRINT

Symbol	Value	Defined By	Referenced By ...		
IO$_WRITEVBLK	00000030	SYS$IODEF	ERROR	EXCEPT	PRINT
			QIOREQ	SCRIPT	
IOC$ALLOSPT	00035A67-R	IOSNPG	ENTRY		
IOC$ALOUBAMAP	000359BE-R	IOSNPG	ENTRY		
IOC$ALOUBAMAPN	000359BA-R	IOSNPG	ENTRY		
IOC$ALTUBAMAP	0003599C-R	IOSNPG	ENTRY		
IOC$AL_SYSUCB	00035758-R	IOBASE			
IOC$APPLYECC	00035C08-R	IOSRAM	ENTRY		
IOC$CANCELIO	00035770-R	IOSNPG	ENTRY		
IOC$CVTLOGPHY	00035C7C-R	IOSRAM	ACPFDT	IOPOST	
IOC$CVT_DEVNAM	00035A7D-R	IOSPGD	DEVALC		
IOC$DIAGBUFILL	00035787-R	IOSNPG	ENTRY		
IOC$DIRPOST1	00029C6A-R	IOPOST			
IOC$FFCHAN	00035AB1-R	IOSPGD	ASSIGN		
IOC$FILSPT	00034DD1-R	BUFCTL			
IOC$GETBYTE	00034D78-R	BUFCTL	ENTRY		
IOC$GL_ADPLIST	00035764-R	IOBASE	ONLY750	QIO	
IOC$GL_DEVLIST	00035760-R	IOBASE	CLOCK	DEVALC	IOSPGD
			QIO		
IOC$GL_DPTLIST	00035768-R	IOBASE	QIO		
IOC$GL_IRPFL	0001DFC0-R	MEMALC	QIOREQ		
IOC$GL_PSBL	0001081C-R	ENTRY	CANCEL	COMDRVSUB	IOPOST
			IOSNPG	QIOREQ	
IOC$GL_PSFL	00010818-R	ENTRY	IOPOST		
IOC$INITBUFWIND	00034D9A-R	BUFCTL	ENTRY		
IOC$INITDRV	00036A18-R	RELOCDRV	QIO		
IOC$INITIATE	00035890-R	IOSNPG	ENTRY	QIOREQ	
IOC$IOPOST	0002996C-R	IOPOST	QIO	SCB	
IOC$K_DIAGPID	00660000	KERNEL	CLOCK		
IOC$K_IOSPACE	40000000	ONLY750	CONFIG	DISPAT	
IOC$LOADMBAMAP	00035D80-R	LODMAP	ENTRY		
IOC$LOADUBAMAP	00035DE1-R	LODMAP	ENTRY		
IOC$LOADUBAMAPA	00035DCA-R	LODMAP	ENTRY		
IOC$MAPVBLK	00035CA3-R	IOSRAM	IOPOST		
IOC$MOVFRUSER	00034DA1-R	BUFCTL	ENTRY		
IOC$MOVFRUSER1	00034DB2-R	BUFCTL	ENTRY		
IOC$MOVFRUSER2	00034DA5-R	BUFCTL	ENTRY		
IOC$MOVTOUSER	00034DB9-R	BUFCTL	ENTRY		
IOC$MOVTOUSER1	00034DCA-R	BUFCTL	ENTRY		
IOC$MOVTOUSER2	00034DBD-R	BUFCTL	ENTRY		
IOC$PTETOPFN	00035E5D-R	LODMAP	ENTRY	IOSRAM	
IOC$PURGDATAP	000363BD-R	ONLY750	ENTRY		
IOC$PUTBYTE	00034D89-R	BUFCTL	ENTRY		
IOC$QNXTSEG	00029AB4-R	IOPOST			
IOC$QNXTSEG1	00029AC0-R	IOPOST			
IOC$REINITDRV	00036A1E-R	RELOCDRV	QIO		
IOC$RELCHAN	000357C2-R	IOSNPG	ENTRY		
IOC$RELDATAP	000358C3-R	IOSNPG	ENTRY		
IOC$RELMAPREG	00035950-R	IOSNPG	ENTRY		
IOC$RELSCHAN	000357B8-R	IOSNPG	ENTRY		
IOC$REQCOM	0003584D-R	IOSNPG	ENTRY		
IOC$REQDATAP	00035917-R	IOSNPG	ENTRY		

Symbol	Value	Defined By	Referenced By ...		
IOC$REQDATAPNW	00035913-R	IOSNPG	ENTRY		
IOC$REQMAPREG	0003598A-R	IOSNPG	ENTRY		
IOC$REQPCHANH	00035819-R	IOSNPG	ENTRY		
IOC$REQPCHANL	00035822-R	IOSNPG	ENTRY		
IOC$REQSCHANH	00035805-R	IOSNPG	ENTRY		
IOC$REQSCHANL	0003580F-R	IOSNPG	ENTRY		
IOC$RETURN	00035A20-R	IOSNPG	ENTRY		
IOC$RTN	00010930-R	ENTRY	QIO		
IOC$SEARCHDEV	00035AD8-R	IOSPGD	ASSIGN	DEVALC	
IOC$SEARCHGEN	00035ADD-R	IOSPGD	DEVALC		
IOC$SENSEDISK	00035D72-R	IOSRAM	ENTRY		
IOC$UNLOCK	00035BCF-R	IOSPGD	ASSIGN	DASSGN	DEVALC
IOC$UPDATRANSP	00035D36-R	IOSRAM	ENTRY		
IOC$VERIFYCHAN	00035BD3-R	IOSPGD	CANCEL	DASSGN	GTCHAN
			QIOREQ		
IOC$WAKACP	00029B1E-R	IOPOST			
IOC$WFIKPCH	00035A21-R	IOSNPG	ENTRY		
IOC$WFIRLCH	00035A43-R	IOSNPG	ENTRY		
IOGEN$CNTRL_INI	0002E377-R	QIO			
IOGEN$CONN_VEC	0003646B-R	ONLY750	QIO		
ISTKPTR	00039A00-R	ONLY750	EXCEPT	KERNEL	MEMMGT
			SHOWMEMORY		
KA$B_ACC_TYPE	00000042	IOBASE			
KA$B_NODE_ID	00000046	IOBASE			
KA$B_RESERVED	00000043	IOBASE			
KA$B_SID_TYPE	0000003D	IOBASE			
KA$K_LEN	00000050	IOBASE			
KA$L_FLAGS	00000032	IOBASE			
KA$L_MEM_SIZE	00000047	IOBASE			
KA$L_SID	0000003A	IOBASE			
KA$M_CHAR	00000100	IOBASE			
KA$M_CRC	00000010	IOBASE			
KA$M_D_FLOAT	00000002	IOBASE			
KA$M_EDIT	00000080	IOBASE			
KA$M_F_FLOAT	00000001	IOBASE			
KA$M_G_FLOAT	00000004	IOBASE			
KA$M_H_FLOAT	00000008	IOBASE			
KA$M_PACKED	00000020	IOBASE			
KA$M_PACK_MUL	00000040	IOBASE			
KA$M_SB_ERR	02000000	IOBASE			
KA$M_TODR	00010000	IOBASE			
KA$M_WCS_LD	01000000	IOBASE			
KA$V_CHAR	00000008	IOBASE			
KA$V_CRC	00000004	IOBASE			
KA$V_D_FLOAT	00000001	IOBASE			
KA$V_EDIT	00000007	IOBASE			
KA$V_F_FLOAT	00000000	IOBASE			
KA$V_G_FLOAT	00000002	IOBASE			
KA$V_H_FLOAT	00000003	IOBASE			
KA$V_PACKED	00000005	IOBASE			
KA$V_PACK_MUL	00000006	IOBASE			
KA$V_SB_ERR	00000019	IOBASE			

Symbol	Value	Defined By	Referenced By ...		
KA$V_TODR	00000010	IOBASE			
KA$V_WCS_LD	00000018	IOBASE			
KA$W_LATENCY	0000003E	IOBASE			
KA$W_MEM_SIZE	00000044	IOBASE			
KA$W_PROGRESS	00000040	IOBASE			
KA$W_RESERVED	00000038	IOBASE			
KA$W_WCS	00000036	IOBASE			
KB_CHECK	0001F2C4-R	KERNEL	ANSI	APT	ATTACH
			BUFFER	CLI	CLOCK
			DIRECTORY	DISPAT	ENTRY
			EVENT	LOOP	PRINT
			SCB		
KB_CHECK_APT	0001F322-R	KERNEL	CLI		
KB_POLL	00024195-R	CONSOLE	CSDDBTDRV	KERNEL	
KDB50_RESPONSE	00000000		WK-CONFIG		
KSTKPTR	00039200-R	ONLY750	KERNEL	MEMMGT	SHOWMEMORY
LIB$CVT_DTB	00031465-R	LIB$CVT_ATB	CVTFILNAM	FILEREAD	
LIB$CVT_HTB	00031473-R	LIB$CVT_ATB			
LIB$CVT_OTB	0003146C-R	LIB$CVT_ATB			
LIB$SIGNAL	000314DE-R	LIB$SIGNAL	DIRECTORY		
LIB$STOP	000314D8-R	LIB$SIGNAL			
LINE_COUNT	0001E281-R	PRINT	CLI		
LOAD_SELF	00000000		WK-DSLOAD		
LOC$ADAPTER	00021624-R	ATTACH			
LOC$PTABLE	00021679-R	ATTACH	DIRECTORY	RMS	
LOC$PTDESC	000216C8-R	ATTACH	QIO		
LOGNUM	0001E274-R	PRINT			
MAP$IOSPACE	000362F4-R	ONLY750	MEMMGT		
MAPEN	00032057-R	PABTDRIVR			
MAPFREE	0002ABDB-R	MEMMGT	CLI	LOAD	START
MAPMEM	0002A80C-R	MEMMGT	KERNEL	SHOWMEMORY	
MAPMEM$IOSPACE	0002AAA3-R	MEMMGT	ONLY750		
MAP_DEBUGGER	0002B141-R	MEMMGT	DEBUG	START	
MBA$INITIAL	00035F2B-R	MBAINT	QIO		
MBA$INT	00035E80-R	MBAINT	QIO		
MCHECK	00000000		WK-PABTDRIVR		
MC_RETURN	00000000		WK-PABTDRIVR		
MEMPOOL$INIT	0002A6EF-R	MEMALC	KERNEL	MEMMGT	
MMG$GL_POBASE	00010808-R	ENTRY			
MMG$GL_SPTBASE	00010804-R	ENTRY	IOSNPG	IOSRAM	MEMMGT
			PABTDRIVR		
MMG$IOLOCK	0002B0BB-R	MEMMGT	QIOFDT		
MMG$PAGEFAULT	00027F7C-R	EXCEPT			
MMG$UNLOCK	0002B0C5-R	MEMMGT	IOPOST		
MODELST	00012970-R	DEBUG	EXCEPT	MCHK750	
MP$GB_FUNCTION	0001D46D-R	DEBUG			
MP$GB_SETCPU	0001D18C-R	CLI	DEBUG		
MP$GL_AP_BASE_ADDR_BKPT	00000000		WK-DEBUG		
MP$GL_AP_BKPT_STORE	00000000		WK-DEBUG		
MP$GL_AP_OFFSET_BKPT	00000000		WK-DEBUG		
MP$GL_AP_SIGNAL_ARRAY	00000000		WK-EXCEPT		
MP$GL_CONDITION_FLAGS	0001C000-R	MPDUMMY	WK-CLI	WK-START	

Symbol	Value	Defined By	Referenced By ...		
MP$GL_FLAGS	00000000		WK-START		
MP$GL_IPR_STATUS	0001D46E-R	DEBUG			
MP$GL_IPR_VALUE	0001D472-R	DEBUG			
MP$GL_LUN	0001D18D-R	CLI			
MP$GL_REG_ADDRESS	0001D476-R	DEBUG			
MP$GL_REG_VALUE	0001D47A-R	DEBUG			
MP$GL_RET_STATUS	0001D47E-R	DEBUG			
MP$GL_SAVED_PSL	00000000		WK-EXCEPT		
MP$GL_SAVED_R1	0001D482-R	DEBUG			
MP$GR_BOOTED_PROCESSORS	0001C40C-R	KERNEL	CLI	CLOCK	DEBUG
			EXCEPT	MEMMGT	PRINT
			WK-START		
MP$GR_IDLING_PROCESSORS	00000000		WK-START		
MP$GR_SAVED_GPRS	00000000		WK-DEBUG	WK-EXCEPT	
MP$GT_DEVICE_NAME	0001D191-R	CLI	DEBUG		
MP$R_ACTIVE_SERVICES	00000000		WK-KERNEL		
MP$R_INTERLOCK_END	00000000		WK-KERNEL		
MP$_ATTACHED_CPU_CHECK	0001E82D-R	MPDUMMY			
MP$_CLEAR_LOCKS	00000000		WK-START		
MP$_COND_DEBUG	00000000		WK-DEBUG		
MP$_COND_HANDLR	00000000		WK-EXCEPT		
MP$_DEALL_MEMORY	0001E81E-R	MPDUMMY	DISPAT		
MP$_GET_GPR	00000000		WK-DEBUG		
MP$_GET_IPR	00000000		WK-DEBUG		
MP$_GET_PROCESSOR_ID	0001E821-R	MPDUMMY	CLOCK	WK-DEBUG	EXCEPT
MP$_PRIMARY_CPU_CHECK	0001E830-R	MPDUMMY	WK-KERNEL		
MP$_RESUME_ATTACHED_PROCESSORS	0001E833-R	MPDUMMY	WK-DEBUG	EXCEPT	WK-KERNEL
MP$_STOP_EVERYTHING	0001E82A-R	MPDUMMY			
MS$CMD	0001BF60-R	TSBTDRIVR			
MT$CHECK_ACCESS	0003143D-R	VMSDUMMY	ENTRY		
NDS$OPEN	00000000		WK-KERNEL		
NI$B_LOOPBACK	00000032	IOBASE			
NI$GN_RPB_BUFFER	00000000		WK-CONFIG		
NI$K_LEN	00000033	IOBASE			
ODS$GET	0002B3E8-R	ODS			
ODS$OPEN	0002B2F7-R	ODS	RMS		
ODS$READ	0002B511-R	ODS			
ONLY$GL_TENUSEC	00035F34-R	ONLY750	KERNEL		
ONLY$GL_UBDELAY	00035F38-R	ONLY750	KERNEL		
ONLY_ATTACH	000364C6-R	ONLY750	ATTACH		
ONLY_CPU	0003653E-R	ONLY750	KERNEL		
ONLY_SCB	000364C4-R	ONLY750	SCB		
POPT_BASE	0003AC00-R	ONLY750	ENTRY	KERNEL	MEMMGT
			SHOWMEMORY		
PARSE_DEVICE	00020A3F-R	ATTACH			
PATCHEXIST$T	0001E254-R	PRINT			
PA_INIT	0003214A-R	PABTDRIVR	WK-CONFIG		
PB$INIT	00000000		WK-CONFIG		
PCB_BASE	00036C78-R	ONLY750	EXCEPT	KERNEL	SHOWMEMORY
PFN$AB_STATE	0001DFD8-R	MEMMGT			
PFN$AB_TYPE	00000000	MEMMGT			
PFN$AL_BAK	0001DFD0-R	MEMMGT			

Symbol	Value	Defined By	Referenced By ...		
PFN$AL_PTE	0001DFCC-R	MEMMGT			
PFN$AW_BLINK	00000000	MEMMGT			
PFN$AW_FLINK	00000000	MEMMGT			
PFN$AW_REFCNT	0001DFD4-R	MEMMGT			
PFN$AW_SWPVBN	0001DFC8-R	MEMMGT			
PHD_BASE	00036C00-R	ONLY750	KERNEL	SHOWMEMORY	
POLL_TIME	0001E700-R	START	KERNEL		
PPA$CLOSE	00000000		WK-RMS		
PPA$DIRECTORY	00000000		WK-DIRECTORY		
PPA$GB_CPU	00000000		WK-KERNEL		
PPA$GB_MID	00000000		WK-KERNEL		
PPA$LOOKUP	00000000		WK-RMS		
PPA$READ	00000000		WK-RMS		
PR$_MAPEN	00000038	SYS$PRDEF	APT		
PR$_SID_TYPRTUV2	00000010	KERNEL	BOOTDRIVR	MEMMGT	
PR$_SYS_TYP800	00000002	KERNEL	CONSOLE		
PR$_SYS_TYP900	00000003	KERNEL	DIRECTORY	MEMMGT	RMS
PR$_SYS_TYP9CC	00000000		WK-MEMMGT		
PR$_SYS_TYP_LLL	0000000A	KERNEL			
PREADVBLK	000243E9-R	CONSOLE	QIO		
PRNT_AP_NAME	00012845-R	DEBUG			
PRNT_PRMT	0001DFE5-R	PARAM	SCRIPT		
PRT$C_UR	0000000F	SYS$PRDEF	DEBUG		
PRT$C_UW	00000004	SYS$PRDEF	DEBUG		
PT$EXTRACT	00020EC4-R	ATTACH			
PT$INTERPRET	00020BEE-R	ATTACH			
QA$ADD_FORCED_ERROR	0002D466-R	QAMAIN	QACHECKS		
QA$ADD_QA_ERROR	0002D469-R	QAMAIN	QACHECKS		
QA$AOB_CHECK_STATE	0001E594-R	QAMAIN	DISPAT	LOOP	QACHECKS
			START		
QA$AOB_FLAGS	0001E598-R	QAMAIN	DISPAT	PARAM	QACHECKS
			START		
QA$AOB_ROUTINE_STATE	0001E590-R	QAMAIN	QACHECKS		
QA$FIND_USER_CALL_FRAME	0002D607-R	QAMAIN	QACHECKS		
QA$LOOP_ON_SUBTEST	0002CFAC-R	QACHECKS	QAMAIN		
QA$LOOP_ON_TEST	0002CEAA-R	QACHECKS	QAMAIN		
QA$L_SAVED_DSA_FLAGS	0001E58C-R	QAMAIN			
QA$MAIN	0002D687-R	QAMAIN	DISPAT	ERROR	KERNEL
			LOOP	PARAM	START
QA$MULTIPLE_PASS	0002CDDB-R	QACHECKS	QAMAIN		
QA$NORMAL_START	0002CD10-R	QACHECKS	QAMAIN		
QA$PRINT_FORCED_ERRORS	0002D868-R	QAMAIN	QACHECKS		
QA$RUN_BACKWARDS	0002D0D5-R	QACHECKS	QAMAIN		
QA$T_HEADER_1	0001AC2B-R	QACHECKS	QAMAIN		
QA$T_HEADER_2	0001AC51-R	QACHECKS	QAMAIN		
QA$T_HEADER_3	0001AC78-R	QACHECKS	QAMAIN		
QA$T_OPERATOR_REQUEST_MESSAGE	0001AAA5-R	QACHECKS	QAMAIN		
QA$W_BRANCH	0001E582-R	QAMAIN	QACHECKS		
QA$W_ERROR_NUMBER	0001E584-R	QAMAIN	QACHECKS		
QA$W_MULTIPLEPASS	0001E560-R	QAFLAGS	QACHECKS	QAMAIN	
QA$W_SAVE_LAST	0001E588-R	QAMAIN	DISPAT	QACHECKS	
QA$W_SAVE_TEST	0001E586-R	QAMAIN	QACHECKS		

Symbol	Value	Defined By	Referenced By ...		
QA$W_SUBTESTLOOPS	0001E55E-R	QAFLAGS	QACHECKS	QAMAIN	
QA$W_TESTLOOPS	0001E55C-R	QAFLAGS	QACHECKS	QAMAIN	
QIO$ADDUNIT	0002DB7D-R	QIO	START		
QIO$CLEANUP	0002DAB6-R	QIO	DIRECTORY	DISPAT	SCRIPT
			START		
QIO$DEALLOCATE	0002E408-R	QIO	ONLY750		
QIO$INITIALIZE	0002DA62-R	QIO	KERNEL		
QIO$MINCORE	00005E3C	KERNEL	MEMALC		
QIOCLEAN_CPU	00036476-R	ONLY750	QIO		
Q_ADAPTER	0001CBF4-R	ATTACH	CLI		
RCTRLC	0001F225-R	KERNEL	PRINT		
READVBLK	000243E9-R	CONSOLE	QIO		
RECEIVE_POLL	00000000		WK-KERNEL		
REMOTE_NODE_CONTROL_LEVEL	00000000		WK-QIO		
RMS$ALLOC_CACHE	0002E88F-R	RMS	ANSI	ODS	RT11
			ULTRIX		
RMS$CLEANUP	0002E8EE-R	RMS	DISPAT		
RMS$CLOSE	0002EF69-R	RMS	ENTRY		
RMS$CONNECT	0002ED0D-R	RMS	ENTRY		
RMS$DISCONNECT	0002EF0F-R	RMS	ENTRY		
RMS$ERROR	0002E7AE-R	RMS			
RMS$FILE_TABLE	0001E5AC-R	RMS			
RMS$GET	0002ED8F-R	RMS	ENTRY		
RMS$INIT	0002E8DF-R	RMS	KERNEL		
RMS$LOAD_XAB	0002E840-R	RMS			
RMS$OPEN	0002E972-R	RMS	ENTRY		
RMS$READ	0002EE51-R	RMS	ENTRY		
RPTEADR	0002B071-R	MEMMGT			
RRD50$B_BR	00000036	IOBASE			
RRD50$K_LEN	00000037	IOBASE			
RRD50$L_CSR	00000032	IOBASE			
RT11$GET	0002F1A7-R	RT11			
RT11$OPEN	0002F0B1-R	RT11	RMS		
RT11$READ	0002F2B7-R	RT11			
RX50_DISK_SELECT	0001C889-R	KERNEL			
SAVE_MCHK	00000000		WK-PABTDRIVR		
SCAN$ALPHA	0002BD54-R	PARSE	ATTACH	QIO	
SCAN$ALPHANUM	0002BD66-R	PARSE	ATTACH		
SCAN$BINARY	0002BE06-R	PARSE			
SCAN$COMPARE	0002BDB9-R	PARSE	SCRIPT		
SCAN$DECIMAL	0002BDFC-R	PARSE	ATTACH		
SCAN$DEVICE	0002BEF9-R	PARSE	ATTACH	LOAD	RMS
SCAN$FILE	0002BD78-R	PARSE			
SCAN$HEX	0002BE0B-R	PARSE			
SCAN$NUMERIC	0002BE0E-R	PARSE	ANSI	ATTACH	DIRECTORY
			DSVECS	PARAM	
SCAN$OCTAL	0002BE01-R	PARSE			
SCAN$SEARCHLIST	0002BEAA-R	PARSE	QIO		
SCAN$SPACE	0002BD8A-R	PARSE			
SCAN$SPACES	0002BD8A-R	PARSE	ATTACH	PARAM	SCRIPT
SCAN$SPANC	0002BD9E-R	PARSE			
SCAN$SYMBOL	0002BD42-R	PARSE	ATTACH		

Symbol	Value	Defined By	Referenced By ...		
SCBVECTOR_000	0002A48D-R	MCHK750	SCB		
SCBVECTOR_038	0002A491-R	MCHK750	SCB		
SCBVECTOR_03C	0002A495-R	MCHK750	SCB		
SCBVECTOR_050	0002A499-R	MCHK750	SCB		
SCBVECTOR_054	0002A43D-R	MCHK750	SCB		
SCBVECTOR_058	0002A49D-R	MCHK750	SCB		
SCBVECTOR_05C	0002A4A1-R	MCHK750	SCB		
SCBVECTOR_060	0002A451-R	MCHK750	SCB		
SCBVECTOR_064	0002A4A5-R	MCHK750	SCB		
SCBVECTOR_068	0002A4A9-R	MCHK750	SCB		
SCBVECTOR_06C	0002A4AD-R	MCHK750	SCB		
SCBVECTOR_070	0002A4B1-R	MCHK750	SCB		
SCBVECTOR_074	0002A4B5-R	MCHK750	SCB		
SCBVECTOR_078	0002A4B9-R	MCHK750	SCB		
SCBVECTOR_07C	0002A4BD-R	MCHK750	SCB		
SCBVECTOR_080	0002A4C1-R	MCHK750	SCB		
SCBVECTOR_0C4	0002A4C5-R	MCHK750	SCB		
SCBVECTOR_0C8	0002A4C9-R	MCHK750	SCB		
SCBVECTOR_0CC	0002A4CD-R	MCHK750	SCB		
SCBVECTOR_0D0	0002A4D1-R	MCHK750	SCB		
SCBVECTOR_0D4	0002A4D5-R	MCHK750	SCB		
SCBVECTOR_0D8	0002A4D9-R	MCHK750	SCB		
SCBVECTOR_0DC	0002A4DD-R	MCHK750	SCB		
SCBVECTOR_0E0	0002A4E1-R	MCHK750	SCB		
SCBVECTOR_0E4	0002A4E5-R	MCHK750	SCB		
SCBVECTOR_0E8	0002A4E9-R	MCHK750	SCB		
SCBVECTOR_0EC	0002A4ED-R	MCHK750	SCB		
SCBVECTOR_0F0	0002A4F1-R	MCHK750	SCB		
SCBVECTOR_0F4	0002A4F5-R	MCHK750	SCB		
SCBVECTOR_0F8	0002A4F9-R	MCHK750	SCB		
SCBVECTOR_0FC	0002A4FD-R	MCHK750	SCB		
SCB_BASE	00037000-R	ONLY750	CHAN750	CONFIG	DEBUG
			DISPAT	PABTDRIVR	QIO
			SCB	SHOWMEMORY	
SCB_IMAGE	00031600-R	SCB	CONFIG	DEBUG	EXCEPT
			KERNEL	ONLY750	QIO
SCB_UNKINT	00037600-R	ONLY750	CHAN750	MEMMGT	SCB
SCH$ASTDEL	00020334-R	ASTDEL	SCB		
SCH$GL_CURPCB	0001C835-R	KERNEL	ASTDEL		
SCH$GL_PCBVEC	0001080C-R	ENTRY	ASSIGN	ASTDEL	IOPOST
SCH$LOCKW	00031444-R	VMSDUMMY	ENTRY		
SCH$NEWLVL	00020361-R	ASTDEL	ASTCON	CHMK	
SCH$POSTEF	0002797F-R	EVENT	ENTRY	IOPOST	
SCH$QAST	00020458-R	ASTDEL	CLOCK	COMDRVSUB	ENTRY
			IOPOST		
SCH$UNLOCK	0003144B-R	VMSDUMMY	ENTRY		
SCH$WAKE	00031440-R	VMSDUMMY			
SCRIPT$CONT	0002F7C6-R	SCRIPT	CLI		
SCRIPT$FLUSH	0002F77B-R	SCRIPT	ATTACH	CLI	DIRECTORY
			LOAD	SHOWMEMORY	START
SCRIPT$INIT	0002F624-R	SCRIPT	KERNEL		
SCRIPT$MINCORE	00000400	SCRIPT	MEMALC		

Symbol	Value	Defined By	Referenced By ...		
SCRIPT$OPEN	0002F62E-R	SCRIPT	CLI		
SCRIPT$STOP	0002F7BD-R	SCRIPT	DEBUG	EXCEPT	KERNEL
SEC_TICK	00000064	CLOCK			
SEND_CONSOLE_RESPONSE	00000000		WK-QIO		
SET_ABORT	000205D5-R	ATTACH			
SET_LOOP_BACK_BIT	00024EAB-R	DEBUG			
SGN$C_IRPCNT	00000040	KERNEL	MEMALC		
SGN$C_NPAGEDYN	0000263C	KERNEL			
SHOWMEMORYFLAGS	0001E6E8-R	SHOWMEMORY	CLI		
SIZE_TERM	000245EC-R	CONSOLE	KERNEL		
SLU$B_ACTIV	00000033	IOBASE			
SLU$B_EXT	00000032	IOBASE			
SLU$B_SPEED	00000034	IOBASE			
SLU$K_LEN	00000035	IOBASE			
SS$_ACCVIO	0000000C	SYS$SSDEF	DEBUG	ERROR	IOPOST
			QIOREQ		
SS$_BADPARAM	00000014	SYS$SSDEF	ACPFDT		
SS$_BREAK	00000414	SYS$SSDEF	DEBUG		
SS$_CANCEL	00000830	SYS$SSDEF	CANCEL		
SS$_CONTINUE	00000001	SYS$SSDEF	DEBUG	ONLY750	
SS$_CONTROLC	00000651	SYS$SSDEF	CONSOLE	ONLY750	SCRIPT
SS$_CTRLERR	00000054	SYS$SSDEF	ERROR	ONLY750	
SS$_DATACHECK	0000005C	SYS$SSDEF	ONLY750		
SS$_DEVOFFLINE	00000084	SYS$SSDEF	QIOREQ		
SS$_ENDOFFILE	00000870	SYS$SSDEF	ACPFDT	CLI	SCRIPT
SS$_FILNOTACC	000000AC	SYS$SSDEF	ACPFDT		
SS$_ILLBLKNUM	000000DC	SYS$SSDEF	ACPFDT	IOPOST	
SS$_ILLIOFUNC	000000F4	SYS$SSDEF	QIOREQ	SCRIPT	
SS$_ILLPAGCNT	000000FC	SYS$SSDEF	BUFFER		
SS$_INSFMEM	00000124	SYS$SSDEF	CANCEL	QIO	
SS$_IVCHAN	0000013C	SYS$SSDEF	QIO		
SS$_NOPRIV	00000024	SYS$SSDEF	ACPFDT		
SS$_NORMAL	00000001	SYS$SSDEF	ACPFDT	BUFFER	CANCEL
			COMDRVSUB	IOSNPG	IOSRAM
			QIO	QIOREQ	SCB
			SCRIPT		
SS$_NOSUCHDEV	00000908	SYS$SSDEF	ERROR		
SS$_NOSUCHFILE	00000910	SYS$SSDEF	ERROR		
SS$_PAGOWNVIO	000001EC	SYS$SSDEF	BUFFER		
SS$_RESIGNAL	00000918	SYS$SSDEF	DEBUG	ONLY750	
SS$_ROPRAND	00000454	SYS$SSDEF	DEBUG		
SS$_TBIT	00000464	SYS$SSDEF	DEBUG		
SS$_WASSET	00000009	SYS$SSDEF	CONSOLE		
SSTKPTR	0003A600-R	ONLY750	EXCEPT	KERNEL	MEMMGT
			SHOWMEMORY		
STACK_BASE	00037C00-R	ONLY750	EXCEPT	MEMMGT	SHOWMEMORY
SWI$GL_FQBL	0001C83D-R	KERNEL			
SWI$GL_FQFL	0001C839-R	KERNEL	FRKCTL		
SYMTAB_HI	0001D469-R	DEBUG	MEMMGT		
SYS$ALLOC	00010238-R	ENTRY	ATTACH		
SYS$ASCTIM	00010248-R	ENTRY	FAO		
SYS$ASSIGN	00010250-R	ENTRY	KERNEL		

Symbol	Value	Defined By	Referenced By ...		
SYS$BINTIM	00010258-R	ENTRY	CLI	CONSOLE	KERNEL
SYS$CALL_HANDL	00010210-R	ENTRY	EXCEPT	UNWIND	
SYS$CANCEL	00010260-R	ENTRY	DASSGN	PRINT	
SYS$CANTIM	00010268-R	ENTRY	CLOCK	DISPAT	
SYS$CLOSE	000105B8-R	ENTRY	DIRECTORY	DSLOAD	HELP
			SCRIPT		
SYS$CLREF	00010298-R	ENTRY	CLOCK	FLAGS	KERNEL
			LOAD	QIOREQ	
SYS$CNTREG	000102A0-R	ENTRY	BUFFER		
SYS$CONNECT	000105C0-R	ENTRY	DIRECTORY	DSLOAD	HELP
			KERNEL	SCRIPT	
SYS$CREATE	7FFEE1C8	SYS$P1_VECTOR	KERNEL		
SYS$CRELOG	7FFEDEB0	SYS$P1_VECTOR	KERNEL	LOAD	
SYS$CRETVA	800000C8	KERNEL	DEBUG		
SYS$CRMPSC	7FFEDE78	SYS$P1_VECTOR	KERNEL		
SYS$DALLOC	000102D8-R	ENTRY	ATTACH	KERNEL	
SYS$DASSGN	000102E0-R	ENTRY			
SYS$DCLEXH	7FFEDEF0	SYS$P1_VECTOR	KERNEL		
SYS$DELTVA	80000110	KERNEL			
SYS$DISCONNECT	000105D0-R	ENTRY	DSLOAD	SCRIPT	
SYS$DISK	00035F7C-R	ONLY750	KERNEL	LOAD	
SYS$EXIT	00010340-R	ENTRY	CLI	KERNEL	
SYS$EXPREG	00010348-R	ENTRY	BUFFER	MEMALC	
SYS$FAO	00010350-R	ENTRY	ANSI	ATTACH	CVRTIM
			DEBUG	DIRECTORY	ERROR
			IOSPGD	KERNEL	PARAM
			PRINT	SCRIPT	
SYS$FAOL	00010358-R	ENTRY	ATTACH	DEBUG	PRINT
SYS$GET	00010580-R	ENTRY	DIRECTORY	HELP	SCRIPT
SYS$GETCHN	000104C8-R	ENTRY	KERNEL		
SYS$GETDVI	7FFEE410	SYS$P1_VECTOR	DIRECTORY		
SYS$GETJPI	7FFEE0D8	SYS$P1_VECTOR	KERNEL		
SYS$GETJPIW	7FFEE420	SYS$P1_VECTOR	KERNEL		
SYS$GETSYI	7FFEE3F8	SYS$P1_VECTOR	DIRECTORY	KERNEL	
SYS$GETTIM	00010378-R	ENTRY	CLOCK		
SYS$GL_OPRMBX	00010800-R	ENTRY			
SYS$GTCHAN	00010380-R	ENTRY			
SYS$HIBER	00010388-R	ENTRY	CLOCK	SCRIPT	
SYS$LKWSET	000103A0-R	ENTRY			
SYS$NUMTIM	000103B8-R	ENTRY	CVRTIM		
SYS$OPEN	00010608-R	ENTRY	DIRECTORY	DSLOAD	HELP
			KERNEL	SCRIPT	
SYS$PARSE	7FFEE230	SYS$P1_VECTOR	DIRECTORY		
SYS$PUT	7FFEE188	SYS$P1_VECTOR	PRINT		
SYS$QIO	000103C8-R	ENTRY	EXCEPT	SCRIPT	
SYS$QIOW	00010200-R	ENTRY	CONSOLE	ERROR	KERNEL
			PRINT	SCRIPT	
SYS$READ	00010590-R	ENTRY	DSLOAD		
SYS$READEF	000103D0-R	ENTRY	CONSOLE	FLAGS	SCRIPT
SYS$SEARCH	7FFEE248	SYS$P1_VECTOR	DIRECTORY		
SYS$SETAST	000103F8-R	ENTRY	KERNEL		
SYS$SETDDIR	7FFEE250	SYS$P1_VECTOR	KERNEL	LOAD	

Symbol	Value	Defined By	Referenced By ...		
SYS$SETEF	00010400-R	ENTRY	CLOCK	CONSOLE	FLAGS
			QIOREQ		
SYS$SETEXV	80000208	KERNEL	EXCEPT		
SYS$SETIMR	00010420-R	ENTRY	CLOCK	CONSOLE	
SYS$SETPRI	00010428-R	ENTRY			
SYS$SETPRT	00010430-R	ENTRY	DEBUG	ONLY750	
SYS$SETRWM	00010438-R	ENTRY			
SYS$SPACE	7FFEE218	SYS$P1_VECTOR	DSLOAD		
SYS$SRCHANDLER	7FFEE118	SYS$P1_VECTOR	LIB$SIGNAL		
SYS$SYSROOT	00035F69-R	ONLY750			
SYS$TRNLOG	00010458-R	ENTRY	KERNEL		
SYS$ULKPAG	00010460-R	ENTRY			
SYS$ULWSET	00010468-R	ENTRY			
SYS$UNWIND	00010470-R	ENTRY	CONFIG	DEBUG	EXCEPT
			MEMMGT	ONLY750	PROBE
SYS$WAITFR	00010478-R	ENTRY			
SYS$WAKE	00010480-R	ENTRY	CLOCK	SCRIPT	
SYS$WFLAND	00010488-R	ENTRY			
SYS$WFLOR	00010490-R	ENTRY			
TICK_NS	000186A0	CLOCK	KERNEL		
TM03_DRIVER	000341BD-R	TMBTDRIVR			
TM78_DRIVER	00033EF0-R	TFBTDRIVR			
TODR_BIAS	10000000	CLOCK	KERNEL		
TODR_BYTE_CNT	00000000		WK-KERNEL	WK-QIO	
TODR_STORE	00000000		WK-KERNEL	WK-QIO	
TS11_DRIVER	000342FF-R	TSBTDRIVR			
TST$MCHK	00027F04-R	EXCEPT	DISPAT	ONLY750	
TU70$K_LEN	00000032	IOBASE			
TU72$K_LEN	00000032	IOBASE			
TU_INIT	00034600-R	MUBTDRIVR			
TXCS$V_RDY	00000000		WK-KERNEL	WK-QIO	
T_EMESSG1	0001152E-R	CLI	DEBUG		
UBA$INITIAL	00036428-R	ONLY750	WK-QIO		
UBA$UNEXINT	0003642C-R	ONLY750	QIO		
UBADP_CPU	0003640F-R	ONLY750	QIO		
UBINTSZ	000000B4	ONLY750	WK-QIO		
UBINT_DISP	0001B3AC-R	QIO	ONLY750		
UDA_RESPONSE	00033E50-R	PUBTDRIVR	WK-CONFIG		
UD_INIT	00033C00-R	PUBTDRIVR	WK-CONFIG		
ULTRIX$B	00002000	ULTRIX	MEMALC		
ULTRIX$GET	000310B1-R	ULTRIX			
ULTRIX$IOB	000040D6	ULTRIX	MEMALC		
ULTRIX$OPEN	00030936-R	ULTRIX	RMS		
ULTRIX$READ	000313BE-R	ULTRIX			
ULTRIX_B_ADD	0001E784-R	ULTRIX	MEMALC		
ULTRIX_FLAGS	0001DF54-R	LOAD	CLI	DIRECTORY	HELP
			PARSE	RMS	SCRIPT
ULTRIX_IOB_ADD	0001E780-R	ULTRIX	MEMALC	SHOWMEMORY	
ULTRIX_V_MODE	00000000	LOAD	CLI	PARSE	SCRIPT
UNMAP_DEBUGGER	0002B15A-R	MEMMGT	DEBUG		
USTKPTR	0003AC00-R	ONLY750	EXCEPT	KERNEL	MEMMGT
			SHOWMEMORY		

Symbol	Value	Defined By	Referenced By ...		
VAX$MODIFY_EXCEPTION	00000000		WK-EXCEPT		
VMS$QIO	000367E7-R	QIOREQ	QIO		
VRABORT	00030631-R	START	APT	CLI	
VRCLRBRK	0002512A-R	DEBUG	APT	CLI	
VRCLREF	00028610-R	FLAGS	CLI		
VRCLRFLG	000285D9-R	FLAGS	CLI		
VRDEPOSIT	00024F10-R	DEBUG	CLI		
VREXAMINE	00024924-R	DEBUG	CLI		
VRRESTART	0003022F-R	START	APT	DISPAT	LOOP
VRSETBASE	0002485A-R	DEBUG	CLI		
VRSETBRK	000250AB-R	DEBUG	CLI		
VRSETDFLT	00024877-R	DEBUG	CLI		
VRSETEF	000285EF-R	FLAGS	CLI		
VRSETFLG	000285B4-R	FLAGS	CLI		
VRSETMEM	0003012E-R	SHOWMEMORY	CLI		
VRSETQA	0002D1B0-R	QAFLAGS	CLI		
VRSETWIDTH	000240D0-R	CONSOLE	CLI		
VRSHOWBASE	00024863-R	DEBUG	CLI		
VRSHOWBRK	000251CA-R	DEBUG	CLI		
VRSHOWDFLT	000248BA-R	DEBUG	CLI		
VRSHOWEF	000286C5-R	FLAGS	CLI	QAMAIN	
VRSHOWFLG	00028631-R	FLAGS	CLI	QAMAIN	
VRSHOWQA	0002D25D-R	QAFLAGS	CLI		
VRSHOWSECTIONS	000307FC-R	START	CLI		
VRSHOWSTATUS	00026EE0-R	DISPAT	CLI		
VRSHOWWIDTH	00024175-R	CONSOLE	CLI		
VRSHOW_CALLS	00021910-R	CALLFRAME	CLI		
VRSTART	0003018C-R	START	APT	CLI	LOAD
VRSUMMARY	00026E68-R	DISPAT	CLI		
VRSUPPORT	00030736-R	START	CLI		
WIDE_FLAG	0001D499-R	DIRECTORY	CLI		
WRITEVBLK	000243CD-R	CONSOLE	QIO		
XDELBPT	00000000		WK-CLI	WK-KERNEL	
XDELTBIT	00000000		WK-KERNEL		
XDS$INIT	00000000	MEMMGT			

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                                        ! Symbols By Value !
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Value                                Symbols...
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00000000        AP$_REQ_CONSRX                  CRD$K_CRD_INITIALIZATION        CRD$K_DS_FLAGS
                CRD$K_HOOK_POINT                CRD$K_READ                      DIR_V_CMM
                DS$K_BLSS_B                     KA$V_F_FLOAT                    PFN$AB_TYPE
                PFN$AW_BLINK                    PFN$AW_FLINK                    ULTRIX_V_MODE
                XDS$INIT
00000001        AP$GK_PROMPT                    AP$GK_REQ_CONSRX                AP$_REQ_RXCDVEC
                CRD$K_DS_CONTROL_C              CRD$K_LAST_HOOK_POINT           CRD$K_TYPECODE
                CRD$K_WRITE                     DIR_V_DRVCLR                    DS$K_BLSSU_B
                DYN$C_ADP                       KA$M_F_FLOAT                    KA$V_D_FLOAT
                SS$_CONTINUE                    SS$_NORMAL
00000002        AP$GK_PROMPT_WITH_STATUS        CRD$K_LAST_ACCESS_CODE          CRD$K_LAST_DS_VARIABLE
                CRD$K_LAST_FUNCTION             DS$K_BLEQ_B                     DYN$C_ACB
                KA$M_D_FLOAT                    KA$V_G_FLOAT                    PR$_SYS_TYP800
00000003        AP$GK_NO_PROMPT                 BPTCODE                         DS$K_BLEQU_B
                DYN$C_AQB                       KA$V_H_FLOAT                    PR$_SYS_TYP900
00000004        DS$K_BEQL_B                     DYN$C_CEB                       KA$M_G_FLOAT
                KA$V_CRC                        PRT$C_UW
00000005        DEV$V_SQD                       DS$K_BEQLU_B                    DYN$C_CRB
                KA$V_PACKED
00000006        DEV$V_SPL                       DS$K_BGEQ_B                     DYN$C_DDB
                IO$V_CANCTRLO                   KA$V_PACK_MUL
00000007        DS$K_BGEQU_B                    DYN$C_FCB                       KA$V_EDIT
00000008        DS$K_BGTR_B                     DYN$C_FRK                       KA$M_H_FLOAT
                KA$V_CHAR
00000009        DS$K_BGTRU_B                    DYN$C_IDB                       SS$_WASSET
0000000A        DS$K_BNEQ_B                     DYN$C_IRP                       PR$_SYS_TYP_LLL
0000000B        DS$K_BNEQU_B                    DYN$C_LOG
0000000C        DS$K_BLSS_M                     DYN$C_PCB                       SS$_ACCVIO
0000000D        DEV$V_NET                       DS$K_BLSSU_M                    DYN$C_PQB
0000000E        DEV$V_FOD                       DS$K_BLEQ_M                     DYN$C_RVT
0000000F        BPTMAX                          DEF$C_ULTRIX_LEN                DS$K_ASCIBUF
                DS$K_BLEQU_M                    DYN$C_TQE                       PRT$C_UR
00000010        DEV$V_SHR                       DS$K_BEQL_M                     DYN$C_UCB
                KA$M_CRC                        KA$V_TODR                       PR$_SID_TYPRTUV2
00000011        DEF$C_BKSTP_LEN                 DS$K_BEQLU_M                    DYN$C_VCB
00000012        DS$K_BGEQ_M                     DYN$C_WCB
00000013        DEV$V_MNT                       DS$K_BGEQU_M                    DYN$C_BUFIO
00000014        DEV$V_MBX                       DS$K_BGTR_M                     DS$K_NYSIZ
                DYN$C_TYPAHD                    HP$C_NAMELEN                    SS$_BADPARAM
00000015        DEV$V_DMT                       DS$K_BGTRU_M                    DYN$C_GSD
00000016        DS$K_BNEQ_M                     DYN$C_MVL
00000017        DEV$V_ALL                       DS$K_BNEQU_M                    DYN$C_NET
00000018        DEV$V_FOR                       DS$K_BVS_M                      DYN$C_KFI
                KA$V_WCS_LD
00000019        DS$K_BVC_M                      DYN$C_MTL                       KA$V_SB_ERR
0000001A        DS$K_BCS_M                      DYN$C_BRDCST                    HPE$C_EPB_SIZE
0000001B        DS$K_BCC_M                      DYN$C_CXB
0000001C        DS$K_BBS                        DYN$C_NDB
0000001D        DS$K_BBC                        DYN$C_SSB
```

```
Value                                   Symbols...
-----                                   ----------
0000001E        DS$K_BBSS                       DYN$C_DPT
0000001F        DS$K_BBCS                       DYN$C_JPB                       IO$_PHYSICAL
00000020        DS$K_BBSC                       DYN$C_PBH                       KA$M_PACKED
00000021        DS$K_BBCC                       DYN$C_PDB                       IO$_READLBLK
00000022        DS$K_BBSSI                      DYN$C_PIB
00000023        DS$K_BBCCI                      DYN$C_PFL                       IO$_SETMODE
00000024        DS$K_BLBS                       DYN$C_SFT                       FIL$C_DIR_SIZE
                SS$_NOPRIV
00000025        DS$GK_SUPPORT_TABLE_ROWS        DS$K_BLBC                       DYN$C_PTR
00000026        DS$K_BERROR                     DYN$C_KFH
00000027        DS$K_BNERROR                    DYN$C_RVX                       IO$_SENSEMODE
00000028        DYN$C_EXTGSD
00000029        DYN$C_SHMGSD
0000002A        DYN$C_SHB
0000002B        DYN$C_MBX
0000002C        DYN$C_IRPE
0000002D        DYN$C_SLAVCEB
0000002E        DYN$C_SHMCEB
0000002F        DYN$C_JIB                       IO$_LOGICAL
00000030        DYN$C_TWP                       IO$_WRITEVBLK
00000031        DYN$C_RBM                       IO$_READVBLK
00000032        DX20$B_DRIVE                    DYN$C_VCA                       HP$B_DHB32_NODE_ID
                HP$B_DMB32_NODE_ID              HP$B_DX20_DRIVE                 HP$K_TU70_LEN
                HP$K_TU72_LEN                   KA$L_FLAGS                      NI$B_LOOPBACK
                RRD50$L_CSR                     SLU$B_EXT                       TU70$K_LEN
                TU72$K_LEN
00000033        DX20$K_LEN                      HP$K_DHB32_LEN                  HP$K_DMB32_LEN
                HP$K_DX20_LEN                   NI$K_LEN                        SLU$B_ACTIV
00000034        SLU$B_SPEED
00000035        SLU$K_LEN
00000036        KA$W_WCS                        RRD50$B_BR
00000037        IO$_READPROMPT                  RRD50$K_LEN
00000038        KA$W_RESERVED                   PR$_MAPEN
0000003A        KA$L_SID
0000003D        KA$B_SID_TYPE
0000003E        KA$W_LATENCY
0000003F        IO$M_FCODE
00000040        DS$K_CCB                        IO$M_CANCTRLO                   IO$M_NOW
                KA$M_PACK_MUL                   KA$W_PROGRESS                   SGN$C_IRPCNT
00000042        KA$B_ACC_TYPE
00000043        KA$B_RESERVED
00000044        KA$W_MEM_SIZE
00000046        KA$B_NODE_ID
00000047        KA$L_MEM_SIZE
0000004B        HP$L_KAA_SLOT
0000004F        HP$B_CPU_ID
00000050        KA$K_LEN
00000054        SS$_CTRLERR
0000005C        SS$_DATACHECK
00000064        SEC_TICK
00000080        DS$K_STRBUF                     DYN$C_SHRBUFIO                  DYN$C_SPECIAL
                KA$M_EDIT
```

```
Value                                   Symbols...
-----                                   ----------
00000084        SS$_DEVOFFLINE
000000AC        SS$_FILNOTACC
000000B4        UBINTSZ
000000C0        DS$GK_USOVR
000000DC        SS$_ILLBLKNUM
000000F4        SS$_ILLIOFUNC
000000FC        SS$_ILLPAGCNT
00000100        IO$M_CTRLCAST                   KA$M_CHAR
00000124        SS$_INSFMEM
0000013C        SS$_IVCHAN
000001EC        SS$_PAGOWNVIO
00000200        DS$A_PRGBGN                     DS$K_BUFSIZ
00000218        FIL$C_SIZE
00000400        SCRIPT$MINCORE
00000414        SS$_BREAK
00000454        SS$_ROPRAND
00000464        SS$_TBIT
00000600        DS$K_SSSIZE
00000651        SS$_CONTROLC
00000830        SS$_CANCEL
00000870        SS$_ENDOFFILE
00000908        SS$_NOSUCHDEV
00000910        SS$_NOSUCHFILE
00000918        SS$_RESIGNAL
00001000        IO$M_TRMNOECHO
00002000        ULTRIX$B
0000263C        SGN$C_NPAGEDYN
00003000        DSA$M_DFLTFLGS
000040D6        ULTRIX$IOB
00005E3C        QIO$MINCORE
0000F800        DS$K_PRGSIZ
00010000        KA$M_TODR
00010010      R-DS$ENDPASS
00010018      R-DS$GPHARD
00010020      R-DS$ABORT
00010028      R-DS$DOSUMMARY                    R-DS$SUMMARY
00010030      R-DS$BGNSUB
00010038      R-DS$ENDSUB
00010040      R-DS$CKLOOP
00010048      R-DS$INLOOP
00010050      R-DS$ESCAPE
00010058      R-DS$BREAK
00010060      R-DS$WAITMS
00010068      R-DS$WAITUS
00010070      R-DS$ABORTWAIT                    R-DS$CANWAIT
00010078      R-DS$CNTRLC
00010080      R-DS$ASKDATA                      R-DS$GETDATA
00010088      R-DS$ASKVLD                       R-DS$GETVIELD
00010090      R-DS$ASKADR                       R-DS$GETADDRESS
00010098      R-DS$ASKLGCL                      R-DS$GETLOGICAL
000100A0      R-DS$ASKSTR                       R-DS$GETSTRING
000100A8      R-DS$BRANCH
```

```
Value                                   Symbols...
-----                                   ----------
000100B0      R-DS$CVTREG
000100B8      R-DS$PARSE
000100C0      R-DS$ERRSYS
000100C8      R-DS$ERRDEV
000100D0      R-DS$ERRHARD
000100D8      R-DS$ERRSOFT
000100E0      R-DS$PRINTB
000100E8      R-DS$PRINTX
000100F0      R-DS$PRINTF
000100F8      R-DS$PRINTS
00010100      R-DS$PRINTSIG
00010108      R-DS$ERRPREP
00010110      R-DS$SETPRIEXV
00010118      R-DS$MAPDBGBLOCK
00010120      R-DS$GETBUF
00010128      R-DS$RELBUF
00010150      R-DS$MMON
00010158      R-DS$MMOFF
00010160      R-DS$SETVEC
00010168      R-DS$CLRVEC
00010170      R-DS$INITSCB
00010178      R-DS$SETIPL
00010180      R-DS$CHANNEL
00010188      R-DS$SETMAP
00010190      R-DS$SHOCHAN                      R-DS$SHOWCHAN
00010198      R-DS$LOAD
000101A0      R-DS$PROBE
000101A8      R-DS$ATTACH
000101B0      R-DS$HELP
000101B8      R-DS$FREEDBGSYM
000101C0      R-DS$LOADPCS
000101C8      R-DS$GETTERM
000101D0      R-DS$SERVICE_DISPATCHER
000101D8      R-DS$MEMSIZE
00010200      R-DS$AQ_SYSSRV                    R-SYS$QIOW
00010210      R-SYS$CALL_HANDL
00010238      R-SYS$ALLOC
00010248      R-SYS$ASCTIM
00010250      R-SYS$ASSIGN
00010258      R-SYS$BINTIM
00010260      R-SYS$CANCEL
00010268      R-SYS$CANTIM
00010298      R-SYS$CLREF
000102A0      R-SYS$CNTREG
000102D8      R-SYS$DALLOC
000102E0      R-SYS$DASSGN
00010340      R-SYS$EXIT
00010348      R-SYS$EXPREG
00010350      R-SYS$FAO
00010358      R-SYS$FAOL
00010378      R-SYS$GETTIM
00010380      R-SYS$GTCHAN
```

```
Value                                   Symbols...
-----                                   ----------
00010388     R-SYS$HIBER
000103A0     R-SYS$LKWSET
000103B8     R-SYS$NUMTIM
000103C8     R-SYS$QIO
000103D0     R-SYS$READEF
000103F8     R-SYS$SETAST
00010400     R-SYS$SETEF
00010420     R-SYS$SETIMR
00010428     R-SYS$SETPRI
00010430     R-SYS$SETPRT
00010438     R-SYS$SETRWM
00010458     R-SYS$TRNLOG
00010460     R-SYS$ULKPAG
00010468     R-SYS$ULWSET
00010470     R-SYS$UNWIND
00010478     R-SYS$WAITFR
00010480     R-SYS$WAKE
00010488     R-SYS$WFLAND
00010490     R-SYS$WFLOR
000104C8     R-SYS$GETCHN
00010580     R-SYS$GET
00010590     R-SYS$READ
000105B8     R-SYS$CLOSE
000105C0     R-SYS$CONNECT
000105D0     R-SYS$DISCONNECT
00010608     R-SYS$OPEN
000107FF     R-DS$AQ_SSEND
00010800     R-SYS$GL_OPRMBX
00010804     R-MMG$GL_SPTBASE
00010808     R-MMG$GL_P0BASE
0001080C     R-SCH$GL_PCBVEC
00010810     R-EXE$GL_ABSTIM
00010818     R-IOC$GL_PSFL
0001081C     R-IOC$GL_PSBL
00010930     R-IOC$RTN
00010B00     R-EXE$GQ_SYSTIME
00010BAE     R-DS$GT_LEGAL
0001152E     R-T_EMESSG1
00011667     R-GT_MENU_ERROR
00011711     R-COMMAND_TREE
0001248F     R-HSC50_BOOT
00012771     R-FMTBPT
00012845     R-PRNT_AP_NAME
0001292F     R-APSLMNE
00012970     R-MODELST
000130E0     R-DS$SRVDISP_TABLE
00013C1B     R-AAT_ARITH
0001443C     R-DS$GA_PTDESC
00017767     R-FIL$GT_DDDEV
00017768     R-FIL$GT_DDSTRING
00017E44     R-DS$GA_PATCH_BIT
00018244     R-DS$GA_PATCH_UWD
```

```
Value                                   Symbols...
-----                                   ----------
000186A0        TICK_NS
0001AAA5      R-QA$T_OPERATOR_REQUEST_MESSAGE
0001AC2B      R-QA$T_HEADER_1
0001AC51      R-QA$T_HEADER_2
0001AC78      R-QA$T_HEADER_3
0001B36C      R-EXE$GL_PWRDONE
0001B3A0      R-CTL$GW_NMIOCH
0001B3A2      R-CTL$GW_CHINDX
0001B3AC      R-UBINT_DISP
0001B46C      R-DEF$Q_BACKSTOP
0001B47D      R-DEF$Q_ULTRIX
0001B65C      R-DS$GA_SUPPORT_TABLE
0001BF60      R-MS$CMD
0001BF80      R-DS$GQ_DAYTIM
0001BF9F      R-DS$GT_START
0001BFD6      R-DS$GT_VDS_VERSION
0001BFE1      R-DS$GT_PROMPT
0001C000      R-MP$GL_CONDITION_FLAGS
0001C004      R-DS$GT_COPYRIGHT
0001C032      R-DS$GT_COPYEAR
0001C051      R-DS$GT_LEGAL_END
0001C070      R-DS$FAB_INPUT
0001C0C0      R-DS$RAB_INPUT
0001C104      R-DS$FAB_OUTPUT
0001C154      R-DS$RAB_OUTPUT
0001C198      R-DS$GA_DS_CTRL_C_FIRST
0001C19C      R-DS$GA_DS_CTRL_C_SECOND
0001C1A0      R-DS$L_USERCNTRLC
0001C20C      R-IMAGE_HEADER
0001C40C      R-IMAGE_HEADER_END                R-MP$GR_BOOTED_PROCESSORS
0001C410      R-DS$GB_SYSTYPE
0001C431      R-CTL$GL_CCB
0001C831      R-CTL$GL_CCBBASE
0001C835      R-DS$GL_PCBVEC                    R-SCH$GL_CURPCB
0001C839      R-SWI$GL_FQFL
0001C83D      R-SWI$GL_FQBL
0001C869      R-BOOT$L_ADP
0001C86D      R-BOOT$L_CSR
0001C871      R-BOOT$L_UNIT
0001C875      R-BOOT$L_R1
0001C879      R-BOOT$L_R2
0001C87D      R-BOOT$L_R5
0001C881      R-BOOT$L_DEVTYP
0001C885      R-BOOT$L_SCORPIO_R3
0001C889      R-RX50_DISK_SELECT
0001C88D      R-BOOT$A_CCA
0001C891      R-DS$GL_EFC0                      R-DS$GQ_EFL
0001C895      R-DS$GL_EFC1
0001C899      R-DS$GA_LASTADR
0001C89D      R-DS$GL_FLAGS
0001C8A1      R-DS$GW_TTIN
0001C8A3      R-DS$GW_TTOUT
```

```
Value                                   Symbols...
-----                                   ----------
0001C8A5     R-DS$GL_ERRCNT
0001C8A9     R-DS$GL_HARDERR_COUNT
0001C8AD     R-DS$GL_PREPERR_COUNT
0001C8B1     R-DS$GL_SOFTERR_COUNT
0001C8B5     R-DS$GL_DEVERR_COUNT
0001C8B9     R-DS$GL_SYSERR_COUNT
0001C8BD     R-DS$GL_ERRSUP_COUNT
0001C8C1     R-DS$GL_NUMTEST
0001C8C5     R-DS$GL_FSTTEST
0001C8C9     R-DS$GL_LSTTEST
0001C8CD     R-DS$GL_SUBTEST
0001C8D1     R-DS$GA_CHKLPPC
0001C8D5     R-DS$GA_LOOPADR
0001C8D9     R-DS$GL_RUNTIM
0001C8DD     R-DS$GL_TIMESEC
0001C8E1     R-DS$GL_WAITIM
0001C8E5     R-DS$GL_RADIX
0001C8E9     R-DS$GL_SIZE
0001C8ED     R-DS$GL_BUFLEN                     R-DS$GQ_BUFQWD
0001C8F1     R-DS$GA_BUFPTR
0001C8F5     R-DS$GB_BYTEBUF
0001C8F6     R-DS$GB_TYPECODE
0001C8F7     R-DS$GB_INHIBIT_NAMING
0001C8F8     R-DS$GT_ASCIBUF
0001C907     R-DS$GT_BUFFER
0001CB07     R-DS$GT_STRBUF
0001CB87     R-DS$GL_TERMCHAR
0001CBE8     R-AP$GW_DATA
0001CBEA     R-AP$GW_AP_NODES
0001CBEC     R-AP$GR_SHARED_DATA
0001CBF4     R-Q_ADAPTER
0001CC00     R-DS$GQ_PHYADR
0001CC08     R-DS$GL_BUFCNT
0001CC20     R-CDB$BLOCK
0001CC70     R-CVT$T_MBASR
0001CC74     R-CVT$T_MBAMAP
0001CC78     R-CVT$T_UBADPR
0001CC7C     R-CVT$T_UBAMAP
0001CD14     R-DS$GL_CLIBASE
0001D18C     R-MP$GB_SETCPU
0001D18D     R-MP$GL_LUN
0001D191     R-MP$GT_DEVICE_NAME
0001D1A4     R-DS$GQ_CURYEAR
0001D1AC     R-DS$GT_NEWYEAR
0001D20E     R-DS$GB_WIDTH
0001D21C     R-DS$GL_CRD_FLAGS
0001D220     R-CRD$GL_CRD_COMMAND_DEBUG
0001D224     R-DS$AL_DS_DISPATCH_VECTORS
0001D228     R-DS$GA_CRD_DS_INTERFACE
0001D240     R-DS$GA_USER_ERROR_TEXT
0001D254     R-DS$GL_CRD_DEBUG
0001D28C     R-DEBUG$GB_FLAGS
```

```
Value                                   Symbols...
-----                                   ----------
0001D28D     R-DS$AB_BPTINST
0001D2A0     R-DS$AA_BPTADDR
0001D2E0     R-DS$AA_BPTBASE
0001D459     R-DBG_ADDR_RTN
0001D461     R-DEBUG_LO
0001D465     R-DEBUG_HI
0001D469     R-SYMTAB_HI
0001D46D     R-MP$GB_FUNCTION
0001D46E     R-MP$GL_IPR_STATUS
0001D472     R-MP$GL_IPR_VALUE
0001D476     R-MP$GL_REG_ADDRESS
0001D47A     R-MP$GL_REG_VALUE
0001D47E     R-MP$GL_RET_STATUS
0001D482     R-MP$GL_SAVED_R1
0001D499     R-WIDE_FLAG
0001D49A     R-END_SIZE
0001D84C     R-DIR_FLAGS
0001D8A0     R-DS$GQ_TESTID
0001D8F0     R-HELPINFO
0001D920     R-DS$GA_SELECTS
0001D934     R-DS$GA_ALLOCATES
0001D948     R-DS$GA_SELECTED
0001DB4C     R-DS$GA_ALLOCATED
0001DD50     R-DS$GA_PTABLE
0001DF54     R-ULTRIX_FLAGS
0001DF55     R-DIAG_FILE_NAME
0001DFB8     R-EXE$GL_SPLITADR
0001DFBC     R-DS$GL_LOOKASIDE
0001DFC0     R-IOC$GL_IRPFL
0001DFC8     R-PFN$AW_SWPVBN
0001DFCC     R-PFN$AL_PTE
0001DFD0     R-PFN$AL_BAK
0001DFD4     R-PFN$AW_REFCNT
0001DFD8     R-DS$GL_MEMSIZE                    R-PFN$AB_STATE
0001DFDC     R-DS$GL_ACTUAL_MEMSIZE
0001DFE0     R-DS$GL_SET_MEMSIZE
0001DFE4     R-DS$GB_MM_ENB
0001DFE5     R-PRNT_PRMT
0001E04C     R-ADDR_128
0001E24C     R-FIRMEXIST$T
0001E250     R-HARDEXIST$T
0001E254     R-PATCHEXIST$T
0001E274     R-LOGNUM
0001E281     R-LINE_COUNT
0001E285     R-DS$GL_PAGE
0001E557     R-DEBUG_THE_SUCKER                 R-DS$GB_VDS_DEBUG
0001E55C     R-QA$W_TESTLOOPS
0001E55E     R-QA$W_SUBTESTLOOPS
0001E560     R-QA$W_MULTIPLEPASS
0001E582     R-QA$W_BRANCH
0001E584     R-QA$W_ERROR_NUMBER
0001E586     R-QA$W_SAVE_TEST
```

```
Value                                   Symbols...
-----                                   ----------
0001E588      R-QA$W_SAVE_LAST
0001E58C      R-QA$L_SAVED_DSA_FLAGS
0001E590      R-QA$AOB_ROUTINE_STATE
0001E594      R-QA$AOB_CHECK_STATE
0001E598      R-QA$AOB_FLAGS
0001E5AC      R-RMS$FILE_TABLE
0001E5BC      R-DS$GB_STOPPING_THE_TIMER
0001E5BD      R-DS$GA_CHMKVEC
0001E5C1      R-DS$GA_BREAKVEC
0001E5C5      R-DS$GA_TBITVEC
0001E5C9      R-EXE$GL_SCB
0001E5CD      R-DS$GA_SOFTINT
0001E6E4      R-DS$GB_QIOACT
0001E6E8      R-SHOWMEMORYFLAGS
0001E6EC      R-DS$GL_IPR_VALUE
0001E6F0      R-BIN_TIME
0001E6F8      R-BEGIN_TIME
0001E700      R-POLL_TIME
0001E708      R-DUE_TIME
0001E780      R-ULTRIX_IOB_ADD
0001E784      R-ULTRIX_B_ADD
0001E800      R-DSX$_INTERLOCK_TEST
0001E806      R-DSX$BOOTATTACHED
0001E80C      R-DSX$STARTATTACHED
0001E812      R-DSX$HALTATTACHED
0001E818      R-DSX$SHOWIDLE
0001E81E      R-MP$_DEALL_MEMORY
0001E821      R-MP$_GET_PROCESSOR_ID
0001E82A      R-MP$_STOP_EVERYTHING
0001E82D      R-MP$_ATTACHED_CPU_CHECK
0001E830      R-MP$_PRIMARY_CPU_CHECK
0001E833      R-MP$_RESUME_ATTACHED_PROCESSORS
0001E836      R-DSX$_SET_INTERLOCK
0001E839      R-DSX$_CLEAR_INTERLOCK
0001E83C      R-BOOT
0001E915      R-APT
0001EAFE      R-INI$BRK
0001EB00      R-DS$SOFTIPL5
0001EB0B      R-DS$USERMODE
0001F0A9      R-BEGIN                           R-BEGIN_BLISS
0001F0C6      R-INIT_CONTEXT
0001F1B7      R-CMK$REFRESH
0001F225      R-RCTRLC
0001F2C4      R-KB_CHECK
0001F322      R-KB_CHECK_APT
0001F4D6      R-GET_TIME
0001F601      R-DSX$CNTRLC
0001F62C      R-DSV$EXIT
0001F72C      R-DSR$CHECK_MENUTEST_OFF_SET
0001F750      R-DSR$CHECK_AUTOTEST_OFF_SET
0001F76F      R-DSX$GETTERM
0001F780      R-ANSI$OPEN
```

```
Value                                   Symbols...
-----                                   ----------
0001FD28      R-ANSI$CLOSE
0001FD59      R-ANSI$CACHEVBN
0001FE5E      R-ANSI$READ
0001FF1F      R-ANSI$GET
000200EC      R-GET_BLOCK_LENGTH
0002011C      R-CMK$APBOOT
0002012A      R-DSX$PPSCB
00020134      R-APT_COM
000202F0      R-APT_MSG
000202F9      R-APT_DONE
00020308      R-EXE$SETAST
00020334      R-SCH$ASTDEL
00020361      R-SCH$NEWLVL
00020458      R-SCH$QAST
000204D8      R-DSV$ATTACH
000205D5      R-SET_ABORT
000205E2      R-DSX$ATTACH
00020A3F      R-PARSE_DEVICE
00020BEE      R-PT$INTERPRET
00020EC4      R-PT$EXTRACT
00021089      R-DSV$SHOWDEVICEB
00021090      R-DSV$SHOWDEVICE
000210EA      R-DSV$SHOWSELECTB
000210F1      R-DSV$SHOWSELECT
00021122      R-DSV$DEATTACH
000211EA      R-DSV$SELECT
000213CA      R-DSV$DESELECT
00021577      R-INI$PTABLE
00021624      R-LOC$ADAPTER
00021679      R-LOC$PTABLE
000216C8      R-LOC$PTDESC
00021722      R-INS$PTABLE
000217BC      R-FIL$RDWRTLBN
000217DC      R-BOO$IMAGE_ATT
00021810      R-DSX$GETSYSBUF
0002181B      R-DSX$GETBUF
00021883      R-DSX$RELSYSBUF
0002188B      R-DSX$RELBUF
00021910      R-VRSHOW_CALLS
000219CF      R-DSR$FIND_USER_PC
00021A00      R-DSX$CHANNEL
00021BAC      R-DSX$SETMAP
00021E28      R-DSP$SHOWMBA
00021E39      R-DSP$SHOWUBI
00021E4A      R-DSX$SHOWCHAN
000221A0      R-DSI$CHANNEL_VEC
00022210      R-EXE_CMODKRNL
000222CC      R-CMK$ASTEXIT
00022307      R-DS$CLI
00022444      R-CLI_ACTION
00022662      R-ACT_CONT
00022675      R-ACT_DEFAULT_DBG
```

```
Value                                   Symbols...
-----                                   ----------
000227DF      R-ACT_NO_ALLOC
000230E0      R-DSX$CANWAIT
000230FB      R-EXE$WAKE
00023109      R-DSX$WAITMS
00023194      R-DSX$WAITUS
000231AF      R-DSX$WAITUS_USOVR
00023215      R-EXE$HIBER
00023238      R-CMK$HIBER
0002324E      R-EXE$CANTIM
00023266      R-CMK$CANTIM
000232A1      R-DSR$SETIMR_INI
000232C0      R-EXE$INSTIMQ
000232F2      R-EXE$SETIMR
00023307      R-CMK$SETIMR
00023380      R-DSI$TIMSRV
00023404      R-DSI$TIMER
000234F7      R-CLK$RE_INIT
00023550      R-INI$LOAD_DEVICE
00023591      R-DSP$CONFIG_LOAD
000240D0      R-VRSETWIDTH
00024175      R-VRSHOWWIDTH
00024195      R-KB_POLL
00024202      R-CMK$RCONSOLE
000243BE      R-CMK$TCONSOLE
000243CD      R-WRITEVBLK
000243E9      R-PREADVBLK                       R-READVBLK
000245EC      R-SIZE_TERM
000246C4      R-DSR$LOAD_CRD
0002471A      R-DSR$UNLOAD_CRD
0002471D      R-DSR$RESTORE_CRD_VECTORS
00024784      R-FIL$CVTFILNAM
0002485A      R-VRSETBASE
00024863      R-VRSHOWBASE
00024877      R-VRSETDFLT
000248BA      R-VRSHOWDFLT
00024924      R-VREXAMINE
00024DBC      R-CLEAR_NEX_BIT
00024DE5      R-CHECK_NEX_BIT
00024E3A      R-CHECK_CSR1
00024EAB      R-SET_LOOP_BACK_BIT
00024EE8      R-CLEAR_LOOP_BACK_BIT
00024F10      R-VRDEPOSIT
000250AB      R-VRSETBRK
0002512A      R-VRCLRBRK
00025197      R-DSP$REMOVEBREAK
000251CA      R-VRSHOWBRK
0002524B      R-COND_DEBUG
00025623      R-FETCH_STORE
0002581A      R-CMK$SGIPR
00025830      R-FETCH_STOR_PREG
0002585F      R-DSV$DEBUG
000259D5      R-DSX$GPHARD
```

```
Value                                   Symbols...
-----                                   ----------
00025A07     R-DSP$GEN_PTABLES
00026647     R-DSX$DIRECTORY
0002697C     R-DSV$DIRECTORY
000269A8     R-DISPATCH
00026C60     R-DSX$ENDPASS
00026D7A     R-DS_CLEANUP
00026E56     R-DSX$DOSUMMARY
00026E68     R-VRSUMMARY
00026EE0     R-VRSHOWSTATUS
00026FB0     R-DSX$LOAD
000272C1     R-DSX$SERVICE_DISPATCHER
000272FA     R-DSX$ERRSOFT
00027321     R-DSX$ERRHARD
00027348     R-DSX$ERRPREP
0002736F     R-DSX$ERRDEV
0002739D     R-DSX$ERRSYS
00027705     R-DS_TESTID
00027771     R-DS_ERRSUP
0002789E     R-DSR$COMPLETION
0002794B     R-EXE$SETEF
00027965     R-EXE$CLREF
0002797F     R-SCH$POSTEF
00027992     R-EXE$READEF
000279B6     R-EXE$WAITFR
000279D3     R-EXE$WFLOR
000279F4     R-EXE$WFLAND
00027A20     R-COND_HANDLR
00027B68     R-DSX$PRINTSIG
00027B7A     R-DSX$PRINTSIGI
00027EC0     R-FIND_USERPC
00027F04     R-TST$MCHK
00027F1C     R-EXE_MCHK
00027F3C     R-EXE_KRNLSTK
00027F48     R-EXE_POWER
00027F54     R-EXE_OPCDEC
00027F5C     R-EXE_OPCCUS
00027F64     R-EXE$ROPRAND                  R-EXE_ROPRAND
00027F6C     R-EXE_RADRMOD
00027F74     R-EXE$ACVIOLAT                 R-EXE_ACCVIO
00027F7C     R-EXE_TRANSL                   R-MMG$PAGEFAULT
00027F88     R-EXE_COMPAT
00027F90     R-EXE_ARITH
00027F9C     R-EXE$BREAK                    R-EXE_BREAK
00028030     R-EXE$TBIT                     R-EXE_TBIT
00028056     R-EXE_UNEXPINT
00028060     R-EXE_CHMK
00028068     R-EXE_CHME
00028070     R-EXE_CHMS
00028078     R-EXE_CHMU
00028087     R-EXE$REFLECT
00028252     R-DSX$SETPRIEXV
00028290     R-EXE$FAO
```

```
Value                                   Symbols...
-----                                   ----------
00028298      R-EXE$FAOL
000285B4      R-VRSETFLG
000285D9      R-VRCLRFLG
000285EF      R-VRSETEF
00028610      R-VRCLREF
00028631      R-VRSHOWFLG
000286C5      R-VRSHOWEF
00028730      R-FIL$OPENFILE
00028836      R-FIL$CACHE_INIT
000288AA      R-FIL$CACHE_TRUNC
00028981      R-FIL$MOUNT
00028A15      R-FIL$FINDFILID
00028D1E      R-FIL$RDCHKFILHDR
00028DF6      R-FIL$WRITEVBN
00028DFD      R-FIL$READVBN
00028EB6      R-FIL$STATBLK
00028F80      R-DSX$HELP
000297E4      R-DSR$KEY_EQUAL
0002996C      R-IOC$IOPOST
00029AB4      R-IOC$QNXTSEG
00029AC0      R-IOC$QNXTSEG1
00029B1E      R-IOC$WAKACP
00029C6A      R-IOC$DIRPOST1
00029D2A      R-DSV$SETLOAD
00029E61      R-DSV$SHOWLOAD
00029E81      R-DSR$IFLOADDEV
00029EAB      R-DSV$RUN
00029EAC      R-DSV$LOAD
00029FCC      R-DSX$ESCAPE
00029FE1      R-DSX$BGNSUB
0002A07F      R-DSX$ENDSUB
0002A1F0      R-DSX$CKLOOP
0002A230      R-DSX$INLOOP
0002A258      R-CHR$MCHK
0002A424      R-DSR$FAULT_CLEAR
0002A43C      R-INT_CMD
0002A43D      R-SCBVECTOR_054
0002A450      R-INT_WBTO
0002A451      R-SCBVECTOR_060
0002A48D      R-SCBVECTOR_000
0002A491      R-SCBVECTOR_038
0002A495      R-SCBVECTOR_03C
0002A499      R-SCBVECTOR_050
0002A49D      R-SCBVECTOR_058
0002A4A1      R-SCBVECTOR_05C
0002A4A5      R-SCBVECTOR_064
0002A4A9      R-SCBVECTOR_068
0002A4AD      R-SCBVECTOR_06C
0002A4B1      R-SCBVECTOR_070
0002A4B5      R-SCBVECTOR_074
0002A4B9      R-SCBVECTOR_078
0002A4BD      R-SCBVECTOR_07C
```

Value	Symbols...		
0002A4C1	R-SCBVECTOR_080		
0002A4C5	R-SCBVECTOR_0C4		
0002A4C9	R-SCBVECTOR_0C8		
0002A4CD	R-SCBVECTOR_0CC		
0002A4D1	R-SCBVECTOR_0D0		
0002A4D5	R-SCBVECTOR_0D4		
0002A4D9	R-SCBVECTOR_0D8		
0002A4DD	R-SCBVECTOR_0DC		
0002A4E1	R-SCBVECTOR_0E0		
0002A4E5	R-SCBVECTOR_0E4		
0002A4E9	R-SCBVECTOR_0E8		
0002A4ED	R-SCBVECTOR_0EC		
0002A4F1	R-SCBVECTOR_0F0		
0002A4F5	R-SCBVECTOR_0F4		
0002A4F9	R-SCBVECTOR_0F8		
0002A4FD	R-SCBVECTOR_0FC		
0002A50A	R-EXE$ALLOCBUF		
0002A50E	R-EXE$ALLOCCEB		
0002A512	R-EXE$ALLOCJIB		
0002A51B	R-EXE$ALLOCIRP		
0002A51F	R-EXE$ALLOCPCB		
0002A527	R-EXE$ALLOCPQB		
0002A530	R-EXE$ALLOCTQE		
0002A56A	R-EXE$ALONONPAGED		
0002A5E8	R-EXE$ALLOCATE		
0002A610	R-EXE$DEANONPAGED		
0002A699	R-EXE$DEALLOCATE		
0002A6EF	R-MEMPOOL$INIT		
0002A7EA	R-DSX$MEMSIZE		
0002A80C	R-MAPMEM		
0002AAA3	R-MAPMEM$IOSPACE		
0002ABDB	R-MAPFREE		
0002AC9B	R-CRD$EXPREG		
0002ACB8	R-EXE$EXPREG		
0002ADD3	R-EXE$CNTREG		
0002AF09	R-DSX$MMON		
0002AF23	R-DSX$MMOFF		
0002AF49	R-DSR$MMENABLE		
0002AF5C	R-CMK$MMENABLE		
0002AF86	R-EXE$SETPRT		
0002AF9B	R-CMK$SETPRT		
0002B071	R-RPTEADR		
0002B0BB	R-MMG$IOLOCK		
0002B0C5	R-MMG$UNLOCK		
0002B0C9	R-DSX$MAPDBGBLOCK		
0002B117	R-DSX$FREEDBGSYM		
0002B141	R-MAP_DEBUGGER		
0002B15A	R-UNMAP_DEBUGGER		
0002B1F4	R-INI$RDONLY	R-INI$WRITABLE	
0002B2F7	R-ODS$OPEN		
0002B3E8	R-ODS$GET		
0002B511	R-ODS$READ		

```
Value                                   Symbols...
-----                                   ----------
0002B5C4      R-DSX$GETDATA
0002B649      R-DSX$GETVIELD
0002B6BA      R-DSX$GETADDRESS
0002B713      R-DSX$GETLOGICAL
0002B833      R-DSX$GETSTRING
0002BB38      R-DSX$SUPERPARSE
0002BB3F      R-DSX$PARSE
0002BD42      R-SCAN$SYMBOL
0002BD44      R-DS$GT_VSYMBOL
0002BD54      R-SCAN$ALPHA
0002BD56      R-DS$GT_VALPHA
0002BD66      R-SCAN$ALPHANUM
0002BD68      R-DS$GT_VALPHANUM
0002BD78      R-SCAN$FILE
0002BD7A      R-DS$GT_VFILE
0002BD8A      R-SCAN$SPACE                      R-SCAN$SPACES
0002BD8C      R-DS$GT_VSPACE
0002BD9E      R-SCAN$SPANC
0002BDB9      R-SCAN$COMPARE
0002BDDB      R-DS$GT_VHEX
0002BDFC      R-SCAN$DECIMAL
0002BE01      R-SCAN$OCTAL
0002BE06      R-SCAN$BINARY
0002BE0B      R-SCAN$HEX
0002BE0E      R-SCAN$NUMERIC
0002BEAA      R-SCAN$SEARCHLIST
0002BEF9      R-SCAN$DEVICE
0002BF59      R-BREAKUP_FILE
0002C088      R-DSX$LOADPCS
0002C144      R-DSV$INITPCS
0002C197      R-DSV$SETPAGE
0002C1BE      R-DSV$SHOWPAGE
0002C1DE      R-DSX$TYPE_OUT
0002C46A      R-DSX$PRINT
0002C4B8      R-DSX$PRINTS
0002C4C5      R-DSX$PRINTX
0002C4D2      R-DSX$PRINTB
0002C4EA      R-DSX$PRINTF
0002C4FF      R-DSX$PRINTI
0002C639      R-DSX$PRINTREV
0002CB1F      R-DSX$DEALLOCATE
0002CB52      R-DSX$CVTREG
0002CD10      R-QA$NORMAL_START
0002CDDB      R-QA$MULTIPLE_PASS
0002CEAA      R-QA$LOOP_ON_TEST
0002CFAC      R-QA$LOOP_ON_SUBTEST
0002D0D5      R-QA$RUN_BACKWARDS
0002D1B0      R-VRSETQA
0002D25D      R-VRSHOWQA
0002D2E8      R-DSX$BRANCH
0002D466      R-QA$ADD_FORCED_ERROR
0002D469      R-QA$ADD_QA_ERROR
```

```
Value                                   Symbols...
-----                                   ----------
0002D607      R-QA$FIND_USER_CALL_FRAME
0002D687      R-QA$MAIN
0002D868      R-QA$PRINT_FORCED_ERRORS
0002D924      R-EXE$QIO
0002DA62      R-QIO$INITIALIZE
0002DAB6      R-QIO$CLEANUP
0002DB7D      R-QIO$ADDUNIT
0002E02B      R-EXE$MAXACMODE
0002E03A      R-BUG$CHECK
0002E377      R-IOGEN$CNTRL_INI
0002E408      R-QIO$DEALLOCATE
0002E44D      R-EXE$PWRTIMCHK
0002E4C4      R-DSR$ALLOCATE_PSEUDO_RPB
0002E53F      R-DSR$DEALLOCATE_PSEUDO_RPB
0002E552      R-DSX$CHECK_SUPPORT
0002E7AE      R-RMS$ERROR
0002E840      R-RMS$LOAD_XAB
0002E88F      R-RMS$ALLOC_CACHE
0002E8DF      R-RMS$INIT
0002E8EE      R-RMS$CLEANUP
0002E972      R-RMS$OPEN
0002ED0D      R-RMS$CONNECT
0002ED8F      R-RMS$GET
0002EE51      R-RMS$READ
0002EF0F      R-RMS$DISCONNECT
0002EF69      R-RMS$CLOSE
0002F0B1      R-RT11$OPEN
0002F1A7      R-RT11$GET
0002F2B7      R-RT11$READ
0002F320      R-DSX$INITSCB
0002F346      R-CMK$INITSCB
0002F3E7      R-DSX$SETVEC
0002F4C6      R-DSX$CLRVEC
0002F56A      R-DSX$SETIPL
0002F586      R-CMK$SETIPL
0002F624      R-SCRIPT$INIT
0002F62E      R-SCRIPT$OPEN
0002F77B      R-SCRIPT$FLUSH
0002F7BD      R-SCRIPT$STOP
0002F7C6      R-SCRIPT$CONT
0002F7FE      R-DS_SUPERLINE
0002F805      R-DS_GETLINE
0002FC34      R-DSR$CHECKLOAD
0002FC53      R-DSV$SHOWMEMORY
0003012E      R-VRSETMEM
0003018C      R-VRSTART
0003022F      R-VRRESTART
0003060B      R-DSX$ABORT
00030631      R-VRABORT
00030635      R-DSI$ABORT
00030736      R-VRSUPPORT
00030790      R-DSV$SHOWTESTS
```

```
Value                                   Symbols...
-----                                   ----------
000307FC     R-VRSHOWSECTIONS
00030936     R-ULTRIX$OPEN
000310B1     R-ULTRIX$GET
000313BE     R-ULTRIX$READ
00031435     R-DS$ENTRY
0003143D     R-MT$CHECK_ACCESS
0003143F     R-ERL$DEVICERR                  R-ERL$DEVICTMO                  R-ERL$RELEASEMB
             R-EXE$SNDEVMSG
00031440     R-EXE$BUFFRQUOTA                R-EXE$BUFQUOPRC                 R-SCH$WAKE
00031444     R-SCH$LOCKW
0003144B     R-SCH$UNLOCK
00031465     R-LIB$CVT_DTB
0003146C     R-LIB$CVT_OTB
00031473     R-LIB$CVT_HTB
000314D8     R-LIB$STOP
000314DE     R-LIB$SIGNAL
00031600     R-SCB_IMAGE
00031700     R-BOO$AL_VECTOR
00031724     R-BOO$GL_UMR_DIS
00031728     R-BOO$GL_UCODE
00031734     R-BOO$GL_UMR_TMPL
00031738     R-BOO$GB_UMR_DP
00031739     R-EXE$GB_CPUTYPE
0003173A     R-EXE$GB_CPUDATA
0003173E     R-EXE$GL_TENUSEC
00031742     R-EXE$GL_UBDELAY
00031748     R-EXE$GL_UMR_PHY
0003174C     R-EXE$GL_UMR_VIR
00031750     R-BOO$QIO
000318A8     R-BOO$MAP
0003198D     R-BOO$DRIVER
00032057     R-MAPEN
0003205B     R-DS$GB_CI_INIT
0003214A     R-PA_INIT
00033C00     R-UD_INIT
00033CE4     R-DS$GB_UDA50_INIT
00033E50     R-UDA_RESPONSE
00033EF0     R-TM78_DRIVER
000341BD     R-TM03_DRIVER
000342FF     R-TS11_DRIVER
00034600     R-TU_INIT
00034AD7     R-BOO$RESELECT                  R-BOO$SELECT
00034B48     R-ACP$ACCESS                    R-ACP$ACCESSNET
00034B53     R-ACP$DEACCESS
00034B5E     R-ACP$MODIFY
00034B69     R-ACP$MOUNT
00034B74     R-ACP$READBLK
00034B91     R-ACP$WRITEBLK
00034C48     R-EXE$ASSIGN
00034D78     R-IOC$GETBYTE
00034D89     R-IOC$PUTBYTE
00034D9A     R-IOC$INITBUFWIND
```

```
Value                                   Symbols...
-----                                   ----------
00034DA1      R-IOC$MOVFRUSER
00034DA5      R-IOC$MOVFRUSER2
00034DB2      R-IOC$MOVFRUSER1
00034DB9      R-IOC$MOVTOUSER
00034DBD      R-IOC$MOVTOUSER2
00034DCA      R-IOC$MOVTOUSER1
00034DD1      R-IOC$FILSPT
00034DE3      R-EXE$CANCEL
00034EE8      R-COM$DELATTNAST
00034F1B      R-COM$FLUSHATTNS
00034F4B      R-COM$POST
00034F5B      R-COM$DRVDEALMEM
00034F80      R-COM$SETATTNAST
00034FE0      R-DATETABLE
00035045      R-EXE$ASCTIM
000350E6      R-EXE$BINTIM
000352DC      R-EXE$NUMTIM
00035412      R-EXE$DASSGN
000354D2      R-EXE$ALLOC
0003556E      R-EXE$DALLOC
0003562C      R-DR$INT
00035643      R-DR$INITIAL
0003564C      R-EXE$IOFORK
00035651      R-EXE$FORK
00035670      R-EXE$FORKDSPTH
000356B4      R-EXE$GETTIM
000356D0      R-EXE$GTCHAN
00035758      R-IOC$AL_SYSUCB
00035760      R-IOC$GL_DEVLIST
00035764      R-IOC$GL_ADPLIST
00035768      R-IOC$GL_DPTLIST
00035770      R-IOC$CANCELIO
00035787      R-IOC$DIAGBUFILL
000357B8      R-IOC$RELSCHAN
000357C2      R-IOC$RELCHAN
00035805      R-IOC$REQSCHANH
0003580F      R-IOC$REQSCHANL
00035819      R-IOC$REQPCHANH
00035822      R-IOC$REQPCHANL
0003584D      R-IOC$REQCOM
00035890      R-IOC$INITIATE
000358C3      R-IOC$RELDATAP
00035913      R-IOC$REQDATAPNW
00035917      R-IOC$REQDATAP
00035950      R-IOC$RELMAPREG
0003598A      R-IOC$REQMAPREG
0003599C      R-IOC$ALTUBAMAP
000359BA      R-IOC$ALOUBAMAPN
000359BE      R-IOC$ALOUBAMAP
00035A20      R-IOC$RETURN
00035A21      R-IOC$WFIKPCH
00035A43      R-IOC$WFIRLCH
```

```
Value                                   Symbols...
-----                                   ----------
00035A67      R-IOC$ALLOSPT
00035A7D      R-IOC$CVT_DEVNAM
00035AB1      R-IOC$FFCHAN
00035AD8      R-IOC$SEARCHDEV
00035ADD      R-IOC$SEARCHGEN
00035BCF      R-IOC$UNLOCK
00035BD3      R-IOC$VERIFYCHAN
00035C08      R-IOC$APPLYECC
00035C7C      R-IOC$CVTLOGPHY
00035CA3      R-IOC$MAPVBLK
00035D36      R-IOC$UPDATRANSP
00035D72      R-IOC$SENSEDISK
00035D80      R-IOC$LOADMBAMAP
00035DCA      R-IOC$LOADUBAMAPA
00035DE1      R-IOC$LOADUBAMAP
00035E5D      R-IOC$PTETOPFN
00035E80      R-MBA$INT
00035F2B      R-MBA$INITIAL
00035F34      R-ONLY$GL_TENUSEC
00035F38      R-ONLY$GL_UBDELAY
00035F3C      R-DS$GB_PRIMARY_CPU_IDENTIFIER
00035F41      R-IO$GQ_PHYSICAL
00035F69      R-SYS$SYSROOT
00035F7C      R-SYS$DISK
00035F8C      R-DEF$Q_DEV
00035FB2      R-DEF$Q_DIR
00036034      R-DSP$CONFIG_ADP
000362F4      R-MAP$IOSPACE
00036389      R-FETCH_LONG
000363BD      R-IOC$PURGDATAP
0003640F      R-UBADP_CPU
00036428      R-UBA$INITIAL
0003642C      R-UBA$UNEXINT
0003642D      R-IO$TESTCSR_L
0003644C      R-IO$TESTCSR_W
0003646B      R-IOGEN$CONN_VEC
00036476      R-QIOCLEAN_CPU
000364C4      R-ONLY_SCB
000364C5      R-HDW_CLOCK_SET
000364C6      R-ONLY_ATTACH
000364C7      R-DSR$ONLY_CONSOLE_CONFIG
0003653E      R-ONLY_CPU
00036540      R-DSX$PROBE
000365B8      R-ACC$HANDLER
00036600      R-EXE$ONEPARM
00036606      R-EXE$ZEROPARM
0003660C      R-EXE$MODIFY
00036612      R-EXE$READ
0003661B      R-EXE$WRITE
0003663E      R-EXE$READLOCK
00036641      R-EXE$WRITELOCK
00036644      R-EXE$MODIFYLOCK
```

```
Value                                   Symbols...
-----                                   ----------
00036647     R-EXE$MODIFYLOCKR
00036651     R-EXE$READLOCKR
00036658     R-EXE$WRITELOCKR
000366CE     R-EXE$READCHK
000366D4     R-EXE$WRITECHK
000366E2     R-EXE$READCHKR
0003670C     R-EXE$WRITECHKR
00036741     R-EXE$SETCHAR
0003675F     R-EXE$SETMODE
0003676F     R-EXE$SENSEMODE
00036797     R-EXE$CARRIAGE
000367E7     R-VMS$QIO
0003697A     R-EXE$ABORTIO
00036987     R-EXE$FINISHIOC
00036989     R-EXE$FINISHIO
000369A1     R-EXE$QIODRVPKT
000369A5     R-EXE$ALTQUEPKT
000369C7     R-EXE$QIOACPPKT
000369D9     R-EXE$QIORETURN
000369E2     R-EXE$INSIOQ
000369FD     R-EXE$INSERTIRP
00036A18     R-IOC$INITDRV
00036A1E     R-IOC$REINITDRV
00036ACC     R-EXE$UNWIND
00036C00     R-AX_BUFF                          R-PHD_BASE
00036C78     R-PCB_BASE
00036E00     R-DS$AX_JIB
00036E74     R-DS$AX_ARB
00036EEC     R-DS$AX_SOFTPCB
00037000     R-SCB_BASE
00037600     R-SCB_UNKINT
00037C00     R-STACK_BASE
00039200     R-KSTKPTR
00039A00     R-ISTKPTR
0003A000     R-ESTKPTR
0003A600     R-SSTKPTR
0003AC00     R-P0PT_BASE                        R-USTKPTR
00080000       DEV$M_MNT
00200000       DEV$M_DMT
00660000       IOC$K_DIAGPID
01000000       DEV$M_FOR                          KA$M_WCS_LD
02000000       DEV$M_SWL                          DS$GK_SID                    KA$M_SB_ERR
10000000       TODR_BIAS
40000000       DEV$M_RCK                          IOC$K_IOSPACE
7FFEDE78       SYS$CRMPSC
7FFEDEB0       SYS$CRELOG
7FFEDEF0       SYS$DCLEXH
7FFEE0D8       SYS$GETJPI
7FFEE118       SYS$SRCHANDLER
7FFEE188       SYS$PUT
7FFEE1C8       SYS$CREATE
7FFEE218       SYS$SPACE
```

```
Value                                   Symbols...
-----                                   ----------
7FFEE230        SYS$PARSE
7FFEE248        SYS$SEARCH
7FFEE250        SYS$SETDDIR
7FFEE3F8        SYS$GETSYI
7FFEE410        SYS$GETDVI
7FFEE420        SYS$GETJPIW
80000000        DEV$M_WCK
800000C8        SYS$CRETVA
80000110        SYS$DELTVA
80000208        SYS$SETEXV


          Key for special characters above:
                +-------------------+
                ! *  - Undefined    !
                ! U  - Universal    !
                ! R  - Relocatable  !
                ! X  - External     !
                ! V  - Vectored     !
                +-------------------+
```

Image Synopsis

```
Virtual memory allocated:                  00010000 00036FFF 00027000 (159744. bytes, 312. pages)
Stack size:                                      20. pages
Image header virtual block limits:                1.        1. (    1. block)
Image binary virtual block limits:                2.      313. (  312. blocks)
Image name and identification:             ECSAA 10.11
Number of files:                                 97.
Number of modules:                               99.
Number of program sections:                      20.
Number of global symbols:                      1262.
Number of cross references:                    2896.
Number of image sections:                         6.
User transfer address:                     00031435
Image type:                                EXECUTABLE.
Map format:                                FULL WITH CROSS REFERENCE in file DISK$DS:[DS.LOCAL.RELEASE.WORK]ECSAA.MAP;1017
Estimated map length:                      371. blocks
```

Link Run Statistics

Performance Indicators	Page Faults	CPU Time	Elapsed Time
Command processing:	565	00:00:14.16	00:00:40.59
Pass 1:	473	00:00:15.85	00:00:51.25
Allocation/Relocation:	103	00:00:00.83	00:00:03.02
Pass 2:	316	00:00:17.19	00:00:53.03
Map data after object module synopsis:	19	00:00:09.11	00:00:31.14
Symbol table output:	0	00:00:00.03	00:00:00.31
Total run values:	1476	00:00:57.17	00:02:59.34

```
Using a working set limited to 3012 pages and 1090 pages of data storage (excluding image)

Total number object records read (both passes):   12906
    of which 157 were in libraries and 3985 were DEBUG data records containing 1517659 bytes

Number of modules extracted explicitly              = 0
    with 6 extracted to resolve undefined symbols

219 library searches were for symbols not in the library searched

A total of 0 global symbol table records was written

LINK DS$W:ECSAA.OPT/OPTIONS/MAP=DS$W:ECSAA.MAP.1017/CROSS/FULL/EXE=DS$W:ECSAA.EXE.1017/NODEBUG/NOTRACEBACK/NOSYSSHR
! DEC/CMS REPLACEMENT HISTORY, Element ECSAA.OPT
! *1    20-OCT-1987 15:16:50 DS "LINK options file for VAX 750 VDS."
! DEC/CMS REPLACEMENT HISTORY, Element ECSAA.OPT
KERNEL, -
ACPFDT, ANSI, APBOOT, APT, ASSIGN, ASTCON, ASTDEL, ATTACH, -
BOOTDRIVR, BOOTIO, BUFCTL, BUFFER, -
CALLFRAME, CANCEL, CHAN750, CHMK, CLI, CLOCK, COMDRVSUB, CONFIG, CONSOLE, -
CRDDUMMY, CSDDBTDRV, DSVECS, CVRTIM, CVTFILNAM, -
DASSGN, DEBUG, DEVALC, DEVICE, DIRECTORY, DISPAT, DLBTDRIVR, DMBTDRIVR, DRINT, -
```

```
DSLOAD, -
ENTRY, ERROR, EVENT, EXCEPT, -
FAO, FLAGS, FILEREAD, FRKCTL, -
GETTIM, GTCHAN, -
HELP, -
IOBASE, IOPOST, IOSNPG, IOSPGD, IOSRAM, -
LOAD, LOOP, LODMAP, -
MBBTDRIVR, MCHK750, MBAINT, MEMALC, MEMMGT, MPDUMMY, -
ODS, ONLY750, -
PABTDRIVR, PARAM, PARSE, PCSDATA, PCSLOAD750, PRINT, PROBE, PUBTDRIVR, -
QACHECKS, QAFLAGS, QAMAIN, QIO, QIOFDT, QIOREQ, -
RELOCDRV, RMS, RT11, -
SCB, SCRIPT, SHOWMEMORY, START, -
TFBTDRIVR, TMBTDRIVR, TSBTDRIVR, MUBTDRIVR, -
ULTRIX, UNWIND, -
VER_ECSAA, VMSDUMMY
!*SYS$LIBRARY:MOUNTSHR/SHAREABLE
!*SYS$LIBRARY:DISMNTSHR/SHAREABLE
BASE=%X10000
DZRO_MIN=100
```

Table of contents

(1) 100 ACCESS AND CREATE ACP FUNCTION PROCESSING ;G:4
(1) 134 DEACCESS ACP FUNCTION PROCESSING ;G:4
(1) 165 DELETE AND MODIFY ACP FUNCTION PROCESSING ;G:4
(1) 196 MOUNT ACP FUNCTION PROCESSING ;G:4
(1) 228 READ AND WRITE BLOCK ACP FUNCTION PROCESSING ;G:4

```
                     0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element ACPFDT.MAR
                     0000     2 ; *4    12-MAY-1986 09:46:45 BARANSKI "Cleaning up Object Libraries."
                     0000     3 ; *3     7-MAY-1986 12:56:53 BARANSKI "<no reason given>"
                     0000     4 ; *2    27-MAR-1986 09:59:50 MUSE "<no reason given>"
                     0000     5 ; *1     6-FEB-1986 15:13:21 DS ""
                     0000     6 ; DEC/CMS REPLACEMENT HISTORY, Element ACPFDT.MAR
                     0000     7         .TITLE  ACPFDT  *** ACPFDT ACP function dispatch                    ;G:4
                     0000     8         .IDENT  "6.1-3"                                                     ;G:4
                 00000000     9         .PSECT  SEP, SHR, EXE, WRT, LONG                                    ;G:4
                     0000    10                                                                             ;G:4
                     0000    11 ;                                                                           ;G:4
                     0000    12 ;*************************************************************************** ;G:4
                     0000    13 ;*                                                                         * ;G:4
                     0000    14 ;*  COPYRIGHT (c) 1977, 1978, 1979, 1980                                   * ;G:4
                     0000    15 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                        * ;G:4
                     0000    16 ;*                                                                         * ;G:4
                     0000    17 ;*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND  COPIED  * ;G:4
                     0000    18 ;*  ONLY  IN  ACCORDANCE  WITH  THE  TERMS  OF  SUCH  LICENSE AND WITH THE  * ;G:4
                     0000    19 ;*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE OR  ANY  OTHER   * ;G:4
                     0000    20 ;*  COPIES  THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY  * ;G:4
                     0000    21 ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE  IS  HEREBY  * ;G:4
                     0000    22 ;*  TRANSFERRED.                                                           * ;G:4
                     0000    23 ;*                                                                         * ;G:4
                     0000    24 ;*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE  * ;G:4
                     0000    25 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT  * ;G:4
                     0000    26 ;*  CORPORATION.                                                           * ;G:4
                     0000    27 ;*                                                                         * ;G:4
                     0000    28 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS  * ;G:4
                     0000    29 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                 * ;G:4
                     0000    30 ;*                                                                         * ;G:4
                     0000    31 ;*************************************************************************** ;G:4
                     0000    32 ;                                                                           ;G:4
                     0000    33 ; D. N. CUTLER 22-NOV-76                                                    ;G:4
                     0000    34 ;                                                                           ;G:4
                     0000    35 ; MODIFIED BY:                                                              ;G:4
                     0000    36 ;                                                                           ;G:4
                     0000    37 ;       V0002   ACG23542        Andrew C. Goldstein,  4-May-1979  14:43     ;G:4
                     0000    38 ;               Check LBN of mapped virtual I/O against UCB$L_MAXBLOCK      ;G:4
                     0000    39 ;                                                                           ;G:4
                     0000    40 ;       V0003   ACG0047         Andrew C. Goldstein,    8-Aug-1979  17:23   ;G:4
                     0000    41 ;               Interface change to protection check routines               ;G:4
                     0000    42 ;                                                                           ;G:4
                     0000    43 ;       V0004   RIH0033         Richard I. Hustvedt     16-Oct-1979     15:55 ;G:4
                     0000    44 ;               Change PCB$W_BYTCNT to JIB$L_BYTCNT; PCB$W_BYTLM to JIB$L_BYTLM; ;G:
                     0000    45 ;               PCB$W_FILCNT to JIB$W_FILCNT.                               ;G:4
                     0000    46 ;                                                                           ;G:4
                     0000    47 ;       V0005   RIH0036         Richard I. Hustvedt     02-Nov-1979         ;G:4
                     0000    48 ;               Set IRP$V_FILACP for file acp requests and bump DIO count   ;G:4
                     0000    49 ;                                                                           ;G:4
                     0000    50 ;       V0006   ACG0100         Andrew C. Goldstein,    3-Jan-1980  17:19   ;G:4
                     0000    51 ;               Permit partial dismount of volume sets                      ;G:4
                     0000    52 ;                                                                           ;G:4
                     0000    53 ;               Dave Butenhof   13-may-1980, Version 5.4                    ;G:4
                     0000    54 ;       02      Modify VMS V2.0 source for Supervisor environment.          ;G:4
                     0000    55 ;                                                                           ;G:4
                     0000    56 ;                                                                           ;G:4
                     0000    57 ;               Dave Butenhof, 08-oct-1980, version 6.1                     ;G:4
```

```
                        0000     58 ;       03      Changed some word offsets to longword.                    ;G:4
                        0000     59 ;**                                                                       ;G:4
                        0000     60 ;                                                                         ;G:4
                        0000     61 ; ACP FUNCTION DECISION TABLE ACTION ROUTINES                             ;G:4
                        0000     62 ;                                                                         ;G:4
                        0000     63 ; MACRO LIBRARY CALLS                                                     ;G:4
                        0000     64 ;                                                                         ;G:4
                        0000     65                                                                          ;G:4
                        0000     66          $CCBDEF                             ;DEFINE CCB OFFSETS      ;G:4
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .IIF    NB,CCB$L_UCB,   CCB$L_UCB:
                00000004 0000                        .BLKL   1
                        0004                 .IIF    NB,CCB$L_WIND,  CCB$L_WIND:
                00000008 0004                        .BLKL   1
                        0008                 .IIF    NB,CCB$B_STS,   CCB$B_STS:
                00000009 0008                        .BLKB   1
                        0009                 .IIF    NB,CCB$B_AMOD,  CCB$B_AMOD:
                0000000A 0009                        .BLKB   1
                        000A                 .IIF    NB,CCB$W_IOC,   CCB$W_IOC:
                0000000C 000A                        .BLKW   1
                        000C                 .IIF    NB,CCB$L_DIRP,  CCB$L_DIRP:
                00000010 000C                        .BLKL   1
                        0010                 .IIF    NB,CCB$C_LENGTH,        CCB$C_LENGTH:
                        0010                 .IIF    NB,CCB$K_LENGTH,        CCB$K_LENGTH:
                     00000000                .RESTORE
                        0000     67          $DEVDEF                             ;DEFINE DEVICE CHARACTERISTICS BITS  ;G:4
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 0010                .=0
                     00000000                .RESTORE
                        0000     68          $DYNDEF                             ;DEFINE STRUCTURE TYPE CODES     ;G:4
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 0010                .=0
                     00000000                .RESTORE
                        0000     69          $IPLDEF                             ;DEFINE INTERRUPT PRIORITY LEVELS ;G:4
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 0010                .=0
                     00000000                .RESTORE
                        0000     70          $IODEF                              ;DEFINE I/O FUNCTION CODES       ;G:4
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 0010                .=0
                     00000000                .RESTORE
                        0000     71          $IRPDEF                             ;DEFINE IRP OFFSETS              ;G:4
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 0010                .=0
                        0000                 .IIF    NB,IRP$L_IOQFL, IRP$L_IOQFL:
                00000004 0000                        .BLKL   1
                        0004                 .IIF    NB,IRP$L_IOQBL, IRP$L_IOQBL:
                00000008 0004                        .BLKL   1
                        0008                 .IIF    NB,IRP$W_SIZE,  IRP$W_SIZE:
                0000000A 0008                        .BLKW   1
                        000A                 .IIF    NB,IRP$B_TYPE,  IRP$B_TYPE:
                0000000B 000A                        .BLKB   1
```

```
                    000B                .IIF    NB,IRP$B_RMOD,  IRP$B_RMOD:
0000000C  000B                                      .BLKB   1
                    000C                .IIF    NB,IRP$L_PID,   IRP$L_PID:
00000010  000C                                      .BLKL   1
                    0010                .IIF    NB,IRP$L_AST,   IRP$L_AST:
00000014  0010                                      .BLKL   1
                    0014                .IIF    NB,IRP$L_ASTPRM,        IRP$L_ASTPRM:
00000018  0014                                      .BLKL   1
                    0018                .IIF    NB,IRP$L_WIND,  IRP$L_WIND:
0000001C  0018                                      .BLKL   1
                    001C                .IIF    NB,IRP$L_UCB,   IRP$L_UCB:
00000020  001C                                      .BLKL   1
                    0020                .IIF    NB,IRP$W_FUNC,  IRP$W_FUNC:
00000022  0020                                      .BLKW   1
                    0022                .IIF    NB,IRP$B_EFN,   IRP$B_EFN:
00000023  0022                                      .BLKB   1
                    0023                .IIF    NB,IRP$B_PRI,   IRP$B_PRI:
00000024  0023                                      .BLKB   1
                    0024                .IIF    NB,IRP$L_IOSB,  IRP$L_IOSB:
00000028  0024                                      .BLKL   1
                    0028                .IIF    NB,IRP$W_CHAN,  IRP$W_CHAN:
0000002A  0028                                      .BLKW   1
                    002A                .IIF    NB,IRP$W_STS,   IRP$W_STS:
0000002C  002A                                      .BLKW   1
                    002C                .IIF    NB,IRP$L_SVAPTE,        IRP$L_SVAPTE:
00000030  002C                                      .BLKL   1
                    0030                .IIF    NB,IRP$W_BOFF,  IRP$W_BOFF:
00000032  0030                                      .BLKW   1
                    0032                .IIF    NB,IRP$W_BCNT,  IRP$W_BCNT:
00000034  0032                                      .BLKW   1
                    0034                .IIF    NB,IRP$L_IOST1, IRP$L_IOST1:
                    0034                .IIF    NB,IRP$L_MEDIA, IRP$L_MEDIA:
00000038  0034                                      .BLKL   1
                    0038                .IIF    NB,IRP$L_IOST2, IRP$L_IOST2:
                    0038                .IIF    NB,IRP$L_TT_TERM,       IRP$L_TT_TERM:
                    0038                .IIF    NB,IRP$B_CARCON,        IRP$B_CARCON:
00000039  0038                                      .BLKB   1
0000003C  0039                                      .BLKB   3
                    003C                .IIF    NB,IRP$Q_NT_PRVMSK,     IRP$Q_NT_PRVMSK:
                    003C                .IIF    NB,IRP$W_ABCNT, IRP$W_ABCNT:
                    003C                .IIF    NB,IRP$W_TT_PRMPT,      IRP$W_TT_PRMPT:
0000003E  003C                                      .BLKW   1
                    003E                .IIF    NB,IRP$W_OBCNT, IRP$W_OBCNT:
00000040  003E                                      .BLKW   1
                    0040                .IIF    NB,IRP$L_SEGVBN,        IRP$L_SEGVBN:
00000044  0040                                      .BLKL   1
                    0044                .IIF    NB,IRP$L_DIAGBUF,       IRP$L_DIAGBUF:
00000048  0044                                      .BLKL   1
                    0048                .IIF    NB,IRP$L_SEQNUM,        IRP$L_SEQNUM:
0000004C  0048                                      .BLKL   1
                    004C                .IIF    NB,IRP$L_EXTEND,        IRP$L_EXTEND:
00000050  004C                                      .BLKL   1
                    0050                .IIF    NB,IRP$L_ARB,   IRP$L_ARB:
00000054  0050                                      .BLKL   1
00000058  0054                                      .BLKL   1
0000005C  0058                                      .BLKL   1
                    005C                .IIF    NB,IRP$C_LENGTH,        IRP$C_LENGTH:
```

```
                        005C                .IIF    NB,IRP$K_LENGTH,        IRP$K_LENGTH:
                    00000000                .RESTORE
                        0000    72          $JIBDEF                         ;DEFINE JIB OFFSETS                     ;G:4
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                    00000000    005C        .=0
                    00000000                .RESTORE
                        0000    73          $PCBDEF                         ;DEFINE PCB OFFSETS                     ;G:4
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                    00000000    005C        .=0
                        0000                .IIF    NB,PCB$L_SQFL,  PCB$L_SQFL:
                    00000004    0000                .BLKL   1
                        0004                .IIF    NB,PCB$L_SQBL,  PCB$L_SQBL:
                    00000008    0004                .BLKL   1
                        0008                .IIF    NB,PCB$W_SIZE,  PCB$W_SIZE:
                    0000000A    0008                .BLKW   1
                        000A                .IIF    NB,PCB$B_TYPE,  PCB$B_TYPE:
                    0000000B    000A                .BLKB   1
                        000B                .IIF    NB,PCB$B_PRI,   PCB$B_PRI:
                    0000000C    000B                .BLKB   1
                        000C                .IIF    NB,PCB$B_ASTACT,        PCB$B_ASTACT:
                    0000000D    000C                .BLKB   1
                        000D                .IIF    NB,PCB$B_ASTEN, PCB$B_ASTEN:
                    0000000E    000D                .BLKB   1
                        000E                .IIF    NB,PCB$W_MTXCNT,        PCB$W_MTXCNT:
                    00000010    000E                .BLKW   1
                        0010                .IIF    NB,PCB$L_ASTQFL,        PCB$L_ASTQFL:
                    00000014    0010                .BLKL   1
                        0014                .IIF    NB,PCB$L_ASTQBL,        PCB$L_ASTQBL:
                    00000018    0014                .BLKL   1
                        0018                .IIF    NB,PCB$L_PHYPCB,        PCB$L_PHYPCB:
                    0000001C    0018                .BLKL   1
                        001C                .IIF    NB,PCB$L_OWNER, PCB$L_OWNER:
                    00000020    001C                .BLKL   1
                        0020                .IIF    NB,PCB$L_WSSWP, PCB$L_WSSWP:
                    00000024    0020                .BLKL   1
                        0024                .IIF    NB,PCB$L_STS,   PCB$L_STS:
                    00000028    0024                .BLKL   1
                        0028                .IIF    NB,PCB$L_WTIME, PCB$L_WTIME:
                    0000002C    0028                .BLKL   1
                        002C                .IIF    NB,PCB$W_STATE, PCB$W_STATE:
                    0000002E    002C                .BLKW   1
                        002E                .IIF    NB,PCB$B_WEFC,  PCB$B_WEFC:
                    0000002F    002E                .BLKB   1
                        002F                .IIF    NB,PCB$B_PRIB,  PCB$B_PRIB:
                    00000030    002F                .BLKB   1
                        0030                .IIF    NB,PCB$W_APTCNT,        PCB$W_APTCNT:
                    00000032    0030                .BLKW   1
                        0032                .IIF    NB,PCB$W_TMBU,  PCB$W_TMBU:
                    00000034    0032                .BLKW   1
                        0034                .IIF    NB,PCB$W_GPGCNT,        PCB$W_GPGCNT:
                    00000036    0034                .BLKW   1
                        0036                .IIF    NB,PCB$W_PPGCNT,        PCB$W_PPGCNT:
                    00000038    0036                .BLKW   1
                        0038                .IIF    NB,PCB$W_ASTCNT,        PCB$W_ASTCNT:
                    0000003A    0038                .BLKW   1
```

```
                 003A          .IIF    NB,PCB$W_BIOCNT,        PCB$W_BIOCNT:
        0000003C 003A                          .BLKW   1
                 003C          .IIF    NB,PCB$W_BIOLM, PCB$W_BIOLM:
        0000003E 003C                          .BLKW   1
                 003E          .IIF    NB,PCB$W_DIOCNT,        PCB$W_DIOCNT:
        00000040 003E                          .BLKW   1
                 0040          .IIF    NB,PCB$W_DIOLM, PCB$W_DIOLM:
        00000042 0040                          .BLKW   1
                 0042          .IIF    NB,PCB$W_PRCCNT,        PCB$W_PRCCNT:
        00000044 0042                          .BLKW   1
                 0044          .IIF    NB,PCB$T_TERMINAL,      PCB$T_TERMINAL:
        0000004C 0044                          .BLKB   8
                 004C          .IIF    NB,PCB$L_PQB,   PCB$L_PQB:
                 004C          .IIF    NB,PCB$L_EFWM,  PCB$L_EFWM:
        00000050 004C                          .BLKL   1
                 0050          .IIF    NB,PCB$L_EFCS,  PCB$L_EFCS:
        00000054 0050                          .BLKL   1
                 0054          .IIF    NB,PCB$L_EFCU,  PCB$L_EFCU:
        00000058 0054                          .BLKL   1
                 0058          .IIF    NB,PCB$L_EFC2P, PCB$L_EFC2P:
        0000005C 0058                          .BLKL   1
                 005C          .IIF    NB,PCB$L_EFC3P, PCB$L_EFC3P:
        00000060 005C                          .BLKL   1
                 0060          .IIF    NB,PCB$L_PID,   PCB$L_PID:
        00000064 0060                          .BLKL   1
                 0064          .IIF    NB,PCB$L_PHD,   PCB$L_PHD:
        00000068 0064                          .BLKL   1
                 0068          .IIF    NB,PCB$T_LNAME, PCB$T_LNAME:
        00000078 0068                          .BLKB   16
                 0078          .IIF    NB,PCB$L_JIB,   PCB$L_JIB:
        0000007C 0078                          .BLKL   1
                 007C          .IIF    NB,PCB$Q_PRIV,  PCB$Q_PRIV:
        00000084 007C                          .BLKQ   1
                 0084          .IIF    NB,PCB$L_ARB,   PCB$L_ARB:
        00000088 0084                          .BLKL   1
                 0088          .IIF    NB,PCB$L_UIC,   PCB$L_UIC:
                 0088          .IIF    NB,PCB$W_MEM,   PCB$W_MEM:
        0000008A 0088                          .BLKW   1
                 008A          .IIF    NB,PCB$W_GRP,   PCB$W_GRP:
        0000008C 008A                          .BLKW   1
                 008C          .IIF    NB,PCB$C_LENGTH,        PCB$C_LENGTH:
                 008C          .IIF    NB,PCB$K_LENGTH,        PCB$K_LENGTH:
              00000000         .RESTORE
                 0000    74    $PRDEF                          ;DEFINE PROCESSOR REGISTERS          ;G:4
                 0000          .SAVE   LOCAL_BLOCK
                 0000          .PSECT  $ABS$,ABS
        00000000 008C          .=0
              00000000         .RESTORE
                 0000    75    $PRVDEF                         ;DEFINE PRIVILEGE BITS               ;G:4
                 0000          .SAVE   LOCAL_BLOCK
                 0000          .PSECT  $ABS$,ABS
        00000000 008C          .=0
              00000000         .RESTORE
                 0000    76    $UCBDEF                         ;DEFINE UCB OFFSETS                  ;G:4
                 0000          .SAVE   LOCAL_BLOCK
                 0000          .PSECT  $ABS$,ABS
        00000000 008C          .=0
```

```
                    0000            .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                    0000            .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
          00000004  0000                    .BLKL   1
                    0004            .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                    0004            .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
          00000008  0004                    .BLKL   1
                    0008            .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
          0000000A  0008                    .BLKW   1
                    000A            .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
          0000000B  000A                    .BLKB   1
                    000B            .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
          0000000C  000B                    .BLKB   1
                    000C            .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                    000C            .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                    000C            .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
          0000000D  000C                    .BLKB   1
          00000010  000D                    .BLKB   3
                    0010            .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                    0010            .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
          00000014  0010                    .BLKL   1
                    0014            .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                    0014            .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                    0014            .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
          00000016  0014                    .BLKW   1
                    0016            .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
          00000018  0016                    .BLKW   1
                    0018            .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                    0018            .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
          0000001A  0018                    .BLKW   1
                    001A            .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                    001A            .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
          0000001C  001A                    .BLKW   1
                    001C            .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
          00000020  001C                    .BLKL   1
                    0020            .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
          00000024  0020                    .BLKL   1
                    0024            .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
          00000028  0024                    .BLKL   1
                    0028            .IIF    NB,UCB$L_PID,   UCB$L_PID:
          0000002C  0028                    .BLKL   1
                    002C            .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
          00000030  002C                    .BLKL   1
                    0030            .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
          00000034  0030                    .BLKL   1
                    0034            .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
          00000038  0034                    .BLKL   1
                    0038            .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
          00000039  0038                    .BLKB   1
                    0039            .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
          0000003A  0039                    .BLKB   1
                    003A            .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
          0000003C  003A                    .BLKW   1
                    003C            .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
                    003C            .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
                    003C            .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
          0000003D  003C                    .BLKB   1
                    003D            .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
```

```
                        003D            .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
                00000003E 003D                  .BLKB   1
                        003E            .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
                        003E            .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
                00000003F 003E                  .BLKB   1
                        003F            .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
                00000040 003F                   .BLKB   1
                        0040            .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
                00000044 0040                   .BLKL   1
                        0044            .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
                00000048 0044                   .BLKL   1
                        0048            .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
                0000004A 0048                   .BLKW   1
                        004A            .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
                        004A            .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
                0000004B 004A                   .BLKB   1
                        004B            .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
                0000004C 004B                   .BLKB   1
                        004C            .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
                00000050 004C                   .BLKL   1
                        0050            .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
                00000052 0050                   .BLKW   1
                        0052            .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
                        0052            .IIF    NB,UCB$B_STATE, UCB$B_STATE:
                00000053 0052                   .BLKB   1
                        0053            .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
                00000054 0053                   .BLKB   1
                        0054            .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
                00000058 0054                   .BLKL   1
                        0058            .IIF    NB,UCB$W_STS,   UCB$W_STS:
                0000005A 0058                   .BLKW   1
                        005A            .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
                0000005C 005A                   .BLKW   1
                        005C            .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
                        005C            .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
                00000060 005C                   .BLKL   1
                        0060            .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
                00000064 0060                   .BLKL   1
                        0064            .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
                        0064            .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
                00000068 0064                   .BLKL   1
                        0068            .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
                0000006C 0068                   .BLKL   1
                        006C            .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
                0000006E 006C                   .BLKW   1
                        006E            .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
                00000070 006E                   .BLKW   1
                        0070            .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
                00000071 0070                   .BLKB   1
                        0071            .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
                00000072 0071                   .BLKB   1
                        0072            .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
                00000074 0072                   .BLKW   1
                        0074            .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
                        0074            .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
                00000000 0074           . = 0
                        0000            .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
```

```
00000002  0000                        .BLKW   1
00000074  0002                .= 116
          0074                .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078  0074                        .BLKL   1
          0078                .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C  0078                        .BLKL   1
          007C                .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080  007C                        .BLKL   1
          0080                .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084  0080                        .BLKL   1
          0084                .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088  0084                        .BLKL   1
          0088                .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C  0088                        .BLKL   1
          008C                .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090  008C                        .BLKL   1
          0090                .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
          0090                .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074  0090                .= 116
          0074                .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075  0074                        .BLKB   1
          0075                .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076  0075                        .BLKB   1
          0076                .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077  0076                        .BLKB   1
          0077                .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078  0077                        .BLKB   1
          0078                .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C  0078                        .BLKL   1
0000007E  007C                        .BLKW   1
          007E                .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080  007E                        .BLKW   1
          0080                .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084  0080                        .BLKL   1
00000080  0084                .= 128
00000084  0080                        .BLKL   1
          0084                .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088  0084                        .BLKL   1
          0088                .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A  0088                        .BLKW   1
          008A                .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C  008A                        .BLKW   1
          008C                .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
          008C                .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E  008C                        .BLKW   1
          008E                .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090  008E                        .BLKW   1
          0090                .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092  0090                        .BLKW   1
          0092                .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
00000094  0092                        .BLKW   1
          0094                .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095  0094                        .BLKB   1
          0095                .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096  0095                        .BLKB   1
          0096                .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098  0096                        .BLKW   1
```

```
                00000096  0098            . = 150
                00000098  0096                          .BLKW   1
                          0098            .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
                0000009C  0098                          .BLKL   1
                          009C            .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
                000000A0  009C                          .BLKL   1
                          00A0            .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
                000000A4  00A0                          .BLKL   1
                          00A4            .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
                000000A6  00A4                          .BLKW   1
                          00A6            .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
                000000A7  00A6                          .BLKB   1
                000000A8  00A7                          .BLKB   1
                00000074  00A8            . = 116
                00000078  0074                          .BLKL   1
                0000007C  0078                          .BLKL   1
                00000080  007C                          .BLKL   1
                00000084  0080                          .BLKL   1
                00000088  0084                          .BLKL   1
                0000008C  0088                          .BLKL   1
                          008C            .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
                00000090  008C                          .BLKL   1
                00000094  0090                          .BLKL   1
                00000098  0094                          .BLKL   1
                0000009C  0098                          .BLKL   1
                          009C            .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
                0000009D  009C                          .BLKB   1
                          009D            .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
                0000009E  009D                          .BLKB   1
                          009E            .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
                0000009F  009E                          .BLKB   1
                000000A0  009F                          .BLKB   1
                          00A0            .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
                000000A1  00A0                          .BLKB   1
                          00A1            .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
                000000A2  00A1                          .BLKB   1
                          00A2            .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
                000000A3  00A2                          .BLKB   1
                000000A4  00A3                          .BLKB   1
                          00A4            .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
                000000A5  00A4                          .BLKB   1
                          00A5            .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
                000000A7  00A5                          .BLKW   1
                000000A8  00A7                          .BLKB   1
                          00A8            .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
                000000AC  00A8                          .BLKL   1
                000000B0  00AC                          .BLKL   1
                000000B4  00B0                          .BLKL   1
                000000B8  00B4                          .BLKL   1
                          00B8            .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
                000000BC  00B8                          .BLKL   1
                          00BC            .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
                          00BC            .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
                00000074  00BC            . = 116
                          0074            .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
                00000078  0074                          .BLKL   1
                          0078            .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
```

```
0000007C  0078                          .BLKL   1
          007C              .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
0000007E  007C                          .BLKW   1
00000080  007E                          .BLKW   1
      00000000            .RESTORE
          0000    77      $VADEF                          ;DEFINE VIRTUAL ADDRESS FIELDS      ;G:4
          0000            .SAVE   LOCAL_BLOCK
          0000            .PSECT  $ABS$,ABS
00000000  00BC            .=0
      00000000            .RESTORE
          0000    78      $VCBDEF                         ;DEFINE VCB OFFSETS                 ;G:4
          0000            .SAVE   LOCAL_BLOCK
          0000            .PSECT  $ABS$,ABS
00000000  00BC            .=0
          0000            .IIF    NB,VCB$L_FCBFL, VCB$L_FCBFL:
00000004  0000                          .BLKL   1
          0004            .IIF    NB,VCB$L_FCBBL, VCB$L_FCBBL:
00000008  0004                          .BLKL   1
          0008            .IIF    NB,VCB$W_SIZE,  VCB$W_SIZE:
0000000A  0008                          .BLKW   1
          000A            .IIF    NB,VCB$B_TYPE,  VCB$B_TYPE:
0000000B  000A                          .BLKB   1
          000B            .IIF    NB,VCB$C_MRKLEN,        VCB$C_MRKLEN:
          000B            .IIF    NB,VCB$K_MRKLEN,        VCB$K_MRKLEN:
          000B            .IIF    NB,VCB$B_STATUS,        VCB$B_STATUS:
0000000C  000B                          .BLKB   1
          000C            .IIF    NB,VCB$W_TRANS, VCB$W_TRANS:
0000000E  000C                          .BLKW   1
          000E            .IIF    NB,VCB$W_RVN,   VCB$W_RVN:
00000010  000E                          .BLKW   1
          0010            .IIF    NB,VCB$L_AQB,   VCB$L_AQB:
00000014  0010                          .BLKL   1
          0014            .IIF    NB,VCB$T_VOLNAME,       VCB$T_VOLNAME:
00000020  0014                          .BLKB   12
          0020            .IIF    NB,VCB$L_RVT,   VCB$L_RVT:
00000024  0020                          .BLKL   1
          0024            .IIF    NB,VCB$C_COMLEN,        VCB$C_COMLEN:
          0024            .IIF    NB,VCB$K_COMLEN,        VCB$K_COMLEN:
          0024            .IIF    NB,VCB$L_HOMELBN,       VCB$L_HOMELBN:
00000028  0024                          .BLKL   1
          0028            .IIF    NB,VCB$L_HOME2LBN,      VCB$L_HOME2LBN:
0000002C  0028                          .BLKL   1
          002C            .IIF    NB,VCB$L_IXHDR2LBN,     VCB$L_IXHDR2LBN:
00000030  002C                          .BLKL   1
          0030            .IIF    NB,VCB$L_IBMAPLBN,      VCB$L_IBMAPLBN:
00000034  0030                          .BLKL   1
          0034            .IIF    NB,VCB$L_SBMAPLBN,      VCB$L_SBMAPLBN:
00000038  0034                          .BLKL   1
          0038            .IIF    NB,VCB$B_IBMAPSIZE,     VCB$B_IBMAPSIZE:
00000039  0038                          .BLKB   1
          0039            .IIF    NB,VCB$B_SBMAPSIZE,     VCB$B_SBMAPSIZE:
0000003A  0039                          .BLKB   1
          003A            .IIF    NB,VCB$B_IBMAPVBN,      VCB$B_IBMAPVBN:
0000003B  003A                          .BLKB   1
          003B            .IIF    NB,VCB$B_SBMAPVBN,      VCB$B_SBMAPVBN:
0000003C  003B                          .BLKB   1
          003C            .IIF    NB,VCB$W_CLUSTER,       VCB$W_CLUSTER:
```

```
0000003E  003C                          .BLKW   1
          003E          .IIF    NB,VCB$W_EXTEND,        VCB$W_EXTEND:
00000040  003E                          .BLKW   1
          0040          .IIF    NB,VCB$L_FREE,  VCB$L_FREE:
00000044  0040                          .BLKL   1
          0044          .IIF    NB,VCB$L_MAXFILES,      VCB$L_MAXFILES:
00000048  0044                          .BLKL   1
          0048          .IIF    NB,VCB$B_WINDOW,        VCB$B_WINDOW:
00000049  0048                          .BLKB   1
          0049          .IIF    NB,VCB$B_LRU_LIM,       VCB$B_LRU_LIM:
0000004A  0049                          .BLKB   1
          004A          .IIF    NB,VCB$W_FILEPROT,      VCB$W_FILEPROT:
0000004C  004A                          .BLKW   1
          004C          .IIF    NB,VCB$W_MCOUNT,        VCB$W_MCOUNT:
0000004E  004C                          .BLKW   1
          004E          .IIF    NB,VCB$B_EOFDELTA,      VCB$B_EOFDELTA:
0000004F  004E                          .BLKB   1
          004F          .IIF    NB,VCB$B_RESFILES,      VCB$B_RESFILES:
00000050  004F                          .BLKB   1
          0050          .IIF    NB,VCB$W_RECORDSZ,      VCB$W_RECORDSZ:
00000052  0050                          .BLKW   1
          0052          .IIF    NB,VCB$B_BLOCKFACT,     VCB$B_BLOCKFACT:
00000053  0052                          .BLKB   1
          0053          .IIF    NB,VCB$B_STATUS2,       VCB$B_STATUS2:
00000054  0053                          .BLKB   1
          0054          .IIF    NB,VCB$L_QUOTAFCB,      VCB$L_QUOTAFCB:
00000058  0054                          .BLKL   1
          0058          .IIF    NB,VCB$L_CACHE, VCB$L_CACHE:
0000005C  0058                          .BLKL   1
          005C          .IIF    NB,VCB$L_QUOCACHE,      VCB$L_QUOCACHE:
00000060  005C                          .BLKL   1
          0060          .IIF    NB,VCB$W_QUOSIZE,       VCB$W_QUOSIZE:
00000062  0060                          .BLKW   1
          0062          .IIF    NB,VCB$W_PENDERR,       VCB$W_PENDERR:
00000064  0062                          .BLKW   1
          0064          .IIF    NB,VCB$C_LENGTH,        VCB$C_LENGTH:
          0064          .IIF    NB,VCB$K_LENGTH,        VCB$K_LENGTH:
00000000  0064          . = 0
          0000          .IIF    NB,VCB$L_BLOCKFL,       VCB$L_BLOCKFL:
00000004  0000                          .BLKL   1
          0004          .IIF    NB,VCB$L_BLOCKBL,       VCB$L_BLOCKBL:
00000008  0004                          .BLKL   1
0000000B  0008          . = 11
00000024  000B          . = 36
          0024          .IIF    NB,VCB$L_CUR_FID,       VCB$L_CUR_FID:
          0024          .IIF    NB,VCB$W_CUR_NUM,       VCB$W_CUR_NUM:
00000026  0024                          .BLKW   1
          0026          .IIF    NB,VCB$W_CUR_SEQ,       VCB$W_CUR_SEQ:
00000028  0026                          .BLKW   1
          0028          .IIF    NB,VCB$L_START_FID,     VCB$L_START_FID:
          0028          .IIF    NB,VCB$W_START_NUM,     VCB$W_START_NUM:
0000002A  0028                          .BLKW   1
          002A          .IIF    NB,VCB$W_START_SEQ,     VCB$W_START_SEQ:
0000002C  002A                          .BLKW   1
          002C          .IIF    NB,VCB$W_MODE,  VCB$W_MODE:
0000002E  002C                          .BLKW   1
          002E          .IIF    NB,VCB$B_TM,    VCB$B_TM:
```

```
0000002F  002E                                  .BLKB   1
          002F                  .IIF    NB,VCB$B_CUR_RVN,       VCB$B_CUR_RVN:
00000030  002F                                  .BLKB   1
          0030                  .IIF    NB,VCB$L_ST_RECORD,     VCB$L_ST_RECORD:
00000034  0030                                  .BLKL   1
          0034                  .IIF    NB,VCB$L_MVL,   VCB$L_MVL:
00000038  0034                                  .BLKL   1
          0038                  .IIF    NB,VCB$L_WCB,   VCB$L_WCB:
0000003C  0038                                  .BLKL   1
          003C                  .IIF    NB,VCB$L_VPFL,  VCB$L_VPFL:
00000040  003C                                  .BLKL   1
          0040                  .IIF    NB,VCB$L_VPBL,  VCB$L_VPBL:
00000044  0040                                  .BLKL   1
          0044                  .IIF    NB,VCB$L_USRLBLAST,     VCB$L_USRLBLAST:
00000048  0044                                  .BLKL   1
0000000B  0048                  . = 11
          000B                  .IIF    NB,VCB$B_QNAMECNT,      VCB$B_QNAMECNT:
0000000C  000B                                  .BLKB   1
          000C                  .IIF    NB,VCB$T_QNAME, VCB$T_QNAME:
00000020  000C                                  .BLKB   20
      00000000                  .RESTORE
          0000     79           $WCBDEF                        ;DEFINE WCB OFFSETS                    ;G:4
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  00BC                  .=0
          0000                  .IIF    NB,WCB$L_WLFL,  WCB$L_WLFL:
00000004  0000                                  .BLKL   1
          0004                  .IIF    NB,WCB$L_WLBL,  WCB$L_WLBL:
00000008  0004                                  .BLKL   1
          0008                  .IIF    NB,WCB$W_SIZE,  WCB$W_SIZE:
0000000A  0008                                  .BLKW   1
          000A                  .IIF    NB,WCB$B_TYPE,  WCB$B_TYPE:
0000000B  000A                                  .BLKB   1
          000B                  .IIF    NB,WCB$B_ACCESS,        WCB$B_ACCESS:
0000000C  000B                                  .BLKB   1
          000C                  .IIF    NB,WCB$L_PID,   WCB$L_PID:
0000000E  000C                                  .BLKB   2
          000E                  .IIF    NB,WCB$W_REFCNT,        WCB$W_REFCNT:
00000010  000E                                  .BLKW   1
          0010                  .IIF    NB,WCB$L_ORGUCB,        WCB$L_ORGUCB:
00000014  0010                                  .BLKL   1
          0014                  .IIF    NB,WCB$W_ACON,  WCB$W_ACON:
00000016  0014                                  .BLKW   1
          0016                  .IIF    NB,WCB$W_NMAP,  WCB$W_NMAP:
00000018  0016                                  .BLKW   1
          0018                  .IIF    NB,WCB$L_FCB,   WCB$L_FCB:
0000001C  0018                                  .BLKL   1
          001C                  .IIF    NB,WCB$L_RVT,   WCB$L_RVT:
00000020  001C                                  .BLKL   1
          0020                  .IIF    NB,WCB$L_STVBN, WCB$L_STVBN:
00000024  0020                                  .BLKL   1
          0024                  .IIF    NB,WCB$C_MAP,   WCB$C_MAP:
          0024                  .IIF    NB,WCB$K_MAP,   WCB$K_MAP:
          0024                  .IIF    NB,WCB$C_LENGTH,        WCB$C_LENGTH:
          0024                  .IIF    NB,WCB$K_LENGTH,        WCB$K_LENGTH:
          0024                  .IIF    NB,WCB$W_P1_COUNT,      WCB$W_P1_COUNT:
00000026  0024                                  .BLKW   1
```

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                 0026                .IIF    NB,WCB$L_P1_LBN,        WCB$L_P1_LBN:
0000002A         0026                                .BLKL   1
                 002A                .IIF    NB,WCB$W_P2_COUNT,      WCB$W_P2_COUNT:
0000002C         002A                                .BLKW   1
                 002C                .IIF    NB,WCB$L_P2_LBN,        WCB$L_P2_LBN:
00000030         002C                                .BLKL   1
00000000         0030                . = 0
                 0000                .IIF    NB,WCB$W_COUNT, WCB$W_COUNT:
00000002         0000                                .BLKW   1
                 0002                .IIF    NB,WCB$L_LBN,   WCB$L_LBN:
00000006         0002                                .BLKL   1
00000000         0006                . = 0
FFFFFFFA         0000                                .BLKB   -6
                 FFFA                .IIF    NB,WCB$W_PREVCOUNT,     WCB$W_PREVCOUNT:
FFFFFFFC         FFFA                                .BLKW   1
                 FFFC                .IIF    NB,WCB$L_PREVLBN,       WCB$L_PREVLBN:
00000000         FFFC                                .BLKL   1
        00000000                     .RESTORE
                 0000    80                                                                      ;G:4
                 0000    81 ;                                                                    ;G:4
                 0000    82 ; LOCAL SYMBOLS                                                      ;G:4
                 0000    83 ;                                                                    ;G:4
                 0000    84 ; ARGUMENT LIST OFFSET DEFINITIONS                                   ;G:4
                 0000    85 ;                                                                    ;G:4
                 0000    86                                                                      ;G:4
00000000         0000    87 P1=0                                  ;FIRST FUNCTION DEPENDENT PARAMETER   ;G:4
00000004         0000    88 P2=4                                  ;SECOND FUNCTION DEPENDENT PARAMETER  ;G:4
00000008         0000    89 P3=8                                  ;THIRD FUNCTION DEPENDENT PARAMETER   ;G:4
0000000C         0000    90 P4=12                                 ;FOURTH FUNCTION DEPENDENT PARAMETER  ;G:4
00000010         0000    91 P5=16                                 ;FIFTH FUNCTION DEPENDENT PARAMETER   ;G:4
00000014         0000    92 P6=20                                 ;SIXTH FUNCTION DEPENDENT PARAMETER   ;G:4
                 0000    93                                                                      ;G:4
                 0000    94 ;                                                                    ;G:4
                 0000    95 ; MAXIMUM NUMBER OF ACP DESCRIPTORS                                  ;G:4
                 0000    96 ;                                                                    ;G:4
                 0000    97                                                                      ;G:4
00000016         0000    98 MXDESCR=5+17                          ;MAXIMUM NUMBER OF ACP DESCRIPTORS    ;G:4
```

```
                        0000    100          .SBTTL  ACCESS AND CREATE ACP FUNCTION PROCESSING                    ;G:4
                        0000    101 ;+                                                                           ;G:4
                        0000    102 ; ACP$ACCESS - ACCESS AND CREATE ACP FUNCTION PROCESSING                     ;G:4
                        0000    103 ; ACP$ACCESSNET - ACCESS (CONNECT) TO NETWORK FUNCTION PROCESSING            ;G:4
                        0000    104 ;                                                                            ;G:4
                        0000    105 ; ***TBS***                                                                  ;G:4
                        0000    106 ;                                                                            ;G:4
                        0000    107 ; INPUTS:                                                                    ;G:4
                        0000    108 ;                                                                            ;G:4
                        0000    109 ;       R0 = SCRATCH.                                                        ;G:4
                        0000    110 ;       R1 = SCRATCH.                                                        ;G:4
                        0000    111 ;       R2 = SCRATCH.                                                        ;G:4
                        0000    112 ;       R3 = ADDRESS OF I/O REQUEST PACKET.                                  ;G:4
                        0000    113 ;       R4 = CURRENT PROCESS PCB ADDRESS.                                    ;G:4
                        0000    114 ;       R5 = ASSIGNED DEVICE UCB ADDRESS.                                    ;G:4
                        0000    115 ;       R6 = ADDRESS OF CCB.                                                 ;G:4
                        0000    116 ;       R7 = I/O FUNCTION CODE BIT NUMBER.                                   ;G:4
                        0000    117 ;       R8 = FUNCTION DECISION TABLE DISPATCH ADDRESS.                       ;G:4
                        0000    118 ;       R9 = SCRATCH.                                                        ;G:4
                        0000    119 ;       R10 = SCRATCH.                                                       ;G:4
                        0000    120 ;       R11 = SCRATCH.                                                       ;G:4
                        0000    121 ;       AP = ADDRESS OF FIRST FUNCTION DEPENDENT PARAMETER.                  ;G:4
                        0000    122 ;                                                                            ;G:4
                        0000    123 ; OUTPUTS:                                                                   ;G:4
                        0000    124 ;                                                                            ;G:4
                        0000    125 ; ***TBS***                                                                  ;G:4
                        0000    126 ;-                                                                           ;G:4
                        0000    127                                                                              ;G:4
                        0000    128          .ENABL  LSB                                                         ;G:4
                        0000    129 ACP$ACCESS::                        ;ACCESS AND CREATE ACP FUNCTION PROCESSING ;
                        0000    130 ACP$ACCESSNET::                     ;ACCESS (CONNECT) TO NETWORK FUNCTION PROCES
50   0000'8F   3C       0000    131          MOVZWL  #SS$_FILNOTACC,R0  ; ROUTINE NOT IMPLEMENTED IN S/A      ;G:4
 00000000'EF   16       0005    132          JSB     L^EXE$ABORTIO      ; ABORT THIS QIO                      ;G:4
```

```
                     000B   134          .SBTTL  DEACCESS ACP FUNCTION PROCESSING                                ;G:4
                     000B   135 ;+                                                                              ;G:4
                     000B   136 ; ACP$DEACCESS - DEACCESS ACP FUNCTION PROCESSING                               ;G:4
                     000B   137 ;                                                                              ;G:4
                     000B   138 ; ***TBS***                                                                    ;G:4
                     000B   139 ;                                                                              ;G:4
                     000B   140 ; INPUTS:                                                                      ;G:4
                     000B   141 ;                                                                              ;G:4
                     000B   142 ;       R0 = SCRATCH.                                                         ;G:4
                     000B   143 ;       R1 = SCRATCH.                                                         ;G:4
                     000B   144 ;       R2 = SCRATCH.                                                         ;G:4
                     000B   145 ;       R3 = ADDRESS OF I/O REQUEST PACKET.                                   ;G:4
                     000B   146 ;       R4 = CURRENT PROCESS PCB ADDRESS.                                     ;G:4
                     000B   147 ;       R5 = ASSIGNED DEVICE UCB ADDRESS.                                     ;G:4
                     000B   148 ;       R6 = ADDRESS OF CCB.                                                  ;G:4
                     000B   149 ;       R7 = I/O FUNCTION CODE BIT NUMBER.                                    ;G:4
                     000B   150 ;       R8 = FUNCTION DECISION TABLE DISPATCH ADDRESS.                        ;G:4
                     000B   151 ;       R9 = SCRATCH.                                                         ;G:4
                     000B   152 ;       R10 = SCRATCH.                                                        ;G:4
                     000B   153 ;       R11 = SCRATCH.                                                        ;G:4
                     000B   154 ;       AP = ADDRESS OF FIRST FUNCTION DEPENDENT PARAMETER.                   ;G:4
                     000B   155 ;                                                                              ;G:4
                     000B   156 ; OUTPUTS:                                                                     ;G:4
                     000B   157 ;                                                                              ;G:4
                     000B   158 ; ***TBS***                                                                    ;G:4
                     000B   159 ;-                                                                             ;G:4
                     000B   160                                                                                ;G:4
                     000B   161 ACP$DEACCESS::                          ;DEACCESS ACP FUNCTION PROCESSING      ;G:4
50   0000'8F   3C    000B   162          MOVZWL  #SS$_FILNOTACC,R0      ; FUNCTION NOR SUPPORTED BY SUPERVISOR ;G:4
 00000000'EF   16    0010   163          JSB     L^EXE$ABORTIO          ; ABORT THIS QIO                       ;G:4
```

```
                     0016   165          .SBTTL  DELETE AND MODIFY ACP FUNCTION PROCESSING                    ;G:4
                     0016   166 ;+                                                                           ;G:4
                     0016   167 ; ACP$MODIFY - DELETE AND MODIFY ACP FUNCTION PROCESSING                     ;G:4
                     0016   168 ;                                                                           ;G:4
                     0016   169 ; ***TBS***                                                                 ;G:4
                     0016   170 ;                                                                           ;G:4
                     0016   171 ; INPUTS:                                                                   ;G:4
                     0016   172 ;                                                                           ;G:4
                     0016   173 ;       R0 = SCRATCH.                                                      ;G:4
                     0016   174 ;       R1 = SCRATCH.                                                      ;G:4
                     0016   175 ;       R2 = SCRATCH.                                                      ;G:4
                     0016   176 ;       R3 = ADDRESS OF I/O REQUEST PACKET.                                ;G:4
                     0016   177 ;       R4 = CURRENT PROCESS PCB ADDRESS.                                  ;G:4
                     0016   178 ;       R5 = ASSIGNED DEVICE UCB ADDRESS.                                  ;G:4
                     0016   179 ;       R6 = ADDRESS OF CCB.                                               ;G:4
                     0016   180 ;       R7 = I/O FUNCTION CODE BIT NUMBER.                                 ;G:4
                     0016   181 ;       R8 = FUNCTION DECISION TABLE DISPATCH ADDRESS.                     ;G:4
                     0016   182 ;       R9 = SCRATCH.                                                      ;G:4
                     0016   183 ;       R10 = SCRATCH.                                                     ;G:4
                     0016   184 ;       R11 = SCRATCH.                                                     ;G:4
                     0016   185 ;       AP = ADDRESS OF FIRST FUNCTION DEPENDENT PARAMETER.                ;G:4
                     0016   186 ;                                                                           ;G:4
                     0016   187 ; OUTPUTS:                                                                  ;G:4
                     0016   188 ;                                                                           ;G:4
                     0016   189 ; ***TBS***                                                                 ;G:4
                     0016   190 ;-                                                                          ;G:4
                     0016   191                                                                            ;G:4
                     0016   192 ACP$MODIFY::                         ;DELETE AND MODIFY ACP FUNCTION PROCESSING ;
50   0000'8F   3C   0016   193          MOVZWL  #SS$_FILNOTACC,R0    ; ROUTINE NOT SUPPORTED BY SUPERVISOR ;G:4
 00000000'EF   16   001B   194          JSB     L^EXE$ABORTIO        ; ABORT THIS QIO                      ;G:4
```

```
                                0021          .SBTTL  MOUNT ACP FUNCTION PROCESSING                                   ;G:4
                                0021    ;+                                                                            ;G:4
                                0021    ; ACP$MOUNT - MOUNT ACP FUNCTION PROCESSING                                   ;G:4
                                0021    ;                                                                             ;G:4
                                0021    ; ***TBS***                                                                   ;G:4
                                0021    ;                                                                             ;G:4
                                0021    ; INPUTS:                                                                     ;G:4
                                0021    ;                                                                             ;G:4
                                0021    ;       R0 = SCRATCH.                                                         ;G:4
                                0021    ;       R1 = SCRATCH.                                                         ;G:4
                                0021    ;       R2 = SCRATCH.                                                         ;G:4
                                0021    ;       R3 = ADDRESS OF I/O REQUEST PACKET.                                   ;G:4
                                0021    ;       R4 = CURRENT PROCESS PCB ADDRESS.                                     ;G:4
                                0021    ;       R5 = ASSIGNED DEVICE UCB ADDRESS.                                     ;G:4
                                0021    ;       R6 = ADDRESS OF CCB.                                                  ;G:4
                                0021    ;       R7 = I/O FUNCTION CODE BIT NUMBER.                                    ;G:4
                                0021    ;       R8 = FUNCTION DECISION TABLE DISPATCH ADDRESS.                        ;G:4
                                0021    ;       R9 = SCRATCH.                                                         ;G:4
                                0021    ;       R10 = SCRATCH.                                                        ;G:4
                                0021    ;       R11 = SCRATCH.                                                        ;G:4
                                0021    ;       AP = ADDRESS OF FIRST FUNCTION DEPENDENT PARAMETER.                   ;G:4
                                0021    ;                                                                             ;G:4
                                0021    ; OUTPUTS:                                                                    ;G:4
                                0021    ;                                                                             ;G:4
                                0021    ; ***TBS***                                                                   ;G:4
                                0021    ;-                                                                            ;G:4
                                0021                                                                                  ;G:4
                                0021    ACP$MOUNT::                                     ;MOUNT ACP FUNCTION PROCESSING        ;G:4
50    0000'8F    3C             0021            MOVZWL  #SS$_FILNOTACC,R0               ; FUNCTION NOT SUPPORTED BY SUPERVISOR ;G:4
 00000000'EF    16             0026            JSB     L^EXE$ABORTIO                   ; ABORT THIS QIO                      ;G:4
                                002C            .DSABL  LSB                                                             ;G:4
```

```
                     002C   228          .SBTTL  READ AND WRITE BLOCK ACP FUNCTION PROCESSING                    ;G:4
                     002C   229 ;+                                                                               ;G:4
                     002C   230 ; ACP$READBLK - READ BLOCK ACP FUNCTION PROCESSING                               ;G:4
                     002C   231 ; ACP$WRITEBLK - WRITE BLOCK ACP FUNCTION PROCESSING                             ;G:4
                     002C   232 ;                                                                               ;G:4
                     002C   233 ; ***TBS***                                                                     ;G:4
                     002C   234 ;                                                                               ;G:4
                     002C   235 ; INPUTS:                                                                       ;G:4
                     002C   236 ;                                                                               ;G:4
                     002C   237 ;       R0 = SCRATCH.                                                         ;G:4
                     002C   238 ;       R1 = SCRATCH.                                                         ;G:4
                     002C   239 ;       R2 = SCRATCH.                                                         ;G:4
                     002C   240 ;       R3 = ADDRESS OF I/O REQUEST PACKET.                                   ;G:4
                     002C   241 ;       R4 = CURRENT PROCESS PCB ADDRESS.                                     ;G:4
                     002C   242 ;       R5 = ASSIGNED DEVICE UCB ADDRESS.                                     ;G:4
                     002C   243 ;       R6 = ADDRESS OF CCB.                                                  ;G:4
                     002C   244 ;       R7 = I/O FUNCTION CODE BIT NUMBER.                                    ;G:4
                     002C   245 ;       R8 = FUNCTION DECISION TABLE DISPATCH ADDRESS.                        ;G:4
                     002C   246 ;       R9 = SCRATCH.                                                         ;G:4
                     002C   247 ;       R10 = SCRATCH.                                                        ;G:4
                     002C   248 ;       R11 = SCRATCH.                                                        ;G:4
                     002C   249 ;       AP = ADDRESS OF FIRST FUNCTION DEPENDENT PARAMETER.                   ;G:4
                     002C   250 ;                                                                               ;G:4
                     002C   251 ; OUTPUTS:                                                                      ;G:4
                     002C   252 ;                                                                               ;G:4
                     002C   253 ; ***TBS***                                                                     ;G:4
                     002C   254 ;-                                                                              ;G:4
                     002C   255                                                                                 ;G:4
                     002C   256          .ENABL  LSB                                                           ;G:4
                     002C   257 ACP$READBLK::                                    ;READ BLOCK ACP FUNCTION PROCESSING  ;G:4
  5A   0000'CF   9E  002C   258          MOVAB   W^EXE$READLOCK,R10             ;SET ADDRESS OF READ CHECK AND LOCK ROUTINE
22 34 A5   1E   E1  0031   259          BBC     S^#DEV$V_RCK,UCB$L_DEVCHAR(R5),20$ ;IF CLR, NO DEVICE READ CHECK ;G:
20 A3   4000 8F   A8  0036   260 10$:    BISW    #IO$M_DATACHECK,IRP$W_FUNC(R3) ;SET DATA CHECK ENABLE          ;G:4
           1A   11  003C   261          BRB     20$                            ;                               ;G:4
                    003E   262 ;                                                                               ;G:4
                    003E   263 ; ZERO LENGTH TRANSFER                                                          ;G:4
                    003E   264 ;                                                                               ;G:4
                    003E   265                                                                                 ;G:4
  50   0000'8F   3C  003E   266 15$:    MOVZWL  #SS$_NORMAL,R0                 ;SET NORMAL COMPLETION          ;G:4
   00000000'EF   16  0043   267          JSB     L^EXE$FINISHIOC                ;FINISH I/O OPERATION           ;G:4
                    0049   268                                                                                 ;G:4
                    0049   269 ACP$WRITEBLK::                                   ;WRITE BLOCK ACP FUNCTION PROCESSING ;G:4
46 34 A5   19   E0  0049   270          BBS     S^#DEV$V_SWL,UCB$L_DEVCHAR(R5),60$ ;IF SET, SOFTWARE WRITE LOCKED ;G
  5A   0000'CF   9E  004E   271          MOVAB   W^EXE$WRITELOCK,R10            ;SET ADDRESS OF WRITE CHECK AND LOCK ROUTINE
DE 34 A5   1F   E0  0053   272          BBS     S^#DEV$V_WCK,UCB$L_DEVCHAR(R5),10$ ;IF SET, DEVICE LEVEL WRITE CHECK
      50   6C   D0  0058   273 20$:     MOVL    P1(AP),R0                      ;GET STARTING ADDRESS OF TRANSFER ;G:4
   51    04 AC   3C  005B   274          MOVZWL  P2(AP),R1                      ;GET NUMBER OF BYTES TO TRANSFER ;G:4
           DD   13  005F   275          BEQL    15$                            ;IF EQL ZERO LENGTH TRANSFER    ;G:4
05 34 A5   05   E1  0061   276          BBC     S^#DEV$V_SQD,UCB$L_DEVCHAR(R5),30$ ;IF CLR, NOT SEQUENTIAL DEVICE ;G
      51   0E   D1  0066   277          CMPL    #14,R1                         ;RECORD TOO SHORT?              ;G:4
           1B   14  0069   278          BGTR    45$                            ;IF GTR YES                     ;G:4
           6A   16  006B   279 30$:     JSB     (R10)                          ;CHECK BUFFER AND LOCK IN MEMORY ;G:4
   50    08 AC   D0  006D   280          MOVL    P3(AP),R0                      ;GET STARTING MEDIA ADDRESS     ;G:4
   51    32 A3   3C  0071   281          MOVZWL  IRP$W_BCNT(R3),R1              ;RETRIEVE TRANSFER BYTE COUNT   ;G:4
   3E A3   51   B0  0075   282          MOVW    R1,IRP$W_OBCNT(R3)             ;SET ORIGNINAL BYTE COUNT       ;G:4
      3C A3   B4  0079   283          CLRW    IRP$W_ABCNT(R3)                ;CLEAR ACCUMULATED BYTE COUNT   ;G:4
      06   00   ED  007C   284          CMPZV   #IRP$V_FCODE,#IRP$S_FCODE,- ;LOGICAL OR PHYSICAL I/O FUNCTION? ;G:4
```

```
                2F   20 A3        007F   285                     IRP$W_FUNC(R3),#IO$_LOGICAL ;                                   ;G:4
                     1B   15      0082   286             BLEQ    120$                    ;IF LEQ YES                             ;G:4
                     07   11      0084   287             BRB     50$                     ; Supervisor does not support Virtual   ;G:4
                                  0086   288                                                                                     ;G:4
                                  0086   289 ;                                                                                   ;G:4
                                  0086   290 ; RECORD LENGTH TOO SHORT FOR MAGTAPE TRANSFER                                     ;G:4
                                  0086   291 ;                                                                                   ;G:4
                                  0086   292                                                                                     ;G:4
             50   0000'8F   3C    0086   293 45$:    MOVZWL  #SS$_BADPARAM,R0        ;SET BAD PARAMETER STATUS               ;G:4
                     0C   11      008B   294             BRB     70$                     ;                                       ;G:4
                                  008D   295                                                                                     ;G:4
                                  008D   296 ;                                                                                   ;G:4
                                  008D   297 ; FILE NOT ACCESSED ON CHANNEL                                                      ;G:4
                                  008D   298 ;                                                                                   ;G:4
                                  008D   299                                                                                     ;G:4
             50   0000'8F   3C    008D   300 50$:    MOVZWL  #SS$_FILNOTACC,R0       ;SET FILE NOT ACCESSED                  ;G:4
                     05   11      0092   301             BRB     70$                     ;                                       ;G:4
                                  0094   302                                                                                     ;G:4
                                  0094   303 ;                                                                                   ;G:4
                                  0094   304 ; PRIVILEGE VIOLATION                                                              ;G:4
                                  0094   305 ;                                                                                   ;G:4
                                  0094   306                                                                                     ;G:4
             50   0000'8F   3C    0094   307 60$:    MOVZWL  #SS$_NOPRIV,R0          ;SET NO PRIVILEGE                       ;G:4
              00000000'EF   16    0099   308 70$:    JSB     L^EXE$ABORTIO           ;                                       ;G:4
                                  009F   309                                                                                     ;G:4
              34 A3   50   D0     009F   310 120$:   MOVL    R0,IRP$L_MEDIA(R3)      ;SAVE MEDIA ADDRESS                     ;G:4
                 59   50   7D     00A3   311             MOVQ    R0,R9                   ;SAVE TRANSFER PARAMETERS               ;G:4
           50    0084 C4   D0     00A6   312             MOVL    PCB$L_ARB(R4),R0        ;GET ACCESS RIGHTS BLOCK                ;G:4
             51    1A A5   3C     00AB   313             MOVZWL  UCB$W_VPROT(R5),R1      ;GET VOLUME PROTECTION MASK             ;G:4
             52    1C A5   D0     00AF   314             MOVL    UCB$L_OWNUIC(R5),R2     ;GET VOLUME OWNER UIC                   ;G:4
                 06   00   ED     00B3   315             CMPZV   #IRP$V_FCODE,#IRP$S_FCODE,- ;PHYSICAL I/O FUNCTION?             ;G:4
             1F    20 A3          00B6   316                     IRP$W_FUNC(R3),#IO$_PHYSICAL ;                                  ;G:4
                     28   15      00B9   317             BLEQ    150$                    ;IF LEQ YES                             ;G:4
                     15   A2      00BB   318             SUBW    #IO$_WRITELBLK-IO$_WRITEPBLK,- ;CONVERT TO PHYSICAL I/O FUNCTION ;G:
                     20 A3        00BD   319                     IRP$W_FUNC(R3)          ;                                       ;G:4
           19 34 A5    05   E0     00BF   320             BBS     S^#DEV$V_SQD,UCB$L_DEVCHAR(R5),140$ ;IF SET, SEQUENTIAL DEVICE  ;G:4
                     5A   D7      00C4   321 130$:   DECL    R10                     ;ROUND BYTE COUNT DOWN                  ;G:4
        5A   5A    F7 8F   78     00C6   322             ASHL    #-VA$S_BYTE,R10,R10     ;CONVERT TO BLOCK COUNT                 ;G:4
                 5A   59   C0     00CB   323             ADDL    R9,R10                  ;CALCULATE ENDING BLOCK NUMBER          ;G:4
                     19   1F     00CE   324             BCS     170$                    ;IF CS ILLEGAL BLOCK NUMBER             ;G:4
           0084 C5   5A   D1     00D0   325             CMPL    R10,UCB$L_MAXBLOCK(R5)  ;LEGAL BLOCK NUMBER?                    ;G:4
                     12   1E     00D5   326             BGEQU   170$                    ;IF GEQU NO                             ;G:4
                 50   59   D0     00D7   327             MOVL    R9,R0                   ;RETRIEVE STARTING MEDIA ADDRESS        ;G:4
                    FF23'   30     00DA   328             BSBW    IOC$CVTLOGPHY           ;CONVERT LOGICAL BLOCK TO PHYSICAL ADDRESS ;
                 1800 8F   AA     00DD   329 140$:   BICW    #IO$M_INHERLOG!IO$M_INHSEEK,- ;CLEAR INHIBIT ERROR LOGGING      ;G:4
                    20 A3         00E1   330                     IRP$W_FUNC(R3)          ;AND EXPLICIT SEEK                      ;G:4
              00000000'EF   16     00E3   331 150$:   JSB     L^EXE$QIODRVPKT         ;QUEUE I/O PACKET TO DRIVER             ;G:4
           50   0000'8F   3C     00E9   332 170$:   MOVZWL  #SS$_ILLBLKNUM,R0       ;SET ILLEGAL BLOCK NUMBER STATUS        ;G:4
                     05   11      00EE   333             BRB     190$                    ;                                       ;G:4
           50   0000'8F   3C     00F0   334 180$:   MOVZWL  #SS$_ENDOFFILE,R0       ;SET END OF FILE STATUS                 ;G:4
              00000000'EF   16     00F5   335 190$:   JSB     L^EXE$FINISHIOC         ;FINISH I/O OPERATION                   ;G:4
                                  00FB   336             .DSABL  LSB                                                             ;G:4
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                    00FB   338          .END                                                    ;G:4
```

ACP$ACCESS		00000000	RG	D	01	IRP$Q_NT_PRVMSK		0000003C	D
ACP$ACCESSNET		00000000	RG	D	01	IRP$S_FCODE	=	00000006	D
ACP$DEACCESS		0000000B	RG	D	01	IRP$V_FCODE	=	00000000	D
ACP$MODIFY		00000016	RG	D	01	IRP$W_ABCNT		0000003C	D
ACP$MOUNT		00000021	RG	D	01	IRP$W_BCNT		00000032	D
ACP$READBLK		0000002C	RG	D	01	IRP$W_BOFF		00000030	D
ACP$WRITEBLK		00000049	RG	D	01	IRP$W_CHAN		00000028	D
CCB$B_AMOD		00000009		D		IRP$W_FUNC		00000020	D
CCB$B_STS		00000008		D		IRP$W_OBCNT		0000003E	D
CCB$C_LENGTH		00000010		D		IRP$W_SIZE		00000008	D
CCB$K_LENGTH		00000010		D		IRP$W_STS		0000002A	D
CCB$L_DIRP		0000000C		D		IRP$W_TT_PRMPT		0000003C	D
CCB$L_UCB		00000000		D		MXDESCR	=	00000016	D
CCB$L_WIND		00000004		D		P1	=	00000000	D
CCB$W_IOC		0000000A		D		P2	=	00000004	D
DEV$V_RCK	=	0000001E		D		P3	=	00000008	D
DEV$V_SQD	=	00000005		D		P4	=	0000000C	D
DEV$V_SWL	=	00000019		D		P5	=	00000010	D
DEV$V_WCK	=	0000001F		D		P6	=	00000014	D
EXE$ABORTIO		********	X		01	PCB$B_ASTACT		0000000C	D
EXE$FINISHIOC		********	X		01	PCB$B_ASTEN		0000000D	D
EXE$QIODRVPKT		********	X		01	PCB$B_PRI		0000000B	D
EXE$READLOCK		********	X		01	PCB$B_PRIB		0000002F	D
EXE$WRITELOCK		********	X		01	PCB$B_TYPE		0000000A	D
IO$M_DATACHECK	=	00004000		D		PCB$B_WEFC		0000002E	D
IO$M_INHERLOG	=	00000800		D		PCB$C_LENGTH		0000008C	D
IO$M_INHSEEK	=	00001000		D		PCB$K_LENGTH		0000008C	D
IO$_LOGICAL	=	0000002F		D		PCB$L_ARB		00000084	D
IO$_PHYSICAL	=	0000001F		D		PCB$L_ASTQBL		00000014	D
IO$_WRITELBLK	=	00000020		D		PCB$L_ASTQFL		00000010	D
IO$_WRITEPBLK	=	0000000B		D		PCB$L_EFC2P		00000058	D
IOC$CVTLOGPHY		********	X		01	PCB$L_EFC3P		0000005C	D
IRP$B_CARCON		00000038		D		PCB$L_EFCS		00000050	D
IRP$B_EFN		00000022		D		PCB$L_EFCU		00000054	D
IRP$B_PRI		00000023		D		PCB$L_EFWM		0000004C	D
IRP$B_RMOD		0000000B		D		PCB$L_JIB		00000078	D
IRP$B_TYPE		0000000A		D		PCB$L_OWNER		0000001C	D
IRP$C_LENGTH		0000005C		D		PCB$L_PHD		00000064	D
IRP$K_LENGTH		0000005C		D		PCB$L_PHYPCB		00000018	D
IRP$L_ARB		00000050		D		PCB$L_PID		00000060	D
IRP$L_AST		00000010		D		PCB$L_PQB		0000004C	D
IRP$L_ASTPRM		00000014		D		PCB$L_SQBL		00000004	D
IRP$L_DIAGBUF		00000044		D		PCB$L_SQFL		00000000	D
IRP$L_EXTEND		0000004C		D		PCB$L_STS		00000024	D
IRP$L_IOQBL		00000004		D		PCB$L_UIC		00000088	D
IRP$L_IOQFL		00000000		D		PCB$L_WSSWP		00000020	D
IRP$L_IOSB		00000024		D		PCB$L_WTIME		00000028	D
IRP$L_IOST1		00000034		D		PCB$Q_PRIV		0000007C	D
IRP$L_IOST2		00000038		D		PCB$T_LNAME		00000068	D
IRP$L_MEDIA		00000034		D		PCB$T_TERMINAL		00000044	D
IRP$L_PID		0000000C		D		PCB$W_APTCNT		00000030	D
IRP$L_SEGVBN		00000040		D		PCB$W_ASTCNT		00000038	D
IRP$L_SEQNUM		00000048		D		PCB$W_BIOCNT		0000003A	D
IRP$L_SVAPTE		0000002C		D		PCB$W_BIOLM		0000003C	D
IRP$L_TT_TERM		00000038		D		PCB$W_DIOCNT		0000003E	D
IRP$L_UCB		0000001C		D		PCB$W_DIOLM		00000040	D
IRP$L_WIND		00000018		D		PCB$W_GPGCNT		00000034	D

PCB$W_GRP	0000008A	D		UCB$L_DEVCHAR	00000034	D	
PCB$W_MEM	00000088	D		UCB$L_DEVDEPEND	0000003C	D	
PCB$W_MTXCNT	0000000E	D		UCB$L_DPC	00000080	D	
PCB$W_PPGCNT	00000036	D		UCB$L_DUETIM	0000005C	D	
PCB$W_PRCCNT	00000042	D		UCB$L_DX_BFPNT	0000009C	D	
PCB$W_SIZE	00000008	D		UCB$L_DX_BUF	00000098	D	
PCB$W_STATE	0000002C	D		UCB$L_DX_RXDB	000000A0	D	
PCB$W_TMBU	00000032	D		UCB$L_EMB	00000078	D	
SIZ...	= 00000001	D		UCB$L_FIRST	00000014	D	
SS$_BADPARAM	********	X	01	UCB$L_FPC	0000000C	D	
SS$_ENDOFFILE	********	X	01	UCB$L_FQBL	00000004	D	
SS$_FILNOTACC	********	X	01	UCB$L_FQFL	00000000	D	
SS$_ILLBLKNUM	********	X	01	UCB$L_FR3	00000010	D	
SS$_NOPRIV	********	X	01	UCB$L_FR4	00000014	D	
SS$_NORMAL	********	X	01	UCB$L_IOQBL	00000044	D	
UCB$B_AMOD	00000053	D		UCB$L_IOQFL	00000040	D	
UCB$B_CEX	00000077	D		UCB$L_IRP	0000004C	D	
UCB$B_CM1	0000004A	D		UCB$L_LINK	0000002C	D	
UCB$B_CM2	0000004B	D		UCB$L_LOGADR	00000064	D	
UCB$B_DEVCLASS	00000038	D		UCB$L_MAXBLOCK	00000084	D	
UCB$B_DEVTYPE	00000039	D		UCB$L_MB_MBX	0000007C	D	
UCB$B_DIPL	00000052	D		UCB$L_MB_PORT	0000008C	D	
UCB$B_DX_SCTCNT	000000A6	D		UCB$L_MB_RAST	00000078	D	
UCB$B_ERTCNT	00000070	D		UCB$L_MB_SHB	00000080	D	
UCB$B_ERTMAX	00000071	D		UCB$L_MB_WAST	00000074	D	
UCB$B_FEX	00000076	D		UCB$L_MB_WIOQBL	00000088	D	
UCB$B_FIPL	0000000B	D		UCB$L_MB_WIOQFL	00000084	D	
UCB$B_LOCSRV	0000003C	D		UCB$L_MEDIA	0000008C	D	
UCB$B_OFFNDX	00000094	D		UCB$L_NT_DATSSB	00000074	D	
UCB$B_OFFRTC	00000095	D		UCB$L_NT_INTSSB	00000078	D	
UCB$B_REMSRV	0000003D	D		UCB$L_OPCNT	00000060	D	
UCB$B_SECTORS	0000003C	D		UCB$L_OWNUIC	0000001C	D	
UCB$B_SLAVE	00000074	D		UCB$L_PID	00000028	D	
UCB$B_SPR	00000075	D		UCB$L_RQBL	00000004	D	
UCB$B_STATE	00000052	D		UCB$L_RQFL	00000000	D	
UCB$B_TRACKS	0000003D	D		UCB$L_SVAPTE	00000068	D	
UCB$B_TT_CRFILL	0000009D	D		UCB$L_SVPN	00000064	D	
UCB$B_TT_DECRF	000000A1	D		UCB$L_TT_DECHAR	000000A8	D	
UCB$B_TT_DELFF	000000A2	D		UCB$L_TT_RDUE	0000008C	D	
UCB$B_TT_DESPEE	000000A0	D		UCB$L_TT_RTIMOU	000000B8	D	
UCB$B_TT_DETYPE	000000A4	D		UCB$L_VCB	00000030	D	
UCB$B_TT_LFFILL	0000009E	D		UCB$T_PARTNER	0000000C	D	
UCB$B_TT_SPEED	0000009C	D		UCB$W_BCNT	0000006E	D	
UCB$B_TYPE	0000000A	D		UCB$W_BCR	00000096	D	
UCB$B_VERTSZ	0000003F	D		UCB$W_BOFF	0000006C	D	
UCB$C_LENGTH	00000074	D		UCB$W_BUFQUO	00000018	D	
UCB$C_MB_LENGTH	00000090	D		UCB$W_BYTESTOGO	0000003E	D	
UCB$C_TT_LENGTH	000000BC	D		UCB$W_CHARGE	0000004A	D	
UCB$K_LENGTH	00000074	D		UCB$W_CYLINDERS	0000003E	D	
UCB$K_MB_LENGTH	00000090	D		UCB$W_DA	0000008C	D	
UCB$K_TT_LENGTH	000000BC	D		UCB$W_DC	0000008E	D	
UCB$L_AMB	00000054	D		UCB$W_DEVBUFSIZ	0000003A	D	
UCB$L_ASTQBL	00000010	D		UCB$W_DEVSTS	0000005A	D	
UCB$L_ASTQFL	0000000C	D		UCB$W_DIRSEQ	00000088	D	
UCB$L_CPID	0000005C	D		UCB$W_DSTADDR	00000018	D	
UCB$L_CRB	00000020	D		UCB$W_DX_BCR	000000A4	D	
UCB$L_DDB	00000024	D		UCB$W_ECI	00000090	D	

UCB$W_EC2	00000092	D	VCB$L_USRLBLAST	00000044	D		
UCB$W_ERRCNT	00000072	D	VCB$L_VPBL	00000040	D		
UCB$W_FUNC	0000007E	D	VCB$L_VPFL	0000003C	D		
UCB$W_MB_SEED	00000000	D	VCB$L_WCB	00000038	D		
UCB$W_MSGCNT	00000016	D	VCB$T_QNAME	0000000C	D		
UCB$W_MSGMAX	00000014	D	VCB$T_VOLNAME	00000014	D		
UCB$W_NT_CHAN	0000007C	D	VCB$W_CLUSTER	0000003C	D		
UCB$W_OFFSET	0000008A	D	VCB$W_CUR_NUM	00000024	D		
UCB$W_REFC	00000050	D	VCB$W_CUR_SEQ	00000026	D		
UCB$W_SIZE	00000008	D	VCB$W_EXTEND	0000003E	D		
UCB$W_SRCADDR	0000001A	D	VCB$W_FILEPROT	0000004A	D		
UCB$W_STS	00000058	D	VCB$W_MCOUNT	0000004C	D		
UCB$W_TT_DESIZE	000000A5	D	VCB$W_MODE	0000002C	D		
UCB$W_UNIT	00000048	D	VCB$W_PENDERR	00000062	D		
UCB$W_VPROT	0000001A	D	VCB$W_QUOSIZE	00000060	D		
VA$S_BYTE	= 00000009	D	VCB$W_RECORDSZ	00000050	D		
VCB$B_BLOCKFACT	00000052	D	VCB$W_RVN	0000000E	D		
VCB$B_CUR_RVN	0000002F	D	VCB$W_SIZE	00000008	D		
VCB$B_EOFDELTA	0000004E	D	VCB$W_START_NUM	00000028	D		
VCB$B_IBMAPSIZE	00000038	D	VCB$W_START_SEQ	0000002A	D		
VCB$B_IBMAPVBN	0000003A	D	VCB$W_TRANS	0000000C	D		
VCB$B_LRU_LIM	00000049	D	WCB$B_ACCESS	0000000B	D		
VCB$B_QNAMECNT	0000000B	D	WCB$B_TYPE	0000000A	D		
VCB$B_RESFILES	0000004F	D	WCB$C_LENGTH	00000024	D		
VCB$B_SBMAPSIZE	00000039	D	WCB$C_MAP	00000024	D		
VCB$B_SBMAPVBN	0000003B	D	WCB$K_LENGTH	00000024	D		
VCB$B_STATUS	0000000B	D	WCB$K_MAP	00000024	D		
VCB$B_STATUS2	00000053	D	WCB$L_FCB	00000018	D		
VCB$B_TM	0000002E	D	WCB$L_LBN	00000002	D		
VCB$B_TYPE	0000000A	D	WCB$L_ORGUCB	00000010	D		
VCB$B_WINDOW	00000048	D	WCB$L_P1_LBN	00000026	D		
VCB$C_COMLEN	00000024	D	WCB$L_P2_LBN	0000002C	D		
VCB$C_LENGTH	00000064	D	WCB$L_PID	0000000C	D		
VCB$C_MRKLEN	0000000B	D	WCB$L_PREVLBN	FFFFFFFC	D		
VCB$K_COMLEN	00000024	D	WCB$L_RVT	0000001C	D		
VCB$K_LENGTH	00000064	D	WCB$L_STVBN	00000020	D		
VCB$K_MRKLEN	0000000B	D	WCB$L_WLBL	00000004	D		
VCB$L_AQB	00000010	D	WCB$L_WLFL	00000000	D		
VCB$L_BLOCKBL	00000004	D	WCB$W_ACON	00000014	D		
VCB$L_BLOCKFL	00000000	D	WCB$W_COUNT	00000000	D		
VCB$L_CACHE	00000058	D	WCB$W_NMAP	00000016	D		
VCB$L_CUR_FID	00000024	D	WCB$W_P1_COUNT	00000024	D		
VCB$L_FCBBL	00000004	D	WCB$W_P2_COUNT	0000002A	D		
VCB$L_FCBFL	00000000	D	WCB$W_PREVCOUNT	FFFFFFFA	D		
VCB$L_FREE	00000040	D	WCB$W_REFCNT	0000000E	D		
VCB$L_HOME2LBN	00000028	D	WCB$W_SIZE	00000008	D		
VCB$L_HOMELBN	00000024	D					
VCB$L_IBMAPLBN	00000030	D					
VCB$L_IXHDR2LBN	0000002C	D					
VCB$L_MAXFILES	00000044	D					
VCB$L_MVL	00000034	D					
VCB$L_QUOCACHE	0000005C	D					
VCB$L_QUOTAFCB	00000054	D					
VCB$L_RVT	00000020	D					
VCB$L_SBMAPLBN	00000034	D					
VCB$L_START_FID	00000028	D					
VCB$L_ST_RECORD	00000030	D					

```
                                    +----------------+
                                    ! Psect synopsis !
                                    +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
SEP                             000000FB  (  251.)  01 (  1.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD    WRT NOVEC LONG
$ABS$                           FFFFFFFC  (    0.)  02 (  2.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
ACP$ACCESS	00000000-R	129 (1)	
ACP$ACCESSNET	00000000-R	130 (1)	
ACP$DEACCESS	0000000B-R	161 (1)	
ACP$MODIFY	00000016-R	192 (1)	
ACP$MOUNT	00000021-R	223 (1)	
ACP$READBLK	0000002C-R	257 (1)	
ACP$WRITEBLK	00000049-R	269 (1)	
DEV$V_RCK	=0000001E		#-259 (1)
DEV$V_SQD	=00000005		#-276 (1) #-320 (1)
DEV$V_SWL	=00000019		#-270 (1)
DEV$V_WCK	=0000001F		#-272 (1)
EXE$ABORTIO	00000000-XR		132 (1) 163 (1) 194 (1) 225 (1)
			308 (1)
EXE$FINISHIOC	00000000-XR		267 (1) 335 (1)
EXE$QIODRVPKT	00000000-XR		331 (1)
EXE$READLOCK	00000000-XR		258 (1)
EXE$WRITELOCK	00000000-XR		271 (1)
IO$M_DATACHECK	=00004000		#-260 (1)
IO$M_INHERLOG	=00000800		#-329 (1)
IO$M_INHSEEK	=00001000		#-329 (1)
IO$_LOGICAL	=0000002F		#-285 (1)
IO$_PHYSICAL	=0000001F		#-316 (1)
IO$_WRITELBLK	=00000020		#-318 (1)
IO$_WRITEPBLK	=0000000B		#-318 (1)
IOC$CVTLOGPHY	00000000-XR		#-328 (1)
IRP$L_MEDIA	00000034		#-310 (1)
IRP$S_FCODE	=00000006		#-284 (1) #-315 (1)
IRP$V_FCODE	=00000000		#-284 (1) #-315 (1)
IRP$W_ABCNT	0000003C		#-283 (1)
IRP$W_BCNT	00000032		#-281 (1)
IRP$W_FUNC	00000020		#-260 (1) 285 (1) 316 (1) #-319 (1)
			#-330 (1)
IRP$W_OBCNT	0000003E		#-282 (1)
MXDESCR	=00000016	98 (1)	
P1	=00000000	87 (1)	#-273 (1)
P2	=00000004	88 (1)	#-274 (1)
P3	=00000008	89 (1)	#-280 (1)
P4	=0000000C	90 (1)	
P5	=00000010	91 (1)	
P6	=00000014	92 (1)	
PCB$L_ARB	00000084		#-312 (1)
SS$_BADPARAM	00000000-XR		#-293 (1)
SS$_ENDOFFILE	00000000-XR		#-334 (1)
SS$_FILNOTACC	00000000-XR		#-131 (1) #-162 (1) #-193 (1) #-224 (1)
			#-300 (1)
SS$_ILLBLKNUM	00000000-XR		#-332 (1)
SS$_NOPRIV	00000000-XR		#-307 (1)
SS$_NORMAL	00000000-XR		#-266 (1)
UCB$L_DEVCHAR	00000034		259 (1) 270 (1) 272 (1) 276 (1)
			320 (1)

```
UCB$L_MAXBLOCK                  00000084                  #-325    (1)
UCB$L_OWNUIC                    0000001C                  #-314    (1)
UCB$W_VPROT                     0000001A                  #-313    (1)
VA$S_BYTE                      =00000009                  #-322    (1)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.03	00:00:00.19
Command processing	901	00:00:00.27	00:00:01.17
Pass 1	786	00:00:03.28	00:00:04.37
Symbol table sort	0	00:00:00.31	00:00:00.29
Pass 2	84	00:00:00.81	00:00:01.49
Symbol table output	2	00:00:00.04	00:00:00.23
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	3	00:00:00.03	00:00:00.06
Assembler run totals	1805	00:00:04.77	00:00:07.80

```
The working set limit was 2400 pages.
198028 bytes (387 pages) of virtual memory were used to buffer the intermediate code.
There were 60 pages of symbol table space allocated to hold 1161 non-local and 15 local symbols.
338 source lines were read in Pass 1, producing 73 object records in Pass 2.
24 pages of virtual memory were used to define 23 macros.
```

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	9
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	2
SYS$COMMON:[SYSLIB]STARLET.MLB;2	8
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	19

```
1544 GETS were required to define 19 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element ANSI.B32
;    0002  0      ! *3    12-MAY-1986 09:52:33 BARANSKI "Cleaning up Object Libraries."
;    0003  0      ! *2     7-MAY-1986 12:59:31 BARANSKI "Documentation Check."
;    0004  0      ! *1     6-FEB-1986 15:13:24 DS ""
;    0005  0      ! DEC/CMS REPLACEMENT HISTORY, Element ANSI.B32
;    0006  0      %title '*** ANSI magtape RMS support'
;    0007  0      module ansi (                                   ! Routines to handle Magtape
;    0008  0                   ident = '7.0-7'                                              !G:3
;    0009  0                   ) =
;    0010  0      !
;    0011  0      ! COPYRIGHT (c) 1980, 1981, 1984
;    0012  0      ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
;    0013  0      !
;    0014  0      ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
;    0015  0      ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
;    0016  0      ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
;    0017  0      ! MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
;    0018  0      ! EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
;    0019  0      ! TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
;    0020  0      ! REMAIN IN DEC.
;    0021  0      !
;    0022  0      ! THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
;    0023  0      ! AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
;    0024  0      ! CORPORATION.
;    0025  0      !
;    0026  0      ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
;    0027  0      ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
;    0028  0
;    0029  0      !++
;    0030  0      ! FACILITY: DIAGNOSTIC SUPERVISOR
;    0031  0      !
;    0032  0      ! ABSTRACT:
;    0033  0      !
;    0034  0      !       These modules simulate the function of the respective
;    0035  0      !       RMS functions.
;    0036  0      !
;    0037  0      ! AUTHOR:       Roger Riggs, CREATION DATE: 10-November-1979
;    0038  0      !
;    0039  0      ! MODIFIED BY:
;    0040  0      !
;    0041  0      !                   Dave Butenhof, 07-oct-1980, version 6.1
;    0042  0      !       01          To allow support of magtape directory command which will
;    0043  0      !                   function in standalone or user mode, support minimal level
;    0044  0      !                   of wildcarding.  "*" means open next file on tape, return
;    0045  0      !                   full file name in NAM block if any.  There is no wildcard
;    0046  0      !                   context of any sort; the caller must remember the first
;    0047  0      !                   file it found, and exit the wildcard loop when that name
;    0048  0      !                   is repeated.  This is for Supervisor use only and will not
;    0049  0      !                   be documented outside the program listings of ANSI and
;    0050  0      !                   DIRECTORY.
;    0051  0      !                                                                        !G:2
;    0052  0      !       02          Support version numbers
;    0053  0      !                   Roger Riggs, 22-oct-1980
;    0054  0      !                                                                        !G:2
;    0055  0      !       03          Added code to implement FAB$V_RWO rewind on open.
;    0056  0      !                   The magtape is rewound before the search for the file begins.
;    0057  0      !                   also added to code to issue IO$_drvclr before first operation.
```

```
0   !                                                                                    !G:2
0   !                - Dave Butenhof, 02-Jun-1981, version 6.4                           !G:2
0   !        04      Fix library specifications, use $DS, $DIAG logical names for
0   !                flexibility.
0   !
0   !        05      - Jack Stansbury, 28-Oct-1981, Version 6.-
0   !                Changed the PSECT declarations to take out the SEP PSECT.
0   !
0   !        06      Bob Bergazzi    May 14, 1984    Version 7.0
0   !                Fixed the compiler warning from BLISS released with VMS 4.0.
0   !                This occurred at the redeclaration of BOO$QIO with the CALL_BOO
0   !                linkage in routine ANSI$OPEN.
0   !
0   !        07      Bob Bergazzi    May 25, 1984    Version 7.0
0   !                Added support for VMS V4 long filenames using HDR4 labels.
0   !-
0
1   begin
1   !
1   ! include files:
1   !
1
1   library '$diag';                !
1
1   library '$ds';                  !
1
1   library 'sys$library:lib';
1
1   linkage
1       jsb = jsb,
1       jsb_scan = jsb (register = 3, register = 4, register = 5) : nopreserve (2),
1       get_block = call ( ;register = 2) : global (cblock = 9, fab = 11);  !
1
1   !
1   ! table of contents:
1   !
1
1   forward routine
1       ansi$open : call_rms addressing_mode (long_relative),       !Open file on magtape
1       ansi$close : call_rms addressing_mode (long_relative),      !Close file on magtape
1       ansi$read : call_rms addressing_mode (long_relative),       !Read block(s) from magtape
1       ansi$get : call_rms addressing_mode (long_relative),        !Get record from magtape
1       get_block_length : get_block addressing_mode (long_relative);!Do a BOO$QIO, returning block length
1
1   !
1   ! macros
1   !
1
1
1   !
1   ! external references:
1   !
1
1   external routine
1       scan$numeric : jsb_scan addressing_mode (long_relative),
1       kb_check : jsb addressing_mode (long_relative),
1       rms$alloc_cache : jsb_cblock addressing_mode (long_relative);
```

```
;    0115  1
;    0116  1     !
;    0117  1     ! psect definitions:
;    0118  1     !
;    0119  1
;    0120  1     PSECT                                                   !                       [05]
;    0121  1         Plit    = Data (NoExecute, Share, NoWrite,          !                       [05]
;    0122  1                         Addressing_Mode (Long_Relative));   !                       [05]
;    0123  1
;    0124  1     PSECT                                                   !                       [05]
;    0125  1         Code    = Code (Execute, Share, NoWrite,            !                       [05]
;    0126  1                         Addressing_Mode (Long_Relative));   !                       [05]
;    0127  1
;    0128  1     PSECT                                                   !                       [05]
;    0129  1         Own     = Work (NoExecute, NoShare, Write,          !                       [05]
;    0130  1                         Addressing_Mode (Long_Relative));   !                       [05]
;    0131  1
;    0132  1     PSECT                                                   !                       [05]
;    0133  1         Global  = Work (NoExecute, NoShare, Write,          !                       [05]
;    0134  1                         Addressing_Mode (Long_Relative));   !                       [05]
```

```
;    0136  1      %sbttl 'ansi$open'
;    0137  1
;    0138  1      global routine ansi$open : call_rms =
;    0139  1
;    0140  1      !++
;    0141  1      ! Functional description:
;    0142  1      !
;    0143  1      !       This routine is responsible for locating the file specified
;    0144  1      !       by the FAB on the magtape specified.  It will search forward
;    0145  1      !       from the current tape position to locate the file.
;    0146  1      !       When a HDR1 record is found the file name is checked,
;    0147  1      !       if the filename matches the rest of the header are skiped.
;    0148  1      !       When a EOF1 record is found the file name is checked,
;    0149  1      !       if the filename matches the tape is backspaced to the start of the data
;    0150  1      !       If at the beginning of the wrong file the entire file is skiped.
;    0151  1      !       If the incorrect file is the same as the first file found when the
;    0152  1      !       search began RMS$_FNF is returned.
;    0153  1      !
;    0154  1      !       If double tape marks are found instead of a file header the
;    0155  1      !       tape is rewound and the search continued until end of tape is
;    0156  1      !       encountered again, when file not found is returned.
;    0157  1      !
;    0158  1      !       For the correct file the entire file is read to determine it length.
;    0159  1      !       The first two blocks read from the tape are saved in the cache
;    0160  1      !       to reduce the amount of positioning for small files.
;    0161  1      !       The current tape position within a file is maintained as TAPEPOS.
;    0162  1      !
;    0163  1      !       If the FAB$V_RWO bit is set in the FAB the tape is rewound before
;    0164  1      !       the search begins
;    0165  1      !
;    0166  1      ! Formal parameters:    none
;    0167  1      !
;    0168  1      ! Implicit inputs:
;    0169  1      !
;    0170  1      !       FAB     Address of related FAB
;    0171  1      !       cblock  Address of per-file context area
;    0172  1      !
;    0173  1      ! Implicit outputs:
;    0174  1      !
;    0175  1      !       FAB     Various fields updated to reflect the file found
;    0176  1      !       cblock  Various fileds updated to reflect the file found
;    0177  1      !
;    0178  1      ! Routine value:
;    0179  1      !
;    0180  1      !       Standard RMS completion codes
;    0181  1      !
;    0182  1      ! Side effects:
;    0183  1      !
;    0184  1      !       The device and associated channel are accessed
;    0185  1      !
;    0186  1      !--
;    0187  1
;    0188  2          BEGIN
;    0189  2
;    0190  2          literal
;    0191  2              true = 1,                                   !Truth
;    0192  2              false = 0,                                  !Falsity
```

```
;    0193  2            end_of_pass1 = 1,                        !Set if end of tape encountered once
;    0194  2            end_of_file = 2;                         !Set if end of file sensed on previous read
;    0195  2
;    0196  2        local
;    0197  2            version,                                 ! Version number in file name
;    0198  2            tapeversion,                             ! Version number in hdr1 block
;    0199  2            flag : bitvector [32],                   !Contains flag bits
;    0200  2            hdr1 : block [80, byte],                 !Contains HDR1 record
;    0201  2            hdr2 : block [80, byte],                 !Contains HDR2 record
;    0202  2            hdr4 : block [80, byte],                 !Contains HDR3 or HDR4 record                          [07]
;    0203  2            first1 : vector [80, byte],              !Contains first HDR1 record found
;    0204  2            filename : vector [132, byte];           !expected filename in HDR1 label
;    0205  2
;    0206  2        external register
;    0207  2            fab = 11 : ref $fab_decl,                !Base of FAB
;    0208  2            cblock = 9 : ref block [, byte];         !Base of common area
;    0209  2
;    0210  2        external routine                             !                                      [06]
;    0211  2            get_block_length : get_block addressing_mode (long_relative),   !BOO$QIO that returns block_length      [06]
;    0212  2            boo$qio : addressing_mode (long_relative);     !                               [06]
;    0213  2
;    0214  2        bind
;    0215  2            status = fab [fab$l_stv];                !Return value from boo$qio
;    0216  2
;    0217  2    !
;    0218  2    ! Initialize dispatch addresses
;    0219  2    !
;    0220  2        cblock [ctl$l_get] = ansi$get;
;    0221  2        cblock [ctl$l_read] = ansi$read;
;    0222  2        cblock [ctl$l_close] = ansi$close;
;    0223  2    !+
;    0224  2    ! convert the file name in the control region into the format
;    0225  2    ! expected for comparison with HDR1 labels.
;    0226  2    ! note that the version number is ignored.
;    0227  2    !-
;    0228  3        begin
;    0229  3
;    0230  3        local
;    0231  3            len,
;    0232  3            verlen,
;    0233  3            veradr,
;    0234  3            adr;                                     !Length and address of current segment
;    0235  3
;    0236  3        adr = ch$find_ch (.cblock [ctl$w_file_len], .cblock [ctl$l_file_ptr], %C']') + 1;
;    0237  3        veradr = ch$find_ch (.cblock [ctl$w_file_len], .cblock [ctl$l_file_ptr], %C';');
;    0238  3        len = .veradr - .adr;                        ! Calculate length of <name>.<type>
;    0239  3        veradr = .veradr + 1;                        ! Address of version (after ";")
;    0240  3        verlen = .cblock [ctl$w_file_len] - (.veradr - .cblock [ctl$l_file_ptr]);   ! Length of rest of name
;    0241  3        version = scan$numeric (10, .verlen, .veradr);      ! Convert ascii to binary
;    0242  3        ch$fill (' ', 132, filename);
;    0243  3        ch$move (.len, .adr, filename);
;    0244  2        end;
;    0245  2        flag = false;
;    0246  2        first1 [0] = 0;                              !Clear first character
;    0247  2
;    0248  3        if not (status = boo$qio (0, 0, 0, io$_drvclr, 0, .cblock [ctl$l_rpb]))
;    0249  2        then return .status;
```

```
;    0250  2
;    0251  2          if .fab [fab$v_rwo]
;    0252  2          then
;    0253  3              begin
;    0254  4              if not (status = boo$qio (0, 0, 0, io$_rewind, 0, .cblock [ctl$l_rpb]))
;    0255  3              then return .status;
;    0256  2              end;
;    0257  2
;    0258  2          until 0 do
;    0259  3              begin
;    0260  3              kb_check ();                                !Check for ^C
;    0261  3              status = boo$qio (hdr1, 80, 0, io$_readlblk, 0, .cblock [ctl$l_rpb]);
;    0262  3
;    0263  3              selectone .status of
;    0264  3                  set
;    0265  3
;    0266  3                  [ss$_normal] :
;    0267  4                      begin
;    0268  4                      flag [end_of_file] = false;
;    0269  4
;    0270  4                      if ((.hdr1 eql %ascii'EOF1') or (.hdr1 eql %ascii'HDR1')) and
;    0271  5                          begin
;    0272  5                          tapeversion = (scan$numeric (10, 4, hdr1 [hd1$t_genno]) - 1)*100 + scan$numeric (10, 2,
;    0273  5                              hdr1 [hd1$t_genver]) + 1;       ! Calculate version number
;    0274  7                          if ((ch$compare (17, filename, 17, hdr1 [hd1$t_fileid], 0) eql 0) or (.filename [0] eql %c
;    0275  6                              '*' and .hdr1 eql %ascii'HDR1')) and (.tapeversion eql .version or .version eql 0)
;    0276  6                              then begin
;    0277  6                                  status = boo$qio (hdr2, 80, 0, io$_readlblk, 0, .cblock [ctl$l_rpb]);
;    0278  6                                  if not .status then return rms$_rer;
;    0279  6
;    0280  6                                  status = boo$qio (hdr4, 80, 0, io$_readlblk, 0, .cblock [ctl$l_rpb]);      ! Really
;    0281  6                                  if not .status then return rms$_rer;                                       ! reads HDR3
;    0282  6
;    0283  6                                  status = boo$qio (hdr4, 80, 0, io$_readlblk, 0, .cblock [ctl$l_rpb]);      ! Reads HDR4
;    0284  6
;    0285  7                                  if ((.filename [0] eql %c'*') and (.version eql 0))                        ! If wildcar
;    0286  6                                     then true                                                               !
;    0287  6                                     else if .status eql ss$_endoffile                                       ! EOF means
;    0288  6                                             then true                                                       ! no HDR4
;    0289  6                                             else if not .status                                             ! Error whic
;    0290  6                                                     then return rms$_rer                                    ! is not EOF
;    0291  6                                                     else if .hdr4 [hd4$b_fileid_ext_size] eql 0     ! Filename fits in H
;    0292  6                                                             then true                                       !
;    0293  6                                                             else             ! Compare the rest of the filename in HDR4
;    0294  6                                                                  if ch$compare (.hdr4 [hd4$b_fileid_ext_size],      !
;    0295  6                                                                                 filename [17],                     !
;    0296  6                                                                                 .hdr4 [hd4$b_fileid_ext_size],     !
;    0297  6                                                                                 hdr4 [hd4$t_fileid_ext], 0) eql 0 !
;    0298  6                                                                      then true                                     !
;    0299  6                                                                      else false                                    !
;    0300  6                                  end
;    0301  5                          else false
;    0302  5                      end
;    0303  4              then
;    0304  5                  begin
;    0305  5
;    0306  5                  local
```

```
;    0307  5                          block_length;
;    0308  5
;    0309  5      !
;    0310  5      ! KLUGE:
;    0311  5      !       This module does NOT actually support $NAM block.  However, if one
;    0312  5      !       is present, it will copy the "resultant name string" into the RSA
;    0313  5      !       field.  This supports the DS "Directory" command and has no other
;    0314  5      !       purpose.
;    0315  5      !
;    0316  5
;    0317  5                          if .fab [fab$l_nam] neq 0
;    0318  5                          then
;    0319  6                              begin
;    0320  6
;    0321  6                              bind
;    0322  6                                  phynam = .cblock [ctl$l_ptable] : bblock,
;    0323  6                                  nam = .fab [fab$l_nam] : bblock;
;    0324  6
;    0325  6                              local
;    0326  6                                  blank,
;    0327  6                                  dev : bblock [dsc$c_s_bln],
;    0328  6                                  file : bblock [dsc$c_s_bln],
;    0329  6                                  longfile : bblock [dsc$c_s_bln],                                    !       [07]
;    0330  6                                  a : bblock [dsc$c_s_bln];
;    0331  6
;    0332  6                              a [dsc$w_length] = .nam [nam$b_rss];
;    0333  6                              a [dsc$a_pointer] = .nam [nam$l_rsa];
;    0334  6                              dev [dsc$a_pointer] = .phynam [dsc$a_pointer] + 1;      ! Trim off "_"
;    0335  6                              dev [dsc$w_length] = .phynam [dsc$w_length] - 1;
;    0336  6                              file [dsc$a_pointer] = hdr1 [hd1$t_fileid];
;    0337  6                              blank = ch$find_ch (17, hdr1 [hd1$t_fileid], %c' ');
;    0338  6                              file [dsc$w_length] = (if .blank eql 0 then 17 else .blank - hdr1 [hd1$t_fileid]);
;    0339  6                              longfile [dsc$a_pointer] = hdr4 [hd4$t_fileid_ext];                 !       [07]
;    0340  7                              if ((.hdr4 eql %ascii'HDR4') or (.hdr4 eql %ascii'EOF4'))           !       [07]
;    0341  6                                 then longfile [dsc$w_length] = .hdr4 [hd4$b_fileid_ext_size]     !       [07]
;    0342  6                                 else longfile [dsc$w_length] = 0;                                !       [07]
;    0343  6                              $fao ($ascid ('!AS:!AS!AS;!ZL'), a, a, dev, file, longfile, .tapeversion);      !       [07]
;    0344  6                                                  ! Convert version to ascii
;    0345  6                              nam [nam$b_rsl] = .a [dsc$w_length]
;    0346  5                              end;
;    0347  5
;    0348  5                          if .hdr1 eql %ascii'HDR1'
;    0349  6                          then begin                                                              !       [07]
;    0350  6                               if .hdr4 eql %ascii'HDR4'      ! At start of file, skip leading EOF        [07]
;    0351  7                                  then begin                  ! Already there if pre-VMS V4 tape          [07]
;    0352  7                                       status = boo$qio (1, 0, 0, io$_skipfile, 0, .cblock [ctl$l_rpb]);
;    0353  7                                       if not .status then return rms$_rer
;    0354  7                                       end
;    0355  6                               end
;    0356  6                          else begin                          ! at end of file, backover trailers and data
;    0357  6                               if .hdr4 neq %ascii'EOF4'      ! Backup an extra tape mark                 [07]
;    0358  7                                  then begin                                                   !       [07]
;    0359  7                                       status = boo$qio (-1, 0, 0, io$_skipfile, 0, .cblock [ctl$l_rpb]);     !       [07]
;    0360  7                                       if not .status then return rms$_rer                    !       [07]
;    0361  6                                       end;                                                   !       [07]
;    0362  6
;    0363  6                              status = boo$qio (-1, 0, 0, io$_skipfile, 0, .cblock [ctl$l_rpb]);
```

```
;    0364  6
;    0365  6                        if not .status then return rms$_rer;
;    0366  6
;    0367  6                        status = boo$qio (-1, 0, 0, io$_skipfile, 0, .cblock [ctl$l_rpb]);
;    0368  6
;    0369  6                        if not .status then return rms$_rer;
;    0370  6
;    0371  6                        status = boo$qio (1, 0, 0, io$_skipfile, 0, .cblock [ctl$l_rpb]);
;    0372  6
;    0373  6                        if not .status then return rms$_rer;
;    0374  6
;    0375  5                        end;
;    0376  5
;    0377  5                    if .(hdr2 [hd2$t_recatr1]) neq %ascii'    '
;    0378  5                    then
;    0379  6                        begin
;    0380  6
;    0381  6                        bind
;    0382  6                            fat = hdr2 [hd2$t_recatr1] : block [fat$c_length, byte];
;    0383  6
;    0384  6                        fab [fab$b_rat] = .fat [fat$b_rattrib];
;    0385  6                        fab [fab$b_rfm] = .fat [fat$v_rtype];
;    0386  6                        fab [fab$b_fsz] = .fat [fat$b_vfcsize];
;    0387  6                        fab [fab$w_mrs] = .fat [fat$w_maxrec];
;    0388  6                        end
;    0389  5                    else
;    0390  6                        begin
;    0391  6
;    0392  6                        selectone .hdr2 [hd2$b_recformat] of
;    0393  6                            set
;    0394  6
;    0395  6                            [%c'F'] :
;    0396  7                                begin
;    0397  7                                fab [fab$b_rfm] = fab$c_fix;
;    0398  7                                fab [fab$w_mrs] = scan$numeric (10, 5, hdr2 [hd2$t_reclen]);
;    0399  6                                end;
;    0400  6
;    0401  6                            [%c'D'] :
;    0402  7                                begin
;    0403  7                                fab [fab$b_rfm] = fab$c_var;
;    0404  7                                fab [fab$w_mrs] = scan$numeric (10, 5, hdr2 [hd2$t_reclen]) - 4;
;    0405  6                                end;
;    0406  6
;    0407  6                            [otherwise] :
;    0408  6                                return rms$_org;
;    0409  6                            tes;
;    0410  6
;    0411  6                        selectone .hdr2 [hd2$b_formcntrl] of
;    0412  6                            set
;    0413  6
;    0414  6                            [%c'A'] :
;    0415  6                                fab [fab$b_rat] = fab$m_ftn;
;    0416  6
;    0417  6                            [%c' '] :
;    0418  6                                fab [fab$b_rat] = fab$m_cr;
;    0419  6
;    0420  6                            [otherwise] :
```

```
;    0421  6                                    fab [fab$b_rat] = 0;
;    0422  6                                tes;
;    0423  6
;    0424  5                                end;
;    0425  5
;    0426  6                            if not (status = rms$alloc_cache ((scan$numeric (10, 5, hdr2 [hd2$t_blocklen]) + 511)/512
;    0427  6                                ))
;    0428  5                            then
;    0429  5                                return rms$_dme;
;    0430  5
;    0431  5                            cblock [ctl$l_eofvbn] = 0;
;    0432  5                            cblock [ctl$w_offbyte] = 0;
;    0433  5                            cblock [ctl$l_lvbn] = cblock [ctl$l_hvbn] = 1;
;    0434  5                            cblock [ctl$l_tapepos] = 1;
;    0435  5
;    0436  5                            while get_block_length( ;block_length) do           !                                   [06]
;    0437  6                                begin
;    0438  6
;    0439  6                                bind
;    0440  6                                    size = cblock [ctl$w_cache_size] : word;
;    0441  6
;    0442  6                                if .cblock [ctl$l_tapepos] eql 1
;    0443  6                                then
;    0444  7                                    begin
;    0445  7
;    0446  7                                    local
;    0447  7                                        tmp;
;    0448  7
;    0449  7                                    tmp = .cblock [ctl$l_cache3];
;    0450  7                                    cblock [ctl$l_cache3] = .cblock [ctl$l_cache1];
;    0451  7                                    cblock [ctl$l_cache1] = .tmp;
;    0452  7                                    cblock [ctl$l_hvbn] = .size + 1;
;    0453  6                                    end;
;    0454  6
;    0455  6                                if .cblock [ctl$l_tapepos] eql .size + 1
;    0456  6                                then
;    0457  7                                    begin
;    0458  7
;    0459  7                                    local
;    0460  7                                        tmp;
;    0461  7
;    0462  7                                    tmp = .cblock [ctl$l_cache3];
;    0463  7                                    cblock [ctl$l_cache3] = .cblock [ctl$l_cache2];
;    0464  7                                    cblock [ctl$l_cache2] = .tmp;
;    0465  7                                    cblock [ctl$l_hvbn] = .size^1 + 1;
;    0466  6                                    end;
;    0467  6
;    0468  6                                cblock [ctl$l_tapepos] = .cblock [ctl$l_tapepos] + .size;
;    0469  6                                cblock [ctl$l_eofvbn] = ((.cblock [ctl$l_eofvbn] + .size - 1) and not (.size - 1)) +
;    0470  6                                ((.block_length + 511)^-9);
;    0471  6                                cblock [ctl$w_offbyte] = .block_length and 511;
;    0472  5                                end;
;    0473  5
;    0474  5                            cblock [ctl$l_eofvbn] = .cblock [ctl$l_eofvbn] + 1;
;    0475  5                            status = boo$qio (-1, 0, 0, io$_skipfile, 0, .cblock [ctl$l_rpb]);
;    0476  5
;    0477  5                            if not .status then return rms$_rer;
```

```
;    0478  5
;    0479  5                        Return RMS$_normal
;    0480  5                        end
;    0481  4                    else
;    0482  5                        begin                        ! Not correct file
;    0483  5
;    0484  5                        if .hdr1 eql 'HDR1'          ! If at start of file skip whole file
;    0485  5                        then
;    0486  6                            begin
;    0487  6
;    0488  6                            if ch$compare (80, hdr1, 80, first1, 0) eql 0
;    0489  6                            then
;    0490  7                                begin
;    0491  7                                if .hdr4 eql %ascii'HDR4'                                    !       [07]
;    0492  8                                    then begin                                               !       [07]
;    0493  8                                         status = boo$qio (-1, 0, 0, io$_skiprecord, 0, .cblock [ctl$l_rpb]); !       [07]
;    0494  8                                         if not .status then return rms$_rer;                !       [07]
;    0495  8                                         end                                                 !       [07]
;    0496  8                                    else begin                          ! Must be pre-VMS V4 tape (no HDR4)      [07]
;    0497  8                                         status = boo$qio (-1, 0, 0, io$_skipfile, 0, .cblock [ctl$l_rpb]); !       [07]
;    0498  8                                         if not .status then return rms$_rer;                !       [07]
;    0499  7                                         end;                                                !       [07]
;    0500  7                                status = boo$qio (-1, 0, 0, io$_skiprecord, 0, .cblock [ctl$l_rpb]);         !       [07]
;    0501  7                                if not .status then return rms$_rer;                         !       [07]
;    0502  7                                status = boo$qio (-1, 0, 0, io$_skiprecord, 0, .cblock [ctl$l_rpb]);         !       [07]
;    0503  7                                if not .status then return rms$_rer;                         !       [07]
;    0504  7                                status = boo$qio (-1, 0, 0, io$_skiprecord, 0, .cblock [ctl$l_rpb]);
;    0505  7                                if not .status then return rms$_rer;
;    0506  7                                return rms$_fnf;
;    0507  7                                end
;    0508  6                            else
;    0509  6
;    0510  6                                if .first1 [0] eql 0 then ch$move (80, hdr1, first1);
;    0511  6
;    0512  6                                if .hdr4 eql %ascii'HDR4'                                    !       [07]
;    0513  7                                   then begin                                                !       [07]
;    0514  7                                        status = boo$qio (1, 0, 0, io$_skipfile, 0, .cblock [ctl$l_rpb]);
;    0515  7                                        if not .status then return rms$_rer;
;    0516  6                                        end;
;    0517  6
;    0518  6                                status = boo$qio (1, 0, 0, io$_skipfile, 0, .cblock [ctl$l_rpb]);
;    0519  6
;    0520  6                                if not .status then return rms$_rer;
;    0521  6
;    0522  6                                status = boo$qio (1, 0, 0, io$_skipfile, 0, .cblock [ctl$l_rpb]);
;    0523  6
;    0524  6                                if not .status then return rms$_rer;
;    0525  6
;    0526  6                                flag [end_of_file] = true;
;    0527  5                                end;
;    0528  5
;    0529  4                            end;
;    0530  4
;    0531  3                        end;
;    0532  3
;    0533  3                    [ss$_dataoverun] :
;    0534  4                        begin
```

```
;    0535  4                    status = boo$qio (1, 0, 0, io$_skipfile, 0, .cblock [ctl$l_rpb]);
;    0536  4
;    0537  4                    if not .status then return rms$_rer;
;    0538  4
;    0539  4                    flag [end_of_file] = false;
;    0540  3                    end;
;    0541  3
;    0542  3                [ss$_endoffile] :
;    0543  4                    begin
;    0544  4
;    0545  4                    if .flag [end_of_file]
;    0546  4                    then
;    0547  5                        begin
;    0548  5                        status = boo$qio (0, 0, 0, io$_rewind, 0, .cblock [ctl$l_rpb]);
;    0549  5                        flag [end_of_file] = false;
;    0550  5
;    0551  5                        if .flag [end_of_pass1] then return rms$_fnf else flag [end_of_pass1] = true;
;    0552  5
;    0553  5                        end
;    0554  4                    else
;    0555  4                        flag [end_of_file] = true;
;    0556  4
;    0557  3                    end;
;    0558  3
;    0559  3                [otherwise] :
;    0560  3                    return rms$_rer;
;    0561  3                tes;
;    0562  3
;    0563  2                end;
;    0564  2
;    0565  2            ss$_normal
;    0566  1            END;


                                                        .TITLE  ANSI *** ANSI magtape RMS support
                                                        .IDENT  \7.0-7\

                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

4C 5A 21 3B 53 41 21 53 41 21 3A 53 41 21  00000 P.AAB:  .ASCII  \!AS:!AS!AS;!ZL\                    ;
                                           0000E        .BLKB   2
                                    0000000E  00010 P.AAA:  .LONG   14                               ;
                                    00000000' 00014        .ADDRESS P.AAB                           ;

                                                        .EXTRN  SCAN$NUMERIC, KB_CHECK
                                                        .EXTRN  RMS$ALLOC_CACHE
                                                        .EXTRN  GET_BLOCK_LENGTH
                                                        .EXTRN  BOO$QIO, SYS$FAO

                                                        .PSECT  CODE,NOWRT,  SHR,2

                                        05FC 00000      .ENTRY  ANSI$OPEN, Save R2,R3,R4,R5,R6,R7,R8,R10    ; 0138
                              5E     FE14   CE  9E 00002  MOVAB   -492(SP), SP                          ;
                              56       0C   AB  9E 00007  MOVAB   12(FAB), R6                          ; 0215
                        0C    A9 00000000V  EF  9E 0000B  MOVAB   ANSI$GET, 12(CBLOCK)                 ; 0220
                        10    A9 00000000V  EF  9E 00013  MOVAB   ANSI$READ, 16(CBLOCK)                ; 0221
                        14    A9 00000000V  EF  9E 0001B  MOVAB   ANSI$CLOSE, 20(CBLOCK)               ; 0222
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                        4C   B9        48   A9        5D   8F   3A 00023          LOCC    #93, 72(CBLOCK), a76(CBLOCK)                ; 0236
                                                         02   12 0002A          BNEQ    1$                                          ;
                                                         51   D4 0002C          CLRL    R1                                          ;
                                  57        01        A1   9E 0002E 1$:       MOVAB   1(R1), ADR                                  ;
                        4C   B9        48   A9             3B   3A 00032          LOCC    #59, 72(CBLOCK), a76(CBLOCK)                ; 0237
                                                         02   12 00038          BNEQ    2$                                          ;
                                                         51   D4 0003A          CLRL    R1                                          ;
                             58        51             57   C3 0003C 2$:       SUBL3   ADR, VERADR, LEN                            ; 0238
                                                         51   D6 00040          INCL    VERADR                                      ; 0239
                             50        4C   A9        51   C3 00042          SUBL3   VERADR, 76(CBLOCK), R0                      ; 0240
                                       54        48   A9   3C 00047          MOVZWL  72(CBLOCK), VERLEN                          ;
                                       54             50   C0 0004B          ADDL2   R0, VERLEN                                  ;
                                       55             51   D0 0004E          MOVL    VERADR, R5                                  ; 0241
                                       53             0A   D0 00051          MOVL    #10, R3                                     ;
                                            00000000G EF   16 00054          JSB     SCAN$NUMERIC                                ;
                                       6E             50   D0 0005A          MOVL    R0, VERSION                                 ;
0084    8F                   20        6E             00   2C 0005D          MOVC5   #0, (SP), #32, #132, FILENAME               ; 0242
                                                 28   AE        00064                                                              ;
                        28   AE             67             58   28 00066          MOVC3   LEN, (ADR), FILENAME                        ; 0243
                                                         5A   D4 0006B          CLRL    FLAG                                        ; 0245
                                            00AC   CE   94 0006D          CLRB    FIRST1                                      ; 0246
                                              38   A9   DD 00071          PUSHL   56(CBLOCK)                                  ; 0248
                                       7E             04   7D 00074          MOVQ    #4, -(SP)                                   ;
                                                      7E   7C 00077          CLRQ    -(SP)                                       ;
                                                      7E   D4 00079          CLRL    -(SP)                                       ;
                                  00000000G  EF       06   FB 0007B          CALLS   #6, BOO$QIO                                 ;
                                       66             50   D0 00082          MOVL    R0, (R6)                                    ;
                                       1C             50   E9 00085          BLBC    R0, 3$                                      ;
                                                 04   AB   95 00088          TSTB    4(FAB)                                      ; 0251
                                                      1B   18 0008B          BGEQ    4$                                          ;
                                                 38   A9   DD 0008D          PUSHL   56(CBLOCK)                                  ; 0254
                                  7E                  24   7D 00090          MOVQ    #36, -(SP)                                  ;
                                                      7E   7C 00093          CLRQ    -(SP)                                       ;
                                                      7E   D4 00095          CLRL    -(SP)                                       ;
00000000G                         EF                  06   FB 00097          CALLS   #6, BOO$QIO                                 ;
                                  66                  50   D0 0009E          MOVL    R0, (R6)                                    ;
                                  04                  50   E8 000A1          BLBS    R0, 4$                                      ;
                                  50                  66   D0 000A4 3$:       MOVL    (R6), R0                                    ; 0255
                                                           04   000A7          RET                                                 ;
                                       00000000G      EF   16 000A8 4$:       JSB     KB_CHECK                                    ; 0260
                                  58             38   A9   D0 000AE          MOVL    56(CBLOCK), R8                              ; 0261
                                                      58   DD 000B2          PUSHL   R8                                          ;
                                  7E                  21   7D 000B4          MOVQ    #33, -(SP)                                  ;
                                                      7E   D4 000B7          CLRL    -(SP)                                       ;
                                  7E             50   8F   9A 000B9          MOVZBL  #80, -(SP)                                  ;
                                                 B0   AD   9F 000BD          PUSHAB  HDR1                                        ;
00000000G                         EF                  06   FB 000C0          CALLS   #6, BOO$QIO                                 ;
                                  66                  50   D0 000C7          MOVL    R0, (R6)                                    ;
                                  01                  66   D1 000CA          CMPL    (R6), #1                                    ; 0266
                                                      03   13 000CD          BEQL    5$                                          ;
                                                 0470 31   000CF          BRW     54$                                         ;
                                  5A                  04   8A 000D2 5$:       BICB2   #4, FLAG                                    ; 0268
31464F45                          8F             B0   AD   D1 000D5          CMPL    HDR1, #826691397                            ; 0270
                                                      0A   13 000DD          BEQL    6$                                          ;
31524448                          8F             B0   AD   D1 000DF          CMPL    HDR1, #827475016                            ;
                                                      5A   12 000E7          BNEQ    9$                                          ;
                                  55             D3   AD   9E 000E9 6$:       MOVAB   HDR1+35, R5                                 ; 0272
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                                54          04  D0 000ED        MOVL    #4, R4                                  ;
                                53          0A  D0 000F0        MOVL    #10, R3                                 ;
                            00000000G       EF  16 000F3        JSB     SCAN$NUMERIC                            ;
                                57          50  D0 000F9        MOVL    R0, R7                                  ;
                                57 00000064 8F  C4 000FC        MULL2   #100, R7                                ;
                                55      D7  AD  9E 00103        MOVAB   HDR1+39, R5                             ; 0273
                                54          02  D0 00107        MOVL    #2, R4                                  ; 0272
                                53          0A  D0 0010A        MOVL    #10, R3                                 ;
                            00000000G       EF  16 0010D        JSB     SCAN$NUMERIC                            ;
                        04  AE      9D A047 9E 00113            MOVAB   -99(R0)[R7], TAPEVERSION                ; 0273
                                54          01  D0 00119        MOVL    #1, R4                                  ; 0274
                B4  AD  28  AE              11  29 0011C        CMPC3   #17, FILENAME, HDR1+4                   ;
                                            03  1A 00122        BGTRU   7$                                      ;
                                54          01  D9 00124        SBWC    #1, R4                                  ;
                                            54  D5 00127 7$:    TSTL    R4                                      ;
                                            10  13 00129        BEQL    8$                                      ;
                                2A      28  AE  91 0012B        CMPB    FILENAME, #42                           ; 0275
                                            12  12 0012F        BNEQ    9$                                      ;
                    31524448    8F      B0  AD  D1 00131        CMPL    HDR1, #827475016                        ;
                                            08  12 00139        BNEQ    9$                                      ;
                                6E      04  AE  D1 0013B 8$:    CMPL    TAPEVERSION, VERSION                    ;
                                            07  13 0013F        BEQL    10$                                     ;
                                            6E  D5 00141        TSTL    VERSION                                 ;
                                            03  13 00143 9$:    BEQL    10$                                     ;
                                          0084  31 00145        BRW     15$                                     ;
                                            58  DD 00148 10$:   PUSHL   R8                                      ; 0277
                                7E          21  7D 0014A        MOVQ    #33, -(SP)                              ;
                                            7E  D4 0014D        CLRL    -(SP)                                   ;
                                7E      50  8F  9A 0014F        MOVZBL  #80, -(SP)                              ;
                                    FF60    CD  9F 00153        PUSHAB  HDR2                                    ;
                    00000000G   EF          06  FB 00157        CALLS   #6, BOO$QIO                             ;
                                66          50  D0 0015E        MOVL    R0, (R6)                                ;
                                48          66  E9 00161        BLBC    (R6), 12$                               ; 0278
                                            58  DD 00164        PUSHL   R8                                      ; 0280
                                7E          21  7D 00166        MOVQ    #33, -(SP)                              ;
                                            7E  D4 00169        CLRL    -(SP)                                   ;
                                7E      50  8F  9A 0016B        MOVZBL  #80, -(SP)                              ;
                                    FF10    CD  9F 0016F        PUSHAB  HDR4                                    ;
                    00000000G   EF          06  FB 00173        CALLS   #6, BOO$QIO                             ;
                                66          50  D0 0017A        MOVL    R0, (R6)                                ;
                                2C          66  E9 0017D        BLBC    (R6), 12$                               ; 0281
                                            58  DD 00180        PUSHL   R8                                      ; 0283
                                7E          21  7D 00182        MOVQ    #33, -(SP)                              ;
                                            7E  D4 00185        CLRL    -(SP)                                   ;
                                7E      50  8F  9A 00187        MOVZBL  #80, -(SP)                              ;
                                    FF10    CD  9F 0018B        PUSHAB  HDR4                                    ;
                    00000000G   EF          06  FB 0018F        CALLS   #6, BOO$QIO                             ;
                                66          50  D0 00196        MOVL    R0, (R6)                                ;
                                2A      28  AE  91 00199        CMPB    FILENAME, #42                           ; 0285
                                            04  12 0019D        BNEQ    11$                                     ;
                                            6E  D5 0019F        TSTL    VERSION                                 ;
                                            2C  13 001A1        BEQL    16$                                     ;
                    00000870    8F          66  D1 001A3 11$:   CMPL    (R6), #2160                             ; 0287
                                            23  13 001AA        BEQL    16$                                     ;
                                03          66  E8 001AC 12$:   BLBS    (R6), 13$                               ; 0289
                                          03EE  31 001AF        BRW     61$                                     ;
                                50    FF14  CD  9A 001B2 13$:   MOVZBL  HDR4+4, R0                              ; 0291
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                                    16  13 001B7          BEQL    16$                                  ;
                        54          01  D0 001B9          MOVL    #1, R4                               ; 0297
   FF15   CD        39  AE          50  29 001BC          CMPC3   R0, FILENAME+17, HDR4+5              ;
                                    03  1A 001C3          BGTRU   14$                                  ;
                        54          01  D9 001C5          SBWC    #1, R4                               ;
                                    54  D5 001C8 14$:     TSTL    R4                                   ;
                                    03  13 001CA          BEQL    16$                                  ;
                                  0282  31 001CC 15$:     BRW     42$                                  ;
                        52      28  AB  D0 001CF 16$:     MOVL    40(FAB), R2                          ; 0317
                                    03  12 001D3          BNEQ    17$                                  ;
                                  0086  31 001D5          BRW     24$                                  ;
                        50      3C  A9  D0 001D8 17$:     MOVL    60(CBLOCK), R0                       ; 0322
                    08  AE      02  A2  9B 001DC          MOVZBW  2(R2), A                             ; 0332
                    0C  AE      04  A2  D0 001E1          MOVL    4(R2), A+4                           ; 0333
     24   AE        04  A0          01  C1 001E6          ADDL3   #1, 4(R0), DEV+4                     ; 0334
     20   AE            60          01  A3 001EC          SUBW3   #1, (R0), DEV                        ; 0335
                    1C  AE      B4  AD  9E 001F1          MOVAB   HDR1+4, FILE+4                       ; 0336
     B4   AD            11          20  3A 001F6          LOCC    #32, #17, HDR1+4                     ; 0337
                                    02  12 001FB          BNEQ    18$                                  ;
                                    51  D4 001FD          CLRL    R1                                   ;
                                    51  D5 001FF 18$:     TSTL    BLANK                                ; 0338
                                    05  12 00201          BNEQ    19$                                  ;
                        51          11  D0 00203          MOVL    #17, R1                              ;
                                    07  11 00206          BRB     20$                                  ;
                        50      B4  AD  9E 00208 19$:     MOVAB   HDR1+4, R0                           ;
                        51          50  C2 0020C          SUBL2   R0, R1                               ;
                    18  AE          51  B0 0020F 20$:     MOVW    R1, FILE                             ;
                    14  AE    FF15  CD  9E 00213          MOVAB   HDR4+5, LONGFILE+4                   ; 0339
              34524448  8F    FF10  CD  D1 00219          CMPL    HDR4, #877806664                     ; 0340
                                    0B  13 00222          BEQL    21$                                  ;
              34464F45  8F    FF10  CD  D1 00224          CMPL    HDR4, #877023045                     ;
                                    08  12 0022D          BNEQ    22$                                  ;
                    10  AE    FF14  CD  9B 0022F 21$:     MOVZBW  HDR4+4, LONGFILE                     ; 0341
                                    03  11 00235          BRB     23$                                  ;
                            10  AE  B4 00237 22$:         CLRW    LONGFILE                             ; 0342
                            04  AE  DD 0023A 23$:         PUSHL   TAPEVERSION                          ; 0343
                            14  AE  9F 0023D              PUSHAB  LONGFILE                             ;
                            20  AE  9F 00240              PUSHAB  FILE                                 ;
                            2C  AE  9F 00243              PUSHAB  DEV                                  ;
                            18  AE  9F 00246              PUSHAB  A                                    ;
                            1C  AE  9F 00249              PUSHAB  A                                    ;
                      00000000'  EF  9F 0024C              PUSHAB  P.AAA                                ;
              00000000G  00         07  FB 00252          CALLS   #7, SYS$FAO                          ;
                    03  A2      08  AE  90 00259          MOVB    A, 3(R2)                             ; 0345
              31524448  8F      B0  AD  D1 0025E 24$:     CMPL    HDR1, #827475016                     ; 0348
                                    24  12 00266          BNEQ    27$                                  ;
              34524448  8F    FF10  CD  D1 00268          CMPL    HDR4, #877806664                     ; 0350
                                    6B  12 00271          BNEQ    29$                                  ;
                                    58  DD 00273 25$:     PUSHL   R8                                   ; 0352
                        7E          25  7D 00275          MOVQ    #37, -(SP)                           ;
                                    7E  7C 00278          CLRQ    -(SP)                                ;
                                    01  DD 0027A          PUSHL   #1                                   ;
              00000000G  EF         06  FB 0027C          CALLS   #6, BOO$QIO                          ;
                        66          50  D0 00283          MOVL    R0, (R6)                             ;
                        55          66  E8 00286          BLBS    (R6), 29$                            ; 0353
                                  0314  31 00289 26$:     BRW     61$                                  ;
              34464F45  8F    FF10  CD  D1 0028C 27$:     CMPL    HDR4, #877023045                     ; 0357
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                                                17  13 00295          BEQL    28$                                  ;
                                                58  DD 00297          PUSHL   R8                                   ; 0359
                                 7E             25  7D 00299          MOVQ    #37, -(SP)                           ;
                                                7E  7C 0029C          CLRQ    -(SP)                                ;
                                 7E             01  CE 0029E          MNEGL   #1, -(SP)                            ;
                      00000000G  EF             06  FB 002A1          CALLS   #6, BOO$QIO                          ;
                                 66             50  D0 002A8          MOVL    R0, (R6)                             ;
                                 DB             66  E9 002AB          BLBC    (R6), 26$                            ; 0360
                                                58  DD 002AE 28$:     PUSHL   R8                                   ; 0363
                                 7E             25  7D 002B0          MOVQ    #37, -(SP)                           ;
                                                7E  7C 002B3          CLRQ    -(SP)                                ;
                                 7E             01  CE 002B5          MNEGL   #1, -(SP)                            ;
                      00000000G  EF             06  FB 002B8          CALLS   #6, BOO$QIO                          ;
                                 66             50  D0 002BF          MOVL    R0, (R6)                             ;
                                 C4             66  E9 002C2          BLBC    (R6), 26$                            ; 0365
                                                58  DD 002C5          PUSHL   R8                                   ; 0367
                                 7E             25  7D 002C7          MOVQ    #37, -(SP)                           ;
                                                7E  7C 002CA          CLRQ    -(SP)                                ;
                                 7E             01  CE 002CC          MNEGL   #1, -(SP)                            ;
                      00000000G  EF             06  FB 002CF          CALLS   #6, BOO$QIO                          ;
                                 66             50  D0 002D6          MOVL    R0, (R6)                             ;
                                 AD             66  E9 002D9          BLBC    (R6), 26$                            ; 0369
                                                95  11 002DC          BRB     25$                                  ; 0371
                      20202020   8F     FF6F    CD  D1 002DE 29$:     CMPL    HDR2+15, #538976288                  ; 0377
                                                1F  13 002E7          BEQL    30$                                  ;
                            1E   AB     FF70    CD  90 002E9          MOVB    FAT+1, 30(FAB)                       ; 0384
   50     FF6F    CD              04             00  EF 002EF          EXTZV   #0, #4, FAT, R0                      ; 0385
                            1F   AB             50  90 002F6          MOVB    R0, 31(FAB)                          ;
                            3F   AB     FF7E    CD  90 002FA          MOVB    FAT+15, 63(FAB)                      ; 0386
                            36   AB     FF7F    CD  B0 00300          MOVW    FAT+16, 54(FAB)                      ; 0387
                                                6E  11 00306          BRB     36$                                  ;
                                 50     FF64    CD  9A 00308 30$:     MOVZBL  HDR2+4, R0                           ; 0392
                            46   8F             50  91 0030D          CMPB    R0, #70                              ; 0395
                                                1B  12 00311          BNEQ    31$                                  ;
                            1F   AB             01  90 00313          MOVB    #1, 31(FAB)                          ; 0397
                                 55     FF6A    CD  9E 00317          MOVAB   HDR2+10, R5                          ; 0398
                                 54             05  D0 0031C          MOVL    #5, R4                               ;
                                 53             0A  D0 0031F          MOVL    #10, R3                              ;
                                    00000000G   EF  16 00322          JSB     SCAN$NUMERIC                         ;
                            36   AB             50  B0 00328          MOVW    R0, 54(FAB)                          ;
                                                2A  11 0032C          BRB     33$                                  ;
                            44   8F             50  91 0032E 31$:     CMPB    R0, #68                              ; 0401
                                                1C  12 00332          BNEQ    32$                                  ;
                            1F   AB             02  90 00334          MOVB    #2, 31(FAB)                          ; 0403
                                 55     FF6A    CD  9E 00338          MOVAB   HDR2+10, R5                          ; 0404
                                 54             05  D0 0033D          MOVL    #5, R4                               ;
                                 53             0A  D0 00340          MOVL    #10, R3                              ;
                                    00000000G   EF  16 00343          JSB     SCAN$NUMERIC                         ;
                 36   AB         50             04  A3 00349          SUBW3   #4, R0, 54(FAB)                      ;
                                                08  11 0034E          BRB     33$                                  ;
                                 50 0001860C    8F  D0 00350 32$:     MOVL    #99852, R0                           ; 0408
                                                    04 00357          RET                                          ;
                                 50       84    AD  9A 00358 33$:     MOVZBL  HDR2+36, R0                          ; 0411
                            41   8F             50  91 0035C          CMPB    R0, #65                              ; 0414
                                                06  12 00360          BNEQ    34$                                  ;
                            1E   AB             01  90 00362          MOVB    #1, 30(FAB)                          ; 0415
                                                0E  11 00366          BRB     36$                                  ;
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                        20          50  91 00368 34$:   CMPB    R0, #32                          ; 0417
                                    06  12 0036B        BNEQ    35$                              ;
                  1E    AB          02  90 0036D        MOVB    #2, 30(FAB)                      ; 0418
                                    03  11 00371        BRB     36$                              ;
                              1E    AB  94 00373 35$:   CLRB    30(FAB)                          ; 0421
                        55    FF65  CD  9E 00376 36$:   MOVAB   HDR2+5, R5                       ; 0426
                        54          05  D0 0037B        MOVL    #5, R4                           ;
                        53          0A  D0 0037E        MOVL    #10, R3                          ;
                        00000000G   EF  16 00381        JSB     SCAN$NUMERIC                     ;
                        50    01FF  C0  9E 00387        MOVAB   511(R0), R0                      ;
                        50 00000200 8F  C6 0038C        DIVL2   #512, R0                         ;
                        00000000G   EF  16 00393        JSB     RMS$ALLOC_CACHE                  ;
                        66          50  D0 00399        MOVL    R0, (R6)                         ;
                        08          50  E8 0039C        BLBS    R0, 37$                          ;
                        50 000184D4 8F  D0 0039F        MOVL    #99540, R0                       ; 0429
                                    04  003A6           RET                                      ;
                              44    A9  D4 003A7 37$:   CLRL    68(CBLOCK)                       ; 0431
                              42    A9  B4 003AA        CLRW    66(CBLOCK)                       ; 0432
                  24    A9          01  D0 003AD        MOVL    #1, 36(CBLOCK)                   ; 0433
                  28    A9          01  D0 003B1        MOVL    #1, 40(CBLOCK)                   ;
                  58    A9          01  D0 003B5        MOVL    #1, 88(CBLOCK)                   ; 0434
            00000000G   EF          00  FB 003B9 38$:   CALLS   #0, GET_BLOCK_LENGTH             ; 0436
                        53          52  D0 003C0        MOVL    R2, R3                           ;
                        68          50  E9 003C3        BLBC    R0, 41$                          ;
                        01    58    A9  D1 003C6        CMPL    88(CBLOCK), #1                   ; 0442
                                    15  12 003CA        BNEQ    39$                              ;
                        50    34    A9  D0 003CC        MOVL    52(CBLOCK), TMP                  ; 0449
                  34    A9    2C    A9  D0 003D0        MOVL    44(CBLOCK), 52(CBLOCK)           ; 0450
                  2C    A9          50  D0 003D5        MOVL    TMP, 44(CBLOCK)                  ; 0451
                  24    A9    0A    A9  3C 003D9        MOVZWL  10(CBLOCK), 36(CBLOCK)           ; 0452
                              24    A9  D6 003DE        INCL    36(CBLOCK)                       ;
                        50    0A    A9  3C 003E1 39$:   MOVZWL  10(CBLOCK), R0                   ; 0455
                        51    01    A0  9E 003E5        MOVAB   1(R0), R1                        ;
                        51    58    A9  D1 003E9        CMPL    88(CBLOCK), R1                   ;
                                    15  12 003ED        BNEQ    40$                              ;
                        51    34    A9  D0 003EF        MOVL    52(CBLOCK), TMP                  ; 0462
                  34    A9    30    A9  D0 003F3        MOVL    48(CBLOCK), 52(CBLOCK)           ; 0463
                  30    A9          51  D0 003F8        MOVL    TMP, 48(CBLOCK)                  ; 0464
        24    A9        50          01  78 003FC        ASHL    #1, R0, 36(CBLOCK)               ; 0465
                              24    A9  D6 00401        INCL    36(CBLOCK)                       ;
                  58    A9          50  C0 00404 40$:   ADDL2   R0, 88(CBLOCK)                   ; 0468
              51        50    44    A9  C1 00408        ADDL3   68(CBLOCK), R0, R1               ; 0469
                                    51  D7 0040D        DECL    R1                               ;
                                    50  D7 0040F        DECL    R0                               ;
                        51          50  CA 00411        BICL2   R0, R1                           ;
                        52    01FF  C3  9E 00414        MOVAB   511(R3), R2                      ; 0470
              52        52    F7    8F  78 00419        ASHL    #-9, R2, R2                      ;
        44    A9        51          52  C1 0041E        ADDL3   R2, R1, 68(CBLOCK)               ;
  50          53        09          00  EF 00423        EXTZV   #0, #9, BLOCK_LENGTH, R0         ; 0471
                  42    A9          50  B0 00428        MOVW    R0, 66(CBLOCK)                   ;
                                    8B  11 0042C        BRB     38$                              ;
                              44    A9  D6 0042E 41$:   INCL    68(CBLOCK)                       ; 0474
                              38    A9  DD 00431        PUSHL   56(CBLOCK)                       ; 0475
                        7E          25  7D 00434        MOVQ    #37, -(SP)                       ;
                                    7E  7C 00437        CLRQ    -(SP)                            ;
                        7E          01  CE 00439        MNEGL   #1, -(SP)                        ;
            00000000G   EF          06  FB 0043C        CALLS   #6, BOO$QIO                      ;
```

```
                                                66              50  D0 00443          MOVL    R0, (R6)                                ;
                                                7E              66  E9 00446          BLBC    (R6), 47$                               ; 0477
                                                50 00010001     8F  D0 00449          MOVL    #65537, R0                              ; 0479
                                                                04  00450          RET                                             ;
                                     31524448   8F       B0    AD  D1 00451 42$:     CMPL    HDR1, #827475016                        ; 0484
                                                                03  13 00459          BEQL    43$                                     ;
                                                                FC4A 31 0045B          BRW     4$                                      ;
                                                54              01  D0 0045E 43$:     MOVL    #1, R4                                  ; 0488
                                00AC    CE      B0      AD      0050    8F  29 00461          CMPC3   #80, HDR1, FIRST1                       ;
                                                                03  1A 00469          BGTRU   44$                                     ;
                                                54              01  D9 0046C          SBWC    #1, R4                                  ;
                                                                54  D5 0046F 44$:     TSTL    R4                                      ;
                                                                71  12 00471          BNEQ    48$                                     ;
                                     34524448   8F       FF10    CD  D1 00473          CMPL    HDR4, #877806664                        ; 0491
                                                                07  12 0047C          BNEQ    45$                                     ;
                                                                58  DD 0047E          PUSHL   R8                                      ; 0493
                                                7E              26  7D 00480          MOVQ    #38, -(SP)                              ;
                                                                05  11 00483          BRB     46$                                     ;
                                                                58  DD 00485 45$:     PUSHL   R8                                      ; 0497
                                                7E              25  7D 00487          MOVQ    #37, -(SP)                              ;
                                                                7E  7C 0048A 46$:     CLRQ    -(SP)                                   ;
                                                7E              01  CE 0048C          MNEGL   #1, -(SP)                               ;
                                     00000000G  EF              06  FB 0048F          CALLS   #6, B00$QIO                             ;
                                                66              50  D0 00496          MOVL    R0, (R6)                                ;
                                                75              66  E9 00499          BLBC    (R6), 50$                               ; 0498
                                                                58  DD 0049C          PUSHL   R8                                      ; 0500
                                                7E              26  7D 0049E          MOVQ    #38, -(SP)                              ;
                                                                7E  7C 004A1          CLRQ    -(SP)                                   ;
                                                7E              01  CE 004A3          MNEGL   #1, -(SP)                               ;
                                     00000000G  EF              06  FB 004A6          CALLS   #6, B00$QIO                             ;
                                                66              50  D0 004AD          MOVL    R0, (R6)                                ;
                                                74              66  E9 004B0          BLBC    (R6), 52$                               ; 0501
                                                                58  DD 004B3          PUSHL   R8                                      ; 0502
                                                7E              26  7D 004B5          MOVQ    #38, -(SP)                              ;
                                                                7E  7C 004B8          CLRQ    -(SP)                                   ;
                                                7E              01  CE 004BA          MNEGL   #1, -(SP)                               ;
                                     00000000G  EF              06  FB 004BD          CALLS   #6, B00$QIO                             ;
                                                66              50  D0 004C4          MOVL    R0, (R6)                                ;
                                                76              66  E9 004C7 47$:     BLBC    (R6), 53$                               ; 0503
                                                                58  DD 004CA          PUSHL   R8                                      ; 0504
                                                7E              26  7D 004CC          MOVQ    #38, -(SP)                              ;
                                                                7E  7C 004CF          CLRQ    -(SP)                                   ;
                                                7E              01  CE 004D1          MNEGL   #1, -(SP)                               ;
                                     00000000G  EF              06  FB 004D4          CALLS   #6, B00$QIO                             ;
                                                66              50  D0 004DB          MOVL    R0, (R6)                                ;
                                                7D              66  E9 004DE          BLBC    (R6), 55$                               ; 0505
                                                                00A9 31 004E1          BRW     57$                                     ;
                                                        00AC    CE  95 004E4 48$:     TSTB    FIRST1                                  ; 0510
                                                                09  12 004E8          BNEQ    49$                                     ;
                00AC    CE      B0      AD      0050    8F  28 004EA          MOVC3   #80, HDR1, FIRST1                       ;
                                     34524448   8F       FF10    CD  D1 004F3 49$:     CMPL    HDR4, #877806664                        ; 0512
                                                                16  12 004FC          BNEQ    51$                                     ;
                                                                58  DD 004FE          PUSHL   R8                                      ; 0514
                                                7E              25  7D 00500          MOVQ    #37, -(SP)                              ;
                                                                7E  7C 00503          CLRQ    -(SP)                                   ;
                                                                01  DD 00505          PUSHL   #1                                      ;
                                     00000000G  EF              06  FB 00507          CALLS   #6, B00$QIO                             ;
```

```
                                66   50  D0 0050E                MOVL    R0, (R6)                                ;
                                4A   66  E9 00511 50$:          BLBC    (R6), 55$                               ; 0515
                                58   DD  00514 51$:          PUSHL   R8                                      ; 0518
                                7E   25  7D 00516           MOVQ    #37, -(SP)                              ;
                                     7E  7C 00519           CLRQ    -(SP)                                   ;
                                     01  DD 0051B           PUSHL   #1                                      ;
                    00000000G   EF       06  FB 0051D           CALLS   #6, B00$QIO                             ;
                                66       50  D0 00524           MOVL    R0, (R6)                                ;
                                76       66  E9 00527 52$:          BLBC    (R6), 61$                               ; 0520
                                         58  DD 0052A           PUSHL   R8                                      ; 0522
                                7E       25  7D 0052C           MOVQ    #37, -(SP)                              ;
                                         7E  7C 0052F           CLRQ    -(SP)                                   ;
                                         01  DD 00531           PUSHL   #1                                      ;
                    00000000G   EF       06  FB 00533           CALLS   #6, B00$QIO                             ;
                                66       50  D0 0053A           MOVL    R0, (R6)                                ;
                                5A       66  E8 0053D           BLBS    (R6), 59$                               ; 0524
                                         5E  11 00540 53$:          BRB     61$                                     ;
                    00000B38    8F       66  D1 00542 54$:          CMPL    (R6), #2104                             ; 0533
                                         1B  12 00549           BNEQ    56$                                     ;
                                         58  DD 0054B           PUSHL   R8                                      ; 0535
                                7E       25  7D 0054D           MOVQ    #37, -(SP)                              ;
                                         7E  7C 00550           CLRQ    -(SP)                                   ;
                                         01  DD 00552           PUSHL   #1                                      ;
                    00000000G   EF       06  FB 00554           CALLS   #6, B00$QIO                             ;
                                66       50  D0 0055B           MOVL    R0, (R6)                                ;
                                3F       66  E9 0055E 55$:          BLBC    (R6), 61$                               ; 0537
                                5A       04  8A 00561           BICB2   #4, FLAG                                ; 0539
                                         37  11 00564           BRB     60$                                     ;
                       00000870    8F       66  D1 00566 56$:          CMPL    (R6), #2160                             ; 0542
                                            31  12 0056D           BNEQ    61$                                     ;
                    27          5A       02  E1 0056F           BBC     #2, FLAG, 59$                           ; 0545
                                         58  DD 00573           PUSHL   R8                                      ; 0548
                                7E       24  7D 00575           MOVQ    #36, -(SP)                              ;
                                         7E  7C 00578           CLRQ    -(SP)                                   ;
                                         7E  D4 0057A           CLRL    -(SP)                                   ;
                       00000000G   EF       06  FB 0057C           CALLS   #6, B00$QIO                             ;
                                66       50  D0 00583           MOVL    R0, (R6)                                ;
                                5A       04  8A 00586           BICB2   #4, FLAG                                ; 0549
                    08          5A       01  E1 00589           BBC     #1, FLAG, 58$                           ; 0551
                                50 00018292   8F  D0 0058D 57$:          MOVL    #98962, R0                              ;
                                         04  00594           RET                                             ;
                                5A       02  88 00595 58$:          BISB2   #2, FLAG                                ;
                                         03  11 00598           BRB     60$                                     ;
                                5A       04  88 0059A 59$:          BISB2   #4, FLAG                                ; 0555
                                    FB08 31  00 0059D 60$:          BRW     4$                                      ; 0263
                                50 0001C0F4   8F  D0 005A0 61$:          MOVL    #114932, R0                             ; 0560
                                         04  005A7           RET                                             ; 0566

; Routine Size:  1448 bytes,    Routine Base:  CODE + 0000

;   0567  1
```

```
;    0569  1      %sbttl 'ansi$close'
;    0570  1
;    0571  1      global routine ansi$close : call_rms =
;    0572  1
;    0573  1      !++
;    0574  1      ! Functional description:
;    0575  1      !
;    0576  1      !       This routine is used to close a file. It positions the tape
;    0577  1      !       to the final end-of-file mark.
;    0578  1      !       This positioning is important since if the same file
;    0579  1      !       is opened again the tape will already be positioned to the EOF1
;    0580  1      !       record.
;    0581  1      !
;    0582  1      ! Formal parameters:    none
;    0583  1      !
;    0584  1      ! Implicit inputs:
;    0585  1      !
;    0586  1      !       FAB     Address of FAB
;    0587  1      !       cblock  Address of perfile data
;    0588  1      !
;    0589  1      ! Implicit outputs:
;    0590  1      !
;    0591  1      ! Routine value:
;    0592  1      !
;    0593  1      !       RMS completion codes
;    0594  1      !
;    0595  1      ! Side effects:
;    0596  1      !
;    0597  1      !       The tape may be moved
;    0598  1      !
;    0599  1      !--
;    0600  1
;    0601  2          begin
;    0602  2
;    0603  2          external register
;    0604  2              cblock = 9 : ref block [, byte],
;    0605  2              fab = 11 : ref $fab_decl;
;    0606  2
;    0607  2          external routine                                !                   [06]
;    0608  2              boo$qio : addressing_mode (long_relative);  !                   [06]
;    0609  2
;    0610  2          bind
;    0611  2              status = fab [fab$l_stv];
;    0612  2
;    0613  2          kb_check ();
;    0614  2          status = boo$qio (1, 0, 0, io$_skipfile, 0, .cblock [ctl$l_rpb]);
;    0615  2
;    0616  2          if not .status then return rms$_ccf;
;    0617  2
;    0618  2          return rms$_normal;
;    0619  1          end;


                                05FC 00000          .ENTRY  ANSI$CLOSE, Save R2,R3,R4,R5,R6,R7,R8,R10    ; 0571
```

```
                                    00000000G  EF  16 00002          JSB     KB_CHECK                                ; 0613
                                          38   A9  DD 00008          PUSHL   56(CBLOCK)                              ; 0614
                                    7E         25  7D 0000B          MOVQ    #37, -(SP)                              ;
                                               7E  7C 0000E          CLRQ    -(SP)                                   ;
                                               01  DD 00010          PUSHL   #1                                      ;
                              00000000G  EF        06  FB 00012          CALLS   #6, BOO$QIO                             ;
                                    0C   AB        50  D0 00019          MOVL    R0, 12(FAB)                             ;
                                         08    0C  AB  E8 0001D          BLBS    12(FAB), 1$                             ; 0616
                                         50 0001C0DC  8F  D0 00021          MOVL    #114908, R0                             ;
                                                      04  00028          RET                                             ;
                                         50 00010001  8F  D0 00029 1$:      MOVL    #65537, R0                              ; 0618
                                                      04  00030          RET                                             ;

; Routine Size:  49 bytes,    Routine Base:  CODE + 05A8

;   0620  1
```

```
;    0622  1      %sbttl 'ansi$cachevbn'
;    0623  1
;    0624  1      global routine ansi$CACHEvbn (vbn) : call_rms =
;    0625  1
;    0626  1      !++
;    0627  1      ! Functional description:
;    0628  1      !
;    0629  1      !       This routine is used to place the desired block in the cache
;    0630  1      !       If necessary the tape is re-positioned to the desired block
;    0631  1      !       and the cache updated to include the desired data
;    0632  1      !
;    0633  1      ! Formal parameters:
;    0634  1      !
;    0635  1      !       VBN     VBN of block desired in the cache
;    0636  1      !
;    0637  1      ! Implicit inputs:
;    0638  1      !
;    0639  1      !       cblock  Address of per-file area
;    0640  1      !
;    0641  1      ! Implicit outputs:
;    0642  1      !
;    0643  1      !       cblock  The cache may be updated
;    0644  1      !
;    0645  1      ! Routine value:
;    0646  1      !
;    0647  1      !       Success or failure RMS codes and I/O failure codes
;    0648  1      !
;    0649  1      ! Side effects:
;    0650  1      !
;    0651  1      !       The device and controller may be accessed to read data from the tape.
;    0652  1      !
;    0653  1      !--
;    0654  1
;    0655  2          begin
;    0656  2
;    0657  2          external register
;    0658  2              cblock = 9 : ref block [, byte];        !control region
;    0659  2
;    0660  2          external routine                                !                       [06]
;    0661  2              boo$qio : addressing_mode (long_relative);  !                       [06]
;    0662  2
;    0663  2          local
;    0664  2              status;                                 !Status of boo$qio calls
;    0665  2
;    0666  2          if .vbn geq .cblock [ctl$l_eofvbn] then return ss$_endoffile;
;    0667  2
;    0668  3          if (.vbn lss .cblock [ctl$l_lvbn]) or (.vbn geq .cblock [ctl$l_hvbn])
;    0669  2          then
;    0670  2                                                  !This block is not in the cache
;    0671  3              begin
;    0672  3
;    0673  3              while .cblock [ctl$l_tapepos] gtr .vbn do
;    0674  4                  begin                           !Backup until the block found
;    0675  4                  kb_check ();
;    0676  4                  status = boo$qio (-1, 0, 0, io$_skiprecord, 0, .cblock [ctl$l_rpb]);
;    0677  4
;    0678  4                  if not .status then return .status;
```

```
;    0679  4
;    0680  4                cblock [ctl$l_tapepos] = .cblock [ctl$l_tapepos] - .cblock [ctl$w_cache_size];
;    0681  4                cblock [ctl$l_lvbn] = cblock [ctl$l_hvbn] = .cblock [ctl$l_tapepos];
;    0682  3                end;
;    0683  3
;    0684  3            until (.vbn geq .cblock [ctl$l_lvbn]) and (.vbn lss .cblock [ctl$l_hvbn]) do
;    0685  4                begin                                   !Read forward until desired data is in the cache
;    0686  4
;    0687  4                local
;    0688  4                    cache;                              !Address of cache block
;    0689  4
;    0690  4                kb_check ();
;    0691  4
;    0692  4                case (.cblock [ctl$l_hvbn] - .cblock [ctl$l_lvbn])/.cblock [ctl$w_cache_size] from 0 to 3 of
;    0693  4                    set
;    0694  4
;    0695  4                    [0] :
;    0696  4                        cache = .cblock [ctl$l_cache1];
;    0697  4
;    0698  4                    [1] :
;    0699  4                        cache = .cblock [ctl$l_cache2];
;    0700  4
;    0701  4                    [2] :
;    0702  4                        cache = .cblock [ctl$l_cache3];
;    0703  4
;    0704  4                    [3] :
;    0705  5                        begin                           !Rotate cache in use
;    0706  5                        cache = .cblock [ctl$l_cache1];
;    0707  5                        cblock [ctl$l_cache1] = .cblock [ctl$l_cache2];
;    0708  5                        cblock [ctl$l_cache2] = .cblock [ctl$l_cache3];
;    0709  5                        cblock [ctl$l_cache3] = .cache;
;    0710  5                        cblock [ctl$l_lvbn] = .cblock [ctl$l_lvbn] + .cblock [ctl$w_cache_size];
;    0711  4                        end;
;    0712  4                    tes;
;    0713  4
;    0714  4                ch$fill (%c'^', 12*.cblock [ctl$w_cache_size], .cache);
;    0715  4                status = boo$qio (.cache, .cblock [ctl$w_cache_size]*512, 0, io$_readlblk, 0,
;    0716  4                    .cblock [ctl$l_rpb]);
;    0717  4
;    0718  4                if not .status then return .status;
;    0719  4
;    0720  4                cblock [ctl$l_tapepos] = .cblock [ctl$l_tapepos] + .cblock [ctl$w_cache_size];
;    0721  4                cblock [ctl$l_hvbn] = min (.cblock [ctl$l_eofvbn] + 1,
;    0722  4                    .cblock [ctl$l_hvbn] + .cblock [ctl$w_cache_size]);
;    0723  3                end;
;    0724  3
;    0725  2            end;
;    0726  2
;    0727  2        ss$_normal
;    0728  1        end;



0DFC 00000        .ENTRY  ANSI$CACHEVBN, Save R2,R3,R4,R5,R6,R7,R8,-   ; 0624
                          R10,R11                                      ;
```

```
                                 5E          04  C2 00002          SUBL2   #4, SP                                  ;
                                 5B      04  AC  D0 00005          MOVL    VBN, R11                                ; 0666
                            44   A9          5B  D1 00009          CMPL    R11, 68(CBLOCK)                         ;
                                             06  19 0000D          BLSS    1$                                      ;
                                 50    0870  8F  3C 0000F          MOVZWL  #2160, R0                               ;
                                             04  00014             RET                                             ;
                            28   A9          5B  D1 00015 1$:      CMPL    R11, 40(CBLOCK)                         ; 0668
                                             06  19 00019          BLSS    2$                                      ;
                            24   A9          5B  D1 0001B          CMPL    R11, 36(CBLOCK)                         ;
                                             4A  19 0001F          BLSS    6$                                      ;
                                 57      58  A9  9E 00021 2$:      MOVAB   88(CBLOCK), R7                          ; 0673
                                 58      0A  A9  9E 00025          MOVAB   10(CBLOCK), R8                          ; 0680
                                 5A      24  A9  9E 00029          MOVAB   36(CBLOCK), R10                         ; 0681
                                 5B          67  D1 0002D 3$:      CMPL    (R7), R11                               ; 0673
                                             30  15 00030          BLEQ    5$                                      ;
                                 00000000G   EF  16 00032          JSB     KB_CHECK                                ; 0675
                                         38  A9  DD 00038          PUSHL   56(CBLOCK)                              ; 0676
                                 7E          26  7D 0003B          MOVQ    #38, -(SP)                              ;
                                             7E  7C 0003E          CLRQ    -(SP)                                   ;
                                 7E          01  CE 00040          MNEGL   #1, -(SP)                               ;
                        00000000G EF         06  FB 00043          CALLS   #6, BOO$QIO                             ;
                                 6E          50  D0 0004A          MOVL    R0, STATUS                              ;
                                 03          6E  E8 0004D          BLBS    STATUS, 4$                              ; 0678
                                           008B  31 00050          BRW     14$                                     ;
                                 50          68  3C 00053 4$:      MOVZWL  (R8), R0                                ; 0680
                                 67          50  C2 00056          SUBL2   R0, (R7)                                ;
                                 6A          67  D0 00059          MOVL    (R7), (R10)                             ; 0681
                            28   A9          6A  D0 0005C          MOVL    (R10), 40(CBLOCK)                       ;
                                             CB  11 00060          BRB     3$                                      ; 0673
                            28   A9          5B  D1 00062 5$:      CMPL    R11, 40(CBLOCK)                         ; 0684
                                             08  19 00066          BLSS    7$                                      ;
                                 6A          5B  D1 00068          CMPL    R11, (R10)                              ;
                                             03  18 0006B 6$:      BGEQ    7$                                      ;
                                           0091  31 0006D          BRW     17$                                     ;
                                 00000000G   EF  16 00070 7$:      JSB     KB_CHECK                                ; 0690
                     50          6A      28  A9  C3 00076          SUBL3   40(CBLOCK), (R10), R0                   ; 0692
                                 51          68  3C 0007B          MOVZWL  (R8), R1                                ;
                                 50          51  C6 0007E          DIVL2   R1, R0                                  ;
                     03          00          50  CF 00081          CASEL   R0, #0, #3                              ;
001A            0014         000E         0008     00085 8$:      .WORD   9$-8$,-                                 ;
                                                                           10$-8$,-                                ;
                                                                           11$-8$,-                                ;
                                                                           12$-8$                                  ;
                                 56      2C  A9  D0 0008D 9$:      MOVL    44(CBLOCK), CACHE                       ; 0696
                                             20  11 00091          BRB     13$                                     ;
                                 56      30  A9  D0 00093 10$:     MOVL    48(CBLOCK), CACHE                       ; 0699
                                             1A  11 00097          BRB     13$                                     ;
                                 56      34  A9  D0 00099 11$:     MOVL    52(CBLOCK), CACHE                       ; 0702
                                             14  11 0009D          BRB     13$                                     ;
                                 56      2C  A9  D0 0009F 12$:     MOVL    44(CBLOCK), CACHE                       ; 0706
                            2C   A9      30  A9  7D 000A3          MOVQ    48(CBLOCK), 44(CBLOCK)                  ; 0707
                            34   A9          56  D0 000A8          MOVL    CACHE, 52(CBLOCK)                       ; 0709
                                 50          68  3C 000AC          MOVZWL  (R8), R0                                ; 0710
                            28   A9          50  C0 000AF          ADDL2   R0, 40(CBLOCK)                          ;
                                 50          68  3C 000B3 13$:     MOVZWL  (R8), R0                                ; 0714
                                 50          0C  C4 000B6          MULL2   #12, R0                                 ;
  50        5E    8F             6E          00  2C 000B9          MOVC5   #0, (SP), #94, R0, (CACHE)              ;
```

```
                                        66     000BF                                                    ;
                                  38    A9  DD 000C0          PUSHL   56(CBLOCK)                        ; 0715
                          7E            21  7D 000C3          MOVQ    #33, -(SP)                        ;
                                        7E  D4 000C6          CLRL    -(SP)                             ;
                          50            68  3C 000C8          MOVZWL  (R8), R0                          ;
                 7E       50            09  78 000CB          ASHL    #9, R0, -(SP)                     ;
                                        56  DD 000CF          PUSHL   CACHE                             ;
                    00000000G  EF       06  FB 000D1          CALLS   #6, BOO$QIO                       ;
                          6E            50  D0 000D8          MOVL    R0, STATUS                        ;
                          04            6E  E8 000DB          BLBS    STATUS, 15$                       ; 0718
                          50            6E  D0 000DE 14$:     MOVL    STATUS, R0                        ;
                                            04 000E1          RET                                       ;
                          50            68  3C 000E2 15$:     MOVZWL  (R8), R0                          ; 0720
                          67            50  C0 000E5          ADDL2   R0, (R7)                          ;
                 51    44  A9            01  C1 000E8          ADDL3   #1, 68(CBLOCK), R1                ; 0721
                          50            68  3C 000ED          MOVZWL  (R8), R0                          ; 0722
                          50            6A  C0 000F0          ADDL2   (R10), R0                         ;
                          50            51  D1 000F3          CMPL    R1, R0                            ; 0721
                                        03  15 000F6          BLEQ    16$                               ;
                          51            50  D0 000F8          MOVL    R0, R1                            ;
                          6A            51  D0 000FB 16$:     MOVL    R1, (R10)                         ;
                                      FF61  31 000FE          BRW     5$                                ; 0684
                          50            01  D0 00101 17$:     MOVL    #1, R0                            ; 0728
                                            04 00104          RET                                       ;

; Routine Size:  261 bytes,    Routine Base:  CODE + 05D9

;   0729  1
```

```
;    0731  1     %sbttl 'ansi$read'
;    0732  1
;    0733  1     global routine ansi$read : call_rms =
;    0734  1
;    0735  1     !++
;    0736  1     ! Functional description:
;    0737  1     !
;    0738  1     !       This routine is used to read a block from an open file.
;    0739  1     !       It uses the block number in the RAB to select the next block
;    0740  1     !       to be read.  Data blocks read from the tape are cached so
;    0741  1     !       this may not require a tape access.  Most of the work to fill
;    0742  1     !       and update the cache is done by ANSI$cacheVBN.
;    0743  1     !
;    0744  1     ! Formal parameters:    none
;    0745  1     !
;    0746  1     ! Implicit inputs:
;    0747  1     !
;    0748  1     !       FAB     Address of FAB for file
;    0749  1     !       RAB     Address of RAB from caller
;    0750  1     !       cblock  Address of per-file area
;    0751  1     !
;    0752  1     ! Implicit outputs:
;    0753  1     !
;    0754  1     !       FAB     Unaffected
;    0755  1     !       RAB     The current position is updated
;    0756  1     !       cblock  The cache may be updates
;    0757  1     !
;    0758  1     ! Routine value:
;    0759  1     !
;    0760  1     !       RMS completion codes
;    0761  1     !
;    0762  1     ! Side effects:
;    0763  1     !
;    0764  1     !       The device and controller may be accessed to read data from the tape.
;    0765  1     !
;    0766  1     !--
;    0767  1
;    0768  2         begin
;    0769  2
;    0770  2         external register
;    0771  2             cblock = 9 : ref block [, byte],
;    0772  2             fab = 11 : ref $fab_decl,
;    0773  2             rab = 10 : ref $rab_decl;
;    0774  2
;    0775  2         external routine                                !                   [06]
;    0776  2             boo$qio : addressing_mode (long_relative);      !               [06]
;    0777  2
;    0778  2         local
;    0779  2             cache : ref vector [, byte],            !Address of current cache block
;    0780  2             user_size,                              !Size to be transfered
;    0781  2             user_address,                           !Address to receive data
;    0782  2             vbn;                                    !Current desired VBN
;    0783  2
;    0784  2         bind
;    0785  2             status = rab [rab$l_stv];               !Current status return value
;    0786  2
;    0787  2         vbn = (if .rab [rab$l_bkt] eql 0 then .cblock [ctl$l_nbp] else .rab [rab$l_bkt]);
```

```
;    0788  2          user_size = .rab [rab$w_usz];
;    0789  2          user_address = rab [rab$l_rbf] = .rab [rab$l_ubf];
;    0790  2          rab [rab$w_rsz] = 0;
;    0791  2          rab [rab$l_rfa0] = .vbn;
;    0792  2          rab [rab$w_rfa4] = 0;
;    0793  2          status = rms$_normal;
;    0794  2
;    0795  2          while .user_size gtr 0 do
;    0796  3              begin
;    0797  3
;    0798  3              local
;    0799  3                  cache_offset,                   !offset within cache
;    0800  3                  cache_section;                  !Index to current section of cache
;    0801  3
;    0802  3              status = ansi$cachevbn (.vbn);
;    0803  3
;    0804  3              if not .status then exitloop;
;    0805  3
;    0806  3              cache_offset = (.vbn - .cblock [ctl$l_lvbn]);
;    0807  3              cache_section = .cache_offset/.cblock [ctl$w_cache_size];
;    0808  3              cache_offset = (.cache_offset - .cache_section*.cblock [ctl$w_cache_size])*512;
;    0809  3              cache = .(cblock [ctl$l_cache1] + .cache_section*4);
;    0810  3              ch$move (min (512, .user_size), cache [.cache_offset], .user_address);
;    0811  3              user_address = .user_address + min (512, .user_size);
;    0812  3              rab [rab$w_rsz] = .rab [rab$w_rsz] + min (512, .user_size);
;    0813  3              user_size = .user_size - min (512, .user_size);
;    0814  3              vbn = .vbn + 1;
;    0815  2              end;
;    0816  2
;    0817  2          cblock [ctl$l_nbp] = .vbn;
;    0818  2
;    0819  2          if .status and %x'FFFF' neq 0
;    0820  2          then
;    0821  2              .status
;    0822  2          else
;    0823  2
;    0824  2              if .status eql ss$_endoffile then rms$_normal else rms$_rer
;    0825  2
;    0826  1          end;


                                    01FC 00000          .ENTRY  ANSI$READ, Save R2,R3,R4,R5,R6,R7,R8        ; 0733
                          5E        08   C2 00002         SUBL2   #8, SP                                      ;
                    0C    AA        9F   00005         PUSHAB  12(RAB)                                     ; 0785
                    38    AA        D5   00008         TSTL    56(RAB)                                     ; 0787
                                    07   12 0000B         BNEQ    1$                                          ;
                04  AE        04    A9   D0 0000D         MOVL    4(CBLOCK), VBN                              ;
                                    05   11 00012         BRB     2$                                          ;
                04  AE        38    AA   D0 00014 1$:     MOVL    56(RAB), VBN                                ;
                    56        20    AA   3C 00019 2$:     MOVZWL  32(RAB), USER_SIZE                          ; 0788
                    50        24    AA   D0 0001D         MOVL    36(RAB), R0                                 ; 0789
                28  AA              50   D0 00021         MOVL    R0, 40(RAB)                                 ;
                08  AE              50   D0 00025         MOVL    R0, USER_ADDRESS                            ;
                                    22   AA   B4 00029         CLRW    34(RAB)                                 ; 0790
```

```
                          10   AA        04   AE  D0 0002C          MOVL    VBN, 16(RAB)                                    ; 0791
                                         14   AA  B4 00031          CLRW    20(RAB)                                         ; 0792
                          00   BE 00010001   8F  D0 00034          MOVL    #65537, a0(SP)                                  ; 0793
                                             56  D5 0003C 3$:      TSTL    USER_SIZE                                       ; 0795
                                             59  15 0003E          BLEQ    5$                                              ;
                                         04   AE  DD 00040          PUSHL   VBN                                             ; 0802
                        FEB3   CF            01  FB 00043          CALLS   #1, ANSI$CACHEVBN                               ;
                          00   BE            50  D0 00048          MOVL    R0, a0(SP)                                      ;
                                   49    00   BE  E9 0004C          BLBC    a0(SP), 5$                                      ; 0804
                  51      04   AE        28   A9  C3 00050          SUBL3   40(CBLOCK), VBN, CACHE_OFFSET                   ; 0806
                                   50    0A   A9  3C 00056          MOVZWL  10(CBLOCK), CACHE_SECTION                       ; 0807
                  50                   51        50  C7 0005A          DIVL3   CACHE_SECTION, CACHE_OFFSET, CACHE_SECTION      ;
                                   52    0A   A9  3C 0005E          MOVZWL  10(CBLOCK), R2                                  ; 0808
                                   52        50  C4 00062          MULL2   CACHE_SECTION, R2                               ;
                  52               51        52  C3 00065          SUBL3   R2, CACHE_OFFSET, R2                            ;
                  51               52        09  78 00069          ASHL    #9, R2, CACHE_OFFSET                            ;
                                   58    2C A940  D0 0006D          MOVL    44(CBLOCK)[CACHE_SECTION], CACHE                ; 0809
                                   57        56  D0 00072          MOVL    USER_SIZE, R7                                   ; 0810
                     00000200     8F            57  D1 00075          CMPL    R7, #512                                        ;
                                                 05  15 0007C          BLEQ    4$                                              ;
                                   57      0200  8F  3C 0007E          MOVZWL  #512, R7                                        ;
              08   BE              6148        57  28 00083 4$:      MOVC3   R7, (CACHE_OFFSET)[CACHE], aUSER_ADDRESS        ;
                          08   AE                57  C0 00089          ADDL2   R7, USER_ADDRESS                                ; 0811
                          22   AA                57  A0 0008D          ADDW2   R7, 34(RAB)                                     ; 0812
                               56                57  C2 00091          SUBL2   R7, USER_SIZE                                   ; 0813
                                         04   AE  D6 00094          INCL    VBN                                             ; 0814
                                              A3  11 00097          BRB     3$                                              ;
                          04   A9        04   AE  D0 00099 5$:      MOVL    VBN, 4(CBLOCK)                                  ; 0817
                               05        00   BE  E9 0009E          BLBC    a0(SP), 6$                                      ; 0819
                               50        00   BE  D0 000A2          MOVL    a0(SP), R0                                      ;
                                              04  000A6          RET                                                     ;
                     00000870  8F        00   BE  D1 000A7 6$:      CMPL    a0(SP), #2160                                   ; 0824
                                              08  12 000AF          BNEQ    7$                                              ;
                               50 00010001   8F  D0 000B1          MOVL    #65537, R0                                      ;
                                              04  000B8          RET                                                     ;
                               50 0001C0F4   8F  D0 000B9 7$:      MOVL    #114932, R0                                     ;
                                              04  000C0          RET                                                     ; 0826

; Routine Size:  193 bytes,    Routine Base:  CODE + 06DE

;   0827  1
```

```
;    0829  1      %sbttl 'ansi$get'
;    0830  1
;    0831  1      global routine ansi$get : call_rms =
;    0832  1
;    0833  1      !++
;    0834  1      ! Functional description:
;    0835  1      !
;    0836  1      !       This routine transfers the next record from the tape into
;    0837  1      !       the callers buffer. Only sequential mode is allowed.  ansi$cachevbn
;    0838  1      !       may be called to read more data from the tape.  The routine does
;    0839  1      !       the necessary deblocking of records from ANS X3.27 format tapes.
;    0840  1      !
;    0841  1      ! Formal parameters:    none
;    0842  1      !
;    0843  1      ! Implicit inputs:
;    0844  1      !
;    0845  1      !       FAB     Address of related open file block
;    0846  1      !       RAB     Address of RAB
;    0847  1      !       cblock  Address of per-file area
;    0848  1      !
;    0849  1      ! Implicit outputs:
;    0850  1      !
;    0851  1      !       FAB     unaffected
;    0852  1      !       RAB     the current position is updated
;    0853  1      !       cblock  Various fields may be updated
;    0854  1      !
;    0855  1      ! Routine value:
;    0856  1      !
;    0857  1      !       RMS completion codes
;    0858  1      !
;    0859  1      ! Side effects:
;    0860  1      !
;    0861  1      !       The device and associated channels may be accessed to read the record.
;    0862  1      !
;    0863  1      !--
;    0864  1
;    0865  2          begin
;    0866  2
;    0867  2          external register
;    0868  2              cblock = 9 : ref block [, byte],        !Base of control block
;    0869  2              rab = 10 : REF $RAB_DECL,               !Base of current rab
;    0870  2              fab = 11 : ref $fab_DECL;               !Base of current fab
;    0871  2
;    0872  2          external routine                            !                           [06]
;    0873  2              boo$qio : addressing_mode (long_relative);      !                   [06]
;    0874  2
;    0875  2          local
;    0876  2              boff,                                   !Current byte offset in page
;    0877  2              vbn;                                    !Current desired VBN
;    0878  2
;    0879  2          bind
;    0880  2              status = rab [rab$l_stv];               !Status returned by calls
;    0881  2
;    0882  2          vbn = .cblock [ctl$l_vbn];                  !Fetch current virtual block
;    0883  2          boff = .cblock [ctl$w_byte];                !Fetch byte offset
;    0884  2
;    0885  2          if .rab [rab$b_rac] eql rab$c_seq           !If sequential access
```

```
;    0886  2          then                                    !Update position based on RFA
;    0887  3              begin
;    0888  3              vbn = .vbn + (.cblock [ctl$w_rec_size] + .boff)/(512*.cblock [ctl$w_cache_size]);
;    0889  3              boff = (.cblock [ctl$w_rec_size] + .boff) mod (512*.cblock [ctl$w_cache_size]);
;    0890  2              end;
;    0891  2
;    0892  2          do
;    0893  3              begin
;    0894  3
;    0895  3              local
;    0896  3                  cache : ref vector [, byte],        !Address of current cache block
;    0897  3                  cache_offset,                       !offset within cache
;    0898  3                  cache_section;                      !Index to current section of cache
;    0899  3
;    0900  3              if not (status = ansi$cachevbn (.vbn)) then exitloop;
;    0901  3
;    0902  3              cache_offset = .vbn - .cblock [ctl$l_lvbn];
;    0903  3              cache_section = .cache_offset/.cblock [ctl$w_cache_size];
;    0904  3              cache_offset = .cache_offset - .cache_section*.cblock [ctl$w_cache_size]*512;
;    0905  3              cache = .(cblock [ctl$l_cache1] + .cache_section*4);
;    0906  3              rab [rab$l_rbf] = .rab [rab$l_ubf];
;    0907  3
;    0908  3              case .fab [fab$b_rfm] from fab$c_fix to fab$c_vfc of
;    0909  3                  set
;    0910  3
;    0911  3                  [fab$c_fix] :
;    0912  4                      begin
;    0913  4
;    0914  5                      if (.boff + .rab [fab$w_mrs]) geq (.cblock [ctl$w_cache_size]*512)
;    0915  4                      then
;    0916  5                          begin
;    0917  5                          vbn = .vbn + .cblock [ctl$w_cache_size];
;    0918  5                          boff = 0;
;    0919  5                          status = 0
;    0920  5                          end
;    0921  4                      else
;    0922  5                          begin
;    0923  5                          cblock [ctl$w_rec_size] = .fab [fab$w_mrs];
;    0924  5
;    0925  5                          if .rab [rab$w_usz] lss .cblock [ctl$w_rec_size] - 4
;    0926  5                          then
;    0927  6                              begin
;    0928  6                              status = rms$_rtb;
;    0929  6                              rab [rab$w_rsz] = .rab [rab$w_usz];
;    0930  6                              end
;    0931  5                          else
;    0932  6                              begin
;    0933  6                              status = rms$_normal;
;    0934  6                              rab [rab$w_rsz] = .cblock [ctl$w_rec_size];
;    0935  5                              end;
;    0936  5
;    0937  5                          ch$move (.rab [rab$w_rsz], cache [.boff], .rab [rab$l_rbf]);
;    0938  5                          status = rms$_normal;
;    0939  4                          end;
;    0940  4
;    0941  3                      end;
;    0942  3
```

```
;    0943  3                [fab$c_var] :
;    0944  4                    begin
;    0945  4
;    0946  5                    if (.cache [.boff] lss %c'0') or (.cache [.boff] gtr %c'9')
;    0947  4                    then
;    0948  5                        begin                       !Not valid record go to next block
;    0949  5                        boff = 0;
;    0950  5                        vbn = .vbn + .cblock [ctl$w_cache_size];
;    0951  5                        status = 0;
;    0952  5                        end
;    0953  4                    else
;    0954  5                        begin                       !Valid record copy it
;    0955  5                        cblock [ctl$w_rec_size] = scan$numeric (10, 4, cache [.boff]);
;    0956  5
;    0957  5                        if .rab [rab$w_usz] lss .cblock [ctl$w_rec_size] - 4
;    0958  5                        then
;    0959  6                            begin
;    0960  6                            status = rms$_rtb;
;    0961  6                            rab [rab$w_rsz] = .rab [rab$w_usz];
;    0962  6                            end
;    0963  5                        else
;    0964  6                            begin
;    0965  6                            status = rms$_normal;
;    0966  6                            rab [rab$w_rsz] = .cblock [ctl$w_rec_size] - 4;
;    0967  5                            end;
;    0968  5
;    0969  5                        ch$move (.rab [rab$w_rsz], cache [.boff + 4], .rab [rab$l_rbf]);
;    0970  5                        status = rms$_normal;
;    0971  4                        end;
;    0972  4
;    0973  3                    end;
;    0974  3
;    0975  3                [fab$c_vfc] :
;    0976  4                    begin
;    0977  4
;    0978  5                    if (.cache [.boff] lss %c'0') or (.cache [.boff] gtr %c'9')
;    0979  4                    then
;    0980  5                        begin                       !Not valid record go to next block
;    0981  5                        boff = 0;
;    0982  5                        vbn = .vbn + .cblock [ctl$w_cache_size];
;    0983  5                        status = 0;
;    0984  5                        end
;    0985  4                    else
;    0986  5                        begin                       !Valid record copy it
;    0987  5                        cblock [ctl$w_rec_size] = scan$numeric (10, 4, cache [.boff]);
;    0988  5
;    0989  5                        if .rab [rab$w_usz] lss .cblock [ctl$w_rec_size] - .fab [fab$b_fsz] - 4
;    0990  5                        then
;    0991  6                            begin
;    0992  6                            status = rms$_rtb;
;    0993  6                            rab [rab$w_rsz] = .rab [rab$w_usz] - .rab [fab$b_fsz];
;    0994  6                            end
;    0995  5                        else
;    0996  6                            begin
;    0997  6                            status = rms$_normal;
;    0998  6                            rab [rab$w_rsz] = .cblock [ctl$w_rec_size] - .fab [fab$b_fsz] - 4;
;    0999  5                            end;
```

```
;   1000  5
;   1001  5                         if .rab [rab$l_rhb] neq 0
;   1002  5                         then
;   1003  5                             ch$move (.fab [fab$b_fsz], cache [.boff + 4],
;   1004  5                                 .rab [rab$l_rhb]);
;   1005  5
;   1006  5                         ch$move (.rab [rab$w_rsz], cache [.boff + .fab [fab$b_fsz] + 4], .rab [rab$l_rbf]);
;   1007  5                         status = rms$_normal;
;   1008  4                         end;
;   1009  4
;   1010  3                     end;
;   1011  3
;   1012  3                 [outrange] :
;   1013  3                     return rms$_org;
;   1014  3                 tes;
;   1015  3
;   1016  3             end
;   1017  2         until .status;
;   1018  2
;   1019  2         cblock [ctl$l_vbn] = .vbn;
;   1020  2         cblock [ctl$w_byte] = .boff;
;   1021  2
;   1022  2         if .status and %x'FFFF' NEQ 0
;   1023  2         then
;   1024  2             rms$_normal
;   1025  2         else
;   1026  2
;   1027  2             if .status eql ss$_endoffile then rms$_eof else rms$_rer
;   1028  2
;   1029  1         end;



                                        01FC 00000          .ENTRY  ANSI$GET, Save R2,R3,R4,R5,R6,R7,R8          ; 0831
                        5E          04  C2 00002          SUBL2   #4, SP                                       ;
                        58      0C  AA  9E 00005          MOVAB   12(RAB), R8                                  ; 0880
                                18  A9  DD 00009          PUSHL   24(CBLOCK)                                   ; 0882
                        56      1C  A9  3C 0000C          MOVZWL  28(CBLOCK), BOFF                             ; 0883
                                1E  AA  95 00010          TSTB    30(RAB)                                      ; 0885
                                    20  12 00013          BNEQ    1$                                           ;
                        52      1E  A9  3C 00015          MOVZWL  30(CBLOCK), R2                               ; 0888
                        52          56  C0 00019          ADDL2   BOFF, R2                                     ;
                        50      0A  A9  3C 0001C          MOVZWL  10(CBLOCK), R0                               ;
                50      50          09  78 00020          ASHL    #9, R0, R0                                   ;
                51      52          50  C7 00024          DIVL3   R0, R2, R1                                   ;
                        6E          51  C0 00028          ADDL2   R1, VBN                                      ;
        7E      00      52          01  7A 0002B          EMUL    #1, R2, #0, -(SP)                            ; 0889
        56      56      8E          50  7B 00030          EDIV    R0, (SP)+, BOFF, BOFF                        ;
                                    6E  DD 00035 1$:      PUSHL   VBN                                          ; 0900
                FDFE    CF          01  FB 00037          CALLS   #1, ANSI$CACHEVBN                            ;
                        68          50  D0 0003C          MOVL    R0, (R8)                                     ;
                        03          50  E8 0003F          BLBS    R0, 2$                                       ;
                                  015C  31 00042          BRW     21$                                          ;
                53      6E      28  A9  C3 00045 2$:      SUBL3   40(CBLOCK), VBN, CACHE_OFFSET                ; 0902
                        51      0A  A9  3C 0004A          MOVZWL  10(CBLOCK), R1                               ; 0903
```

```
                50          53          51  C7 0004E        DIVL3   R1, CACHE_OFFSET, CACHE_SECTION                ;
                52          50          51  C5 00052        MULL3   R1, CACHE_SECTION, R2                          ; 0904
                52          52          09  78 00056        ASHL    #9, R2, R2                                     ;
                            53          52  C2 0005A        SUBL2   R2, CACHE_OFFSET                               ;
                            57      2C A940  D0 0005D        MOVL    44(CBLOCK)[CACHE_SECTION], CACHE               ; 0905
                      28    AA      24  AA  D0 00062        MOVL    36(RAB), 40(RAB)                               ; 0906
                02          01      1F  AB  8F 00067        CASEB   31(FAB), #1, #2                                ; 0908
              00AF        005D        000E     0006C 3$:    .WORD   4$-3$,-                                        ;
                                                                     8$-3$,-                                        ;
                                                                     12$-3$                                         ;
                            50 0001860C  8F  D0 00072        MOVL    #99852, R0                                     ; 1013
                                            04 00079        RET                                                    ;
                            52      36  AA  3C 0007A 4$:    MOVZWL  54(RAB), R2                                    ; 0914
                            52          56  C0 0007E        ADDL2   BOFF, R2                                       ;
                50          51          09  78 00081        ASHL    #9, R1, R0                                     ;
                            50          52  D1 00085        CMPL    R2, R0                                         ;
                                        08  19 00088        BLSS    5$                                             ;
                            6E          51  C0 0008A        ADDL2   R1, VBN                                        ; 0917
                                        56  D4 0008D        CLRL    BOFF                                           ; 0918
                                      009A  31 0008F        BRW     14$                                            ; 0919
                      1E    A9      36  AB  B0 00092 5$:    MOVW    54(FAB), 30(CBLOCK)                            ; 0923
                            50      1E  A9  3C 00097        MOVZWL  30(CBLOCK), R0                                 ; 0925
                            50          04  C2 0009B        SUBL2   #4, R0                                         ;
  50      20    AA          10          00  ED 0009E        CMPZV   #0, #16, 32(RAB), R0                           ;
                                        0E  18 000A4        BGEQ    6$                                             ;
                            68 000181A8  8F  D0 000A6        MOVL    #98728, (R8)                                   ; 0928
                      22    AA      20  AA  B0 000AD        MOVW    32(RAB), 34(RAB)                               ; 0929
                                        0C  11 000B2        BRB     7$                                             ;
                            68 00010001  8F  D0 000B4 6$:    MOVL    #65537, (R8)                                   ; 0933
                      22    AA      1E  A9  B0 000BB        MOVW    30(CBLOCK), 34(RAB)                            ; 0934
          28    BA        6647      22  AA  28 000C0 7$:    MOVC3   34(RAB), (BOFF)[CACHE], @40(RAB)               ; 0937
                                        50  11 000C7        BRB     11$                                            ; 0938
                            30        6647  91 000C9 8$:    CMPB    (BOFF)[CACHE], #48                             ; 0946
                                        58  1F 000CD        BLSSU   13$                                            ;
                            39        6647  91 000CF        CMPB    (BOFF)[CACHE], #57                             ;
                                        52  1A 000D3        BGTRU   13$                                            ;
                55          57          56  C1 000D5        ADDL3   BOFF, CACHE, R5                                ; 0955
                            54          04  D0 000D9        MOVL    #4, R4                                         ;
                            53          0A  D0 000DC        MOVL    #10, R3                                        ;
                                00000000G  EF  16 000DF        JSB     SCAN$NUMERIC                                   ;
                      1E    A9          50  B0 000E5        MOVW    R0, 30(CBLOCK)                                 ;
                            50      1E  A9  3C 000E9        MOVZWL  30(CBLOCK), R0                                 ; 0957
                            50          04  C2 000ED        SUBL2   #4, R0                                         ;
  50      20    AA          10          00  ED 000F0        CMPZV   #0, #16, 32(RAB), R0                           ;
                                        0E  18 000F6        BGEQ    9$                                             ;
                            68 000181A8  8F  D0 000F8        MOVL    #98728, (R8)                                   ; 0960
                      22    AA      20  AA  B0 000FF        MOVW    32(RAB), 34(RAB)                               ; 0961
                                        0B  11 00104        BRB     10$                                            ;
                            68 00010001  8F  D0 00106 9$:    MOVL    #65537, (R8)                                   ; 0965
                      22    AA          50  B0 0010D        MOVW    R0, 34(RAB)                                    ; 0966
          28    BA    04 A647      22  AA  28 00111 10$:   MOVC3   34(RAB), 4(BOFF)[CACHE], @40(RAB)              ; 0969
                                        79  11 00119 11$:   BRB     19$                                            ; 0970
                            30        6647  91 0011B 12$:   CMPB    (BOFF)[CACHE], #48                             ; 0978
                                        06  1F 0011F        BLSSU   13$                                            ;
                            39        6647  91 00121        CMPB    (BOFF)[CACHE], #57                             ;
                                        09  1B 00125        BLEQU   15$                                            ;
                                        56  D4 00127 13$:   CLRL    BOFF                                           ; 0981
```

```
                                6E          51  C0 00129        ADDL2   R1, VBN                                  ; 0982
                                            68  D4 0012C 14$:   CLRL    (R8)                                     ; 0983
                                            6B  11 0012E        BRB     20$                                      ;
                55              57          56  C1 00130 15$:   ADDL3   BOFF, CACHE, R5                          ; 0987
                                54          04  D0 00134        MOVL    #4, R4                                   ;
                                53          0A  D0 00137        MOVL    #10, R3                                  ;
                                  00000000G EF  16 0013A        JSB     SCAN$NUMERIC                             ;
                        1E      A9          50  B0 00140        MOVW    R0, 30(CBLOCK)                           ;
                        04      AE      3F  AB  9A 00144        MOVZBL  63(FAB), 4(SP)                           ; 0989
                                50      1E  A9  3C 00149        MOVZWL  30(CBLOCK), R0                           ;
                                50      04  AE  C2 0014D        SUBL2   4(SP), R0                                ;
                                50          04  C2 00151        SUBL2   #4, R0                                   ;
    50      20  AA              10          00  ED 00154        CMPZV   #0, #16, 32(RAB), R0                     ;
                                            13  18 0015A        BGEQ    16$                                      ;
                                68 000181A8 8F  D0 0015C        MOVL    #98728, (R8)                             ; 0992
                                50      3F  AA  9A 00163        MOVZBL  63(RAB), R0                              ; 0993
            22  AA      20      AA          50  A3 00167        SUBW3   R0, 32(RAB), 34(RAB)                     ;
                                            0B  11 0016D        BRB     17$                                      ;
                                68 00010001 8F  D0 0016F 16$:   MOVL    #65537, (R8)                             ; 0997
                        22      AA          50  B0 00176        MOVW    R0, 34(RAB)                              ; 0998
                                      2C    AA  D5 0017A 17$:   TSTL    44(RAB)                                  ; 1001
                                            08  13 0017D        BEQL    18$                                      ;
            2C  BA      04 A647     04      AE  28 0017F        MOVC3   4(SP), 4(BOFF)[CACHE], a44(RAB)          ; 1003
                50              56      04  AE  C1 00187 18$:   ADDL3   4(SP), BOFF, R0                          ; 1006
            28  BA      04 A047     22      AA  28 0018C        MOVC3   34(RAB), 4(R0)[CACHE], a40(RAB)          ;
                                68 00010001 8F  D0 00194 19$:   MOVL    #65537, (R8)                             ; 1007
                                03          68  E8 0019B 20$:   BLBS    (R8), 21$                                ; 1017
                                          FE94  31 0019E        BRW     1$                                       ;
                        18      A9          6E  D0 001A1 21$:   MOVL    VBN, 24(CBLOCK)                          ; 1019
                        1C      A9          56  B0 001A5        MOVW    BOFF, 28(CBLOCK)                         ; 1020
                                08          68  E9 001A9        BLBC    (R8), 22$                                ; 1022
                                50 00010001 8F  D0 001AC        MOVL    #65537, R0                               ; 1024
                                            04  001B3           RET                                              ;
                    00000870    8F          68  D1 001B4 22$:   CMPL    (R8), #2160                              ; 1027
                                            08  12 001BB        BNEQ    23$                                      ;
                                50 0001827A 8F  D0 001BD        MOVL    #98938, R0                               ;
                                            04  001C4           RET                                              ;
                                50 0001C0F4 8F  D0 001C5 23$:   MOVL    #114932, R0                              ;
                                            04  001CC           RET                                              ; 1029

; Routine Size:  461 bytes,    Routine Base:  CODE + 079F


;   1030  1
;   1031  1
;   1032  1     global routine get_block_length ( ;block_length) : get_block =  ! begin [06]
;   1033  1
;   1034  2         begin
;   1035  2
;   1036  2         linkage
;   1037  2             call_boo = call : global (r1 = 1);
;   1038  2
;   1039  2         external routine
;   1040  2             boo$qio : call_boo addressing_mode (long_relative);
;   1041  2
;   1042  2         global register
;   1043  2             r1 = 1;
```

```
;   1044  2
;   1045  2         external register
;   1046  2             cblock = 9 : ref block [, byte],                !Base of common area
;   1047  2             fab = 11 : ref $fab_decl;                       !Base of FAB
;   1048  2
;   1049  2         bind
;   1050  2             status = fab [fab$l_stv];                       !Return value from boo$qio
;   1051  2
;   1052  2         kb_check ();
;   1053  2         status = boo$qio (.cblock [ctl$l_cache3], .cblock [ctl$w_cache_size]*512, 0, io$_readlblk, 0, .cblock [ctl$l_rpb
;   1054  2         block_length = .r1;
;   1055  2         .status
;   1056  1         end;                                                ! end [06]



                                                  05F8 00000        .ENTRY  GET_BLOCK_LENGTH, Save R3,R4,R5,R6,R7,R8,-  ; 1032
                                                                            R10                                         ;
                                     00000000G  EF  16 00002        JSB     KB_CHECK                                    ; 1052
                                           38   A9  DD 00008        PUSHL   56(CBLOCK)                                  ; 1053
                                 7E             21  7D 0000B        MOVQ    #33, -(SP)                                  ;
                                                7E  D4 0000E        CLRL    -(SP)                                       ;
                                 50        0A   A9  3C 00010        MOVZWL  10(CBLOCK), R0                              ;
                     7E          50             09  78 00014        ASHL    #9, R0, -(SP)                               ;
                                           34   A9  DD 00018        PUSHL   52(CBLOCK)                                  ;
                        00000000G  EF             06  FB 0001B        CALLS   #6, BOO$QIO                                 ;
                              0C   AB             50  D0 00022        MOVL    R0, 12(FAB)                                 ;
                                 52             51  D0 00026        MOVL    R1, BLOCK_LENGTH                            ; 1054
                                 50        0C   AB  D0 00029        MOVL    12(FAB), R0                                 ; 1056
                                                    04 0002D        RET                                                 ;

; Routine Size:  46 bytes,    Routine Base:  CODE + 096C


;   1057  1
;   1058  1     end
;   1059  0     eludom




;                                   PSECT SUMMARY
;
;       Name                    Bytes                       Attributes
;
;  DATA                            24  NOVEC,NOWRT,  RD ,NOEXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  CODE                          2458  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
```

Symbol	Type	Defined	Referenced ...											
$ASCID	Macro	Lib01	343											
$FAB_DECL	Macro	Lib03	207	605	772	870	1047							
$FAO	Macro	Lib03	343											
$RAB_DECL	Macro	Lib03	773	869										
A	Local	330	332=	333=	343a	345.								
ADR	Local	234	236=	238.	243a.									
ANSI$CACHEVBN	GlobRout	624	802c	900c										
ANSI$CLOSE	GlobRout	571	97f	222a										
ANSI$GET	GlobRout	831	99f	220a										
ANSI$OPEN	GlobRout	138	96f											
ANSI$READ	GlobRout	733	98f	221a										
BBLOCK	Structur	Lib02	322	323	327	328	329	330						
BLANK	Local	326	337=	338.										
BLOCK_LENGTH	Local	307	436=	470.	471.									
	RoutForm	1032	1054=											
BOFF	Local	876	883=	888.	889=	889.	914.	918=	937.	946.	949=	955.	969.	978.
			981=	987.	1003.	1006.	1020.							
BOO$QIO	ExtRout	212	248c	254c	261c	277c	280c	283c	352c	359c	363c	367c	371c	475c
			493c	497c	500c	502c	504c	514c	518c	522c	535c	548c	608e	614c
			661e	676c	715c	776e	873e	1040e	1053c					
CACHE	Local	688	696=	699=	702=	706=	709.	714a=	715.					
	Local	779	809=	810a.										
	Local	896	905=	937a.	946a.	955aa	969a.	978a.	987aa	1003a.	1006a.			
CACHE_OFFSET	Local	799	806=	807.	808=	808.	810.							
	Local	897	902=	903.	904=	904.								
CACHE_SECTION	Local	800	807=	808.	809.									
	Local	898	903=	904.	905.									
CALL_BOO	Linkage	1037	1040											
CALL_RMS	Linkage	Lib02	96	97	98	99	138	571	624	733	831			
CBLOCK	ExtReg	208	220a=	221a=	222a=	236a.	237a.	240a.	248a.	254a.	261a.	277a.	280a.	283a.
			322a.	352a.	359a.	363a.	367a.	371a.	431a=	432a=	433a=	434a=	440aa	442a.
			449a.	450a=	450a.	451a=	452a=	455a.	462a.	463a=	463a.	464a=	465a=	468a=
			468a.	469a=	469a.	471a=	474a=	474a.	475a.	493a.	497a.	500a.	502a.	504a.
			514a.	518a.	522a.	535a.	548a.							
	ExtReg	604	614a.											
	ExtReg	658	666a.	668a.	673a.	676a.	680a=	680a.	681a=	681a.	684a.	692a.	696a.	699a.
			702a.	706a.	707a=	707a.	708a=	708a.	709a=	710a=	710a.	714a.	715a.	716a.
			720a=	720a.	721a=	721a.	722a.							
	ExtReg	771	787a.	806a.	807a.	808a.	809.	817a=						
	ExtReg	868	882a.	883a.	888a.	889a.	902a.	903a.	904a.	905.	914a.	917a.	923a=	925a.
			934a.	950a.	955a=	957a.	966a.	982a.	987a=	989a.	998a.	1019a=	1020a=	
	ExtReg	1046	1053a.											
CTL$L_CACHE1	Macro	Lib02	450	451	696	706	707	809	905					
CTL$L_CACHE2	Macro	Lib02	463	464	699	707	708							
CTL$L_CACHE3	Macro	Lib02	449	450	462	463	702	708	709	1053				
CTL$L_CLOSE	Macro	Lib02	222											
CTL$L_EOFVBN	Macro	Lib02	431	469	474	666	721							
CTL$L_FILE_PTR	Macro	Lib02	236	237	240									
CTL$L_GET	Macro	Lib02	220											
CTL$L_HVBN	Macro	Lib02	433	452	465	668	681	684	692	721	722			
CTL$L_LVBN	Macro	Lib02	433	668	681	684	692	710	806	902				
CTL$L_NBP	Macro	Lib02	787	817										
CTL$L_PTABLE	Macro	Lib02	322											
CTL$L_READ	Macro	Lib02	221											
CTL$L_RPB	Macro	Lib02	248	254	261	277	280	283	352	359	363	367	371	475

Symbol	Type	Defined	Referenced ...											
			493	497	500	502	504	514	518	522	535	548	614	676
			716	1053										
CTL$L_TAPEPOS	Macro	Lib02	434	442	455	468	673	680	681	720				
CTL$L_VBN	Macro	Lib02	882	1019										
CTL$W_BYTE	Macro	Lib02	883	1020										
CTL$W_CACHE_SIZE	Macro	Lib02	440	680	692	710	714	715	720	722	807	808	888	889
			903	904	914	917	950	982	1053					
CTL$W_FILE_LEN	Macro	Lib02	236	237	240									
CTL$W_OFFBYTE	Macro	Lib02	432	471										
CTL$W_REC_SIZE	Macro	Lib02	888	889	923	925	934	955	957	966	987	989	998	
DEV	Local	327	334=	335=	343a									
DSC$A_POINTER	Macro	Lib03	333	334	336	339								
DSC$C_S_BLN	Literal	Lib03	327	328	329	330								
DSC$W_LENGTH	Macro	Lib03	332	335	338	341	342	345						
END_OF_FILE	Literal	194	268	526	539	545	549	555						
END_OF_PASS1	Literal	193	551											
FAB	ExtReg	207	215aa	251a.	317a.	323a.	384a=	385a=	386a=	387a=	397a=	398a=	403a=	404a=
			415a=	418a=	421a=									
	ExtReg	605	611aa											
	ExtReg	772												
	ExtReg	870	908a.	923a.	989a.	998a.	1003a.	1006a.						
	ExtReg	1047	1050aa											
FAB$B_FSZ	Macro	Lib03	386	989	993	998	1003	1006						
FAB$B_RAT	Macro	Lib03	384	415	418	421								
FAB$B_RFM	Macro	Lib03	385	397	403	908								
FAB$C_BLN	Literal	Lib03	207	605	772	870	1047							
FAB$C_FIX	Literal	Lib03	397	908	911									
FAB$C_VAR	Literal	Lib03	403	943										
FAB$C_VFC	Literal	Lib03	908	975										
FAB$L_NAM	Macro	Lib03	317	323										
FAB$L_STV	Macro	Lib03	215	611	1050									
FAB$M_CR	Literal	Lib03	418											
FAB$M_FTN	Literal	Lib03	415											
FAB$V_RWO	Macro	Lib03	251											
FAB$W_MRS	Macro	Lib03	387	398	404	914	923							
FALSE	Literal	192	245	268	299	301	539	549						
FAT	Bind	382	384.	385.	386.	387.								
FAT$B_RATTRIB	Macro	Lib03	384											
FAT$B_VFCSIZE	Macro	Lib03	386											
FAT$C_LENGTH	Literal	Lib03	382											
FAT$V_RTYPE	Macro	Lib03	385											
FAT$W_MAXREC	Macro	Lib03	387											
FILE	Local	328	336=	338=	343a									
FILENAME	Local	204	242=	243=	274.	285.	295.							
FIRST1	Local	203	246=	488.	510.	510=								
FLAG	Local	199	245=	268=	526=	539=	545.	549=	551.	551=	555=			
GET_BLOCK	Linkage	89	100	211	1032									
GET_BLOCK_LENGTH	GlobRout	1032	100f	436c										
HD1$T_FILEID	Macro	Lib03	274	336	337	338								
HD1$T_GENNO	Macro	Lib03	272											
HD1$T_GENVER	Macro	Lib03	273											
HD2$B_FORMCNTRL	Macro	Lib03	411											
HD2$B_RECFORMAT	Macro	Lib03	392											
HD2$T_BLOCKLEN	Macro	Lib03	426											
HD2$T_RECATR1	Macro	Lib03	377	382										

Symbol	Type	Defined	Referenced ...
HD2$T_RECLEN	Macro	Lib03	398 404
HD4$B_FILEID_EXT_SIZE	Macro	Lib03	291 294 296 341
HD4$T_FILEID_EXT	Macro	Lib03	297 339
HDR1	Local	200	261a 270. 272a 273a 274. 275. 336a 337. 338a 348. 484. 488. 510.
HDR2	Local	201	277a 377. 382a 392. 398a 404a 411. 426a
HDR4	Local	202	280a 283a 291. 294. 296. 297. 339a 340. 341. 350. 357. 491. 512.
IO$_DRVCLR	Literal	Lib03	248
IO$_READLBLK	Literal	Lib03	261 277 280 283 715 1053
IO$_REWIND	Literal	Lib03	254 548
IO$_SKIPFILE	Literal	Lib03	352 359 363 367 371 475 497 514 518 522 535 614
IO$_SKIPRECORD	Literal	Lib03	493 500 502 504 676
JSB	Linkage	87	113
JSB_CBLOCK	Linkage	Lib02	114
JSB_SCAN	Linkage	88	112
KB_CHECK	ExtRout	113	260c 613c 675c 690c 1052c
LEN	Local	231	238= 243.
LONGFILE	Local	329	339= 341= 342= 343a
NAM	Bind	323	332. 333. 345=
NAM$B_RSL	Macro	Lib03	345
NAM$B_RSS	Macro	Lib03	332
NAM$L_RSA	Macro	Lib03	333
PHYNAM	Bind	322	334. 335.
R1	GlobReg	1043	1054.
RAB	ExtReg	773	785aa 787a. 788a. 789a= 789a. 790a= 791a= 792a= 812a= 812a.
	ExtReg	869	880aa 885a. 906a= 906a. 914a. 925a. 929a= 929a. 934a= 937a. 937a= 957a. 961a= 961a. 966a= 969a. 969a= 989a. 993a= 993a. 998a= 1001a. 1004a= 1006a. 1006a=
RAB$B_RAC	Macro	Lib03	885
RAB$C_BLN	Literal	Lib03	773 869
RAB$C_SEQ	Literal	Lib03	885
RAB$L_BKT	Macro	Lib03	787
RAB$L_RBF	Macro	Lib03	789 906 937 969 1006
RAB$L_RFA0	Macro	Lib03	791
RAB$L_RHB	Macro	Lib03	1001 1004
RAB$L_STV	Macro	Lib03	785 880
RAB$L_UBF	Macro	Lib03	789 906
RAB$W_RFA4	Macro	Lib03	792
RAB$W_RSZ	Macro	Lib03	790 812 929 934 937 961 966 969 993 998 1006
RAB$W_USZ	Macro	Lib03	788 925 929 957 961 989 993
RMS$ALLOC_CACHE	ExtRout	114	426c
RMS$_CCF	Literal	Lib03	616
RMS$_DME	Literal	Lib03	429
RMS$_EOF	Literal	Lib03	1027
RMS$_FNF	Literal	Lib03	506 551
RMS$_NORMAL	Literal	Lib03	479 618 793 824 933 938 965 970 997 1007 1024
RMS$_ORG	Literal	Lib03	408 1013
RMS$_RER	Literal	Lib03	278 281 290 353 360 365 369 373 477 494 498 501 503 505 515 520 524 537 560 824 1027
RMS$_RTB	Literal	Lib03	928 960 992
SCAN$NUMERIC	ExtRout	112	241c 272c 398c 404c 426c 955c 987c
SIZE	Bind	440	452. 455. 465. 468. 469.
SS$_DATAOVERUN	Literal	Lib03	533
SS$_ENDOFFILE	Literal	Lib03	287 542 666 824 1027

Symbol	Type	Defined	Referenced ...											
SS$_NORMAL	Literal	Lib03	266	565	727									
STATUS	Bind	215	248=	249.	254=	255.	261=	263.	277=	278.	280=	281.	283=	287.
			289.	352=	353.	359=	360.	363=	365.	367=	369.	371=	373.	426=
			475=	477.	493=	494.	497=	498.	500=	501.	502=	503.	504=	505.
			514=	515.	518=	520.	522=	524.	535=	537.	548=			
	Bind	611	614=	616.										
	Local	664	676=	678.	715=	718.								
	Bind	785	793=	802=	804.	819.	821.	824.						
	Bind	880	900=	919=	928=	933=	938=	951=	960=	965=	970=	983=	992=	997=
			1007=	1017.	1022.	1027.								
	Bind	1050	1053=	1055.										
SYS$FAO	ExtRout	343	343c											
TAPEVERSION	Local	198	272=	275.	343.									
TMP	Local	447	449=	451.										
	Local	460	462=	464.										
TRUE	Literal	191	286	288	292	298	526	551	555					
USER_ADDRESS	Local	781	789=	810a=	811=	811.								
USER_SIZE	Local	780	788=	795.	810.	811.	812.	813=	813.					
VBN	RoutForm	624	666.	668.	673.	684.								
	Local	782	787=	791.	802.	806.	814=	814.	817.					
	Local	877	882=	888=	888.	900.	902.	917=	917.	950=	950.	982=	982.	1019.
VERADR	Local	233	237=	238.	239=	239.	240.	241.						
VERLEN	Local	232	240=	241.										
VERSION	Local	197	241=	275.	285.									

CROSS REFERENCE MAP

Line #	Event	File ...
1	Source (start)	DISK$DS:[DS.LOCAL.RELEASE.WORK]ANSI.B32;1
7	Module ANSI	
80	Library #1	DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
82	Library #2	DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
84	Library #3	SYS$COMMON:[SYSLIB]LIB.L32;3
1059	Eludom ANSI	

KEY TO REFERENCE TYPE FLAGS

.	Fetch
=	Store
c	Routine call
a	Address use
a	Indirect use
e	External, external routine, or external literal declaration
f	Forward or forward routine declaration
h	Condition handler enabling
m	Map declaration
u	Undeclare declaration

; Library Statistics
;

```
;                                        -------- Symbols --------      Pages      Processing
;       File                             Total    Loaded   Percent      Mapped     Time
;
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
;                                          942         1         0          96       00:00.0
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
;                                          675        23         3          47       00:00.0
;  SYS$COMMON:[SYSLIB]LIB.L32;3          21522        65         0        1156       00:00.8
```

```
;                                  COMMAND QUALIFIERS

;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:ANSI.B32

; Size:          2458 code + 24 data bytes
; Run Time:         00:08.8
; Elapsed Time:     00:11.9
; Lines/CPU Min:     7236
; Lexemes/CPU-Min: 89343
; Memory Used:  468 pages
; Compilation Complete
```

Table of contents

(1)   55   Libraries, Included Macros, Equated Symbols
(1)   62   Data Psect Declarations
(1)   76   Work Psect Declarations
(1)   92   Return Error Message
(1)   100   DSX$PPSCB   ;G:2

```
0000    ; DEC/CMS REPLACEMENT HISTORY, Element APBOOT.MAR
0000    ; *5    12-MAY-1986 09:59:21 BARANSKI "Cleaning up Object Libraries."
0000    ; *4     7-MAY-1986 13:09:03 BARANSKI "Documentation Check."
0000    ; *3    25-APR-1986 16:42:47 SHELHAMER "<no reason given>"
0000    ; *2    25-APR-1986 13:34:16 SHELHAMER "<no reason given>"
0000    ; *1     6-FEB-1986 15:13:27 DS ""
0000    ; DEC/CMS REPLACEMENT HISTORY, Element APBOOT.MAR
0000            .Title  APBOOT       Diagnostic Supervisor AP Boot Command Module
0000            .Ident  "7.0-0"                                                    ;G:4
0000            .NoShow Conditionals
0000
0000    ;++
0000    ; COPYRIGHT (C) 1984, 1985
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0000    ;
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```

```
0000     32 ;++
0000     33 ; Facility:
0000     34 ;
0000     35 ;       VAX Diagnostic Supervisor
0000     36 ;
0000     37 ; Abstract:
0000     38 ;
0000     39 ;       This module provides support for booting an attached processor on the BI.
0000     40 ;       For all supervisors except Scorpio, this module issues an error message and
0000     41 ;       returns.
0000     42 ;
0000     43 ; Environment:
0000     44 ;
0000     45 ; Author:
0000     46 ;
0000     47 ;       James Shelhamer         20-Nov-84       Version 7.
0000     48 ;
0000     49 ;
0000     50 ; Modifications:
0000     51 ;
0000     52 ;       None
0000     53 ;--
```

```
                        0000     55          .SubTitle       Libraries, Included Macros, Equated Symbols
                        0000     56
                        0000     57          .Library        /Sys$Library:Lib/       ; Use Lib last
                        0000     58          .Library        /$CRD/                  ; Use CRD.Mar third
                        0000     59          .Library        /$DS/                   ; Use DS.Mar second
                        0000     60          .Library        /$Diag/                 ; Use Diag.Mar first
```

```
                                    0000    62          .SubTitle       Data Psect Declarations
                                00000000    63          .Psect          Data, NoExe, Shr, NoWrt, Long
                                    0000    64                                                                  ;G:3
                                    0000    65          $DS_DSDEF                                               ;G:3
                                    0000    66 ; The following return codes are for use with APR$CHECK_FOR_PROMPT. They
                                    0000    67 ; indicate what was received from the AP.
                           00000001 0000    68 AP$GK_PROMPT == 1                            ; prompt only received
                           00000002 0000    69 AP$GK_PROMPT_WITH_STATUS == 2                ; prompt and status revd
                           00000003 0000    70 AP$GK_NO_PROMPT == 3                         ; no prompt received,
                                    0000    71
                                    0000    72 NOT_AN_AP_SYSTEM:
6E 6E 61 63 20 75 6F 59 20 3F 3F 00' 0000    73          .ASCIC  "?? You cannot boot an attached processor on this system.!/"
61 20 6E 61 20 74 6F 6F 62 20 74 6F  000C
63 6F 72 70 20 64 65 68 63 61 74 74  0018
69 68 74 20 6E 6F 20 72 6F 73 73 65  0024
   2F 21 2E 6D 65 74 73 79 73 20 73  0030
                              3A    0000
                                    003B    74
```

```
                     003B     76          .Subtitle       Work Psect Declarations
                 00000000     77          .Psect          Work, NoExe, NoShr, Wrt, Long
                     0000     78
                     0000     79 ;
                     0000     80 ; Request codes. Issued by the AP to the PP. They are the first longword
                     0000     81 ; in AP$GR_SHARED_DATA, the data block associated with requests.
                     0000     82 ;
                 00000001     0000     83 AP$GK_REQ_CONSRX == 1                        ; Request for console floppy I/O
                     0000     0000     84 AP$GW_DATA::
                     0000     0000     85          .WORD   0
                     0002     0002     86 AP$GW_AP_NODES::
                     0000     0002     87          .WORD   0
                     0004     0004     88 AP$GR_SHARED_DATA::                          ; CPU-shared area. First
                 00000008     0004     89          .BLKL   1                           ; longword used to indicate
                     0008     0008     90                                              ; request type or return code
```

```
                            0008     92          .Subtitle       Return Error Message
                         00000000    93          .Psect          Code, Exe, Shr, NoWrt, Long
                            0000     94
                            0000     95 CMK$APBOOT::
                            0000     96          $DS_PRINTF_S    NOT_AN_AP_SYSTEM        ; Issue error message
                 00000000'EF   9F    0000                        PUSHAB  NOT_AN_AP_SYSTEM
               00000000'9F   01      FB  0006                    CALLS   #$$N, @#DS$PRINTF
                                     02  000D     97          REI                             ; And return.
                                         000E     98
```

```
                                 000E          .Subtitle       DSX$PPSCB                                                  ;G:2
                                 000E  ;++                                                                                ;G:2
                                 000E  ;                                                                                  ;G:2
                                 000E  ; Functional Description:                                                          ;G:2
                                 000E  ;       Returns an error - there is no PP SCB on non-8200 systems                  ;G:2
                                 000E  ;                                                                                  ;G:2
                                 000E  ;--                                                                                ;G:2
                            0000 000E          .ENTRY  DSX$PPSCB,^M<>                                                     ;G:2
        50   006600B1 8F     D0  0010          MOVL    #DS$_NOSUPPORT,R0                ; ERROR                           ;G:2
                              04  0017          RET                                                                        ;G:2
                                 0018                                                                                     ;G:2
                                 0018          .End
```

```
$$N                             = 00000001    D
AP$GK_NO_PROMPT                 = 00000003  G D
AP$GK_PROMPT                    = 00000001  G D
AP$GK_PROMPT_WITH_STATUS        = 00000002  G D
AP$GK_REQ_CONSRX                = 00000001  G D
AP$GR_SHARED_DATA                 00000004 RG D  02
AP$GW_AP_NODES                    00000002 RG D  02
AP$GW_DATA                        00000000 RG D  02
BIT...                          = 00660160    D
CMK$APBOOT                        00000000 RG D  03
DS$K_ERROR                      = 00000002    D
DS$K_NORMAL                     = 00000001    D
DS$K_SEVERE                     = 00000004    D
DS$K_SUBSYS                     = 00000066    D
DS$K_WARNING                    = 00000000    D
DS$PRINTF                         ********  X   03
DS$_AP_NORMAL_BREAK             = 00660150    D
DS$_ARITH                       = 006600D0    D
DS$_ASBE                        = 00660118    D
DS$_BADLINK                     = 006600F0    D
DS$_BADTYPE                     = 006600E8    D
DS$_BIIC                        = 00660120    D
DS$_CHME                        = 006600A8    D
DS$_CHMK                        = 006600E0    D
DS$_DEVNAME                     = 00660108    D
DS$_ERROR                       = 00660002    D
DS$_FHWE                        = 00660068    D
DS$_FRAGBUF                     = 00660080    D
DS$_ICBUSY                      = 006600C8    D
DS$_ICERR                       = 006600C0    D
DS$_IHWE                        = 00660060    D
DS$_ILLCHAR                     = 00660018    D
DS$_ILLPAGCNT                   = 00660078    D
DS$_ILLUNIT                     = 00660100    D
DS$_INIT_FAIL                   = 00660140    D
DS$_INSFMEM                     = 00660050    D
DS$_INVCPU                      = 00660130    D
DS$_IPL2HI                      = 006600B8    D
DS$_IVADDR                      = 00660040    D
DS$_IVVECT                      = 00660038    D
DS$_KRNLSTK                     = 00660090    D
DS$_LOGIC                       = 00660070    D
DS$_MCHK                        = 00660088    D
DS$_MEM_ALLOC_ERR               = 00660138    D
DS$_MMOFF                       = 00660058    D
DS$_NEEDUNIT                    = 006600F8    D
DS$_NODE                        = 00660128    D
DS$_NOPCS                       = 00660110    D
DS$_NORMAL                      = 00660001    D
DS$_NOSUPPORT                   = 006600B1    D
DS$_NOTALLOWMP                  = 00660148    D
DS$_NOTDON                      = 00660030    D
DS$_NOTIMP                      = 006600B0    D
DS$_NULLSTR                     = 00660010    D
DS$_OVERFLOW                    = 00660008    D
DS$_POWER                       = 00660098    D
DS$_PROGERR                     = 00660020    D
DS$_SEVERE                      = 00660004    D
DS$_TRANSL                      = 006600A0    D
DS$_TRUNCATE                    = 00660028    D
DS$_UNEXPINT                    = 006600D8    D
DS$_UNSUPPDEV                   = 00660158    D
DS$_VASFULL                     = 00660048    D
DS$_WARNING                     = 00660000    D
DSX$PPSCB                         0000000E RG D  03
NOT_AN_AP_SYSTEM                  00000000 R  D  01
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
DATA	0000003B (59.)	01 (1.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC LONG
WORK	00000008 (8.)	02 (2.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC LONG
CODE	00000018 (24.)	03 (3.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$N	=00000001	96 (1)	#-96 (1)
AP$GK_NO_PROMPT	=00000003	70 (1)	
AP$GK_PROMPT	=00000001	68 (1)	
AP$GK_PROMPT_WITH_STATUS	=00000002	69 (1)	
AP$GK_REQ_CONSRX	=00000001	83 (1)	
AP$GR_SHARED_DATA	00000004-R	88 (1)	
AP$GW_AP_NODES	00000002-R	86 (1)	
AP$GW_DATA	00000000-R	84 (1)	
BIT...	=00660160	65 (1)	65 (1)
CMK$APBOOT	00000000-R	95 (1)	
DS$K_ERROR	=00000002	65 (1)	
DS$K_NORMAL	=00000001	65 (1)	
DS$K_SEVERE	=00000004	65 (1)	
DS$K_SUBSYS	=00000066	65 (1)	65 (1)
DS$K_WARNING	=00000000	65 (1)	
DS$PRINTF	00000000-XR		96 (1)
DS$_AP_NORMAL_BREAK	=00660150	65 (1)	
DS$_ARITH	=006600D0	65 (1)	
DS$_ASBE	=00660118	65 (1)	
DS$_BADLINK	=006600F0	65 (1)	
DS$_BADTYPE	=006600E8	65 (1)	
DS$_BIIC	=00660120	65 (1)	
DS$_CHME	=006600A8	65 (1)	
DS$_CHMK	=006600E0	65 (1)	
DS$_DEVNAME	=00660108	65 (1)	
DS$_ERROR	=00660002	65 (1)	
DS$_FHWE	=00660068	65 (1)	
DS$_FRAGBUF	=00660080	65 (1)	
DS$_ICBUSY	=006600C8	65 (1)	
DS$_ICERR	=006600C0	65 (1)	
DS$_IHWE	=00660060	65 (1)	
DS$_ILLCHAR	=00660018	65 (1)	
DS$_ILLPAGCNT	=00660078	65 (1)	
DS$_ILLUNIT	=00660100	65 (1)	
DS$_INIT_FAIL	=00660140	65 (1)	
DS$_INSFMEM	=00660050	65 (1)	
DS$_INVCPU	=00660130	65 (1)	
DS$_IPL2HI	=006600B8	65 (1)	
DS$_IVADDR	=00660040	65 (1)	
DS$_IVVECT	=00660038	65 (1)	
DS$_KRNLSTK	=00660090	65 (1)	
DS$_LOGIC	=00660070	65 (1)	
DS$_MCHK	=00660088	65 (1)	
DS$_MEM_ALLOC_ERR	=00660138	65 (1)	
DS$_MMOFF	=00660058	65 (1)	
DS$_NEEDUNIT	=006600F8	65 (1)	
DS$_NODE	=00660128	65 (1)	
DS$_NOPCS	=00660110	65 (1)	
DS$_NORMAL	=00660001	65 (1)	
DS$_NOSUPPORT	=006600B1	65 (1)	#-108 (1)

```
DS$_NOTALLOWMP                =00660148     65     (1)
DS$_NOTDON                    =00660030     65     (1)
DS$_NOTIMP                    =006600B0     65     (1)      65     (1)
DS$_NULLSTR                   =00660010     65     (1)
DS$_OVERFLOW                  =00660008     65     (1)
DS$_POWER                     =00660098     65     (1)
DS$_PROGERR                   =00660020     65     (1)
DS$_SEVERE                    =00660004     65     (1)
DS$_TRANSL                    =006600A0     65     (1)
DS$_TRUNCATE                  =00660028     65     (1)
DS$_UNEXPINT                  =006600D8     65     (1)
DS$_UNSUPPDEV                 =00660158     65     (1)
DS$_VASFULL                   =00660048     65     (1)
DS$_WARNING                   =00660000     65     (1)      65     (1)
DSX$PPSCB                      0000000E-R   107    (1)
NOT_AN_AP_SYSTEM               00000000-R   72     (1)      96     (1)
```

```
                                        +-------------------------+
                                        ! Performance indicators !
                                        +-------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    34    00:00:00.04    00:00:00.22
Command processing               951    00:00:00.27    00:00:00.89
Pass 1                           268    00:00:00.49    00:00:02.09
Symbol table sort                  0    00:00:00.01    00:00:00.01
Pass 2                             6    00:00:00.10    00:00:00.25
Symbol table output                0    00:00:00.02    00:00:00.02
Psect synopsis output              0    00:00:00.00    00:00:00.00
Cross-reference output             2    00:00:00.04    00:00:00.07
Assembler run totals            1261    00:00:00.97    00:00:03.55

The working set limit was 2400 pages.
23823 bytes (47 pages) of virtual memory were used to buffer the intermediate code.
There were 10 pages of symbol table space allocated to hold 66 non-local and 0 local symbols.
111 source lines were read in Pass 1, producing 22 object records in Pass 2.
9 pages of virtual memory were used to define 8 macros.

                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              3
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]CRD.MLB;1               0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       2
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                 5
```

```
130 GETS were required to define 5 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1)   91   DECLARATIONS
(2)   120   APT SUPPORT ROUTINES

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element APT.MAR
0000     2 ; *8     6-OCT-1987 13:53:34 BARANSKI ""
0000     3 ; *7    22-OCT-1986 10:17:50 MARTIN "FIX DS$GT_PROMPT"
0000     4 ; *6    23-JUN-1986 14:11:02 MARTIN "DONE"
0000     5 ; *5    23-JUN-1986 09:37:21 MARTIN "DONE"
0000     6 ; *4    23-JUN-1986 09:34:12 MARTIN "DONE"
0000     7 ; *3    12-MAY-1986 10:07:16 BARANSKI "Cleaning up Object Libraries."
0000     8 ; *2     7-MAY-1986 13:26:39 BARANSKI "Documentation Check."
0000     9 ; *1     6-FEB-1986 15:13:31 DS ""
0000    10 ; DEC/CMS REPLACEMENT HISTORY, Element APT.MAR
0000    11         .TITLE  APT     *** APT interface to APT control
0000    12         .IDENT  "10"                                                    ;G:11
0000    13         .LIST   MEB
0000    14         .NLIST  CND
0000    15 ;
0000    16 ; COPYRIGHT (C) 1977, 1983, 1986                                       ;G:6
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0000    32 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    33
0000    34 ;++
0000    35 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR.
0000    36 ;
0000    37 ; ABSTRACT:
0000    38 ;
0000    39 ; ENVIRONMENT:
0000    40 ;
0000    41 ; AUTHOR:       N. HOWGATE      03-DEC-77       VERSION 01.
0000    42 ;                                                                      ;G:2
0000    43 ; MODIFIED BY:
0000    44 ;                                                                      ;G:2
0000    45 ;               N. HOWGATE      22-JUN-78       VERSION 02(ESSAA-4.03).
0000    46 ;       01      CORRECT DUMP-MODE PROBLEM
0000    47 ;                                                                      ;G:2
0000    48 ;               N. HOWGATE      07-DEC-78       VERSION 03 (ESSAA-5.01)
0000    49 ;       02      EMULATE CHARACTER STRING INSTRUCTION
0000    50 ;                                                                      ;G:2
0000    51 ;               R. RIGGS        12-JUL-79
0000    52 ;       03      ADD CODE TO EXECUTE APT PTEXT DECODER
0000    53 ;                                                                      ;G:2
0000    54 ;               Roger Riggs, 28-May-1980, Version 5.4
0000    55 ;       04      Added code to check that on APT PTEXT command
0000    56 ;               that there is at least one command to process.
0000    57 ;
```

```
0000     58 ;        05      - Jack Stansbury, 22-Oct-1981, Version 6.-
0000     59 ;                Changed SEP Psect to CODE.
0000     60 ;                Fixed truncation errors. Change to lower case on message.
0000     61 ;                Also added .LIBRARY statements for $DS and $DIAG.
0000     62 ;
0000     63 ;        06      - Jack Stansbury, 12-Oct-1981, Version 6.-
0000     64 ;                Changed the call to DS$PARSE to DSX$SUPERPARSE. See the CLI
0000     65 ;                module for an explanation of SUPERPARSE. It returns with the
0000     66 ;                low bit clear in R0 if anything went wrong.
0000     67 ;
0000     68 ;        07      - Jack Stansbury, 12-Oct-1981, Version 6.-
0000     69 ;                Took out references to HALTD and HALTI. Made them just HALT.
0000     70 ;
0000     71 ;        08      - Jack Stansbury, 3-Feb-1982, Version 6.6
0000     72 ;                Added a .LIBRARY statement for LIB. Note: This .LIBRARY
0000     73 ;                statement must be the first one since the libraries are
0000     74 ;                searched in LIFC (Last-In, First-Checked) order.
0000     75 ;
0000     76 ;        09      Bob Bergazzi    2-Feb-1983      Version 6.11
0000     77 ;                Added code to COM_PTEXT that clears out DS$GL_CLIBASE.
0000     78 ;                We should clear these flags out on every command,
0000     79 ;                otherwise subsequent commands may be affected by previous
0000     80 ;                commands. This coincides with a change to APT which allows
0000     81 ;                any commands as PTEXT. The bug prompting this was
0000     82 ;                SET EVENT 1, CLEAR EVENT 1, which caused a hung load.
0000     83 ;
0000     84 ;        10      Bob Bergazzi    11-Apr-1983     Version 6.11
0000     85 ;                Fixed the previous edit.
0000     86 ;                                                                        ;G:6
0000     87 ;        11      STEVE MEIER     23-jun-1986     Version 10.2            ;G:6
0000     88 ;                changed literal to symbolic string ( "DS> " ).          ;G:6
0000     89 ;--
```

```
                                  0000          .SBTTL  DECLARATIONS
                                  0000  ;
                                  0000  ; INCLUDE FILES:
                                  0000  ;
                                  0000          .LIBRARY        /SYS$LIBRARY:LIB/                       ;               [08]
                                  0000          .LIBRARY        /$DS/                                   ;               [05]
                                  0000          .LIBRARY        /$DIAG/                                 ;               [05]
                                  0000
                                  0000  ;
                                  0000  ; MACROS:
                                  0000  ;
                                  0000
                                  0000  ;
                                  0000  ; EQUATED SYMBOLS:
                                  0000  ;
                                  0000  $DS_DSDEF
                                  0000  $DS_DSADEF                                      ; APT DEFINITIONS
                                  0000  $DS_HDRDEF                                      ; HEADER DEFINITIONS
                                  0000  CLIDEF                                          ; CLI DEFINITIONS
                                  0000  DSFDEF
                                  0000
                                  0000  ;
                                  0000  ; OWN STORAGE:
                                  0000  ;
                                  0000          .SAVE
                              00000000          .PSECT  Data, NoExe, Shr, NoWrt, Long                   ;               [05]
                                  0000          MODNAM  APT
                     54 50 41 00' 0000      $MODULE:        .ASCIC  \APT\
                              03  0000
64 65 76 72 65 73 65 52 20 3F 3F 00' 0004  T_PRGERR:       .ASCIC  "?? Reserved APT command received"      ;               [05]
64 6E 61 6D 6D 6F 63 20 54 50 41 20  0010
         64 65 76 69 65 63 65 72 20  001C
                              20  0004
```

```
                     0025   120          .SBTTL  APT SUPPORT ROUTINES
                 00000000   121          .PSECT  Code, Exe, Shr, NoWrt, Long                    ;               [05]
                     0000   122 ;++
                     0000   123 ; FUNCTIONAL DESCRIPTION:
                     0000   124 ;
                     0000   125 ;
                     0000   126 ; CALLING SEQUENCE:
                     0000   127 ;
                     0000   128 ;       NONE
                     0000   129 ;
                     0000   130 ; INPUT PARAMETERS:
                     0000   131 ;
                     0000   132 ;       NONE
                     0000   133 ;
                     0000   134 ; IMPLICIT INPUTS:
                     0000   135 ;
                     0000   136 ;       NONE
                     0000   137 ;
                     0000   138 ; OUTPUT PARAMETERS:
                     0000   139 ;
                     0000   140 ;       NONE
                     0000   141 ;
                     0000   142 ; IMPLICIT OUTPUTS:
                     0000   143 ;
                     0000   144 ;       NONE
                     0000   145 ;
                     0000   146 ; COMPLETION CODES:
                     0000   147 ;
                     0000   148 ;       NONE
                     0000   149 ;
                     0000   150 ; SIDE EFFECTS:
                     0000   151 ;
                     0000   152 ;       NONE
                     0000   153 ;
                     0000   154 ;--
                     0000   155
                     0000   156 APT_COM::
                     0000   157          CASE    DSA$GL_APTCOM,LIMIT=#0,TYPE=L,<-
                     0000   158          COM_NOP,-                                      ; <000> NOP
                     0000   159          COM_RSRV,-                                     ; <001> RESERVED
                     0000   160          COM_PTEXT,-                                    ; <002> PROCESS PTEXT
                     0000   161          COM_DUMP,-                                     ; <003> DUMP
                     0000   162          COM_ZERO,-                                     ; <004> ZERO CORE
                     0000   163          COM_START,-                                    ; <005> START DIAGNOSTIC
                     0000   164          COM_ABORT,-                                    ; <006> ABORT DIAGNOSTIC
                     0000   165          COM_RSRV,-                                     ; <007> RESERVED
                     0000   166          COM_RSRV,-                                     ; <010> RESERVED
                     0000   167          COM_CONT,-                                     ; <011> CONTINUE
                     0000   168          >
09'  00   0000FE04'EF   CF  0000          CASEL   DSA$GL_APTCOM,#0,S^#<<30001$-30000$>/2>-1
                            0008      30000$:
                0036'       0008          .SIGNED_WORD    COM_NOP-30000$
                0014'       000A          .SIGNED_WORD    COM_RSRV-30000$
                00DD'       000C          .SIGNED_WORD    COM_PTEXT-30000$
                0043'       000E          .SIGNED_WORD    COM_DUMP-30000$
                007B'       0010          .SIGNED_WORD    COM_ZERO-30000$
                00AA'       0012          .SIGNED_WORD    COM_START-30000$
```

```
                        00BD' 0014                .SIGNED_WORD    COM_ABORT-30000$
                        0014' 0016                .SIGNED_WORD    COM_RSRV-30000$
                        0014' 0018                .SIGNED_WORD    COM_RSRV-30000$
                        00D0' 001A                .SIGNED_WORD    COM_CONT-30000$
                              001C          30001$:
                              001C  169
                              001C  170 COM_RSRV:
          0000FE04'EF    D4   001C  171           CLRL    DSA$GL_APTCOM                       ; CLEAR COMMAND
          0000FE40'EF    D4   0022  172           CLRL    DSA$GL_MSGTYP                       ; CLEAR MESSAGE TYPE
                              0028  173           ERRSUP_S        MSGADR=T_PRGERR ; RESERVED COMMAND CODE
          00000000'EF    DF   0028                       PUSHAL  $MODULE
          00000004'EF    DF   002E                       PUSHAL  T_PRGERR
                   01    DD   0034                       PUSHL   #$ER
     00000000'EF   03    FB   0036                       CALLS   #3, DS_ERRSUP
                         05   003D  174           RSB                                         ; RETURN
                              003E  175
                              003E  176 COM_NOP:
          0000FE04'EF    D4   003E  177           CLRL    DSA$GL_APTCOM                       ; CLEAR COMMAND
          0000FE40'EF    D4   0044  178           CLRL    DSA$GL_MSGTYP                       ; CLEAR MESSAGE TYPE
                         05   004A  179           RSB                                         ; RETURN
                              004B  180
                              004B  181 COM_DUMP:
          0000FE04'EF    D4   004B  182           CLRL    DSA$GL_APTCOM                       ; CLEAR COMMAND
          0000FE40'EF    D4   0051  183           CLRL    DSA$GL_MSGTYP                       ; CLEAR MESSAGE TYPE
0000FE00'EF    88000000 8F   CA   0057  184           BICL    #DSA$M_APT!DSA$M_NORPT,DSA$GL_FLAGS     ; CLEAR APT AND NO REPORT
0000FE00'EF    00001000 8F   C8   0062  185           BISL    #DSA$M_OPER,DSA$GL_FLAGS            ; INDICATE OPERATOR PRESENT
                   06    C8   006D  186           BISL    #DS$M_LODFLG!DS$M_STRFLG,-
          00000000'EF          006F  187                   DS$GL_FLAGS                         ; INDICATE PROGRAM LOADED AND STARTE
       04 A2    00000000'EF   9E   0074  188           MOVAB   VRRESTART,CLI$L_COMMAND(R2)     ; LOAD DUMMY RESTART COMMAND
          00000000'EF    16   007C  189           JSB     VRRESTART                           ; DO A RESTART                  [05]
                         05   0082  190           RSB                                         ; RETURN
```

```
                                0083   COM_ZERO:
      00000000'8F    00   DA   0083           MTPR    #0,#PR$_MAPEN                  ; TURN OFF MEMORY MANAGEMENT IF ENAB
           0000FE04'EF    D4   008A           CLRL    DSA$GL_APTCOM                  ; CLEAR COMMAND
           0000FE40'EF    D4   0090           CLRL    DSA$GL_MSGTYP                  ; CLEAR MESSAGE TYPE
      0000001C'EF    00   D2   0096           MCOML   #0,DS$GL_CLIBASE+CLI$L_DATA    ; SET UP AN "ALL" INDICATOR
           00000000'EF    16   009D           JSB     VRCLRBRK                       ;  AND GO CLEAR BREAKPOINTS      [05]
                     50   D4   00A3           CLRL    R0                             ; CLEAR INDEX
                                00A5
                0000'C0   7C   00A5   10$:    CLRQ    DS$A_PRGBGN(R0)                ; CLEAR
   F4 50    00000000'8F   F2   00A9           AOBLSS  #<DS$K_PRGSIZ/8>,R0,10$        ; ALL LOCATIONS
                          05   00B1           RSB                                    ; RETURN
                                00B2
                                00B2   COM_START:
           0000FE04'EF    D4   00B2           CLRL    DSA$GL_APTCOM                  ; CLEAR COMMAND
           0000FE40'EF    D4   00B8           CLRL    DSA$GL_MSGTYP                  ; CLEAR MESSAGE TYPE
           00000000'EF    16   00BE           JSB     VRSTART                        ; START                          [05]
                          05   00C4           RSB                                    ; RETURN
                                00C5
                                00C5   COM_ABORT:
           0000FE04'EF    D4   00C5           CLRL    DSA$GL_APTCOM                  ; CLEAR COMMAND
           0000FE40'EF    D4   00CB           CLRL    DSA$GL_MSGTYP                  ; CLEAR MESSAGE TYPE
           00000000'EF    16   00D1           JSB     VRABORT                        ; ABORT                          [05]
                          05   00D7           RSB                                    ; RETURN
                                00D8
                                00D8   COM_CONT:
           0000FE04'EF    D4   00D8           CLRL    DSA$GL_APTCOM                  ; CLEAR COMMAND
           0000FE40'EF    D4   00DE           CLRL    DSA$GL_MSGTYP                  ; CLEAR MESSAGE TYPE
                          04   00E4           RET                                    ; RETURN TO CLI'S CALLER
```

```
                                00E5
                                00E5  COM_PTEXT:
                     30   BB    00E5          PUSHR   #^M<R4,R5>                  ; Save a couple
55   0000FA00'EF      9E    00E7          MOVAB   DSA$AT_APTTXT,R5            ; Point to text area
                                00EE
                     04   11    00EE          BRB     15$                         ; Assume must be some text
                     65   95    00F0  10$:    TSTB    (R5)                        ; Any text left?
                     26   13    00F2          BEQL    25$                         ; NO, exit
                                00F4  15$:
50   0000FE00'EF      9E    00F4          MOVAB   DSA$AT_APTTXT+1024,R0       ; Point past two pages
           54   65    9E    00FB          MOVAB   (R5),R4                     ; Point to current position
      64   0A0D 8F    B1    00FE  20$:    CMPW    #^X0A0D,(R4)                ; CRLF here?
                     18   13    0103          BEQL    30$                         ; Branch if it is
        F5 54   50    F2    0105          AOBLSS  R0,R4,20$                   ; increment and try next
                                0109          ERRSUP_S
      00000000'EF      DF    0109                  PUSHAL  $MODULE
                     00   DD    010F                  PUSHL   #0
                     02   DD    0111                  PUSHL   #$ER
00000000'EF          03   FB    0113                  CALLS   #3, DS_ERRSUP
                   0090   31    011A  25$:    BRW     100$                        ; Exit
                                011D
           54   55    C2    011D  30$:    SUBL2   R5,R4                       ; Length of text just scanned
           54   04    C2    0120          SUBL    #4,R4                       ; Must be at least 4 characters
                     13   18    0123          BGEQ    40$                         ; Branch if enough
                                0125          ERRSUP_S
      00000000'EF      DF    0125                  PUSHAL  $MODULE
                     00   DD    012B                  PUSHL   #0
                     03   DD    012D                  PUSHL   #$ER
00000000'EF          03   FB    012F                  CALLS   #3, DS_ERRSUP
                     75   11    0136          BRB     100$                        ; Exit
                                0138
85   00000001'EF      D1    0138  40$:    CMPL    L^DS$GT_PROMPT+1,(R5)+      ; Prompt present?   "DS> "          [11]
                     13   13    013F          BEQL    45$                         ; Branch if present
                                0141          ERRSUP_S                            ; no prompt present
      00000000'EF      DF    0141                  PUSHAL  $MODULE
                     00   DD    0147                  PUSHL   #0
                     04   DD    0149                  PUSHL   #$ER
00000000'EF          03   FB    014B                  CALLS   #3, DS_ERRSUP
                     59   11    0152          BRB     100$                        ; Exit
                                0154
                     03   BB    0154  45$:    PUSHR   #^M<R0,R1>                  ; Better saved than sorry.          [09]
50   0000044C'EF      DE    0156          MOVAL   L^DS$GL_CLIBASE+CLI$K_SIZE,R0   ; Start at the end.          [09]
                     70   D4    015D          CLRL    -(R0)                       ; After this it is quad aligned     [10]
51   00000089 8F      D0    015F          MOVL    #CLI$K_SIZE/8,R1            ; Number of QUAD words to clear     [09]
                                0166
                     70   7C    0166  50$:    CLRQ    -(R0)                       ; Loop til we reach beginning       [09]
              FB 51   F5    0168          SOBGTR  R1,50$                      ;                                   [09]
                     03   BA    016B          POPR    #^M<R0,R1>                  ; Restore                           [09]
                                016D
        34 A2   54    7D    016D          MOVQ    R4,CLI$Q_BUFQWD(R2)         ; Set length and address of input
                                0171
      00000000'EF      DF    0171          PUSHAL  L^CLI_ACTION                ; Push SUPERPARSE params            [06]
      00000000'EF      DF    0177          PUSHAL  L^COMMAND_TREE              ;                                   [06]
              34 A2   7F    017D          PUSHAQ  CLI$Q_BUFQWD(R2)            ;                                   [06]
00000000'9F          03   FB    0180          CALLS   #3, @#DSX$SUPERPARSE        ; Call the Supervisor Parser        [06]
                                0187
              13 50   E8    0187          BLBS    R0,60$                      ; Branch if it worked               [06]
```

```
                                018A   274          ERRSUP_S                          ; OOPS, APT should not make mistakes
        00000000'EF     DF      018A                        PUSHAL  $MODULE
                  00    DD      0190                        PUSHL   #0
                  05    DD      0192                        PUSHL   #$ER
    00000000'EF   03    FB      0194                        CALLS   #3, DS_ERRSUP
                  10    11      019B   275          BRB     100$                      ; Exit
                                019D   276
                                019D   277 ;                                                                                [06]
                                019D   278 ; No longer need to check NOTNUF flag.                                           [06]
                                019D   279 ;                                                                                [06]
                                019D   280
          50    04 A2   D0      019D   281 60$:     MOVL    CLI$L_COMMAND(R2),R0      ; Address of processing routine
                  02    13      01A1   282          BEQL    70$                       ; Branch if none
                  60    16      01A3   283          JSB     (R0)                      ; Call it
                                01A5   284
        55    02 A544   9E      01A5   285 70$:     MOVAB   2(R5)[R4],R5              ; Point past current line
                FF43    31      01AA   286          BRW     10$                       ; Try again
                                01AD   287
                  30    BA      01AD   288 100$:    POPR    #^M<R4,R5>                ; Restore
        0000FE04'EF     D4      01AF   289          CLRL    DSA$GL_APTCOM             ; Clear command
        0000FE40'EF     D4      01B5   290          CLRL    DSA$GL_MSGTYP             ; Clear error text
                        05      01BB   291          RSB                               ; Return
```

```
                          01BC   293
                          01BC   294 ;+
                          01BC   295 ; ROUTINE TO SYNCHRONIZE SUPERVISOR
                          01BC   296 ; WITH APT RECIEPT OF ERROR MESSAGES
                          01BC   297 ;-
                          01BC   298 APT_MSG::
0000FE00'EF   01    D3    01BC   299          BITL    #DSA$M_HALT, -                  ; IF HALT ON ERROR                  [07]
                          01C3   300                  DSA$GL_FLAGS                    ;
                    0E    12    01C3   301          BNEQ    APT_RTN                 ; IN-LINE BPT HAS ALREADY
                          01C5   302                                                  ; BEEN SET
                          01C5   303 APT_DONE::
                          01C5   304 10$:
00000000'EF         16    01C5   305          JSB     KB_CHECK                        ; Check for ^C at terminal          [05]
0000FE40'EF         D5    01CB   306          TSTL    DSA$GL_MSGTYP                   ; WAIT FOR MESSAGE TO BE
                          01D1   307                                                  ; ACKNOWLEDGED
                    F2    12    01D1   308          BNEQ    10$                     ; LOOP
                          01D3   309 APT_RTN:
                          05    01D3   310          RSB                             ; RETURN
                          01D4   311 .END
```

```
$ER                             = 00000006     D
$MODULE                           00000000 R   D   02
APT_COM                           00000000 RG  D   03
APT_DONE                          000001C5 RG  D   03
APT_MSG                           000001BC RG  D   03
APT_RTN                           000001D3 R   D   03
BIT...                          = 0000001A     D
CLI$K_BUFSIZ                    = 00000100     D
CLI$K_SIZE                        0000044C     D
CLI$L_ADDRESS                     00000018     D
CLI$L_COMMAND                     00000004     D
CLI$L_DATA                        0000001C     D
CLI$L_FLAGS                       00000000     D
CLI$L_FLAGS2                      00000444     D
CLI$L_LAST                        00000024     D
CLI$L_NEXT                        00000030     D
CLI$L_PASS                        0000002C     D
CLI$L_SUBT                        00000028     D
CLI$L_TEMP_BASE                   00000448     D
CLI$L_TEST                        00000020     D
CLI$M_START_OR_RUN              = 00000008     D
CLI$Q_BUFQWD                      00000034     D
CLI$Q_FILE                        00000008     D
CLI$Q_SECTION                     00000010     D
CLI$Q_TIME                        0000043C     D
CLI$T_BUFFER                      0000003C     D
CLI$V_ADAPTER                   = 00000018     D
CLI$V_ADR                       = 0000000B     D
CLI$V_ASCII                     = 00000013     D
CLI$V_BASE_QUAL                 = 00000002     D
CLI$V_BREAK                     = 0000000A     D
CLI$V_BRIEF                     = 0000001B     D
CLI$V_BYTE                      = 0000000D     D
CLI$V_CLEAR                     = 00000002     D
CLI$V_DEC                       = 00000010     D
CLI$V_DEFAULT                   = 0000000C     D
CLI$V_DEPOSIT                   = 00000019     D
CLI$V_EVENT                     = 00000008     D
CLI$V_EXAM                      = 00000005     D
CLI$V_FLAGS                     = 00000009     D
CLI$V_HEX                       = 00000012     D
CLI$V_KERNEL                    = 00000017     D
CLI$V_LOAD                      = 00000006     D
CLI$V_LONG                      = 0000000F     D
CLI$V_NEXT                      = 00000001     D
CLI$V_NOALLOC                   = 00000000     D
CLI$V_NOTNUF                    = 00000001     D
CLI$V_OCT                       = 00000011     D
CLI$V_PREG                      = 0000001A     D
CLI$V_QA                        = 00000007     D
CLI$V_QACKLOOPLOOPS             = 0000001C     D
CLI$V_QAERRORPRINTS             = 0000001B     D
CLI$V_QAMULTIPLEPASS            = 0000001F     D
CLI$V_QASUBTESTLOOPS            = 0000001E     D
CLI$V_QATESTLOOPS               = 0000001D     D
CLI$V_REG                       = 00000014     D
CLI$V_REQUIRED                  = 00000000     D
CLI$V_RUN                       = 00000015     D
CLI$V_SET                       = 00000003     D
CLI$V_SHOW                      = 00000004     D
CLI$V_START_OR_RUN              = 00000003     D
CLI$V_VALSEC                    = 00000016     D
CLI$V_WORD                      = 0000000E     D
CLI_ACTION                        ********   X   03
COMMAND_TREE                      ********   X   03
COM_ABORT                         000000C5 R   D   03
COM_CONT                          000000D8 R   D   03
COM_DUMP                          0000004B R   D   03
COM_NOP                           0000003E R   D   03
COM_PTEXT                         000000E5 R   D   03
COM_RSRV                          0000001C R   D   03
COM_START                         000000B2 R   D   03
COM_ZERO                          00000083 R   D   03
DS$A_PRGBGN                       ********   X   03
DS$GL_CLIBASE                     ********   X   03
DS$GL_FLAGS                       ********   X   03
DS$GT_PROMPT                      ********   X   03
DS$K_ERROR                      = 00000002     D
DS$K_NORMAL                     = 00000001     D
DS$K_PRGSIZ                       ********   X   03
DS$K_SEVERE                     = 00000004     D
DS$K_SUBSYS                     = 00000066     D
DS$K_WARNING                    = 00000000     D
DS$M_ABRTFLG                    = 00000040     D
DS$M_BADTIME                    = 00100000     D
DS$M_BATCH                      = 00400000     D
DS$M_BRKCLR                     = 00001000     D
DS$M_BRKPT                      = 00000800     D
DS$M_CHARFLG                    = 00000100     D
DS$M_CMDFLG                     = 00000080     D
DS$M_CTRLC                      = 00000001     D
DS$M_CTRLO                      = 00010000     D
DS$M_DEVFLG                     = 00000200     D
DS$M_DISABLCC                   = 01000000     D
DS$M_DONFLG                     = 00002000     D
DS$M_ERRFLG                     = 00000010     D
DS$M_EXCEPT                     = 00080000     D
DS$M_EXETST                     = 00040000     D
DS$M_HLTFLG                     = 00000008     D
DS$M_LODFLG                     = 00000002     D
DS$M_MEMMGT                     = 00008000     D
DS$M_NI                         = 04000000     D
DS$M_OUTPUT                     = 00800000     D
DS$M_RUBFLG                     = 00000020     D
DS$M_SCRIPT                     = 00200000     D
DS$M_SETIMR                     = 02000000     D
DS$M_STRFLG                     = 00000004     D
DS$M_SUBT                       = 00004000     D
DS$M_SYSFLG                     = 00000400     D
DS$M_TIMED                      = 02000000     D
DS$M_TIMED_OUT                  = 08000000     D
DS$M_TIMRON                     = 00020000     D
DS$V_ABRTFLG                    = 00000006     D
DS$V_BADTIME                    = 00000014     D
```

```
DS$V_BATCH                      = 00000016    D
DS$V_BRKCLR                     = 0000000C    D
DS$V_BRKPT                      = 0000000B    D
DS$V_CHARFLG                    = 00000008    D
DS$V_CMDFLG                     = 00000007    D
DS$V_CTRLC                      = 00000000    D
DS$V_CTRLO                      = 00000010    D
DS$V_DEVFLG                     = 00000009    D
DS$V_DISABLCC                   = 00000018    D
DS$V_DONFLG                     = 0000000D    D
DS$V_ERRFLG                     = 00000004    D
DS$V_EXCEPT                     = 00000013    D
DS$V_EXETST                     = 00000012    D
DS$V_HLTFLG                     = 00000003    D
DS$V_LODFLG                     = 00000001    D
DS$V_MEMMGT                     = 0000000F    D
DS$V_NI                         = 0000001A    D
DS$V_OUTPUT                     = 00000017    D
DS$V_RUBFLG                     = 00000005    D
DS$V_SCRIPT                     = 00000015    D
DS$V_SETIMR                     = 00000019    D
DS$V_STRFLG                     = 00000002    D
DS$V_SUBT                       = 0000000E    D
DS$V_SYSFLG                     = 0000000A    D
DS$V_TIMED                      = 00000019    D
DS$V_TIMED_OUT                  = 0000001B    D
DS$V_TIMRON                     = 00000011    D
DS$_AP_NORMAL_BREAK             = 00660150    D
DS$_ARITH                       = 006600D0    D
DS$_ASBE                        = 00660118    D
DS$_BADLINK                     = 006600F0    D
DS$_BADTYPE                     = 006600E8    D
DS$_BIIC                        = 00660120    D
DS$_CHME                        = 006600A8    D
DS$_CHMK                        = 006600E0    D
DS$_DEVNAME                     = 00660108    D
DS$_ERROR                       = 00660002    D
DS$_FHWE                        = 00660068    D
DS$_FRAGBUF                     = 00660080    D
DS$_ICBUSY                      = 006600C8    D
DS$_ICERR                       = 006600C0    D
DS$_IHWE                        = 00660060    D
DS$_ILLCHAR                     = 00660018    D
DS$_ILLPAGCNT                   = 00660078    D
DS$_ILLUNIT                     = 00660100    D
DS$_INIT_FAIL                   = 00660140    D
DS$_INSFMEM                     = 00660050    D
DS$_INVCPU                      = 00660130    D
DS$_IPL2HI                      = 006600B8    D
DS$_IVADDR                      = 00660040    D
DS$_IVVECT                      = 00660038    D
DS$_KRNLSTK                     = 00660090    D
DS$_LOGIC                       = 00660070    D
DS$_MCHK                        = 00660088    D
DS$_MEM_ALLOC_ERR               = 00660138    D
DS$_MMOFF                       = 00660058    D
DS$_NEEDUNIT                    = 006600F8    D
DS$_NODE                        = 00660128    D
DS$_NOPCS                       = 00660110    D
DS$_NORMAL                      = 00660001    D
DS$_NOSUPPORT                   = 006600B1    D
DS$_NOTALLOWMP                  = 00660148    D
DS$_NOTDON                      = 00660030    D
DS$_NOTIMP                      = 006600B0    D
DS$_NULLSTR                     = 00660010    D
DS$_OVERFLOW                    = 00660008    D
DS$_POWER                       = 00660098    D
DS$_PROGERR                     = 00660020    D
DS$_SEVERE                      = 00660004    D
DS$_TRANSL                      = 006600A0    D
DS$_TRUNCATE                    = 00660028    D
DS$_UNEXPINT                    = 006600D8    D
DS$_UNSUPPDEV                   = 00660158    D
DS$_VASFULL                     = 00660048    D
DS$_WARNING                     = 00660000    D
DSA$AL_APTMAIL                    0000FE00    D
DSA$AT_APTTXT                     0000FA00    D
DSA$GL_APTCOM                     0000FE04    D
DSA$GL_DEVLEN                     0000FE58    D
DSA$GL_ERRNO                      0000FE44    D
DSA$GL_EVENT                      0000FE48    D
DSA$GL_FLAGS                      0000FE00    D
DSA$GL_MSGTYP                     0000FE40    D
DSA$GL_PASSES                     0000FE08    D
DSA$GL_PASSNO                     0000FE54    D
DSA$GL_SECTNO                     0000FE10    D
DSA$GL_SID                        0000FE14    D
DSA$GL_SUBTNO                     0000FE4C    D
DSA$GL_TESTNO                     0000FE50    D
DSA$GL_UNITS                      0000FE0C    D
DSA$GQ_MSGPTR                     0000FE68    D
DSA$GT_DEVNAM                     0000FE5C    D
DSA$M_APT                       = 80000000    D
DSA$M_HALT                      = 00000001    D
DSA$M_NORPT                     = 08000000    D
DSA$M_OPER                      = 00001000    D
DSX$SUPERPARSE                    ********    X    03
DS_ERRSUP                         ********    X    03
KB_CHECK                          ********    X    03
L$A_CCP                           00000240    D
L$A_DEVP                          0000021C    D
L$A_DREG                          00000224    D
L$A_DTP                           00000218    D
L$A_ICP                           0000023C    D
L$A_LASTADR                       00000214    D
L$A_NAME                          00000208    D
L$A_REPP                          00000244    D
L$A_SECNAM                        00000250    D
L$A_STATAB                        00000248    D
L$A_TSTCNT                        00000254    D
L$L_ENVIRON                       00000204    D
L$L_ERRTYP                        0000024C    D
L$L_HEADLENGTH                    00000200    D
L$L_REV                           0000020C    D
```

```
L$L_UNIT                          00000220    D
L$L_UNUSED                        00000228    D
L$L_UPDATE                        00000210    D
PR$_MAPEN                         ********    X   03
SIZ...                          = 00000001    D
T_PRGERR                          00000004 R  D   02
VRABORT                           ********    X   03
VRCLRBRK                          ********    X   03
VRRESTART                         ********    X   03
VRSTART                           ********    X   03
```

+----------------+
! Psect synopsis !
+----------------+

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000FE70 (65136.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
DATA	00000025 (37.)	02 (2.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC LONG
CODE	000001D4 (468.)	03 (3.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

```
                                        +-------------------------+
                                        ! Symbol Cross Reference !
                                        +-------------------------+

SYMBOL                          VALUE        DEFINITION      REFERENCES...
------                          -----        ----------      -------------
$ER                            =00000006     274    (5)     #-173    (2)     #-235    (5)     #-241    (5)     #-246    (5)
                                                             #-274    (5)
$MODULE                         00000000-R   117    (1)       173    (2)       235    (5)       241    (5)       246    (5)
                                                               274    (5)
APT_COM                         00000000-R   156    (2)
APT_DONE                        000001C5-R   303    (7)
APT_MSG                         000001BC-R   298    (7)
APT_RTN                         000001D3-R   309    (7)     #-301    (7)
BIT...                         =0000001A     110    (1)       106    (1)       110    (1)
CLI$K_BUFSIZ                   =00000100     109    (1)       109    (1)
CLI$K_SIZE                      0000044C     109    (1)       250    (5)       251    (5)       254    (5)       257    (5)
                                                             #-260    (5)
CLI$L_ADDRESS                   00000018     109    (1)
CLI$L_COMMAND                   00000004     109    (1)     #-188    (2)     #-281    (5)
CLI$L_DATA                      0000001C     109    (1)     #-196    (3)
CLI$L_FLAGS                     00000000     109    (1)
CLI$L_FLAGS2                    00000444     109    (1)
CLI$L_LAST                      00000024     109    (1)
CLI$L_NEXT                      00000030     109    (1)
CLI$L_PASS                      0000002C     109    (1)
CLI$L_SUBT                      00000028     109    (1)
CLI$L_TEMP_BASE                 00000448     109    (1)
CLI$L_TEST                      00000020     109    (1)
CLI$M_START_OR_RUN             =00000008     109    (1)
CLI$Q_BUFQWD                    00000034     109    (1)     #-266    (5)       270    (5)
CLI$Q_FILE                      00000008     109    (1)
CLI$Q_SECTION                   00000010     109    (1)
CLI$Q_TIME                      0000043C     109    (1)
CLI$T_BUFFER                    0000003C     109    (1)
CLI$V_ADAPTER                  =00000018     109    (1)
CLI$V_ADR                      =0000000B     109    (1)
CLI$V_ASCII                    =00000013     109    (1)
CLI$V_BASE_QUAL                =00000002     109    (1)
CLI$V_BREAK                    =0000000A     109    (1)
CLI$V_BRIEF                    =0000001B     109    (1)
CLI$V_BYTE                     =0000000D     109    (1)
CLI$V_CLEAR                    =00000002     109    (1)
CLI$V_DEC                      =00000010     109    (1)
CLI$V_DEFAULT                  =0000000C     109    (1)
CLI$V_DEPOSIT                  =00000019     109    (1)
CLI$V_EVENT                    =00000008     109    (1)
CLI$V_EXAM                     =00000005     109    (1)
CLI$V_FLAGS                    =00000009     109    (1)
CLI$V_HEX                      =00000012     109    (1)
CLI$V_KERNEL                   =00000017     109    (1)
CLI$V_LOAD                     =00000006     109    (1)
CLI$V_LONG                     =0000000F     109    (1)
CLI$V_NEXT                     =00000001     109    (1)
CLI$V_NOALLOC                  =00000000     109    (1)
CLI$V_NOTNUF                   =00000001     109    (1)
```

```
CLI$V_OCT                       =00000011     109     (1)
CLI$V_PREG                      =0000001A     109     (1)
CLI$V_QA                        =00000007     109     (1)
CLI$V_QACKLOOPLOOPS             =0000001C     109     (1)
CLI$V_QAERRORPRINTS             =0000001B     109     (1)
CLI$V_QAMULTIPLEPASS            =0000001F     109     (1)
CLI$V_QASUBTESTLOOPS            =0000001E     109     (1)
CLI$V_QATESTLOOPS               =0000001D     109     (1)
CLI$V_REG                       =00000014     109     (1)
CLI$V_REQUIRED                  =00000000     109     (1)
CLI$V_RUN                       =00000015     109     (1)
CLI$V_SET                       =00000003     109     (1)
CLI$V_SHOW                      =00000004     109     (1)
CLI$V_START_OR_RUN              =00000003     109     (1)       109     (1)
CLI$V_VALSEC                    =00000016     109     (1)
CLI$V_WORD                      =0000000E     109     (1)
CLI_ACTION                       00000000-XR                    268     (5)
COMMAND_TREE                     00000000-XR                    269     (5)
COM_ABORT                        000000C5-R    210     (3)      168     (2)
COM_CONT                         000000D8-R    216     (3)      168     (2)
COM_DUMP                         0000004B-R    181     (2)      168     (2)
COM_NOP                          0000003E-R    176     (2)      168     (2)
COM_PTEXT                        000000E5-R    222     (5)      168     (2)
COM_RSRV                         0000001C-R    170     (2)      168     (2)
COM_START                        000000B2-R    204     (3)      168     (2)
COM_ZERO                         00000083-R    192     (3)      168     (2)
DS$A_PRGBGN                      00000000-XR                  #-200     (3)
DS$GL_CLIBASE                    00000000-XR                  #-196     (3)       250     (5)
DS$GL_FLAGS                      00000000-XR                  #-187     (2)
DS$GT_PROMPT                     00000000-XR                  #-244     (5)
DS$K_ERROR                      =00000002     106     (1)
DS$K_NORMAL                     =00000001     106     (1)
DS$K_PRGSIZ                      00000000-XR                  #-201     (3)
DS$K_SEVERE                     =00000004     106     (1)
DS$K_SUBSYS                     =00000066     106     (1)       106     (1)
DS$K_WARNING                    =00000000     106     (1)
DS$M_ABRTFLG                    =00000040     110     (1)
DS$M_BADTIME                    =00100000     110     (1)
DS$M_BATCH                      =00400000     110     (1)
DS$M_BRKCLR                     =00001000     110     (1)
DS$M_BRKPT                      =00000800     110     (1)
DS$M_CHARFLG                    =00000100     110     (1)
DS$M_CMDFLG                     =00000080     110     (1)
DS$M_CTRLC                      =00000001     110     (1)
DS$M_CTRLO                      =00010000     110     (1)
DS$M_DEVFLG                     =00000200     110     (1)
DS$M_DISABLCC                   =01000000     110     (1)
DS$M_DONFLG                     =00002000     110     (1)
DS$M_ERRFLG                     =00000010     110     (1)
DS$M_EXCEPT                     =00080000     110     (1)
DS$M_EXETST                     =00040000     110     (1)
DS$M_HLTFLG                     =00000008     110     (1)
DS$M_LODFLG                     =00000002     110     (1)     #-186     (2)
DS$M_MEMMGT                     =00008000     110     (1)
DS$M_NI                         =04000000     110     (1)
DS$M_OUTPUT                     =00800000     110     (1)
DS$M_RUBFLG                     =00000020     110     (1)
```

```
DS$M_SCRIPT                     =00200000     110     (1)
DS$M_SETIMR                     =02000000     110     (1)
DS$M_STRFLG                     =00000004     110     (1)     #-186     (2)
DS$M_SUBT                       =00004000     110     (1)
DS$M_SYSFLG                     =00000400     110     (1)
DS$M_TIMED                      =02000000     110     (1)
DS$M_TIMED_OUT                  =08000000     110     (1)
DS$M_TIMRON                     =00020000     110     (1)
DS$V_ABRTFLG                    =00000006     110     (1)
DS$V_BADTIME                    =00000014     110     (1)
DS$V_BATCH                      =00000016     110     (1)
DS$V_BRKCLR                     =0000000C     110     (1)
DS$V_BRKPT                      =0000000B     110     (1)
DS$V_CHARFLG                    =00000008     110     (1)
DS$V_CMDFLG                     =00000007     110     (1)
DS$V_CTRLC                      =00000000     110     (1)
DS$V_CTRLO                      =00000010     110     (1)
DS$V_DEVFLG                     =00000009     110     (1)
DS$V_DISABLCC                   =00000018     110     (1)
DS$V_DONFLG                     =0000000D     110     (1)
DS$V_ERRFLG                     =00000004     110     (1)
DS$V_EXCEPT                     =00000013     110     (1)
DS$V_EXETST                     =00000012     110     (1)
DS$V_HLTFLG                     =00000003     110     (1)
DS$V_LODFLG                     =00000001     110     (1)
DS$V_MEMMGT                     =0000000F     110     (1)
DS$V_NI                         =0000001A     110     (1)
DS$V_OUTPUT                     =00000017     110     (1)
DS$V_RUBFLG                     =00000005     110     (1)
DS$V_SCRIPT                     =00000015     110     (1)
DS$V_SETIMR                     =00000019     110     (1)
DS$V_STRFLG                     =00000002     110     (1)
DS$V_SUBT                       =0000000E     110     (1)
DS$V_SYSFLG                     =0000000A     110     (1)
DS$V_TIMED                      =00000019     110     (1)
DS$V_TIMED_OUT                  =0000001B     110     (1)
DS$V_TIMRON                     =00000011     110     (1)
DS$_AP_NORMAL_BREAK             =00660150     106     (1)
DS$_ARITH                       =006600D0     106     (1)
DS$_ASBE                        =00660118     106     (1)
DS$_BADLINK                     =006600F0     106     (1)
DS$_BADTYPE                     =006600E8     106     (1)
DS$_BIIC                        =00660120     106     (1)
DS$_CHME                        =006600A8     106     (1)
DS$_CHMK                        =006600E0     106     (1)
DS$_DEVNAME                     =00660108     106     (1)
DS$_ERROR                       =00660002     106     (1)
DS$_FHWE                        =00660068     106     (1)
DS$_FRAGBUF                     =00660080     106     (1)
DS$_ICBUSY                      =006600C8     106     (1)
DS$_ICERR                       =006600C0     106     (1)
DS$_IHWE                        =00660060     106     (1)
DS$_ILLCHAR                     =00660018     106     (1)
DS$_ILLPAGCNT                   =00660078     106     (1)
DS$_ILLUNIT                     =00660100     106     (1)
DS$_INIT_FAIL                   =00660140     106     (1)
DS$_INSFMEM                     =00660050     106     (1)
```

```
DS$_INVCPU                  =00660130     106    (1)
DS$_IPL2HI                  =006600B8     106    (1)
DS$_IVADDR                  =00660040     106    (1)
DS$_IVVECT                  =00660038     106    (1)
DS$_KRNLSTK                 =00660090     106    (1)
DS$_LOGIC                   =00660070     106    (1)
DS$_MCHK                    =00660088     106    (1)
DS$_MEM_ALLOC_ERR           =00660138     106    (1)
DS$_MMOFF                   =00660058     106    (1)
DS$_NEEDUNIT                =006600F8     106    (1)
DS$_NODE                    =00660128     106    (1)
DS$_NOPCS                   =00660110     106    (1)
DS$_NORMAL                  =00660001     106    (1)
DS$_NOSUPPORT               =006600B1     106    (1)
DS$_NOTALLOWMP              =00660148     106    (1)
DS$_NOTDON                  =00660030     106    (1)
DS$_NOTIMP                  =006600B0     106    (1)      106    (1)
DS$_NULLSTR                 =00660010     106    (1)
DS$_OVERFLOW                =00660008     106    (1)
DS$_POWER                   =00660098     106    (1)
DS$_PROGERR                 =00660020     106    (1)
DS$_SEVERE                  =00660004     106    (1)
DS$_TRANSL                  =006600A0     106    (1)
DS$_TRUNCATE                =00660028     106    (1)
DS$_UNEXPINT                =006600D8     106    (1)
DS$_UNSUPPDEV               =00660158     106    (1)
DS$_VASFULL                 =00660048     106    (1)
DS$_WARNING                 =00660000     106    (1)      106    (1)
DSA$AT_APTTXT                0000FA00                     224    (5)      230    (5)
DSA$GL_APTCOM                0000FE04                   #-168    (2)    #-171    (2)    #-177    (2)    #-182    (2)
                                                        #-194    (3)    #-205    (3)    #-211    (3)    #-217    (3)
                                                        #-289    (5)
DSA$GL_FLAGS                 0000FE00                   #-184    (2)    #-185    (2)    #-300    (7)
DSA$GL_MSGTYP                0000FE40                   #-172    (2)    #-178    (2)    #-183    (2)    #-195    (3)
                                                        #-206    (3)    #-212    (3)    #-218    (3)    #-290    (5)
                                                        #-306    (7)
DSA$M_APT                   =80000000                   #-184    (2)
DSA$M_HALT                  =00000001                   #-299    (7)
DSA$M_NORPT                 =08000000                   #-184    (2)
DSA$M_OPER                  =00001000                   #-185    (2)
DSX$SUPERPARSE               00000000-XR                  271    (5)
DS_ERRSUP                    00000000-XR                  173    (2)      235    (5)      241    (5)      246    (5)
                                                          274    (5)
KB_CHECK                     00000000-XR                  305    (7)
PR$_MAPEN                    00000000-XR                 #-193    (3)
SIZ...                      =00000001     110    (1)      110    (1)
T_PRGERR                     00000004-R    118    (1)      173    (2)
VRABORT                      00000000-XR                  213    (3)
VRCLRBRK                     00000000-XR                  197    (3)
VRRESTART                    00000000-XR                  188    (2)      189    (2)
VRSTART                      00000000-XR                  207    (3)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.00	00:00:00.19
Command processing	930	00:00:00.30	00:00:00.98
Pass 1	565	00:00:01.22	00:00:02.74
Symbol table sort	0	00:00:00.07	00:00:00.07
Pass 2	24	00:00:00.29	00:00:00.46
Symbol table output	2	00:00:00.02	00:00:00.16
Psect synopsis output	2	00:00:00.00	00:00:00.01
Cross-reference output	5	00:00:00.14	00:00:00.19
Assembler run totals	1555	00:00:02.04	00:00:04.80

The working set limit was 2400 pages.
73184 bytes (143 pages) of virtual memory were used to buffer the intermediate code.
There were 20 pages of symbol table space allocated to hold 291 non-local and 15 local symbols.
311 source lines were read in Pass 1, producing 30 object records in Pass 2.
24 pages of virtual memory were used to define 18 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	4
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	4
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	6
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	14

357 GETS were required to define 14 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 106 ASSIGN I/O CHANNEL
(1) 308 TEST IF MAILBOX SPECIFIED

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element ASSIGN.MAR
0000     2 ; *3    12-MAY-1986 10:10:48 BARANSKI "Cleaning up Object Libraries."
0000     3 ; *2     7-MAY-1986 14:02:49 BARANSKI "Documentaion Check."
0000     4 ; *1     6-FEB-1986 15:13:33 DS ""
0000     5 ; DEC/CMS REPLACEMENT HISTORY, Element ASSIGN.MAR
0000     6         .TITLE  ASSIGN *** ASSIGN assign device
0000     7         .IDENT  "8.3-3"                                                ;G:2
0000     8
0000     9 ;
0000    10 ;******************************************************************************
0000    11 ;*                                                                            *
0000    12 ;*  COPYRIGHT (c) 1977, 1978, 1979, 1980, 1985                                * ;G:2
0000    13 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                          *
0000    14 ;*                                                                            *
0000    15 ;*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND  COPIED    *
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0000    18 ;*  COPIES  THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY    *
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0000    22 ;*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE    *
0000    23 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT   *
0000    24 ;*  CORPORATION.                                                              *
0000    25 ;*                                                                            *
0000    26 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS    *
0000    27 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                   *
0000    28 ;*                                                                            *
0000    29 ;******************************************************************************
0000    30 ;
0000    31 ; D. N. CUTLER 25-AUG-76
0000    32 ;
0000    33 ; SYSTEM SERVICE ASSIGN I/O CHANNEL
0000    34 ;
0000    35 ; MODIFICATION HISTORY:
0000    36 ;                                                                          ;G:2
0000    37 ;       03      M. Baggett      14-Aug-1985     Version 8.3
0000    38 ;               Trucation error.
0000    39 ;
0000    40 ;               Dave Butenhof   13-may-1980, Version 5.4
0000    41 ;       02      Modify VMS V2.0 source to run in supervisor environment
0000    42 ;
0000    43 ;               N. HOWGATE      20-FEB-78       VERSION 02 (ESSAA-4.00).
0000    44 ;       01      DIAGNOSTIC SUPERVISOR INTEGRATION
0000    45 ;
0000    46 ;       V08     LMK0003         LEN KAWELL      20-JAN-1980
0000    47 ;               ADD NON-SHAREABLE DEVICE IMPLICIT ALLOCATION PRIVILEGE CHECK.
0000    48 ;
0000    49 ;       V07     RIH0033         R. HUSTVEDT     16-OCT-1979
0000    50 ;               CHANGE PCB$W_BYTCNT TO JIB$L_BYTCNT.
0000    51 ;
0000    52 ;       V06     LMK0002         LEN KAWELL      27-SEP-1979
0000    53 ;               SET CCB$M_AMB IF A MAILBOX WAS ASSOCIATED WITH DEVICE.
0000    54 ;
0000    55 ;       V05     LMK0001         LEN KAWELL      27-JUL-1979
0000    56 ;               RETAINED LOCK OF I/O DATABASE BEFORE CALL TO IOC$CREATE_UCB
0000    57 ;               AS THAT IS THE NEW INTERFACE TO IOC$CREATE_UCB.
```

```
                     0000     58 ;
                     0000     59 ;       V04     ADE0002         A.D.E           22-JUN-1979     13:00
                     0000     60 ;               Test UCB$V_TEMPLATE in UCB$W_STS to determine if a
                     0000     61 ;               UCB needs to be created rather than deadreckoning
                     0000     62 ;               on UCB$NET0
                     0000     63 ;
                     0000     64 ;       V03     SGD0001         S.G.D.          04-APR-1979     17:10
                     0000     65 ;               Use "_NET" instead of "NET".
                     0000     66 ;
                     0000     67 ;       V02     TGD0001         T.G. DOPIRAK    22-FEB-1979
                     0000     68 ;               RETURN SS$_DEVACTIVE IF MAILBOX ALREADY ASSOCIATED
                     0000     69 ;               WITH DEVICE.
                     0000     70 ;
                     0000     71 ;--
                     0000     72
                     0000     73 ;
                     0000     74 ; MACRO LIBRARY CALLS
                     0000     75 ;
                     0000     76
                     0000     77          $CCBDEF                             ;DEFINE CCB OFFSETS
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .IIF    NB,CCB$L_UCB,   CCB$L_UCB:
                00000004  0000                         .BLKL   1
                     0004                 .IIF    NB,CCB$L_WIND,  CCB$L_WIND:
                00000008  0004                         .BLKL   1
                     0008                 .IIF    NB,CCB$B_STS,   CCB$B_STS:
                00000009  0008                         .BLKB   1
                     0009                 .IIF    NB,CCB$B_AMOD,  CCB$B_AMOD:
                0000000A  0009                         .BLKB   1
                     000A                 .IIF    NB,CCB$W_IOC,   CCB$W_IOC:
                0000000C  000A                         .BLKW   1
                     000C                 .IIF    NB,CCB$L_DIRP,  CCB$L_DIRP:
                00000010  000C                         .BLKL   1
                     0010                 .IIF    NB,CCB$C_LENGTH,        CCB$C_LENGTH:
                     0010                 .IIF    NB,CCB$K_LENGTH,        CCB$K_LENGTH:
                     0000                 .RESTORE
                     0000     78          $IODEF                              ;DEFINE I/O FUNCTION CODES
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .PSECT  $ABS$,ABS
                00000000  0010             .=0
                     0000                 .RESTORE
                     0000     79          $JIBDEF                             ;DEFINE JIB OFFSETS
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .PSECT  $ABS$,ABS
                00000000  0010             .=0
                     0000                 .RESTORE
                     0000     80          $LOGDEF                             ;DEFINE LOG OFFSETS
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .PSECT  $ABS$,ABS
                00000000  0010             .=0
                     0000                 .RESTORE
                     0000     81          $PCBDEF                             ;DEFINE PCB OFFSETS
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .PSECT  $ABS$,ABS
                00000000  0010             .=0
                     0000                 .IIF    NB,PCB$L_SQFL,  PCB$L_SQFL:
                00000004  0000                         .BLKL   1
```

```
                    0004            .IIF    NB,PCB$L_SQBL,  PCB$L_SQBL:
00000008  0004                              .BLKL   1
                    0008            .IIF    NB,PCB$W_SIZE,  PCB$W_SIZE:
0000000A  0008                              .BLKW   1
                    000A            .IIF    NB,PCB$B_TYPE,  PCB$B_TYPE:
0000000B  000A                              .BLKB   1
                    000B            .IIF    NB,PCB$B_PRI,   PCB$B_PRI:
0000000C  000B                              .BLKB   1
                    000C            .IIF    NB,PCB$B_ASTACT,        PCB$B_ASTACT:
0000000D  000C                              .BLKB   1
                    000D            .IIF    NB,PCB$B_ASTEN, PCB$B_ASTEN:
0000000E  000D                              .BLKB   1
                    000E            .IIF    NB,PCB$W_MTXCNT,        PCB$W_MTXCNT:
00000010  000E                              .BLKW   1
                    0010            .IIF    NB,PCB$L_ASTQFL,        PCB$L_ASTQFL:
00000014  0010                              .BLKL   1
                    0014            .IIF    NB,PCB$L_ASTQBL,        PCB$L_ASTQBL:
00000018  0014                              .BLKL   1
                    0018            .IIF    NB,PCB$L_PHYPCB,        PCB$L_PHYPCB:
0000001C  0018                              .BLKL   1
                    001C            .IIF    NB,PCB$L_OWNER, PCB$L_OWNER:
00000020  001C                              .BLKL   1
                    0020            .IIF    NB,PCB$L_WSSWP, PCB$L_WSSWP:
00000024  0020                              .BLKL   1
                    0024            .IIF    NB,PCB$L_STS,   PCB$L_STS:
00000028  0024                              .BLKL   1
                    0028            .IIF    NB,PCB$L_WTIME, PCB$L_WTIME:
0000002C  0028                              .BLKL   1
                    002C            .IIF    NB,PCB$W_STATE, PCB$W_STATE:
0000002E  002C                              .BLKW   1
                    002E            .IIF    NB,PCB$B_WEFC,  PCB$B_WEFC:
0000002F  002E                              .BLKB   1
                    002F            .IIF    NB,PCB$B_PRIB,  PCB$B_PRIB:
00000030  002F                              .BLKB   1
                    0030            .IIF    NB,PCB$W_APTCNT,        PCB$W_APTCNT:
00000032  0030                              .BLKW   1
                    0032            .IIF    NB,PCB$W_TMBU,  PCB$W_TMBU:
00000034  0032                              .BLKW   1
                    0034            .IIF    NB,PCB$W_GPGCNT,        PCB$W_GPGCNT:
00000036  0034                              .BLKW   1
                    0036            .IIF    NB,PCB$W_PPGCNT,        PCB$W_PPGCNT:
00000038  0036                              .BLKW   1
                    0038            .IIF    NB,PCB$W_ASTCNT,        PCB$W_ASTCNT:
0000003A  0038                              .BLKW   1
                    003A            .IIF    NB,PCB$W_BIOCNT,        PCB$W_BIOCNT:
0000003C  003A                              .BLKW   1
                    003C            .IIF    NB,PCB$W_BIOLM, PCB$W_BIOLM:
0000003E  003C                              .BLKW   1
                    003E            .IIF    NB,PCB$W_DIOCNT,        PCB$W_DIOCNT:
00000040  003E                              .BLKW   1
                    0040            .IIF    NB,PCB$W_DIOLM, PCB$W_DIOLM:
00000042  0040                              .BLKW   1
                    0042            .IIF    NB,PCB$W_PRCCNT,        PCB$W_PRCCNT:
00000044  0042                              .BLKW   1
                    0044            .IIF    NB,PCB$T_TERMINAL,      PCB$T_TERMINAL:
0000004C  0044                              .BLKB   8
                    004C            .IIF    NB,PCB$L_PQB,   PCB$L_PQB:
```

```
                    004C                .IIF    NB,PCB$L_EFWM,  PCB$L_EFWM:
00000050  004C                                   .BLKL   1
                    0050                .IIF    NB,PCB$L_EFCS,  PCB$L_EFCS:
00000054  0050                                   .BLKL   1
                    0054                .IIF    NB,PCB$L_EFCU,  PCB$L_EFCU:
00000058  0054                                   .BLKL   1
                    0058                .IIF    NB,PCB$L_EFC2P, PCB$L_EFC2P:
0000005C  0058                                   .BLKL   1
                    005C                .IIF    NB,PCB$L_EFC3P, PCB$L_EFC3P:
00000060  005C                                   .BLKL   1
                    0060                .IIF    NB,PCB$L_PID,   PCB$L_PID:
00000064  0060                                   .BLKL   1
                    0064                .IIF    NB,PCB$L_PHD,   PCB$L_PHD:
00000068  0064                                   .BLKL   1
                    0068                .IIF    NB,PCB$T_LNAME, PCB$T_LNAME:
00000078  0068                                   .BLKB   16
                    0078                .IIF    NB,PCB$L_JIB,   PCB$L_JIB:
0000007C  0078                                   .BLKL   1
                    007C                .IIF    NB,PCB$Q_PRIV,  PCB$Q_PRIV:
00000084  007C                                   .BLKQ   1
                    0084                .IIF    NB,PCB$L_ARB,   PCB$L_ARB:
00000088  0084                                   .BLKL   1
                    0088                .IIF    NB,PCB$L_UIC,   PCB$L_UIC:
                    0088                .IIF    NB,PCB$W_MEM,   PCB$W_MEM:
0000008A  0088                                   .BLKW   1
                    008A                .IIF    NB,PCB$W_GRP,   PCB$W_GRP:
0000008C  008A                                   .BLKW   1
                    008C                .IIF    NB,PCB$C_LENGTH,        PCB$C_LENGTH:
                    008C                .IIF    NB,PCB$K_LENGTH,        PCB$K_LENGTH:
                    0000                .RESTORE
                    0000     82         $PRDEF                          ;DEFINE PROCESSOR REGISTERS
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
00000000  008C                          .=0
                    0000                .RESTORE
                    0000     83         $PRVDEF                         ;DEFINE PRIVILEGE BITS
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
00000000  008C                          .=0
                    0000                .RESTORE
                    0000     84         $SSDEF                          ;DEFINE SYSTEM STATUS VALUES
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
00000000  008C                          .=0
                    0000                .RESTORE
                    0000     85         $UCBDEF                         ;DEFINE UCB OFFSETS
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
00000000  008C                          .=0
                    0000                .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                    0000                .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
00000004  0000                                   .BLKL   1
                    0004                .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                    0004                .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
00000008  0004                                   .BLKL   1
                    0008                .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
0000000A  0008                                   .BLKW   1
```

```
                        000A            .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
                0000000B  000A                  .BLKB   1
                        000B            .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
                0000000C  000B                  .BLKB   1
                        000C            .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                        000C            .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                        000C            .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
                0000000D  000C                  .BLKB   1
                00000010  000D                  .BLKB   3
                        0010            .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                        0010            .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
                00000014  0010                  .BLKL   1
                        0014            .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                        0014            .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                        0014            .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
                00000016  0014                  .BLKW   1
                        0016            .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
                00000018  0016                  .BLKW   1
                        0018            .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                        0018            .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
                0000001A  0018                  .BLKW   1
                        001A            .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                        001A            .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
                0000001C  001A                  .BLKW   1
                        001C            .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
                00000020  001C                  .BLKL   1
                        0020            .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
                00000024  0020                  .BLKL   1
                        0024            .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
                00000028  0024                  .BLKL   1
                        0028            .IIF    NB,UCB$L_PID,   UCB$L_PID:
                0000002C  0028                  .BLKL   1
                        002C            .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
                00000030  002C                  .BLKL   1
                        0030            .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
                00000034  0030                  .BLKL   1
                        0034            .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
                00000038  0034                  .BLKL   1
                        0038            .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
                00000039  0038                  .BLKB   1
                        0039            .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
                0000003A  0039                  .BLKB   1
                        003A            .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
                0000003C  003A                  .BLKW   1
                        003C            .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
                        003C            .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
                        003C            .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
                0000003D  003C                  .BLKB   1
                        003D            .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
                        003D            .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
                0000003E  003D                  .BLKB   1
                        003E            .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
                        003E            .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
                0000003F  003E                  .BLKB   1
                        003F            .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
                00000040  003F                  .BLKB   1
                        0040            .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
```

```
00000044  0040                                  .BLKL   1
          0044                  .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
00000048  0044                                  .BLKL   1
          0048                  .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
0000004A  0048                                  .BLKW   1
          004A                  .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
          004A                  .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
0000004B  004A                                  .BLKB   1
          004B                  .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
0000004C  004B                                  .BLKB   1
          004C                  .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
00000050  004C                                  .BLKL   1
          0050                  .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
00000052  0050                                  .BLKW   1
          0052                  .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
          0052                  .IIF    NB,UCB$B_STATE, UCB$B_STATE:
00000053  0052                                  .BLKB   1
          0053                  .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
00000054  0053                                  .BLKB   1
          0054                  .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
00000058  0054                                  .BLKL   1
          0058                  .IIF    NB,UCB$W_STS,   UCB$W_STS:
0000005A  0058                                  .BLKW   1
          005A                  .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
0000005C  005A                                  .BLKW   1
          005C                  .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
          005C                  .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
00000060  005C                                  .BLKL   1
          0060                  .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
00000064  0060                                  .BLKL   1
          0064                  .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
          0064                  .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
00000068  0064                                  .BLKL   1
          0068                  .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
0000006C  0068                                  .BLKL   1
          006C                  .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
0000006E  006C                                  .BLKW   1
          006E                  .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
00000070  006E                                  .BLKW   1
          0070                  .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
00000071  0070                                  .BLKB   1
          0071                  .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
00000072  0071                                  .BLKB   1
          0072                  .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074  0072                                  .BLKW   1
          0074                  .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
          0074                  .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000  0074                  . = 0
          0000                  .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002  0000                                  .BLKW   1
00000074  0002                  . = 116
          0074                  .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078  0074                                  .BLKL   1
          0078                  .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C  0078                                  .BLKL   1
          007C                  .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080  007C                                  .BLKL   1
```

```
                        0080            .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084  0080                                  .BLKL   1
                        0084            .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088  0084                                  .BLKL   1
                        0088            .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C  0088                                  .BLKL   1
                        008C            .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090  008C                                  .BLKL   1
                        0090            .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
                        0090            .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074  0090          .= 116
                        0074            .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075  0074                                  .BLKB   1
                        0075            .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076  0075                                  .BLKB   1
                        0076            .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077  0076                                  .BLKB   1
                        0077            .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078  0077                                  .BLKB   1
                        0078            .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C  0078                                  .BLKL   1
0000007E  007C                                  .BLKW   1
                        007E            .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080  007E                                  .BLKW   1
                        0080            .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084  0080                                  .BLKL   1
00000080  0084          .= 128
00000084  0080                                  .BLKL   1
                        0084            .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088  0084                                  .BLKL   1
                        0088            .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A  0088                                  .BLKW   1
                        008A            .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C  008A                                  .BLKW   1
                        008C            .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
                        008C            .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E  008C                                  .BLKW   1
                        008E            .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090  008E                                  .BLKW   1
                        0090            .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092  0090                                  .BLKW   1
                        0092            .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
00000094  0092                                  .BLKW   1
                        0094            .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095  0094                                  .BLKB   1
                        0095            .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096  0095                                  .BLKB   1
                        0096            .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098  0096                                  .BLKW   1
00000096  0098          .= 150
00000098  0096                                  .BLKW   1
                        0098            .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C  0098                                  .BLKL   1
                        009C            .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0  009C                                  .BLKL   1
                        00A0            .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
000000A4  00A0                                  .BLKL   1
```

```
                    00A4            .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
000000A6            00A4                    .BLKW   1
                    00A6            .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
000000A7            00A6                    .BLKB   1
000000A8            00A7                    .BLKB   1
00000074            00A8            . = 116
00000078            0074                    .BLKL   1
0000007C            0078                    .BLKL   1
00000080            007C                    .BLKL   1
00000084            0080                    .BLKL   1
00000088            0084                    .BLKL   1
0000008C            0088                    .BLKL   1
                    008C            .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
00000090            008C                    .BLKL   1
00000094            0090                    .BLKL   1
00000098            0094                    .BLKL   1
0000009C            0098                    .BLKL   1
                    009C            .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
0000009D            009C                    .BLKB   1
                    009D            .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
0000009E            009D                    .BLKB   1
                    009E            .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
0000009F            009E                    .BLKB   1
000000A0            009F                    .BLKB   1
                    00A0            .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
000000A1            00A0                    .BLKB   1
                    00A1            .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
000000A2            00A1                    .BLKB   1
                    00A2            .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
000000A3            00A2                    .BLKB   1
000000A4            00A3                    .BLKB   1
                    00A4            .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
000000A5            00A4                    .BLKB   1
                    00A5            .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
000000A7            00A5                    .BLKW   1
000000A8            00A7                    .BLKB   1
                    00A8            .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
000000AC            00A8                    .BLKL   1
000000B0            00AC                    .BLKL   1
000000B4            00B0                    .BLKL   1
000000B8            00B4                    .BLKL   1
                    00B8            .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
000000BC            00B8                    .BLKL   1
                    00BC            .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
                    00BC            .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
00000074            00BC            . = 116
                    0074            .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
00000078            0074                    .BLKL   1
                    0078            .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
0000007C            0078                    .BLKL   1
                    007C            .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
0000007E            007C                    .BLKW   1
00000080            007E                    .BLKW   1
                    0000            .RESTORE
                    0000    86
                    0000    87 ;
                    0000    88 ; LOCAL SYMBOLS
```

```
                        0000     89 ;
                        0000     90 ; ARGUMENT LIST OFFSET DEFINITIONS
                        0000     91 ;
                        0000     92
                00000004 0000    93 DEVNAM=4                            ;ADDRESS OF DEVICE NAME STRING DESCRIPTOR
                00000008 0000    94 CHAN=8                              ;ADDRESS TO STORE ASSIGNED CHANNEL NUMBER
                0000000C 0000    95 ACMODE=12                           ;ACCESS MODE
                00000010 0000    96 MBXNAM=16                           ;ADDRESS OF MAILBOX NAME STRING DESCRIPTOR
                        0000     97
                        0000     98 ;
                        0000     99 ; LOCAL DATA
                        0000    100 ;
                        0000    101
                00000000  0000  102          .PSECT  SEP,    SHR,    EXE,    WRT,    LONG
          54 45 4E 5F   0000    103 NETNAM: .ASCII  /_NET/                 ;NETWORK DEVICE NAME
                        0004    104 NETEND:                                ;REFERENCE LABEL
```

```
0004   106          .SBTTL  ASSIGN I/O CHANNEL
0004   107 ;+
0004   108 ; EXE$ASSIGN - ASSIGN I/O CHANNEL
0004   109 ;
0004   110 ; THIS SERVICE PROVIDES THE CAPABILITY TO ASSIGN A DEVICE TO AN I/O CHANNEL
0004   111 ; AND ESTABLISH NECESSARY DEVICE LINKAGE AND CONTROL INFORMATION IN THE
0004   112 ; ASSOCIATED CHANNEL CONTROL BLOCK. OPTIONALLY A MAILBOX CAN ALSO BE
0004   113 ; SPECIFIED WHICH WILL RECEIVE UNSOLICITED INPUT SENT TO THE ASSIGNED
0004   114 ; DEVICE.
0004   115 ;
0004   116 ; INPUTS:
0004   117 ;
0004   118 ;       DEVNAM(AP) = ADDRESS OF DEVICE NAME STRING DESCRIPTOR.
0004   119 ;       CHAN(AP) = ADDRESS TO STORE ASSIGNED CHANNEL NUMBER.
0004   120 ;       ACMODE(AP) = ACCESS MODE CHANNEL IS TO BE ASSIGNED TO.
0004   121 ;       MBXNAM(AP) = ADDRESS OF MAILBOX NAME STRING DESCRIPTOR (ZERO IMPLIES
0004   122 ;               NONE).
0004   123 ;
0004   124 ;       R4 = CURRENT PROCESS PCB ADDRESS.
0004   125 ;
0004   126 ; OUTPUTS:
0004   127 ;
0004   128 ;       R0 LOW BIT CLEAR INDICATES FAILURE TO ASSIGN CHANNEL TO DEVICE.
0004   129 ;
0004   130 ;               R0 = SS$_ACCVIO - DEVICE NAME STRING, DEVICE NAME STRING
0004   131 ;                       DESCRIPTOR, MAILBOX NAME STRING, OR MAILBOX NAME
0004   132 ;                       STRING DESCRIPTOR CANNOT BE READ BY CALLING ACCESS
0004   133 ;                       MODE, OR CHANNEL NUMBER CANNOT BE WRITTEN BY CALLING
0004   134 ;                       ACCESS MODE.
0004   135 ;
0004   136 ;       R0 = SS$_DEVALLOC - DEVICE ALLOCATED TO ANOTHER PROCESS.
0004   137 ;
0004   138 ;       R0 = SS$_DEVNOTMBX - SPECIFIED MAILBOX DEVICE IS NOT A
0004   139 ;               MAILBOX.
0004   140 ;
0004   141 ;       R0 = SS$_EXQUOTA - PROCESS HAS INSUFFICIENT BUFFER QUOTA TO
0004   142 ;               ALLOCATE NETWORK UCB.
0004   143 ;
0004   144 ;       R0 = SS$_INSFMEM - SUFFICIENT SYSTEM DYNAMIC MEMORY DOES NOT
0004   145 ;               EXIST TO ALLOCATE NETWORK UCB.
0004   146 ;
0004   147 ;       R0 = SS$_IVDEVNAM - DEVICE OR MAILBOX NAME STRING CONTAINS
0004   148 ;               INVALID CHARACTERS, OR NO DEVICE NAME STRING
0004   149 ;               DESCRIPTOR SPECIFIED.
0004   150 ;
0004   151 ;       R0 = SS$_IVLOGNAM - ZERO OR GREATER THAN MAXIMUM LENGTH
0004   152 ;               DEVICE OR MAILBOX NAME STRING SPECIFIED.
0004   153 ;
0004   154 ;       R0 = SS$_NOIOCHAN - NO I/O CHANNEL IS AVAILABLE FOR ASSIGNMENT.
0004   155 ;
0004   156 ;       R0 = SS$_NOPRIV - PROCESS DOES NOT HAVE PRIVILEGE TO CREATE
0004   157 ;               NETWORK UCB OR DOES NOT HAVE PRIVILEGE TO ALLOCATE
0004   158 ;               THE DEVICE.
0004   159 ;
0004   160 ;       R0 = SS$_NOSUCHDEV - SPECIFIED DEVICE OR MAILBOX DOES NOT
0004   161 ;               EXIST ON HOST SYSTEM.
0004   162 ;
```

```
                                0004   163 ;       R0 LOW BIT SET INDICATES SUCCESSFUL COMPLETION.
                                0004   164 ;
                                0004   165 ;               R0 = SS$_REMOTE - NORMAL COMPLETION, ASSIGNMENT COMPLETED
                                0004   166 ;                    ON REMOTE SYSTEM.
                                0004   167 ;
                                0004   168 ;               R0 = SS$_NORMAL - NORMAL COMPLETION, ASSIGNMENT COMPLETED
                                0004   169 ;                    ON HOST SYSTEM.
                                0004   170 ;
                                0004   171 ;               R0 = SS$_DEVACTIVE - MAILBOX ALREADY ASSOCIATED WITH DEVICE
                                0004   172 ;-
                                0004   173
                           0FFC 0004   174         .ENTRY  EXE$ASSIGN,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>
      54  00000000'EF   9E  0006   175         MOVAB   DS$AX_SOFTPCB,R4        ;SOFTWARE PCB TO R4
        5B    08 AC   D0  000D   176         MOVL    CHAN(AP),R11            ;GET ADDRESS TO STORE CHANNEL NUMBER
                      11  0011   177         IFNOWRT #2,(R11),30$            ;CAN CHANNEL NUMBER BE WRITTEN?
      6B    02    00    0D  0011                 PROBEW  #0,#2,(R11)
                        3B  13  0015                 BEQL    30$
                        6B  B4  0017   178         CLRW    (R11)               ;CLEAR CHANNEL NUMBER IN CASE OF ERROR
        5A    10 AC   D0  0019   179         MOVL    MBXNAM(AP),R10          ;GET ADDRESS OF MAILBOX NAME DESCRIPTOR
                      0C  13  001D   180         BEQL    10$                     ;IF EQL NO MAILBOX SPECIFIED
                      1F  001F   181         IFNORD  #8,(R10),30$            ;CAN MAILBOX DESCRIPTOR BE READ?
      6A    08    00    0C  001F                 PROBER  #0,#8,(R10)
                        2D  13  0023                 BEQL    30$
            7E    6A    7D  0025   182         MOVQ    (R10),-(SP)             ;COPY MAILBOX NAME DESCRIPTOR
            5A    5E    D0  0028   183         MOVL    SP,R10                  ;SET ADDRESS OF MAILBOX NAME DESCRIPTOR
      50  0144  8F    3C  002B   184 10$:     MOVZWL  #SS$_IVDEVNAM,R0        ;SET INVALID DEVICE NAME STATUS
        59    04 AC   D0  0030   185         MOVL    DEVNAM(AP),R9           ;GET ADDRESS OF DEVICE NAME DESCRIPTOR
                      1B  13  0034   186         BEQL    20$                     ;IF EQL NO DEVICE SPECIFIED
                      0036   187         IFNORD  #8,(R9),30$             ;CAN DEVICE NAME DESCRIPTOR BE READ?
      69    08    00    0C  0036                 PROBER  #0,#8,(R9)
                        16  13  003A                 BEQL    30$
  50  0C AC   02    00    EF  003C   188         EXTZV   #0,#2,ACMODE(AP),R0     ;GET SPECIFIED ACCESS MODE
        00000000'EF   16  0042   189         JSB     EXE$MAXACMODE           ;MAXIMIZE ACCESS MODE                    [03]
            58    50    D0  0048   190         MOVL    R0,R8                   ;SAVE MAXIMIZED ACCESS MODE
               FFB2'    30  004B   191         BSBW    IOC$FFCHAN              ;FIND FREE I/O CHANNEL
             05 50      E8  004E   192         BLBS    R0,FREECHAN             ;IF LBS FREE I/O CHANNEL FOUND
                      04  0051   193 20$:      RET                             ;
            50    0C    3C  0052   194 30$:     MOVZWL  #SS$_ACCVIO,R0          ;SET ACCESS VIOLATION STATUS
                      04  0055   195         RET                             ;
                          0056   196
                          0056   197 ;
                          0056   198 ; FREE CHANNEL FOUND
                          0056   199 ;
                          0056   200
                          0056   201                 .ENABL  LSB
                          0056   202 FREECHAN:                               ;FREE CHANNEL FOUND
            57    51    D0  0056   203         MOVL    R1,R7                   ;SAVE CHANNEL INDEX
               00B2     30  0059   204         BSBW    TEST_MAILBOX            ;TEST IF MAILBOX SPECIFIED
             3D 50      E9  005C   205         BLBC    R0,30$                  ;IF LBC SEARCH FAILURE
            51    59    D0  005F   206         MOVL    R9,R1                   ;SET ADDRESS OF DEVICE NAME DESCRIPTOR
               FF9B'    30  0062   207         BSBW    IOC$SEARCHDEV           ;SEARCH FOR DEVICE
             36 50      E9  0065   208         BLBC    R0,40$                  ;IF LBC SEARCH FAILURE
                          0068   209
                          0068   210 ;
                          0068   211 ; DEVICE FOUND
                          0068   212 ;
                          0068   213
```

```
          55   51   D0  0068          MOVL    R1,R5                          ;SAVE ADDRESS OF DEVICE UCB
     6C 34 A5   00'  E0  006B          BBS     S^#DEV$V_SPL,UCB$L_DEVCHAR(R5),80$ ;IF SET, SPOOLED DEVICE
               0D   E1  0070          BBC     S^#UCB$V_TEMPLATE,-            ;IF CLR, ASSIGNING TO A LOCAL DEVICE
        03 58 A5        0072                  UCB$W_STS(R5),LOCAL            ;
            0084   31  0075          BRW     NETWORK                        ;IF SET, NETWORK ASSIGN
                       0078
                       0078  ;
                       0078  ; LOCAL ASSIGNMENT
                       0078  ;
                       0078
                       0078  LOCAL:                                         ;LOCAL ASSIGNMENT
      50   28 A5   D0  0078          MOVL    UCB$L_PID(R5),R0               ;GET PROCESS ID OF OWNER
               2A   13  007C          BEQL    50$                            ;IF EQL DEVICE NOT ALLOCATED
          51   54   D0  007E          MOVL    R4,R1                          ;COPY PROCESS PCB ADDRESS
      60 A1    50   D1  0081  10$:    CMPL    R0,PCB$L_PID(R1)               ;PROCESS ID MATCH?
               2B   13  0085          BEQL    70$                            ;IF EQL YES
      51   1C A1   3C  0087          MOVZWL  PCB$L_OWNER(R1),R1             ;GET CREATOR PROCESS INDEX
               0A   13  008B          BEQL    20$                            ;IF EQL NO CREATOR
 51   00000000'FF41   D0  008D          MOVL    @L^SCH$GL_PCBVEC[R1],R1        ;GET ADDRESS OF CREATOR PCB
               EA   11  0095          BRB     10$                            ;
      50   0840 8F   3C  0097  20$:    MOVZWL  #SS$_DEVALLOC,R0               ;SET DEVICE ALREADY ALLOCATED
               5B   11  009C  30$:    BRB     90$                            ;
                       009E
                       009E  ;
                       009E  ; DEVICE SEARCH FAILURE
                       009E  ;
                       009E
      50   08F0 8F   B1  009E  40$:    CMPW    #SS$_NONLOCAL,R0               ;REMOTE DEVICE?
               54   12  00A3          BNEQ    90$                            ;IF NEQ NO
            005D   31  00A5          BRW     REMOTE                         ;
                       00A8
                       00A8  ;
                       00A8  ; DEVICE NOT SPOOLED OR ALLOCATED - IF IT'S ALSO NOT SHAREABLE, CHECK THAT
                       00A8  ; PROCESS HAS PRIVILEGE TO ALLOCATE IT
                       00A8  ;
                       00A8
     05 34 A5   00'  E0  00A8  50$:    BBS     S^#DEV$V_SHR,UCB$L_DEVCHAR(R5),70$ ;IF SET, DEVICE SHAREABLE
                       00AD  ;
                       00AD  ; NONSHAREABLE DEVICE - PERFORM IMPLICIT ALLOCATION
                       00AD  ;
                       00AD
     28 A5   60 A4   D0  00AD  60$:    MOVL    PCB$L_PID(R4),UCB$L_PID(R5) ;SET CURRENT PROCESS AS OWNER
                       00B2
                       00B2  ;
                       00B2  ; ASSOCIATE MAILBOX IF:
                       00B2  ;
                       00B2  ;       1. NOT FILE DEVICE
                       00B2  ;       2. NOT SHAREABLE DEVICE
                       00B2  ;       3. MAILBOX NOT ALREADY ASSOCIATED
                       00B2  ;       4. MAILBOX IS SPECIFIED
                       00B2  ;
                       00B2
     25 34 A5   00'  E0  00B2  70$:    BBS     S^#DEV$V_FOD,UCB$L_DEVCHAR(R5),80$ ;IF SET, FILE DEVICE
     20 34 A5   00'  E0  00B7          BBS     S^#DEV$V_SHR,UCB$L_DEVCHAR(R5),80$ ;IF SET, SHARED DEVICE
               56   D5  00BC          TSTL    R6                             ;ARE WE ASSOCIATING A MBX
               1C   13  00BE          BEQL    80$                            ;IF NOT JUST CONTINUE
            54 A5   D5  00C0          TSTL    UCB$L_AMB(R5)                  ;IS THERE ONE CURRENTLY ASSOC?
```

```
                 0D   13   00C3   271          BEQL    75$                             ;IF NOT ASSOC NEW ONE
           54 A5  56   D1   00C5   272          CMPL    R6,UCB$L_AMB(R5)                ;TRYING TO ASSOC DIFFERENT MBX?
                  11   13   00C9   273          BEQL    80$                             ;IF NOT JUST CONTINUE
        50  02C4 8F   3C   00CB   274          MOVZWL  #SS$_DEVACTIVE,R0               ;DON'T DO THE ASSIGN
                  27   11   00D0   275          BRB     90$                             ;RETURN THE ERROR
                       00D2   276 75$:
           54 A5  56   D0   00D2   277          MOVL    R6,UCB$L_AMB(R5)                ;SET ASSOCIATED MAILBOX UCB ADDRESS
                50 A6  B6   00D6   278          INCW    UCB$W_REFC(R6)                  ;INCREMENT MAILBOX UCB REFERENCE COUNT
              56   01   9A   00D9   279          MOVZBL  #CCB$M_AMB,R6                   ;SET ASSOCIATED MAILBOX FLAG
     50  00000000'FF47   9E   00DC   280 80$:     MOVAB   @CTL$GL_CCBBASE[R7],R0          ;COMPUTE BASE OF CCB
              60   55   D0   00E4   281          MOVL    R5,CCB$L_UCB(R0)                ;STORE UCB ADDRESS IN CCB
                50 A5  B6   00E7   282          INCW    UCB$W_REFC(R5)                  ;INCREMENT UCB REFERENCE COUNT
        09 A0 58   01   81   00EA   283          ADDB3   #1,R8,CCB$B_AMOD(R0)            ;STORE ACCESS MODE OF CHANNEL
           08 A0 56   90   00EF   284          MOVB    R6,CCB$B_STS(R0)                ;SET CHANNEL STATUS FLAGS
              6B 57   AE   00F3   285          MNEGW   R7,(R11)                        ;STORE ASSIGNED CHANNEL NUMBER
              50 01   3C   00F6   286          MOVZWL  #SS$_NORMAL,R0                  ;SET NORMAL COMPLETION STATUS
                 FF04' 31   00F9   287 90$:     BRW     IOC$UNLOCK                      ;UNLOCK I/O DATA BASE AND RETURN
                       00FC   288
                       00FC   289 ;
                       00FC   290 ; NETWORK ASSIGNMENT
                       00FC   291 ;
                       00FC   292
                       00FC   293 NETWORK:                                             ;
        50  08F0 8F   3C   00FC   294          MOVZWL  #SS$_NONLOCAL,R0                ; Set return to non-local
                 FEFC' 30   0101   295          BSBW    IOC$UNLOCK                      ; Unlock I/O database and return
                  04   0104   296          RET
                       0105   297          .DSABL  LSB
                       0105   298
                       0105   299 ;
                       0105   300 ; REMOTE DEVICE SPECIFIED
                       0105   301 ;
                       0105   302
                       0105   303 REMOTE:                                              ;
     50  08F0 8F   3C   0105   304          MOVZWL  #SS$_NONLOCAL,R0                ; Set return to non-local
                 FEF3' 30   010A   305          BSBW    IOC$UNLOCK                      ; unlock i/o data base
                  04   010D   306          RET
```

```
                                010E    308          .SBTTL  TEST IF MAILBOX SPECIFIED
                                010E    309 ;
                                010E    310 ; SUBROUTINE TO TEST IF A MAILBOX IS SPECIFIED
                                010E    311 ;
                                010E    312 ; INPUTS:
                                010E    313 ;
                                010E    314 ;       R10 = ADDRESS OF MAILBOX NAME DESCRIPTOR
                                010E    315 ;
                                010E    316 ; OUTPUTS:
                                010E    317 ;
                                010E    318 ;       R0 = SS$_NORMAL IF SPECIFIED MAILBOX EXISTS
                                010E    319 ;            SS$_NOSUCHDEV IF SPECIFIED MAILBOX DOES NOT EXIST
                                010E    320 ;            SS$_DEVNOTMBX IF SPECIFIED DEVICE IS NOT A MAILBOX
                                010E    321 ;       R6 = ADDRESS OF MAILBOX UCB
                                010E    322 ;            ZERO IF MAILBOX NOT SPECIFIED (USED AS CHANNEL STATUS FLAGS)
                                010E    323 ;
                                010E    324
                                010E    325 TEST_MAILBOX:                                   ;
          56    5A    D0        010E    326          MOVL    R10,R6                       ;SET ADDRESS OF MAILBOX NAME DESCRIPTOR
                1B    13        0111    327          BEQL    10$                          ;IF EQL NO NAME SPECIFIED
          51    56    D0        0113    328          MOVL    R6,R1                        ;COPY ADDRESS OF MAILBOX NAME DESCRIPTOR
             FEE7'    30        0116    329          BSBW    IOC$SEARCHDEV                ;SEARCH FOR DEVICE
            15 50     E9        0119    330          BLBC    R0,20$                       ;IF LBC SEARCH ERROR
 50     0074 8F     3C        011C    331          MOVZWL  #SS$_DEVNOTMBX,R0            ;SET DEVICE NOT MAILBOX STATUS
0B 34 A1    00'     E1        0121    332          BBC     S^#DEV$V_MBX,UCB$L_DEVCHAR(R1),20$ ;IF CLR, DEVICE NOT MAILBOX
06 34 A1    00'     E0        0126    333          BBS     S^#DEV$V_NET,UCB$L_DEVCHAR(R1),20$ ;IF SET, NETWORK DEVICE
          56    51    D0        012B    334          MOVL    R1,R6                        ;SAVE ADDRESS OF MAILBOX UCB
          50    01    3C        012E    335 10$:     MOVZWL  #SS$_NORMAL,R0               ;SET NORMAL COMPLETION STATUS
                      05        0131    336 20$:     RSB                                  ;
                                0132    337
                                0132    338          .END
```

```
ACMODE                          = 0000000C     D
CCB$B_AMOD                        00000009     D
CCB$B_STS                         00000008     D
CCB$C_LENGTH                      00000010     D
CCB$K_LENGTH                      00000010     D
CCB$L_DIRP                        0000000C     D
CCB$L_UCB                         00000000     D
CCB$L_WIND                        00000004     D
CCB$M_AMB                       = 00000001     D
CCB$W_IOC                         0000000A     D
CHAN                            = 00000008     D
CTL$GL_CCBBASE                    ********   X   02
DEV$V_FOD                         ********   X   02
DEV$V_MBX                         ********   X   02
DEV$V_NET                         ********   X   02
DEV$V_SHR                         ********   X   02
DEV$V_SPL                         ********   X   02
DEVNAM                          = 00000004     D
DS$AX_SOFTPCB                     ********   X   02
EXE$ASSIGN                        00000004 RG  D   02
EXE$MAXACMODE                     ********   X   02
FREECHAN                          00000056 R   D   02
IOC$FFCHAN                        ********   X   02
IOC$SEARCHDEV                     ********   X   02
IOC$UNLOCK                        ********   X   02
LOCAL                             00000078 R   D   02
MBXNAM                          = 00000010     D
NETEND                            00000004 R   D   02
NETNAM                            00000000 R   D   02
NETWORK                           000000FC R   D   02
PCB$B_ASTACT                      0000000C     D
PCB$B_ASTEN                       0000000D     D
PCB$B_PRI                         0000000B     D
PCB$B_PRIB                        0000002F     D
PCB$B_TYPE                        0000000A     D
PCB$B_WEFC                        0000002E     D
PCB$C_LENGTH                      0000008C     D
PCB$K_LENGTH                      0000008C     D
PCB$L_ARB                         00000084     D
PCB$L_ASTQBL                      00000014     D
PCB$L_ASTQFL                      00000010     D
PCB$L_EFC2P                       00000058     D
PCB$L_EFC3P                       0000005C     D
PCB$L_EFCS                        00000050     D
PCB$L_EFCU                        00000054     D
PCB$L_EFWM                        0000004C     D
PCB$L_JIB                         00000078     D
PCB$L_OWNER                       0000001C     D
PCB$L_PHD                         00000064     D
PCB$L_PHYPCB                      00000018     D
PCB$L_PID                         00000060     D
PCB$L_PQB                         0000004C     D
PCB$L_SQBL                        00000004     D
PCB$L_SQFL                        00000000     D
PCB$L_STS                         00000024     D
PCB$L_UIC                         00000088     D
PCB$L_WSSWP                       00000020     D
PCB$L_WTIME                       00000028     D
PCB$Q_PRIV                        0000007C     D
PCB$T_LNAME                       00000068     D
PCB$T_TERMINAL                    00000044     D
PCB$W_APTCNT                      00000030     D
PCB$W_ASTCNT                      00000038     D
PCB$W_BIOCNT                      0000003A     D
PCB$W_BIOLM                       0000003C     D
PCB$W_DIOCNT                      0000003E     D
PCB$W_DIOLM                       00000040     D
PCB$W_GPGCNT                      00000034     D
PCB$W_GRP                         0000008A     D
PCB$W_MEM                         00000088     D
PCB$W_MTXCNT                      0000000E     D
PCB$W_PPGCNT                      00000036     D
PCB$W_PRCCNT                      00000042     D
PCB$W_SIZE                        00000008     D
PCB$W_STATE                       0000002C     D
PCB$W_TMBU                        00000032     D
REMOTE                            00000105 R   D   02
SCH$GL_PCBVEC                     ********   X   02
SIZ...                          = 00000002     D
SS$_ACCVIO                      = 0000000C     D
SS$_DEVACTIVE                   = 000002C4     D
SS$_DEVALLOC                    = 00000840     D
SS$_DEVNOTMBX                   = 00000074     D
SS$_IVDEVNAM                    = 00000144     D
SS$_NONLOCAL                    = 000008F0     D
SS$_NORMAL                      = 00000001     D
TEST_MAILBOX                      0000010E R   D   02
UCB$B_AMOD                        00000053     D
UCB$B_CEX                         00000077     D
UCB$B_CM1                         0000004A     D
UCB$B_CM2                         0000004B     D
UCB$B_DEVCLASS                    00000038     D
UCB$B_DEVTYPE                     00000039     D
UCB$B_DIPL                        00000052     D
UCB$B_DX_SCTCNT                   000000A6     D
UCB$B_ERTCNT                      00000070     D
UCB$B_ERTMAX                      00000071     D
UCB$B_FEX                         00000076     D
UCB$B_FIPL                        0000000B     D
UCB$B_LOCSRV                      0000003C     D
UCB$B_OFFNDX                      00000094     D
UCB$B_OFFRTC                      00000095     D
UCB$B_REMSRV                      0000003D     D
UCB$B_SECTORS                     0000003C     D
UCB$B_SLAVE                       00000074     D
UCB$B_SPR                         00000075     D
UCB$B_STATE                       00000052     D
UCB$B_TRACKS                      0000003D     D
UCB$B_TT_CRFILL                   0000009D     D
UCB$B_TT_DECRF                    000000A1     D
UCB$B_TT_DELFF                    000000A2     D
UCB$B_TT_DESPEE                   000000A0     D
UCB$B_TT_DETYPE                   000000A4     D
UCB$B_TT_LFFILL                   0000009E     D
```

UCB$B_TT_SPEED	0000009C	D	UCB$V_TEMPLATE	=	0000000D	D
UCB$B_TYPE	0000000A	D	UCB$W_BCNT		0000006E	D
UCB$B_VERTSZ	0000003F	D	UCB$W_BCR		00000096	D
UCB$C_LENGTH	00000074	D	UCB$W_BOFF		0000006C	D
UCB$C_MB_LENGTH	00000090	D	UCB$W_BUFQUO		00000018	D
UCB$C_TT_LENGTH	000000BC	D	UCB$W_BYTESTOGO		0000003E	D
UCB$K_LENGTH	00000074	D	UCB$W_CHARGE		0000004A	D
UCB$K_MB_LENGTH	00000090	D	UCB$W_CYLINDERS		0000003E	D
UCB$K_TT_LENGTH	000000BC	D	UCB$W_DA		0000008C	D
UCB$L_AMB	00000054	D	UCB$W_DC		0000008E	D
UCB$L_ASTQBL	00000010	D	UCB$W_DEVBUFSIZ		0000003A	D
UCB$L_ASTQFL	0000000C	D	UCB$W_DEVSTS		0000005A	D
UCB$L_CPID	0000005C	D	UCB$W_DIRSEQ		00000088	D
UCB$L_CRB	00000020	D	UCB$W_DSTADDR		00000018	D
UCB$L_DDB	00000024	D	UCB$W_DX_BCR		000000A4	D
UCB$L_DEVCHAR	00000034	D	UCB$W_EC1		00000090	D
UCB$L_DEVDEPEND	0000003C	D	UCB$W_EC2		00000092	D
UCB$L_DPC	00000080	D	UCB$W_ERRCNT		00000072	D
UCB$L_DUETIM	0000005C	D	UCB$W_FUNC		0000007E	D
UCB$L_DX_BFPNT	0000009C	D	UCB$W_MB_SEED		00000000	D
UCB$L_DX_BUF	00000098	D	UCB$W_MSGCNT		00000016	D
UCB$L_DX_RXDB	000000A0	D	UCB$W_MSGMAX		00000014	D
UCB$L_EMB	00000078	D	UCB$W_NT_CHAN		0000007C	D
UCB$L_FIRST	00000014	D	UCB$W_OFFSET		0000008A	D
UCB$L_FPC	0000000C	D	UCB$W_REFC		00000050	D
UCB$L_FQBL	00000004	D	UCB$W_SIZE		00000008	D
UCB$L_FQFL	00000000	D	UCB$W_SRCADDR		0000001A	D
UCB$L_FR3	00000010	D	UCB$W_STS		00000058	D
UCB$L_FR4	00000014	D	UCB$W_TT_DESIZE		000000A5	D
UCB$L_IOQBL	00000044	D	UCB$W_UNIT		00000048	D
UCB$L_IOQFL	00000040	D	UCB$W_VPROT		0000001A	D
UCB$L_IRP	0000004C	D				
UCB$L_LINK	0000002C	D				
UCB$L_LOGADR	00000064	D				
UCB$L_MAXBLOCK	00000084	D				
UCB$L_MB_MBX	0000007C	D				
UCB$L_MB_PORT	0000008C	D				
UCB$L_MB_RAST	00000078	D				
UCB$L_MB_SHB	00000080	D				
UCB$L_MB_WAST	00000074	D				
UCB$L_MB_WIOQBL	00000088	D				
UCB$L_MB_WIOQFL	00000084	D				
UCB$L_MEDIA	0000008C	D				
UCB$L_NT_DATSSB	00000074	D				
UCB$L_NT_INTSSB	00000078	D				
UCB$L_OPCNT	00000060	D				
UCB$L_OWNUIC	0000001C	D				
UCB$L_PID	00000028	D				
UCB$L_RQBL	00000004	D				
UCB$L_RQFL	00000000	D				
UCB$L_SVAPTE	00000068	D				
UCB$L_SVPN	00000064	D				
UCB$L_TT_DECHAR	000000A8	D				
UCB$L_TT_RDUE	0000008C	D				
UCB$L_TT_RTIMOU	000000B8	D				
UCB$L_VCB	00000030	D				
UCB$T_PARTNER	0000000C	D				

```
                                    +----------------+
                                    ! Psect synopsis !
                                    +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           000000BC  (  188.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
SEP                             00000132  (  306.)  02 (  2.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD    WRT NOVEC LONG
```

```
                                  +-------------------------+
                                  ! Symbol Cross Reference !
                                  +-------------------------+

SYMBOL                      VALUE        DEFINITION      REFERENCES...
------                      -----        ----------      -------------
ACMODE                     =0000000C     95     (1)      188     (1)
CCB$B_AMOD                  00000009                    #-283    (1)
CCB$B_STS                   00000008                    #-284    (1)
CCB$L_UCB                   00000000                    #-281    (1)
CCB$M_AMB                  =00000001                    #-279    (1)
CHAN                       =00000008     94     (1)    #-176    (1)
CTL$GL_CCBBASE              00000000-XR                  280     (1)
DEV$V_FOD                   00000000-XR                 #-266    (1)
DEV$V_MBX                   00000000-XR                 #-332    (1)
DEV$V_NET                   00000000-XR                 #-333    (1)
DEV$V_SHR                   00000000-XR                 #-250    (1)    #-267    (1)
DEV$V_SPL                   00000000-XR                 #-215    (1)
DEVNAM                     =00000004     93     (1)    #-185    (1)
DS$AX_SOFTPCB               00000000-XR                  175     (1)
EXE$ASSIGN                  00000004-R   174     (1)
EXE$MAXACMODE               00000000-XR                  189     (1)
FREECHAN                    00000056-R   202     (1)    #-192    (1)
IOC$FFCHAN                  00000000-XR                 #-191    (1)
IOC$SEARCHDEV               00000000-XR                 #-207    (1)    #-329    (1)
IOC$UNLOCK                  00000000-XR                 #-287    (1)    #-295    (1)    #-305    (1)
LOCAL                       00000078-R   224     (1)    #-217    (1)
MBXNAM                     =00000010     96     (1)    #-179    (1)
NETEND                      00000004-R   104     (1)
NETNAM                      00000000-R   103     (1)
NETWORK                     000000FC-R   293     (1)    #-218    (1)
PCB$L_OWNER                 0000001C                    #-230    (1)
PCB$L_PID                   00000060                    #-228    (1)    #-255    (1)
REMOTE                      00000105-R   303     (1)    #-243    (1)
SCH$GL_PCBVEC               00000000-XR                 #-232    (1)
SS$_ACCVIO                 =0000000C                    #-194    (1)
SS$_DEVACTIVE              =000002C4                    #-274    (1)
SS$_DEVALLOC               =00000840                    #-234    (1)
SS$_DEVNOTMBX              =00000074                    #-331    (1)
SS$_IVDEVNAM               =00000144                    #-184    (1)
SS$_NONLOCAL               =000008F0                    #-241    (1)    #-294    (1)    #-304    (1)
SS$_NORMAL                 =00000001                    #-286    (1)    #-335    (1)
TEST_MAILBOX                0000010E-R   325     (1)    #-204    (1)
UCB$L_AMB                   00000054                    #-270    (1)    #-272    (1)    #-277    (1)
UCB$L_DEVCHAR               00000034                      215     (1)      250    (1)      266    (1)      267    (1)
                                                          332     (1)      333    (1)
UCB$L_PID                   00000028                    #-225    (1)    #-255    (1)
UCB$V_TEMPLATE             =0000000D                    #-216    (1)
UCB$W_REFC                  00000050                    #-278    (1)    #-282    (1)
UCB$W_STS                   00000058                      217     (1)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.04	00:00:00.21
Command processing	933	00:00:00.35	00:00:01.88
Pass 1	704	00:00:02.64	00:00:04.36
Symbol table sort	0	00:00:00.36	00:00:00.35
Pass 2	66	00:00:00.70	00:00:01.22
Symbol table output	2	00:00:00.03	00:00:00.06
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	4	00:00:00.04	00:00:00.05
Assembler run totals	1738	00:00:04.16	00:00:08.13

The working set limit was 2400 pages.
155496 bytes (304 pages) of virtual memory were used to buffer the intermediate code.
There were 70 pages of symbol table space allocated to hold 1254 non-local and 15 local symbols.
338 source lines were read in Pass 1, producing 82 object records in Pass 2.
21 pages of virtual memory were used to define 20 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	3
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	4
SYS$COMMON:[SYSLIB]STARLET.MLB;2	9
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	16

1508 GETS were required to define 16 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 44 HISTORY ; DETAILED
(1) 60 DECLARATIONS
(1) 89 EXE$SETAST - SET AST ENABLES

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element ASTCON.MAR
0000     2 ; *3    12-MAY-1986 10:13:00 BARANSKI "RESERVE ASTDEL"
0000     3 ; *2     7-MAY-1986 14:11:27 BARANSKI "Documentaion Check."
0000     4 ; *1     6-FEB-1986 15:13:35 DS ""
0000     5 ; DEC/CMS REPLACEMENT HISTORY, Element ASTCON.MAR
0000     6         .TITLE  ASTCON  *** ASTCON AST control service
0000     7         .IDENT  "7.0-2"                                                ;G:2
0000     8
0000     9 ;
0000    10 ;*****************************************************************************
0000    11 ;*                                                                           *
0000    12 ;*  COPYRIGHT (c) 1977, 1978, 1979, 1980, 1981                               * ;G:2
0000    13 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
0000    14 ;*                                                                           *
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0000    23 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT  *
0000    24 ;*  CORPORATION.                                                             *
0000    25 ;*                                                                           *
0000    26 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS   *
0000    27 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    28 ;*                                                                           *
0000    29 ;*****************************************************************************
0000    30
0000    31 ;++
0000    32 ; FACILITY: EXECUTIVE, SYSTEM SERVICES
0000    33 ;
0000    34 ; ABSTRACT:
0000    35 ;       THIS MODULE CONTAINS THE SYSTEM SERVICES SETAST WHICH CONTROLS
0000    36 ;       THE STATE OF THE AST ENABLES AND DCLAST WHICH DECLARES AN
0000    37 ;       AST FOR A PARTICULAR ACCESS MODE.
0000    38 ;
0000    39 ; ENVIRONMENT:
0000    40 ;
0000    41 ;--
0000    42 ;
0000    43 ;       .PAGE
0000    44         .SBTTL  HISTORY                 ; DETAILED
0000    45 ;
0000    46 ; AUTHOR:       R. HUSTVEDT      CREATION DATE: 21-SEP-76
0000    47 ;
0000    48 ; MODIFIED BY:
0000    49 ;
0000    50 ;               Dave Butenhof   18-jun-1980,    version 5.5
0000    51 ;       01      Use VMS SYSASTCON module to implement supervisor SETAST
0000    52 ;               service.
0000    53 ;
0000    54 ;       02      - Jack Stansbury, 23-Oct-1981, Version 7.0              ;G:2
0000    55 ;               Fixed some truncation errors. Added .LIBRARY statements
0000    56 ;               for $DS and $DIAG. Removed previous .PSECT SEP statement,
0000    57 ;               changed it to .PSECT CODE.
```

0000 58

```
                        0000     60          .SBTTL  DECLARATIONS
                        0000     61
                        0000     62 ;
                        0000     63 ; INCLUDE FILES:
                        0000     64 ;
                        0000     65          .LIBRARY        /$DS/           ;                                       [02]
                        0000     66          .LIBRARY        /$DIAG/         ;                                       [02]
                        0000     67                                          ;                                       [02]
                        0000     68          $ACBDEF                         ; DEFINE AST CONTROL BLOCK OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .IIF    NB,ACB$L_ASTQFL,        ACB$L_ASTQFL:
                00000004 0000                        .BLKL   1
                        0004                 .IIF    NB,ACB$L_ASTQBL,        ACB$L_ASTQBL:
                00000008 0004                        .BLKL   1
                        0008                 .IIF    NB,ACB$W_SIZE,  ACB$W_SIZE:
                0000000A 0008                        .BLKW   1
                        000A                 .IIF    NB,ACB$B_TYPE,  ACB$B_TYPE:
                0000000B 000A                        .BLKB   1
                        000B                 .IIF    NB,ACB$B_RMOD,  ACB$B_RMOD:
                0000000C 000B                        .BLKB   1
                        000C                 .IIF    NB,ACB$L_PID,   ACB$L_PID:
                00000010 000C                        .BLKL   1
                        0010                 .IIF    NB,ACB$L_AST,   ACB$L_AST:
                00000014 0010                        .BLKL   1
                        0014                 .IIF    NB,ACB$L_ASTPRM,        ACB$L_ASTPRM:
                00000018 0014                        .BLKL   1
                        0018                 .IIF    NB,ACB$C_LENGTH,        ACB$C_LENGTH:
                        0018                 .IIF    NB,ACB$K_LENGTH,        ACB$K_LENGTH:
                        0018                 .IIF    NB,ACB$L_KAST,  ACB$L_KAST:
                0000001C 0018                        .BLKL   1
                        0000                 .RESTORE
                        0000     69          $IPLDEF                         ; DEFINE IPL VALUES
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 001C                .=0
                        0000                 .RESTORE
                        0000     70          $PCBDEF                         ; DEFINE PCB OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 001C                .=0
                        0000                 .IIF    NB,PCB$L_SQFL,  PCB$L_SQFL:
                00000004 0000                        .BLKL   1
                        0004                 .IIF    NB,PCB$L_SQBL,  PCB$L_SQBL:
                00000008 0004                        .BLKL   1
                        0008                 .IIF    NB,PCB$W_SIZE,  PCB$W_SIZE:
                0000000A 0008                        .BLKW   1
                        000A                 .IIF    NB,PCB$B_TYPE,  PCB$B_TYPE:
                0000000B 000A                        .BLKB   1
                        000B                 .IIF    NB,PCB$B_PRI,   PCB$B_PRI:
                0000000C 000B                        .BLKB   1
                        000C                 .IIF    NB,PCB$B_ASTACT,        PCB$B_ASTACT:
                0000000D 000C                        .BLKB   1
                        000D                 .IIF    NB,PCB$B_ASTEN, PCB$B_ASTEN:
                0000000E 000D                        .BLKB   1
                        000E                 .IIF    NB,PCB$W_MTXCNT,        PCB$W_MTXCNT:
                00000010 000E                        .BLKW   1
                        0010                 .IIF    NB,PCB$L_ASTQFL,        PCB$L_ASTQFL:
```

```
                00000014  0010                    .BLKL   1
                          0014          .IIF    NB,PCB$L_ASTQBL,        PCB$L_ASTQBL:
                00000018  0014                    .BLKL   1
                          0018          .IIF    NB,PCB$L_PHYPCB,        PCB$L_PHYPCB:
                0000001C  0018                    .BLKL   1
                          001C          .IIF    NB,PCB$L_OWNER, PCB$L_OWNER:
                00000020  001C                    .BLKL   1
                          0020          .IIF    NB,PCB$L_WSSWP, PCB$L_WSSWP:
                00000024  0020                    .BLKL   1
                          0024          .IIF    NB,PCB$L_STS,   PCB$L_STS:
                00000028  0024                    .BLKL   1
                          0028          .IIF    NB,PCB$L_WTIME, PCB$L_WTIME:
                0000002C  0028                    .BLKL   1
                          002C          .IIF    NB,PCB$W_STATE, PCB$W_STATE:
                0000002E  002C                    .BLKW   1
                          002E          .IIF    NB,PCB$B_WEFC,  PCB$B_WEFC:
                0000002F  002E                    .BLKB   1
                          002F          .IIF    NB,PCB$B_PRIB,  PCB$B_PRIB:
                00000030  002F                    .BLKB   1
                          0030          .IIF    NB,PCB$W_APTCNT,        PCB$W_APTCNT:
                00000032  0030                    .BLKW   1
                          0032          .IIF    NB,PCB$W_TMBU,  PCB$W_TMBU:
                00000034  0032                    .BLKW   1
                          0034          .IIF    NB,PCB$W_GPGCNT,        PCB$W_GPGCNT:
                00000036  0034                    .BLKW   1
                          0036          .IIF    NB,PCB$W_PPGCNT,        PCB$W_PPGCNT:
                00000038  0036                    .BLKW   1
                          0038          .IIF    NB,PCB$W_ASTCNT,        PCB$W_ASTCNT:
                0000003A  0038                    .BLKW   1
                          003A          .IIF    NB,PCB$W_BIOCNT,        PCB$W_BIOCNT:
                0000003C  003A                    .BLKW   1
                          003C          .IIF    NB,PCB$W_BIOLM, PCB$W_BIOLM:
                0000003E  003C                    .BLKW   1
                          003E          .IIF    NB,PCB$W_DIOCNT,        PCB$W_DIOCNT:
                00000040  003E                    .BLKW   1
                          0040          .IIF    NB,PCB$W_DIOLM, PCB$W_DIOLM:
                00000042  0040                    .BLKW   1
                          0042          .IIF    NB,PCB$W_PRCCNT,        PCB$W_PRCCNT:
                00000044  0042                    .BLKW   1
                          0044          .IIF    NB,PCB$T_TERMINAL,      PCB$T_TERMINAL:
                0000004C  0044                    .BLKB   8
                          004C          .IIF    NB,PCB$L_PQB,   PCB$L_PQB:
                          004C          .IIF    NB,PCB$L_EFWM,  PCB$L_EFWM:
                00000050  004C                    .BLKL   1
                          0050          .IIF    NB,PCB$L_EFCS,  PCB$L_EFCS:
                00000054  0050                    .BLKL   1
                          0054          .IIF    NB,PCB$L_EFCU,  PCB$L_EFCU:
                00000058  0054                    .BLKL   1
                          0058          .IIF    NB,PCB$L_EFC2P, PCB$L_EFC2P:
                0000005C  0058                    .BLKL   1
                          005C          .IIF    NB,PCB$L_EFC3P, PCB$L_EFC3P:
                00000060  005C                    .BLKL   1
                          0060          .IIF    NB,PCB$L_PID,   PCB$L_PID:
                00000064  0060                    .BLKL   1
                          0064          .IIF    NB,PCB$L_PHD,   PCB$L_PHD:
                00000068  0064                    .BLKL   1
                          0068          .IIF    NB,PCB$T_LNAME, PCB$T_LNAME:
```

```
00000078  0068                                  .BLKB   16
          0078                  .IIF    NB,PCB$L_JIB,   PCB$L_JIB:
0000007C  0078                                  .BLKL   1
          007C                  .IIF    NB,PCB$Q_PRIV,  PCB$Q_PRIV:
00000084  007C                                  .BLKQ   1
          0084                  .IIF    NB,PCB$L_ARB,   PCB$L_ARB:
00000088  0084                                  .BLKL   1
          0088                  .IIF    NB,PCB$L_UIC,   PCB$L_UIC:
          0088                  .IIF    NB,PCB$W_MEM,   PCB$W_MEM:
0000008A  0088                                  .BLKW   1
          008A                  .IIF    NB,PCB$W_GRP,   PCB$W_GRP:
0000008C  008A                                  .BLKW   1
          008C                  .IIF    NB,PCB$C_LENGTH,        PCB$C_LENGTH:
          008C                  .IIF    NB,PCB$K_LENGTH,        PCB$K_LENGTH:
          0000                  .RESTORE
          0000    71            $PRDEF                          ; DEFINE PROCESSOR REGISTER VALUES
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000    72            $PSLDEF                         ; DEFINE PSL FIELDS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000    73            $RSNDEF                         ; DEFINE RESOURCE NUMBERS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000    74            $SSDEF                          ; DEFINE STATUS CODE VALUES
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000    75
          0000    76 ;
          0000    77 ; EQUATES:
          0000    78 ;
          0000    79
0000000C  0000    80 ACMODE=12                                  ; DISPLACEMENT TO ACCESS MODE
00000004  0000    81 AST=4                                      ; DISPLACEMENT TO AST ADDRESS
00000008  0000    82 ASTPRM=8                                   ; DISPLACEMENT TO AST PARAMETER
00000004  0000    83 ENABLE=4                                   ; DISPLACEMENT TO ENABLE ARGUMENT
          0000    84 ;
          0000    85 ; OWN STORAGE:
          0000    86 ;
      00000000    87            .PSECT  Y$EXEPAGED,BYTE         ; PAGED PSECT
```

```
                                0000     89          .SBTTL  EXE$SETAST - SET AST ENABLES
                                0000     90          .PSECT  Code, Exe, Shr, NoWrt, Long     ;                                [02]
                                0000     91
                                0000     92 ;++
                                0000     93 ; FUNCTIONAL DESCRIPTION:
                                0000     94 ;       EXE$SETAST ALLOWS A PROCESS TO ENABLE OR DISABLE THE DELIVERY
                                0000     95 ;       OF ASTS FOR THE PROCESS AT THE ACCESS MODE ISSUING THE CALL TO
                                0000     96 ;       EXE$SETAST.   THE PREVIOUS STATE OF THE AST ENABLE FOR THAT
                                0000     97 ;       ACCESS MODE IS RETURNED IN BIT 1 OF REGISTER 0 AS PART OF
                                0000     98 ;       THE SUCCESSFUL COMPLETION STATUS CODE.
                                0000     99 ;
                                0000    100 ; CALLING SEQUENCE:
                                0000    101 ;       CALLG   ARGLIST,EXE$SETAST
                                0000    102 ;
                                0000    103 ; INPUT PARAMETERS:
                                0000    104 ;       04(AP) - NEW SETTING FOR AST ENABLE
                                0000    105 ;       R4 - PCB ADDRESS OF CURRENT PROCESS
                                0000    106 ;
                                0000    107 ; IMPLICIT INPUTS:
                                0000    108 ;       SCH$GL_CURPCB - POINTER TO CURRENT PROCESS PCB
                                0000    109 ;
                                0000    110 ; OUTPUT PARAMETERS:
                                0000    111 ;       R0 - COMPLETION STATUS CODE
                                0000    112 ;
                                0000    113 ; IMPLICIT OUTPUTS:
                                0000    114 ;       AST ENABLE FOR PREVIOUS MODE IS SET ACCORDING TO ARGUMENT
                                0000    115 ;
                                0000    116 ;       THE NEW SETTING FOR THE ASTLVL REGISTER IS PLACED BOTH IN
                                0000    117 ;       THE PROCESSOR REGISTER AND THE CURRENT HARDWARE PCB.
                                0000    118 ;
                                0000    119 ; COMPLETION CODES:
                                0000    120 ;       SS$_WASCLR  -  AST ENABLE FOR ACCESS MODE WAS CLEAR
                                0000    121 ;       SS$_WASSET  -  AST ENABLE FOR ACCESS MODE WAS SET
                                0000    122 ;
                                0000    123 ; SIDE EFFECTS:
                                0000    124 ;       ANY PENDING ASTS FOR THIS PROCESS WHICH BECOME DELIVERABLE
                                0000    125 ;       AS A RESULT OF SETTING AN AST ENABLE MAY BE DELIVERED UPON
                                0000    126 ;       EXIT FROM THIS SERVICE.
                                0000    127 ;
                                0000    128 ;--
                                0000    129
                           003C 0000    130          .ENTRY  EXE$SETAST,^M<R2,R3,R4,R5>
    54  00000000'EF      DE   0002    131          MOVAL   DS$AX_SOFTPCB, R4       ; Get PCB address
                  51     DC   0009    132          MOVPSL  R1                      ; GET CURRENT PSL
    51  51  02  18      EF   000B    133          EXTZV   #PSL$V_CURMOD,#PSL$S_CURMOD,R1,R1 ; Extract current mode
                  55     09   3C   0010    134          MOVZWL  #SS$_WASSET,R5          ; ASSUME SET
        03 0D A4  51     E0   0013    135          BBS     R1,PCB$B_ASTEN(R4),10$  ; TEST OLD ENABLE SETTING
                  55     01   3C   0018    136          MOVZWL  #SS$_WASCLR,R5          ; IT WAS CLEAR
0D A4   01  51    04     AC   F0   001B    137 10$:     INSV    ENABLE(AP),R1,#1,PCB$B_ASTEN(R4)  ; SET NEW ENABLE VALUE
         00000000'EF     16   0022    138          JSB     SCH$NEWLVL              ;;; COMPUTE NEW ASTLVL                           [02]
                  50     55   D0   0028    139          MOVL    R5,R0                   ; SET COMPLETION STATUS
                         04   002B    140          RET                             ; AND RETURN TO CALLER
                              002C    141          .END
```

```
ACB$B_RMOD                      0000000B    D
ACB$B_TYPE                      0000000A    D
ACB$C_LENGTH                    00000018    D
ACB$K_LENGTH                    00000018    D
ACB$L_AST                       00000010    D
ACB$L_ASTPRM                    00000014    D
ACB$L_ASTQBL                    00000004    D
ACB$L_ASTQFL                    00000000    D
ACB$L_KAST                      00000018    D
ACB$L_PID                       0000000C    D
ACB$W_SIZE                      00000008    D
ACMODE                        = 0000000C    D
AST                           = 00000004    D
ASTPRM                        = 00000008    D
DS$AX_SOFTPCB                   ********  X   03
ENABLE                        = 00000004    D
EXE$SETAST                      00000000 RG D   03
PCB$B_ASTACT                    0000000C    D
PCB$B_ASTEN                     0000000D    D
PCB$B_PRI                       0000000B    D
PCB$B_PRIB                      0000002F    D
PCB$B_TYPE                      0000000A    D
PCB$B_WEFC                      0000002E    D
PCB$C_LENGTH                    0000008C    D
PCB$K_LENGTH                    0000008C    D
PCB$L_ARB                       00000084    D
PCB$L_ASTQBL                    00000014    D
PCB$L_ASTQFL                    00000010    D
PCB$L_EFC2P                     00000058    D
PCB$L_EFC3P                     0000005C    D
PCB$L_EFCS                      00000050    D
PCB$L_EFCU                      00000054    D
PCB$L_EFWM                      0000004C    D
PCB$L_JIB                       00000078    D
PCB$L_OWNER                     0000001C    D
PCB$L_PHD                       00000064    D
PCB$L_PHYPCB                    00000018    D
PCB$L_PID                       00000060    D
PCB$L_PQB                       0000004C    D
PCB$L_SQBL                      00000004    D
PCB$L_SQFL                      00000000    D
PCB$L_STS                       00000024    D
PCB$L_UIC                       00000088    D
PCB$L_WSSWP                     00000020    D
PCB$L_WTIME                     00000028    D
PCB$Q_PRIV                      0000007C    D
PCB$T_LNAME                     00000068    D
PCB$T_TERMINAL                  00000044    D
PCB$W_APTCNT                    00000030    D
PCB$W_ASTCNT                    00000038    D
PCB$W_BIOCNT                    0000003A    D
PCB$W_BIOLM                     0000003C    D
PCB$W_DIOCNT                    0000003E    D
PCB$W_DIOLM                     00000040    D
PCB$W_GPGCNT                    00000034    D
PCB$W_GRP                       0000008A    D
PCB$W_MEM                       00000088    D
PCB$W_MTXCNT                    0000000E    D
PCB$W_PPGCNT                    00000036    D
PCB$W_PRCCNT                    00000042    D
PCB$W_SIZE                      00000008    D
PCB$W_STATE                     0000002C    D
PCB$W_TMBU                      00000032    D
PSL$S_CURMOD                  = 00000002    D
PSL$V_CURMOD                  = 00000018    D
SCH$NEWLVL                      ********  X   03
SIZ...                        = 00000001    D
SS$_WASCLR                    = 00000001    D
SS$_WASSET                    = 00000009    D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000008C (140.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
Y$EXEPAGED	00000000 (0.)	02 (2.)	NOPIC USR CON REL LCL NOSHR EXE RD WRT NOVEC BYTE
CODE	0000002C (44.)	03 (3.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

```
                                        +-------------------------+
                                        ! Symbol Cross Reference !
                                        +-------------------------+

SYMBOL                          VALUE        DEFINITION      REFERENCES...
------                          -----        ----------      -------------
ACMODE                         =0000000C     80     (1)
AST                            =00000004     81     (1)
ASTPRM                         =00000008     82     (1)
DS$AX_SOFTPCB                   00000000-XR                   131    (1)
ENABLE                         =00000004     83     (1)    #-137    (1)
EXE$SETAST                      00000000-R   130    (1)
PCB$B_ASTEN                     0000000D                      135    (1)      137    (1)
PSL$S_CURMOD                   =00000002                    #-133    (1)
PSL$V_CURMOD                   =00000018                    #-133    (1)
SCH$NEWLVL                      00000000-XR                   138    (1)
SS$_WASCLR                     =00000001                    #-136    (1)
SS$_WASSET                     =00000009                    #-134    (1)

                                        +-------------------------+
                                        ! Performance indicators !
                                        +-------------------------+

Phase                     Page faults    CPU Time       Elapsed Time
-----                     -----------    --------       ------------
Initialization                     25    00:00:00.02    00:00:00.19
Command processing                928    00:00:00.34    00:00:00.90
Pass 1                            563    00:00:01.55    00:00:02.85
Symbol table sort                   0    00:00:00.19    00:00:00.19
Pass 2                             38    00:00:00.39    00:00:00.69
Symbol table output                 2    00:00:00.01    00:00:00.01
Psect synopsis output               2    00:00:00.00    00:00:00.00
Cross-reference output              3    00:00:00.01    00:00:00.01
Assembler run totals             1563    00:00:02.51    00:00:04.84

The working set limit was 2400 pages.
82723 bytes (162 pages) of virtual memory were used to buffer the intermediate code.
There were 40 pages of symbol table space allocated to hold 674 non-local and 1 local symbols.
141 source lines were read in Pass 1, producing 53 object records in Pass 2.
15 pages of virtual memory were used to define 14 macros.
```

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              3
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           1
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       7
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                11

816 GETS were required to define 11 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 45 HISTORY ; DETAILED
(1) 94 Librarys and Equated Symbols
(1) 118 Data PSect Declarations
(1) 130 SCH$ASTDEL - AST DELIVERY INTERRUPT HANDLER
(1) 366 SCH$QAST - ENQUEUE AST CONTROL BLOCK FOR PROCESS

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element ASTDEL.MAR
0000     2 ; *3    12-MAY-1986 10:14:49 BARANSKI "Cleaning up Object Libraries."
0000     3 ; *2     7-MAY-1986 14:16:44 BARANSKI "Documentaion Check."
0000     4 ; *1     6-FEB-1986 15:13:37 DS ""
0000     5 ; DEC/CMS REPLACEMENT HISTORY, Element ASTDEL.MAR
0000     6         .TITLE  ASTDEL  *** ASTDEL AST delivery
0000     7         .IDENT  "6.7-7"                                                ;G:2
0000     8         .NoShow Conditionals                    ;[07]                  ;G:2
0000     9
0000    10 ;
0000    11 ;*******************************************************************************
0000    12 ;*                                                                             *
0000    13 ;*  COPYRIGHT (c) 1977, 1978, 1979, 1980, 1982                                 * ;G:2
0000    14 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                           *
0000    15 ;*                                                                             *
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0000    19 ;*  COPIES  THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY     *
0000    20 ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE  IS  HEREBY     *
0000    21 ;*  TRANSFERRED.                                                               *
0000    22 ;*                                                                             *
0000    23 ;*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE     *
0000    24 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT    *
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0000    26 ;*                                                                             *
0000    27 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS     *
0000    28 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                    *
0000    29 ;*                                                                             *
0000    30 ;*******************************************************************************
0000    31
0000    32 ;++
0000    33 ; FACILITY: EXECUTIVE, SCHEDULER
0000    34 ;
0000    35 ; ABSTRACT:
0000    36 ;       ASTDEL CONTAINS THE AST DELIVERY INTERRUPT SERVICE ROUTINE AND THE
0000    37 ;       ASSOCIATED SUBROUTINES SCH$QAST AND SCH$NEWLVL.  THESE ROUTINES
0000    38 ;       IMPLEMENT THE PRIMITIVE AST QUEUEING AND DELIVERY MECHANISMS.
0000    39 ;
0000    40 ; ENVIRONMENT:
0000    41 ;       MODE = KERNEL
0000    42 ;--
0000    43 ;
0000    44 ;       .PAGE
0000    45         .SBTTL  HISTORY                 ; DETAILED
0000    46 ;
0000    47 ; AUTHOR:       R. HUSTVEDT      CREATION DATE: 1-SEP-76
0000    48 ;
0000    49 ; MODIFIED BY:
0000    50 ;                                                                          ;G:2
0000    51 ;       V2.04   RIH0082         RICHARD I. HUSTVEDT     04-APR-1980
0000    52 ;               REMOVE ASTPEN FLAG AND REPLACE WITH ACCESS MODE CHECK
0000    53 ;
0000    54 ;       V2.03   LMK0001         LEN KAWELL      23-JAN-1980
0000    55 ;               ADD CHECKS TO AVOID FILLING THE STACK WHEN AST'S ARE
0000    56 ;               CONTINUALLY QUEUED TO A MODE BEFORE IT CAN EXECUTE
0000    57 ;               THE (SECOND) AST DELIVERY REI.
```

```
                     0000     58 ;
                     0000     59 ;       V2.02   RIH0031         R. I. HUSTVEDT  07-JUL-1979     14:35
                     0000     60 ;               CHECK FOR AUTOMATIC STACK EXPANSION AND EXPAND USER STACK.
                     0000     61 ;
                     0000     62 ;       V2.01   RIH0030         R. I. HUSTVEDT  20-JUL-1979     10:40
                     0000     63 ;               ADD GLOBAL FOR RETURN ADDRESS FROM AST CALL
                     0000     64 ;
                     0000     65 ;       ADAPTED TO DIAGNOSTIC SUPERVISOR ENVIRONMENT
                     0000     66 ;                                                                          ;G:2
                     0000     67 ;               Roger Riggs, 27-Jan-1980, Version 5.2
                     0000     68 ;       01      Fixed so ACB is requeued to head of queue if rejected
                     0000     69 ;               because ast is already active on this level.
                     0000     70 ;                                                                          ;G:2
                     0000     71 ;       02      David Butenhof   06-Feb-80
                     0000     72 ;               Add routine EXE$SETAST to emulate VMS function of
                     0000     73 ;               enabling/disabling AST delivery.
                     0000     74 ;
                     0000     75 ;               Dave Butenhof   13-may-1980, Version 5.4
                     0000     76 ;       03      Modify VMS V2.0 source for supervisor environment
                     0000     77 ;                                                                          ;G:2
                     0000     78 ;               Dave Butenhof   18-jun-1980, version 5.5
                     0000     79 ;       04      Remove EXE$SETAST routine from here, to enhance VMS
                     0000     80 ;               compatibility AST delivery enable/disable will be
                     0000     81 ;               implemented as VMS does it.
                     0000     82 ;                                                                          ;G:2
                     0000     83 ;       05      Dave Butenhof, 23-feb-1981, version 6.3
                     0000     84 ;               Fix truncation errors
                     0000     85 ;
                     0000     86 ;       06      - Jack Stansbury, 22-Oct-1981, Version 6.-
                     0000     87 ;               Changed PSECT SEP to PSECT Data and PSECT Code.
                     0000     88 ;               Also added .LIBRARY statements for $DS and $DIAG.
                     0000     89 ;
                     0000     90 ;       07      Jack Stansbury, 1-June-1982, Version 6.7
                     0000     91 ;               Fixed three truncation errors.
                     0000     92 ;-
```

```
                     0000     94          .Subtitle       Librarys and Equated Symbols
                     0000     95
                     0000     96 ;
                     0000     97 ; INCLUDE FILES:
                     0000     98 ;
                     0000     99          .LIBRARY        /$DS/           ;                                       [06]
                     0000    100          .LIBRARY        /$DIAG/         ;                                       [06]
                     0000    101                          ;                                                       [06]
                     0000    102          CMKDEF                          ; CHMK HOOKS AND SYMBOLS
                     0000    103          $ACBDEF                         ; AST CONTROL BLOCK DEFINITIONS
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .IIF    NB,ACB$L_ASTQFL,        ACB$L_ASTQFL:
 00000004            0000                         .BLKL   1
                     0004                 .IIF    NB,ACB$L_ASTQBL,        ACB$L_ASTQBL:
 00000008            0004                         .BLKL   1
                     0008                 .IIF    NB,ACB$W_SIZE,  ACB$W_SIZE:
 0000000A            0008                         .BLKW   1
                     000A                 .IIF    NB,ACB$B_TYPE,  ACB$B_TYPE:
 0000000B            000A                         .BLKB   1
                     000B                 .IIF    NB,ACB$B_RMOD,  ACB$B_RMOD:
 0000000C            000B                         .BLKB   1
                     000C                 .IIF    NB,ACB$L_PID,   ACB$L_PID:
 00000010            000C                         .BLKL   1
                     0010                 .IIF    NB,ACB$L_AST,   ACB$L_AST:
 00000014            0010                         .BLKL   1
                     0014                 .IIF    NB,ACB$L_ASTPRM,        ACB$L_ASTPRM:
 00000018            0014                         .BLKL   1
                     0018                 .IIF    NB,ACB$C_LENGTH,        ACB$C_LENGTH:
                     0018                 .IIF    NB,ACB$K_LENGTH,        ACB$K_LENGTH:
                     0018                 .IIF    NB,ACB$L_KAST,  ACB$L_KAST:
 0000001C            0018                         .BLKL   1
                     0000                 .RESTORE
                     0000    104          $IPLDEF                         ; IPL DEFINITIONS
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .PSECT  $ABS$,ABS
 00000000            001C                 .=0
                     0000                 .RESTORE
                     0000    105          $PCBDEF                         ; PCB DEFINITIONS
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .PSECT  $ABS$,ABS
 00000000            001C                 .=0
                     0000                 .IIF    NB,PCB$L_SQFL,  PCB$L_SQFL:
 00000004            0000                         .BLKL   1
                     0004                 .IIF    NB,PCB$L_SQBL,  PCB$L_SQBL:
 00000008            0004                         .BLKL   1
                     0008                 .IIF    NB,PCB$W_SIZE,  PCB$W_SIZE:
 0000000A            0008                         .BLKW   1
                     000A                 .IIF    NB,PCB$B_TYPE,  PCB$B_TYPE:
 0000000B            000A                         .BLKB   1
                     000B                 .IIF    NB,PCB$B_PRI,   PCB$B_PRI:
 0000000C            000B                         .BLKB   1
                     000C                 .IIF    NB,PCB$B_ASTACT,        PCB$B_ASTACT:
 0000000D            000C                         .BLKB   1
                     000D                 .IIF    NB,PCB$B_ASTEN, PCB$B_ASTEN:
 0000000E            000D                         .BLKB   1
                     000E                 .IIF    NB,PCB$W_MTXCNT,        PCB$W_MTXCNT:
 00000010            000E                         .BLKW   1
```

```
                     0010          .IIF    NB,PCB$L_ASTQFL,        PCB$L_ASTQFL:
00000014             0010                  .BLKL   1
                     0014          .IIF    NB,PCB$L_ASTQBL,        PCB$L_ASTQBL:
00000018             0014                  .BLKL   1
                     0018          .IIF    NB,PCB$L_PHYPCB,        PCB$L_PHYPCB:
0000001C             0018                  .BLKL   1
                     001C          .IIF    NB,PCB$L_OWNER, PCB$L_OWNER:
00000020             001C                  .BLKL   1
                     0020          .IIF    NB,PCB$L_WSSWP, PCB$L_WSSWP:
00000024             0020                  .BLKL   1
                     0024          .IIF    NB,PCB$L_STS,   PCB$L_STS:
00000028             0024                  .BLKL   1
                     0028          .IIF    NB,PCB$L_WTIME, PCB$L_WTIME:
0000002C             0028                  .BLKL   1
                     002C          .IIF    NB,PCB$W_STATE, PCB$W_STATE:
0000002E             002C                  .BLKW   1
                     002E          .IIF    NB,PCB$B_WEFC,  PCB$B_WEFC:
0000002F             002E                  .BLKB   1
                     002F          .IIF    NB,PCB$B_PRIB,  PCB$B_PRIB:
00000030             002F                  .BLKB   1
                     0030          .IIF    NB,PCB$W_APTCNT,        PCB$W_APTCNT:
00000032             0030                  .BLKW   1
                     0032          .IIF    NB,PCB$W_TMBU,  PCB$W_TMBU:
00000034             0032                  .BLKW   1
                     0034          .IIF    NB,PCB$W_GPGCNT,        PCB$W_GPGCNT:
00000036             0034                  .BLKW   1
                     0036          .IIF    NB,PCB$W_PPGCNT,        PCB$W_PPGCNT:
00000038             0036                  .BLKW   1
                     0038          .IIF    NB,PCB$W_ASTCNT,        PCB$W_ASTCNT:
0000003A             0038                  .BLKW   1
                     003A          .IIF    NB,PCB$W_BIOCNT,        PCB$W_BIOCNT:
0000003C             003A                  .BLKW   1
                     003C          .IIF    NB,PCB$W_BIOLM, PCB$W_BIOLM:
0000003E             003C                  .BLKW   1
                     003E          .IIF    NB,PCB$W_DIOCNT,        PCB$W_DIOCNT:
00000040             003E                  .BLKW   1
                     0040          .IIF    NB,PCB$W_DIOLM, PCB$W_DIOLM:
00000042             0040                  .BLKW   1
                     0042          .IIF    NB,PCB$W_PRCCNT,        PCB$W_PRCCNT:
00000044             0042                  .BLKW   1
                     0044          .IIF    NB,PCB$T_TERMINAL,      PCB$T_TERMINAL:
0000004C             0044                  .BLKB   8
                     004C          .IIF    NB,PCB$L_PQB,   PCB$L_PQB:
                     004C          .IIF    NB,PCB$L_EFWM,  PCB$L_EFWM:
00000050             004C                  .BLKL   1
                     0050          .IIF    NB,PCB$L_EFCS,  PCB$L_EFCS:
00000054             0050                  .BLKL   1
                     0054          .IIF    NB,PCB$L_EFCU,  PCB$L_EFCU:
00000058             0054                  .BLKL   1
                     0058          .IIF    NB,PCB$L_EFC2P, PCB$L_EFC2P:
0000005C             0058                  .BLKL   1
                     005C          .IIF    NB,PCB$L_EFC3P, PCB$L_EFC3P:
00000060             005C                  .BLKL   1
                     0060          .IIF    NB,PCB$L_PID,   PCB$L_PID:
00000064             0060                  .BLKL   1
                     0064          .IIF    NB,PCB$L_PHD,   PCB$L_PHD:
00000068             0064                  .BLKL   1
```

```
                     0068                .IIF    NB,PCB$T_LNAME, PCB$T_LNAME:
00000078             0068                        .BLKB   16
                     0078                .IIF    NB,PCB$L_JIB,   PCB$L_JIB:
0000007C             0078                        .BLKL   1
                     007C                .IIF    NB,PCB$Q_PRIV,  PCB$Q_PRIV:
00000084             007C                        .BLKQ   1
                     0084                .IIF    NB,PCB$L_ARB,   PCB$L_ARB:
00000088             0084                        .BLKL   1
                     0088                .IIF    NB,PCB$L_UIC,   PCB$L_UIC:
                     0088                .IIF    NB,PCB$W_MEM,   PCB$W_MEM:
0000008A             0088                        .BLKW   1
                     008A                .IIF    NB,PCB$W_GRP,   PCB$W_GRP:
0000008C             008A                        .BLKW   1
                     008C                .IIF    NB,PCB$C_LENGTH,        PCB$C_LENGTH:
                     008C                .IIF    NB,PCB$K_LENGTH,        PCB$K_LENGTH:
                     0000                .RESTORE
                     0000    106         $PHDDEF                         ; PHD DEFINITIONS
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
00000000             008C                .=0
                     0000                .RESTORE
                     0000    107         $PRDEF                          ; PROCESSOR REGISTER DEFINITIONS
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
00000000             008C                .=0
                     0000                .RESTORE
00000000             008C                .=0
                     0000                .RESTORE
                     0000    108         $PRIDEF                         ; PRIORITY INCREMENT CLASS DEFS
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
00000000             008C                .=0
                     0000                .RESTORE
                     0000    109         $PSLDEF                         ; PSL FIELD DEFINITIONS
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
00000000             008C                .=0
                     0000                .RESTORE
                     0000    110         $SSDEF                          ; STATUS CODE DEFINITIONS
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
00000000             008C                .=0
                     0000                .RESTORE
                     0000    111
                     0000    112 ;
                     0000    113 ; EQUATED SYMBOLS:
                     0000    114 ;
                     0000    115
00000000             0000    116 ASTEXIT=0                               ; AST EXIT CHANGE MODE CODE
```

```
                                0000   118          .Subtitle       Data PSect Declarations
                            00000000   119          .PSECT  Data, NoExe, Shr, NoWrt, Long   ;                    [06]
                                0000   120
                                0000   121 ;
                                0000   122 ; OWN STORAGE:
                                0000   123 ;
                                0000   124
                                0000   125          MODNAM  ASTDEL
                  4C 45 44 54 53 41 00' 0000      $MODULE:          .ASCIC  \ASTDEL\
                                06    0000
                                0007   126
                                0007   127 ASTACKERR:
52 4F 52 52 45 20 4B 43 41 54 53 00' 0007   128          .ASCIC  .STACK ERROR.
                                0B    0007
```

```
                     0013   130          .SBTTL  SCH$ASTDEL - AST DELIVERY INTERRUPT HANDLER
                  00000000   131          .PSECT  Code, Exe, Shr, NoWrt, Long     ;                    [06]
                     0000   132
                     0000   133 ;++
                     0000   134 ; FUNCTIONAL DESCRIPTION:
                     0000   135 ;       SCH$ASTDEL RECEIVES THE AST DELIVERY INTERRUPT (IPL - 2) WHICH
                     0000   136 ;       IS INITIATED BY AN REI INSTRUCTION DETECTING ASTLVL LESS THAN
                     0000   137 ;       OR EQUAL TO PSL<CURRENT_MODE>.  THE HEAD OF THE AST QUEUE
                     0000   138 ;       FOR THE CURRENT PROCESS IS REMOVED AND PROCESSED.  SPECIAL
                     0000   139 ;       KERNEL MODE ASTS ARE PROCESSED WITH IPL REMAINING AT IPL 2.
                     0000   140 ;       NORMAL ASTS ARE DELIVERED BY PUSHING THE AST INFORMATION ON
                     0000   141 ;       THE STACK OF THE MODE RECEIVING THE AST AND THE AST ACTIVE
                     0000   142 ;       BIT FOR THAT MODE IS SET TO PREVENT SUBSEQUENT ASTS UNTIL THE
                     0000   143 ;       CURRENT ONE FOR THAT MODE HAS BEEN PROCESSED.
                     0000   144 ;       SPURIOUS AST INTERRUPTS WILL BE DETECTED AND IGNORED.
                     0000   145 ;
                     0000   146 ;
                     0000   147 ; CALLING SEQUENCE:
                     0000   148 ;       IPL - 2  INTERRUPT
                     0000   149 ;
                     0000   150 ;
                     0000   151 ; INPUT PARAMETERS:
                     0000   152 ;       00(SP) = PC AT AST DELIVERY INTERRUPT
                     0000   153 ;       04(SP) = PSL AT AST DELIVERY INTERRUPT
                     0000   154 ;
                     0000   155 ; IMPLICIT INPUTS:
                     0000   156 ;       PCB OF CURRENT PROCESS LOCATED VIA SCH$GL_CURPCB
                     0000   157 ;       AST CONTROL BLOCK AT HEAD OF AST QUEUE FOR PROCESS
                     0000   158 ;
                     0000   159 ;
                     0000   160 ; OUTPUT PARAMETERS:
                     0000   161 ;       NONE
                     0000   162 ;
                     0000   163 ; IMPLICIT OUTPUTS:
                     0000   164 ;       *** TBS ***
                     0000   165 ;
                     0000   166 ; COMPLETION CODES:
                     0000   167 ;       NONE
                     0000   168 ;
                     0000   169 ; SIDE EFFECTS:
                     0000   170 ;       *** TBS ***
                     0000   171 ;
                     0000   172 ;--
                     0000   173
                     0000   174          .ALIGN  LONG                    ; INTERRUPT ROUTINES ON LW BOUND
                     0000   175 SCH$ASTDEL::                             ; AST DELIVERY INTERRUPT HANDLER
                3F   BB  0000   176          PUSHR   #^M<R0,R1,R2,R3,R4,R5>  ; SAVE R0-R5
54   00000000'EF   D0  0002   177          MOVL    L^SCH$GL_CURPCB, R4     ; Get pointer to current PCB
                     0009   178          SETIPL  #IPL$_SYNCH             ; BLOCK SYSTEM EVENTS
                12   07  DA  0009                  MTPR    #IPL$_SYNCH,S^#PR$_IPL
             55   10 B4  0F  000C   179 10$:     REMQUE  @PCB$L_ASTQFL(R4),R5    ; AND REMOVE HEAD OF QUEUE
                18   1D  0010   180          BVS     ASTDEXIT                ; EXIT IF QUEUE EMPTY
          4B 0B A5   07  E5  0012   181          BBCC    #ACB$V_KAST,ACB$B_RMOD(R5),NORM ; BR IF NORMAL AST
```

```
                     0017   183 ;
                     0017   184 ;       THE KERNEL AST ROUTINE IS ENTERED VIA A JSB TO THE SPECIFIED
                     0017   185 ;       ADDRESS WITH IPL=2 AND THE POINTER TO THE AST CONTROL BLOCK
                     0017   186 ;       IN R5.  IT IS THE RESPONSIBILITY OF THE KERNEL AST ROUTINE
                     0017   187 ;       TO PROPERLY RELEASE OR OTHERWISE DISPOSE OF THE AST CONTROL
                     0017   188 ;       BLOCK.  THE PCB BASE ADDRESS IS IN R4.
                     0017   189 ;
                     0017   190 ;       REGISTERS R0-R5 HAVE BEEN PRESERVED AND ARE AVAILABLE FOR
                     0017   191 ;       USE BY THE AST ROUTINE.
                     0017   192 ;
                     0017   193         SETIPL  #IPL$_ASTDEL                ; DROP IPL TO PERMIT SYSTEM EVENTS
          12   02   DA   0017                 MTPR    #IPL$_ASTDEL,S^#PR$_IPL
            18 B5   16   001A   194         JSB     @ACB$L_KAST(R5)             ; DO KERNEL MODE AST
    54 00000000'EF   D0   001D   195         MOVL    L^SCH$GL_CURPCB, R4         ; Get pointer to current PCB
    0000002D'EF   16   0024   196         JSB     SCH$NEWLVL                  ; COMPUTE NEW ASTLVL                    [07]
                     002A   197
                     002A   198 ASTDEXIT:                                    ; AST DELIVERY EXIT
          3F   BA   002A   199         POPR    #^M<R0,R1,R2,R3,R4,R5>      ; RESTORE REGISTERS R0-R5
               02   002C   200         REI                                 ; AND RETURN
```

```
                                  002D   ;
                                  002D   ;       SCH$NEWLVL - COMPUTE NEW ASTLVL
                                  002D   ;
                                  002D   ; INPUT:
                                  002D   ;       R4 - ADDRESS OF CURRENT PCB
                                  002D   ;
                                  002D   ; OUTPUT:
                                  002D   ;       PR$_ASTLVL - NEW AST LEVEL
                                  002D   ;       PHD$V_ASTLVL - NEW AST LEVEL
                                  002D   ;
                                  002D
                                  002D   SCH$NEWLVL::                                  ; COMPUTE NEW AST LEVEL
          50    10 A4     DE      002D           MOVAL   PCB$L_ASTQFL(R4),R0           ; GET ADDRESS OF AST QUEUE
                                  0031           DSBINT  #IPL$_SYNCH                   ; DISABLE SYSTEM EVENTS
             7E    12     DB      0031                   MFPR    S^#PR$_IPL,-(SP)
             12    07     DA      0034                   MTPR    #IPL$_SYNCH,S^#PR$_IPL
             51    60     D0      0037           MOVL    (R0),R1                       ; GET FLINK
             51    50     D1      003A           CMPL    R0,R1                         ; AND CHECK FOR EMPTY QUEUE
                   19     13      003D           BEQL    20$                           ; YES, QUEUE IS EMPTY
  52   0B A1    02    00     EF      003F           EXTZV   #0,#2,ACB$B_RMOD(R1),R2       ; GET REQUEST MODE
       04 0B A1    07     E1      0045           BBC     #ACB$V_KAST,ACB$B_RMOD(R1),10$  ; NOT A KERNEL AST
                   52     D4      004A           CLRL    R2                            ; SET TO KERNEL MODE
                   0D     11      004C           BRB     30$                           ; FOR ASTLVL
                                  004E
   50   0D A4    0C A4     8B      004E   10$:    BICB3   PCB$B_ASTACT(R4),PCB$B_ASTEN(R4),R0 ; COMPUTE DELIVERABLE
          03 50    52     E0      0054           BBS     R2,R0,30$                     ; YES, CAN BE DELIVERED
                                  0058
             52    04     D0      0058   20$:    MOVL    #4,R2                         ; NONE DELIVERABLE, NULL ASTLVL
                                  005B
             13    52     DA      005B   30$:    MTPR    R2,#PR$_ASTLVL                ; SET ASTLVL REGISTER
                                  005E           ENBINT                                ; ENABLE SYSTEM EVENTS AGAIN
             12    8E     DA      005E                   MTPR    (SP)+,S^#PR$_IPL
                   05             0061           RSB                                   ; RETURN
```

```
                                0062   233 ;
                                0062   234 ;       AT THIS POINT THE KERNEL STACK IS:
                                0062   235 ;       00(SP) = SAVED R0
                                0062   236 ;       04(SP) = SAVED R1
                                0062   237 ;       08(SP) = SAVED R2
                                0062   238 ;       12(SP) = SAVED R3
                                0062   239 ;       16(SP) = SAVED R4
                                0062   240 ;       20(SP) = SAVED R5
                                0062   241 ;       24(SP) = SAVED PC
                                0062   242 ;       28(SP) = SAVED PSL
                                0062   243 ;
                                0062   244
                                0062   245 NORM:                                        ; NORMAL AST DELIVERY
   53   0B A5   02   00   EF    0062   246          EXTZV   #ACB$V_MODE, -              ; GET AST REQUEST MODE                  [07]
                                0068   247                    #ACB$S_MODE, -          ;                                       [07]
                                0068   248                    ACB$B_RMOD(R5), -       ;                                       [07]
                                0068   249                    R3                      ;                                       [07]
   53   1C AE   02   18   ED    0068   250          CMPZV   #PSL$V_CURMOD, -            ; IS CURRENT MODE LEGAL                 [07]
                                006E   251                    #PSL$S_CURMOD, -        ;                                       [07]
                                006E   252                    28(SP), -               ;                                       [07]
                                006E   253                    R3                      ;                                       [07]
                           06   18   006E   254          BGEQ    20$                     ; YES, NOT SPURIOUS
                                0070   255
              10 A4        65   0E   0070   256 10$:     INSQUE  (R5),PCB$L_ASTQFL(R4)   ; REQUEUE AT HEAD OF QUEUE
                           B4   11   0074   257          BRB     ASTDEXIT                ; AND EXIT
                                0076   258
    F5 0D A4        53   E1   0076   259 20$:     BBC     R3,PCB$B_ASTEN(R4),10$  ; BR IF AST DISABLED
    F0 0C A4        53   E2   007B   260          BBSS    R3,PCB$B_ASTACT(R4),10$ ; SET AST ACTIVE
    03 0B A5        06   E5   0080   261          BBCC    #ACB$V_QUOTA,ACB$B_RMOD(R5),30$ ; SKIP IF NO QUOTA ACCOUNTING
          38 A4     B6   0085   262          INCW    PCB$W_ASTCNT(R4)        ; UPDATE OUTSTANDING COUNT
                                0088   263
                                0088   264 30$:                                       ; AND DELIVER AST
        A2 AF       16   0088   265          JSB     SCH$NEWLVL                      ; COMPUTE NEW AST LEVEL                 [07]
                                008B   266          SETIPL  #IPL$_ASTDEL            ; NOW DROP IPL TO PERMIT SYSTEM EVENTS
      12   02       DA   008B                   MTPR    #IPL$_ASTDEL,S^#PR$_IPL
                                008E   267 ;
                                008E   268 ;       A NEW VALUE FOR ASTLVL HAS NOW BEEN COMPUTED AND SET.
                                008E   269 ;       THE AST REPRESENTED BY THE AST CONTROL BLOCK LOCATED VIA
                                008E   270 ;       R5 CAN NOW BE DELIVERED.
                                008E   271 ;
           53        D5   008E   272          TSTL    R3                      ; CHECK FOR DELIVERY TO KERNEL
           43        12   0090   273          BNEQ    NOTKMODE                ; NOT KERNEL MODE
```

```
                                0092   275 ;
                                0092   276 ;       DELIVER NORMAL AST TO KERNEL MODE
                                0092   277 ;
                     03   BA    0092   278         POPR    #^M<R0,R1>              ; RESTORE R0,R1
                                0094   279 ;
                                0094   280 ;       00(SP) = R2, 04(SP) = R3, 08(SP) = R4, 12(SP) = R5,
                                0094   281 ;       16(SP) = PC, 20(SP) = PSL
                                0094   282 ;
                                0094   283 40$:
           7E   08 AE   7D      0094   284         MOVQ    8(SP),-(SP)             ; SHUFFLE STACK
                                0098   285 ;
                                0098   286 ;       00(SP) = R4, 04(SP) = R5, 08(SP) = R2, 12(SP) = R3,
                                0098   287 ;       16(SP) = R4, 20(SP) = R5, 24(SP) = PC, 28(SP) = PSL
                                0098   288 ;
           7E   08 AE   7D      0098   289         MOVQ    8(SP),-(SP)             ; OPEN FOR AST ARG LIST
                                009C   290 ;
                                009C   291 ;       00(SP) = R2, 04(SP) = R3, 08(SP) = R4, 12(SP) = R5,
                                009C   292 ;       16(SP) = R2, 20(SP) = R3, 24(SP) = R4, 28(SP) = R5,
                                009C   293 ;       32(SP) = PC, 36(SP) = PSL
                                009C   294 ;
           18 AE   50   7D      009C   295         MOVQ    R0,24(SP)               ; SET R0,R1 IN ARG LIST
                                00A0   296
        14 AE   14 A5   D0      00A0   297 50$:    MOVL    ACB$L_ASTPRM(R5),20(SP) ; SET AST PARAMETER IN ARG LIST
           10 AE   05   D0      00A5   298         MOVL    #5,16(SP)               ; SET COUNT FOR ARGUMENT LIST
              50   55   D0      00A9   299         MOVL    R5,R0                   ; RELEASE AST CONTROL BLOCK
                 10 A5   DD      00AC   300         PUSHL   ACB$L_AST(R5)           ; SAVE AST ROUTINE ADDRESS
     00000000'EF   16   00AF   301         JSB     EXE$DEANONPAGED         ; TO DYNAMIC POOL                       [07]
                    3E   BA      00B5   302         POPR    #^M<R1,R2,R3,R4,R5>     ; RESTORE R1-R5
                                00B7   303         SETIPL  #0                      ; DROP IPL TO ZERO
                12   00   DA    00B7                       MTPR    #0,S^#PR$_IPL
                                00BA   304 ;       BRB     EXE$ASTDEL              ; FALL THROUGH TO CALL AST ROUTINE
```

```
                        00BA    306 ;
                        00BA    307 ;       CALL AST ROUTINE WITH AST ARGUMENT LIST
                        00BA    308 ;
                        00BA    309 ;       THE CALL IS EXECUTED AT THE MODE WHICH RECEIVED THE AST WITH
                        00BA    310 ;       THE AST ARGUMENT LIST ON THE TOP OF THE STACK.  WHEN THE
                        00BA    311 ;       AST ROUTINE RETURNS FROM THE CALL, AN ASTEXIT CHANGE MODE
                        00BA    312 ;       TO KERNEL INSTRUCTION WILL BE ISSUED.  ASTEXIT WILL RESET
                        00BA    313 ;       THE AST ACTIVE BIT FOR THE CURRENT MODE AND MAY CAUSE DELIVERY
                        00BA    314 ;       OF ADDITIONAL ASTS.
                        00BA    315 ;
                        00BA    316 ;       AST ARGUMENT LIST:
                        00BA    317 ;       ------------------
                        00BA    318 ;
                        00BA    319 ;       00(SP) = NUMBER OF ARGUMENTS, =5
                        00BA    320 ;       04(SP) = AST PARAMETER
                        00BA    321 ;       08(SP) = SAVED R0
                        00BA    322 ;       12(SP) = SAVED R1
                        00BA    323 ;       16(SP) = SAVED PC
                        00BA    324 ;       20(SP) = SAVED PSL
                        00BA    325 ;
                        00BA    326 EXE$ASTDEL:                                 ; DELIVER AST CALL
          61    6E  FA  00BA    327           CALLG   (SP),(R1)                 ; CALL AST ROUTINE
          5E    08  C0  00BD    328           ADDL    #8,SP                     ; REMOVE ARG COUNT AND ASTPRM
                        00C0    329           CMK     ASTEXIT                   ; AND EXIT FROM AST ROUTINE
                7E  DC  00C0                  MOVPSL  -(SP)
        06 6E   1A  E0  00C2                  BBS     #PSL$V_IS, (SP), 30000$
                8E  D4  00C6                  CLRL    (SP)+
                00  BC  00C8                  CHMK    #CMK$_ASTEXIT
                06  11  00CA                  BRB     30001$
00000000'EF     16  00CC        30000$:       JSB     CMK$ASTEXIT
                    00D2        30001$:
                03  BA  00D2    330           POPR    #^M<R0,R1>                ; RESTORE R0,R1
                    02  00D4    331           REI                               ; EXECUTE REI IN MODE OF AST
```

```
                                00D5   333 ;
                                00D5   334 ;       DELIVER NORMAL AST FOR EXEC, SUPER AND USER MODE
                                00D5   335 ;
                                00D5   336
                                00D5   337 NOTKMODE:                                    ; NOT AN AST FOR KERNEL MODE
                                00D5   338 ;
            51    53    DB    00D5   339          MFPR    R3,R1                         ; GET STACK POINTER
                                00D8   340          IFNOWRT #24,-24(R1),STACKERR,R3 ; ENOUGH STACK SPACE??
      E8 A1   18    53    0D  00D8                PROBEW  R3,#24,-24(R1)
                  2D    13    00DD                BEQL    STACKERR
          71    18 AE   7D    00DF   341          MOVQ    24(SP),-(R1)                  ; MOVE PC,PSL TO PROPER STACK
             71    8E   7D    00E3   342          MOVQ    (SP)+,-(R1)                   ; AND R0,R1 FROM KERNEL STACK
                                00E6   343
          71    14 A5   D0    00E6   344 10$:     MOVL    ACB$L_ASTPRM(R5),-(R1)        ; SET AST PARAMETER IN ARG LIST
             71    05   D0    00EA   345          MOVL    #5,-(R1)                      ; AND FINALLY, ARGUMENT COUNT OF 5
             53    51   DA    00ED   346          MTPR    R1,R3                         ; SAVE UPDATED STACK POINTER
               10 A5   DD    00F0   347          PUSHL   ACB$L_AST(R5)                 ; STACK AST ENTRY POINT
       14 AE    C4 AF   DE    00F3   348          MOVAL   EXE$ASTDEL,20(SP)             ; SET PC TO AST DELIVERY CALL
             50    55   D0    00F8   349          MOVL    R5,R0                         ; SET ADDRESS OF ACB FOR RELEASE
             53    05   C4    00FB   350          MULL    #1+<1@<PSL$V_CURMOD-PSL$V_PRVMOD>>, -; CURRENT MODE = PREVIOUS MODE
                                00FE   351                    R3                    ;                                              [07]
      18 AE   53    16   78    00FE   352          ASHL    #PSL$V_PRVMOD,R3,24(SP)       ; SYNTHESIZE PSL FOR PROPER MODE
          00000000'EF   16    0103   353          JSB     EXE$DEANONPAGED               ; RELEASE AST CONTROL BLOCK                    [07]
                  3E    BA    0109   354          POPR    #^M<R1,R2,R3,R4,R5>           ; RESTORE R1-R5
                        02    010B   355          REI                                   ; AND ENTER AST MODE
                                010C   356                                              ; DROPS IPL TO ZERO
                                010C   357
                                010C   358 ;
                                010C   359 ;       REFLECT STACK ERROR
                                010C   360 ;
                                010C   361 STACKERR:                                   ; ERROR IN STACK MOVE
                                010C   362          ERRSUP_S   ,ASTACKERR
          00000000'EF   DF    010C                        PUSHAL  $MODULE
          00000007'EF   DF    0112                        PUSHAL  ASTACKERR
                  01    DD    0118                        PUSHL   #$ER
      00000000'EF   03    FB    011A                        CALLS   #3, DS_ERRSUP
                        00    0121   363          HALT
                  E8    11    0122   364          BRB     STACKERR
```

```
                     0124   366          .SBTTL  SCH$QAST - ENQUEUE AST CONTROL BLOCK FOR PROCESS
                     0124   367
                     0124   368 ;++
                     0124   369 ;
                     0124   370 ; FUNCTIONAL DESCRIPTION:
                     0124   371 ;       SCH$QAST INSERTS THE AST CONTROL BLOCK SUPPLIED IN THE PROPER
                     0124   372 ;       POSITION BY ACCESS MODE IN THE AST QUEUE OF THE PROCESS SPECIFIED
                     0124   373 ;       BYT THE PID FIELD OF THE AST CONTROL BLOCK.  AN AST ARRIVAL EVENT
                     0124   374 ;       IS THEN REPORTED FOR THE PROCESS TO REACTIVATE FROM A WAIT STATE
                     0124   375 ;       IF APPROPRIATE.  THE AST CONTROL BLOCK WILL BE RELEASED IMMEDIATELY
                     0124   376 ;       IF THE PID SPECIFIES A NON-EXISTENT PROCESS.
                     0124   377 ;
                     0124   378 ; CALLING SEQUENCE:
                     0124   379 ;       BSB/JSB SCH$QAST
                     0124   380 ;
                     0124   381 ; INPUT PARAMETERS:
                     0124   382 ;       R2 - PRIORITY INCREMENT CLASS
                     0124   383 ;       R5 - POINTER TO AST CONTROL BLOCK
                     0124   384 ;
                     0124   385 ; IMPLICIT INPUTS:
                     0124   386 ;       PCB OF PROCESS IDENTIFIED BY PID FIELD
                     0124   387 ;
                     0124   388 ; OUTPUT PARAMETERS:
                     0124   389 ;       R0 - COMPLETION STATUS CODE
                     0124   390 ;       R4 - PCB ADDRESS OF PROCESS FOR WHICH AST WAS QUEUED
                     0124   391 ;
                     0124   392 ; IMPLICIT OUTPUTS:
                     0124   393 ;       *** TBS ***
                     0124   394 ;
                     0124   395 ; SIDE EFFECTS:
                     0124   396 ;       THE PROCESS IDENTIFIED BY THE PID IN THE AST CONTROL BLOCK
                     0124   397 ;       WILL BE MADE EXECUTABLE IF NOT SUSPENDED.
                     0124   398 ;
                     0124   399 ; COMPLETION CODES:
                     0124   400 ;       SS$_NORMAL  -  NORMAL SUCCESSFUL COMPLETION STATUS
                     0124   401 ;       SS$_NONEXPR -  NON-EXISTENT PROCESS
                     0124   402 ;
                     0124   403 ;--
                     0124   404
                     0124   405 SCH$QAST::                                  ; ENQUEUE AST FOR PROCESS
          50   0C A5   3C  0124   406          MOVZWL  ACB$L_PID(R5),R0       ; GET PROCESS INDEX FOR AST TARGET
                     0128   407          DSBINT  #IPL$_SYNCH                ; DISABLE SYSTEM EVENTS
             7E   12   DB  0128                  MFPR    S^#PR$_IPL,-(SP)
             12   07   DA  012B                  MTPR    #IPL$_SYNCH,S^#PR$_IPL
     54  00000000'FF40   D0  012E   408          MOVL    @L^SCH$GL_PCBVEC[R0],R4 ; Look up PCB address
         60 A4   0C A5   D1  0136   409          CMPL    ACB$L_PID(R5),PCB$L_PID(R4) ; CHECK FOR MATCH IN PID
                 12   13  013B   410          BEQL    20$                    ; OK, PID MATCHES
                     013D   411
                     013D   412 10$:                                        ; PROCESS NOT FOUND
             50   55   D0  013D   413          MOVL    R5,R0                  ; RELEASE AST CONTROL BLOCK
          00000000'EF   16  0140   414          JSB     EXE$DEANONPAGED        ; IF NO SUCH PROCESS                    [07]
                     0146   415
                     0146   416          ENBINT                             ; ENABLE INTERRUPTS
             12   8E   DA  0146                  MTPR    (SP)+,S^#PR$_IPL
          50   08E8 8F   3C  0149   417          MOVZWL  #SS$_NONEXPR,R0        ; SET ERROR STATUS CODE
                     05  014E   418          RSB                            ; AND RETURN
                     014F   419
```

```
                                014F   20 20$:                                          ; PROCESS EXISTS
   50   0B A5   02   00   EF   014F   421          EXTZV   #ACB$V_MODE, -                ; EXTRACT REQUEST ACCESS MODE          [07]
                                0155   422                    #ACB$S_MODE, -              ;                                      [07]
                                0155   423                    ACB$B_RMOD(R5), -           ;                                      [07]
                                0155   424                    R0                          ;                                      [07]
          51   10 A4   DE       0155   425          MOVAL   PCB$L_ASTQFL(R4),R1           ; POINT TO QUEUE HEADER
               53   61   D0     0159   426          MOVL    (R1),R3                       ; AND COPY HEADER ADDRESS
                                015C   427
               53   51   D1     015C   428 30$:     CMPL    R1,R3                         ; CHECK FOR END OF QUEUE
                    17   13     015F   429          BEQL    40$                           ; INSERT IF AT END
        0D 0B A5    07   E0     0161   430          BBS     #ACB$V_KAST,ACB$B_RMOD(R5),37$  ; BR IF SPECIAL KERNEL AST
   50   0B A3   02   00   ED     0166   431          CMPZV   #0,#2,ACB$B_RMOD(R3),R0 ; COMPARE ACCESS MODES
                    05   14     016C   432          BGTR    37$                           ; IF GTR AT RIGHT PLACE
                                016E   433
               53   63   D0     016E   434 35$:     MOVL    (R3),R3                       ; FLINK ON TO NEXT ACB
                    E9   11     0171   435          BRB     30$                           ; AND TRY AGAIN
                                0173   436
        F6 0B A3    07   E0     0173   437 37$:     BBS     #ACB$V_KAST,ACB$B_RMOD(R3),35$  ; BR TO QUEUE KAST FIFO
                                0178   438
                                0178   439 40$:                                          ; INSERT IN AST QUEUE
          04 B3    65   0E     0178   440          INSQUE  (R5),@ACB$L_ASTQBL(R3)        ; INSERT AFTER PREVIOUS
          51   10 A4   D0       017C   441          MOVL    PCB$L_ASTQFL(R4),R1           ; ADDRESS OF AST QUEUE HEAD
                    50   D4     0180   442          CLRL    R0                            ; ASSUME KERNEL AST
               0B A1   95       0182   443          TSTB    ACB$B_RMOD(R1)                ; KERNAL AST REQUESTED?
                    10   19     0185   444          BLSS    50$                           ; AN INTERNAL AST
   50   0B A1   02   00   EF     0187   445          EXTZV   #ACB$V_MODE, -                ; GET MOST PRIVILEGED AST LEVEL        [07]
                                018D   446                    #ACB$S_MODE, -              ;                                      [07]
                                018D   447                    ACB$B_RMOD(R1), -           ;                                      [07]
                                018D   448                    R0                          ;                                      [07]
     51   0D A4   0C A4   8B     018D   449          BICB3   PCB$B_ASTACT(R4), -           ; COMPUTE INACTIVE ENABLED             [07]
                                0193   450                    PCB$B_ASTEN(R4), -          ;                                      [07]
                                0193   451                    R1                          ;                                      [07]
          03 51    50   E1       0193   452          BBC     R0,R1,80$                     ; SKIP IF ACTIVE OR DISABLED
                                0197   453
               13   50   DA     0197   454 50$:     MTPR    R0,#PR$_ASTLVL                ; ALSO SET ASTLVL REGISTER
                                019A   455
                                019A   456 80$:     ENBINT                                ; ENABLE INTERRUPTS
               12   8E   DA     019A                        MTPR    (SP)+,S^#PR$_IPL
               50   01   3C     019D   457          MOVZWL  #SS$_NORMAL,R0                ; SET SUCCESS STATUS CODE
                         05     01A0   458          RSB                                   ; AND RETURN
                                01A1   459
                                01A1   460          .END
```

```
$ER                             = 00000002     D
$MODULE                           00000000 R   D   02
ACB$B_RMOD                        0000000B     D
ACB$B_TYPE                        0000000A     D
ACB$C_LENGTH                      00000018     D
ACB$K_LENGTH                      00000018     D
ACB$L_AST                         00000010     D
ACB$L_ASTPRM                      00000014     D
ACB$L_ASTQBL                      00000004     D
ACB$L_ASTQFL                      00000000     D
ACB$L_KAST                        00000018     D
ACB$L_PID                         0000000C     D
ACB$S_MODE                      = 00000002     D
ACB$V_KAST                      = 00000007     D
ACB$V_MODE                      = 00000000     D
ACB$V_QUOTA                     = 00000006     D
ACB$W_SIZE                        00000008     D
ASTACKERR                         00000007 R   D   02
ASTDEXIT                          0000002A R   D   03
ASTEXIT                         = 00000000     D
CMK$ASTEXIT                       ********   X   03
CMK$_APBOOT                     = 00000004     D
CMK$_ASTEXIT                    = 00000000     D
CMK$_CANTIM                     = 0000000B     D
CMK$_HIBER                      = 00000007     D
CMK$_INITSCB                    = 00000008     D
CMK$_LAST                       = 0000000E     D
CMK$_MMENABLE                   = 00000003     D
CMK$_RCONSOLE                   = 00000001     D
CMK$_REFRESH                    = 00000005     D
CMK$_SCHDWK                     = 00000006     D
CMK$_SETIMR                     = 0000000C     D
CMK$_SETIPL                     = 00000009     D
CMK$_SETPRT                     = 0000000D     D
CMK$_SGIPR                      = 0000000A     D
CMK$_TCONSOLE                   = 00000002     D
DS_ERRSUP                         ********   X   03
EXE$ASTDEL                        000000BA R   D   03
EXE$DEANONPAGED                   ********   X   03
IPL$_ASTDEL                     = 00000002     D
IPL$_SYNCH                      = 00000007     D
NORM                              00000062 R   D   03
NOTKMODE                          000000D5 R   D   03
PCB$B_ASTACT                      0000000C     D
PCB$B_ASTEN                       0000000D     D
PCB$B_PRI                         0000000B     D
PCB$B_PRIB                        0000002F     D
PCB$B_TYPE                        0000000A     D
PCB$B_WEFC                        0000002E     D
PCB$C_LENGTH                      0000008C     D
PCB$K_LENGTH                      0000008C     D
PCB$L_ARB                         00000084     D
PCB$L_ASTQBL                      00000014     D
PCB$L_ASTQFL                      00000010     D
PCB$L_EFC2P                       00000058     D
PCB$L_EFC3P                       0000005C     D
PCB$L_EFCS                        00000050     D
PCB$L_EFCU                        00000054     D
PCB$L_EFWM                        0000004C     D
PCB$L_JIB                         00000078     D
PCB$L_OWNER                       0000001C     D
PCB$L_PHD                         00000064     D
PCB$L_PHYPCB                      00000018     D
PCB$L_PID                         00000060     D
PCB$L_PQB                         0000004C     D
PCB$L_SQBL                        00000004     D
PCB$L_SQFL                        00000000     D
PCB$L_STS                         00000024     D
PCB$L_UIC                         00000088     D
PCB$L_WSSWP                       00000020     D
PCB$L_WTIME                       00000028     D
PCB$Q_PRIV                        0000007C     D
PCB$T_LNAME                       00000068     D
PCB$T_TERMINAL                    00000044     D
PCB$W_APTCNT                      00000030     D
PCB$W_ASTCNT                      00000038     D
PCB$W_BIOCNT                      0000003A     D
PCB$W_BIOLM                       0000003C     D
PCB$W_DIOCNT                      0000003E     D
PCB$W_DIOLM                       00000040     D
PCB$W_GPGCNT                      00000034     D
PCB$W_GRP                         0000008A     D
PCB$W_MEM                         00000088     D
PCB$W_MTXCNT                      0000000E     D
PCB$W_PPGCNT                      00000036     D
PCB$W_PRCCNT                      00000042     D
PCB$W_SIZE                        00000008     D
PCB$W_STATE                       0000002C     D
PCB$W_TMBU                        00000032     D
PR$_ASTLVL                      = 00000013     D
PR$_IPL                         = 00000012     D
PSL$S_CURMOD                    = 00000002     D
PSL$V_CURMOD                    = 00000018     D
PSL$V_IS                        = 0000001A     D
PSL$V_PRVMOD                    = 00000016     D
SCH$ASTDEL                        00000000 RG  D   03
SCH$GL_CURPCB                     ********     X   03
SCH$GL_PCBVEC                     ********     X   03
SCH$NEWLVL                        0000002D RG  D   03
SCH$QAST                          00000124 RG  D   03
SIZ...                          = 00000001     D
SS$_NONEXPR                     = 000008E8     D
SS$_NORMAL                      = 00000001     D
STACKERR                          0000010C R   D   03
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000008C (140.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
DATA	00000013 (19.)	02 (2.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC LONG
CODE	000001A1 (417.)	03 (3.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$ER	=00000002	362 (1)	#-362 (1)
$MODULE	00000000-R	125 (1)	362 (1)
ACB$B_RMOD	0000000B		181 (1) 219 (1) 220 (1) 248 (1)
			261 (1) 423 (1) 430 (1) 431 (1)
			437 (1) #-443 (1) 447 (1)
ACB$L_AST	00000010		#-300 (1) #-347 (1)
ACB$L_ASTPRM	00000014		#-297 (1) #-344 (1)
ACB$L_ASTQBL	00000004		440 (1)
ACB$L_KAST	00000018		194 (1)
ACB$L_PID	0000000C		#-406 (1) #-409 (1)
ACB$S_MODE	=00000002		#-247 (1) #-422 (1) #-446 (1)
ACB$V_KAST	=00000007		#-181 (1) #-220 (1) #-430 (1) #-437 (1)
ACB$V_MODE	=00000000		#-246 (1) #-421 (1) #-445 (1)
ACB$V_QUOTA	=00000006		#-261 (1)
ASTACKERR	00000007-R	127 (1)	362 (1)
ASTDEXIT	0000002A-R	198 (1)	#-180 (1) #-257 (1)
ASTEXIT	=00000000	116 (1)	
BIT...	=00000018	102 (1)	102 (1)
CMK$ASTEXIT	00000000-XR		329 (1)
CMK$_APBOOT	=00000004	102 (1)	
CMK$_ASTEXIT	=00000000	102 (1)	#-329 (1)
CMK$_CANTIM	=0000000B	102 (1)	
CMK$_HIBER	=00000007	102 (1)	
CMK$_INITSCB	=00000008	102 (1)	
CMK$_LAST	=0000000E	102 (1)	
CMK$_MMENABLE	=00000003	102 (1)	
CMK$_RCONSOLE	=00000001	102 (1)	
CMK$_REFRESH	=00000005	102 (1)	
CMK$_SCHDWK	=00000006	102 (1)	
CMK$_SETIMR	=0000000C	102 (1)	
CMK$_SETIPL	=00000009	102 (1)	
CMK$_SETPRT	=0000000D	102 (1)	
CMK$_SGIPR	=0000000A	102 (1)	
CMK$_TCONSOLE	=00000002	102 (1)	
DS_ERRSUP	00000000-XR		362 (1)
EXE$ASTDEL	000000BA-R	326 (1)	348 (1)
EXE$DEANONPAGED	00000000-XR		301 (1) 353 (1) 414 (1)
IPL$_ASTDEL	=00000002		#-193 (1) #-266 (1)
IPL$_SYNCH	=00000007		#-178 (1) #-215 (1) #-407 (1)
NORM	00000062-R	245 (1)	#-181 (1)
NOTKMODE	000000D5-R	337 (1)	#-273 (1)
PCB$B_ASTACT	0000000C		#-224 (1) 260 (1) #-449 (1)
PCB$B_ASTEN	0000000D		#-224 (1) 259 (1) #-450 (1)
PCB$L_ASTQFL	00000010		179 (1) 214 (1) 256 (1) 425 (1)
			#-441 (1)
PCB$L_PID	00000060		#-409 (1)
PCB$W_ASTCNT	00000038		#-262 (1)
PR$_ASTLVL	=00000013		#-229 (1) #-454 (1)
PR$_IPL	=00000012		#-178 (1) #-193 (1) #-215 (1) #-230 (1)
			#-266 (1) #-303 (1) #-407 (1) #-416 (1)

```
                                                        #-456    (1)
PSL$S_CURMOD                  =00000002                 #-251    (1)
PSL$V_CURMOD                  =00000018                 #-250    (1)    #-350    (1)
PSL$V_IS                      =0000001A     102    (1)  #-329    (1)
PSL$V_PRVMOD                  =00000016                 #-350    (1)    #-352    (1)
SCH$ASTDEL                     00000000-R   175    (1)
SCH$GL_CURPCB                  00000000-XR              #-177    (1)    #-195    (1)
SCH$GL_PCBVEC                  00000000-XR              #-408    (1)
SCH$NEWLVL                     0000002D-R   213    (1)    196    (1)      265    (1)
SCH$QAST                       00000124-R   405    (1)
SS$_NONEXPR                   =000008E8                 #-417    (1)
SS$_NORMAL                    =00000001                 #-457    (1)
STACKERR                       0000010C-R   361    (1)  #-340    (1)    #-364    (1)

                                          +-------------------------+
                                          ! Performance indicators !
                                          +-------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    25    00:00:00.00    00:00:00.17
Command processing               924    00:00:00.28    00:00:00.82
Pass 1                           649    00:00:02.34    00:00:04.09
Symbol table sort                  0    00:00:00.24    00:00:00.24
Pass 2                            45    00:00:00.55    00:00:00.93
Symbol table output                2    00:00:00.01    00:00:00.05
Psect synopsis output              2    00:00:00.01    00:00:00.01
Cross-reference output             4    00:00:00.03    00:00:00.07
Assembler run totals            1653    00:00:03.46    00:00:06.38

The working set limit was 2400 pages.
114580 bytes (224 pages) of virtual memory were used to buffer the intermediate code.
There were 50 pages of symbol table space allocated to hold 813 non-local and 20 local symbols.
460 source lines were read in Pass 1, producing 58 object records in Pass 2.
26 pages of virtual memory were used to define 25 macros.

                                          +---------------------------+
                                          ! Macro library statistics !
                                          +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              3
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                4
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           6
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       9
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                22

1024 GETS were required to define 22 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1)	208	Libraries, Equated Symbols, Externals	
(1)	263	Data Psect Declarations	
(1)	345	Work Psect Declarations	
(1)	362	DSV$ATTACH	Attach command processor
(1)	463	DSX$ATTACH	Process ATTACH command
(1)	659	Process invalid generic name error	
(1)	668	Process invalid generic name error	
(1)	778	Get name processing	
(3)	850	Get device attributes	
(3)	949	parse device name	
(3)	1167	PT_INTERPRET	Decode PT-descriptor
(3)	1470	DP$EXTRACT	Make P-table printable
(4)	1665	GET_LINE	Condition getline
(4)	1715	FORMAT_PROMPT	Format and load prompt
(4)	1761	DSV$SHOWDEVICE	Display device information
(4)	1835	DSV$SHOWSELECT	Display information selects
(4)	1887	DSV$DEATTACH	Deattach device
(4)	1956	Deattach subtree	
(4)	1985	DSV$SELECT	Select device for testing
(4)	2178	DSV$DESELECT	Deselect device for testing
(5)	2299	SHOW_DEV Routine	
(6)	2392	INI$PTABLE	Initialize P-table
(6)	2431	Check ambiguous device	
(6)	2502	Locate /Adapter value	
(6)	2562	LOC$PTABLE Routine	
(6)	2630	LOC$PTDESC	Locate PT-descriptor
(6)	2702	INS$PTABLE	Insert P-table

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element ATTACH.MAR
0000     2 ; *10    9-DEC-1987 09:28:49 BARANSKI "merging 7A1"
0000     3 ; *9    11-NOV-1987 08:34:14 GEARIN "ADDED SUPPORT FOR EXTENDED P-TABLE"
0000     4 ; *8    10-AUG-1987 09:50:52 GEARIN "FIXED IDENT FIELD"
0000     5 ;  7A1  10-AUG-1987 09:15:00 GEARIN "MODIFY MAX UNIT # FIX"
0000     6 ; *7    13-JUL-1987 09:10:42 GEARIN "FIXED MAX UNIT # BUG"
0000     7 ; *6    12-MAY-1987 09:42:30 MI "ADDED ALL AS A KEYWORD PARAMETER TO DEATTACH"
0000     8 ; *5    27-JAN-1987 09:22:46 GEARIN "REPLACED = IDENT WITH"
0000     9 ; *4    12-MAY-1986 10:18:26 BARANSKI "Cleaning up Object Libraries."
0000    10 ; *3     7-MAY-1986 14:29:16 BARANSKI "Documentaion Check."
0000    11 ; *2    12-FEB-1986 12:26:04 BARANSKI "<no reason given>"
0000    12 ; *1     6-FEB-1986 15:13:39 DS ""
0000    13 ; DEC/CMS REPLACEMENT HISTORY, Element ATTACH.MAR
0000    14         .Title  ATTACH  *** ATTACH Handle ATTACH command
0000    15         .Ident  "10.10-9"                                              ;G:9
0000    16         .Dsabl  GBL
0000    17         .NoShow Conditionals
0000    18                                                                        ;G:9
0000    19 ;++
0000    20 ; Copyright (c) 1978, 1982, 1983, 1984,1985,1987                      ;G:6
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0000    22 ;
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0000    27 ; EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
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0000    35 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0000    36 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    37
0000    38 ;++
0000    39 ; Facility:
0000    40 ;
0000    41 ; Abstract:
0000    42 ;
0000    43 ; Environment:
0000    44 ;
0000    45 ; Author: Roger Riggs, Creation date:  10-OCT-1978
0000    46 ;
0000    47 ; Modified by:
0000    48 ;                                                                     ;G:3
0000    49 ;       [02]    Roger Riggs, 27-Mar-1980                              ;G:3
0000    50 ;               Extended buffer for show devices.
0000    51 ;                                                                     ;G:3
0000    52 ;       [03]    Roger Riggs, 10-Apr-1980                              ;G:3
0000    53 ;               Added $DS_$ADD and $DS_$COMPLEMENT operations to
0000    54 ;               PT-descriptor interpreter
0000    55 ;                                                                     ;G:3
0000    56 ;       [04]    Dave Butenhof, 24-sep-1980, Version 6.1               ;G:3
0000    57 ;               Split DSV$ATTACH routine into DSV$ATTACH control routine
```

```
0000     58 ;              and DSX$ATTACH, which is callable by diagnostics and will
0000     59 ;              cause no typeout or console/script reads.  The primary
0000     60 ;              purpose is to support the AUTOSIZER.
0000     61 ;                                                                    ;G:3
0000     62 ;       [05]   Dave Butenhof, 19-dec-1980, Version 6.2               ;G:3
0000     63 ;              Implement MCT as NEBULA 'central bus'.  Also generalize
0000     64 ;              'central bus' string compares, and generate error if
0000     65 ;              the wrong 'central bus' name is typed (e.g., 'CMI' for 780).
0000     66 ;                                                                    ;G:3
0000     67 ;       [06]   Dave Butenhof, 30-mar-1981, version 6.3               ;G:3
0000     68 ;              Implement new 'hub' structures, cross-implementation-wise:
0000     69 ;              'HUB' and 'PHAD'.
0000     70 ;                                                                    ;G:3
0000     71 ;       [07]   Marion Baggett, 2-Oct-1981 Version 6.-               ;G:3
0000     72 ;              Print only device and type fields for /BRIEF switch
0000     73 ;              on SHOW DEVICE, and SHOW SELECT commands.
0000     74 ;                                                                    ;G:3
0000     75 ;       [08]   Dave Butenhof, 20-Oct-1981, version 6.-               ;G:3
0000     76 ;              Fix a bug in Ptable descriptor location routine.
0000     77 ;                                                                    ;G:3
0000     78 ;       [09]   Dave Butenhof, 22-Oct-1981, version 6.-               ;G:3
0000     79 ;              Add ATTACH control C handler.  Also new Ptable
0000     80 ;              descriptor commands $DS_$LOGICAL and $DS_$CASE.
0000     81 ;                                                                    ;G:3
0000     82 ;       [10]   Jack Stansbury, 27-Oct-1981, Version 6.-              ;G:3
0000     83 ;              Fixed truncation errors.
0000     84 ;                                                                    ;G:3
0000     85 ;       [11]   Dave Butenhof, 06-Nov-1981, Version 6.-               ;G:3
0000     86 ;              Implemented SELECT/ADAPTER and DESELECT/ADAPTER.
0000     87 ;                                                                    ;G:3
0000     88 ;       [12]   Dave Butenhof, 18-Nov-1981, version 6.5               ;G:3
0000     89 ;              Implement DEATTACH command.
0000     90 ;                                                                    ;G:3
0000     91 ;       [13]   Dave Butenhof, 20-Nov-1981, version 6.5               ;G:3
0000     92 ;              Convert all PRINT's to use type codes, and delete unused
0000     93 ;              message 't_insfmem'.
0000     94 ;                                                                    ;G:3
0000     95 ;       [14]   Dave Butenhof, 24-Feb-1982, version 6.6               ;G:3
0000     96 ;              Convert parsing of Device type field to allow use of
0000     97 ;              '_' in the name (e.g., 'CI_NODE').
0000     98 ;                                                                    ;G:3
0000     99 ;       [15]   Dave Butenhof, 02-Mar-1982, version 6.6               ;G:3
0000    100 ;              Correct bug in SELECT/DESELECT: If /Adapter not specified,
0000    101 ;              and device is duplicated, only first found is acted on, and
0000    102 ;              no message is given.  Due to SELECT sorting, it may not even
0000    103 ;              be possible to DESELECT that device (without /Adapter).
0000    104 ;              Solution: Give error if no /Adapter on duplicate name.
0000    105 ;                                                                    ;G:3
0000    106 ;       [16]   Dave Butenhof, 10-Mar-1982, version 6.6               ;G:3
0000    107 ;              Correct some truncation errors.
0000    108 ;                                                                    ;G:3
0000    109 ;       [17]   Dave Butenhof, 07-Apr-1982, version 6.7               ;G:3
0000    110 ;              Add support for new Ptable descriptor directive, $DS_$NAME;
0000    111 ;              this will allow use of enforced generic naming conventions,
0000    112 ;              and inherited device names, while remaining compatible with
0000    113 ;              the current schema.  Note that this directive must IMMEDIATELY
0000    114 ;              follow the $DS_$INITIALIZE directive, and is treated as an
```

```
0000  ;                 extension of same.
0000  ;                                                                                  ;G:3
0000  ;        [18]     Jack Stansbury, 13-Apr-1982, Version 6.7                         ;G:3
0000  ;                 Fixed two truncation errors.
0000  ;                                                                                  ;G:3
0000  ;        [19]     Dave Butenhof, 06-May-1982, Version 6.8                          ;G:3
0000  ;                 Make modifications (very minor) to support splitting
0000  ;                 PTD$M_INHERITED into two separated bits, PTD$M_INHERIT_PRE
0000  ;                 to inherit device prefix, and PTD$M_INHERIT_CON to inherit
0000  ;                 controller designation.
0000  ;
0000  ;        [20]     Marion Baggett, 6-Oct-1982 Version 6.9                           ;G:3
0000  ;                 When inserting PTABLE for RB730, do not re-adjust the RB730
0000  ;                 PTABLE for CSR values.  The RB730 is not on the the unibus.
0000  ;
0000  ;        [21]     Domenic Andella, 13-Apr-82 Version 6.11                          ;G:3
0000  ;                 Added central bus name "ABUS" to CENTRAL_BUS list, and
0000  ;                 changed constant in DSX$ATTACH routine, GET_LINK label
0000  ;                 from 3 to 4 to account for new central bus name.
0000  ;
0000  ;        [22]     John Ciukaj     14-Apr-1983     Version 6.11
0000  ;                 - Inhibit device allocation in user mode during
0000  ;                   Select operation if 'Inhibit Allocate' bit is
0000  ;                   set in CRD Flags
0000  ;
0000  ;        [23]     Domenic Andella 14-Apr-83       Version 6.11
0000  ;                 Corrected bug in DSX$ATTACH routine, GET_LINK label
0000  ;                 to check all CPU link names.
0000  ;
0000  ;        [24]     M. Baggett      11-MAY-1983     VERSION 6.11
0000  ;                 Changed ptd$m_name to mean alphanumeric.
0000  ;
0000  ;        [25]     Bob Bergazzi    May 16,1983     Version 6.11
0000  ;                 Changed the order of the .LIB statements.
0000  ;
0000  ;        [26]     M. Baggett      10-OCT-1983     VERSION 6.13
0000  ;                 Change to support HSC50 disk/tape names of the form
0000  ;                 name$GGannn, where 'name' is a maximum
0000  ;                 of 6 characters and 'GG' is the generic name and is
0000  ;                 present with a controller letter and unit number.
0000  ;
0000  ;        [27]     Domenic Andella 16-FEB-1984     VERSION 6.13
0000  ;                 Add code in GET_LINK to add offset of X200 to
0000  ;                 ptable vector field if attached to SBIA 1 for
0000  ;                 an 8600 CPU.
0000  ;
0000  ;        [28]     RE MUSE         11 MAY 1984     Version 7.0
0000  ;                 added code to handle long device names (15 characters)
0000  ;                 of the form 'node$device'.
0000  ;
0000  ;        [29]     Ted Salem       09 AUG 1984     Version 7.1                      ;G:3
0000  ;                 Added code to check if /noallocate is present in
0000  ;                 the select command.
0000  ;
0000  ;        [30]     Ted Salem       29 AUG 1984     Version 7.1
0000  ;                 Modified SHOW SELECT and SHOW DEVICE commands so that the returned l
0000  ;                 will contain information on the devices' allocation status.
```

```
0000   172 ;
0000   173 ;       [31]    Amy Iorio       16 OCT 1984     Version 7.1
0000   174 ;               Added allocation class to possible device names
0000   175 ;               user may declare.
0000   176 ;
0000   177 ;       [32]    M. Baggett      14-Nov-1984     Version 7.1
0000   178 ;               Fixed bugs in [31] and clean up some coding.
0000   179 ;
0000   180 ;       [33]    Richard E. Muse 18-Jan-1985     VERSION 6.13
0000   181 ;               If adapter being attached is on a BI. Need to
0000   182 ;               add code to GET_LINK such that the  HP$W_VECTOR
0000   183 ;               field contains the correct BI offset.
0000   184 ;
0000   185 ;       [34]    Ted Salem       22-Jan-1985     Version 8.1
0000   186 ;               Fixed a /noallocate problem.
0000   187 ;
0000   188 ;       [35]    R.E. Muse       9-MAY-1985      Version 8.2                     ;G:3
0000   189 ;               removed cpu specific code that check for the vector
0000   190 ;               offset requirement - this code was placed in their
0000   191 ;               respective "ONLYnnn" modules for each different cpu type.
0000   192 ;
0000   193 ;               Jason Mi        12-May-1987     Version 10.8                    ;G:6
0000   194 ;               Added ALL as a keyword paramater to DEATTACH command.           ;G:6
0000   195 ;
0000   196 ;               David Gearin    07-Jul-1987     Version 10.9                    ;G:8
0000   197 ;               If max unit # is equal to 255 do not decrement the              ;G:9
0000   198 ;               the maximum unit # by one. [temp fix]                           ;G:9
0000   199 ;                                                                               ;G:8
0000   200 ;               David Gearin    10-Aug-1987     Version 10.9                    ;G:8
0000   201 ;               Fix ident field to 10.9-8.                                      ;G:8
0000   202 ;                                                                               ;G:9
0000   203 ;               David Gearin    02-Oct-1987     Version 10.10                   ;G:9
0000   204 ;               Add new extended ptable block format to ptables.                ;G:9
0000   205 ;-
0000   206
```

```
                     0000   208          .Subtitle       Libraries, Equated Symbols, Externals
                     0000   209 ;
                     0000   210 ; Libraries
                     0000   211 ;
                     0000   212
                     0000   213 .library         \SYS$LIBRARY:LIB\       ;                                   [25]
                     0000   214 .library         \$DS\                   ;                                   [25]
                     0000   215 .library         \$diag\                 ;                                   [25]
                     0000   216
                     0000   217 ;
                     0000   218 ; Equated Symbols:
                     0000   219 ;
                     0000   220 ;         .NLIST
                     0000   221 ;         .NLIST  ME,MEB
                     0000   222 ;         .LIST
                     0000   223           $Ds_PtdDef                              ; Define $DS_$NAME flag codes   [17]
                     0000   224           $Ds_PdDef                               ; Define PD$_ byte codes        [17]
                     0000   225           $DS_HDRDEF
                     0000   226           $DS_HPODEF
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .PSECT  $ABS$,ABS
                00000000 0258             .=0
                     0000                 .IIF    NB,HP$Q_DEVICE, HP$Q_DEVICE:
                00000008 0000             .IIF    NB,.BLKQ,       .BLKQ   1
                     0008                 .IIF    NB,HP$W_SIZE,   HP$W_SIZE:
                0000000A 0008             .IIF    NB,.BLKW,       .BLKW   1
                     000A                 .IIF    NB,HP$B_FLAGS,  HP$B_FLAGS:
                0000000B 000A             .IIF    NB,.BLKB,       .BLKB   1
                     000B                 .IIF    NB,HP$B_DRIVE,  HP$B_DRIVE:
                0000000C 000B             .IIF    NB,.BLKB,       .BLKB   1
                     000C                 .IIF    NB,HP$T_DEVICE, HP$T_DEVICE:
                00000018 000C             .IIF    NB,.BLKB,       .BLKB   12
                     0018                 .IIF    NB,HP$A_DEVICE, HP$A_DEVICE:
                0000001C 0018             .IIF    NB,.BLKL,       .BLKL   1
                     001C                 .IIF    NB,HP$A_DVA,    HP$A_DVA:
                00000020 001C             .IIF    NB,.BLKL,       .BLKL   1
                     0020                 .IIF    NB,HP$A_LINK,   HP$A_LINK:
                00000024 0020             .IIF    NB,.BLKL,       .BLKL   1
                     0024                 .IIF    NB,HP$W_VECTOR, HP$W_VECTOR:
                00000026 0024             .IIF    NB,.BLKW,       .BLKW   1
                     0026                 .IIF    NB,HP$T_TYPE,   HP$T_TYPE:
                00000032 0026             .IIF    NB,.BLKB,       .BLKB   12
                     0032                 .IIF    NB,HP$A_DEPENDENT,      HP$A_DEPENDENT:
                     0000                 .RESTORE
                     0000   227           $DS_HPEODEF                                                     ;G:9
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .PSECT  $ABS$,ABS
                00000000 0258             .=0
                     0000                 .IIF    NB,HPE$T_DEVICE,        HPE$T_DEVICE:
                00000014 0000             .IIF    NB,.BLKL,       .BLKL   5
                     0014                 .IIF    NB,HPE$W_EXT_DRIVE,     HPE$W_EXT_DRIVE:
                00000016 0014             .IIF    NB,.BLKW,       .BLKW   1
                     0016                 .IIF    NB,HPE$A_EPB,   HPE$A_EPB:
                0000001A 0016             .IIF    NB,.BLKL,       .BLKL   1
                     0000                 .RESTORE
                     0000   228           $DS_DSADEF
                     0000   229           $DS_DSDEF
```

```
                        0000    230          $PRDEF
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 FE70                .=0
                        0000                 .RESTORE
                        0000    231          $SSDEF
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 FE70                .=0
                        0000                 .RESTORE
                        0000    232          $IPLDEF
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 FE70                .=0
                        0000                 .RESTORE
                        0000    233          CLIDEF
                        0000    234          DSFDEF                                  ;                                       [07]
                        0000    235          $ds_dsadef                              ; APT mailbox defs                      [09]
                        0000    236          $ds_typedef                             ; Define type codes                     [12]
                        0000    237          CRDDef                                  ; Define bit definitions for
                        0000    238                                                  ; CRD$GL_CRD_Flags                      [22]
                        0000    239
                        0000    240 ;        .NLIST
                        0000    241 ;        .LIST   MEB
                        0000    242 ;        .LIST
                        0000    243
                        0000    244
                        0000    245          .EXTRN  DS$GA_SELECTS,  DS$GL_CLIBASE,  ONLY_ATTACH
                        0000    246          .EXTRN  DS$PRINTF,      DS_SUPERLINE,   DS_ERRSUP,      SCRIPT$FLUSH
                        0000    247          .EXTRN  EXE$ALONONPAGED,EXE$DEANONPAGED,DSX$PRINT       ;                       [12]
                        0000    248          .EXTRN  DS$GA_ALLOCATES                                 ;                       [30]
                        0000    249          .EXTRN  SCAN$ALPHANUM,  SCAN$DEVICE,    SCAN$NUMERIC
                        0000    250          .EXTRN  SCAN$SPACES,    SCAN$SYMBOL
                        0000    251          .EXTRN  SYS$FAO,        SYS$ALLOC,      SYS$DALLOC
                        0000    252          .EXTRN  DS$GA_PTABLE,   DS$GA_PTDESC
                        0000    253          .EXTRN  DSR$COMPLETION, DSR$IFLOADDEV
                        0000    254          .EXTRN  DS$GL_FLAGS, KB_CHECK   ;                                               [09]
                        0000    255          .extrn  scan$decimal,scan$alpha ;                                               [09]
                        0000    256          .extrn  ds$cntrlc, Dsx$Print, Ds$GB_Inhibit_Naming      ;                       [17]
                        0000    257          .extrn  DS$GL_CRD_FLAGS         ;                                               [22]
                        0000    258                                                                                          ;G:9
            0000001A    0000    259          HPE$C_EPB_SIZE  == 26           ; Size of extended p-table                      ;G:10
            00000014    0000    260          HP$C_NAMELEN    == 20           ;                                                 [28]
                        0000    261                                                                                          ;G:9
```

```
                                        0000   263          .SBTTL  Data Psect Declarations
                                        0000   264
                                    00000000   265          .PSECT  Data, NoExe, Shr, NoWrt, Long          ;                [10]
                                        0000   266          MODNAM  ATTACH
                48 43 41 54 54 41 00'   0000       $MODULE:        .ASCIC  \ATTACH\
                                        06      0000
                                        0007   267 T_INVALID:
69 6C 61 76 6E 49 0000000F'010E0000'    0007   268          .ASCID  "Invalid or unknown name.!/!AC? "
6E 77 6F 6E 6B 6E 75 20 72 6F 20 64     0015
3F 43 41 21 2F 21 2E 65 6D 61 6E 20     0021
                                        20      002D
                                        002E   269 T_Bad_Name:                                                  ;        [17]
72 72 45 20 3F 3F 00000036'010E0000'    002E   270          .Ascid  \?? Error in !AC!ACname, format should be "!AC"!/!AC? \ ;        [17]
43 41 21 43 41 21 20 6E 69 20 72 6F     003C
74 61 6D 72 6F 66 20 2C 65 6D 61 6E     0048
22 20 65 62 20 64 6C 75 6F 68 73 20     0054
   20 3F 43 41 21 2F 21 22 43 41 21     0060
                                        006B   271 T_BAD_RANGE:                                                 ;        [31]
72 72 45 20 3F 3F 00000073'010E0000'    006B   272          .ASCID  \?? Error in !AC, range should be "!AC"!/!AC? \;
72 20 2C 43 41 21 20 6E 69 20 72 6F     0079
20 64 6C 75 6F 68 73 20 65 67 6E 61     0085
41 21 2F 21 22 43 41 21 22 20 65 62     0091
                        20 3F 43        009D
                                        00A0   273 T_ALLOC:                                                   ;        [31]
            6E 61 67 67 24 6D 24 00'    00A0   274          .Ascic  \$m$ggan\                                  ;
                                        07      00A0
                                        00A8   275 T_RANGE:                                                   ;        [31]
61 20 31 20 6E 65 65 77 74 65 62 00'    00A8   276          .Ascic  \between 1 and 255\    ;
                    35 35 32 20 64 6E   00B4
                                        11      00A8
                                        00BA   277 T_UNRANGE:                                                 ;        [31]
6E 6F 69 74 61 63 6F 6C 6C 61 20 00'    00BA   278          .Ascic  \ allocation range \     ;
                  20 65 67 6E 61 72 20  00C6
                                        12      00BA
                                        00CD   279 T_Part_Of:                                                 ;        [17]
      20 66 6F 20 74 72 61 70 20 00'    00CD   280          .Ascic  \ part of \               ;                [17]
                                        09      00CD
                                        00D7   281 T_UNIT_EXCESS:
6E 20 74 69 6E 55 000000DF'010E0000'    00D7   282          .ASCID  "Unit number too big or not allowed.!/!AC? "
69 62 20 6F 6F 74 20 72 65 62 6D 75     00E5
6C 6C 61 20 74 6F 6E 20 72 6F 20 67     00F1
20 3F 43 41 21 2F 21 2E 64 65 77 6F     00FD
                                        0109   283 T_MAIN_BUS:
20 65 72 65 68 54 00000111'010E0000'    0109   284          .ASCID  "There is no !AD on this type processor.!/!AC? "
6E 6F 20 44 41 21 20 6F 6E 20 73 69     0117
70 20 65 70 79 74 20 73 69 68 74 20     0123
21 2F 21 2E 72 6F 73 73 65 63 6F 72     012F
                        20 3F 43 41     013B
                                        013F   285 T_PROMPT:
   20 3F 43 41 21 00000147'010E0000'    013F   286          .ASCID  "!AC? "
65 6D 61 4E 20 65 63 69 76 65 44 00'    014C   287 T_NAME: .ASCIC  "Device Name"
                                        0B      014C
6B 6E 69 4C 20 65 63 69 76 65 44 00'    0158   288 T_LINK: .ASCIC  "Device Link"
                                        0B      0158
65 70 79 74 20 65 63 69 76 65 44 00'    0164   289 T_TYPE: .ASCIC  "Device type"
                                        0B      0164
                                        0170   290 T_NO_SUCH_DEV:
```

```
76 65 64 20 68 63 75 73 20 6F 4E 00' 0170   291          .ASCIC  "No such device !AD:!/"
      2F 21 3A 44 41 21 20 65 63 69  017C
                                 15  0170
                                     0186   292 t_no_such_adapter:                    ;                                  [11]
61 64 61 20 68 63 75 73 20 6F 4E 00' 0186   293          .ascic  "No such adapter !AD:!/"        ;                          [11]
   2F 21 3A 44 41 21 20 72 65 74 70  0192
                                 16  0186
                                     019D   294 t_no_such_on_adapter:                  ;                                  [11]
76 65 64 20 68 63 75 73 20 6F 4E 00' 019D   295          .ascic  "No such device !AD: on adapter !AD:!/" ;                  [11]
20 6E 6F 20 3A 44 41 21 20 65 63 69  01A9
3A 44 41 21 20 72 65 74 70 61 64 61  01B5
                              2F 21  01C1
                                 25  019D
                                     01C3   296 T_Ambig_Adap:                          ; Ambigous adapter name            [15]
74 61 63 69 6C 70 75 44 20 3F 3F 00' 01C3   297          .AsciC  "?? Duplicate adapter name is illegal (!AS)!/"  ;          [15]
61 6E 20 72 65 74 70 61 64 61 20 65  01CF
61 67 65 6C 6C 69 20 73 69 20 65 6D  01DB
         2F 21 29 53 41 21 28 20 6C  01E7
                                 2C  01C3
                                     01F0   298 T_Ambig_Dev:                           ; Ambiguous device name            [15]
65 73 75 20 74 73 75 4D 20 3F 3F 00' 01F0   299          .AsciC  "?? Must use /Adapter with duplicated device name !AS!/" ;  [15]
69 77 20 72 65 74 70 61 64 41 2F 20  01FC
65 74 61 63 69 6C 70 75 64 20 68 74  0208
6D 61 6E 20 65 63 69 76 65 64 20 64  0214
               2F 21 53 41 21 20 65  0220
                                 36  01F0
                                     0227   300 t_deattach:                            ;                                  [12]
65 65 62 20 73 61 68 20 53 41 21 00' 0227   301          .ascic  "!AS has been de-attached.!/"   ;                          [12]
65 68 63 61 74 74 61 2D 65 64 20 6E  0233
                        2F 21 2E 64  023F
                                 1B  0227
                                     0243   302 T_DEVALLOC:
61 63 6F 6C 6C 41 20 3A 44 41 21 00' 0243   303          .ASCIC  "!AD: Allocated to another user!/"
68 74 6F 6E 61 20 6F 74 20 64 65 74  024F
         2F 21 72 65 73 75 20 72 65  025B
                                 20  0243
                                     0264   304 T_DEV_MOUNTED:                                          ;                  [34]
65 63 69 76 65 44 20 3A 44 41 21 00' 0264   305          .ASCIC  "!AD: Device is currently mounted and cannot be allocated.!/" ; [34]
6C 74 6E 65 72 72 75 63 20 73 69 20  0270
6E 61 20 64 65 74 6E 75 6F 6D 20 79  027C
20 65 62 20 74 6F 6E 6E 61 63 20 64  0288
2F 21 2E 64 65 74 61 63 6F 6C 6C 61  0294
                                 3B  0264
                                     02A0   306 T_SHOWDEV_ALLOC:                                        ;                  [30]
21 5F 21 43 41 21 5F 21 53 41 21 00' 02A0   307          .ASCIC  "!AS!_!AC!_!AS!_!XL  !AS  ALLOCATED !/"         ;                  [30]
53 41 21 20 20 4C 58 21 5F 21 53 41  02AC
20 44 45 54 41 43 4F 4C 4C 41 20 20  02B8
                              2F 21  02C4
                                 25  02A0
                                     02C6   308 T_SHOWDEVB_ALLOC:                                ;                          [30]
41 20 20 43 41 21 5F 21 53 41 21 00' 02C6   309          .ASCIC  "!AS!_!AC  ALLOCATED !/"                ;                  [30]
   2F 21 20 44 45 54 41 43 4F 4C 4C  02D2
                                 16  02C6
                                     02DD   310 T_SHOWDEV:
21 5F 21 43 41 21 5F 21 53 41 21 00' 02DD   311          .ASCIC  "!AS!_!AC!_!AS!_!XL  !AS  !/"
53 41 21 20 20 4C 58 21 5F 21 53 41  02E9
                        2F 21 20 20  02F5
```

```
                                  1B  02DD
                                      02F9   312 T_SHOWDEVB:                                  ;                                    [07]
21 20 20 43 41 21 5F 21 53 41 21 00'  02F9   313         .ASCIC  "!AS!_!AC  !/"               ;                                    [07]
                                  2F  0305
                                  0C  02F9
70 20 72 6F 66 20 65 75 6C 61 56 00'  0306   314 T_PNF:  .ASCIC  'Value for prompt "!AC" not found in script!/'  ;                [09]
20 22 43 41 21 22 20 74 70 6D 6F 72   0312
6E 69 20 64 6E 75 6F 66 20 74 6F 6E   031E
         2F 21 74 70 69 72 63 73 20   032A
                                  2C  0306
68 74 20 67 6E 69 70 70 69 6B 53 00'  0333   315 T_SKIP: .ASCIC  'Skipping this line!/'  ;                                    [09]
         2F 21 65 6E 69 6C 20 73 69   033F
                                  14  0333
                                      0348   316 T_SHOULDBE:
      65 62 20 64 6C 75 6F 68 73 00'  0348   317         .ascic  \should be\                  ;                                    [09]
                                  09  0348
                                      0352   318 t_yesno:                                     ;                                    [09]
73 65 59 2C 6F 4E 0000035A'010E0000'  0352   319         .ascid  \No,Yes\                     ;                                    [09]
                                      0360   320 T_STRING:
6E 6F 20 43 41 21 00000368'010E0000'  0360   321         .ASCID  "!AC one of !AS!/!AC? "
41 21 2F 21 53 41 21 20 66 6F 20 65   036E
                           20 3F 43   037A
                                      037D   322 Q_HUB:                                       ;                                    [11]
         42 55 48 00000385'010E0000'  037D   323         .ASCID  "HUB"                        ; Name of HUB device                 [11]
                                      0388   324
                                      0388   325 part_list:                                   ; List of generic name parts         [17]
                                  05' 0388   326         .byte   10$-part_list                ; Offset to 'generic'                [17]
                                  05' 0389   327         .byte   10$-part_list                ;   same                             [17]
                                  0D' 038A   328         .byte   20$-part_list                ; Offset to 'controller'             [17]
                                  18' 038B   329         .byte   30$-part_list                ; Offset to 'unit'                   [17]
                                  1D' 038C   330         .byte   40$-part_list                ; Offset to ''                       [17]
            63 69 72 65 6E 65 67 00'  038D   331 10$:    .ascic  \generic\                    ;                                    [17]
                                  07  038D
   72 65 6C 6C 6F 72 74 6E 6F 63 00'  0395   332 20$:    .ascic  \controller\                 ;                                    [17]
                                  0A  0395
                     74 69 6E 75 00'  03A0   333 30$:    .ascic  \unit\                       ;                                    [17]
                                  04  03A0
                                  00' 03A5   334 40$:    .ascic  \\                           ;                                    [17]
                                  00  03A5
                                      03A6   335
                                      03A6   336 CENTRAL_BUS:                                          ; List of 'central bus' names
                                  05  03A6   337         .BYTE   5                                     ; Number of bus names          [21]
                        49 42 53 00'  03A7   338         .ASCIC  "SBI"                                 ; STAR - CPU type 1
                                  03  03A7
                        49 4D 43 00'  03AB   339         .ASCIC  "CMI"                                 ; COMET - CPU type 2
                                  03  03AB
                     44 41 48 50 00'  03AF   340         .ASCIC  "PHAD"                                ; PHysical Address Decoder     [06]
                                  04  03AF
                     53 55 42 41 00'  03B4   341         .ASCIC  "ABUS"                                ; VENUS - CPU type 4           [21]
                                  04  03B4
                        42 55 48 00'  03B9   342         .ASCIC  "HUB"                                 ; system HUB device            [06]
                                  03  03B9
                                      03BD   343
```

```
                03BD   345          .SBTTL  Work Psect Declarations
                03BD   346
            00000000   347          .PSECT  Work, Noshr, Noexe, Wrt, Long   ;                                [07]
    00000000    0000   348          FLG$V_BRIEF     = 0                ; Flag for brief form of commands       [07]
                0000   349 COMM_FLAGS:                                 ;                                       [07]
    00000001    0000   350          .BLKB   1                          ; Storage area for /BRIEF flag          [07]
                0001   351 abort_attach:                               ;                                       [09]
    00000002    0001   352          .blkb   1                          ; Use to abort ATTACH cmd on ^C         [09]
                0002   353 alloc:                                      ;                                       [31]
          00    0002   354          .byte   0                          ; Allocation class flag                 [31]
                0003   355 range:                                      ;                                       [31]
          00    0003   356          .byte   0                          ; Range for allocation flag             [31]
                0004   357 q_adapter::                                 ;                                       [11]
    0000000C    0004   358          .blkq   1                          ; Descriptor for link device name       [11]
                000C   359 temp_store:                                                                        ;G:9
    00000010    000C   360          .blkl   1                                                                 ;G:9
```

```
                     0010   362          .SBTTL  DSV$ATTACH      Attach command processor
                     0010   363
                 00000000   364          .PSECT  Code, Exe, Shr, NoWrt, Long              ;                [10]
                     0000   365 ;++
                     0000   366 ;
                     0000   367 ; Functional Description:
                     0000   368 ;       This routine is called from CLI to finish processing an
                     0000   369 ;       ATTACH command
                     0000   370 ;
                     0000   371 ; Calling Sequence:
                     0000   372 ;       BSBW    DSV$ATTACH
                     0000   373 ;
                     0000   374 ; Input Parameters:
                     0000   375 ;       NONE
                     0000   376 ;
                     0000   377 ; Implicit Inputs:
                     0000   378 ;       R2      Base of CLI data base, DS$GL_CLIBASE
                     0000   379 ;       CLI$Q_FILE      Length,address of remainder of command line
                     0000   380 ;
                     0000   381 ; Output Parameters:
                     0000   382 ;       NONE
                     0000   383 ;
                     0000   384 ; Implicit Outputs:
                     0000   385 ;       New Device Parameter Block or modifications to previous one
                     0000   386 ;
                     0000   387 ; Side Effects:
                     0000   388 ;       NONE
                     0000   389 ;--
```

```
                                0000   391
                                0000   392 DSV$ATTACH::
          00000001'EF    94     0000   393          clrb    L^abort_attach          ; Clear abort flag                          [09]
                                0006   394          $ds_cntrlc_s    set_abort       ; Set up ^C handler                         [09]
                      00    DD  0006                PUSHL   #0
          000000FD'EF       DF  0008                PUSHAL  set_abort
     00000000'9F    02     FB  000E                CALLS   #2, a#DS$CNTRLC
          00000000'EF   16     0015   395          JSB     SCRIPT$FLUSH            ; Flush scripts if this console command [10]
              7E    53     7D  001B   396          MOVQ    R3,-(SP)                ; Save R3 and R4
                    55     DD  001E   397          PUSHL   R5                      ; Save R5
                 53   7E     DE  0020   398          MOVAL   -(SP),R3                ; Allocate location and set ptr
5E        00000064 8F     C2  0023   399          SUBL2   #100,SP                 ; Allocate stack buffer
                 54   6E     9E  002A   400          MOVAB   (SP),R4                 ;  and set pointer to it
5E        0000006C 8F     C2  002D   401          SUBL2   #108,SP                 ; Allocate ATTACH prompt string
   04 AE        08 AE     9E  0034   402          MOVAB   8(SP),4(SP)             ; Set string descriptor address
              55   6E     7E  0039   403          MOVAQ   (SP),R5                 ;  and remember where it is
                    3C     BB  003C   404          PUSHR   #^M<R2,R3,R4,R5>        ; Save regs destroyed by MOVC3
                 08 A2     28  003E   405          MOVC3   CLI$Q_FILE(R2),-        ; Copy command line to local
                64   0C B2          0041   406                  @CLI$Q_FILE+4(R2),(R4) ;  buffer (for later appends)
                    3C     BA  0044   407          POPR    #^M<R2,R3,R4,R5>        ; Restore registers
                 0C A2     64  9E  0046   408          MOVAB   (R4),CLI$Q_FILE+4(R2)   ; Correct buffer pointer
             65   0064 8F     3C  004A   409 10$:     MOVZWL  #100,(R5)               ; Re-set length of buffer
                    65     7F  004F   410          PUSHAQ  (R5)                    ; Address of return prompt
                 08 A2     7F  0051   411          PUSHAQ  CLI$Q_FILE(R2)          ; Address of command descriptor
          010A'CF    02     FB  0054   412          CALLS   #2,W^DSX$ATTACH         ; Try to do the attach
                 74 50     E8  0059   413          BLBS    R0,40$                  ; Exit loop if success
     0000FE00'EF    1F     E0  005C   414          bbs     #dsa$v_apt, -           ; If APT mode, abort processing             [09]
                    30         0063   415                  L^dsa$gl_flags, 20$     ; ...with error (fatal)                     [09]
                    15     E1  0064   416          BBC     #DS$V_SCRIPT,-          ;                                           [07]
           2B 00000000'EF         0066   417                  L^DS$GL_FLAGS,30$       ; Branch if not script running          [07]
                    04 B5  9F  006C   418          PUSHAB  a4(R5)                  ; Address of prompt ASCIC string            [07]
          00000306'EF       9F  006F   419          PUSHAB  L^T_PNF                 ; Edit string for prompt not found          [07]
                    01     DD  0075   420          pushl   #ds$k_printf            ; Use Printf                                [13]
                    15     DD  0077   421          pushl   #ds$k_type_command_err  ; And command error type code               [13]
     00000000'EF    04     FB  0079   422          CALLS   #4, L^DSX$PRINT         ; Type it                                   [13]
          00000333'EF   9F     0080   423          PUSHAB  L^T_SKIP                ; Edit string for skipping                  [07]
                    01     DD  0086   424          pushl   #ds$k_printf            ; Use Printf                                [13]
                    15     DD  0088   425          pushl   #ds$k_type_command_err  ; Command error also                        [13]
     00000000'EF    03     FB  008A   426          CALLS   #3, L^DSX$PRINT         ; Type it.                                  [13]
                 003C   31     0091   427          BRW     40$                     ; exit                                      [07]
                 0052   31     0094   428 20$:     brw     50$                     ; Waystation to 50$                         [13]
                                0097   429 30$:                                   ;                                           [07]
          00000000'EF   16     0097   430          jsb     L^kb_check              ; Check for ^C's                            [09]
       2C 00000001'EF   E8     009D   431          blbs    abort_attach, 40$       ; Return directly if so                     [09]
                    04 B5  9F  00A4   432          PUSHAB  a4(R5)                  ; Address of prompt ASCIC string
7E        00000064 8F     08 A2  C3  00A7   433          SUBL3   CLI$Q_FILE(R2),#100,-(SP); Length of remaining buffer
                    63     DF  00B0   434          PUSHAL  (R3)                    ; Where to return length read
              51   08 B244   9E  00B2   435          MOVAB   @CLI$Q_FILE(R2)[R4],R1  ; Point to end of current string
                 81   20     90  00B7   436          MOVB    #^A" ",(R1)+            ; Separate new argument by space
                    08 A2     B6  00BA   437          INCW    CLI$Q_FILE(R2)          ; Increase length
                    61     9F  00BD   438          PUSHAB  (R1)                    ; Calculate address to read to
     00000000'EF    04     FB  00BF   439          CALLS   #4,L^DS_SUPERLINE       ; Read a line
                 07 50     E9  00C6   440          BLBC    R0,40$                  ; Can't continue if failure
                08 A2    63     C0  00C9   441          ADDL2   (R3),CLI$Q_FILE(R2)     ; Set new input line size
                   FF7A   31     00CD   442          BRW     10$                     ; Try again                                 [13]
     5E   000000D4 8F     C0  00D0   443 40$:     ADDL2   #212,SP                 ; Clear off buffers
                 55   8E     D0  00D7   444          MOVL    (SP)+,R5                ; Restore registers
```

```
                53   8E   7D  00DA          MOVQ    (SP)+,R3
                                00DD          $ds_cntrlc_s                    ; Clear out handler                    [09]
                     00   DD  00DD                  PUSHL   #0
                     00   DD  00DF                  PUSHL   #0
        00000000'9F  02   FB  00E1                  CALLS   #2, a#DS$CNTRLC
                          05  00E8          RSB                             ; Return to caller
                                00E9
                                00E9  50$:                                  ; ATTACH error in APT mode             [09]
                                00E9          errsup_s        msgadr=a4(r5)   ; ERRSUP w/ returned message           [09]
             00000000'EF  DF  00E9                  PUSHAL  $MODULE
                   04 B5  DF  00EF                  PUSHAL  a4(r5)
                     01   DD  00F2                  PUSHL   #$ER
        00000000'EF  03   FB  00F4                  CALLS   #3, DS_ERRSUP
                     D3   11  00FB          brb     40$                     ; Exit routine if continued            [09]
                                00FD
                                00FD  ;
                                00FD  ; Control C handler for DSV$ATTACH.  Intercepts ^C and causes quick return
                                00FD  ; to CLI.  Putting a KB_CHECK call in the loop would work as well: but this
                                00FD  ; way causes routine cleanup, so CONTINUE will not continue ATTACH cmd.
                                00FD  ;
                        0000    00FD  .entry  set_abort, ^M<>                 ;                                      [09]
        00000001'EF  01   90  00FF          movb    #1, abort_attach        ; Set abort flag                       [09]
                50   01   D0  0106          movl    #1, r0                  ; Return success                       [09]
                          04  0109          ret                             ;                                      [09]
```

```
                        .SBTTL  DSX$ATTACH      Process ATTACH command

;++
; Functional description:
;       This routine is called from DSV$ATTACH to translate an attach
;       command line using a PTABLE descriptor, and create a PTABLE
;       from this data.  If any argument is missing or invalid, it will
;       return with the given prompt string buffer set to the correct
;       prompt to get more data from the operator, and the input line
;       descriptor re-set to exclude the remaining (if any) incorrect
;       text of the input line.
;
; Calling sequence:
;       DS$ATTACH (cmdline, [prompt])
;
; Input Parameters:
;       cmdline         pointer to command line descriptor
;       prompt          pointer to ASCIC-type buffer (with length of remainder
;                       of buffer in byte 1)
;
; Implicit inputs:
;       none
;
; Output Parameters
;       prompt          the buffer is filled with an ASCIC string suitable for
;                       prompting the operator for the next ATTACH parameter.
; Implicit outputs:
;       none
;
; Side Effects:
;       If successfull, creates a PTABLE in dynamic pool space
;
; Register usage:
;       R4,R5           Descriptor of remaining input string
;       R6              Pointer to prompt string descriptor
;       R8              Pointer to input descriptor
;       R10             PTABLE descriptor "PC" for decode
;       R11             Pointer to PTABLE
;
; Return codes:
;       DS$_BADTYPE     Device type argument is bad (no PTABLE descriptor)
;       DS$_BADLINK     Device given as link is not attached
;       DS$_ILLUNIT     Unit number not given or was illegal (too big)
;       DS$_DEVNAME     Invalid device name given
;       SS$_BADPARAM    Number was in bad radix or out of range
;       SS$_INSFARG     Too few arguments given to complete ATTACH
;--
```

```
                        010A   512
                        010A   513          $OFFSET 4,POSITIVE,<-
                        010A   514                  <ATC$_CMDLINE,4>,-
                        010A   515                  <ATC$_PROMPT,4>>
                        010A                 .SAVE   LOCAL_BLOCK
                        010A                 .PSECT $ABS$ ABS
                00000004 FE70                .=4
                        0004         ATC$_CMDLINE:
                00000008 0004                .BLKB   4
                        0008         ATC$_PROMPT:
                0000000C 0008                .BLKB   4
                       0000010A              .RESTORE
                        010A   516
                        010A   517          $OffSet 0, NEGATIVE, <-          ; Offsets for local data                [17]
                        010A   518                  <Name_Flags, 1>, -       ; .. Name flags from $DS_$NAME          [17]
                        010A   519                  <Parent_Controller, 1>, - ; .. Controller letter of parent       [17]
                        010A   520                  <Max_Unit, 2>, -         ; .. Maximum unit number allowed        [17]
                        010A   521                  <PtDesc, 4>, -           ; .. Address of Ptable descriptor       [17]
                        010A   522                  <Parent_Ptable, 4>, -    ; .. Address of Parent Ptable           [17]
                        010A   523                  <Generic, 10>, -         ; .. Generic name string from $DS_$NAME [17]
                        010A   524                  <Local_Block> -          ; Size of local block                   [17]
                        010A   525                  >                        ;                                       [17]
                        010A                 .SAVE   LOCAL_BLOCK
                        010A                 .PSECT $ABS$ ABS
                00000000 FE70                .=0
                FFFFFFFF 0000                .BLKB   -1
                        FFFF         Name_Flags:
                FFFFFFFE FFFF                .BLKB   -1
                        FFFE         Parent_Controller:
                FFFFFFFC FFFE                .BLKB   -2
                        FFFC         Max_Unit:
                FFFFFFF8 FFFC                .BLKB   -4
                        FFF8         PtDesc:
                FFFFFFF4 FFF8                .BLKB   -4
                        FFF4         Parent_Ptable:
                FFFFFFEA FFF4                .BLKB   -10
                        FFEA         Generic:
                FFFFFFE6 FFEA                .BLKB   -4
                        FFE6         Local_Block:
                       0000010A              .RESTORE
                        010A   526
                    0FFC 010A   527 .ENTRY  DSX$ATTACH, ^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>
                        010C   528
5E    E6 AD     9E    010C   529          MovAB   Local_Block(Fp), Sp      ; Allocate local storage block          [17]
58    04 BC     7E    0110   530          MOVAQ   @ATC$_CMDLINE(AP),R8     ; Point to command line desc.
      02 A8     B4    0114   531          CLRW    2(R8)                    ; Clear length used so far
   54   68     7D    0117   532          MOVQ    (R8),R4                  ; Set up register descriptor
   02   6C     91    011A   533          CMPB    (AP),#2                  ; Both arguments given?
        06     19    011D   534          BLSS    10$                      ; No--fake prompt buffer
56    08 BC     7E    011F   535          MOVAQ   @ATC$_PROMPT(AP),R6      ; Set up prompt pointer
        07     12    0123   536          BNEQ    20$                      ; Branch if specified
        7E     3F    0125   537 10$:     PUSHAW  -(SP)                    ; Allocate fake buffer
        02     DD    0127   538          PUSHL   #2                       ; Finish descriptor
   56   6E     DE    0129   539          MOVAL   (SP),R6                  ; Save pointer to descriptor
                     012C   540 20$:
        5B     D4    012C   541          CLRL    R11                      ; Clear PT address
        1D     11    012E   542          BRB     GET_TYPE                 ; Get hardware device type
```

```
                                0130
                                0130  BAD_TYPE:
        00000164'EF    9F       0130          PUSHAB  L^T_TYPE                  ; Set prompt to return                [10]
        00000007'EF    7F       0136          PUSHAQ  L^T_INVALID               ; Error message                       [10]
  00000B88'EF    02    FB       013C          CALLS   #2,L^FORMAT_PROMPT        ; Format it for return                [10]
  50    006600E8 8F    D0       0143          MOVL    #DS$_BADTYPE,R0           ; Set return code
                032E    31       014A          BRW     ERROR_EXIT                ; Return
                                014D
                                014D  GET_TYPE:
  53    00000164'EF    9E       014D          MOVAB   L^T_TYPE,R3               ; Address of prompt string            [10]
        00000B60'EF    16       0154          Jsb     L^GET_LINE                ; Get something from operator         [18]
              36 50    E9       015A          BLBC    R0,10$                    ; Exit if error on input
                                015D
        00000000'EF    16       015D          Jsb     L^SCAN$SYMBOL             ; Scan the hardware type              [16]
           57    50    3C       0163          MOVZWL  R0,R7                     ; Save length of type string
                 C8    13       0166          BEQL    BAD_TYPE                  ; Branch if not there
                                0168
           7E    50    7D       0168          MOVQ    R0,-(SP)                  ; Save descriptor of type
        000011F0'EF    16       016B          Jsb     L^LOC$PTDESC              ; Locate descriptor R0/R1             [18]
                 BD    13       0171          BEQL    BAD_TYPE                  ; Branch if not found
                                0173
        02 A8    57    A0       0173          ADDW2   R7,2(R8)                  ; Add type string to length used
           5A    50    D0       0177          MOVL    R0,R10                    ; Save address of hardware type block
        F8 AD    50    D0       017A          MovL    R0, PtDesc(Fp)            ; Save it again                       [17]
           50    8A    9A       017E          MOVZBL  (R10)+,R0                 ; Get length of ASCIC name
           5A    50    C0       0181          ADDL    R0,R10                    ; Skip name
           51    8A    9A       0184          MOVZBL  (R10)+,R1                 ; Fetch size of PT
           51    1A    C0       0187          ADDL2   #HPE$C_EPB_SIZE,R1        ; make room for long device name      [28]
        00000000'EF    16       018A          Jsb     L^EXE$ALONONPAGED         ; Allocate a block for this PT        [18]
              03 50    E8       0190          BLBS    R0,20$                    ; Branch if enough memory
                                0193  10$:
                02E5    31       0193          BRW     ERROR_EXIT
                                0196  20$:
           5B    52    D0       0196          MOVL    R2,R11                    ; Copy address of block
  50    51    FD 8F    78       0199          ASHL    #-3,R1,R0                 ; Number of quadwords present
                 82    7C       019E  30$:    CLRQ    (R2)+                     ; Clear one
              FB 50    F5       01A0          SOBGTR  R0,30$                    ; Branch if not done yet
        08 AB    51    B0       01A3          MOVW    R1,HP$W_SIZE(R11)         ; Save true length of block
                                01A7
        52    26 AB    9E       01A7          MOVAB   HP$T_TYPE(R11),R2         ; Point to type storage location
           82    6E    90       01AB          MOVB    (SP),(R2)+                ; Store length
        57    04 AE    D0       01AE          MOVL    4(SP),R7                  ; Set address to copy from
           50    6E    3C       01B2          MOVZWL  (SP),R0                   ; Set length to copy
                 8E    7C       01B5          CLRQ    (SP)+                     ; Remove descriptor
                                01B7
           82    87    90       01B7  40$:    MOVB    (R7)+,(R2)+               ; Copy byte
              FA 50    F5       01BA          SOBGTR  R0,40$                    ; Copy whole string
                 1D    11       01BD          BRB     GET_LINK                  ; Get device linking this to the processor
                                01BF  BAD_LINK:
        00000158'EF    9F       01BF          PUSHAB  L^T_LINK                  ; Set prompt to return                [10]
        00000007'EF    7F       01C5          PUSHAQ  L^T_INVALID               ; Format string                       [10]
  00000B88'EF    02    FB       01CB          CALLS   #2,L^FORMAT_PROMPT        ; Format prompt for output            [10]
  50    006600F0 8F    D0       01D2          MOVL    #DS$_BADLINK,R0           ; Set return code
                029F    31       01D9          BRW     ERROR_EXIT
                                01DC
                                01DC  GET_LINK:
  53    00000158'EF    9E       01DC          MOVAB   L^T_LINK,R3               ; Prompt line                         [10]
```

```
                00000B60'EF   16  01E3   600          Jsb     L^GET_LINE                      ; Get some input                                [18]
                      03 50   E8  01E9   601          BLBS    R0,10$                          ; Branch if it worked
                       028C   31  01EC   602          BRW     ERROR_EXIT                      ; Take error exit
                              01EF   603 10$:
                00000000'EF   16  01EF   604          Jsb     L^SCAN$DEVICE                   ; Get device name of connection                 [16]
                    57   50   3C  01F5   605          MOVZWL  R0,R7                           ; Save length of link name
                         C5   13  01F8   606          BEQL    BAD_LINK                        ; Bad device
                              01FA   607
                              01FA   608 ;
                              01FA   609 ; See if the link name typed is one of the pre-defined 'central bus' names.
                              01FA   610 ; If so, make sure it is the correct one (e.g., 'SBI' for STAR, 'CMI' for
                              01FA   611 ; COMET).  If it is not the correct one, return an error.
                              01FA   612 ;
                              01FA   613
                    50   50   3C  01FA   614          MOVZWL  R0,R0                           ; isolate device name length
                    007C 8F   BB  01FD   615          PUSHR   #^M<R2,R3,R4,R5,R6>             ; Save registers
                         55   D4  0201   616          CLRL    R5                              ; name index
                53  000003A6'EF   9E  0203   617          MOVAB   L^CENTRAL_BUS, R3               ; Point to table of names               [10]
                    54   83   9A  020A   618          MOVZBL  (R3)+, R4                       ; Get number of names in table
                    52   83   9A  020D   619 20$:     MOVZBL  (R3)+, R2                       ; Get length of next name
                         55   D6  0210   620          INCL    R5                              ; Increment type code tried
                    56   51   D0  0212   621          MOVL    R1, R6                          ; Copy input string address
                    50   52   B1  0215   622          CMPW    R2, R0                          ; Same length as input?
                         05   13  0218   623          BEQL    40$                             ; If yes, compare strings
                    53   52   C0  021A   624 30$:     ADDL2   R2, R3                          ; Skip rest of string
                         4A   11  021D   625          BRB     60$                             ; Try next string
                    86   63   91  021F   626 40$:     CMPB    (R3), (R6)+                     ; Compare bytes of strings
                         F6   12  0222   627          BNEQ    30$                             ; If no match, try next string
                         53   D6  0224   628          INCL    R3                              ; Advance pointer
                      F6 52   F5  0226   629          SOBGTR  R2, 40$                         ; Loop through string
                    04   55   91  0229   630          CMPB    R5, #4                          ; Is is implementation-specific?        [21]
                         2D   14  022C   631          BGTR    50$                             ; No, accept it unconditionally         [23]
            0000FE17'EF   55   91  022E   632          CMPB    R5, L^DSA$GL_SID+3              ; Match--is it correct one?
                         24   13  0235   633          BEQL    50$                             ; Yes, continue
                    007C 8F   BA  0237   634          POPR    #^M<R2,R3,R4,R5,R6>             ; Restore registers
                00000158'EF   9F  023B   635          PUSHAB  L^T_LINK                        ; Prompt string to return               [10]
                      7E   50   7D  0241   636          MOVQ    R0, -(SP)                       ; Descriptor of input name              [10]
                00000109'EF   7F  0244   637          PUSHAQ  L^T_MAIN_BUS                    ; 'There is no !AD on this type pro.'   [10]
            00000B88'EF   04   FB  024A   638          CALLS   #4, L^FORMAT_PROMPT             ; Format it for return                  [10]
            50  006600F0 8F   D0  0251   639          MOVL    #DS$_BADLINK, R0                ; Set return code
                     0220   31  0258   640          BRW     ERROR_EXIT                      ; Error!!!
                    007C 8F   BA  025B   641 50$:     POPR    #^M<R2,R3,R4,R5,R6>             ; Good match.  Restore regs.
                 02 A8   57   A0  025F   642          ADDW2   R7, 2(R8)                       ; Increase string length used
                      F4 AD   D4  0263   643          ClrL    Parent_Ptable(Fp)               ; Device is connected to HUB            [17]
                       0163   31  0266   644          BRW     GET_NAME                        ; Get device name generic               [17]
                      A1 54   F5  0269   645 60$:     SOBGTR  R4, 20$                         ; Try next name string
                    007C 8F   BA  026C   646          POPR    #^M<R2,R3,R4,R5,R6>             ; Restore registers
                              0270   647                                                                                          ;G:10
                    52   01   CE  0270   648          mnegl   #1, r2                          ; Set wildcard link for loc$ptable      [09]
                000011A1'EF   16  0273   649          Jsb     L^LOC$PTABLE                    ; Locate P-table for link               [18]
                 F4 AD   51   D0  0279   650          MovL    R1, Parent_Ptable(Fp)           ; Save address of parent                [17]
                         03   12  027D   651          BNEQ    70$                             ; Found it
                      FF3D   31  027F   652          BRW     BAD_LINK                        ; Can't find link P-table
                 02 A8   57   A0  0282   653 70$:     ADDW2   R7,2(R8)                        ; Increase length used so far
                 20 AB   51   D0  0286   654          MOVL    R1,HP$A_LINK(R11)               ; Store link address
              18 AB   1C A1   D0  028A   655          MOVL    HP$A_DVA(R1),HP$A_DEVICE(R11) ; Initialize device address
                              028F   656                                                                                           ;G:10
```

```
                    013A   31  028F   657         BrW     GET_NAME                        ; Get new device name          [27]
```

```
                          0292   659          .Subtitle       Process invalid generic name error
                          0292   660
                          0292   661 BAD_UNIT_EXC:
          0000014C'EF   9F  0292   662          PUSHAB  L^T_NAME                ; Set prompt text                [17]
          000000D7'EF   7F  0298   663          pushaq  t_unit_excess           ; Unit number too large          [17]
    00000B88'EF    02   FB  029E   664          CALLS   #2,L^FORMAT_PROMPT      ; Format and store               [17]
    50    00660100 8F   D0  02A5   665          movl    #ds$_illunit, r0        ; Illegal unit number            [17]
                01CC   31  02AC   666          brw     error_exit              ; Error                          [17]
```

```
                                02AF   .sbttl  Process invalid generic name error
                                02AF   ;
                                02AF   ; BAD_NAME is branched to if parse_device routine fails.  The Ptable
                                02AF   ; descriptor is analysed to print out what the problem was, and what the
                                02AF   ; correct format of the name ought to be.  The format it uses is 'GGan'
                                02AF   ; where 'GG' is replaced by the Ptable descriptor's generic string (or
                                02AF   ; 'gg' if there is none), 'a' represents that the name must have a
                                02AF   ; controller letter, and 'n' represents that the name must have a unit
                                02AF   ; number.  If the PTD$V_NAME generic flag is set, and PTD$V_CONTROLLER and
                                02AF   ; PTD$V_UNIT flags are not, then the name is  an alphanumeric node name of
                                02AF   ; 6 or fewer characters.  This is represented  in the error message as
                                02AF   ; 'name' instead of the 'GGan' form. If PTD$V_NAME and PTD$V_CONTROLLER
                                02AF   ; and/or PTD$V_UNIT flag is set then the generic name is represented as
                                02AF   ; name$GGan in the error message. If the alloc flag is set then the
                                02AF   ; generic name is represented as '$(1-255)$GGan' in the error message.
                                02AF   ; If the range flag is set then the range is represented as decimal
                                02AF   ; 1 to 255.
                                02AF   ;
                                02AF   ;
                                02AF   ;
                                02AF   ; Inputs:
                                02AF   ;       R2 => return code from parse_device.
                                02AF   ;               0 = no generic found.
                                02AF   ;               1 = bad generic prefix
                                02AF   ;               2 = bad controller (none where should be, or present where
                                02AF   ;                       shouldn't be)
                                02AF   ;               3 = bad unit (none where should be, or present where
                                02AF   ;                       shouldn't be)
                                02AF   ;               4 = bad node name
                                02AF   ;               5 = bad allocation class name
                                02AF   ;
                                02AF   ; This code segment will cause loading of the return prompt string, and error
                                02AF   ; exit from DSX$ATTACH.
                                02AF   ;
                                02AF
                                02AF   bad_name:                                ;                                      [17]
          04    52    D1        02AF           cmpl    r2, #4                   ; Validate status                      [17]
                03    15        02B2           bleq    10$                      ; branch if OK                         [17]
          52    04    D0        02B4           movl    #4, r2                   ; Knock value down to legal range      [17]
50   00000388'EF42    90        02B7   10$:    movb    part_list[r2], r0        ; Get byte offset of message           [17]
52   00000388'EF40    9E        02BF           movab   part_list[r0], r2        ; Get address of message               [17]
       55    FF AD    9A        02C7           movzbl  Name_Flags(Fp), r5       ; Get generic flags                    [17]
          53    6E    9E        02CB           movab   (sp), r3                 ; Save stack pointer                   [17]
       1B 55    02    E1        02CE           bbc     #ptd$v_name, r5, 20$     ; Branch if normal name format         [17]
                                02D2   ;       BITL    #PTD$M_CONTROLLER!PTD$M_UNIT, R5 ; Anything else to check for ? [26]
                                02D2   ;       BNEQ    20$                      ; Branch if more to check.             [26]
  7E   656D616E 8F    D0        02D2           movl    #^A"name", -(sp)         ; Push string                          [17]
          7E    04    90        02D9           movb    #4, -(sp)                ; ...make it ASCIC                     [17]
  51   0000038C'EF    9A        02DC           movzbl  part_list+4, r1          ; Get to the part_list null ASCIC      [17]
51   00000388'EF41    9E        02E3           movab   part_list[r1], r1        ; ...string                            [17]
                5A    11        02EB           brb     87$                      ; Go do formatting, etc.               [17]
                                02ED   20$:                                     ; Normal name formatting               [17]
                54    D4        02ED           clrl    r4                       ; Length of string created             [17]
       06 55    00    E1        02EF           bbc     #ptd$v_unit, r5, 30$     ; Branch if no unit needed             [17]
       7E    6E 8F    90        02F3           movb    #^A"n", -(sp)            ; Make string on stack                 [17]
                54    D6        02F7           incl    r4                       ; Count the byte                       [17]
          55    01    E1        02F9   30$:    bbc     #ptd$v_controller, -     ; Branch if                            [17]
```

```
                12        02FC   725                 r5, 50$                  ; ...no controller needed                [17]
                5E   D7   02FD   726         DECL    SP                       ; Allocate one byte                      [17]
                54   D6   02FF   727         incl    r4                       ; And count it                           [17]
           55   04   E1   0301   728         bbc     #ptd$v_inherit_Con, -    ; Does device inherit parent's name?     [19]
                06        0304   729                 r5, 40$                  ; ...if not, use 'a'                     [17]
        6E   FE AD   90   0305   730         MovB    Parent_Controller(Fp), -; Get parent's controller letter          [17]
                          0309   731                 (Sp)                     ; .. onto stack                          [17]
                04   12   0309   732         bneq    50$                      ; If valid, use it                       [17]
        6E   61 8F   90   030B   733 40$:    movb    #^A"a", (sp)             ; Put controller format on stack         [17]
        51   EA AD   9E   030F   734 50$:    movab   Generic(Fp), r1          ; Get address of generic string          [17]
           50   61   9A   0313   735         MovZBL  (R1), R0                 ; Get length of generic string           [26]
                0B   13   0316   736         beql    70$                      ; Branch if null (use 'gg')              [17]
         7E   6140   90   0318   737 60$:    movb    (r1)[r0], -(sp)          ; Push on bytes in right order           [26]
                54   D6   031C   738         incl    r4                       ; Count 'em                              [17]
             F7 50   F5   031E   739         sobgtr  r0, 60$                  ; Do them all                            [17]
                08   11   0321   740         brb     80$                      ; Finish off                             [17]
      7E   6767 8F   B0   0323   741 70$:    movw    #^A"gg", -(sp)           ; Push on 'gg' string                    [17]
           54   02   C0   0328   742         addl2   #2, r4                   ; And set length                         [17]
     0D 0A AB   02   E1   032B   743 80$:    BBC     #HP$V_NAME,HP$B_FLAGS(R11),85$  ; Check if name needed           [28]
           7E   24   90   0330   744         MOVB    #^A"$",-(SP)             ; Set delimiter                          [26]
  7E   656D616E 8F   D0   0333   745         MOVL    #^A"name", -(SP)         ; Set string                             [26]
           54   05   C0   033A   746         ADDL2   #5, R4                   ; Adjust length                          [26]
           7E   54   90   033D   747 85$:    movb    r4, -(sp)                ; Make string on stack be ASCIC          [17]
  51   000000CD'EF   9E   0340   748         movab   t_part_of, r1            ; say 'Error in ? part of name'          [17]
    54 00000003'EF   E8   0347   749 87$:    blbs    range,110$               ; See if error in allocation range       [31]
    25 00000002'EF   E8   034E   750         blbs    alloc,100$               ; See if error in allocation class       [31]
       0000014C'EF   9F   0355   751 90$:    pushab  L^t_name                 ; Prompt string                          [17]
             04 AE   9F   035B   752         pushab  4(sp)                    ; Correct name format string             [17]
                61   9F   035E   753         pushab  (r1)                     ; ' part of ' or ''                      [17]
                62   9F   0360   754         pushab  (r2)                     ; Failing part of the name               [17]
       0000002E'EF   7F   0362   755         pushaq  t_bad_name               ; Format string for the whole mess       [17]
      0B88'CF   05   FB   0368   756         calls   #5, w^format_prompt      ; Format the output prompt               [17]
  50   00660108 8F   D0   036D   757         movl    #ds$_devname, r0         ; Set failure reason                     [17]
           5E   53   D0   0374   758         movl    r3, sp                   ; Restore stack                          [17]
              0101   31   0377   759         brw     error_exit               ; return                                 [17]
       0000014C'EF   9F   037A   760 100$:   pushab  L^t_name                 ; Prompt string                          [31]
       000000A0'EF   9F   0380   761         pushab  t_alloc                  ; Correct name format string             [31]
                61   9F   0386   762         pushab  (r1)                     ; ' part of ' or ''                      [31]
                62   9F   0388   763         pushab  (r2)                     ; Failing part of the name               [31]
       0000002E'EF   7F   038A   764         pushaq  t_bad_name               ; Format string for the whole mess       [31]
      0B88'CF   05   FB   0390   765         calls   #5, w^format_prompt      ; Format the output prompt               [31]
  50   00660108 8F   D0   0395   766         movl    #ds$_devname, r0         ; Set failure reason                     [31]
           5E   53   D0   039C   767         movl    r3, sp                   ; Restore stack                          [31]
              00D9   31   039F   768         brw     error_exit               ; return                                 [31]
       0000014C'EF   9F   03A2   769 110$:   pushab  L^t_name                 ; Prompt string                          [31]
       000000A8'EF   9F   03A8   770         pushab  t_range                  ; Correct name format string             [31]
       000000BA'EF   9F   03AE   771         pushab  t_unrange                ; Failing part of the name               [31]
       0000006B'EF   7F   03B4   772         pushaq  t_bad_range              ; Format string for the whole mess       [31]
      0B88'CF   04   FB   03BA   773         calls   #4, w^format_prompt      ; Format the output prompt               [31]
  50   00660108 8F   D0   03BF   774         movl    #ds$_devname, r0         ; Set failure reason                     [31]
           5E   53   D0   03C6   775         movl    r3, sp                   ; Restore stack                          [31]
              00AF   31   03C9   776         brw     error_exit               ; return                                 [31]
```

```
                                03CC    778          .sbttl  Get name processing
                                03CC    779
                                03CC    780 GET_NAME:
                     00C1   30  03CC    781          BsbW    Get_Attributes          ; Set up rest of local block          [17]
          53  0000014C'EF   9E  03CF    782          MOVAB   L^T_NAME,R3             ; prompt string                       [10]
              00000B60'EF   16  03D6    783          Jsb     L^GET_LINE              ; Get something                       [18]
                     03 50  E8  03DC    784          BLBS    R0,10$                  ; Branch if not error
                     0099   31  03DF    785          BRW     ERROR_EXIT              ; Take error exit
                                03E2    786 10$:
                     0182   30  03E2    787          BsbW    Parse_Device            ; Get this new device name            [17]
                       03   12  03E5    788          BNeq    15$                     ; Skip if OK                          [17]
                     FEC5   31  03E7    789          Brw     Bad_Name                ; Branch if invalid                   [17]
                 57  08 AB   3C  03EA    790 15$:     MOVZWL  HP$W_SIZE(R11),R7       ;                                     ;G:10
              59 5B  57       C1  03EE    791          ADDL3   R7,R11,R9               ; address of end of p-table           ;G:10
              57 59  04       C3  03F2    792          SUBL3   #4,R9,R7                ; address to store hpe$a_epb          ;G:9
              67 59  1A       C3  03F6    793          SUBL3   #HPE$C_EPB_SIZE,R9,(R7) ; beginning of extended ptable        ;G:9
                 59  67       D0  03FA    794          MOVL    (R7),R9                 ; address of extended p-table         ;G:9
                 52           D4  03FD    795          ClrL    R2                      ; Initial unit number                 [17]
           11 FF AD   00      E1  03FF    796          BbC     #Ptd$V_Unit, -          ; Branch if no unit allowed           [17]
                                0404    797                   Name_Flags(Fp), 25$     ;                                     [17]
          52  50   10   10    EF  0404    798          EXTZV   #16,#16,R0,R2           ; Get unit number                     [26]
                7E  FC AD   3C  0409    799          MOVZWL  MAX_UNIT(FP),-(SP)      ; Set for longword compare            [26]
                    8E   52   D1  040D    800          CMPL    R2,(SP)+                ; Check full unit number              [26]
                         03   1B  0410    801          BLequ   25$                     ; Branch if OK                        [17]
                       FE7D   31  0412    802          BrW     Bad_Unit_Exc            ; Branch to error routine             [17]
              00FF 8F   52   B1  0415    803 25$:     CMPW    R2, #^XFF               ; To small to fit in a byte?          ;G:9
                         04   14  041A    804          BGTR    30$                                                           ;G:9
                0B AB    52   90  041C    805          MovB    R2, Hp$B_Drive(R11)     ; Move to Ptable                      [17]
                14 A9    52   B0  0420    806 30$:     MOVW    R2,HPE$W_EXT_DRIVE(R9)  ; Move max unit # to extended ptable ;G:9
                   50    50   9A  0424    807          MOVZBL  R0,R0                   ; Isolate length of device name
                02 A8    50   A0  0427    808          ADDW2   R0,2(R8)                ; Increase length used so far
          05 0A AB    02   E1  042B    809          BBC     #HP$V_NAME,HP$B_FLAGS(R11),35$ ; if long device name?        [28]
                   52    69   DE  0430    810          MOVAL   HPE$T_DEVICE(R9),R2                                           ;G:9
                         04   11  0433    811          BRB     37$                     ; continue as before                  [28]
                                0435    812 35$:
                52   0C AB    9E  0435    813          MOVAB   HP$T_DEVICE(R11),R2     ; address to store device name in pt
                                0439    814 37$:
             6B    50    01    C1  0439    815          ADDL3   #1,R0,HP$Q_DEVICE(R11)  ; Store length of ascic name
                04 AB    62   9E  043D    816          MOVAB   (R2),HP$Q_DEVICE+4(R11) ; Store address of "_" in device name
                82   5F  8F   90  0441    817          MOVB    #^A"_",(R2)+            ; Insert "_" physical device indicator
                                0445    818
                   82    81   90  0445    819 40$:     MOVB    (R1)+,(R2)+             ; Copy byte
                     FA  50   F5  0448    820          SOBGTR  R0,40$                  ; Copy whole string
                   5A    03   C0  044B    821          ADDL    #3,R10                  ; Point past max unit number and name
            00000000'EF    16   044E    822          JSB     ONLY_ATTACH             ; check need for vector offsets  [35]
```

```
                                0454   824
          7E    54    7D      0454   825        MOVQ    R4,-(SP)                ; length/address of remaining input
                66    7F      0457   826        PUSHAQ  (R6)                    ; Address of prompt descriptor
            04 AE    7F      0459   827        PUSHAQ  4(SP)                   ; Address of descriptor
                5B    DD      045C   828        PUSHL   R11                     ; Base of P-table
                5A    DD      045E   829        PUSHL   R10                     ; Start of PT-desc
     0716'CF    04    FB      0460   830        CALLS   #4,W^PT$INTERPRET       ; Do PT-descriptor interpretation
   02 A8   02 AE    A0      0465   831        ADDW2   2(SP),2(R8)             ; Include length used
```

```
                5E   08   C0  046A   833          ADDL    #8,SP                    ; Remove descriptor
                  0B 50   E9  046D   834          BLBC    R0,ERROR_EXIT            ; Take error exit if failed
        0000124A'EF   6B   FA  0470   835          CALLG   (R11),L^INS$PTABLE       ; Insert it                          [10]
                  01 50   E9  0477   836          BLBC    R0,ERROR_EXIT            ; Failed take error exit
                          04  047A   837          RET
                              047B   838
                              047B   839 ERROR_EXIT:
                     50   DD  047B   840          PUSHL   R0                       ; Save error code
```

```
                68   02 A8    3C   047D   842          MOVZWL  2(R8),(R8)              ; Return length used
                   50   5B    D0   0481   843          MOVL    R11,R0                  ; Copy address of buffer
                        06    13   0484   844          BEQL    10$                     ; Skip if none
                00000000'EF    16   0486   845          Jsb     L^EXE$DEANONPAGED       ; Release it                    [18]
                                    048C   846 10$:
                        50 8ED0    048C   847          POPL    R0                      ; Restore error code          ;G:9
                                   048F   848          RET
```

```
                                0490          .Subtitle       Get device attributes
                                0490
                                0490  ;++
                                0490  ; Functional Description:
                                0490  ;
                                0490  ;       This routine is called by DSX$ATTACH to set up the local
                                0490  ;       storage block with the information on generic name to
                                0490  ;       enforce, maximum number of units, etc.  If running from
                                0490  ;       a script, APT, or if there is no $DS_$NAME directive in
                                0490  ;       the PTABLE descriptor, it will cause behavior similar to
                                0490  ;       the previous ATTACH--i.e., there will be no enforced
                                0490  ;       generic names, and the PTD$V_UNIT bit will be set iff
                                0490  ;       MAX_UNIT is greater than 0.
                                0490  ;
                                0490  ; Inputs and Outputs for this routine are in the local storage
                                0490  ; block allocated at the beginning of DSX$ATTACH.  It also references
                                0490  ; both the parent Ptable (if any) and the current Ptable descriptor,
                                0490  ; through pointers stored in said local block.
                                0490  ;
                                0490  ;--
                                0490                                                                    ;G:9
                                0490  Get_Attributes:                          ;                                [17]
          00FC 8F      BB       0490          PushR   #^M<R2,R3,R4,R5,R6,R7>   ; Save some registers                [17]
            FF AD      94       0494          ClrB    Name_Flags(Fp)           ; No flags set                      [17]
            EA AD      94       0497          ClrB    Generic(Fp)              ; No enforced generic yet           [17]
            FE AD      94       049A          ClrB    Parent_Controller(Fp)    ; No enforced controller yet        [17]
        57  F8 AD      D0       049D          MovL    PtDesc(Fp), R7           ; Get Ptable descriptor start       [17]
          50    87      9A       04A1          MovZBL  (R7)+, R0                ; Get length of type string[17]   ;G:9
  FC AD   01 A740      9B       04A4          MovZBW  1(R7)[R0], Max_Unit(Fp)  ; Fetch maximum unit number         [17]
                0E      13       04AA          BEqlU   10$                      ; Branch if old ATTACH said no unit[17] ;G:9
      FF AD     01      90       04AC          MovB    #Ptd$M_Unit, -           ; If there is no NAME statement,    [17]
                                04B0                   Name_Flags(Fp)          ; .. this device must have unit     [17]
   FF 8F   FC AD      91       04B0          CMPB    MAX_UNIT(FP),#^XFF       ; If # is 255 do not decrement    ;G:10
                                04B5                                          ; because that is number to be used ;G:10
                                04B5                                          ; [256 will not fit into a byte     ;G:10
                                04B5                                          ; so 255 is used]                   ;G:10
                03      13       04B5          BEQL    10$                      ; Do not decrement                  ;G:10
            FC AD      97       04B7          DecB    Max_Unit(Fp)             ; Convert count to max, not max+1  [19] ;G:1
    57   04 A740      9E       04BA  10$:    MovAB   4(R7)[R0], R7            ; Skip all of $DS_$INITIALIZE       [19]
      80 8F     87      91       04BF          CmpB    (R7)+, #PD$_Start        ; Next byte ought to be start code  [17]
                76      12       04C3          BNeq    20$                      ; Skip out if something's wrong     [17]
      8E 8F     67      91       04C5          CMPB    (R7),#PD$_EPB            ; Extended P-table Block?         ;G:9
                15      12       04C9          BNEQ    12$                      ; NO.  Branch.                    ;G:9
                57      96       04CB          INCB    R7                       ; Skip PD$_EPB byte               ;G:9
      FC AD     87      B0       04CD          MOVW    (R7)+,MAX_UNIT(FP)                                         ;G:9
  FFFF 8F   FC AD      B1       04D1          CMPW    MAX_UNIT(FP),#^XFFFF     ; If # is 65535 do not decrement  ;G:9
                                04D7                                          ; because that is number to be used ;G:9
                                04D7                                          ; [65536 will not fit into a word   ;G:9
                                04D7                                          ; so 65535 is used].              ;G:9
                04      13       04D7          BEQLU   11$                                                        ;G:9
      FF AD     01      90       04D9          MovB    #Ptd$M_Unit, -           ; If there is no NAME statement,    [17]
                                04DD                   Name_Flags(Fp)          ; .. this device must have unit     [17]
                                04DD                                                                              ;G:9
            FC AD      B7       04DD  11$:    DECW    MAX_UNIT(FP)                                               ;G:9
                                04E0                                                                              ;G:9
                                04E0  12$:                                                                        ;G:9
      8D 8F     87      91       04E0          CmpB    (R7)+, #PD$_Name         ; Is the next byte start of NAME?   [17]
```

```
                        55   12  04E4          BNeq    20$                          ; Skip out if it's not                  [17]
                FF AD   87   90  04E6          MovB    (R7)+, Name_Flags(Fp)        ; Set real name flags                   [17]
                    50  87   9A  04EA          MovZBL  (R7)+, R0                    ; Get length of generic name            [17]
                EA AD   50   90  04ED          MovB    R0, Generic(Fp)              ; Save length away                      [17]
   EB AD   09   00   67  50   2C  04F1          MovC5   R0, (R7), -                  ; Copy generic string                   [17]
                                  04F8                   #0, -                       ; .. zero filled                        [17]
                                  04F8                   #9, Generic+1(Fp)           ; .. into local storage                 [17]
                50   F4 AD   D0  04F8          MovL    Parent_Ptable(Fp), R0        ; Get parent Ptable                     [17]
                        3D   13  04FC          BEql    20$                          ; Exit if attached to HUB               [17]
                FF AD   18   93  04FE          BitB    #Ptd$M_Inherit, -            ; Check if device should inherit either [19]
                                  0502                   Name_Flags(Fp)              ; .. name or controller                 [19]
                        37   13  0502          BEql    20$                          ; Skip if niether bit is set            [19]
            55   04 A0   01   C1  0504          AddL3   #1, Hp$Q_Device+4(R0), -     ; Get address of parent name (- '_')    [17]
                                  0509                   R5                          ;                                       [17]
               54   60   01   A3  0509          SubW3   #1, Hp$Q_Device(R0), R4      ; Get length of same                    [17]
                    54   54   3C  050D          MovZWL  R4, R4                       ; Zero extend length                    [17]
                00000000'EF   16  0510          Jsb     L^Scan$Alpha                 ; Scan over alphabetic                  [17]
                        23   13  0516          BEql    20$                          ; Exit if none there (??)               [17]
               52   50   01   C3  0518          SubL3   #1, R0, R2                   ; Get length minus 1                    [17]
                    02   52   D1  051C          CmpL    R2, #2                       ; Generic should be at least 2 chars    [17]
                        1A   1F  051F          BLssU   20$                          ; Don't use if not valid generic form   [17]
            05 FF AD   04   E1  0521          BbC     #Ptd$V_Inherit_Con, -        ; Don't use controller letter if        [19]
                                  0526                   Name_Flags(Fp), 15$         ; .. not supposed to                    [19]
             FE AD   6142   90  0526          MovB    (R1)[R2], -                  ; Store parent's controller letter      [17]
                                  052B                   Parent_Controller(Fp)       ;                                       [17]
            0B FF AD   03   E1  052B  15$:    BbC     #Ptd$V_Inherit_Pre, -        ; Don't use prefix if shouldn't         [19]
                                  0530                   Name_Flags(Fp), 20$         ; .. inherit it                         [19]
                EA AD   52   90  0530          MovB    R2, Generic(Fp)              ; If valid, use parent name as generic  [17]
   EB AD   09   00   61  52   2C  0534          MovC5   R2, (R1), -                  ; Copy to Generic, fill with 0          [17]
                                  053B                   #0, -                       ;                                       [17]
                                  053B                   #9, Generic+1(Fp)           ;                                       [17]
                00000000'EF   E9  053B  20$:    BlbC    L^Ds$GB_Inhibit_Naming,-     ; If should not enforce naming          [19]
                        0B        0541                   40$                         ;                                       [19]
                    EA AD   94  0542  30$:    ClrB    Generic(Fp)                  ; .. then no enforced generics          [17]
                    FE AD   94  0545          ClrB    Parent_Controller(Fp)        ; .. or controller                      [17]
            FF AD   FA 8F   8A  0548          BicB2   #^C<Ptd$M_Unit ! -           ; .. and allow only unit and name       [17]
                                  054D                   Ptd$M_Name>, -              ; .... flags                            [17]
                                  054D                   Name_Flags(Fp)              ;                                       [17]
                00FC 8F   BA  054D  40$:    PopR    #^M<R2,R3,R4,R5,R6,R7>       ; Restore registers                     [17]
                        05  0551          Rsb                                  ; Return                                [17]
                                  0552
```

```
                        0552   949 .sbttl  parse device name
                        0552   950 ;
                        0552   951 ; Small routine to save hassle in checking for alphas
                        0552   952 ;
                        0552   953
                        0552   954 if_alpha:                                    ;                                   [17]
                  50    D4    0552   955          clrl    r0                     ; Assume bad                        [17]
                  54    D5    0554   956          tstl    r4                     ; Any string left?                  [17]
                  0E    15    0556   957          bleq    10$                    ; Branch if not                     [17]
            41 8F     65    91    0558   958          cmpb    (r5), #^A"A"           ; Check for alpha                   [17]
                  08    19    055C   959          blss    10$                    ; Branch if not                     [17]
            5A 8F     65    91    055E   960          cmpb    (r5), #^A"Z"           ;                                   [17]
                  02    14    0562   961          bgtr    10$                    ; Branch if not                     [17]
                  50    D6    0564   962          incl    r0                     ; It's OK                           [17]
                  05    0566   963 10$:     rsb                            ; Return                            [17]
                        0567   964
                        0567   965 ;
                        0567   966 ; This routine parses a device name.  It's output is the same as that for
                        0567   967 ; the SCAN$DEVICE routine in PARSE.  However, it takes into account the
                        0567   968 ; generic name and flags of the NAME statement in parsing. This routine
                        0567   969 ; can handle device names of the form 'node$ggan'.
                        0567   970 ;
                        0567   971 ; NOTE: This code assumes that if the PTD$V_INHERITED flag is set, the link
                        0567   972 ;       device will have a controller letter.  If there is ever a chain of
                        0567   973 ;       devices for which this might not be true, the code must be changed.
                        0567   974 ;
                        0567   975 ; Inputs:
                        0567   976 ;       R4 => remaining length of input string
                        0567   977 ;       R5 => address of remaining input string
                        0567   978 ;
                        0567   979 ; Outputs:
                        0567   980 ;       R0 => low word length of device name which was parsed (0 if none)
                        0567   981 ;             high word has device unit number (-1 if none)
                        0567   982 ;       R1 => address of device name (input R5)
                        0567   983 ;       R2 => Success code:
                        0567   984 ;             0 = OK (no errors found: may not be any name at all)
                        0567   985 ;             1 = error in generic prefix
                        0567   986 ;             2 = error in controller
                        0567   987 ;             3 = error in unit number
                        0567   988 ;             4 = error in node name format
                        0567   989 ;             5 = error in allocation class format
                        0567   990 ;       R4 => updated past device name (if any)
                        0567   991 ;       R5 => updated past device name (if any)
                        0567   992 ;
                        0567   993 parse_device::                              ;                                   [17]
              00FF  8F    BB    0567   994          pushr   #^M<r0,r1,r2,r3,r4,r5,r6,r7>    ; Save registers            [17]
          57    FF  AD    9A    056B   995          MovZBL  Name_Flags(Fp), R7     ; Get flags conveniently local      [17]
          04  AE    55    D0    056F   996          movl    r5, 4(sp)              ; Set saved R1 to start of string   [17]
00000002'EF     00    90    0573   997          movb    #0,alloc               ; Clear allocation flag             [31]
00000003'EF     00    90    057A   998          movb    #0,range               ; Clear range flag                  [31]
          03  57    02    E1    0581   999          bbc     #ptd$v_name, R7,1$     ; Handle if it's node name          [31]
                0134    31    0585  1000          brw     120$                   ; long device name set up           [31]
                        0588  1001 1$:                                    ; input for allocation class        [31]
      50    54    01    C3    0588  1002          SUBL3   #1,R4,R0               ; use for index                     [28]
                24    85    91    058C  1003          CMPB    (R5)+,#^A"$"           ; check for allocation format       [31]
                      15    12    058F  1004          BNEQ    3$                     ; else check for cluster            [31]
00000002'EF     01    90    0591  1005          MOVB    #1,ALLOC               ; set flag for allocation format    [31]
```

```
                30   85   91  0598  1006          CMPB    (R5)+,#^A"0"                    ; if leading zeros then error          [31]
                   09   12  059B  1007          BNEQ     3$                             ; no error                             [31]
                        059D  1008                                                       ; input for allocation class           [31]
             08 AE   05   D0  059D  1009          movl    #5,8(sp)                        ; error flag for allocation format     [31]
                   52   D4  05A1  1010          clrl    r2                              ; flag for un-enforced prefix devices  [31]
                 00FD   31  05A3  1011          brw     100$                            ; clean up                             [31]
                        05A6  1012 3$:                                                   ; used to be 1$                        [31]
                24   85   91  05A6  1013          CMPB    (R5)+,#^A"$"                    ; check for cluster device name format [28]
                   0F   13  05A9  1014          BEQL    4$                              ; if cluster format then 4$            [28]
                 F8 50   F5  05AB  1015          SOBGTR  R0,3$                           ; do for all name length               [28]
        00000002'EF   94  05AE  1016          CLRB    ALLOC                           ; not allocation only one $            [31]
             55   04 AE   D0  05B4  1017          MOVL    4(SP),R5                        ; restore input string pointer         [28]
                   1A   11  05B8  1018          BRB     5$                              ; continue as before                   [28]
                        05BA  1019 4$:                                                   ; used to be 2$                        [31]
             0A AB   04   88  05BA  1020          BISB2   #HP$M_NAME,HP$B_FLAGS(R11) ; we have a long device name                [28]
             55   04 AE   D0  05BE  1021          MOVL    4(SP),R5                        ; restore input string pointer         [28]
             08 AE   04   D0  05C2  1022          MOVL    #4,8(SP)                        ; condition error code                 [28]
                53   0A   D0  05C6  1023          MOVL    #10,R3                          ; max length for'node'                 [28]
        00000002'EF   95  05C9  1024          TSTB    ALLOC                           ; see if allocation flag set           [32]
                   15   12  05CF  1025          BNEQ    15$                             ; check for digits between $           [31]
                 00EF   31  05D1  1026          BRW     122$                            ; go to 122$                           [28]
                        05D4  1027 5$:
             08 AE   01   D0  05D4  1028          movl    #1, 8(sp)                       ; Assume prefix error in saved R2      [17]
                   52   D4  05D8  1029          clrl    r2                              ; Flag for un-enforced prefix devices  [17]
             51   EA AD   9E  05DA  1030 10$:     MovAB   Generic(Fp), R1                 ; Get address of enforced generic      [17]
                50   81   9A  05DE  1031          MovZBL  (R1)+, R0                       ; .. and it's length                   [17]
                   2A   12  05E1  1032          bneq    20$                             ; Branch if OK to check                [17]
                 00C4   31  05E3  1033          brw     110$                            ; No enforced generic for this device  [17]
                   55   D6  05E6  1034 15$:     incl    r5                              ; Get past '$'                         [31]
                   54   D7  05E8  1035          decl    r4                              ; Decrement length                     [31]
        00000000'EF   16  05EA  1036          jsb     L^scan$decimal                  ; Check for numbers                    [31]
                   07   12  05F0  1037          bneq    17$                             ; Branch around error jump             [31]
             08 AE   05   D0  05F2  1038          movl    #5,8(sp)                        ; Error code for allocation class      [31]
                 00AA   31  05F6  1039          brw     100$                            ; Error found clean it up              [31]
    0000FFFF 8F   50   D1  05F9  1040 17$:     cmpl    r0,#65535                       ; See if within range                  [32]
                   08   14  0600  1041          bgtr    18$                             ; Intermediate step                    [31]
                01   50   D1  0602  1042          cmpl    r0,#1                           ; Check range                          [32]
                   03   19  0605  1043          blss    18$                             ; Intermediate step                    [31]
                 00C1   31  0607  1044          brw     125$                            ; Do letter check for cluster name     [31]
                 0084   31  060A  1045 18$:     brw     95$                             ; Skip check for letters               [31]
                   54   D5  060D  1046 20$:     tstl    r4                              ; Any string left?                     [17]
                   0C   15  060F  1047          bleq    25$                             ; Error if none                        [17]
                85   81   91  0611  1048          cmpb    (r1)+, (r5)+                    ; Compare a byte                       [17]
                   07   12  0614  1049          bneq    25$                             ; No good if mismatch                  [17]
                   54   D7  0616  1050          decl    r4                              ; Count the byte we checked            [17]
                  F2 50   F5  0618  1051          sobgtr  r0, 20$                         ; And loop til we're done              [17]
                   03   11  061B  1052          brb     30$                             ;                                      [31]
                  0083   31  061D  1053 25$:     BRW     100$                            ; Branches in 20$ out of range         [32]
                08 AE   D6  0620  1054 30$:     incl    8(sp)                           ; Increment saved R2                   [17]
             57   01   E0  0623  1055          bbs     #ptd$v_controller, -            ; Is there supposed to be a controller? [17]
                   0F       0626  1056                   R7, 50$                         ; ...if so, check for it               [17]
                 FF28   30  0627  1057          bsbw    if_alpha                        ; Is next character an alpha?          [17]
                1F 50   E9  062A  1058          blbc    r0, 60$                         ; If not, then we're OK--check unit    [17]
                73 52   E9  062D  1059          blbc    r2, 100$                        ; If enforced prefix, that's an error  [17]
                   54   D7  0630  1060          decl    r4                              ; Skip over the backtracked byte       [17]
                   55   D6  0632  1061          incl    r5                              ;                                      [17]
                   16   11  0634  1062          brb     60$                             ; Check unit number                    [17]
```

```
                                0636  1063 50$:                                  ; Need controller letter                [17]
                FF19   30       0636  1064        bsbW    if_alpha               ; Check next character                  [17]
               67 50   E9       0639  1065        blbc    r0, 100$               ; Error if not a letter!                [17]
                  54   D7       063C  1066        decl    r4                     ; Want to lose this                     [17]
            50    85   9A       063E  1067        movzbl  (r5)+, r0              ; Get controller letter                 [17]
         56   FE AD   9A       0641  1068        MovZBL  Parent_Controller(Fp), -; Get correct letter                    [17]
                                0645  1069                R6                     ; .. into R6                            [17]
                  05   13       0645  1070        beql    60$                    ; Not specified, check unit             [17]
            56    50   D1       0647  1071        cmpl    r0, r6                 ; Compare them                          [17]
                  57   12       064A  1072        bneq    100$                   ; Error if not equal                    [17]
                                064C  1073 60$:                                  ; Check for unit                        [17]
               08 AE   D6       064C  1074        incl    8(sp)                  ; Increment assumed error code          [17]
        00000000'EF    16       064F  1075        Jsb     L^scan$decimal         ; Is there a number here?               [17]
                  09   12       0655  1076        bneq    70$                    ; Branch if was                         [17]
         48 57    00   E0       0657  1077        bbs     #ptd$v_unit, R7, 100$  ; Error if wasn't, and needed one       [17]
            50    01   CE       065B  1078        mnegl   #1, r0                 ; Set no unit number code in R0         [17]
                  04   11       065E  1079        brb     80$                    ; Join common                           [17]
                                0660  1080 70$:                                  ; Found a unit number                   [17]
         3F 57    00   E1       0660  1081        bbc     #ptd$v_unit, R7, 100$  ; Error if was, and didn't want one     [17]
         02 AE    50   B0       0664  1082 80$:   movw    r0, 2(sp)              ; Set high word of saved R0             [17]
   6E    55   14 AE   A3       0668  1083        subw3   20(sp), r5, (sp)       ; Calculate length of name found        [17]
                  54   D5       066D  1084        tstl    r4                     ; Check for more characters             [17]
                  13   15       066F  1085        bleq    90$                    ; Really OK either way...               [17]
                  54   D7       0671  1086        decl    r4                     ; Assume we'll want next character      [17]
            3A    85   91       0673  1087        cmpb    (r5)+, #^A":"          ; Is it a colon?                        [17]
                  0C   13       0676  1088        beql    90$                    ; That's cool, a colon feels just fine  [17]
                  54   D6       0678  1089        incl    r4                     ; Don't want next character, elsewise   [17]
            20    75   91       067A  1090        cmpb    -(r5), #^A" "          ; Is next a space?                      [17]
                  05   13       067D  1091        beql    90$                    ; Can be terminated by space            [17]
            09    65   91       067F  1092        cmpb    (r5), #^x9             ; Is it a tab?                          [17]
                  1F   12       0682  1093        bneq    100$                   ; Otherwise, may be hex 'unit number'   [17]
                                0684  1094 90$:                                  ; Here's the successful return stuff    [17]
         10 AE    54   7D       0684  1095        movq    r4, 16(sp)             ; Update saved pointers                 [17]
            00FF  8F   BA       0688  1096        popr    #^M<r0,r1,r2,r3,r4,r5,r6,r7>    ; Restore the registers         [17]
                  52   D4       068C  1097        clrl    r2                     ; No error found                        [17]
                  50   B5       068E  1098        tstw    r0                     ; Check for anything found              [17]
                       05       0690  1099        rsb                            ; And return happily                    [17]
                                0691  1100 95$:                                  ; Set codes for range error             [31]
   00000003'EF    01   90       0691  1101        movb    #1,range               ; Set range error flag                  [31]
   00000002'EF    00   90       0698  1102        movb    #0,alloc               ; Clear allocation error flag           [31]
         08 AE    05   9A       069F  1103        movzbl  #5,8(sp)               ; Sets code                             [31]
                                06A3  1104 100$:                                 ; Error return                          [17]
            00FF  8F   BA       06A3  1105        popr    #^M<r0,r1,r2,r3,r4,r5,r6,r7>    ; Restore registers             [17]
                  50   7C       06A7  1106        clrq    r0                     ; Act as if nothing found               [17]
                       05       06A9  1107        rsb                            ; and return                            [17]
                                06AA  1108 110$:                                 ; Here if no enforced prefix            [17]
            53    02   D0       06AA  1109        movl    #2, r3                 ; Set min length for generic            [17]
               004E   30       06AD  1110        bsbw    scan_alpha             ; Check string                          [17]
                  F1   19       06B0  1111        blss    100$                   ; If too few, error                     [17]
                  55   D7       06B2  1112        decl    r5                     ; Backup for controller check           [17]
                  54   D6       06B4  1113        incl    r4                     ;                                       [17]
            52    01   D0       06B6  1114        movl    #1, r2                 ; set flag                              [17]
               FF64   31       06B9  1115        brw     30$                    ; Check controller                      [17]
                                06BC  1116 120$:                                 ; Node name check                       [17]
         08 AE    04   D0       06BC  1117        movl    #4, 8(sp)              ; Give back node name error code        [17]
            53    06   D0       06C0  1118        movl    #6, r3                 ; Maximum length of node name           [17]
                                06C3  1119 122$:                                 ; Do letter check for cluster name      [31]
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                45   10  06C3          bsbb    scan_alphanum           ; Check it                                [24]
                DC   1A  06C5          BGtrU   100$                    ; Branch if error                         [17]
                50   B5  06C7          TstW    R0                      ; Check for zero length, too              [17]
                D8   15  06C9          BLeq    100$                    ; Error if nothing                        [17]
                         06CB  125$:                                   ; 122$ broken up to input allocation      [31]
            57  03   D3  06CB          BITL    #PTD$M_CONTROLLER!PTD$M_UNIT, R7 ; Check for more field proc'g   [26]
                27   13  06CE          BEQL    135$                    ; Branch if not                           [26]
                54   D5  06D0          TSTL    R4                      ; Anything left ?                         [26]
                1E   15  06D2          Bleq    129$                    ; Branch if not                           [26]
            24  65   91  06D4          CMPB    (R5),#^A"$"             ; should be '$'                           [28]
                1E   12  06D7          BNEQ    135$                    ; Branch if not.                          [26]
                55   D6  06D9          INCL    R5                      ; Skip '$'.                               [26]
                54   D7  06DB          DECL    R4                      ; Skip character                          [26]
                34   BB  06DD          PUSHR   #^M<R2,R4,R5>           ; save registers                          [28]
        52  0C AB   9E  06DF          MOVAB   HP$T_DEVICE(R11),R2     ; pointer to device name                  [28]
        82  5F 8F   90  06E3          MOVB    #^A"_",(R2)+            ; insert '_' physical device indicator    [28]
                         06E7  128$:
            20  65   91  06E7          CMPB    (R5),#^A" "             ; are we finished ?                       [28]
                06   13  06EA          BEQL    129$                    ; then go to 129$                         [28]
            82  85   90  06EC          MOVB    (R5)+,(R2)+             ; copy byte                               [28]
              F5 54   F5  06EF          SOBGTR  R4,128$                 ; do for whole string                     [28]
                         06F2  129$:
                34   BA  06F2          POPR    #^M<R2,R4,R5>           ; restore registers                       [28]
              FEDD   31  06F4          BRW     5$                      ;Check for other enforced functions.      [26]
        50  FF 8F   98  06F7  135$:    CvtBL   #-1, R0                 ; Set to return 'no unit number'          [17]
              FF66   31  06FB          BRW     80$                     ; OK if less than                         [17]
                         06FE
                         06FE  ;
                         06FE  ; Small routine to call scan$alpha and compare return length
                         06FE  ;
                         06FE
                         06FE  scan_alpha:                             ;                                         [17]
                08   BB  06FE          pushr   #^M<r3>                 ; Save the compare length                 [17]
        00000000'EF  16  0700          Jsb     L^scan$alpha            ; Call PARSE scan routine                 [17]
            8E  50   D1  0706          cmpl    r0, (sp)+               ; Do comparison                           [17]
                     05  0709          rsb                             ; Return                                  [17]
                         070A  ;
                         070A  ; Small routine to call scan$alphanum and compare return length
                         070A  ;
                         070A
                         070A  scan_alphanum:                          ;                                         [24]
                08   BB  070A          pushr   #^M<r3>                 ; Save the compare length                 [24]
        00000000'EF  16  070C          Jsb     L^scan$alphanum         ; Call PARSE scan routine                 [24]
            8E  50   D1  0712          cmpl    r0, (sp)+               ; Do comparison                           [24]
                     05  0715          rsb                             ; Return                                  [24]
                         0716
```

```
0716  1167          .SBTTL  PT_INTERPRET    Decode PT-descriptor
0716  1168
0716  1169 ;++
0716  1170 ; FUNCTIONAL DESCRIPTION:
0716  1171 ;
0716  1172 ;       This routine is used to interpret the P-table descriptor
0716  1173 ;       which builds the P-table for the current unit.
0716  1174 ;       Each OP code is examined and executed.  If during the
0716  1175 ;       execution input text is required, the input string is examined
0716  1176 ;       if the string is empty the input routine is called to get input.
0716  1177 ;
0716  1178 ; CALLING SEQUENCE:
0716  1179 ;
0716  1180 ;       PT$INTERPRET (INITPC, BASE, TEXT, PROMPT)
0716  1181 ;
0716  1182 ; INPUT PARAMETERS:
0716  1183 ;
0716  1184 ;       INITPC  Initial PC for interpretation
0716  1185 ;       BASE    Base for data storage
0716  1186 ;       TEXT    Address of Quad descriptor of text
0716  1187 ;       PROMPT  Address of buffer to receive ASCIC prompt text
0716  1188 ;               if failure
0716  1189 ;                                                                    ;G:10
0716  1190 ; IMPLICIT INPUTS:      NONE
0716  1191 ;
0716  1192 ; OUTPUT PARAMETERS:
0716  1193 ;
0716  1194 ; IMPLICIT OUTPUTS:
0716  1195 ;
0716  1196 ;       P-table effected by intpretation of PT-descriptor
0716  1197 ;
0716  1198 ; REGISTER USAGE:
0716  1199 ;
0716  1200 ;       R0      Length of compare string/scratch
0716  1201 ;       R1      Address of compare string/scratch
0716  1202 ;       R2      Current index in PD_STRING/scratch
0716  1203 ;       R3      Remaining length in PD_STRING/scratch
0716  1204 ;       R4      Length of input string
0716  1205 ;       R5      Address of input string
0716  1206 ;       R6      Address of prompt string descriptor
0716  1207 ;       R8      Address of input descriptor
0716  1208 ;       R9      Current VALUE
0716  1209 ;       R10     Virtural PC for P-table intpretation
0716  1210 ;       R11     Base of P-table
0716  1211 ;
0716  1212 ; COMPLETION CODES:
0716  1213 ;
0716  1214 ;       SS$_NORMAL
0716  1215 ;       SS$_BADPARAM
0716  1216 ;       SS$_INSFARG
0716  1217 ;--
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```
                        0716  1219
                        0716  1220          $OFFSET 4,POSITIVE,< -
                        0716  1221                  <IARG$_PC,4>,-
                        0716  1222                  <IARG$_BASE,4>,-
                        0716  1223                  <IARG$_TEXT,4>,-
                        0716  1224                  <IARG$_PROMPT,4>>
                        0716                  .SAVE   LOCAL_BLOCK
                        0716                  .PSECT $ABS$ ABS
                00000004  FFFF                .=4
                          0004        IARG$_PC:
                00000008  0004                .BLKB   4
                          0008        IARG$_BASE:
                0000000C  0008                .BLKB   4
                          000C        IARG$_TEXT:
                00000010  000C                .BLKB   4
                          0010        IARG$_PROMPT:
                00000014  0010                .BLKB   4
                      00000716                .RESTORE
                        0716  1225
                        0716  1226          $OFFSET 0,NEGATIVE,< -
                        0716  1227                  <OLDPC,4>,-
                        0716  1228                  <DESC,8>,-
                        0716  1229                  <BUFFER,132>,-
                        0716  1230                  <LOCAL,0>>
                        0716                  .SAVE   LOCAL_BLOCK
                        0716                  .PSECT $ABS$ ABS
                00000000  FFFF                .=0
                FFFFFFFC  0000                .BLKB   -4
                          FFFC        OLDPC:
                FFFFFFF4  FFFC                .BLKB   -8
                          FFF4        DESC:
                FFFFFF70  FFF4                .BLKB   -132
                          FF70        BUFFER:
                          FF70        LOCAL:
                      00000716                .RESTORE
                        0716  1231
```

```
                                0716  1233
                          0FFC  0716  1234 .ENTRY  PT$INTERPRET,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>
                                0718  1235
          5E    FF70 CD   9E  0718  1236          MOVAB   LOCAL(FP),SP              ; Allocate space for local storage
       F8 AD    FF70 CD   9E  071D  1237          MOVAB   BUFFER(FP),DESC+4(FP)     ; Address of buffer to descriptor
                              0723  1238
             58    0C BC   7E  0723  1239          MOVAQ   @IARG$_TEXT(AP),R8        ; Get address of text descriptor
                54    68   7D  0727  1240          MOVQ    (R8),R4                   ; Fetch descriptor
                54    54   3C  072A  1241          MOVZWL  R4,R4                     ; Be sure we only use word of length
             56    10 BC   7E  072D  1242          MOVAQ   @IARG$_PROMPT(AP),R6      ; Set address of prompt string
             5A    04 AC   D0  0731  1243          MOVL    IARG$_PC(AP),R10          ; Get initial PC
             5B    08 AC   D0  0735  1244          MOVL    IARG$_BASE(AP),R11        ; Base of P-table
             6A    80 8F   91  0739  1245          CMPB    #PD$_START,(R10)          ; Must start with start OP
                      27   12  073D  1246          BNEQ    BADPARAM                  ; Branch if not
                              073F  1247 INTERPRET:
          FC AD    5A   D0  073F  1248          MOVL    R10,OLDPC(FP)             ; Incase of backup
                              0743  1249          CASE    SRC=(R10)+,TYPE=B,LIMIT=#PD$_START,DISPLIST=< -
                              0743  1250                  PD_START, -
                              0743  1251                  PD_FINISH, -
                              0743  1252                  PD_DECIMAL, -
                              0743  1253                  PD_OCTAL, -
                              0743  1254                  PD_HEXADECIMAL, -
                              0743  1255                  PD_STRING, -
                              0743  1256                  PD_LITERAL, -
                              0743  1257                  PD_FETCH, -
                              0743  1258                  PD_STORE, -
                              0743  1259                  PD_COMPLEMENT, -
                              0743  1260                  pd_add, -                 ; Add statment                          [09]
                              0743  1261                  pd_logical, -             ; Logical prompt statment               [09]
                              0743  1262                  pd_case, -                ; Case statement                        [09]
                              0743  1263                  pd_name, -                ; Name directive                      ;G:9
                              0743  1264                  pd_epb>                   ; Extended P-table Block [17]         ;G:9
    0E'   80 8F    8A   8F   0743                  CASEB   (R10)+,#PD$_START,S^#<<30001$-30000$>/2>-1
                              0748          30000$:
                    0022'     0748                  .SIGNED_WORD    PD_START-30000$
                    0027'     074A                  .SIGNED_WORD    PD_FINISH-30000$
                    0118'     074C                  .SIGNED_WORD    PD_DECIMAL-30000$
                    0149'     074E                  .SIGNED_WORD    PD_OCTAL-30000$
                    0179'     0750                  .SIGNED_WORD    PD_HEXADECIMAL-30000$
                    0215'     0752                  .SIGNED_WORD    PD_STRING-30000$
                    002B'     0754                  .SIGNED_WORD    PD_LITERAL-30000$
                    0030'     0756                  .SIGNED_WORD    PD_FETCH-30000$
                    0041'     0758                  .SIGNED_WORD    PD_STORE-30000$
                    0052'     075A                  .SIGNED_WORD    PD_COMPLEMENT-30000$
                    0057'     075C                  .SIGNED_WORD    pd_add-30000$
                    0071'     075E                  .SIGNED_WORD    pd_logical-30000$
                    00E9'     0760                  .SIGNED_WORD    pd_case-30000$
                    0106'     0762                  .SIGNED_WORD    pd_name-30000$
                    0112'     0764                  .SIGNED_WORD    pd_epb-30000$
                              0766          30001$:
                              0766  1265 BADPARAM:
             50    14   D0   0766  1266          MOVL    S^#SS$_BADPARAM,R0        ; Bad PT-desc
                      04   0769  1267          RET                               ; Return
                              076A  1268
                              076A  1269 PD_START:
             59    01   CE   076A  1270          MNEGL   #1,R9                     ; Initialize to minus 1
                   D0   11   076D  1271          BRB     INTERPRET                 ; Next
```

```
                                076F  1272
                                076F  1273 PD_FINISH:
                     50   01    D0  076F  1274          MOVL    S^#SS$_NORMAL,R0        ; It worked
                                04  0772  1275          RET
                                    0773  1276
                                    0773  1277 PD_LITERAL:
                     59   8A    D0  0773  1278          MOVL    (R10)+,R9               ; Set current value
                          C7    11  0776  1279          BRB     INTERPRET               ; Next!
                                    0778  1280
                                    0778  1281 PD_FETCH:
                     50   8A    3C  0778  1282          MOVZWL  (R10)+,R0               ; Get byte offset
                     51   8A    9A  077B  1283          MOVZBL  (R10)+,R1               ; Bit offset
                     52   8A    9A  077E  1284          MOVZBL  (R10)+,R2               ; Field size
               59    6B40   52    51  EF  0781  1285          EXTZV   R1,R2,(R11)[R0],R9      ; Get field
                          B6    11  0787  1286          BRB     INTERPRET               ; Next!
                                    0789  1287
                                    0789  1288 PD_STORE:
                     50   8A    3C  0789  1289          MOVZWL  (R10)+,R0               ; Get byte offset
                     51   8A    9A  078C  1290          MOVZBL  (R10)+,R1               ; Bit offset
                     52   8A    9A  078F  1291          MOVZBL  (R10)+,R2               ; Field size
               6B40   52    51    59  F0  0792  1292          INSV    R9,R1,R2,(R11)[R0]      ; Insert the field
                          A5    11  0798  1293          BRB     INTERPRET
                                    079A  1294
                                    079A  1295 PD_COMPLEMENT:
                     59   59    D2  079A  1296          MCOML   R9,R9                   ; Complement value
                          A0    11  079D  1297          BRB     INTERPRET               ; Next function
                                    079F  1298
                                    079F  1299 PD_ADD:
                     50   8A    3C  079F  1300          MOVZWL  (R10)+,R0               ; Get byte offset
                     51   8A    9A  07A2  1301          MOVZBL  (R10)+,R1               ; Get bit offset
                     52   8A    9A  07A5  1302          MOVZBL  (R10)+,R2               ; Field size
               53    6B40   52    51  EE  07A8  1303          EXTV    R1,R2,(R11)[R0],R3      ; Get sign extended field value
                     53   59    C0  07AE  1304          ADDL    R9,R3                   ; Add in current value
               6B40   52    51    53  F0  07B1  1305          INSV    R3,R1,R2,(R11)[R0]      ; Put field back
                          86    11  07B7  1306          BRB     INTERPRET               ; Next function
                                    07B9  1307
                                    07B9  1308 pd_logical:                             ; Process LOGICAL                  [09]
                     52   5E    D0  07B9  1309          movl    sp, r2                  ; Save stack pointer               [09]
                     53   5A    D0  07BC  1310          movl    r10, r3                 ; Get address of prompt string     [09]
               00000B60'EF        16  07BF  1311          Jsb     L^get_line              ; Get data                         [18]
                      68   50    E9  07C5  1312          blbc    r0, 50$                 ; Exit immediately if error        [09]
               00000000'EF        16  07C8  1313          Jsb     L^scan$alpha            ; Read alpha string                [18]
                          41    13  07CE  1314          beql    40$                     ; Error if none                    [09]
                     53   50    D0  07D0  1315          movl    r0, r3                  ; Save length read                 [09]
                          59    D4  07D3  1316          clrl    r9                      ; Assume 'no'                      [09]
                7E   4F4E  8F    B0  07D5  1317          movw    #^A"NO", -(sp)          ; Push on 'no' to check            [09]
                     7E   02    90  07DA  1318          movb    #2, -(sp)               ; Make it ASCIC                    [09]
                      4E  8F    61  91  07DD  1319          cmpb    (r1), #^A"N"            ; Does it really start with an 'n'?[09]
                          0B    13  07E1  1320          beql    10$                     ; Yep--verify                      [09]
                     5E   52    D0  07E3  1321          movl    r2, sp                  ; Restore stack                    [09]
                          59    D6  07E6  1322          incl    r9                      ; It's a 'yes' or nothing          [09]
               53455903   8F    DD  07E8  1323          pushl   #3+<^A"YES"@8>          ; Push on ASCIC 'yes'              [09]
                     50   8E    9A  07EE  1324 10$:     movzbl  (sp)+, r0               ; Get the length                   [09]
                     50   53    D1  07F1  1325          cmpl    r3, r0                  ; Is input too long?               [09]
                          1B    14  07F4  1326          bgtr    40$                     ; If so, error                     [09]
                     50   53    D0  07F6  1327          movl    r3, r0                  ; Copy to destructable it          [09]
                     8E   81    91  07F9  1328 20$:     cmpb    (r1)+, (sp)+            ; Compare bytes                    [09]
```

```
                    13   12  07FC          bneq    40$                     ; Error!                                [09]
                 F8 50   F5  07FE          sobgtr  r0, 20$                 ; Loop on the check                     [09]
              5E    52   D0  0801  30$:    movl    r2, sp                  ; Restore stack                         [09]
              50    8A   9A  0804          movzbl  (r10)+, r0              ; Get length of prompt                  [09]
              5A    50   C0  0807          addl2   r0, r10                 ; Skip it                               [09]
           02 A8    53   A0  080A          addw    r3, 2(r8)               ; We've just accepted more of string    [09]
                 FF2E   31  080E          brw     interpret               ; Back for next statement               [09]
              5E    52   D0  0811  40$:    movl    r2, sp                  ; Restore stack                         [09]
                    6A   9F  0814          pushab  (r10)                   ; Address of prompt                     [09]
        00000352'EF    7F  0816          pushaq  t_yesno                 ; 'yes,no'                              [09]
        00000348'EF    9F  081C          pushab  t_shouldbe              ; 'Should be'                           [09]
        00000360'EF    7F  0822          pushaq  t_string                ; Use invalid string argument           [09]
       0B88'CF    04   FB  0828          calls   #4, w^format_prompt     ; Format prompt return                  [09]
              50    14   D0  082D          movl    #ss$_badparam, r0       ; Invalid parameter                     [09]
                         04  0830  50$:    ret                             ;                                       [09]
                             0831
                             0831  pd_case:                                ; Case operation                        [09]
              50    8A   9A  0831          movzbl  (r10)+, r0              ; Count of cases                        [09]
                    0B   13  0834          beql    20$                     ; Exit if none (it's OK, though)        [09]
              51    8A   7D  0836  10$:    movq    (r10)+, r1              ; Get next case pair                    [09]
              59    51   D1  0839          cmpl    r1, r9                  ; Does this one match?                  [09]
                    06   13  083C          beql    30$                     ; If it does, do replacement            [09]
                 F5 50   F5  083E          sobgtr  r0, 10$                 ; Loop through cases                    [09]
                 FEFB   31  0841  20$:    brw     interpret               ; OK, return                            [09]
              59    52   D0  0844  30$:    movl    r2, r9                  ; Do value replacement                  [09]
       5A   F8 AA40    7E  0847          movaq   -8(r10)[r0], r10        ; Skip rest of the values               [09]
                    F3   11  084C          brb     20$                     ; Mission accomplished, as ordered      [09]
                             084E
                             084E  Pd_Name:                                ; Just skip over the name directive     [17]
           50    01 AA   9A  084E          MovZBL  1(R10), R0              ; Get length of enforced generic        [17]
       5A   02 AA40    9E  0852          MovAB   2(R10)[R0], R10         ; Skip over it all                      [17]
                 FEE5   31  0857          BrW     Interpret               ; Return                                [17]
                             085A  PD_EPB:                                                                         ;G:9
              5A    02   C0  085A          ADDL2   #2,R10                  ; Skip over word storage                ;G:9
                 FEDF   31  085D          BRW     INTERPRET                                                       ;G:9
                             0860  PD_DECIMAL:
              53    0A   D0  0860          MOVL    #10,R3                  ; Set radix
                 008F   30  0863          BSBW    PD_NUMERIC              ; Join common
41 21 20 43 41 21 0000086E'010E0000'  0866          .ASCID  "!AC !AC decimal !UL thru !UL!/!AC? "                 ;G:10
55 21 20 6C 61 6D 69 63 65 64 20 43  0874
2F 21 4C 55 21 20 75 72 68 74 20 4C  0880
                20 3F 43 41 21  088C
                             0891  PD_OCTAL:
              53    08   D0  0891          MOVL    #8,R3                   ; Set radix
                    5F   10  0894          BSBB    PD_NUMERIC              ; Join common
41 21 20 43 41 21 0000089E'010E0000'  0896          .ASCID  "!AC !AC octal !6OL thru !6OL!/!AC? "
4C 4F 36 21 20 6C 61 74 63 6F 20 43  08A4
2F 21 4C 4F 36 21 20 75 72 68 74 20  08B0
                20 3F 43 41 21  08BC
                             08C1  PD_HEXADECIMAL:
              53    10   D0  08C1          MOVL    #16,R3                  ; Set radix
                    2F   10  08C4          BSBB    PD_NUMERIC              ; join common
41 21 20 43 41 21 000008CE'010E0000'  08C6          .ASCID  "!AC !AC hexadecimal !XL thru !XL!/!AC? "
61 6D 69 63 65 64 61 78 65 68 20 43  08D4
21 20 75 72 68 74 20 4C 58 21 20 6C  08E0
         20 3F 43 41 21 2F 21 4C 58  08EC
                             08F5  PD_NUMERIC:
```

```
                     53   DD  08F5  1377          PUSHL   R3                      ; Save radix
                  53 5A   D0  08F7  1378          MOVL    R10,R3                  ; Address of ascic prompt
                  52 5A   D0  08FA  1379          MOVL    R10,R2                  ; Save prompt string for later
          00000B60'EF     16  08FD  1380          Jsb     L^GET_LINE              ; Span spaces, new input if necessary   [18]
                  53 8ED0 0903  1381          POPL    R3                      ; restore radix
               53 50   E9  0906  1382          BLBC    R0,30$                  ; Return if input errors
                  51 8A   9A  0909  1383          MOVZBL  (R10)+,R1               ; Length of prompt
                  5A 51   C0  090C  1384          ADDL    R1,R10                  ; Skip over prompt
                  57 55   D0  090F  1385          MOVL    R5,R7                   ; Save current string address
                     04   BB  0912  1386          PUSHR   #^M<R2>                 ; Save pointer on stack now
          00000000'EF     16  0914  1387          Jsb     L^SCAN$NUMERIC          ; Scan and fetch input                  [18]
                     04   BA  091A  1388          POPR    #^M<R2>                 ; Restore pointer
                     22   13  091C  1389          BEQL    20$                     ; Branch on bad input
                57 55 57   C3  091E  1390          SUBL3   R7,R5,R7                ; Calculate length of number
                     51   D5  0922  1391          TSTL    R1                      ; High order portion must be zero
                     1A   12  0924  1392          BNEQ    20$                     ; Branch on out of range
                  6A 50   D1  0926  1393          CMPL    R0,(R10)                ; Compare data with low limit
                     15   1F  0929  1394          BLSSU   20$                     ; Branch if less than limit
               04 AA 50   D1  092B  1395          CMPL    R0,4(R10)               ; Compare data with high limit
                     0F   1A  092F  1396          BGTRU   20$                     ; Branch if out of range
                  59 50   D0  0931  1397          MOVL    R0,R9                   ; Set current value
                  5A 08   C0  0934  1398          ADDL    #8,R10                  ; Skip over low/high
                     8E   D5  0937  1399          TSTL    (SP)+                   ; Remove edit string address
               02 A8 57   A0  0939  1400          ADDW2   R7,2(R8)                ; Increase length used so far
                  FDFF    31  093D  1401          BRW     INTERPRET               ; Next instruction
                          0940  1402 20$:
                  50 8E   D0  0940  1403          MOVL    (SP)+,R0                ; Get address of error edit string
                     62   9F  0943  1404          PUSHAB  (R2)                    ; Prompt address
                  7E 6A   7D  0945  1405          MOVQ    (R10),-(SP)             ; Push lower/upper bounds
          00000348'EF     9F  0948  1406          PUSHAB  L^T_SHOULDBE            ; Descriptive text argument             [10]
                     62   9F  094E  1407          PUSHAB  (R2)                    ; Prompt
                     60   7F  0950  1408          PUSHAQ  (R0)                    ; Address of format descriptor
          00000B88'EF 06   FB  0952  1409          CALLS   #6,L^FORMAT_PROMPT      ; Do formatting & copy                  [10]
                  50 14   D0  0959  1410          MOVL    #SS$_BADPARAM,R0        ; Bad parameter return
                          095C  1411 30$:
                     04   04  095C  1412          RET                             ; Return on error
```

```
                        095D  1414
                        095D  1415 PD_STRING:
        53   5A   D0   095D  1416          MOVL    R10,R3                  ; Copy address of ascic prompt
        57   53   D0   0960  1417          MOVL    R3,R7                   ; Save prompt address
 00000B60'EF   16   0963  1418          Jsb     L^GET_LINE              ; Verify something there
      01 50   E8   0969  1419          BLBS    R0,10$                  ; Branch if it worked
                   04   096C  1420          RET                             ; Return if input spaz
                        096D  1421 10$:
        59   01   CE   096D  1422          MNEGL   #1,R9                   ; Initialize VALUE
        53   8A   9A   0970  1423          MOVZBL  (R10)+,R3               ; Get length of prompt
                        0973  1424
        5A   53   C0   0973  1425 20$:     ADDL    R3,R10                  ; Skip over something
        53   8A   9A   0976  1426          MOVZBL  (R10)+,R3               ; Get length of next something
             2D   13   0979  1427          BEQL    70$                     ; Branch if end of list
             59   D6   097B  1428          INCL    R9                      ; Update string index
                        097D  1429
  50    54   53   C3   097D  1430          SUBL3   R3,R4,R0                ; Length remaining after this match
             F0   19   0981  1431          BLSS    20$                     ; Input shorter, try next string
        51   55   D0   0983  1432          MOVL    R5,R1                   ; Copy input address
             05   11   0986  1433          BRB     40$                     ; Start with count
        8A   81   91   0988  1434 30$:     CMPB    (R1)+,(R10)+            ; Compare character
             E6   12   098B  1435          BNEQ    20$                     ; Branch if mismatch
          F8 53   F4   098D  1436 40$:     SOBGEQ  R3,30$                  ; Count and try again if more
  53    51   55   C3   0990  1437          SUBL3   R5,R1,R3                ; Calc length of string
    02  A8   53   A0   0994  1438          ADDW2   R3,2(R8)                ; Increase length used so far
        54   50   7D   0998  1439          MOVQ    R0,R4                   ; Put updated input pointers back
             53   D4   099B  1440          CLRL    R3                      ; Already in position, add zero
        5A   53   C0   099D  1441 50$:     ADDL    R3,R10                  ; Skip over this one
        53   8A   9A   09A0  1442          MOVZBL  (R10)+,R3               ; Get length of next item
             F8   12   09A3  1443          BNEQ    50$                     ; Branch if not end
           FD97   31   09A5  1444          BRW     INTERPRET               ; Next instruction
                        09A8  1445
                        09A8  1446 70$:
    52   FF70 CD   9E   09A8  1447          MOVAB   BUFFER(FP),R2           ; Address buffer
                        09AD  1448
  5A   FC AD   01   C1   09AD  1449          ADDL3   #1,OLDPC(FP),R10        ; Point to prompt
        50   8A   9A   09B2  1450          MOVZBL  (R10)+,R0               ; Length of prompt
        5A   50   C0   09B5  1451          ADDL    R0,R10                  ; Skip prompt
                        09B8  1452
        50   8A   9A   09B8  1453 80$:     MOVZBL  (R10)+,R0               ; Get length of possible string
             0B   13   09BB  1454          BEQL    100$                    ; Branch if last string
        82   8A   90   09BD  1455 90$:     MOVB    (R10)+,(R2)+            ; Copy byte
          FA 50   F5   09C0  1456          SOBGTR  R0,90$                  ; Branch if any left
        82   2C   90   09C3  1457          MOVB    #^A',',(R2)+            ; Insert ','
             F0   11   09C6  1458          BRB     80$                     ; Try again
                        09C8  1459
             52   D7   09C8  1460 100$:    DECL    R2                      ; Remove ','
F4 AD   52   F8 AD   C3   09CA  1461          SUBL3   DESC+4(FP),R2,DESC(FP)  ; Length of prompt
             67   9F   09D0  1462          PUSHAB  (R7)                    ; Address of prompt string
           F4 AD   7F   09D2  1463          PUSHAQ  DESC(FP)                ; Address of strings
     00000348'EF   9F   09D5  1464          PUSHAB  L^T_SHOULDBE            ; Address of "should be" insert         [10]
     00000360'EF   7F   09DB  1465          PUSHAQ  L^T_STRING              ; Address of format descriptor          [10]
00000B88'EF   04   FB   09E1  1466          CALLS   #4,L^FORMAT_PROMPT      ; Do formatting                         [10]
        50   14   D0   09E8  1467          MOVL    #SS$_BADPARAM,R0        ; Bad parameter
                   04   09EB  1468          RET
```

```
                        09EC  1470          .SBTTL  DP$EXTRACT      Make P-table printable
                        09EC  1471
                        09EC  1472 ;++
                        09EC  1473 ; FUNCTIONAL DESCRIPTION:
                        09EC  1474 ;
                        09EC  1475 ;       This routine can be used to convert the data stored in              ;G:10
                        09EC  1476 ;       a P-table using the PT-descriptor to an ASCII string to be
                        09EC  1477 ;       printed.
                        09EC  1478 ;
                        09EC  1479 ; CALLING SEQUENCE:
                        09EC  1480 ;
                        09EC  1481 ;       PT$EXTRACT(PC,BASE,LENGTH,ADDRESS)
                        09EC  1482 ;
                        09EC  1483 ; INPUT PARAMETERS:
                        09EC  1484 ;
                        09EC  1485 ;       PC      Start of PT-descriptor
                        09EC  1486 ;       BASE    Base of P-table
                        09EC  1487 ;       TEXT    Address of QUAD descriptor of buffer
                        09EC  1488 ;
                        09EC  1489 ; IMPLICIT INPUTS:
                        09EC  1490 ;
                        09EC  1491 ; OUTPUT PARAMETERS:
                        09EC  1492 ;
                        09EC  1493 ;       TEXT    The length in the descriptor is updated
                        09EC  1494 ;
                        09EC  1495 ; IMPLICIT OUTPUTS:     NONE
                        09EC  1496 ;
                        09EC  1497 ; COMPLETION CODES:
                        09EC  1498 ;
                        09EC  1499 ;       SS$_BADPARAM    Incorrectly formed PT-descriptor
                        09EC  1500 ;       SS$_NORMAL      Completed successfully
                        09EC  1501 ;
                        09EC  1502 ; REGISTER USAGE:
                        09EC  1503 ;
                        09EC  1504 ;       R9      current VALUE
                        09EC  1505 ;       R10     Current PC in PT-descriptor
                        09EC  1506 ;       R11     Base address of P-table
                        09EC  1507 ;--
```

```
                                 09EC
                                 09EC          $OFFSET 4,POSITIVE,< -
                                 09EC          <EARG$_PC,4>, -
                                 09EC          <EARG$_BASE,4>, -
                                 09EC          <EARG$_TEXT,4>>
                                 09EC          .SAVE   LOCAL_BLOCK
                                 09EC          .PSECT $ABS$ ABS
                        00000004 FFFF          .=4
                                 0004    EARG$_PC:
                        00000008 0004          .BLKB   4
                                 0008    EARG$_BASE:
                        0000000C 0008          .BLKB   4
                                 000C    EARG$_TEXT:
                        00000010 000C          .BLKB   4
                              000009EC         .RESTORE
                                 09EC
                            0FFC 09EC .ENTRY  PT$EXTRACT,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>
                                 09EE
                 5A   04 AC   7D 09EE          MOVQ    EARG$_PC(AP),R10        ; Get PC and BASE
                 57   0C BC   7D 09F2          MOVQ    @EARG$_TEXT(AP),R7      ; Get length of buffer
                         56   D4 09F6          CLRL    R6                      ; Clear Last valid edit string
                 6A   80 8F   91 09F8          CMPB    #PD$_START,(R10)        ; Verify good format
                         23   12 09FC          BNEQ    EX_BADPARAM             ; WRONG!
                                 09FE    EXTRACT:
                                 09FE          CASE    SRC=(R10)+,TYPE=B,LIMIT=#PD$_START,DISPLIST=< -
                                 09FE                  EX_START, -
                                 09FE                  EX_FINISH, -
                                 09FE                  EX_DECIMAL, -
                                 09FE                  EX_OCTAL, -
                                 09FE                  EX_HEXADECIMAL, -
                                 09FE                  EX_STRING, -
                                 09FE                  EX_LITERAL, -
                                 09FE                  EX_FETCH, -
                                 09FE                  EX_STORE, -
                                 09FE                  EX_COMPLEMENT, -
                                 09FE                  ex_add, -               ; Add operation                    [09]
                                 09FE                  ex_logical, -           ; logical                          [09]
                                 09FE                  ex_case, -              ; Case                             [09]
                                 09FE                  ex_name,-                                                ;G:9
                                 09FE                  ex_epb>         ; name                          [17]  ;G:9
        0E'  80 8F   8A   8F     09FE          CASEB   (R10)+,#PD$_START,S^#<<30003$-30002$>/2>-1
                                 0A03    30002$:
                            0022' 0A03          .SIGNED_WORD    EX_START-30002$
                            006C' 0A05          .SIGNED_WORD    EX_FINISH-30002$
                            0024' 0A07          .SIGNED_WORD    EX_DECIMAL-30002$
                            0024' 0A09          .SIGNED_WORD    EX_OCTAL-30002$
                            0024' 0A0B          .SIGNED_WORD    EX_HEXADECIMAL-30002$
                            002F' 0A0D          .SIGNED_WORD    EX_STRING-30002$
                            004F' 0A0F          .SIGNED_WORD    EX_LITERAL-30002$
                            004F' 0A11          .SIGNED_WORD    EX_FETCH-30002$
                            0079' 0A13          .SIGNED_WORD    EX_STORE-30002$
                            0051' 0A15          .SIGNED_WORD    EX_COMPLEMENT-30002$
                            004F' 0A17          .SIGNED_WORD    ex_add-30002$
                            0041' 0A19          .SIGNED_WORD    ex_logical-30002$
                            0053' 0A1B          .SIGNED_WORD    ex_case-30002$
                            005C' 0A1D          .SIGNED_WORD    ex_name-30002$
                            0067' 0A1F          .SIGNED_WORD    ex_epb-30002$
```

```
                                0A21        30003$:
                                0A21  1539 EX_BADPARAM:
          50    14    D0        0A21  1540          MOVL    S^#SS$_BADPARAM,R0      ; bad format PT-descriptor
                      04        0A24  1541          RET
                                0A25  1542
                                0A25  1543 EX_START:
                D7    11        0A25  1544          BRB     EXTRACT                 ; Nop
                                0A27  1545 EX_DECIMAL:
                                0A27  1546 EX_OCTAL:
                                0A27  1547 EX_HEXADECIMAL:
       56   FF AA    9E        0A27  1548          MOVAB   -1(R10),R6              ; Save PC of prompt type inst
                1E    10        0A2B  1549          BSBB    SKIP                    ; Skip prompt
          5A    08    C0        0A2D  1550          ADDL    #8,R10                  ; Skip low and high limits
                CC    11        0A30  1551          BRB     EXTRACT                 ; Next inst
                                0A32  1552 EX_STRING:
       56   FF AA    9E        0A32  1553          MOVAB   -1(R10),R6              ; Save address of prompt type inst
                13    10        0A36  1554          BSBB    SKIP
                50    D4        0A38  1555          CLRL    R0                      ; Clear advance length
                                0A3A  1556 10$:
          5A    50    C0        0A3A  1557          ADDL    R0,R10                  ; Skip something
          50    8A    9A        0A3D  1558          MOVZBL  (R10)+,R0               ; Get length
                F8    12        0A40  1559          BNEQ    10$                     ; Try again
                BA    11        0A42  1560          BRB     EXTRACT                 ; Next instruction
                                0A44  1561 ex_logical:                              ;                                       [09]
       56   FF AA    9E        0A44  1562          movab   -1(r10), r6             ; Save address of directive             [09]
            B3 AF    9F        0A48  1563          pushab  extract                 ; Set up for SKIP to do RSB             [09]
                                0A4B  1564 SKIP:
          50    8A    9A        0A4B  1565          MOVZBL  (R10)+,R0               ; Get length
          5A    50    C0        0A4E  1566          ADDL    R0,R10                  ; Skip string
                      05        0A51  1567          RSB
                                0A52  1568
                                0A52  1569 EX_LITERAL:
                                0A52  1570 EX_FETCH:
                                0A52  1571 EX_ADD:
                8A    D5        0A52  1572          TSTL    (R10)+                  ; Skip literal or word+byte+byte
                                0A54  1573 EX_COMPLEMENT:
                A8    11        0A54  1574          BRB     EXTRACT                 ; next!
                                0A56  1575 ex_case:                                 ;                                       [09]
          50    8A    9A        0A56  1576          movzbl  (r10)+, r0              ; Get number of cases                   [09]
       5A    6A40    7E        0A59  1577          movaq   (r10)[r0], r10          ; Skip the cases                        [09]
                9F    11        0A5D  1578          brb     extract                 ; And continue interpretation           [09]
                                0A5F  1579
                                0A5F  1580 Ex_Name:                                 ; Skip over Name directive              [17]
       50    01 AA    9A        0A5F  1581          MovZBL  1(R10), R0              ; Get length of enforced generic        [17]
    5A    02 AA40    9E        0A63  1582          MovAB   2(R10)[R0], R10         ; Skip over it all                      [17]
                94    11        0A68  1583          BrB     Extract                 ; Return                                [17]
                                0A6A  1584
                                0A6A  1585 ex_epb:                                                                          ;G:9
          5A    02    C0        0A6A  1586          ADDL2   #2,R10                  ; Skip over word storage                ;G:9
                8F    11        0A6D  1587          BRb     extract                                                         ;G:9
                                0A6F  1588                                                                                  ;G:9
                                0A6F  1589 EX_FINISH:
       50    0C BC    7D        0A6F  1590          MOVQ    @EARG$_TEXT(AP),R0      ; Get length and address again
 0C BC    58    51    C3        0A73  1591          SUBL3   R1,R8,@EARG$_TEXT(AP)   ; Store new length
          50    01    D0        0A78  1592          MOVL    S^#SS$_NORMAL,R0        ; It worked
                      04        0A7B  1593          RET
```

```
                                0A7C  1595
                                0A7C  1596 EX_STORE:
                  50    8A   3C  0A7C  1597          MOVZWL  (R10)+,R0                ; Get byte offset
                  51    8A   9A  0A7F  1598          MOVZBL  (R10)+,R1                ; Get bit offset
                  52    8A   9A  0A82  1599          MOVZBL  (R10)+,R2                ; Get field size
      59   6B40   52    51   EF  0A85  1600          EXTZV   R1,R2,(R11)[R0],R9       ; Set current value
                        56   D5  0A8B  1601          TSTL    R6                       ; Valid?
                        03   12  0A8D  1602          BNeq    5$                       ; Yes, continue                    [17]
                      FF6C   31  0A8F  1603          BrW     EXTRACT                  ; No, next instruction             [17]
```

```
                                  0A92  1605 5$:     CASE    SRC=(R6)+,TYPE=B,LIMIT=#PD$_DECIMAL,DISPLIST=< -
                                  0A92  1606                 st_decimal,st_octal, -  ;                                  [09]
                                  0A92  1607                 st_hexadecimal, -       ;                                  [09]
                                  0A92  1608                 st_string, 10$, 10$, -  ;                                  [09]
                                  0A92  1609                 10$, 10$, 10$, -        ;                                  [09]
                                  0A92  1610                 st_logical>             ;                                  [09]
          09'  82 8F   86   8F    0A92              CASEB   (R6)+,#PD$_DECIMAL,S^#<<30005$-30004$>/2>-1
                                  0A97        30004$:
                            0017' 0A97              .SIGNED_WORD    st_decimal-30004$
                            0027' 0A99              .SIGNED_WORD    st_octal-30004$
                            0039' 0A9B              .SIGNED_WORD    st_hexadecimal-30004$
                            004A' 0A9D              .SIGNED_WORD    st_string-30004$
                            0014' 0A9F              .SIGNED_WORD    10$-30004$
                            0014' 0AA1              .SIGNED_WORD    10$-30004$
                            0014' 0AA3              .SIGNED_WORD    10$-30004$
                            0014' 0AA5              .SIGNED_WORD    10$-30004$
                            0014' 0AA7              .SIGNED_WORD    10$-30004$
                            0075' 0AA9              .SIGNED_WORD    st_logical-30004$
                                  0AAB        30005$:
                       FF50   31  0AAB  1611 10$:    brw     extract                 ; Nop, just return                 [09]
                                  0AAE  1612 ST_DECIMAL:
                    53   56   D0  0AAE  1613         MOVL    R6,R3                   ; Prompt address
                        0082   30  0AB1  1614         bsbw    ex_common               ; Do common                        [09]
     20 2E 4C 55 21 3D 43 41 21 00' 0AB4  1615         .ASCIC  "!AC=!UL. "
                             09  0AB4
                                  0ABE  1616 ST_OCTAL:
                    53   56   D0  0ABE  1617         MOVL    R6,R3                   ; Prompt address
                         73   10  0AC1  1618         BSBB    EX_COMMON               ; Octal
29 4F 28 4C 4F 36 21 3D 43 41 21 00' 0AC3  1619         .ASCIC  "!AC=!6OL(O) "
                             20  0ACF
                             0C  0AC3
                                  0AD0  1620 ST_HEXADECIMAL:
                    53   56   D0  0AD0  1621         MOVL    R6,R3                   ; Prompt address
                         61   10  0AD3  1622         BSBB    EX_COMMON               ; Hexadecimal
20 29 58 28 4C 58 21 3D 43 41 21 00' 0AD5  1623         .ASCIC  "!AC=!XL(X) "
                             0B  0AD5
                                  0AE1  1624 ST_STRING:
                    53   56   D0  0AE1  1625         MOVL    R6,R3                   ; Save address of prompt
                    50   86   9A  0AE4  1626         MOVZBL  (R6)+,R0                ; Get length of prompt
                    56   50   C0  0AE7  1627 10$:    ADDL    R0,R6                   ; Skip previous string
                    50   86   9A  0AEA  1628         MOVZBL  (R6)+,R0                ; Get length of string
                         12   13  0AED  1629         BEQL    30$                     ; Branch if end
                      F5 59   F4  0AEF  1630         SOBGEQ  R9,10$                  ; Count and branch
                 59   FF A6   9E  0AF2  1631         MOVAB   -1(R6),R9               ; Address of prompt
                         3E   10  0AF6  1632         BSBB    EX_COMMON               ; Join common
        20 43 41 21 3D 43 41 21 00' 0AF8  1633         .ASCIC  "!AC=!AC "
                             08  0AF8
                         33   10  0B01  1634 30$:    BSBB    EX_COMMON               ; Join common
        20 3F 3F 3F 3D 43 41 21 00' 0B03  1635         .ASCIC  "!AC=??? "
                             08  0B03
                                  0B0C  1636
                                  0B0C  1637 st_logical:                             ;                                  [09]
                    53   56   D0  0B0C  1638         movl    r6, r3                  ; Get last prompt address          [09]
          50   00000B2D'EF   9E  0B0F  1639         movab   20$, r0                 ; 'yes' string                     [09]
                      07 59   E8  0B16  1640         blbs    r9, 10$                 ; If stored value is 1 (yes), OK   [09]
          50   00000B32'EF   9E  0B19  1641         movab   30$, r0                 ; Else set string to 'no'          [09]
                    59   50   D0  0B20  1642 10$:    movl    r0, r9                  ; Set R9 to string                 [09]
```

```
                    11   10  0B23  1643          bsbb    ex_common               ; (SP) gives format string              [09]
 43 41 21 3D 43 41 21 00'  0B25  1644          .ascic  "!AC=!AC"               ;                                       [09]
                    07   0B25
          20 73 65 59 00'  0B2D  1645 20$:      .ascic  "Yes "                  ; Yes response                          [09]
                    04   0B2D
             20 6F 4E 00'  0B32  1646 30$:      .ascic  "No "                   ; No response                           [09]
                    03   0B32
                         0B36  1647
                         0B36  1648 EX_COMMON:
               02    BA  0B36  1649          POPR    #^M<R1>                 ; Address of edit string
            50   81    9A  0B38  1650          MOVZBL  (R1)+,R0                ; Get length
            0183 8F    BB  0B3B  1651          PUSHR   #^M<R0,R1,R7,R8>        ; Push R0/R1, buffer len,address
                         0B3F  1652
            0208 8F    BB  0B3F  1653          PUSHR   #^M<R3,R9>              ; Push field name, value
              10 AE    7F  0B43  1654          PUSHAQ  16(SP)                  ; Address of output descriptor
              14 AE    DF  0B46  1655          PUSHAL  20(SP)                  ; Store length back in descriptor
              10 AE    7F  0B49  1656          PUSHAQ  16(SP)                  ; Address of edit string
00000000'EF    05    FB  0B4C  1657          CALLS   #5,L^SYS$FAO            ; Edit string
                         0B53  1658
               0F    BA  0B53  1659          POPR    #^M<R0,R1,R2,R3>        ; Clean stack, get length in R2
         57    52    C2  0B55  1660          SUBL    R2,R7                   ; Lessen available length
         58    52    C0  0B58  1661          ADDL    R2,R8                   ; And skip over for next time           ;G:10
               56    D4  0B5B  1662          CLRL    R6                      ; Don't do again
            FE9E    31  0B5D  1663          BRW     EXTRACT                 ; Next!
```

```
                        1665          .SBTTL  GET_LINE        Condition getline
                        1666
                        1667 ;++
                        1668 ; FUNCTIONAL DESCRIPTION:
                        1669 ;
                        1670 ;       This routine conditionally prompts for input with the
                        1671 ;       prompt string provided, if any input is left from the last time
                        1672 ;       it is used before prompting is done.
                        1673 ;
                        1674 ; CALLING SEQUENCE:
                        1675 ;
                        1676 ;       BSBB    GET_LINE
                        1677 ;
                        1678 ; INPUT PARAMETERS:     NONE
                        1679 ;
                        1680 ; IMPLICIT INPUTS:
                        1681 ;
                        1682 ;       R3      Address of prompt string (ASCIC)
                        1683 ;       R4      Length remaining in last input string
                        1684 ;       R5      Address of remaining input string
                        1685 ;       R6      Address of prompt string output descriptor
                        1686 ;       R8      Address of input line descriptor
                        1687 ;
                        1688 ; OUTPUT PARAMETERS:    NONE
                        1689 ;
                        1690 ; IMPLICIT OUTPUTS:
                        1691 ;
                        1692 ;       R4      Length of input string
                        1693 ;       R5      Address of input string
                        1694 ;
                        1695 ; SIDE EFFECTS:         NONE
                        1696 ;
                        1697 ; COMPLETION CODES:     NONE
                        1698 ;--
```

```
                          0B60  1700
                          0B60  1701 GET_LINE:
              53    DD    0B60  1702          PUSHL   R3                      ; Save register
     00000000'EF    16    0B62  1703          Jsb     L^SCAN$SPACES           ; Skip over leading spaces          [18]
       02 A8   50    A0    0B68  1704          ADDW2   R0,2(R8)                ; Add to length used so far
              53  8ED0    0B6C  1705          POPL    R3                      ; Restore register
          50   01    D0    0B6F  1706          MOVL    S^#SS$_NORMAL,R0        ; Assume it worked
              54    D5    0B72  1707          TSTL    R4                      ; Any input left?
              11    12    0B74  1708          BNEQ    10$                     ; Exit if some input left
              63    9F    0B76  1709          PUSHAB  (R3)                    ; Prompt string
     0000013F'EF    7F    0B78  1710          PUSHAQ  L^T_PROMPT              ; Edit string (add " ?")            [10]
       88'AF   02    FB    0B7E  1711          CALLS   #2,B^FORMAT_PROMPT      ; Format it
    50   0114 8F    3C    0B82  1712          MOVZWL  #SS$_INSFARG,R0         ; Not enough arguments
                    05    0B87  1713 10$:     RSB
```

```
                        0B88  1715          .SBTTL  FORMAT_PROMPT   Format and load prompt
                        0B88  1716
                        0B88  1717 ;++
                        0B88  1718 ; Functional description:
                        0B88  1719 ;       Call FAO with arguments and format string given, store resultant
                        0B88  1720 ;       string in prompt output string
                        0B88  1721 ;
                        0B88  1722 ; Calling sequence:
                        0B88  1723 ;       FORMAT_PROMPT (FORMAT, params)
                        0B88  1724 ;
                        0B88  1725 ; Input parameters:
                        0B88  1726 ;       format          address of format descriptor
                        0B88  1727 ;       params          list of arguments to FAO
                        0B88  1728 ;
                        0B88  1729 ; Implicit inputs:
                        0B88  1730 ;       R6              contains pointer to output descriptor
                        0B88  1731 ;
                        0B88  1732 ; Outputs:
                        0B88  1733 ;       none
                        0B88  1734 ;
                        0B88  1735 ; Implicit outputs:
                        0B88  1736 ;       prompt string modified
                        0B88  1737 ;
                        0B88  1738 ; Side effects:
                        0B88  1739 ;       none
                        0B88  1740 ;
                        0B88  1741 ; Return codes:
                        0B88  1742 ;       FAO return codes (success, string truncated, or bad directive)
                        0B88  1743 ;--
```

```
                                0B88  1745
                                0B88  1746          $OFFSET 4,POSITIVE,<-
                                0B88  1747                  <FPT$_FORMAT,4>,-
                                0B88  1748                  <FPT$_ARGS>>
                                0B88                .SAVE   LOCAL_BLOCK
                                0B88                .PSECT $ABS$ ABS
                    00000004    FFFF                .=4
                                0004        FPT$_FORMAT:
                    00000008    0004                .BLKB   4
                                0008        FPT$_ARGS:
                    0000000C    0008                .BLKB   4
                          00000B88                  .RESTORE
                                0B88  1749
                                0B88  1750 FORMAT_PROMPT:
                          0008  0B88  1751          .WORD   ^M<R3>
                53    7E    7E  0B8A  1752          MOVAQ   -(SP),R3                ; Allocate output descriptor
             63 66    01    A3  0B8D  1753          SUBW3   #1,(R6),(R3)            ; Set length
       04 A3   01 04 A6    C1  0B91  1754          ADDL3   4(R6),#1,4(R3)          ; Address to put text
                                0B97  1755          $FAOL_S @FPT$_FORMAT(AP),(R3),- ; Do formatting
                                0B97  1756                  (R3),FPT$_ARGS(AP)
             08 AC    DF        0B97                        PUSHAL  FPT$_ARGS(AP)
                63    7F        0B9A                        PUSHAQ  (R3)
                63    3F        0B9C                        PUSHAW  (R3)
             04 BC    7F        0B9E                        PUSHAQ  @FPT$_FORMAT(AP)
   00000000'GF    04    FB      0BA1                        CALLS   #4,G^SYS$FAOL
      66    63    01    A1      0BA8  1757          ADDW3   #1,(R3),(R6)            ; Length including length byte
        04 B6    63    90      0BAC  1758          MOVB    (R3),@4(R6)             ; Store result length
                       04      0BB0  1759          RET
```

```
                        0BB1  1761          .SBTTL  DSV$SHOWDEVICE  Display device information
                        0BB1  1762
                        0BB1  1763 ;++
                        0BB1  1764 ; FUNCTIONAL DESCRIPTION:
                        0BB1  1765 ;
                        0BB1  1766 ;       This routine is called from CLI to display information about
                        0BB1  1767 ;       devices attached to the system.
                        0BB1  1768 ;
                        0BB1  1769 ; CALLING SEQUENCE:
                        0BB1  1770 ;
                        0BB1  1771 ;       BSBW    DSV$SHOWDEVICE
                        0BB1  1772 ;
                        0BB1  1773 ; INPUT PARAMETERS:
                        0BB1  1774 ;
                        0BB1  1775 ; IMPLICIT INPUTS:
                        0BB1  1776 ;
                        0BB1  1777 ;       CLI$Q_FILE(R2)  Has descriptor for rest of command line.
                        0BB1  1778 ;
                        0BB1  1779 ; OUTPUT PARAMETERS:    NONE
                        0BB1  1780 ;
                        0BB1  1781 ; IMPLICIT OUTPUTS:     NONE
                        0BB1  1782 ;
                        0BB1  1783 ; SIDE EFFECTS:         NONE
                        0BB1  1784 ;
                        0BB1  1785 ; COMPLETION CODES:     NONE
                        0BB1  1786 ;
                        0BB1  1787 ; REGISTER USAGE:
                        0BB1  1788 ;
                        0BB1  1789 ;       R0      Length of device name as typed
                        0BB1  1790 ;       R1      Address of device name as typed
                        0BB1  1791 ;       R2      Length of Device name in DPB
                        0BB1  1792 ;       R3      Address of device name in DPB
                        0BB1  1793 ;       R5      Index into DPBLIST
                        0BB1  1794 ;       R6      Address of link device for /Adapter
                        0BB1  1795 ;       R10     DPB address
                        0BB1  1796 ;--
```

```
                          0BB1  1798
                          0BB1  1799 DSV$SHOWDEVICEB::                                                    ;                                                [07]
00000000'EF   01    88    0BB1  1800          BISB2   #1@FLG$V_BRIEF,COMM_FLAGS  ; Set brief flag          [07]
                          0BB8  1801 DSV$SHOWDEVICE::
      50   08 A2    7D    0BB8  1802          MOVQ    CLI$Q_FILE(R2),R0          ; Get descriptor of input
         08FF 8F    BB    0BBC  1803          PUSHR   #^M<R0,R1,R2,R3,R4,R5,R6,R7,R11>       ;          [11]
                          0BC0  1804
   55 00000000'EF   DE    0BC0  1805          MOVAL   DS$GA_PTABLE,R5            ; Base PTABLE list
            0582    30    0BC7  1806          bsbw    loc$adapter                ; Find /Adapter value, if any   [11]
          39 50     E9    0BCA  1807          blbc    r0, 70$                    ; If not found, return          [11]
        54   65     D0    0BCD  1808 10$:     MOVL    (R5),R4                    ; Get count of PT entries       [11]
     5B   6544     D0    0BD0  1809 20$:     MOVL    (R5)[R4],R11               ; Get address of Associated PT
            2D     13    0BD4  1810          BEQL    60$                        ; Branch if none
            56     D5    0BD6  1811          tstl    r6                         ; Was /Adapter specified?       [11]
            06     19    0BD8  1812          blss    30$                        ; If not, continue              [11]
     20 AB  56     D1    0BDA  1813          cmpl    r6, hp$a_link(r11)         ; Compare with link of current device [11]
            23     12    0BDE  1814          bneq    60$                        ; If not, on to next device     [11]
        50  6E     D0    0BE0  1815 30$:     MOVL    (SP),R0                    ; Get length of input           [11]
            18     13    0BE3  1816          BEQL    50$                        ; Branch if Null input..equiv to all
     51   04 AE    D0    0BE5  1817          MOVL    4(SP),R1                   ; Get address of input
        52  6B     7D    0BE9  1818          MOVQ    HP$Q_DEVICE(R11),R2        ; Get length,address of device name
            52     D7    0BEC  1819          DECL    R2                         ; Remove "_"
            53     D6    0BEE  1820          INCL    R3                         ; skip "_"
        52  50     D1    0BF0  1821          CMPL    R0,R2                      ; Compare name lengths
            0E     14    0BF3  1822          BGTR    60$                        ; Skip compare if input longer than name
        83  81     91    0BF5  1823 40$:     CMPB    (R1)+,(R3)+                ; Compare characters
            09     12    0BF8  1824          BNEQ    60$                        ; Branch if mismatch
         F8 50     F5    0BFA  1825          SOBGTR  R0,40$                     ; Count and continue
                          0BFD  1826
00000FE4'EF   16    0BFD  1827 50$:     Jsb     L^SHOW_DEV                 ; Display this DPB                  [18]
                          0C03  1828
         CA 54    F5    0C03  1829 60$:     SOBGTR  R4,20$                     ; Count and branch if more
                          0C06  1830
      08FF 8F     BA    0C06  1831 70$:     POPR    #^M<R0,R1,R2,R3,R4,R5,R6,R7,R11>       ;
00000000'EF   01    8A    0C0A  1832          BICB2   #1@FLG$V_BRIEF,COMM_FLAGS       ; Clear brief flag before exit  [07]
                    05    0C11  1833          RSB
```

```
                        .SBTTL  DSV$SHOWSELECT  Display information selects

                ;++
                ; FUNCTIONAL DESCRIPTION:
                ;
                ;       This routine is called from CLI to display information
                ;       about device selected for test
                ;
                ; CALLING SEQUENCE:
                ;
                ;       BSBW    DSV$SHOWSELECT
                ;
                ; INPUT PARAMETERS:     NONE
                ;
                ; IMPLICIT INPUTS:
                ;
                ;       CLI$Q_FILE(R2)  Descriptor of device to be shown
                ;
                ; OUTPUT PARAMETERS:    NONE
                ;
                ; IMPLICIT OUTPUTS:     NONE
                ;
                ; COMPLETION CODES:     NONE
                ;
                ; SIDE EFFECTS:         NONE
                ;
                ; REGISTER USAGE:
                ;
                ;       R0/R1   Scratch
                ;
                ;       R10     Address of DPB for device to be shown
                ;--
```

```
                                  0C12
                                  0C12  DSV$SHOWSELECTB::                                  ;                                                  [07]
      00000000'EF    01    88     0C12          BISB2   #1@FLG$V_BRIEF,COMM_FLAGS          ; Set brief flag                          [07]
                                  0C19  DSV$SHOWSELECT::
                0898 8F    BB     0C19          PUSHR   #^M<R4,R3,R7,R11>
                                  0C1D
      53    00000000'EF    DE     0C1D          MOVAL   DS$GA_PTABLE,R3                  ; Base PTABLE LIST
                  54   63  D0     0C24          MOVL    (R3),R4                          ; Fetch count of PT entries
                                  0C27  10$:
   0C 00000000'EF    54    E1     0C27          BBC     R4,DS$GA_SELECTS,20$             ; Branch if not SELECTED
              5B   6344    D0     0C2F          MOVL    (R3)[R4],R11                     ; Address of PT
                     06    13     0C33          BEQL    20$                              ; Branch if none
           00000FE4'EF    16     0C35          Jsb     L^SHOW_DEV                       ; Display device information for this     [18]
                                  0C3B  20$:
                  E9 54    F5     0C3B          SOBGTR  R4,10$                           ; Count and Branch if more
                0898 8F    BA     0C3E          POPR    #^M<R4,R3,R7,R11>                        ; Restore
      00000000'EF    01    8A     0C42          BICB2   #1@FLG$V_BRIEF,COMM_FLAGS                ; Clear brief flag before exit    [07]
                           05     0C49          RSB
```

```
                                0C4A          .Subtitle       DSV$DEATTACH    Deattach device
                                0C4A
                                0C4A  ;++
                                0C4A  ; FUNCTIONAL DESCRIPTION:
                                0C4A  ;
                                0C4A  ;       This routine is called from CLI to reverse the ATTACH command
                                0C4A  ;       for a given device.  Since the attach data base is a tree
                                0C4A  ;       structure, all subsidiary devices are also implicitly
                                0C4A  ;       deattached.
                                0C4A  ;
                                0C4A  ; CALLING SEQUENCE:
                                0C4A  ;
                                0C4A  ;       BSBW    DSV$DEATTACH
                                0C4A  ;
                                0C4A  ; INPUT PARAMETERS:     NONE
                                0C4A  ;
                                0C4A  ; IMPLICIT INPUTS:
                                0C4A  ;
                                0C4A  ;       CLI$Q_FILE      descriptor of device to be added
                                0C4A  ;       Q_ADAPTER       descriptor of adapter device is attached to
                                0C4A  ;
                                0C4A  ; OUTPUT PARAMETERS:    NONE
                                0C4A  ;
                                0C4A  ; IMPLICIT OUTPUTS:     NONE
                                0C4A  ;
                                0C4A  ; SIDE EFFECTS:         NONE
                                0C4A  ;
                                0C4A  ; COMPLETION CODES:     N/A
                                0C4A  ;--
                                0C4A
                                0C4A  dsv$deattach::                                  ;                                [12]
          00E7 8F       BB      0C4A          pushr   #^M<r0,r1,r2,r5,r6,r7>          ; Save registers                 [12]
      00000000'EF       16      0C4E          jsb     script$flush                    ; Flush out scripts if should    [12]
55    00000000'EF       DE      0C54          moval   ds$ga_ptable, r5                ; Cache address of table         [12]
             04EE       30      0C5B          bsbw    loc$adapter                     ; Find the specified adapter     [12]
           65 50        E9      0C5E          blbc    r0, 20$                         ; If not found, return           [12]
      50   08 A2        7D      0C61          movq    cli$q_file(r2), r0              ; Get device to deattach         [12]
               03       12      0C65          bneq    4$                              ; There is a device            ;G:6
             005C       31      0C67          brw     20$                             ; Branch if no device          ;G:6
   52   61   08        9C      0C6A  4$:     rotl    #8,(r1),r2                      ; Get first 3 characters of name ;G:
        52   50        90      0C6E          movb    r0,r2                           ; Insert length                ;G:6
52    4C4C4103 8F       D1      0C71          cmpl    #<^A"@ALL"-61>,r2               ; Compare with ascic "ALL"     ;G:6
               1A       12      0C78          bneq    8$                              ; No. Branch for one device    ;G:6
        57   65        D0      0C7A          movl    (r5),r7                         ; Get size of ptabel           ;G:6
      51   6547        D0      0C7D  5$:     movl    (r5)[r7],r1                     ; Address of next ptable       ;G:6
               0B       13      0C81          beql    6$                              ; Skip if gone                 ;G:6
      56   20 A1        D1      0C83          cmpl    hp$a_link(r1),r6                ; Check again adapter          ;G:6
               05       12      0C87          bneq    6$                              ; If not linked to it , skip   ;G:6
        50   57        D0      0C89          movl    r7,r0                           ; Copy the index               ;G:6
               3D       10      0C8C          bsbb    30$                             ; Do deattach for this device  ;G:6
           EC 57        F5      0C8E  6$:     sobgtr  r7,5$                           ; Loop through the table       ;G:6
             0032       31      0C91          brw     20$                             ; End of table, return         ;G:7
        52   56        D0      0C94  8$:     movl    r6, r2                          ; Copy link address              [12]
             0507       30      0C97          bsbw    loc$ptable                      ; Locate it                      [12]
               28       12      0C9A          bneq    10$                             ; If found, then it's OK         [12]
      52   08 AE        D0      0C9C          movl    8(sp), r2                       ; Restore CLI table pointer      [12]
7E    00000004'EF       7D      0CA0          movq    q_adapter, -(sp)                ; Get adapter name               [12]
```

```
          6E   6E   3C  0CA7  1944          movzwl  (sp), (sp)                      ; Make sure high word is 0      [12]
       7E   08 A2   7D  0CAA  1945          movq    cli$q_file(r2), -(sp)           ; Get device name               [12]
          6E   6E   3C  0CAE  1946          movzwl  (sp), (sp)                      ; And zero extend length        [12]
     0000019D'EF    9F  0CB1  1947          pushab  L^t_no_such_on_adapter          ; No such device                [12]
              01    DD  0CB7  1948          pushl   #ds$k_printf                    ; Use PRINTF                    [12]
              15    DD  0CB9  1949          pushl   #ds$k_type_command_err          ; Message is command error      [12]
  00000000'GF  07   FB  0CBB  1950          calls   #7, G^dsx$print                 ; Print it                      [12]
              02    11  0CC2  1951          brb     20$                             ; Return                        [12]
              05    10  0CC4  1952 10$:     bsbb    30$                             ; Do the stuff, recursively     [12]
        00E7 8F     BA  0CC6  1953 20$:     popr    #^M<r0,r1,r2,r5,r6,r7>          ; Restore the registers         [12]
                    05  0CCA  1954          rsb
```

```
                                0CCB  1956          .Subtitle       Deattach subtree
                                0CCB  1957 ;+
                                0CCB  1958 ; This routine deallocates the Ptable for a device, clears the select bit
                                0CCB  1959 ; and Ptable vector pointer for it; and if there were devices attached to
                                0CCB  1960 ; it, does the same for each of them.
                                0CCB  1961 ;-
                      1F    BB  0CCB  1962 30$:     pushr   #^M<r0,r1,r2,r3,r4>             ; Save some registers           [12]
                                0CCD  1963 ;
                                0CCD  1964 ; See if anything attached to this one (R1)
                                0CCD  1965 ;
                   50   65    D0  0CCD  1966          movl    (r5), r0                        ; Size of table                [12]
                 51   6540    D0  0CD0  1967 40$:     movl    (r5)[r0], r1                    ; Get address of next Ptable   [12]
                        09    13  0CD4  1968          beql    50$                             ; Skip if gone                 [12]
               04 AE    20 A1  D1  0CD6  1969          cmpl    hp$a_link(r1), 4(sp)            ; Check against input device   [12]
                        02    12  0CDB  1970          bneq    50$                             ; If not linked to it, skip    [12]
                        EC    10  0CDD  1971          bsbb    30$                             ; Do same for IT, recursively  [12]
                     EE 50    F5  0CDF  1972 50$:     sobgtr  r0, 40$                 ; Loop through the table       [12]
                                0CE2  1973          $print  #ds$k_type_command_out, -       ; Print command info           [12]
                                0CE2  1974                    #ds$k_printf, -               ; .. use PRINTF                [12]
                                0CE2  1975                    L^t_deattach, -               ; .. Deattach message          [12]
                                0CE2  1976                    4(sp)                         ; .. address of Ptable         [12]
                         04 AE  DD  0CE2                    PUSHL   4(sp)
                 00000227'EF    9F  0CE5                    PUSHAB  L^t_deattach
                        7E    01  9A  0CEB                    movzbl  #ds$k_printf, -(sp)
                        7E    16  98  0CEE                    cvtbl   #ds$k_type_command_out, -(sp)
            00000000'GF    04  FB  0CF1                    CALLS   #$$N+2, G^DSX$PRINT
                        50    6E  7D  0CF8  1977          movq    (sp), r0                        ; Get original r0 and r1       [12]
                      6540    D4  0CFB  1978          clrl    (r5)[r0]                        ; Clear table pointer          [12]
         00 00000000'EF    50  E5  0CFE  1979          bbcc    r0, L^ds$ga_selects, 60$        ; Clear select bit for it      [12]
                        50    51  D0  0D06  1980 60$:     movl    r1, r0                          ; Copy address of Ptable       [12]
                 00000000'EF    16  0D09  1981          Jsb     L^exe$deanonpaged               ; Deallocate it                [18]
                        1F    BA  0D0F  1982          popr    #^M<r0,r1,r2,r3,r4>             ; Restore registers            [12]
                                  05  0D11  1983          rsb                             ; Return                       [12]
```

```
                        0D12  1985          .SBTTL  DSV$SELECT      Select device for testing
                        0D12  1986
                        0D12  1987 ;++
                        0D12  1988 ; FUNCTIONAL DESCRIPTION:
                        0D12  1989 ;
                        0D12  1990 ;       This routine is called from DS$CLI for each device to be
                        0D12  1991 ;       tested.  It sets the select bit and moves the P-table
                        0D12  1992 ;       entry to the end of the P-table list
                        0D12  1993 ;
                        0D12  1994 ; CALLING SEQUENCE:
                        0D12  1995 ;
                        0D12  1996 ;       BSBW    DSV$SELECT
                        0D12  1997 ;
                        0D12  1998 ; INPUT PARAMETERS:     NONE
                        0D12  1999 ;
                        0D12  2000 ; IMPLICIT INPUTS:
                        0D12  2001 ;
                        0D12  2002 ;       CLI$Q_FILE      descriptor of device to be added
                        0D12  2003 ;
                        0D12  2004 ; OUTPUT PARAMETERS:    NONE
                        0D12  2005 ;
                        0D12  2006 ; IMPLICIT OUTPUTS:
                        0D12  2007 ;
                        0D12  2008 ;       DS$GA_PTABLE    The indicated unit is moved to the head.
                        0D12  2009 ;
                        0D12  2010 ; SIDE EFFECTS:         NONE
                        0D12  2011 ;
                        0D12  2012 ; COMPLETION CODES:     N/A
                        0D12  2013 ;--
                        0D12  2014
                        0D12  2015 DSV$SELECT::
      00FF 8F   BB      0D12  2016          PUSHR   #^M<R0,R1,R2,R3,R4,R5,R6,R7>     ; Preserve                          [11]
00000000'EF   16      0D16  2017          JSB     SCRIPT$FLUSH                    ; Flush scripts if console command  [10]
        03A6  30      0D1C  2018          BsbW    CheckAmbiguous                  ; Check for ambiguous names         [15]
      1B 50   E9      0D1F  2019          BlbC    R0, 10$                         ; If error, hopscotch on to exit    [15]
55 00000000'EF   DE      0D22  2020          MOVAL   DS$GA_PTABLE,R5                 ; Point to P-table
53 00000000'EF   DE      0D29  2021          MOVAL   DS$GA_SELECTS,R3                ; Point to select bit mask
57 00000000'EF   DE      0D30  2022          MOVAL   DS$GA_ALLOCATES,R7              ; Point to allocated bit            [30]
        0412  30      0D37  2023          bsbw    loc$adapter                     ; Find /Adapter, if any             [11]
      03 50   E8      0D3A  2024          blbs    r0, 20$                         ; Continue if OK                    [11]
        0116  31      0D3D  2025 10$:     brw     140$                            ; Return if not                     [11]
   50   08 A2   7D      0D40  2026 20$:     MOVQ    CLI$Q_FILE(R2),R0               ; Descriptor of device              [11]
         5E   13      0D44  2027          BEQL    60$                             ; Exit if no device
52   61   08   9C      0D46  2028          ROTL    #8,(R1),R2                      ; Get first 3 characters of name
     52   50   90      0D4A  2029          MOVB    R0,R2                           ; Insert length
52 4C4C4103 8F   D1      0D4D  2030          CMPL    #<^A"@ALL"-61>,R2               ; compare with ascic "all"
         51   12      0D54  2031          BNEQ    70$                             ; Branch if not all
```

```
                                0D56  2033
                                0D56  2034 ;+
                                0D56  2035 ; Process SELECT ALL command
                                0D56  2036 ;-
                 54    65   D0  0D56  2037          MOVL    (R5),R4                  ; Get count of devices possible
               50    6544   D0  0D59  2038 30$:     MOVL    (R5)[R4],R0              ; Anything here?
                       42   13  0D5D  2039          BEQL    50$                      ; No check next
                       56   D5  0D5F  2040          tstl    r6                       ; If no /Adapter                        [11]
                       06   19  0D61  2041          blss    40$                      ; ...then branch around the check       [11]
              56    20 A0   D1  0D63  2042          cmpl    hp$a_link(r0), r6        ; Is this on the right link?            [11]
                       38   12  0D67  2043          bneq    50$                      ; If not, loop to next                  [11]
                 50    60   7D  0D69  2044 40$:     MOVQ    HP$Q_DEVICE(R0),R0       ; Get device name                       [11]
                       50   D7  0D6C  2045          DECL    R0                       ; remove "_" from length
                       51   D6  0D6E  2046          INCL    R1                       ; remove "_" from address
            00000000'EF    16  0D70  2047          Jsb     L^DSR$IFLOADDEV          ; Is this the load device?              [18]
                    28 50   E8  0D76  2048          BLBS    R0,50$                   ; Branch if it is
      63    01    54    01   F0  0D79  2049          INSV    #1,R4,#1,(R3)            ; Set selected flag                     [30]
              1F 67    54   E0  0D7E  2050          BBS     R4,(R7),50$              ; Branch if already set                 [30]
                    00D6   30  0D82  2051          BSBW    150$                     ; Allocate the device if necessary      [11]
                    04 50   E8  0D85  2052          BLBS    R0,45$                   ; Branch if successful
              10 63    54   E5  0D88  2053          BBCC    R4,(R3),47$              ; clear select bit if allocate failed
               52    6544   D0  0D8C  2054 45$:     MOVL    (R5)[R4],R2              ; Get base of the P-table               [30]
          0C 0A A2    01   E1  0D90  2055          BBC     #HP$V_WASALL,   -        ; Branch if we did not allocate         [30]
                                0D95  2056                  HP$B_FLAGS(R2),50$       ;                                       [30]
      67    01    54    01   F0  0D95  2057          INSV    #1,R4,#1,(R7)            ; Set Allocated flag                    [30]
                       05   11  0D9A  2058          BRB     50$                      ; Continue                              [32]
      67    01    54    00   F0  0D9C  2059 47$:     INSV    #0,R4,#1,(R7)            ; Clear allocated flag                  [30]
                    B5 54   F5  0DA1  2060 50$:     SOBGTR  R4,30$                   ; Do them all
                    00AF   31  0DA4  2061 60$:     BRW     140$                     ; Branch to exit                        [11]
                                0DA7  2062
```

```
                        0DA7  2064
                        0DA7  2065 ;+
                        0DA7  2066 ; Process SELECT device command
                        0DA7  2067 ;-
            52   01  CE  0DA7  2068 70$:    mnegl   #1, r2                      ; Set wildcard link                     [09]
                 56  D5  0DAA  2069         tstl    r6                          ; If there's no /Adapter,               [11]
                 03  19  0DAC  2070         blss    80$                         ; ...then don't check it                [11]
            52   56  D0  0DAE  2071         movl    r6, r2                      ; If is, use address of link device     [11]
               03ED  30  0DB1  2072 80$:    bsbw    loc$ptable                  ; Search for it                         [11]
                 48  12  0DB4  2073         BNEQ    110$                        ; Branch if found
         52   08 AE  D0  0DB6  2074         MOVL    8(SP),R2                    ; Get base of CLI
                 56  D5  0DBA  2075         tstl    r6                          ; /ADAPTER?                             [11]
                 25  19  0DBC  2076         blss    90$                         ; Branch if not                         [11]
      7E  00000004'EF  7D  0DBE  2077         movq    q_adapter, -(sp)            ; Push on adapter name                  [11]
            6E   6E  3C  0DC5  2078         movzwl  (sp), (sp)                  ; Zero extend                           [11]
         7E   08 A2  7D  0DC8  2079         movq    cli$q_file(r2), -(sp)       ; Push on device name                   [11]
            6E   6E  3C  0DCC  2080         movzwl  (sp), (sp)                  ; Zero extend                           [11]
         0000019D'EF  9F  0DCF  2081         pushab  L^t_no_such_on_adapter      ; Format string                         [11]
                 01  DD  0DD5  2082         pushl   #ds$k_printf                ; Use printf                            [13]
                 15  DD  0DD7  2083         pushl   #ds$k_type_command_err      ; Command error type code               [13]
   00000000'GF   07  FB  0DD9  2084         calls   #7, G^dsx$print             ; Print it                              [13]
               0073  31  0DE0  2085         brW     140$                        ; Exit                                  [11]
         7E   08 A2  7D  0DE3  2086 90$:    MOVQ    CLI$Q_FILE(R2),-(SP)        ; Stack file name                       [11]
            6E   6E  3C  0DE7  2087 100$:   movzwl  (sp), (sp)                  ; Zero extend length                    [11]
         00000170'EF  9F  0DEA  2088         PUSHAB  L^T_NO_SUCH_DEV             ; Edit string                           [11]
                 01  DD  0DF0  2089         pushl   #ds$k_printf                ; Use PRINTF                            [13]
                 15  DD  0DF2  2090         pushl   #ds$k_type_command_err      ; Command error type code               [13]
   00000000'GF   05  FB  0DF4  2091         CALLS   #5, G^DSX$PRINT             ; Type the error                        [13]
               0058  31  0DFB  2092         BRW     140$                        ; Branch to exit
                         0DFE  2093 110$:
```

```
                                0DFE  2095
                                0DFE  2096 ;+
                                0DFE  2097 ; Compress P-table list to high end of table
                                0DFE  2098 ; R1 = P-table address
                                0DFE  2099 ;-
              54    50    D0  0DFE  2100          MOVL    R0,R4                   ; Copy unit index of device
                 58    10  0E01  2101          BSBB    150$                    ; Allocate device if necessary          [11]
              50 50    E9  0E03  2102          BLBC    R0,140$                 ; Branch if can't allocate
               6544    DD  0E06  2103          PUSHL   (R5)[R4]                ; Save address of P-table
               6544    D4  0E09  2104          CLRL    (R5)[R4]                ; Clear address of P-table
              54    65    D0  0E0C  2105          MOVL    (R5),R4                 ; Get count of entries
              52    54    D0  0E0F  2106          MOVL    R4,R2                   ; current position
                                0E12  2107
           50    6542    D0  0E12  2108 120$:   MOVL    (R5)[R2],R0             ; Copy address to first available
                 1D    13  0E16  2109          BEQL    130$                    ; Empty, next
               6542    D4  0E18  2110          CLRL    (R5)[R2]                ; Clear it out
            6544    50    D0  0E1B  2111          MOVL    R0,(R5)[R4]             ; Put it in the first available slot
     50    63    01    52    EF  0E1F  2112          EXTZV   R2,#1,(R3),R0           ; Get select bit
     63    01    54    50    F0  0E24  2113          INSV    R0,R4,#1,(R3)           ; Insert new select bit
     50    67    01    52    EF  0E29  2114          EXTZV   R2,#1,(R7),R0           ; Get allocated bit                     [30]
     67    01    54    50    F0  0E2E  2115          INSV    R0,R4,#1,(R7)           ; Insert new allocated bit              [30]
                 54    D7  0E33  2116          DECL    R4                      ; Use previous entry next time
              DA 52    F5  0E35  2117 130$:   SOBGTR  R2,120$                 ; Decrement and continue
                                0E38  2118
               6544 8ED0  0E38  2119          POPL    (R5)[R4]                ; Insert unit at available slot
     63    01    54    01    F0  0E3C  2120          INSV    #1,R4,#1,(R3)           ; Set the select bit
           52    6544    D0  0E41  2121          MOVL    (R5)[R4],R2             ; Get address of P-table for base       [30]
        07 0A A2    01    E1  0E45  2122          BBC     #HP$V_WASALL, -         ; If device was allocated               [30]
                                0E4A  2123                  HP$B_FLAGS(R2),135$     ; then,                                 [30]
     67    01    54    01    F0  0E4A  2124          INSV    #1,R4,#1,(R7)           ; Set the allocated bit                 [30]
                 05    11  0E4F  2125          BRB     140$                    ; retrun                                [32]
     67    01    54    00    F0  0E51  2126 135$:   INSV    #0,R4,#1,(R7)           ; Clear the allocated bit               [30]
               00FF 8F    BA  0E56  2127 140$:   POPR    #^M<R0,R1,R2,R3,R4,R5,R6,R7>    ; Restore                       [11]
                    05    0E5A  2128          RSB
                                0E5B  2129
```

```
                                0E5B  2131
                                0E5B  2132 ;+
                                0E5B  2133 ; Allocate device (R5)[R4] if usermode and should be allocated
                                0E5B  2134 ; and not already allocated.  Produce error messages if it fails.
                                0E5B  2135 ;-
              50    01    D0    0E5B  2136 150$:   MOVL    S^#SS$_NORMAL,R0          ; Assume success. esp. if S/A
     0000FE00'EF    1C    E1    0E5E  2137         BBC     #DSA$V_USER, -
                   38          0E65  2138                 DSA$GL_FLAGS, 155$        ; Exit if not usermode
                               0E66  2139         Br_If_Inhibit_Allocate  155$      ; If bit set in DS$GL_CRD_Flags,
     00000000'EF    03    E0    0E66               BBS     #CRD$V_Inhibit_Allocate, -                ; If bit set, branch
                   30          0E6D                         L^DS$GL_CRD_Flags, 155$        ;                                [36]
                               0E6E  2140                                           ; inhibit device allocation                [22]
          52    0C AE    D0    0E6E  2141         MOVL    12(SP),R2                 ; GET base of CLI                          [29]
  24 00000444 E2    00    E0    0E72  2142         BBS     #CLI$V_NOALLOC, -         ;                                          [29]
                               0E7A  2143                 L^CLI$L_FLAGS2(R2),155$   ; BRANCH if /NOALLOCATE                   [29]
          52    6544    D0    0E7A  2144         MOVL    (R5)[R4],R2               ; Get address of P-table
       1B 0A A2    00    E1    0E7E  2145         BBC     #HP$V_ALLOC, -
                               0E83  2146                 HP$B_FLAGS(R2), 155$      ; Branch if should not be allocated
       16 0A A2    01    E2    0E83  2147         BBSS    #HP$V_WASALL, -
                               0E88  2148                 HP$B_FLAGS(R2), 155$      ; Branch if already allocated
                               0E88  2149         $ALLOC_S HP$Q_DEVICE(R2)          ; Address of device name
                   7E    7C    0E88                       CLRQ    -(SP)
                   00    DD    0E8A                       PUSHL   #0
                   00    DD    0E8C                       PUSHL   #0
                   62    7F    0E8E                       PUSHAQ  HP$Q_DEVICE(R2)
     00000000'GF    05    FB    0E90                       CALLS   #5,G^SYS$ALLOC
          50    0641 8F    B1    0E97  2150         CMPW    #SS$_DEVALRALLOC,R0       ; Already allocated to us?
                   03    12    0E9C  2151         BNEQ    160$                      ; Branch if FALSE                          [34]
                 0050    31    0E9E  2152 155$:   BRW     180$                      ; Branch to exit
                4D 50    E8    0EA1  2153 160$:   BLBS    R0,180$                   ; Branch to exit if successful
          0A A2    02    8A    0EA4  2154         BICB    #HP$M_WASALL, -
                               0EA8  2155                 HP$B_FLAGS(R2)            ; Clear allocated bit
                   50    DD    0EA8  2156         PUSHL   R0                        ; Save return code
              7E   62    7D    0EAA  2157         MOVQ    HP$Q_DEVICE(R2),-(SP)     ; device name arg for print
      00000170'EF    9F    0EAD  2158         PUSHAB  L^T_NO_SUCH_DEV           ; Assume no such device                    [10]
          50    0908 8F    B1    0EB3  2159         CMPW    #SS$_NOSUCHDEV,R0         ; No such device?
                   29    13    0EB8  2160         BEQL    170$                      ; Branch if truth
     6E   00000243'EF    9E    0EBA  2161         MOVAB   L^T_DEVALLOC,(SP)         ; Assume allocated to other user           [10]
          50    0840 8F    B1    0EC1  2162         CMPW    #SS$_DEVALLOC,R0          ; Already allocated to another?
                   1B    13    0EC6  2163         BEQL    170$                      ; Branch if truth
     6E   00000264'EF    9E    0EC8  2164         MOVAB   L^T_DEV_MOUNTED,(SP)      ; Assume device has been mounted           [34]
          50    006C 8F    B1    0ECF  2165         CMPW    #SS$_DEVMOUNT,R0          ; Already mounted ?                        [34]
                   0D    13    0ED4  2166         BEQL    170$                      ; Branch if truth                          [34]
              5E   0C    C0    0ED6  2167         ADDL    #12,SP                    ; Remove descriptor of name and text
                   50 8ED0    0ED9  2168         POPL    R0                        ; Restore completion code
      00000000'EF    16    0EDC  2169         Jsb     L^DSR$COMPLETION          ; Other errors                             [18]
                   05    0EE2  2170         RSB                                   ; Return
                               0EE3  2171
                   01    DD    0EE3  2172 170$:   pushl   #ds$k_printf              ; Use printf to print                      [13]
                   15    DD    0EE5  2173         pushl   #ds$k_type_command_err    ; Command error type code                  [13]
     00000000'GF    05    FB    0EE7  2174         CALLS   #5, G^DSX$PRINT           ; Print the error                          [13]
                   50 8ED0    0EEE  2175         POPL    R0                        ; Restore completion code
                   05    0EF1  2176 180$:   RSB
```

```
                        0EF2  2178          .SBTTL  DSV$DESELECT    Deselect device for testing
                        0EF2  2179
                        0EF2  2180 ;++
                        0EF2  2181 ; FUNCTIONAL DESCRIPTION:
                        0EF2  2182 ;
                        0EF2  2183 ;       This routine is called from DS$CLI for each device to be
                        0EF2  2184 ;       remved from testing.  It clears the select bit
                        0EF2  2185 ;
                        0EF2  2186 ; CALLING SEQUENCE:
                        0EF2  2187 ;
                        0EF2  2188 ;       BSBW    DSV$DESELECT
                        0EF2  2189 ;
                        0EF2  2190 ; INPUT PARAMETERS:     NONE
                        0EF2  2191 ;
                        0EF2  2192 ; IMPLICIT INPUTS:
                        0EF2  2193 ;
                        0EF2  2194 ;       CLI$Q_FILE      descriptor of device to be removed
                        0EF2  2195 ;
                        0EF2  2196 ; OUTPUT PARAMETERS:    NONE
                        0EF2  2197 ;
                        0EF2  2198 ; IMPLICIT OUTPUTS:     NONE
                        0EF2  2199 ;
                        0EF2  2200 ; SIDE EFFECTS:         NONE
                        0EF2  2201 ;
                        0EF2  2202 ; COMPLETION CODES:     N/A
                        0EF2  2203 ;
                        0EF2  2204 ; REGISTER USAGE:
                        0EF2  2205 ;--
```

```
                                0EF2  2207
                                0EF2  2208 DSV$DESELECT::
              00FF 8F    BB    0EF2  2209          PUSHR   #^M<R0,R1,R2,R3,R4,R5,R6,R7>    ; Preserve                          [11]
        00000000'EF      16    0EF6  2210          JSB     SCRIPT$FLUSH                    ; Flush scripts if console command  [10]
                01C6     30    0EFC  2211          BsbW    CheckAmbiguous                  ; Check for ambiguous names         [15]
              1B 50      E9    0EFF  2212          BlbC    R0, 10$                         ; If error, hopscotch on to exit    [15]
   55   00000000'EF      DE    0F02  2213          MOVAL   DS$GA_PTABLE,R5                 ; Point to P-table
   57   00000000'EF      DE    0F09  2214          MOVAL   DS$GA_ALLOCATES,R7              ; Point to allocated bit mask       [30]
   53   00000000'EF      DE    0F10  2215          MOVAL   DS$GA_SELECTS,R3                ; Point to select bit mask
                0232     30    0F17  2216          bsbw    loc$adapter                     ; Find /Adapter, if any             [11]
              03 50      E8    0F1A  2217          blbs    r0, 20$                         ; Continue if OK                    [11]
                009D     31    0F1D  2218 10$:     brw     120$                            ; Return elsewise                   [11]
         50   08 A2      7D    0F20  2219 20$:     MOVQ    CLI$Q_FILE(R2),R0               ; Descriptor of device              [11]
                  33     13    0F24  2220          BEQL    60$                             ; Branch if no device               [11]
      52   61   08      9C    0F26  2221          ROTL    #8,(R1),R2                      ; Get first 3 characters of name
           52   50      90    0F2A  2222          MOVB    R0,R2                           ; Insert length
   52   4C4C4103 8F      D1    0F2D  2223          CMPL    #<^A"@ALL"-61>,R2               ; compare with ascic "all"
                  25     12    0F34  2224          BNEQ    70$                             ; Branch if not all
```

```
                        0F36  2226
                        0F36  2227 ;*
                        0F36  2228 ; Process DESELECT ALL command
                        0F36  2229 ;-
          54    65  D0  0F36  2230          MOVL    (R5),R4                 ; Get count of devices possible
             6544  D5  0F39  2231 30$:      TSTL    (R5)[R4]                ; Anything here?
                18  13  0F3C  2232          BEQL    50$                     ; No check next
                56  D5  0F3E  2233          tstl    r6                      ; If no /Adapter,                       [11]
                0A  19  0F40  2234          blss    40$                     ; ...don't check it                     [11]
       50    6544  D0  0F42  2235          movl    (r5)[r4], r0            ; Get address of link Ptable            [11]
    56    20 A0  D1  0F46  2236          cmpl    hp$a_link(r0), r6       ; Compare                               [11]
                0A  12  0F4A  2237          bneq    50$                     ; If not equal, loop to next            [11]
    00 67    54  E5  0F4C  2238 40$:      BBCC    R4,(R7),45$             ; Branch if already clear and clear     [30]
    02 63    54  E5  0F50  2239 45$:      BBCC    R4,(R3),50$             ; Branch if already clear and clear     [11]
                6C  10  0F54  2240          BSBB    130$                    ; Deallocate the device if necessary
             E0 54  F5  0F56  2241 50$:     SOBGTR  R4,30$                  ; Do them all
                62  11  0F59  2242 60$:     BRB     120$                    ; Branch to exit                        [11]
                        0F5B  2243
```

```
                                0F5B  2245
                                0F5B  2246 ;+
                                0F5B  2247 ; Process DESELECT device command
                                0F5B  2248 ;-
            52    01    CE    0F5B  2249 70$:    mnegl   #1, r2                      ; Set wildcard link                     [09]
                  56    D5    0F5E  2250         tstl    r6                          ; If no /Adapter,                       [11]
                  03    19    0F60  2251         blss    80$                         ; ...don't check for it                 [11]
            52    56    D0    0F62  2252         movl    r6, r2                      ; Use /ADAPTER address                  [11]
               0239     30    0F65  2253 80$:    bsbw    loc$ptable                  ; Search for it                         [09]
                  46    12    0F68  2254         BNEQ    110$                        ; Branch if found
         52    08 AE    D0    0F6A  2255         MOVL    8(SP),R2                    ; Get base of CLI
                  56    D5    0F6E  2256         tstl    r6                          ; /ADAPTER?                             [11]
                  24    19    0F70  2257         blss    90$                         ; Branch if not                         [11]
      7E  00000004'EF   7D    0F72  2258         movq    q_adapter, -(sp)            ; Push on adapter name                  [11]
            6E    6E    3C    0F79  2259         movzwl  (sp), (sp)                  ; Zero extend                           [11]
         7E    08 A2    7D    0F7C  2260         movq    cli$q_file(r2), -(sp)       ; Push on device name                   [11]
            6E    6E    3C    0F80  2261         movzwl  (sp), (sp)                  ; Zero extend                           [11]
         0000019D'EF    9F    0F83  2262         pushab  L^t_no_such_on_adapter      ; Format string                         [11]
                  01    DD    0F89  2263         pushl   #ds$k_printf                ; Use PRINTF                            [13]
                  15    DD    0F8B  2264         pushl   #ds$k_type_command_err      ; Command error type code               [13]
   00000000'GF    07    FB    0F8D  2265         calls   #7, G^dsx$print             ; Print it                              [13]
                  27    11    0F94  2266         brb     120$                        ; Exit                                  [11]
         7E    08 A2    7D    0F96  2267 90$:    MOVQ    CLI$Q_FILE(R2),-(SP)        ; Stack file name                       [11]
            6E    6E    3C    0F9A  2268 100$:   movzwl  (sp), (sp)                  ; Zero extend                           [11]
         00000170'EF    9F    0F9D  2269         PUSHAB  L^T_NO_SUCH_DEV             ; Edit string                           [11]
                  01    DD    0FA3  2270         pushl   #ds$k_printf                ; Use PRINTF                            [13]
                  15    DD    0FA5  2271         pushl   #ds$k_type_command_err      ; Command error type code               [13]
   00000000'GF    05    FB    0FA7  2272         CALLS   #5, G^DSX$PRINT             ; Type the error                        [13]
                  0D    11    0FAE  2273         BRB     120$                        ; Branch to exit
                                0FB0  2274 110$:
         54    50    D0    0FB0  2275         MOVL    R0,R4                       ; Copy index
      00 67    54    E5    0FB3  2276         BBCC    R4,(R7),115$                ; Branch if already clear and clear     [30]
      02 63    54    E5    0FB7  2277 115$:   BBCC    R4,(R3),120$                ; Branch if not selected
                  05    10    0FBB  2278         bsbb    130$                        ; Deallocate the device if necessary    [11]
            00FF  8F    BA    0FBD  2279 120$:   POPR    #^M<R0,R1,R2,R3,R4,R5,R6,R7>    ; Restore                           [11]
                  05    0FC1  2280         RSB                                 ; Return
                        0FC2  2281
```

```
                                0FC2  2283
                                0FC2  2284 ;+
                                0FC2  2285 ; Deallocate the device (R5)[R4] if usermode and should be deallocated
                                0FC2  2286 ; and was allocated.
                                0FC2  2287 ;-
0000FE00'EF    1C    E1        0FC2  2288 130$:   BBC      #DSA$V_USER, -
                19              0FC9  2289                  DSA$GL_FLAGS, 140$      ; Exit if not usermode
      50   6544    D0        0FCA  2290          MOVL     (R5)[R4],R0             ; Get address of P-table
   10 0A A0    00    E1        0FCE  2291          BBC      #HP$V_ALLOC, -
                               0FD3  2292                  HP$B_FLAGS(R0), 140$    ; Branch if should not be allocated
   0B 0A A0    01    E5        0FD3  2293          BBCC     #HP$V_WASALL, -
                               0FD8  2294                  HP$B_FLAGS(R0), 140$    ; Branch if already allocated
                               0FD8  2295          $DALLOC_S HP$Q_DEVICE(R0)       ; Deallocate the device
                00    DD        0FD8                        PUSHL    #0
                60    7F        0FDA                        PUSHAQ   HP$Q_DEVICE(R0)
00000000'GF     02    FB        0FDC                        CALLS    #2,G^SYS$DALLOC
                      05        0FE3  2296 140$:   RSB                             ; Return
```

```
                    0FE4  2299          .SUBTITLE       SHOW_DEV Routine
                    0FE4  2300
```

```
0FE4  2302 ;++
0FE4  2303 ; FUNCTIONAL DESCRIPTION:
0FE4  2304 ;
0FE4  2305 ;       This routine types out a line describing a single device.
0FE4  2306 ;
0FE4  2307 ; CALLING SEQUENCE:
0FE4  2308 ;
0FE4  2309 ;       BSBW    SHOW_DEV
0FE4  2310 ;
0FE4  2311 ; INPUT PARAMETERS:     NONE
0FE4  2312 ;
0FE4  2313 ; IMPLICIT INPUTS:
0FE4  2314 ;
0FE4  2315 ;       R4      Index of the PTABLE entry                    [30]
0FE4  2316 ;       R10     Address of DPB for device
0FE4  2317 ;               Contents of DS$GA_TYPLIST
0FE4  2318 ;
0FE4  2319 ; OUTPUT PARAMETERS:    NONE
0FE4  2320 ;
0FE4  2321 ; IMPLICIT OUTPUTS:     NONE
0FE4  2322 ;
0FE4  2323 ; SIDE EFFECTS:         NONE
0FE4  2324 ;
0FE4  2325 ; REGISTER USAGE:
0FE4  2326 ;
0FE4  2327 ;       R7      Address of the string to be printed
0FE4  2328 ;       R11     Address of P-table for device to be displayed
0FE4  2329 ;--
```

```
                                0FE4  2331
                    00000100    0FE4  2332 SHOWBUF_SIZ     = 256                    ; Length of buffer
                                0FE4  2333 SHOW_DEV:
                                0FE4  2334
          5E    FF00 CE   9E    0FE4  2335          MOVAB   -SHOWBUF_SIZ(SP),SP      ; Allocate buffer space
                     6E   9F    0FE9  2336          PUSHAB  (SP)                     ; Address of buffer
          7E    0100 8F   3C    0FEB  2337          MOVZWL  #SHOWBUF_SIZ,-(SP)       ; Length of buffer
                                0FF0  2338
            51    26 AB   9E    0FF0  2339          MOVAB   HP$T_TYPE(R11),R1        ; Get address of ascic type string
               50    81   9A    0FF4  2340          MOVZBL  (R1)+,R0                 ; Get length
           000011F0'EF    16    0FF7  2341          Jsb     L^LOC$PTDESC             ; Locate the descriptor                 [18]
                     0D   12    0FFD  2342          BNEQ    10$                      ; Branch if located
                                0FFF  2343
       08 AE   2E2E2E2E 8F   D0  0FFF  2344          MOVL    #^A"...."",8(SP)         ; String is "...."
                     6E   03   D0  1007  2345          MOVL    #3,(SP)                  ; Set length of string
                          4C   11  100A  2346          BRB     20$                      ; Branch to print
                                100C  2347
                          6E   7F  100C  2348 10$:     PUSHAQ  (SP)                     ; Address of descriptor
                          5B   DD  100E  2349          PUSHL   R11                      ; Address of P-table
                     51   80   9A  1010  2350          MOVZBL  (R0)+,R1                 ; Get length of name
                     04 A041   9F  1013  2351          PUSHAB  4(R0)[R1]                ; Push address of start code
          FFFFF9CE EF   03   FB  1017  2352          CALLS   #3,L^PT$EXTRACT          ; Convert to ascii                      [10]
                                101E  2353
                                101E  2354 ;+
                                101E  2355 ;       Put the address of the proper string to be printed in register 7      [30]
                                101E  2356 ;-
       1A 00000000'EF   00   E0  101E  2357          BBS     #FLG$V_BRIEF,COMM_FLAGS,16$ ; Branch if in brief form           [30]
       09 00000000'EF   54   E1  1026  2358          BBC     R4,DS$GA_ALLOCATES,15$   ; Branch if not ALLOCATED              [30]
          57    000002A0'EF   9E  102E  2359          MOVAB   L^T_SHOWDEV_ALLOC,R7     ; Use allocated message                 [30]
                          21   11  1035  2360          BRB     20$                      ; Continue                              [32]
          57    000002DD'EF   9E  1037  2361 15$:     MOVAB   L^T_SHOWDEV,R7           ; Use unallocated message               [30]
                          18   11  103E  2362          BRB     20$                      ; Continue                              [32]
                                1040  2363
       09 00000000'EF   54   E1  1040  2364 16$:     BBC     R4,DS$GA_ALLOCATES,17$   ; Branch if not ALLOCATED              [30]
          57    000002C6'EF   9E  1048  2365          MOVAB   L^T_SHOWDEVB_ALLOC,R7    ; Use allocated-brief message          [30]
                          07   11  104F  2366          BRB     20$                      ; Continue                              [32]
          57    000002F9'EF   9E  1051  2367 17$:     MOVAB   L^T_SHOWDEVB,R7          ; Use unallocated-brief message        [30]
                                1058  2368
       2B 00000000'EF   00   E0  1058  2369 20$:     BBS     #FLG$V_BRIEF,COMM_FLAGS,50$ ; Branch if brief form.            [07]
                          6E   7F  1060  2370          PUSHAQ  (SP)                     ; Address of descriptor                 [07]
                        18 AB   DD  1062  2371          PUSHL   HP$A_DEVICE(R11)         ; Stuff device address
                        20 BB   7F  1065  2372          PUSHAQ  @HP$A_LINK(R11)          ; Address of link name quad desc
                          07   12  1068  2373          BNEQ    30$                      ; Branch if descriptor
          6E    0000037D'EF   7E  106A  2374          MOVAQ   Q_HUB,(SP)               ; Use HUB device name                   [11]
                        26 AB   9F  1071  2375 30$:     PUSHAB  HP$T_TYPE(R11)           ; Address of ascic type
                          6B   7F  1074  2376          PUSHAQ  HP$Q_DEVICE(R11)         ; Address of ascid device name
                          57   DD  1076  2377          PUSHL   R7                       ; Address of edit string                [10]
                          01   DD  1078  2378          pushl   #ds$k_printf             ; Use PRINTF                            [13]
                          16   DD  107A  2379          pushl   #ds$k_type_command_out   ; Command output type code             [13]
          00000000'GF   08   FB  107C  2380          CALLS   #8, G^DSX$PRINT          ; Print the line                        [13]
                                1083  2381
          5E    00000108 8F   C0  1083  2382 40$:     ADDL    #SHOWBUF_SIZ+8,SP        ; Remove descriptor and buffer          [07]
                          05   108A  2383          RSB                              ; Return
                        26 AB   9F  108B  2384 50$:     PUSHAB  HP$T_TYPE(R11)           ; Address of ascic type                 [07]
                          6B   7F  108E  2385          PUSHAQ  HP$Q_DEVICE(R11)         ; Address of ascid device name          [07]
                          57   DD  1090  2386          PUSHL   R7                       ; Address of edit string                [07]
                          01   DD  1092  2387          pushl   #ds$k_printf             ; Use PRINTF                            [13]
```

```
                 16   DD  1094  2388          pushl   #ds$k_type_command_out  ; Command output type code              [13]
00000000'GF      05   FB  1096  2389          CALLS   #5, G^DSX$PRINT         ; Print the line                        [13]
                 E4   11  109D  2390          BRB     40$                     ;                                       [07]
```

```
                        109F  2392          .SBTTL  INI$PTABLE      Initialize P-table
                        109F  2393
                        109F  2394 ;++
                        109F  2395 ; FUNCTIONAL DESCRIPTION:
                        109F  2396 ;
                        109F  2397 ;       This routine is used to initialize DS$GA_PTABLE and
                        109F  2398 ;       DS$GA_SELECTS, DS$GA_SELECTED.
                        109F  2399 ;
                        109F  2400 ; CALLING SEQUENCE:
                        109F  2401 ;
                        109F  2402 ;       BSBW    INI$PTABLE
                        109F  2403 ;
                        109F  2404 ; INPUT PARAMETERS:     NONE
                        109F  2405 ;
                        109F  2406 ; IMPLICIT INPUTS:      NONE
                        109F  2407 ;
                        109F  2408 ; OUTPUT PARAMETERS:    NONE
                        109F  2409 ;
                        109F  2410 ; IMPLICIT OUTPUTS:
                        109F  2411 ;
                        109F  2412 ;       DS$GA_SELECTS, DS$GA_SELECTED, DS$GA_PTABLE.
                        109F  2413 ;
                        109F  2414 ; SIDE EFFECTS:         NONE
                        109F  2415 ;
                        109F  2416 ; COMPLETION CODES:     SS$_NORMAL
                        109F  2417 ;--
```

```
                                109F  2419
                                109F  2420 INI$PTABLE::
          51   00000000'EF    DE  109F  2421          MOVAL   DS$GA_PTABLE,R1          ; Point to table
                    50   61   D0  10A6  2422          MOVL    (R1),R0                 ; Get count
                      6140   D4  10A9  2423 10$:      CLRL    (R1)[R0]
   00000000'EF   01   50   00   F0  10AC  2424          INSV    #0,R0,#1,DS$GA_SELECTS  ; Clear select bit
   00000000'EF   01   50   00   F0  10B5  2425          INSV    #0,R0,#1,DS$GA_ALLOCATES ; Clear the allocate bit       [30]
                        E8 50   F5  10BE  2426          SOBGTR  R0,10$                  ; Do next unit
                    50   01   D0  10C1  2427          MOVL    S^#SS$_NORMAL,R0        ; Success of course
                                05  10C4  2428          RSB
                                10C5  2429
```

```
                        10C5  2431          .Subtitle       Check ambiguous device
                        10C5  2432
                        10C5  2433 ;++
                        10C5  2434 ; Functional Description:
                        10C5  2435 ;
                        10C5  2436 ;       This routines searches to make sure that the /Adapter
                        10C5  2437 ;       argument (if specified) is unique; and that if /Adapter
                        10C5  2438 ;       is NOT used, the device name is unique.
                        10C5  2439 ;
                        10C5  2440 ; Calling Sequence:
                        10C5  2441 ;
                        10C5  2442 ;       BsbW    CheckAmbiguous
                        10C5  2443 ;
                        10C5  2444 ; Input Parameters:     NONE
                        10C5  2445 ;
                        10C5  2446 ; Implicit Inputs:      NONE
                        10C5  2447 ;
                        10C5  2448 ; Output Parameters:    NONE
                        10C5  2449 ;
                        10C5  2450 ; Implicit Outputs:     NONE
                        10C5  2451 ;
                        10C5  2452 ; Status Return:        R0 (LBS if OK, LBC if error)
                        10C5  2453 ;
                        10C5  2454 ;--
```

```
                                10C5
                                10C5  CheckAmbiguous:                                  ; Check for ambiguous names                [15]
          007F 8F     BB        10C5          PushR   #^M<r0,r1,r2,r3,r4,r5,R6>          ; Save registers                   [15]
               56     D4        10C9          ClrL    R6                                ; Assume we'll skip ahead to device        [15]
       0B 62  18     E1        10CB          Bbc     #Cli$V_Adapter, -                 ; If no /Adapter, don't have               [15]
                                10CF                   Cli$L_Flags(R2), 10$             ; .. to check adapter name                 [15]
               56     D6        10CF          IncL    R6                                ; Have to check adapter first              [15]
  6E   00000004'EF    7D        10D1          MovQ    Q_Adapter, (Sp)                   ; Set save descriptor to adapter name      [15]
               0C     11        10D8          Brb     20$                               ; Join common                              [15]
       52   08 AE     D0        10DA  10$:    MovL    8(Sp), R2                         ; Make sure we have original R2            [15]
       41 62  18     E0        10DE          Bbs     #Cli$V_Adapter, -                 ; Duplicates are OK if                     [15]
                                10E2                   Cli$L_Flags(R2), 60$             ; .. /Adapter was given                    [15]
       6E   08 A2     7D        10E2          MovQ    Cli$Q_File(R2), (Sp)              ; Set descriptor to device name            [15]
          6E   6E     3C        10E6  20$:    MovZWL  (Sp), (Sp)                        ; Make sure length is word                 [15]
               53     D4        10E9          ClrL    R3                                ; No matches so far                        [15]
  55   00000000'EF    DE        10EB          MovAL   Ds$GA_PTable, R5                  ; Address of list                          [15]
          54   65     D0        10F2          MovL    (R5), R4                          ; Length of list                           [15]
       52   6544      D0        10F5  30$:    MovL    (R5)[R4], R2                      ; Get address of P-tables                  [15]
               22     13        10F9          BEql    50$                               ; Branch if no entry here                  [15]
    50   62   01      C3        10FB          SubL3   #1, Hp$Q_Device(R2), R0           ; Length of name                           [15]
          6E   50     D1        10FF          CmpL    R0, (Sp)                          ; Length match                             [15]
               19     12        1102          BNeq    50$                               ; Branch if length mismatch                [15]
       51   04 AE     D0        1104          MovL    4(Sp), R1                         ; Get address of desired                   [15]
  52   04 A2   01     C1        1108          AddL3   #1, Hp$Q_Device+4(R2),R2          ; Point to device name                     [15]
          81   82     91        110D  40$:    CmpB    (R2)+, (R1)+                      ; Compare a byte                           [15]
               0B     12        1110          BNeq    50$                               ; Branch if mismatch                       [15]
            F8 50     F5        1112          SobGtr  R0, 40$                           ; Continue to compare                      [15]
               53     D5        1115          TstL    R3                                ; Found a match...is it the first?         [15]
               12     12        1117          BNeq    80$                               ; No, generate an error                    [15]
       53   6544      D0        1119          MovL    (R5)[R4], R3                      ; Get address of entry                     [15]
            D5 54     F5        111D  50$:    SobGtr  R4, 30$                           ; Next if any                              [15]
            B7 56     F4        1120          SobGeq  R6, 10$                           ; If just did adapter, do device           [15]
          6E   01     D0        1123  60$:    MovL    #1, (Sp)                          ; Success                                  [15]
          007F 8F     BA        1126  70$:    PopR    #^M<r0,r1,r2,r3,r4,r5,R6>          ; Restore all registers            [15]
                      05        112A          Rsb                                       ; Return                                   [15]
                                112B
               6E     7F        112B  80$:    PushAQ  (Sp)                              ; Duplicate name descriptor on stack       [15]
     000001C3'EF      9F        112D          PushAB  L^T_Ambig_Adap                    ; Address of format string                 [15]
            07 56     E8        1133          BlbS    R6, 90$                           ; Branch if this is adapter error          [15]
  6E   000001F0'EF    9E        1136          MovAB   L^T_Ambig_Dev, (Sp)               ; Replace format string with device        [15]
               01     DD        113D  90$:    PushL   #Ds$K_PrintF                      ; Use PrintF typeout                       [15]
               15     DD        113F          PushL   #Ds$K_Type_Command_Err            ; Command error typecode                   [15]
  00000000'GF  04     FB        1141          CallS   #4, G^Dsx$Print                   ; Print error                              [15]
               6E     D4        1148          ClrL    (Sp)                              ; Clear saved R0                           [15]
               DA     11        114A          Brb     70$                               ; Return                                   [15]
```

```
                        .SBTTL  Locate /Adapter value

;++
; Functional Description:
;
;       This routine uses the module-global Q_ADAPTER as the
;       name of an adapter device, if CLI$V_ADAPTER is set.
;       It will look up this device and return the address
;       of the Ptable.  If the device is the special name
;       'HUB', it will return 0.  Otherwise it will return
;       -1.
;
; Calling Sequence:
;       bsbw    loc$adapter
;
; Parameters: none
;
; Implicit inputs:
;       q_adapter       Descriptor of adapter name
;       cli$l_flags(r2) Checks CLI$V_ADAPTER bit.
;
; Outputs:
;       R6              Address of Ptable, or -1 if not found.
;
; Implicit inputs: none
;
; Return status:
;       R0      1 if succeeded, 0 if failed.  (Success includes no /Adapter).
;--
```

```
                                  114C  2532
                                  114C  2533 loc$adapter::                                  ;                                                  [11]
                  56   01   CE    114C  2534          mnegl   #1, r6                        ; Set to no /Adapter                               [11]
               4A 62   18   E1    114F  2535          bbc     #cli$v_adapter, -             ; If not /Adapter                                  [11]
                                  1153  2536                   cli$l_flags(r2), 20$         ; ...then branch                                   [11]
          50   00000004'EF   7D    1153  2537          movq    q_adapter, r0                 ; Get descriptor of adapter device                 [11]
                  03   50   B1    115A  2538          cmpw    r0, #3                        ; Is length same as 'HUB'?                         [11]
                       0F   12    115D  2539          bneq    10$                           ; If not, try loc$ptable lookup                    [11]
   00425548 8F   61   18   00   ED    115F  2540          cmpzv   #0, #24, (r1), #^A"HUB"       ; Compare with 'HUB' keyword                       [11]
                       04   12    1168  2541          bneq    10$                           ; If not, try loc$ptable                           [11]
                       56   D4    116A  2542          clrl    r6                            ; OK, set return and go home                       [11]
                       2F   11    116C  2543          brb     20$                           ; Return success                                   [11]
                       04   BB    116E  2544 10$:     pushr   #^M<r2>                       ; Don't let R2 get wiped out                       [11]
                  52   01   CE    1170  2545          mnegl   #1, r2                        ; Find it on any link                              [11]
                       2C   10    1173  2546          bsbb    loc$ptable                    ; Find the Ptable for it                           [11]
                       04   BA    1175  2547          popr    #^M<r2>                       ; And restore it                                   [11]
                  56   51   D0    1177  2548          movl    r1, r6                        ; Store address away                               [11]
                       21   12    117A  2549          bneq    20$                           ; Branch if found                                  [11]
                    04 A2   D4    117C  2550          clrl    cli$l_command(r2)             ; Otherwise, clear command address                 [11]
          7E   00000004'EF   7D    117F  2551          movq    q_adapter, -(sp)              ; Push adapter name desc on stack                  [11]
                  6E   6E   3C    1186  2552          movzwl  (sp), (sp)                    ; Zero extend length, just in case                 [11]
               00000186'EF   9F    1189  2553          pushab  L^t_no_such_adapter           ; Message to type                                  [11]
                       01   DD    118F  2554          pushl   #ds$k_printf                  ; Use PRINTF                                       [13]
                       15   DD    1191  2555          pushl   #ds$k_type_command_err        ; Command error type code                          [13]
          00000000'GF   05   FB    1193  2556          calls   #5, G^dsx$print               ; Print it out                                     [13]
                       50   D4    119A  2557          clrl    r0                            ; Return failure                                   [11]
                            05    119C  2558          rsb                                   ; Return                                           [11]
                  50   01   D0    119D  2559 20$:     movl    #1, r0                        ; Set success                                      [11]
                            05    11A0  2560          rsb                                   ; Return                                           [11]
```

```
                        11A1  2562          .SUBTITLE       LOC$PTABLE Routine
                        11A1  2563
                        11A1  2564 ;++
                        11A1  2565 ; FUNCTIONAL DESCRIPTION:
                        11A1  2566 ;
                        11A1  2567 ;       This routine locates a P-table given the device name.
                        11A1  2568 ;
                        11A1  2569 ; CALLING SEQUENCE:
                        11A1  2570 ;
                        11A1  2571 ;       BSBW    LOC$PTABLE
                        11A1  2572 ;
                        11A1  2573 ; INPUT PARAMETERS:     NONE
                        11A1  2574 ;
                        11A1  2575 ; IMPLICIT INPUTS:
                        11A1  2576 ;
                        11A1  2577 ;       R0      Length of name to be located
                        11A1  2578 ;       R1      Address of name to be located
                        11A1  2579 ;       R2      Link field of Ptable to locate
                        11A1  2580 ;
                        11A1  2581 ; OUTPUT PARAMETERS:    NONE
                        11A1  2582 ;
                        11A1  2583 ; IMPLICIT OUTPUTS:
                        11A1  2584 ;
                        11A1  2585 ;       R0      Index into DS$GA_PTABLE of located entry
                        11A1  2586 ;       R1      Address of P-table
                        11A1  2587 ;
                        11A1  2588 ; CONDITION CODES:
                        11A1  2589 ;
                        11A1  2590 ;       Z-bit   Clear if entry found, else set
                        11A1  2591 ;
                        11A1  2592 ; REGISTER USAGE:
                        11A1  2593 ;
                        11A1  2594 ;       R5      Address of DS$GA_PTABLE
                        11A1  2595 ;       R4      Current index into table
                        11A1  2596 ;--
```

```
                          11A1  2598
                          11A1  2599 LOC$PTABLE::
                3F   BB   11A1  2600          pushr   #^M<r0,r1,r2,r3,r4,r5>  ; Save registers                          [09]
             6E   6E   3C   11A3  2601          movzwl  (sp), (sp)             ; Make sure length is word               [11]
             53   52   D0   11A6  2602          movl    r2, r3                 ; Do something with link address         [09]
                       11A9  2603
          55 00000000'EF   DE   11A9  2604          MOVAL   DS$GA_PTABLE,R5        ; Address of list
                54   65   D0   11B0  2605          MOVL    (R5),R4                ; Length of list
              52   6544   D0   11B3  2606 10$:     MOVL    (R5)[R4],R2            ; Get address of P-tables
                   2D   13   11B7  2607          BEQL    40$                    ; Branch if no entry here
                   53   D5   11B9  2608          tstl    r3                     ; Is R2 valid, or wildcard?              [09]
                   06   19   11BB  2609          blss    20$                    ; If wildcard, continue compare          [09]
              20 A2   53   D1   11BD  2610          cmpl    r3, hp$a_link(r2)      ; Compare link fields                    [09]
                   23   12   11C1  2611          bneq    40$                    ; Check next                             [09]
                       11C3  2612 20$:                                          ;                                        [09]
           50   62   01   C3   11C3  2613          SUBL3   #1,HP$Q_DEVICE(R2),R0  ; Length of name
                6E   50   D1   11C7  2614          CMPL    R0,(SP)                ; Length match
                   1A   12   11CA  2615          BNEQ    40$                    ; Branch if length mismatch
              51   04 AE   D0   11CC  2616          MOVL    4(SP),R1               ; Get address of desired
          52   04 A2   01   C1   11D0  2617          ADDL3   #1,HP$Q_DEVICE+4(R2),R2 ; Point to device name
                81   82   91   11D5  2618 30$:     CMPB    (R2)+,(R1)+            ; Compare a byte
                   0C   12   11D8  2619          BNEQ    40$                    ; Branch if mismatch
                F8 50   F5   11DA  2620          SOBGTR  R0,30$                 ; Continue to compare
              55   6544   D0   11DD  2621          MOVL    (R5)[R4],R5            ; Get address of entry                   ;G:10
                6E   54   7D   11E1  2622          MOVQ    R4,(SP)                ; Superceed saved R0/R1
                   05   11   11E4  2623          BRB     50$                    ; exit
             CA 54   F5   11E6  2624 40$:     SOBGTR  R4,10$                 ; Next if any
                6E   7C   11E9  2625          CLRQ    (SP)                   ; Clear R0/R1
                3F   BA   11EB  2626 50$:     popr    #^M<r0,r1,r2,r3,r4,r5> ; Restore all registers                  [09]
                51   D5   11ED  2627          TSTL    R1                     ; Set condition codes from PT address
                     05   11EF  2628          RSB
```

```
                        11F0  2630          .SBTTL  LOC$PTDESC      Locate PT-descriptor
                        11F0  2631
                        11F0  2632 ;++
                        11F0  2633 ; FUNCTIONAL DESCRIPTION:
                        11F0  2634 ;
                        11F0  2635 ;       This routine is used to locate the PT-descriptor
                        11F0  2636 ;       given the hardware type name.
                        11F0  2637 ;
                        11F0  2638 ; CALLING SEQUENCE:
                        11F0  2639 ;
                        11F0  2640 ;       BSBW    LOC$PTDESC
                        11F0  2641 ;
                        11F0  2642 ; INPUT PARAMETERS:     NONE
                        11F0  2643 ;
                        11F0  2644 ; IMPLICIT INPUTS:
                        11F0  2645 ;
                        11F0  2646 ;       R0      Length of device type
                        11F0  2647 ;       R1      Address of device type
                        11F0  2648 ;
                        11F0  2649 ; OUTPUT PARAMETERS:    NONE
                        11F0  2650 ;
                        11F0  2651 ; IMPLICIT OUTPUTS:
                        11F0  2652 ;
                        11F0  2653 ;       R0      Address of PT-descriptor
                        11F0  2654 ;
                        11F0  2655 ; CONDITION CODES:
                        11F0  2656 ;
                        11F0  2657 ;       Z-bit   Clear if found else set
                        11F0  2658 ;
                        11F0  2659 ; SIDE EFFECTS:          NONE
                        11F0  2660 ;--
```

```
                                  11F0  2662
                                  11F0  2663 LOC$PTDESC::
                        3F   BB   11F0  2664          PUSHR   #^M<R0,R1,R2,R3,R4,R5>  ; Save a couple
                                  11F2  2665
                        52   D4   11F2  2666          CLRL    R2                      ; Base Page 0/page 1
00000058 8F     0200    C2   D1   11F4  2667          CMPL    L$L_HEADLENGTH(R2),#^X58; Check length of Header
                        0B   12   11FD  2668          BNEQ    10$                     ; Branch if bad header
              55  021C    C2   D0   11FF  2669          MOVL    L$A_DEVP(R2),R5         ; Address of DEVTYP list
                        04   13   1204  2670          BEQL    10$                     ; Branch if null
                        13   10   1206  2671          BSBB    PT_LOCATE               ; Find PT-descriptor here
                        09   12   1208  2672          BNEQ    20$                     ; Exit if found
                                  120A  2673 10$:
           55   00000000'EF   DE   120A  2674          MOVAL   DS$GA_PTDESC,R5         ; Point to descriptor list
                        08   10   1211  2675          BSBB    PT_LOCATE               ; Search this list
                                  1213  2676 20$:
                     5E   08   C0   1213  2677          ADDL    #8,SP                   ; Remove saved R0/R1
                        3C   BA   1216  2678          POPR    #^M<R2,R3,R4,R5>
                        50   D5   1218  2679          TSTL    R0                      ; Set condition codes from return
                             05   121A  2680          RSB                             ; Return
                                  121B  2681
                                  121B  2682 PT_LOCATE:
                        54   65   D0   121B  2683          MOVL    (R5),R4                 ; Get length of table
                             27   13   121E  2684          beql    40$                     ; Branch if table is empty              [08]
                     53   6544   D0   1220  2685 10$:     MOVL    (R5)[R4],R3             ; Get address of PT-descriptor
                  50    04 AE   7D   1224  2686          MOVQ    4(SP),R0                ; Get length,address
                        50   50   3C   1228  2687          movzwl  r0, r0                  ; Zero extend word length               [11]
                        83   50   91   122B  2688          CMPB    R0,(R3)+                ; Length match?
                             14   12   122E  2689          BNEQ    30$                     ; No match, next
                        83   81   91   1230  2690 20$:     CMPB    (R1)+,(R3)+             ; Compare byte
                             0F   12   1233  2691          BNEQ    30$                     ; Branch if not found
                          F8 50   F5   1235  2692          SOBGTR  R0,20$                  ; Count and branch
                 04 A3    80 8F   91   1238  2693          CMPB    #PD$_START,4(R3)        ; Verify PT-descriptor follows
                             05   12   123D  2694          BNEQ    30$                     ; Branch if not
                     50   6544   D0   123F  2695          MOVL    (R5)[R4],R0             ; Address of PT-descriptor
                             05   1243  2696          RSB                             ; Return with Z-bit clear
                                  1244  2697
                          D9 54   F5   1244  2698 30$:     SOBGTR  R4,10$                  ; Do next entry
                             50   D4   1247  2699 40$:     clrl    r0                      ; Not found                             [08]
                             05   1249  2700          RSB                             ; Return Z-bit Set
```

```
                        124A  2702          .SBTTL  INS$PTABLE      Insert P-table
                        124A  2703
                        124A  2704 ;++
                        124A  2705 ; FUNCTIONAL DESCRIPTION:
                        124A  2706 ;
                        124A  2707 ;       This routine can be called with the address of the P-table
                        124A  2708 ;       to be entered in DS$GA_PTABLE. It takes care of superceding
                        124A  2709 ;       existing Ptables for the same device name and link.
                        124A  2710 ;
                        124A  2711 ; CALLING SEQUENCE:
                        124A  2712 ;
                        124A  2713 ;       INS$PTABLE(PT)
                        124A  2714 ;
                        124A  2715 ; INPUT PARAMETERS:
                        124A  2716 ;
                        124A  2717 ;       AP      Address of P-table to insert
                        124A  2718 ;
                        124A  2719 ; IMPLICIT INPUTS:
                        124A  2720 ;
                        124A  2721 ;       DS$GA_PTABLE
                        124A  2722 ;
                        124A  2723 ; OUTPUT PARAMETERS:    NONE
                        124A  2724 ;
                        124A  2725 ; IMPLICIT OUTPUTS:
                        124A  2726 ;
                        124A  2727 ;       DS$GA_PTABLE
                        124A  2728 ;
                        124A  2729 ; COMPLETION CODES:     NONE
                        124A  2730 ;--
```

```
                                 124A  2732
                           003C  124A  2733 .ENTRY  INS$PTABLE,^M<R2,R3,R4,R5>
                      50   6C   7D  124C  2734        MOVQ    HP$Q_DEVICE(AP),R0      ; Get length/address of device name
                           51   D6  124F  2735        INCL    R1                      ; Skip "-"
                           50   D7  1251  2736        DECL    R0                      ; Skip "-"
                     52   20 AC   D0  1253  2737        movl    hp$a_link(ap), r2       ; Link of device                        [09]
                   FFFFFF44 EF   16  1257  2738        Jsb     L^LOC$PTABLE            ; See if already exists                 [18]
                           48   13  125D  2739        BEQL    30$                     ; Branch if not found
                                    125F  2740
                55   00000000'EF   DE  125F  2741        MOVAL   DS$GA_PTABLE,R5         ; Get address of possibles
                        54   65   D0  1266  2742        MOVL    (R5),R4                 ; Get number of possibles
                     53   6544   D0  1269  2743 10$:     MOVL    (R5)[R4],R3             ; Point to this P-table
                           26   13  126D  2744        BEQL    20$                     ; Branch if none
                   20 A3   51   D1  126F  2745        CMPL    R1,HP$A_LINK(R3)        ; This P-table point to OLD PT for new
                           20   12  1273  2746        BNEQ    20$                     ; Branch if not
                26 A3   5205 8F   B1  1275  2747        CMPW    #5!<^A"R"a8>,HP$T_TYPE(R3); Check for RB730. Special case.     [20]
                           0A   12  127B  2748        BNEQ    12$                     ; Branch if no match on first part.     [20]
             28 A3   30333742 8F   D1  127D  2749        CMPL    #^A"B730",2+HP$T_TYPE(R3) ; Finish checking                     [20]
                           0A   13  1285  2750        BEQL    15$                     ; Skip if match. Do not change PTABLE   [20]
                18 A3   1C A1   CA  1287  2751 12$:     BICL    HP$A_DVA(R1),HP$A_DEVICE(R3) ; Remove old DVA bits
                18 A3   1C AC   C8  128C  2752        BISL    HP$A_DVA(AP),HP$A_DEVICE(R3); Insert new DVA bits
                   20 A3   5C   D0  1291  2753 15$:     MOVL    AP,HP$A_LINK(R3)        ; Point to new P-table
                         D1 54   F5  1295  2754 20$:     SOBGTR  R4,10$                  ; Branch if more to process
                     6540   5C   D0  1298  2755        MOVL    AP,(R5)[R0]             ; Use this index again
                       50   51   D0  129C  2756        MOVL    R1,R0                   ; Copy address of dynamic memory
                   00000000'EF   16  129F  2757        Jsb     L^EXE$DEANONPAGED       ; deallocate old PT                     [18]
                           2F   11  12A5  2758        BRB     60$                     ; Return normal
                                    12A7  2759 30$:
             55   00000000'EF   DE  12A7  2760        MOVAL   DS$GA_PTABLE,R5         ; Point to P-table list
                        54   65   D0  12AE  2761        MOVL    (R5),R4                 ; Get length of list
                           6544   D5  12B1  2762 40$:     TSTL    (R5)[R4]                ; Occupied?
                             1C   13  12B4  2763        BEQL    50$                     ; No, use it
                          F8 54   F5  12B6  2764        SOBGTR  R4,40$                  ; Search whole list
                                    12B9  2765        ERRSUP_S
                   00000000'EF   DF  12B9                      PUSHAL  $MODULE
                           00   DD  12BF                      PUSHL   #0
                           02   DD  12C1                      PUSHL   #$ER
             00000000'EF   03   FB  12C3                      CALLS   #3, DS_ERRSUP
             50   00660002 8F   D0  12CA  2766        MOVL    #DS$_ERROR,R0           ; Flag error
                           04   12D1  2767        RET                             ; Return
                                    12D2  2768 50$:
                        6544   5C   D0  12D2  2769        MOVL    AP,(R5)[R4]             ; Insert pointer to PT
          00 00000000'EF   54   E5  12D6  2770 60$:     BBCC    R4,DS$GA_SELECTS,70$    ; Clear select bit
                        50   01   D0  12DE  2771 70$:     MOVL    S^#SS$_NORMAL,R0        ; Success
                           04   12E1  2772        RET
                                    12E2  2773
                                    12E2  2774        .END
```

```
$$N                             = 00000002     D
$$T1                            = 00000001     D
$ER                             = 00000003     D
$MODULE                           00000000 R   D   02
ABORT_ATTACH                      00000001 R   D   03
ALLOC                             00000002 R   D   03
ATC$_CMDLINE                      00000004     D
ATC$_PROMPT                       00000008     D
BADPARAM                          00000766 R   D   04
BAD_LINK                          000001BF R   D   04
BAD_NAME                          000002AF R   D   04
BAD_TYPE                          00000130 R   D   04
BAD_UNIT_EXC                      00000292 R   D   04
BIT...                          = 00000004     D
BUFFER                            FFFFFF70     D
CENTRAL_BUS                       000003A6 R   D   02
CHECKAMBIGUOUS                    000010C5 R   D   04
CLI$K_BUFSIZ                    = 00000100     D
CLI$K_SIZE                        0000044C     D
CLI$L_ADDRESS                     00000018     D
CLI$L_COMMAND                     00000004     D
CLI$L_DATA                        0000001C     D
CLI$L_FLAGS                       00000000     D
CLI$L_FLAGS2                      00000444     D
CLI$L_LAST                        00000024     D
CLI$L_NEXT                        00000030     D
CLI$L_PASS                        0000002C     D
CLI$L_SUBT                        00000028     D
CLI$L_TEMP_BASE                   00000448     D
CLI$L_TEST                        00000020     D
CLI$M_START_OR_RUN              = 00000008     D
CLI$Q_BUFQWD                      00000034     D
CLI$Q_FILE                        00000008     D
CLI$Q_SECTION                     00000010     D
CLI$Q_TIME                        0000043C     D
CLI$T_BUFFER                      0000003C     D
CLI$V_ADAPTER                   = 00000018     D
CLI$V_ADR                       = 0000000B     D
CLI$V_ASCII                     = 00000013     D
CLI$V_BASE_QUAL                 = 00000002     D
CLI$V_BREAK                     = 0000000A     D
CLI$V_BRIEF                     = 0000001B     D
CLI$V_BYTE                      = 0000000D     D
CLI$V_CLEAR                     = 00000002     D
CLI$V_DEC                       = 00000010     D
CLI$V_DEFAULT                   = 0000000C     D
CLI$V_DEPOSIT                   = 00000019     D
CLI$V_EVENT                     = 00000008     D
CLI$V_EXAM                      = 00000005     D
CLI$V_FLAGS                     = 00000009     D
CLI$V_HEX                       = 00000012     D
CLI$V_KERNEL                    = 00000017     D
CLI$V_LOAD                      = 00000006     D
CLI$V_LONG                      = 0000000F     D
CLI$V_NEXT                      = 00000001     D
CLI$V_NOALLOC                   = 00000000     D
CLI$V_NOTNUF                    = 00000001     D
CLI$V_OCT                       = 00000011     D
CLI$V_PREG                      = 0000001A     D
CLI$V_QA                        = 00000007     D
CLI$V_QACKLOOPLOOPS             = 0000001C     D
CLI$V_QAERRORPRINTS             = 0000001B     D
CLI$V_QAMULTIPLEPASS            = 0000001F     D
CLI$V_QASUBTESTLOOPS            = 0000001E     D
CLI$V_QATESTLOOPS               = 0000001D     D
CLI$V_REG                       = 00000014     D
CLI$V_REQUIRED                  = 00000000     D
CLI$V_RUN                       = 00000015     D
CLI$V_SET                       = 00000003     D
CLI$V_SHOW                      = 00000004     D
CLI$V_START_OR_RUN              = 00000003     D
CLI$V_VALSEC                    = 00000016     D
CLI$V_WORD                      = 0000000E     D
COMM_FLAGS                        00000000 R   D   03
CRD$M_CRD_DEBUG                 = 00000001     D
CRD$M_CTRL_C_NO_ECHO            = 00000002     D
CRD$M_FLUSH_CTRL_C              = 00000004     D
CRD$M_INHIBIT_ALLOCATE          = 00000008     D
CRD$V_CRD_DEBUG                 = 00000000     D
CRD$V_CTRL_C_NO_ECHO            = 00000001     D
CRD$V_FLUSH_CTRL_C              = 00000002     D
CRD$V_INHIBIT_ALLOCATE          = 00000003     D
DESC                              FFFFFFF4     D
DIR...                          = 00000001     D
DS$CNTRLC                         ********     X   00
DS$GA_ALLOCATES                   ********     X   00
DS$GA_PTABLE                      ********     X   00
DS$GA_PTDESC                      ********     X   00
DS$GA_SELECTS                     ********     X   00
DS$GB_INHIBIT_NAMING              ********     X   00
DS$GL_CLIBASE                     ********     X   00
DS$GL_CRD_FLAGS                   ********     X   00
DS$GL_FLAGS                       ********     X   00
DS$K_ERROR                              = 00000002     D
DS$K_NORMAL                             = 00000001     D
DS$K_PRINTB                             = 00000002     D
DS$K_PRINTF                             = 00000001     D
DS$K_PRINTI                             = 00000000     D
DS$K_PRINTX                             = 00000003     D
DS$K_SEVERE                             = 00000004     D
DS$K_SUBSYS                             = 00000066     D
DS$K_TYPE_ABORT_PROGRAM                 = 00000014     D
DS$K_TYPE_ABORT_TEST                    = 00000013     D
DS$K_TYPE_COMMAND_ERR                   = 00000015     D
DS$K_TYPE_COMMAND_OUT                   = 00000016     D
DS$K_TYPE_CRD_AUTOTEST                  = 0000001A     D
DS$K_TYPE_DS_PROMPT                     = 00000001     D
DS$K_TYPE_DS_START                      = 0000001D     D
DS$K_TYPE_ERRDEV                        = 00000008     D
DS$K_TYPE_ERRHARD                       = 00000006     D
DS$K_TYPE_ERROR_BODY                    = 00000009     D
DS$K_TYPE_ERROR_END                     = 0000000A     D
DS$K_TYPE_ERRPREP                       = 0000001B     D
DS$K_TYPE_ERRSOFT                       = 00000007     D
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DS$K_TYPE_ERRSUP                = 00000004    D        DS$V_BADTIME                    = 00000014    D
DS$K_TYPE_ERRSYS                = 00000005    D        DS$V_BATCH                      = 00000016    D
DS$K_TYPE_ERR_HALT              = 0000000D    D        DS$V_BRKCLR                     = 0000000C    D
DS$K_TYPE_EXCEPTION             = 0000000C    D        DS$V_BRKPT                      = 0000000B    D
DS$K_TYPE_EXCEPTION_HEAD        = 0000000B    D        DS$V_CHARFLG                    = 00000008    D
DS$K_TYPE_FIRST_PASS            = 00000011    D        DS$V_CMDFLG                     = 00000007    D
DS$K_TYPE_GENERAL               = 00000000    D        DS$V_CTRLC                      = 00000000    D
DS$K_TYPE_GENERAL_ERROR         = 00000003    D        DS$V_CTRLO                      = 00000010    D
DS$K_TYPE_NO_TESTS              = 00000012    D        DS$V_DEVFLG                     = 00000009    D
DS$K_TYPE_PARAM_ERROR           = 0000001C    D        DS$V_DISABLCC                   = 00000018    D
DS$K_TYPE_PROGRAM_END           = 00000010    D        DS$V_DONFLG                     = 0000000D    D
DS$K_TYPE_PROGRAM_INFO          = 00000017    D        DS$V_ERRFLG                     = 00000004    D
DS$K_TYPE_PROGRAM_START         = 0000000F    D        DS$V_EXCEPT                     = 00000013    D
DS$K_TYPE_QIO_INVADP            = 00000024    D        DS$V_EXETST                     = 00000012    D
DS$K_TYPE_QIO_NODRIVER          = 00000022    D        DS$V_HLTFLG                     = 00000003    D
DS$K_TYPE_QIO_WRONGVER          = 00000023    D        DS$V_LODFLG                     = 00000001    D
DS$K_TYPE_SCRIPT_ECHO           = 00000021    D        DS$V_MEMMGT                     = 0000000F    D
DS$K_TYPE_SCRIPT_PNF            = 0000001E    D        DS$V_NI                         = 0000001A    D
DS$K_TYPE_SCRIPT_PROMPT         = 00000020    D        DS$V_OUTPUT                     = 00000017    D
DS$K_TYPE_SCRIPT_SKIP           = 0000001F    D        DS$V_RUBFLG                     = 00000005    D
DS$K_TYPE_SEQUENCE_ERROR        = 00000019    D        DS$V_SCRIPT                     = 00000015    D
DS$K_TYPE_START_ERR             = 00000018    D        DS$V_SETIMR                     = 00000019    D
DS$K_TYPE_START_LIST            = 00000025    D        DS$V_STRFLG                     = 00000002    D
DS$K_TYPE_SUMMARY               = 0000000E    D        DS$V_SUBT                       = 0000000E    D
DS$K_TYPE_USER_PROMPT           = 00000002    D        DS$V_SYSFLG                     = 0000000A    D
DS$K_WARNING                    = 00000000    D        DS$V_TIMED                      = 00000019    D
DS$M_ABRTFLG                    = 00000040    D        DS$V_TIMED_OUT                  = 0000001B    D
DS$M_BADTIME                    = 00100000    D        DS$V_TIMRON                     = 00000011    D
DS$M_BATCH                      = 00400000    D        DS$_AP_NORMAL_BREAK             = 00660150    D
DS$M_BRKCLR                     = 00001000    D        DS$_ARITH                       = 006600D0    D
DS$M_BRKPT                      = 00000800    D        DS$_ASBE                        = 00660118    D
DS$M_CHARFLG                    = 00000100    D        DS$_BADLINK                     = 006600F0    D
DS$M_CMDFLG                     = 00000080    D        DS$_BADTYPE                     = 006600E8    D
DS$M_CTRLC                      = 00000001    D        DS$_BIIC                        = 00660120    D
DS$M_CTRLO                      = 00010000    D        DS$_CHME                        = 006600A8    D
DS$M_DEVFLG                     = 00000200    D        DS$_CHMK                        = 006600E0    D
DS$M_DISABLCC                   = 01000000    D        DS$_DEVNAME                     = 00660108    D
DS$M_DONFLG                     = 00002000    D        DS$_ERROR                       = 00660002    D
DS$M_ERRFLG                     = 00000010    D        DS$_FHWE                        = 00660068    D
DS$M_EXCEPT                     = 00080000    D        DS$_FRAGBUF                     = 00660080    D
DS$M_EXETST                     = 00040000    D        DS$_ICBUSY                      = 006600C8    D
DS$M_HLTFLG                     = 00000008    D        DS$_ICERR                       = 006600C0    D
DS$M_LODFLG                     = 00000002    D        DS$_IHWE                        = 00660060    D
DS$M_MEMMGT                     = 00008000    D        DS$_ILLCHAR                     = 00660018    D
DS$M_NI                         = 04000000    D        DS$_ILLPAGCNT                   = 00660078    D
DS$M_OUTPUT                     = 00800000    D        DS$_ILLUNIT                     = 00660100    D
DS$M_RUBFLG                     = 00000020    D        DS$_INIT_FAIL                   = 00660140    D
DS$M_SCRIPT                     = 00200000    D        DS$_INSFMEM                     = 00660050    D
DS$M_SETIMR                     = 02000000    D        DS$_INVCPU                      = 00660130    D
DS$M_STRFLG                     = 00000004    D        DS$_IPL2HI                      = 006600B8    D
DS$M_SUBT                       = 00004000    D        DS$_IVADDR                      = 00660040    D
DS$M_SYSFLG                     = 00000400    D        DS$_IVVECT                      = 00660038    D
DS$M_TIMED                      = 02000000    D        DS$_KRNLSTK                     = 00660090    D
DS$M_TIMED_OUT                  = 08000000    D        DS$_LOGIC                       = 00660070    D
DS$M_TIMRON                     = 00020000    D        DS$_MCHK                        = 00660088    D
DS$PRINTF                         ********    X    00  DS$_MEM_ALLOC_ERR               = 00660138    D
DS$V_ABRTFLG                    = 00000006    D        DS$_MMOFF                       = 00660058    D
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DS$_NEEDUNIT                    = 006600F8    D
DS$_NODE                        = 00660128    D
DS$_NOPCS                       = 00660110    D
DS$_NORMAL                      = 00660001    D
DS$_NOSUPPORT                   = 006600B1    D
DS$_NOTALLOWMP                  = 00660148    D
DS$_NOTDON                      = 00660030    D
DS$_NOTIMP                      = 006600B0    D
DS$_NULLSTR                     = 00660010    D
DS$_OVERFLOW                    = 00660008    D
DS$_POWER                       = 00660098    D
DS$_PROGERR                     = 00660020    D
DS$_SEVERE                      = 00660004    D
DS$_TRANSL                      = 006600A0    D
DS$_TRUNCATE                    = 00660028    D
DS$_UNEXPINT                    = 006600D8    D
DS$_UNSUPPDEV                   = 00660158    D
DS$_VASFULL                     = 00660048    D
DS$_WARNING                     = 00660000    D
DSA$AL_APTMAIL                    0000FE00    D
DSA$AT_APTTXT                     0000FA00    D
DSA$GL_APTCOM                     0000FE04    D
DSA$GL_DEVLEN                     0000FE58    D
DSA$GL_ERRNO                      0000FE44    D
DSA$GL_EVENT                      0000FE48    D
DSA$GL_FLAGS                      0000FE00    D
DSA$GL_MSGTYP                     0000FE40    D
DSA$GL_PASSES                     0000FE08    D
DSA$GL_PASSNO                     0000FE54    D
DSA$GL_SECTNO                     0000FE10    D
DSA$GL_SID                        0000FE14    D
DSA$GL_SUBTNO                     0000FE4C    D
DSA$GL_TESTNO                     0000FE50    D
DSA$GL_UNITS                      0000FE0C    D
DSA$GQ_MSGPTR                     0000FE68    D
DSA$GT_DEVNAM                     0000FE5C    D
DSA$V_APT                       = 0000001F    D
DSA$V_USER                      = 0000001C    D
DSR$COMPLETION                    ********      X   00
DSR$IFLOADDEV                     ********      X   00
DSV$ATTACH                        00000000 RG   D   04
DSV$DEATTACH                      00000C4A RG   D   04
DSV$DESELECT                      00000EF2 RG   D   04
DSV$SELECT                        00000D12 RG   D   04
DSV$SHOWDEVICE                    00000BB8 RG   D   04
DSV$SHOWDEVICEB                   00000BB1 RG   D   04
DSV$SHOWSELECT                    00000C19 RG   D   04
DSV$SHOWSELECTB                   00000C12 RG   D   04
DSX$ATTACH                        0000010A RG   D   04
DSX$PRINT                         ********      X   00
DS_ERRSUP                         ********      X   00
DS_SUPERLINE                      ********      X   00
EARG$_BASE                        00000008      D
EARG$_PC                          00000004      D
EARG$_TEXT                        0000000C      D
ERROR_EXIT                        0000047B R    D   04
EXE$ALONONPAGED                   ********      X   00
EXE$DEANONPAGED                   ********      X   00
EXTRACT                           000009FE R    D   04
EX_ADD                            00000A52 R    D   04
EX_BADPARAM                       00000A21 R    D   04
EX_CASE                           00000A56 R    D   04
EX_COMMON                         00000B36 R    D   04
EX_COMPLEMENT                     00000A54 R    D   04
EX_DECIMAL                        00000A27 R    D   04
EX_EPB                            00000A6A R    D   04
EX_FETCH                          00000A52 R    D   04
EX_FINISH                         00000A6F R    D   04
EX_HEXADECIMAL                    00000A27 R    D   04
EX_LITERAL                        00000A52 R    D   04
EX_LOGICAL                        00000A44 R    D   04
EX_NAME                           00000A5F R    D   04
EX_OCTAL                          00000A27 R    D   04
EX_START                          00000A25 R    D   04
EX_STORE                          00000A7C R    D   04
EX_STRING                         00000A32 R    D   04
FLG$V_BRIEF                     = 00000000      D
FORMAT_PROMPT                     00000B88 R    D   04
FPT$_ARGS                         00000008      D
FPT$_FORMAT                       00000004      D
GENERIC                           FFFFFFEA      D
GET_ATTRIBUTES                    00000490 R    D   04
GET_LINE                          00000B60 R    D   04
GET_LINK                          000001DC R    D   04
GET_NAME                          000003CC R    D   04
GET_TYPE                          0000014D R    D   04
HP$A_DEPENDENT                    00000032      D
HP$A_DEVICE                       00000018      D
HP$A_DVA                          0000001C      D
HP$A_LINK                         00000020      D
HP$B_DRIVE                        0000000B      D
HP$B_FLAGS                        0000000A      D
HP$C_NAMELEN                    = 00000014    G D
HP$M_NAME                       = 00000004      D
HP$M_WASALL                     = 00000002      D
HP$Q_DEVICE                       00000000      D
HP$T_DEVICE                       0000000C      D
HP$T_TYPE                         00000026      D
HP$V_ALLOC                      = 00000000      D
HP$V_NAME                       = 00000002      D
HP$V_WASALL                     = 00000001      D
HP$W_SIZE                         00000008      D
HP$W_VECTOR                       00000024      D
HPE$A_EPB                         00000016      D
HPE$C_EPB_SIZE                  = 0000001A    G D
HPE$T_DEVICE                      00000000      D
HPE$W_EXT_DRIVE                   00000014      D
IARG$_BASE                        00000008      D
IARG$_PC                          00000004      D
IARG$_PROMPT                      00000010      D
IARG$_TEXT                        0000000C      D
IF_ALPHA                          00000552 R    D   04
INI$PTABLE                        0000109F RG   D   04
INS$PTABLE                        0000124A RG   D   04
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INTERPRET                       0000073F R  D  04
KB_CHECK                        ********   X   00
L$A_CCP                         00000240     D
L$A_DEVP                        0000021C     D
L$A_DREG                        00000224     D
L$A_DTP                         00000218     D
L$A_ICP                         0000023C     D
L$A_LASTADR                     00000214     D
L$A_NAME                        00000208     D
L$A_REPP                        00000244     D
L$A_SECNAM                      00000250     D
L$A_STATAB                      00000248     D
L$A_TSTCNT                      00000254     D
L$L_ENVIRON                     00000204     D
L$L_ERRTYP                      0000024C     D
L$L_HEADLENGTH                  00000200     D
L$L_REV                         0000020C     D
L$L_UNIT                        00000220     D
L$L_UNUSED                      00000228     D
L$L_UPDATE                      00000210     D
LOC$ADAPTER                     0000114C RG D  04
LOC$PTABLE                      000011A1 RG D  04
LOC$PTDESC                      000011F0 RG D  04
LOCAL                           FFFFFF70     D
LOCAL_BLOCK                     FFFFFFE6     D
MAX_UNIT                        FFFFFFFC     D
NAME_FLAGS                      FFFFFFFF     D
OLDPC                           FFFFFFFC     D
ONLY_ATTACH                     ********   X   00
PARENT_CONTROLLER               FFFFFFFE     D
PARENT_PTABLE                   FFFFFFF4     D
PARSE_DEVICE                    00000567 RG D  04
PART_LIST                       00000388 R  D  02
PD$_ADD                     =   0000008A     D
PD$_CASE                    =   0000008C     D
PD$_COMPLEMENT              =   00000089     D
PD$_DECIMAL                 =   00000082     D
PD$_END                     =   00000081     D
PD$_EPB                     =   0000008E     D
PD$_FETCH                   =   00000087     D
PD$_HEXADECIMAL             =   00000084     D
PD$_LITERAL                 =   00000086     D
PD$_LOGICAL                 =   0000008B     D
PD$_NAME                    =   0000008D     D
PD$_OCTAL                   =   00000083     D
PD$_START                   =   00000080     D
PD$_STORE                   =   00000088     D
PD$_STRING                  =   00000085     D
PD_ADD                          0000079F R  D  04
PD_CASE                         00000831 R  D  04
PD_COMPLEMENT                   0000079A R  D  04
PD_DECIMAL                      00000860 R  D  04
PD_EPB                          0000085A R  D  04
PD_FETCH                        00000778 R  D  04
PD_FINISH                       0000076F R  D  04
PD_HEXADECIMAL                  000008C1 R  D  04
PD_LITERAL                      00000773 R  D  04
PD_LOGICAL                      000007B9 R  D  04
PD_NAME                         0000084E R  D  04
PD_NUMERIC                      000008F5 R  D  04
PD_OCTAL                        00000891 R  D  04
PD_START                        0000076A R  D  04
PD_STORE                        00000789 R  D  04
PD_STRING                       0000095D R  D  04
PT$EXTRACT                      000009EC RG D  04
PT$INTERPRET                    00000716 RG D  04
PTD$M_CONTROLLER            =   00000002     D
PTD$M_DEVICE                =   00000003     D
PTD$M_ENDDEVICE             =   0000001B     D
PTD$M_INHERIT               =   00000018     D
PTD$M_INHERITED             =   00000008     D
PTD$M_INHERIT_CON           =   00000010     D
PTD$M_INHERIT_PRE           =   00000008     D
PTD$M_NAME                  =   00000004     D
PTD$M_UNIT                  =   00000001     D
PTD$V_CONTROLLER            =   00000001     D
PTD$V_INHERIT_CON           =   00000004     D
PTD$V_INHERIT_PRE           =   00000003     D
PTD$V_NAME                  =   00000002     D
PTD$V_UNIT                  =   00000000     D
PTDESC                          FFFFFFF8     D
PT_LOCATE                       0000121B R  D  04
Q_ADAPTER                       00000004 RG D  03
Q_HUB                           0000037D R  D  02
RANGE                           00000003 R  D  03
SAVABS...                   =   0000000C     D
SCAN$ALPHA                      ********   X   00
SCAN$ALPHANUM                   ********   X   00
SCAN$DECIMAL                    ********   X   00
SCAN$DEVICE                     ********   X   00
SCAN$NUMERIC                    ********   X   00
SCAN$SPACES                     ********   X   00
SCAN$SYMBOL                     ********   X   00
SCAN_ALPHA                      000006FE R  D  04
SCAN_ALPHANUM                   0000070A R  D  04
SCRIPT$FLUSH                    ********   X   00
SET_ABORT                       000000FD RG D  04
SHOWBUF_SIZ                 =   00000100     D
SHOW_DEV                        00000FE4 R  D  04
SIZ...                      =   00000001     D
SKIP                            00000A4B R  D  04
SS$_BADPARAM                =   00000014     D
SS$_DEVALLOC                =   00000840     D
SS$_DEVALRALLOC             =   00000641     D
SS$_DEVMOUNT                =   0000006C     D
SS$_INSFARG                 =   00000114     D
SS$_NORMAL                  =   00000001     D
SS$_NOSUCHDEV               =   00000908     D
ST_DECIMAL                      00000AAE R  D  04
ST_HEXADECIMAL                  00000AD0 R  D  04
ST_LOGICAL                      00000B0C R  D  04
ST_OCTAL                        00000ABE R  D  04
ST_STRING                       00000AE1 R  D  04
SYS$ALLOC                       ********  GX   00
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SYS$DALLOC                      ********  GX    00
SYS$FAO                         ********   X    00
SYS$FAOL                        ********  G     04
TEMP_STORE                      0000000C R    D   03
T_ALLOC                         000000A0 R    D   02
T_AMBIG_ADAP                    000001C3 R    D   02
T_AMBIG_DEV                     000001F0 R    D   02
T_BAD_NAME                      0000002E R    D   02
T_BAD_RANGE                     0000006B R    D   02
T_DEATTACH                      00000227 R    D   02
T_DEVALLOC                      00000243 R    D   02
T_DEV_MOUNTED                   00000264 R    D   02
T_INVALID                       00000007 R    D   02
T_LINK                          00000158 R    D   02
T_MAIN_BUS                      00000109 R    D   02
T_NAME                          0000014C R    D   02
T_NO_SUCH_ADAPTER               00000186 R    D   02
T_NO_SUCH_DEV                   00000170 R    D   02
T_NO_SUCH_ON_ADAPTER            0000019D R    D   02
T_PART_OF                       000000CD R    D   02
T_PNF                           00000306 R    D   02
T_PROMPT                        0000013F R    D   02
T_RANGE                         000000A8 R    D   02
T_SHOULDBE                      00000348 R    D   02
T_SHOWDEV                       000002DD R    D   02
T_SHOWDEVB                      000002F9 R    D   02
T_SHOWDEVB_ALLOC                000002C6 R    D   02
T_SHOWDEV_ALLOC                 000002A0 R    D   02
T_SKIP                          00000333 R    D   02
T_STRING                        00000360 R    D   02
T_TYPE                          00000164 R    D   02
T_UNIT_EXCESS                   000000D7 R    D   02
T_UNRANGE                       000000BA R    D   02
T_YESNO                         00000352 R    D   02
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Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	FFFFFFFF (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
DATA	000003BD (957.)	02 (2.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC LONG
WORK	00000010 (16.)	03 (3.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC LONG
CODE	000012E2 (4834.)	04 (4.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$N	=00000002	1976 (4)	1976 (4)
$$T1	=00000001	2149 (4)	2149 (4)
$ER	=00000003	2765 (6)	#-2765 (6) #-450 (1)
$MODULE	00000000-R	266 (1)	2765 (6) 450 (1)
ABORT_ATTACH	00000001-R	351 (1)	#-393 (1) #-431 (1) #-459 (1)
ALLOC	00000002-R	353 (1)	#-1005 (3) #-1016 (3) #-1024 (3) #-1102 (3)
			#-750 (1) #-997 (3)
ATC$_CMDLINE	00000004	515 (1)	530 (1)
ATC$_PROMPT	00000008	515 (1)	535 (1)
BADPARAM	00000766-R	1265 (3)	#-1246 (3)
BAD_LINK	000001BF-R	591 (1)	#-606 (1) #-652 (1)
BAD_NAME	000002AF-R	703 (1)	#-789 (1)
BAD_TYPE	00000130-R	544 (1)	#-558 (1) #-562 (1)
BAD_UNIT_EXC	00000292-R	661 (1)	#-802 (1)
BIT...	=00000004	237 (1)	223 (1) 224 (1) 229 (1) 234 (1)
			236 (1) 237 (1)
BUFFER	FFFFFF70	1230 (3)	1237 (3) 1447 (3)
CENTRAL_BUS	000003A6-R	336 (1)	617 (1)
CHECKAMBIGUOUS	000010C5-R	2457 (6)	#-2018 (4) #-2211 (4)
CLI$K_BUFSIZ	=00000100	233 (1)	233 (1)
CLI$K_SIZE	0000044C	233 (1)	
CLI$L_ADDRESS	00000018	233 (1)	
CLI$L_COMMAND	00000004	233 (1)	#-2550 (6)
CLI$L_DATA	0000001C	233 (1)	
CLI$L_FLAGS	00000000	233 (1)	2461 (6) 2467 (6) 2536 (6)
CLI$L_FLAGS2	00000444	233 (1)	2143 (4)
CLI$L_LAST	00000024	233 (1)	
CLI$L_NEXT	00000030	233 (1)	
CLI$L_PASS	0000002C	233 (1)	
CLI$L_SUBT	00000028	233 (1)	
CLI$L_TEMP_BASE	00000448	233 (1)	
CLI$L_TEST	00000020	233 (1)	
CLI$M_START_OR_RUN	=00000008	233 (1)	
CLI$Q_BUFQWD	00000034	233 (1)	
CLI$Q_FILE	00000008	233 (1)	#-1802 (4) #-1923 (4) #-1945 (4) #-2026 (4)
			#-2079 (4) #-2086 (4) #-2219 (4) #-2260 (4)
			#-2267 (4) #-2468 (6) #-405 (1) 406 (1)
			#-408 (1) 411 (1) #-433 (1) 435 (1)
			#-437 (1) #-441 (1)
CLI$Q_SECTION	00000010	233 (1)	
CLI$Q_TIME	0000043C	233 (1)	
CLI$T_BUFFER	0000003C	233 (1)	
CLI$V_ADAPTER	=00000018	233 (1)	#-2460 (6) #-2466 (6) #-2535 (6)
CLI$V_ADR	=0000000B	233 (1)	
CLI$V_ASCII	=00000013	233 (1)	
CLI$V_BASE_QUAL	=00000002	233 (1)	
CLI$V_BREAK	=0000000A	233 (1)	
CLI$V_BRIEF	=0000001B	233 (1)	
CLI$V_BYTE	=0000000D	233 (1)	
CLI$V_CLEAR	=00000002	233 (1)	

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CLI$V_DEC                       =00000010     233     (1)
CLI$V_DEFAULT                   =0000000C     233     (1)
CLI$V_DEPOSIT                   =00000019     233     (1)
CLI$V_EVENT                     =00000008     233     (1)
CLI$V_EXAM                      =00000005     233     (1)
CLI$V_FLAGS                     =00000009     233     (1)
CLI$V_HEX                       =00000012     233     (1)
CLI$V_KERNEL                    =00000017     233     (1)
CLI$V_LOAD                      =00000006     233     (1)
CLI$V_LONG                      =0000000F     233     (1)
CLI$V_NEXT                      =00000001     233     (1)
CLI$V_NOALLOC                   =00000000     233     (1)     #-2142    (4)
CLI$V_NOTNUF                    =00000001     233     (1)
CLI$V_OCT                       =00000011     233     (1)
CLI$V_PREG                      =0000001A     233     (1)
CLI$V_QA                        =00000007     233     (1)
CLI$V_QACKLOOPLOOPS             =0000001C     233     (1)
CLI$V_QAERRORPRINTS             =0000001B     233     (1)
CLI$V_QAMULTIPLEPASS            =0000001F     233     (1)
CLI$V_QASUBTESTLOOPS            =0000001E     233     (1)
CLI$V_QATESTLOOPS               =0000001D     233     (1)
CLI$V_REG                       =00000014     233     (1)
CLI$V_REQUIRED                  =00000000     233     (1)
CLI$V_RUN                       =00000015     233     (1)
CLI$V_SET                       =00000003     233     (1)
CLI$V_SHOW                      =00000004     233     (1)
CLI$V_START_OR_RUN              =00000003     233     (1)       233     (1)
CLI$V_VALSEC                    =00000016     233     (1)
CLI$V_WORD                      =0000000E     233     (1)
COMM_FLAGS                       00000000-R   349     (1)     #-1800    (4)     #-1832    (4)     #-1870    (4)     #-1884    (4)
                                                               2357    (6)       2369    (6)
CRD$M_CRD_DEBUG                 =00000001     237     (1)
CRD$M_CTRL_C_NO_ECHO            =00000002     237     (1)
CRD$M_FLUSH_CTRL_C              =00000004     237     (1)
CRD$M_INHIBIT_ALLOCATE          =00000008     237     (1)
CRD$V_CRD_DEBUG                 =00000000     237     (1)
CRD$V_CTRL_C_NO_ECHO            =00000001     237     (1)
CRD$V_FLUSH_CTRL_C              =00000002     237     (1)
CRD$V_INHIBIT_ALLOCATE          =00000003     237     (1)     #-2139    (4)
DESC                             FFFFFFF4     1230    (3)     #-1237    (3)     #-1461    (3)       1463    (3)
DIR...                          =00000001     1748    (4)       1224    (3)       1230    (3)       1513    (3)       1748    (4)
                                                                515    (1)        525    (1)
DS$CNTRLC                        00000000-XR                    256    (1)        394    (1)        446    (1)
DS$GA_ALLOCATES                  00000000-XR                   2022    (4)       2214    (4)       2358    (6)       2364    (6)
                                                               2425    (6)        248    (1)
DS$GA_PTABLE                     00000000-XR                   1805    (4)       1874    (4)       1920    (4)       2020    (4)
                                                               2213    (4)       2421    (6)       2471    (6)        252    (1)
                                                               2604    (6)       2741    (6)       2760    (6)
DS$GA_PTDESC                     00000000-XR                    252    (1)       2674    (6)
DS$GA_SELECTS                    00000000-XR                   1877    (4)       1979    (4)       2021    (4)       2215    (4)
                                                               2424    (6)        245    (1)       2770    (6)
DS$GB_INHIBIT_NAMING             00000000-XR                    256    (1)     #-938     (3)
DS$GL_CLIBASE                    00000000-XR                    245    (1)
DS$GL_CRD_FLAGS                  00000000-XR                   2139    (4)        257    (1)
DS$GL_FLAGS                      00000000-XR                    254    (1)        417    (1)
DS$K_ERROR                      =00000002     229     (1)
DS$K_NORMAL                     =00000001     229     (1)
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DS$K_PRINTB                     =00000002     236     (1)
DS$K_PRINTF                     =00000001     236     (1)     #-1948  (4)     #-1976  (4)     #-2082  (4)     #-2089  (4)
                                                              #-2172  (4)     #-2263  (4)     #-2270  (4)     #-2378  (6)
                                                              #-2387  (6)     #-2496  (6)     #-2554  (6)     #-420   (1)
                                                              #-424   (1)
DS$K_PRINTI                     =00000000     236     (1)
DS$K_PRINTX                     =00000003     236     (1)
DS$K_SEVERE                     =00000004     229     (1)
DS$K_SUBSYS                     =00000066     229     (1)     229     (1)
DS$K_TYPE_ABORT_PROGRAM         =00000014     236     (1)
DS$K_TYPE_ABORT_TEST            =00000013     236     (1)
DS$K_TYPE_COMMAND_ERR           =00000015     236     (1)     #-1949  (4)     #-2083  (4)     #-2090  (4)     #-2173  (4)
                                                              #-2264  (4)     #-2271  (4)     #-2497  (6)     #-2555  (6)
                                                              #-421   (1)     #-425   (1)
DS$K_TYPE_COMMAND_OUT           =00000016     236     (1)     #-1976  (4)     #-2379  (6)     #-2388  (6)
DS$K_TYPE_CRD_AUTOTEST          =0000001A     236     (1)
DS$K_TYPE_DS_PROMPT             =00000001     236     (1)
DS$K_TYPE_DS_START              =0000001D     236     (1)
DS$K_TYPE_ERRDEV                =00000008     236     (1)
DS$K_TYPE_ERRHARD               =00000006     236     (1)
DS$K_TYPE_ERROR_BODY            =00000009     236     (1)
DS$K_TYPE_ERROR_END             =0000000A     236     (1)
DS$K_TYPE_ERRPREP               =0000001B     236     (1)
DS$K_TYPE_ERRSOFT               =00000007     236     (1)
DS$K_TYPE_ERRSUP                =00000004     236     (1)
DS$K_TYPE_ERRSYS                =00000005     236     (1)
DS$K_TYPE_ERR_HALT              =0000000D     236     (1)
DS$K_TYPE_EXCEPTION             =0000000C     236     (1)
DS$K_TYPE_EXCEPTION_HEAD        =0000000B     236     (1)
DS$K_TYPE_FIRST_PASS            =00000011     236     (1)
DS$K_TYPE_GENERAL               =00000000     236     (1)
DS$K_TYPE_GENERAL_ERROR         =00000003     236     (1)
DS$K_TYPE_NO_TESTS              =00000012     236     (1)
DS$K_TYPE_PARAM_ERROR           =0000001C     236     (1)
DS$K_TYPE_PROGRAM_END           =00000010     236     (1)
DS$K_TYPE_PROGRAM_INFO          =00000017     236     (1)
DS$K_TYPE_PROGRAM_START         =0000000F     236     (1)
DS$K_TYPE_QIO_INVADP            =00000024     236     (1)
DS$K_TYPE_QIO_NODRIVER          =00000022     236     (1)
DS$K_TYPE_QIO_WRONGVER          =00000023     236     (1)
DS$K_TYPE_SCRIPT_ECHO           =00000021     236     (1)
DS$K_TYPE_SCRIPT_PNF            =0000001E     236     (1)
DS$K_TYPE_SCRIPT_PROMPT         =00000020     236     (1)
DS$K_TYPE_SCRIPT_SKIP           =0000001F     236     (1)
DS$K_TYPE_SEQUENCE_ERROR        =00000019     236     (1)
DS$K_TYPE_START_ERR             =00000018     236     (1)
DS$K_TYPE_START_LIST            =00000025     236     (1)
DS$K_TYPE_SUMMARY               =0000000E     236     (1)
DS$K_TYPE_USER_PROMPT           =00000002     236     (1)
DS$K_WARNING                    =00000000     229     (1)
DS$M_ABRTFLG                    =00000040     234     (1)
DS$M_BADTIME                    =00100000     234     (1)
DS$M_BATCH                      =00400000     234     (1)
DS$M_BRKCLR                     =00001000     234     (1)
DS$M_BRKPT                      =00000800     234     (1)
DS$M_CHARFLG                    =00000100     234     (1)
DS$M_CMDFLG                     =00000080
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DS$M_CTRLC                      =00000001     234     (1)
DS$M_CTRLO                      =00010000     234     (1)
DS$M_DEVFLG                     =00000200     234     (1)
DS$M_DISABLCC                   =01000000     234     (1)
DS$M_DONFLG                     =00002000     234     (1)
DS$M_ERRFLG                     =00000010     234     (1)
DS$M_EXCEPT                     =00080000     234     (1)
DS$M_EXETST                     =00040000     234     (1)
DS$M_HLTFLG                     =00000008     234     (1)
DS$M_LODFLG                     =00000002     234     (1)
DS$M_MEMMGT                     =00008000     234     (1)
DS$M_NI                         =04000000     234     (1)
DS$M_OUTPUT                     =00800000     234     (1)
DS$M_RUBFLG                     =00000020     234     (1)
DS$M_SCRIPT                     =00200000     234     (1)
DS$M_SETIMR                     =02000000     234     (1)
DS$M_STRFLG                     =00000004     234     (1)
DS$M_SUBT                       =00004000     234     (1)
DS$M_SYSFLG                     =00000400     234     (1)
DS$M_TIMED                      =02000000     234     (1)
DS$M_TIMED_OUT                  =08000000     234     (1)
DS$M_TIMRON                     =00020000     234     (1)
DS$PRINTF                        00000000-XR                  246     (1)
DS$V_ABRTFLG                    =00000006     234     (1)
DS$V_BADTIME                    =00000014     234     (1)
DS$V_BATCH                      =00000016     234     (1)
DS$V_BRKCLR                     =0000000C     234     (1)
DS$V_BRKPT                      =0000000B     234     (1)
DS$V_CHARFLG                    =00000008     234     (1)
DS$V_CMDFLG                     =00000007     234     (1)
DS$V_CTRLC                      =00000000     234     (1)
DS$V_CTRLO                      =00000010     234     (1)
DS$V_DEVFLG                     =00000009     234     (1)
DS$V_DISABLCC                   =00000018     234     (1)
DS$V_DONFLG                     =0000000D     234     (1)
DS$V_ERRFLG                     =00000004     234     (1)
DS$V_EXCEPT                     =00000013     234     (1)
DS$V_EXETST                     =00000012     234     (1)
DS$V_HLTFLG                     =00000003     234     (1)
DS$V_LODFLG                     =00000001     234     (1)
DS$V_MEMMGT                     =0000000F     234     (1)
DS$V_NI                         =0000001A     234     (1)
DS$V_OUTPUT                     =00000017     234     (1)
DS$V_RUBFLG                     =00000005     234     (1)
DS$V_SCRIPT                     =00000015     234     (1)     0-416     (1)
DS$V_SETIMR                     =00000019     234     (1)
DS$V_STRFLG                     =00000002     234     (1)
DS$V_SUBT                       =0000000E     234     (1)
DS$V_SYSFLG                     =0000000A     234     (1)
DS$V_TIMED                      =00000019     234     (1)
DS$V_TIMED_OUT                  =0000001B     234     (1)
DS$V_TIMRON                     =00000011     234     (1)
DS$_AP_NORMAL_BREAK             =00660150     229     (1)
DS$_ARITH                       =006600D0     229     (1)
DS$_ASBE                        =00660118     229     (1)
DS$_BADLINK                     =006600F0     229     (1)     0-595     (1)     0-639     (1)
DS$_BADTYPE                     =006600E8     229     (1)     0-548     (1)
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DS$_BIIC                =00660120     229    (1)
DS$_CHME                =006600A8     229    (1)
DS$_CHMK                =006600E0     229    (1)
DS$_DEVNAME             =00660108     229    (1)    #-757    (1)    #-766    (1)    #-774    (1)
DS$_ERROR               =00660002     229    (1)    #-2766   (6)
DS$_FHWE                =00660068     229    (1)
DS$_FRAGBUF             =00660080     229    (1)
DS$_ICBUSY              =006600C8     229    (1)
DS$_ICERR               =006600C0     229    (1)
DS$_IHWE                =00660060     229    (1)
DS$_ILLCHAR             =00660018     229    (1)
DS$_ILLPAGCNT           =00660078     229    (1)
DS$_ILLUNIT             =00660100     229    (1)    #-665    (1)
DS$_INIT_FAIL           =00660140     229    (1)
DS$_INSFMEM             =00660050     229    (1)
DS$_INVCPU              =00660130     229    (1)
DS$_IPL2HI              =006600B8     229    (1)
DS$_IVADDR              =00660040     229    (1)
DS$_IVVECT              =00660038     229    (1)
DS$_KRNLSTK             =00660090     229    (1)
DS$_LOGIC               =00660070     229    (1)
DS$_MCHK                =00660088     229    (1)
DS$_MEM_ALLOC_ERR       =00660138     229    (1)
DS$_MMOFF               =00660058     229    (1)
DS$_NEEDUNIT            =006600F8     229    (1)
DS$_NODE                =00660128     229    (1)
DS$_NOPCS               =00660110     229    (1)
DS$_NORMAL              =00660001     229    (1)
DS$_NOSUPPORT           =006600B1     229    (1)
DS$_NOTALLOWMP          =00660148     229    (1)
DS$_NOTDON              =00660030     229    (1)
DS$_NOTIMP              =006600B0     229    (1)      229    (1)
DS$_NULLSTR             =00660010     229    (1)
DS$_OVERFLOW            =00660008     229    (1)
DS$_POWER               =00660098     229    (1)
DS$_PROGERR             =00660020     229    (1)
DS$_SEVERE              =00660004     229    (1)
DS$_TRANSL              =006600A0     229    (1)
DS$_TRUNCATE            =00660028     229    (1)
DS$_UNEXPINT            =006600D8     229    (1)
DS$_UNSUPPDEV           =00660158     229    (1)
DS$_VASFULL             =00660048     229    (1)
DS$_WARNING             =00660000     229    (1)      229    (1)
DSA$GL_FLAGS             0000FE00                     2138   (4)      2289   (4)      415    (1)
DSA$GL_SID               0000FE14                   #-632    (1)
DSA$V_APT               =0000001F                   #-414    (1)
DSA$V_USER              =0000001C                   #-2137   (4)    #-2288   (4)
DSR$COMPLETION           00000000-XR                  2169   (4)      253    (1)
DSR$IFLOADDEV            00000000-XR                  2047   (4)      253    (1)
DSV$ATTACH               00000000-R    392    (1)
DSV$DEATTACH             00000C4A-R    1917   (4)
DSV$DESELECT             00000EF2-R    2208   (4)
DSV$SELECT               00000D12-R    2015   (4)
DSV$SHOWDEVICE           00000BB8-R    1801   (4)
DSV$SHOWDEVICEB          00000BB1-R    1799   (4)
DSV$SHOWSELECT           00000C19-R    1871   (4)
DSV$SHOWSELECTB          00000C12-R    1869   (4)
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DSX$ATTACH                      0000010A-R   527    (1)      412    (1)
DSX$PRINT                       00000000-XR                  1950    (4)     1976    (4)     2084    (4)     2091    (4)
                                                             2174    (4)     2265    (4)     2272    (4)     2380    (6)
                                                             2389    (6)      247    (1)     2498    (6)     2556    (6)
                                                              256    (1)      422    (1)      426    (1)
DS_ERRSUP                       00000000-XR                  246    (1)     2765    (6)      450    (1)
DS_SUPERLINE                    00000000-XR                  246    (1)      439    (1)
EARG$_BASE                      00000008     1513    (3)
EARG$_PC                        00000004     1513    (3)   #-1517    (3)
EARG$_TEXT                      0000000C     1513    (3)   #-1518    (3)   #-1590    (3)   #-1591    (3)
ERROR_EXIT                      0000047B-R    839    (2)    #-549    (1)   #-574    (1)    #-596    (1)    #-602    (1)
                                                            #-640    (1)   #-666    (1)    #-759    (1)    #-768    (1)
                                                            #-776    (1)   #-785    (1)    #-834    (2)    #-836    (2)
EXE$ALONONPAGED                 00000000-XR                  247    (1)      571    (1)
EXE$DEANONPAGED                 00000000-XR                 1981    (4)      247    (1)     2757    (6)      845    (3)
EXTRACT                         000009FE-R   1522    (3)   #-1544    (3)   #-1551    (3)   #-1560    (3)     1563    (3)
                                                            #-1574    (3)   #-1578    (3)   #-1583    (3)   #-1587    (3)
                                                            #-1603    (3)   #-1611    (4)   #-1663    (4)
EX_ADD                          00000A52-R   1571    (3)     1538    (3)
EX_BADPARAM                     00000A21-R   1539    (3)   #-1521    (3)
EX_CASE                         00000A56-R   1575    (3)     1538    (3)
EX_COMMON                       00000B36-R   1648    (4)   #-1614    (4)   #-1618    (4)   #-1622    (4)   #-1632    (4)
                                                            #-1634    (4)   #-1643    (4)
EX_COMPLEMENT                   00000A54-R   1573    (3)     1538    (3)
EX_DECIMAL                      00000A27-R   1545    (3)     1538    (3)
EX_EPB                          00000A6A-R   1585    (3)     1538    (3)
EX_FETCH                        00000A52-R   1570    (3)     1538    (3)
EX_FINISH                       00000A6F-R   1589    (3)     1538    (3)
EX_HEXADECIMAL                  00000A27-R   1547    (3)     1538    (3)
EX_LITERAL                      00000A52-R   1569    (3)     1538    (3)
EX_LOGICAL                      00000A44-R   1561    (3)     1538    (3)
EX_NAME                         00000A5F-R   1580    (3)     1538    (3)
EX_OCTAL                        00000A27-R   1546    (3)     1538    (3)
EX_START                        00000A25-R   1543    (3)     1538    (3)
EX_STORE                        00000A7C-R   1596    (3)     1538    (3)
EX_STRING                       00000A32-R   1552    (3)     1538    (3)
FLG$V_BRIEF                    =00000000      348    (1)   #-1800    (4)   #-1832    (4)   #-1870    (4)   #-1884    (4)
                                                            #-2357    (6)   #-2369    (6)
FORMAT_PROMPT                   00000B88-R   1750    (4)     1341    (3)     1409    (3)     1466    (3)     1711    (4)
                                                             547    (1)      594    (1)      638    (1)      664    (1)
                                                             756    (1)      765    (1)      773    (1)
FPT$_ARGS                       00000008     1748    (4)     1756    (4)
FPT$_FORMAT                     00000004     1748    (4)     1756    (4)
GENERIC                         FFFFFFEA      525    (1)     1030    (3)      734    (1)    #-874    (3)    #-910    (3)
                                                             913    (3)   #-934    (3)      937    (3)    #-940    (3)
GET_ATTRIBUTES                  00000490-R    871    (3)   #-781    (1)
GET_LINE                        00000B60-R   1701    (4)     1311    (3)     1380    (3)     1418    (3)      553    (1)
                                                             600    (1)      783    (1)
GET_LINK                        000001DC-R    598    (1)    #-590    (1)
GET_NAME                        000003CC-R    780    (1)    #-644    (1)   #-657    (1)
GET_TYPE                        0000014D-R    551    (1)    #-542    (1)
HP$A_DEVICE                     00000018                    #-2371    (6)   #-2751    (6)   #-2752    (6)    #-655    (1)
HP$A_DVA                        0000001C                    #-2751    (6)   #-2752    (6)    #-655    (1)
HP$A_LINK                       00000020                    #-1813    (4)   #-1933    (4)   #-1969    (4)   #-2042    (4)
                                                            #-2236    (4)     2372    (6)   #-2610    (6)   #-2737    (6)
                                                            #-2745    (6)   #-2753    (6)    #-654    (1)
HP$B_DRIVE                      0000000B                    #-805    (1)
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HP$B_FLAGS                      0000000A                        #-1020  (3)     2056  (4)     2123  (4)     2146  (4)
                                                                  2148  (4)  #-2155  (4)     2292  (4)     2294  (4)
                                                                   743  (1)     809  (1)
HP$C_NAMELEN                    =00000014       260     (1)
HP$M_NAME                       =00000004                       #-1020  (3)
HP$M_WASALL                     =00000002                       #-2154  (4)
HP$Q_DEVICE                      00000000                       #-1818  (4)  #-2044  (4)     2149  (4)  #-2157  (4)
                                                                  2295  (4)     2376  (6)     2385  (6)  #-2475  (6)
                                                                #-2479  (6)  #-2613  (6)  #-2617  (6)  #-2734  (6)
                                                                #-815   (1)  #-816   (1)  #-919   (3)  #-921   (3)
HP$T_DEVICE                      0000000C                       1134  (3)     813  (1)
HP$T_TYPE                        00000026                       2339  (6)     2375  (6)     2384  (6)  #-2747  (6)
                                                                #-2749  (6)     582  (1)
HP$V_ALLOC                      =00000000                       #-2145  (4)  #-2291  (4)
HP$V_NAME                       =00000002                       #-743   (1)  #-809   (1)
HP$V_WASALL                     =00000001                       #-2055  (4)  #-2122  (4)  #-2147  (4)  #-2293  (4)
HP$W_SIZE                        00000008                       #-580   (1)  #-790   (1)
HPE$C_EPB_SIZE                  =0000001A       259     (1)     #-570   (1)  #-793   (1)
HPE$T_DEVICE                     00000000                        810  (1)
HPE$W_EXT_DRIVE                  00000014                       #-806   (1)
IARG$_BASE                       00000008       1224     (3)    #-1244  (3)
IARG$_PC                         00000004       1224     (3)    #-1243  (3)
IARG$_PROMPT                     00000010       1224     (3)     1242  (3)
IARG$_TEXT                       0000000C       1224     (3)     1239  (3)
IF_ALPHA                         00000552-R      954     (3)    #-1057  (3)  #-1064  (3)
INI$PTABLE                       0000109F-R     2420     (6)
INS$PTABLE                       0000124A-R     2733     (6)      835  (2)
INTERPRET                        0000073F-R     1247     (3)    #-1271  (3)  #-1279  (3)  #-1286  (3)  #-1293  (3)
                                                                #-1297  (3)  #-1306  (3)  #-1335  (3)  #-1352  (3)
                                                                #-1360  (3)  #-1363  (3)  #-1401  (3)  #-1444  (3)
KB_CHECK                         00000000-XR                    254   (1)     430  (1)
L$A_DEVP                         0000021C                       #-2669  (6)
L$L_HEADLENGTH                   00000200                       #-2667  (6)
LOC$ADAPTER                      0000114C-R     2533     (6)    #-1806  (4)  #-1921  (4)  #-2023  (4)  #-2216  (4)
LOC$PTABLE                       000011A1-R     2599     (6)    #-1940  (4)  #-2072  (4)  #-2253  (4)  #-2546  (6)
                                                                  2738  (6)     649  (1)
LOC$PTDESC                       000011F0-R     2663     (6)     2341  (6)     561  (1)
LOCAL                            FFFFFF70       1230     (3)     1236  (3)
LOCAL_BLOCK                      FFFFFFE6        525     (1)      529  (1)
MAX_UNIT                         FFFFFFFC        525     (1)    #-799   (1)  #-878   (3)  #-882   (3)  #-887   (3)
                                                                #-894   (3)  #-895   (3)  #-903   (3)
NAME_FLAGS                       FFFFFFFF        525     (1)    #-709   (1)     797  (1)  #-873   (3)  #-881   (3)
                                                                #-901   (3)  #-908   (3)  #-917   (3)     929  (3)
                                                                  933   (3)  #-944   (3)  #-995   (3)
OLDPC                            FFFFFFFC       1230     (3)    #-1248  (3)  #-1449  (3)
ONLY_ATTACH                      00000000-XR                    245   (1)     822  (1)
PARENT_CONTROLLER                FFFFFFFE        525     (1)    #-1068  (3)  #-730   (1)  #-875   (3)  #-931   (3)
                                                                #-941   (3)
PARENT_PTABLE                    FFFFFFF4        525     (1)    #-643   (1)  #-650   (1)  #-914   (3)
PARSE_DEVICE                     00000567-R      993     (3)    #-787   (1)
PART_LIST                        00000388-R      325     (1)     326  (1)     327  (1)     328  (1)     329  (1)
                                                                  330  (1)  #-707  (1)     708  (1)  #-716  (1)
                                                                  717  (1)
PD$_ADD                         =0000008A       224     (1)
PD$_CASE                        =0000008C       224     (1)
PD$_COMPLEMENT                  =00000089       224     (1)
PD$_DECIMAL                     =00000082       224     (1)    #-1610  (4)
```

```
PD$_END                         =00000081      224     (1)
PD$_EPB                         =0000008E      224     (1)     #-891    (3)
PD$_FETCH                       =00000087      224     (1)
PD$_HEXADECIMAL                 =00000084      224     (1)
PD$_LITERAL                     =00000086      224     (1)
PD$_LOGICAL                     =0000008B      224     (1)
PD$_NAME                        =0000008D      224     (1)     #-906    (3)
PD$_OCTAL                       =00000083      224     (1)
PD$_START                       =00000080      224     (1)     #-1245   (3)     #-1264   (3)     #-1520   (3)     #-1538   (3)
                                                               #-2693   (6)     #-889    (3)
PD$_STORE                       =00000088      224     (1)
PD$_STRING                      =00000085      224     (1)
PD_ADD                           0000079F-R    1299    (3)       1264   (3)
PD_CASE                          00000831-R    1345    (3)       1264   (3)
PD_COMPLEMENT                    0000079A-R    1295    (3)       1264   (3)
PD_DECIMAL                       00000860-R    1364    (3)       1264   (3)
PD_EPB                           0000085A-R    1361    (3)       1264   (3)
PD_FETCH                         00000778-R    1281    (3)       1264   (3)
PD_FINISH                        0000076F-R    1273    (3)       1264   (3)
PD_HEXADECIMAL                   000008C1-R    1372    (3)       1264   (3)
PD_LITERAL                       00000773-R    1277    (3)       1264   (3)
PD_LOGICAL                       000007B9-R    1308    (3)       1264   (3)
PD_NAME                          0000084E-R    1357    (3)       1264   (3)
PD_NUMERIC                       000008F5-R    1376    (3)     #-1366   (3)     #-1370   (3)     #-1374   (3)
PD_OCTAL                         00000891-R    1368    (3)       1264   (3)
PD_START                         0000076A-R    1269    (3)       1264   (3)
PD_STORE                         00000789-R    1288    (3)       1264   (3)
PD_STRING                        0000095D-R    1415    (3)       1264   (3)
PT$EXTRACT                       000009EC-R    1515    (3)       2352   (6)
PT$INTERPRET                     00000716-R    1234    (3)       830    (1)
PTD$M_CONTROLLER                =00000002      223     (1)     #-1125   (3)       223    (1)
PTD$M_DEVICE                    =00000003      223     (1)
PTD$M_ENDDEVICE                 =0000001B      223     (1)
PTD$M_INHERIT                   =00000018      223     (1)       223    (1)     #-916    (3)
PTD$M_INHERITED                 =00000008      223     (1)
PTD$M_INHERIT_CON               =00000010      223     (1)       223    (1)
PTD$M_INHERIT_PRE               =00000008      223     (1)       223    (1)
PTD$M_NAME                      =00000004      223     (1)     #-943    (3)
PTD$M_UNIT                      =00000001      223     (1)     #-1125   (3)       223    (1)     #-880    (3)     #-900    (3)
                                                               #-942    (3)
PTD$V_CONTROLLER                =00000001      223     (1)     #-1055   (3)     #-724    (1)
PTD$V_INHERIT_CON               =00000004      223     (1)     #-728    (1)     #-928    (3)
PTD$V_INHERIT_PRE               =00000003      223     (1)     #-932    (3)
PTD$V_NAME                      =00000002      223     (1)     #-711    (1)     #-999    (3)
PTD$V_UNIT                      =00000000      223     (1)     #-1077   (3)     #-1081   (3)     #-721    (1)     #-796    (1)
PTDESC                           FFFFFFF8      525     (1)     #-566    (1)     #-876    (3)
PT_LOCATE                        0000121B-R    2682    (6)     #-2671   (6)     #-2675   (6)
Q_ADAPTER                        00000004-R    357     (1)     #-1943   (4)     #-2077   (4)     #-2258   (4)     #-2463   (6)
                                                               #-2537   (6)     #-2551   (6)
Q_HUB                            0000037D-R    322     (1)       2374   (6)
RANGE                            00000003-R    355     (1)     #-1101   (3)     #-749    (1)     #-998    (3)
SAVABS...                       =0000000C      1748    (4)
SCAN$ALPHA                       00000000-XR                     1153   (3)       1313   (3)       255    (1)       923    (3)
SCAN$ALPHANUM                    00000000-XR                     1162   (3)       249    (1)
SCAN$DECIMAL                     00000000-XR                     1036   (3)       1075   (3)       255    (1)
SCAN$DEVICE                      00000000-XR                     249    (1)       604    (1)
SCAN$NUMERIC                     00000000-XR                     1387   (3)       249    (1)
```

```
SCAN$SPACES                     00000000-XR                     1703    (4)     250     (1)
SCAN$SYMBOL                     00000000-XR                      250    (1)     556     (1)
SCAN_ALPHA                      000006FE-R      1151    (3)    #-1110   (3)
SCAN_ALPHANUM                   0000070A-R      1160    (3)    #-1120   (3)
SCRIPT$FLUSH                    00000000-XR                     1919    (4)     2017    (4)     2210    (4)     246     (1)
                                                                 395    (1)
SET_ABORT                       000000FD-R      458     (1)     394    (1)
SHOWBUF_SIZ                     =00000100       2332    (6)     2335    (6)    #-2337   (6)    #-2382   (6)
SHOW_DEV                        00000FE4-R      2333    (6)     1827    (4)     1880    (4)
SIZ...                          =00000001       237     (1)     223    (1)     234     (1)     237     (1)
SKIP                            00000A4B-R      1564    (3)    #-1549   (3)    #-1554   (3)
SS$_BADPARAM                    =00000014                      #-1266   (3)    #-1342   (3)    #-1410   (3)    #-1467   (3)
                                                               #-1540   (3)
SS$_DEVALLOC                    =00000840                      #-2162   (4)
SS$_DEVALRALLOC                 =00000641                      #-2150   (4)
SS$_DEVMOUNT                    =0000006C                      #-2165   (4)
SS$_INSFARG                     =00000114                      #-1712   (4)
SS$_NORMAL                      =00000001                      #-1274   (3)    #-1592   (3)    #-1706   (4)    #-2136   (4)
                                                               #-2427   (6)    #-2771   (6)
SS$_NOSUCHDEV                   =00000908                      #-2159   (4)
ST_DECIMAL                      00000AAE-R      1612    (4)     1610    (4)
ST_HEXADECIMAL                  00000AD0-R      1620    (4)     1610    (4)
ST_LOGICAL                      00000B0C-R      1637    (4)     1610    (4)
ST_OCTAL                        00000ABE-R      1616    (4)     1610    (4)
ST_STRING                       00000AE1-R      1624    (4)     1610    (4)
SYS$ALLOC                       00000000-XR                     2149    (4)     251     (1)
SYS$DALLOC                      00000000-XR                     2295    (4)     251     (1)
SYS$FAO                         00000000-XR                     1657    (4)     251     (1)
SYS$FAOL                        00000000-XR                     1756    (4)
TEMP_STORE                      0000000C-R      359     (1)
T_ALLOC                         000000A0-R      273     (1)     761    (1)
T_AMBIG_ADAP                    000001C3-R      296     (1)     2493    (6)
T_AMBIG_DEV                     000001F0-R      298     (1)     2495    (6)
T_BAD_NAME                      0000002E-R      269     (1)     755    (1)     764     (1)
T_BAD_RANGE                     0000006B-R      271     (1)     772    (1)
T_DEATTACH                      00000227-R      300     (1)     1976    (4)
T_DEVALLOC                      00000243-R      302     (1)     2161    (4)
T_DEV_MOUNTED                   00000264-R      304     (1)     2164    (4)
T_INVALID                       00000007-R      267     (1)     546    (1)     593     (1)
T_LINK                          00000158-R      288     (1)     592    (1)     599     (1)     635     (1)
T_MAIN_BUS                      00000109-R      283     (1)     637    (1)
T_NAME                          0000014C-R      287     (1)     662    (1)     751     (1)     760     (1)     769     (1)
                                                                782    (1)
T_NO_SUCH_ADAPTER               00000186-R      292     (1)     2553    (6)
T_NO_SUCH_DEV                   00000170-R      290     (1)     2088    (4)     2158    (4)     2269    (4)
T_NO_SUCH_ON_ADAPTER            0000019D-R      294     (1)     1947    (4)     2081    (4)     2262    (4)
T_PART_OF                       000000CD-R      279     (1)     748    (1)
T_PNF                           00000306-R      314     (1)     419    (1)
T_PROMPT                        0000013F-R      285     (1)     1710    (4)
T_RANGE                         000000A8-R      275     (1)     770    (1)
T_SHOULDBE                      00000348-R      316     (1)     1339    (3)     1406    (3)     1464    (3)
T_SHOWDEV                       000002DD-R      310     (1)     2361    (6)
T_SHOWDEVB                      000002F9-R      312     (1)     2367    (6)
T_SHOWDEVB_ALLOC                000002C6-R      308     (1)     2365    (6)
T_SHOWDEV_ALLOC                 000002A0-R      306     (1)     2359    (6)
T_SKIP                          00000333-R      315     (1)     423    (1)
T_STRING                        00000360-R      320     (1)     1340    (3)     1465    (3)
```

```
T_TYPE                          00000164-R   289    (1)      545    (1)      552    (1)
T_UNIT_EXCESS                   000000D7-R   281    (1)      663    (1)
T_UNRANGE                       000000BA-R   277    (1)      771    (1)
T_YESNO                         00000352-R   318    (1)      1338   (3)

                                          +-------------------------+
                                          ! Performance indicators !
                                          +-------------------------+

Phase                     Page faults    CPU Time       Elapsed Time
-----                     -----------    --------       ------------
Initialization                     40    00:00:00.04    00:00:00.22
Command processing                930    00:00:00.25    00:00:00.85
Pass 1                           1025    00:00:04.68    00:00:07.10
Symbol table sort                   0    00:00:00.34    00:00:00.34
Pass 2                            226    00:00:01.74    00:00:03.35
Symbol table output                 2    00:00:00.07    00:00:00.23
Psect synopsis output               2    00:00:00.00    00:00:00.06
Cross-reference output              6    00:00:00.35    00:00:00.56
Assembler run totals             2233    00:00:07.47    00:00:12.71

The working set limit was 2900 pages.
240429 bytes (470 pages) of virtual memory were used to buffer the intermediate code.
There were 70 pages of symbol table space allocated to hold 1064 non-local and 207 local symbols.
2774 source lines were read in Pass 1, producing 102 object records in Pass 2.
51 pages of virtual memory were used to define 39 macros.

                                          +---------------------------+
                                          ! Macro library statistics !
                                          +---------------------------+

Macro library name                            Macros defined
------------------                            --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1                 12
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                    7
SYS$COMMON:[SYSLIB]LIB.MLB;2                               0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                    0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1                  0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1                 0
SYS$COMMON:[SYSLIB]LIB.MLB;2                               0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                          14
SYS$COMMON:[SYSLIB]STARLET.MLB;2                           0
TOTALS (all libraries)                                    33

1129 GETS were required to define 33 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(2) 198 Declarations
(3) 275 DRIVER FIXED DATA AREA
(4) 378 BOO$QIO - BOOTSTRAP QIO ROUTINE
(5) 675 BOO$MAP - ROUTINE TO MAP DATA FOR BOO$QIO
(6) 736 BOO$PURDPR - Purge UBA Buffered Datapath
(8) 840 BOO$SELECT - Select boot driver
(9) 924 BOO$MOVE - Select and move boot driver

```
                                ; DEC/CMS REPLACEMENT HISTORY, Element BOOTDRIVR.MAR
                                ; *7     4-DEC-1986 13:28:59 BAGGETT "ADDED CHANGES FOR RT UVAX"
                                ; *6    12-MAY-1986 10:29:22 BARANSKI "Cleaning up Object Libraries."
                                ; *5     7-MAY-1986 16:51:32 BARANSKI "Documentation Check."
                                ; *4     5-MAY-1986 16:47:41 SALEM "DONE"
                                ; *3    25-APR-1986 16:03:39 MUSE "<no reason given>"
                                ; *2    14-FEB-1986 09:59:45 BAGGETT "PUT BACK CHANGE DELETED BY CMS ERROR"
                                ; *1     6-FEB-1986 15:13:49 DS ""
                                ; DEC/CMS REPLACEMENT HISTORY, Element BOOTDRIVR.MAR
                                        .TITLE  BOOTDRIVR       *** BOOTDRIVR non-interrupt I/O
                                        .IDENT  "10.0-28"                                               ;G:7

                                ;
                                ;*****************************************************************************
                                ;*                                                                           *
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                                ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
                                ;*                                                                           *
                                ;*****************************************************************************
                                ;
                                ;++
                                ;
                                ;  FACILITY:
                                ;
                                ;       Minimal bootstrap driver for all VMS system disks.
                                ;
                                ; ENVIRONMENT:
                                ;
                                ;       Runs at IPL 31, kernel mode, memory management may be on or off,
                                ;       IS=1 (running on interrupt stack), code must be PIC.
                                ;
                                ; ABSTRACT:
                                ;
                                ;       This module contains a routine called BOO$QIO that handles I/O
                                ;       transfers to and from the VMS system disks.
                                ;
                                ; AUTHOR:
                                ;
                                ;       The VMS group
                                ;
                                ; MODIFIED BY:
                                ;       28      M. Baggett      18-Nov-1986     VDS 10.3                    ;G:7
                                ;               Added changes RT uVAX to match AURORA.                      ;G:7
```

```
0000  ;                                                                                  ;G:5
0000  ;      27     T. Salem        5-May-1986      VDS 10.0                            ;G:4
0000  ;             Changed Processor SID to Microvax defined in $prdef                  ;G:4
0000  ;                                                                                  ;G:4
0000  ;      26     M. Baggett      17-Jan-1886     VDS 9.1                             ;G:2
0000  ;             Change error code from DS$_NOSUPPORT to DS$_UNSUPPDEV                ;G:2
0000  ;                                                                                  ;G:2
0000  ;      25     M. Baggett      16-Jan-1986     VDS 9.1
0000  ;             Removed HALT and added error status for unsupported
0000  ;             load devices.
0000  ;
0000  ;      24     M. Baggett      20-Sep-1985     VDS 9.0
0000  ;             Added back changes for AURORA.
0000  ;
0000  ;      23     Jim Shelhamer   12-Sept-1985    Version 8.3
0000  ;             Reset BOO$GL_UMR_TMPL. It gets set up for UNIBUS
0000  ;             devices, but fails to be reset for MASSBUS devices.
0000  ;             Also, went to better revision numbering, ie [23] not
0000  ;             [0223], which runs off the listing.
0000  ;
0000  ;      0222   Bob Bergazzi    July 25,1985    Version  8.3
0000  ;             Add code from BDABTDRIVR to set up pseudo map register
0000  ;             address in EXE$GL_UMR_PHY and EXE$GL_UMR_VIR.
0000  ;
0000  ;      0221   Bob Bergazzi    July 24,1985    Version 8.3
0000  ;             Made compatible with VMB version 13.
0000  ;
0000  ;      0220   Bob Bergazzi    June 3, 1985    Version 8.3
0000  ;             Added fixed data areas onto BOO$AL_VECTOR in order to be
0000  ;             compatible with VMS bootdrivrs.
0000  ;
0000  ;      0219   Bob Bergazzi    Jan. 16, 1985   Version 8.1
0000  ;             Added real BOO$PURDPR for 11/8SS.
0000  ;
0000  ;      0218   Bob Bergazzi    Nov. 28,1984
0000  ;             Added code for the 11/8SS cpu to BOO$PURDPR. Also, moved
0000  ;             edit which makes BOO$SELECT global into the .ENH from the
0000  ;             .UPD due to an edit clash.
0000  ;
0000  ;      0217   Bob Bergazzi    27-May-1983
0000  ;             Added another dispatch for CPU XXX in the CPUDISP MACRO.
0000  ;             This edit was put in by the supervisor group in the .ENH
0000  ;             file because the edit applies to a change in the .ENH file.
0000  ;             Eventually a new BOOTDRIVR module may be taken from VMS
0000  ;             which has the correct code in it.
0000  ;
0000  ;      DS02   Marion Baggett, 4-March-1983 Version 6.11
0000  ;             Added support for HSCCI booting.
0000  ;
0000  ;      DS01   Roger Riggs, 24-oct-1980, version 6.1
0000  ;             Added changes to version 4 VMB/BOOTDRIVR to make it usable
0000  ;             as bootdrivers for the Diagnostic Supervisor.
0000  ;             Note that some changes are here an others are in
0000  ;             BOOTDRIVR.ENH, since there are conflicts between VMS
0000  ;             changes and DS changes.
0000  ;
0000  ;      0216   CAS0001         C.A. Samuelson          30-Apr-1980
```

```
                                0000   115 ;               Add Purge of Buffered Datapath for UBA boot drivers
                                0000   116 ;
                                0000   117 ;       0215    TMH0001         Tim Halvorsen           10-Mar-1980
                                0000   118 ;               Mask off upper bits of PTE when constructing map register.
                                0000   119 ;
                                0000   120 ;       0214    KDM0092         Kathleen D. Morse       23-Jan-1980     16:40
                                0000   121 ;               Change VMB version number from 2 to 3.
                                0000   122 ;
                                0000   123 ;       00213   SRB0005         Steve Beckhardt         27-Nov-1979     16:10
                                0000   124 ;               Added code to support passing driver name from
                                0000   125 ;               boot driver to SYSBOOT.  Also added version # vector.
                                0000   126 ;                                                                       ;G:5
                                0000   127 ;       0212    SRB0004         Steve Beckhardt         31-Oct-1979     10:45
                                0000   128 ;               Moved all drivers into separate modules.  Added code
                                0000   129 ;               for connecting only the necessary driver.
                                0000   130 ;                                                                       ;G:5
                                0000   131 ;       0211    SRB0003         Steve Beckhardt         25-Oct-1979     16:40
                                0000   132 ;               Added console TU58 driver.
                                0000   133 ;                                                                       ;G:5
                                0000   134 ;       0210    CHF0001         Charlie Franks          23-Sep-1979     15:50
                                0000   135 ;               Added code and definitions to support RM80 bootable
                                0000   136 ;               system, includes: SSE and SSEI bit definitions, additions
                                0000   137 ;               to the MBAGEOM table and the MBA_DISK_DRUVER routine, and
                                0000   138 ;               the SSERROR skip sector routine.
                                0000   139 ;               Corrected byte count remaining update after encountering
                                0000   140 ;               a transfer error in MBA_DISK_DRIVER (convert MBA$L_BCR from
                                0000   141 ;               word to longword).
                                0000   142 ;                                                                       ;G:5
                                0000   143 ;       0209    SRB0002         Steve Beckhardt         13-Sep-1979     16:50
                                0000   144 ;               Added symbol EXE$GB_CPUTYPE (removed from module VMB)
                                0000   145 ;               so that it gets loaded into non-paged pool with the
                                0000   146 ;               boot driver.
                                0000   147 ;                                                                       ;G:5
                                0000   148 ;       0208    SRB0001         Steve Beckhardt         27-Aug-1979     10:30
                                0000   149 ;               Added boot device definitions ($BTDDEF).  Fixed CPUDISP
                                0000   150 ;               macro.  Added support for booting from console block
                                0000   151 ;               storage device.  Added 11/780 console floppy driver.
                                0000   152 ;               Changed boot value of R0 when booting from RL01/2 from
                                0000   153 ;               0 to 2.
                                0000   154 ;                                                                       ;G:5
                                0000   155 ;       0207    CHP0006         C. Peters               23-Jul-1979     16:16
                                0000   156 ;               Correct calculation of number of map registers needed.
                                0000   157 ;               Always invalidate one past the number required.
                                0000   158 ;                                                                       ;G:5
                                0000   159 ;       0206    CHP0005         C. Peters               20-Jul-1979     12:14
                                0000   160 ;               Add geometry of RM05 to MBAGEOM table.
                                0000   161 ;                                                                       ;G:5
                                0000   162 ;       0205    CHP0004         C. Peters               06-Jul-1979     14:06
                                0000   163 ;               Recode RK06/7 drive initialization code to correct bug
                                0000   164 ;               in RK07 handling.
                                0000   165 ;                                                                       ;G:5
                                0000   166 ;       0204    CHP0003         C. Peters               24-May-1979     14:24
                                0000   167 ;               Only invalidate the last UBA map register if the
                                0000   168 ;               transfer was page-aligned. Remove all code relating
                                0000   169 ;               to COMET-specific UBA map register format. All UBA
                                0000   170 ;               map registers are now alike. Delete definition of
                                0000   171 ;               storage for CPU_TYPE. Use instead a global symbol
```

```
                                0000   172 ;               EXE$GB_CPUTYPE initialized by VMB to hold the CPU
                                0000   173 ;               identification code.
                                0000   174 ;                                                                   ;G:5
                                0000   175 ;       0203    CHP0002         C. Peters                 11-May-1979     13:20
                                0000   176 ;               Add code to invalidate the last UBA map register to stop
                                0000   177 ;               a wild transfer. This code is CPU-specific.
                                0000   178 ;                                                                   ;G:5
                                0000   179 ;       0202    CHP0001         C. Peters                 23-Mar-1979     8:48
                                0000   180 ;               Fill out module header. Add CPUDISP macro. Add local
                                0000   181 ;               symbol CPU_TYPE for CPUDISP's use. Add many comments.
                                0000   182 ;               Extract processor type from PR$_SID and store in local
                                0000   183 ;               CPU_TYPE. Find adapter type from CONFREG, and store in
                                0000   184 ;               general register. Initialize map registers in a CPU-
                                0000   185 ;               and adapter-dependent way. Determine which driver to
                                0000   186 ;               use based on adapter and device type. Add routine
                                0000   187 ;               header comments to MBA and RK06/7 driver code. Derive
                                0000   188 ;               device CSR address in RK06/7 driver from PR$_MAPEN
                                0000   189 ;               value used as index into RPB. Add routine header
                                0000   190 ;               comments to ECC routine. Replace .PAGEs with form feeds.
                                0000   191 ;               Add code and definitions to support RL02 bootable
                                0000   192 ;               system: includes $RLDEF, a test for the RL02 device
                                0000   193 ;               type, and the minimal RL02 driver code (written by C.
                                0000   194 ;               Franks).
                                0000   195 ;
                                0000   196 ;--
```

```
                     0000   198          .SBTTL  Declarations
                     0000   199
                     0000   200 ;
                     0000   201 ; INCLUDE FILES;
                     0000   202 ;
                     0000   203          .LIBRARY        /SYS$LIBRARY:LIB/       ;
                     0000   204          .LIBRARY        /$DS/                   ;
                     0000   205          .LIBRARY        /$DIAG/                 ;
                     0000   206
                     0000   207 ;
                     0000   208 ; MACRO LIBRARY CALLS
                     0000   209 ;
                     0000   210          $DS_DSDEF                               ; DS error codes                        [25]
                     0000   211          $BQODEF                                 ; Define boot qio offsets               [022
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   212          $BTDDEF                                 ; Define boot device types
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
00000021             0000   213                  BTD$K_BDA       = 33    ;                                       [022
                     0000   214          $BUADEF                                 ; Define BUA adapter registers          [218
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   215          $IODEF                                  ; DEFINE I/O FUNCTION CODES
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   216          $MBADEF                                 ; DEFINE MASSBUS ADAPTER REGISTERS
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   217          $NDTDEF                                 ; NEXUS device types
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   218          $PRDEF                                  ; DEFINE PROCESSOR REGISTERS
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   219          $PTEDEF                                 ; DEFINE PAGE TABLE ENTRY FIELDS
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   220          $RPBDEF                                 ; DEFINE RESTART PARAMETER BLOCK
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   221          $SSDEF                                  ; DEFINE STATUS CODES
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   222          $UBADEF                                 ; UNIBUS ADAPTER REGISTER DEFINITIONS
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   223          $UBIDEF                                 ; 11/750 UNIBUS adapter regs.
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   224          $VADEF                                  ; DEFINE VIRTUAL ADDRESS FIELDS
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   225
                     0000   226 ;
                     0000   227 ; MACROS
                     0000   228 ;
```

```
                     0000   229
                     0000   230 ;
                     0000   231 ; CPU type dispatch macro:
                     0000   232 ;
                     0000   233 ;       The addresses in the address list are:
                     0000   234 ;               address of code for CPU type=1 (11/780)
                     0000   235 ;               address of code for CPU type=2 (11/750)
                     0000   236 ;               address of code for CPU type=3 (?)
                     0000   237 ;
                     0000   238 ;       CPUDISP is invoked to handle CPU differences in line, e.g.,
                     0000   239 ;
                     0000   240 ;               CPUDISP <10$,20$>       ;*DISPATCH ON CPU TYPE*
                     0000   241 ;       10$:    <11/780 specific code>
                     0000   242 ;       20$:    <11/750 specific code>
                     0000   243 ;                                       ;*END OF CPU-DEPENDENT CODE*
                     0000   244 ;
                     0000   245 ; When the next CPU is added, all occurrences of CPUDISP must be
                     0000   246 ; expanded to handle three CPU specific paths.
                     0000   247 ;
                     0000   248
                     0000   249         .MACRO  CPUDISP,ADDRLIST
                     0000   250         CASE    W^EXE$GB_CPUTYPE,<ADDRLIST>,LIMIT=#PR$_SID_TYP780,TYPE=B
                     0000   251         .ENDM   CPUDISP
                     0000   252
                     0000   253 ;
                     0000   254 ; LOCAL SYMBOLS
                     0000   255 ;
                     0000   256
                     0000   257         $DEFINI BDT                     ; Define Boot Driver Table offsets
                     0000               .SAVE   LOCAL_BLOCK
                     0000   258
                     0000   259 $DEF     BDT$L_CPUTYPE   .BLKW   1       ;  CPU type
                     0000               .IIF    NB,BDT$L_CPUTYPE,       BDT$L_CPUTYPE:
00000002             0000               .IIF    NB,,.BLKW,      .BLKW   1
                     0002   260 $DEF     BDT$L_DEVTYPE   .BLKW   1       ;  Boot R0 device type
                     0002               .IIF    NB,BDT$L_DEVTYPE,       BDT$L_DEVTYPE:
00000004             0002               .IIF    NB,,.BLKW,      .BLKW   1
                     0004   261 $DEF     BDT$L_ACTION    .BLKL   1       ;  Action routine
                     0004               .IIF    NB,BDT$L_ACTION,        BDT$L_ACTION:
00000008             0004               .IIF    NB,,.BLKL,      .BLKL   1
                     0008   262 $DEF     BDT$L_SIZE      .BLKL   1       ;  Driver size
                     0008               .IIF    NB,BDT$L_SIZE,  BDT$L_SIZE:
0000000C             0008               .IIF    NB,,.BLKL,      .BLKL   1
                     000C   263 $DEF     BDT$L_ADDR      .BLKL   1       ;  Driver address (offset)
                     000C               .IIF    NB,BDT$L_ADDR,  BDT$L_ADDR:
00000010             000C               .IIF    NB,,.BLKL,      .BLKL   1
                     0010   264 $DEF     BDT$L_ENTRY     .BLKL   1       ;  Driver entry (offset from address)
                     0010               .IIF    NB,BDT$L_ENTRY, BDT$L_ENTRY:
00000014             0010               .IIF    NB,,.BLKL,      .BLKL   1
                     0014   265 $DEF     BDT$L_DRIVRNAME .BLKL   1       ;  Driver name (offset from address)
                     0014               .IIF    NB,BDT$L_DRIVRNAME,     BDT$L_DRIVRNAME:
00000018             0014               .IIF    NB,,.BLKL,      .BLKL   1
                     0018   266
00000018             0018   267 BDT$K_LENGTH=.                           ;  Length of entry
                     0018   268
                     0018   269         $DEFEND BDT                     ; End of Boot Driver Table definitions
                     0000               .RESTORE
```

```
                     0000   270 ;
                     0000   271 ; WEAK SYMBOLS
                     0000   272 ;
                     0000   273 .WEAK   BDA_MAPREGS                    ; KDB50 pseudo map registers          [022
```

```
                  0000          .SBTTL  DRIVER FIXED DATA AREA
                  0000
                  0000  ;
                  0000  ;       FIXED DATA CELLS FOR BOOTSTRAP DRIVER
                  0000  ;
                  0000
              00000000          .PSECT  BOOTDRIVR_1,LONG        ; CERTAIN DRIVERS REQUIRE ALIGNMENT!    [022
                  0000
                  0000  BOO$AL_VECTOR::                         ; VECTOR TO BOOT DRIVER ENTRY POINTS
      00000050'   0000          .LONG   BOO$QIO-BOO$AL_VECTOR   ; OFFSET TO BOOTSTRAP QIO ROUTINE
      000001A8'   0004          .LONG   BOO$MAP-BOO$AL_VECTOR   ; OFFSET TO MAPPING ROUTINE
      00000000'   0008          .LONG   BOO$SELECT-BOO$AL_VECTOR; OFFSET TO BOOTSTRAP I/O DRIVER
                  000C                                          ; INITIALLY SET TO ROUTINE WHICH
                  000C                                          ; SELECTS DRIVER
      00000000    000C          .LONG   0                       ; OFFSET TO SYSTEM DISK DRIVER NAME
                  0010                                          ; (ASCIC STRING). SET UP BY BOOT DRIVER.
                  0010  ;
                  0010  ; The next two words are the version number and the version number check fields.
                  0010  ; (The second word is the ones complement of the first word.)  The version
                  0010  ; number should be incremented whenever the interface between VMB and the
                  0010  ; rest of the system changes.  Release 1.0 VMB did not contain these fields.
                  0010  ;
                  0010  ;       Version 2 - Boot driver passes system disk driver name to SYSBOOT
                  0010  ;       Version 3 - VMB build memory description vector into RPB
                  0010  ;       Version 4 - VMB BOOTDRIVR purges UBA buffered datapath, all drivers
                  0010  ;                   return to BOOTDRIVR with success/failure status
                  0010  ;       Version 5 - VMB passes an argument list to the secondary boot
                  0010  ;                   in AP.  FILEREAD cacheing is present.
                  0010  ;       Version 6 - VMB passes nexus device type of boot adapter in
                  0010  ;                   RPB$B_BOOTNDT.
                  0010  ;       Version 7 - BOO$AL_VECTOR now has new entry points for RESELECTing
                  0010  ;                   a driver and UNIT_INIT for a driver.  Also new info
                  0010  ;                   passed in the argument list.
                  0010  ;       Version 8 - BOO$AL_VECTOR now has a new cell: BQO$L_UCODE.
                  0010  ;       Version 9 - VMB passes number of bad memory pages found during
                  0010  ;                   bootstrap scan in RPB$L_BADPGS.
                  0010  ;       Version 10- BOO$AL_VECTOR has two new cells: UNIT_DISC and DEVNAME
                  0010  ;
                  0010  ;       Version 11- BOO$AL_VECTOR has two new cells:  TENUSEC and UBDELAY
                  0010  ;
                  0010  ;       Version 12- RPB$W_BOOTNDT is defined, high byte of this word must
                  0010  ;                   be cleared in SYSBOOT for versions of VMB less than 12.
                  0010  ;
                  0010  ;       Version 13- RPB$B_CTRLLTR is defined; SYSBOOT must clear this field
                  0010  ;                   for older versions of VMB.
                  0010  ;
                  0010
      0000000D    0010  VMB_VERSION = 13
                  0010
                  0010          ASSUME  <.-BOO$AL_VECTOR> EQ BQO$W_VERSION
     FFF2 000D    0010          .WORD   VMB_VERSION,^C<VMB_VERSION> ; VERSION # AND VERSION # CHECK FIELD.
      00000000'   0014          .LONG   BOO$RESELECT-BOO$AL_VECTOR ; Offset to set new driver
      00000070'   0018          .LONG   BOO$MOVE-BOO$AL_VECTOR  ; Offset to routine to select and move
                  001C          ASSUME  <.-BOO$AL_VECTOR> EQ BQO$L_UNIT_INIT
      00000000    001C          .LONG   0                       ; Offset to UNIT_INIT
                  0020          ASSUME  <.-BOO$AL_VECTOR> EQ BQO$L_AUXDRNAME
      00000000    0020          .LONG   0                       ; Offset to auxiliary driver name
```

```
                  0024                                          ;  second driver
                  0024          ASSUME  <.-BOO$AL_VECTOR> EQ BQO$L_UMR_DIS
                  0024  BOO$GL_UMR_DIS::                        ; Number of map registers disabled
        00000000  0024          .LONG   0
                  0028          ASSUME  <.-BOO$AL_VECTOR> EQ BQO$L_UCODE
                  0028  BOO$GL_UCODE::                          ; Address of microcode in memory
        00000000  0028          .LONG   0
                  002C          ASSUME  <.-BOO$AL_VECTOR> EQ BQO$L_UNIT_DISC
        00000000  002C          .LONG   0                       ; Offset to UNIT_DISC
                  0030          ASSUME  <.-BOO$AL_VECTOR> EQ BQO$L_DEVNAME
        00000000  0030          .LONG   0                       ; Offset to boot device name
                  0034          ASSUME  <.-BOO$AL_VECTOR> EQ BQO$L_UMR_TMPL
                  0034  BOO$GL_UMR_TMPL::                       ; UNIBUS map register template
        80000000  0034          .LONG   UBA$M_MAP_VALID         ;  Default is valid, no buff data path
                  0038          ASSUME  <.-BOO$AL_VECTOR> EQ BQO$B_UMR_DP
                  0038  BOO$GB_UMR_DP::                         ; UNIBUS map register data path
              01  0038          .BYTE   1                       ;  Default is Buffered #1
                  0039          ASSUME  <.-BOO$AL_VECTOR> EQ BQO$B_CPUTYPE
                  0039  EXE$GB_CPUTYPE::                        ; Location to hold processor
              01  0039          .BYTE   1                       ;  identification code
                  003A          ASSUME  <.-BOO$AL_VECTOR> EQ BQO$L_CPUDATA
                  003A  EXE$GB_CPUDATA::                        ; Location to hold contents of SID.
        00000001  003A          .LONG   1
                  003E          ASSUME  <.-BOO$AL_VECTOR> EQ BQO$L_TENUSEC
                  003E  EXE$GL_TENUSEC::                        ; Location to hold TIMEDWAIT delay count
        00000001  003E          .LONG   1
                  0042          ASSUME  <.-BOO$AL_VECTOR> EQ BQO$L_UBDELAY
                  0042  EXE$GL_UBDELAY::                        ; Location to hold TIMEDWAIT delay count
        00000001  0042          .LONG   1
                  0046  ;
                  0046  ; The addition of two longwords here, EXE$GL_UMR_PHY, and EXE$GL_UMR_VIR, which
                  0046  ; point to the pseudo map registers, allows BOO$QIO to locate these longwords
                  0046  ; in memory.
            0000  0046          .WORD   0                       ; Reserved, puts structure back on
                  0048                                          ;  longword boundaries.
                  0048  ;       ASSUME  <.-BOO$AL_VECTOR> EQ BQO$L_UMR_PHY
        00000048  0048  BQO$L_UMR_PHY = .-BOO$AL_VECTOR         ; Remove this line, restore previous with ne
                  0048  EXE$GL_UMR_PHY::                        ; Location to hold physical address of
        00000000  0048          .LONG   0                       ;  pseudo map registers.
                  004C
                  004C  ;       ASSUME  <.-BOO$AL_VECTOR> EQ BQO$L_UMR_VIR
        0000004C  004C  BQO$L_UMR_VIR = .-BOO$AL_VECTOR         ; Remove this line, restore previous with ne
                  004C  EXE$GL_UMR_VIR::                        ; Location to hold virtual address of
        00000000  004C          .LONG   0                       ;  pseudo map registers.
                  0050  ;                                                                                 end
```

```
                                0050   378          .SBTTL  BOO$QIO - BOOTSTRAP QIO ROUTINE
                                0050   379
                                0050   380 ;++
                                0050   381 ; FUNCTIONAL DESCRIPTION:
                                0050   382 ;
                                0050   383 ;       BOO$QIO PROVIDES THE DEVICE INDEPENDENT I/O INTERFACE FOR BOTH
                                0050   384 ;       READING AND WRITING THE BOOTSTRAP DEVICE.
                                0050   385 ;
                                0050   386 ; CALLING SEQUENCE:
                                0050   387 ;
                                0050   388 ;       CALLG   ARGLIST,BOO$QIO
                                0050   389 ;
                                0050   390 ; INPUT PARAMETERS:
                                0050   391 ;
                                0050   392 ;       BUF(AP)  - BUFFER ADDRESS
                                0050   393 ;       SIZE(AP) - SIZE OF BUFFER IN BYTES
                                0050   394 ;       LBN(AP)  - LOGICAL BLOCK NUMBER
                                0050   395 ;       FUNC(AP) - FUNCTION CODE
                                0050   396 ;                  ACCEPTS IO$_READLBLK AND IO$_WRITELBLK
                                0050   397 ;       MODE(AP) - ADDRESS INTERPRETATION MODE
                                0050   398 ;                  0 => PHYSICAL, 1 => VIRTUAL
                                0050   399 ;       RPB(AP) - ADDRESS OF RESTART PARAMETER BLOCK
                                0050   400 ;
                                0050   401 ; OUTPUT PARAMETERS:
                                0050   402 ;
                                0050   403 ;       R0 - COMPLETION STATUS CODE
                                0050   404 ;       R1 - TOTAL BYTES TRANSFERRED
                                0050   405 ;
                                0050   406 ;--
                                0050   407
                                0050   408 ;
                                0050   409 ; Offsets from AP to input arguments:
                                0050   410 ;
                                0050   411
                    00000004    0050   412          BUF     = 4
                    00000008    0050   413          SIZE    = 8
                    0000000C    0050   414          LBN     = 12
                    00000010    0050   415          FUNC    = 16
                    00000014    0050   416          MODE    = 20
                    00000018    0050   417          RPB     = 24
                                0050   418
                                0050   419 BOO$QIO::
                        0FFC    0050   420          .WORD   ^M<R2,R3,R4,R5,R6,R7,-  ; PRESERVE REGISTERS
                                0052   421                  R8,R9,R10,R11>
                                0052   422
DA AF   80000000 8F     D0      0052   423          MOVL    #UBA$M_MAP_VALID, -     ; Reset template                [23]
                                005A   424                  BOO$GL_UMR_TMPL         ;                               [23]
                                005A   425 ;
                                005A   426 ; If mapping is enabled, the processor register RP$_MAPEN contains a 1.
                                005A   427 ; Otherwise, the register contains a 0. Use this value as an index to
                                005A   428 ; choose the appropriate address of the adapter's register space.
                                005A   429 ;
                                005A   430
      59    18 AC     D0      005A   431          MOVL    RPB(AP),R9              ; GET BASE ADDRESS OF RESTART PARAMETER BLK
         51    38     DB      005E   432          MFPR    #PR$_MAPEN,R1           ; CHECK FOR MAPPING ENABLED
                                0061   433          ASSUME  RPB$L_ADPVIR EQ RPB$L_ADPPHY+4
   53    5C A941     D0      0061   434          MOVL    RPB$L_ADPPHY(R9)[R1],R3 ; GET CORRECT POINTER TO CONFIG REG
```

```
                     0066   435
                     0066   436 ;
                     0066   437 ; Using the argument list as input, calculate the transfer size, number
                     0066   438 ; of map registers, starting LBN, starting VPN, and base of a page table
                     0066   439 ; to use in mapping.
                     0066   440 ;
                     0066   441
        5A   04 AC   D0   0066   442          MOVL    BUF(AP),R10             ; Get buffer address
        58   08 AC   3C   006A   443          MOVZWL  SIZE(AP),R8             ; GET TRANSFER SIZE IN BYTES
             04       12   006E   444          BNEQ    10$                     ; CONTINUE IF LEGAL SIZE
     58   01   10      9C   0070   445          ROTL    #16,#1,R8               ; ELSE FORCE TO 64K SIZE
57   5A   09   00      EF   0074   446 10$:     EXTZV   #VA$V_BYTE,#VA$S_BYTE,R10,R7    ; Get byte offset into page
   57   03FF C847      9E   0079   447          MOVAB   ^X3FF(R8)[R7],R7        ; Calculate highest address plus
                       007F   448                                           ; an overflow page.
  57   57   F7 8F      78   007F   449          ASHL    #-9,R7,R7               ; Reduce to number of pages
                       0084   450                                           ; (= number of map registers).
        5B   0C AC   D0   0084   451          MOVL    LBN(AP),R11             ; AND BLOCK NUMBER FOR RETRY
        51   50 A9   D0   0088   452          MOVL    RPB$L_SVASPT(R9),R1     ; ASSUME SYSTEM SPACE
        03 5A   1F      E0   008C   453          BBS     #VA$V_SYSTEM,R10,20$    ; Branch if system address
           51   08      DB   0090   454          MFPR    #PR$_P0BR,R1            ; OTHERWISE GET P0 PT BASE
52   5A   15   09      EF   0093   455 20$:     EXTZV   #VA$V_VPN,#VA$S_VPN,R10,R2      ; Get base VPN for transfer
                       0098   456 ;                                                                   begin   [022
                     0098   457 ; Now to determine if map registers are used, a check is made to see what
                     0098   458 ; device we are booting from.  Device types are set up as follows:
                     0098   459 ;       0 = a massbus device
                     0098   460 ;    1-31 = reserved for unibus devices
                     0098   461 ;      32 = HSC on a CI
                     0098   462 ;      33 = BDA
                     0098   463 ;      64 = Console
                     0098   464 ;
                     0098   465 ; All devices use map registers except the console device and the HSC.
                     0098   466 ;                                                                   end     [022
          66 A9      91   0098   467          CMPB    RPB$B_DEVTYP(R9),-      ; Booting from BDA?                     [022
             21               009B   468                  #BTD$K_BDA              ;                               [022
             4F      12   009C   469          BNEQ    30$                     ; Branch if not a BDA                   [022
     08   98 AF      91   009E   470          cmpb    exe$gb_cputype,#pr$_sid_typuv2 ; Branch if MicroVax.    [24][27] ;G:
             07      13   00A2   471          BEQL    22$                     ;                                       [24]
  00'8F   92 AF      91   00A4   472          cmpb    exe$gb_cputype,#pr$_sid_typrtuv2 ; Branch if RT MicroVax.       [24]
             03      12   00A9   473          BNEQ    23$                     ;                                       [24]
           00CC      31   00AB   474 22$:     BRW     PUSH_RETRY              ;                                       [24]
                       00AE   475 23$:                                                                    ;G:7
                       00AE   476 ;                                                                   begin   [022
                     00AE   477 ; Now set up the map registers for the BDA. There are 2 pages of map registers
                     00AE   478 ; allocated but we will only use 1 page.  The reason for allocating 2 pages
                     00AE   479 ; is to ensure that the page of map registers that we use are physically con-
                     00AE   480 ; tiguous.  So first we must find the page boundary of the map registers.
                     00AE   481 ; This will be the starting address of the map registers.
                     00AE   482 ;
50   00000000'EF      9E   00AE   483          MOVAB   BDA_MAPREGS,R0          ; Get the start of the map registers    [022
50   000001FF 8F      C0   00B5   484          ADDL    #^X1FF,R0               ; Determine the start of the map reg.   [022
50   000001FF 8F      CA   00BC   485          BICL    #^X1FF,R0               ; on a page boundary                    [022
      85 AF   50      D0   00C3   486          MOVL    R0,EXE$GL_UMR_VIR       ; Save address of page aligned m.r.     [022
                       00C7   487
        54   38      DB   00C7   488          MFPR    #PR$_MAPEN,R4           ; Get the mapping status                [022
          17 54      E9   00CA   489          BLBC    R4,25$                  ; if map not enabled, branch around.    [022
        FF77 CF      D4   00CD   490          CLRL    EXE$GL_UMR_PHY          ; Initialize address of page aligned m.r.[02
50   50   15   09      EF   00D1   491          EXTZV   #VA$V_VPN,#VA$S_VPN,R0,R0 ; Convert VA to virtual page number   [022
```

```
                50    50 B940    D0  00D6    492          MOVL    @RPB$L_SVASPT(R9)[R0],R0 ; Get the physical page number          [022
                15    09   50    F0  00DB    493          INSV    R0,#VA$V_VPN,#VA$S_VPN,-;                                        [022
                      FF66 CF        00DF    494                  EXE$GL_UMR_PHY           ; Set physical address of map reg.      [022
                           07    11  00E2    495          BRB     27$                      ; Branch around                         [022
                                     00E4    496
                      FF64 CF    D0  00E4    497 25$:     MOVL    EXE$GL_UMR_VIR,-         ;                                       [022
                      FF5D CF        00E8    498                  EXE$GL_UMR_PHY           ; Save the physical addr. of m.r.       [022
                           09    11  00EB    499 27$:     BRB     INIT_MAPREGS             ; Go set up map registers               [022
                         66 A9    91  00ED    500 30$:     CMPB    RPB$B_DEVTYP(R9),-       ; If booting from console block         [022
                            20        00F0    501                  #BTD$K_HSCCI             ; storage device or CI,                 [DS0
                            03    19  00F1    502          BLSS    INIT_MAPREGS             ; don't load map registers              [022
                          0084    31  00F3    503          BRW     PUSH_RETRY               ;                                       [022
                                     00F6    504
                                     00F6    505 ;
                                     00F6    506 ; Register usage right now is as follows:
                                     00F6    507 ;
                                     00F6    508 ;       R1      - address of page table for virtual-->physical mapping
                                     00F6    509 ;       R2      - base VPN for the transfer
                                     00F6    510 ;       R3      - address of the adapter's configuration register
                                     00F6    511 ;       R7      - number of map registers needed (plus one extra)
                                     00F6    512 ;       R8      - transfer size in bytes
                                     00F6    513 ;       R9      - address of the RPB
                                     00F6    514 ;       R10     - buffer address
                                     00F6    515 ;       R11     - starting LBN of the transfer
                                     00F6    516 ;
                                     00F6    517 ; In an adapter-dependent fashion, initialize the required number of
                                     00F6    518 ; adapter map registers. First calculate the address of the starting map
                                     00F6    519 ; register number. Right now, map registers for all UNIBUS and MASSBUS
                                     00F6    520 ; adapters for all processors start at the same offset from the base of
                                     00F6    521 ; the adapter's register space.
                                     00F6    522 ;
                                     00F6    523 ; During map register initialization, the following registers change
                                     00F6    524 ; for each page mapped:
                                     00F6    525 ;
                                     00F6    526 ;       R2      - address of the next VPN to map
                                     00F6    527 ;       R4      - address of the next map register to load
                                     00F6    528 ;       R5      - PFN of the page being mapped
                                     00F6    529 ;
                                     00F6    530
                                     00F6    531 INIT_MAPREGS:                            ; Initialize the map registers.
                                     00F6    532 ; This assumes that UNIT_INIT routine of BDA initializes EXE$GL_UMR_PHY field   [022
                                     00F6    533 ; and it also initializes EXE$GL_UMR_VIR.                                        [022
                         66 A9    91  00F6    534          CMPB    RPB$B_DEVTYP(R9),-       ; Booting from BDA?                     [022
                            21        00F9    535                  #BTD$K_BDA               ;                                       [022
                            0B    12  00FA    536          BNEQ    10$                      ; Branch if not a BDA                   [022
                      54    38    DB  00FC    537          MFPR    #PR$_MAPEN,R4            ; Check for mapping enabled             [022
                                     00FF    538          ASSUME  EXE$GL_UMR_VIR  EQ       EXE$GL_UMR_PHY+4                ;       [022
                54    FF44 CF44    D0  00FF    539          MOVL    EXE$GL_UMR_PHY[R4],R4    ; Get either physical or virtual address[022
                                     0105    540                                           ; pseudo map registers                  [022
                            0B    11  0105    541          BRB     COMPUTE_PFN              ;                                       [022
                                     0107    542 10$:     ASSUME  MBA$L_MAP EQ UBA$L_MAP
                                     0107    543          ASSUME  MBA$L_MAP EQ UBI$L_MAP
                  54    FF19 CF    D0  0107    544          MOVL    W^BOO$GL_UMR_DIS,R4      ; Pick up number of disable UMR's       [022
                54    0800 C344    DE  010C    545          MOVAL   MBA$L_MAP(R3)[R4],R4     ; Point to first useable map register   [022
                                     0112    546
                                     0112    547 COMPUTE_PFN:                             ; Loop once per page.
                      55    82     9E  0112    548          MOVAB   (R2)+,R5                 ; Get a virtual page number.
```

```
                0B 14 AC    E9  0115   549          BLBC    MODE(AP),10$            ; If physical page #, branch.
                55   6145   D0  0119   550          MOVL    (R1)[R5],R5             ; Get page table entry
          . 55  FFE00000 8F   CA  011D   551          BICL    #^C<PTE$M_PFN>,R5       ; and extract PFN from entry
                                 0124   552 ;                                       ;                                  begin   [022
                                 0124   553 ; Derive the boot device adapter's type (UNIBUS adapter or MASSBUS
                                 0124   554 ; adapter) from the RPB, and save a flag indicating the adapter type
                                 0124   555 ; in a register.  The seemingly complicated fooling around with both
                                 0124   556 ; a UMR_DP and UMR_TMPL is to allow flexibility in what devices desire
                                 0124   557 ; in the way of data paths: Only UNIBUS devices will ever even pick up
                                 0124   558 ; the UMR_DP bit.  Thus all non-UNIBUS boot devices will never purge
                                 0124   559 ; a data path.  UNIBUS devices have a choice: by clearing UMR_DP in
                                 0124   560 ; their UNIT_INIT routines, the boot drivers can elect to not use
                                 0124   561 ; the buffered data path.
                                 0124   562 ;                                                                          end     [022
                                 0124   563
                      50    D4   0124   564 10$:     CLRL    R0                      ; Assume not UNIBUS
                56    63    D0   0126   565          MOVL    (R3),R6                 ; Fetch nexus type of adapter
             56   0102 8F    B1   0129   566          CMPW    #<NDT$_BUA&^xFFFF>,R6   ; See if a BAckplane-UNIBUS adapter. NOTE
                                 012E   567                                          ;  anding with ^xFFFF is to avoid
                                 012E   568                                          ;  truncation warning from assembler.
                      0F    13   012E   569          BEQL    15$                     ; EQL implies BAckplane-UNIBUS adapter.
             56   0103 8F    B1   0130   570          CMPW    #<NDT$_BLA&^xFFFF>,R6   ; See if a BAckplane-LESI adapter. NOTE
                                 0135   571                                          ; anding with ^xFFFF is to avoid
                                 0135   572                                          ; truncation warning from assembler.
                      11    13   0135   573          BEQL    16$                     ; EQL implies BAckplane-LESI adapter.
                56    03    CA   0137   574          BICL    #3,R6                   ; Make canonical adapter type
                28    56    B1   013A   575          CMPW    R6, #NDT$_UBO           ; See if boot adapter is a UNIBUS,
                      11    12   013D   576          BNEQ    20$                     ; NEQ implies NOT.
                                 013F   577 15$:                                    ; If yes, UNIBUS adapter then
             FEF5 CF    F0   013F   578          INSV    BOO$GB_UMR_DP,-         ;  Pick up the data path
             02   15         0143   579                  #UBA$V_MAP_DPD,#2,-
             FEEC CF         0145   580                  BOO$GL_UMR_TMPL         ;  and put it in the template
                      50    D6   0148   581 16$:     INCL    R0                      ;  Set a flag for later user               end
                                 014A   582 ;
                                 014A   583 ; This is a UNIBUS adapter.
                                 014A   584 ;
                                 014A   585 ; Map registers for the UNIBUS adapter look like the following:
                                 014A   586 ;
                                 014A   587 ;       +-----------------------------------------+
                                 014A   588 ;       | V |   | BO | DP # |  |  page frame number  |
                                 014A   589 ;       +-----------------------------------------+
                                 014A   590 ;
                                 014A   591 ; The code sets the byte offset bit if relevant, sets the valid bit,
                                 014A   592 ; sets the low bit in the 4-bit data path field to indicate that the
                                 014A   593 ; first buffered data path is to be used, and loads the page frame
                                 014A   594 ; number into the low bits.
                                 014A   595 ;
                                 014A   596
          19   04 AC    F0   014A   597          INSV    BUF(AP),#UBA$V_MAP_BO,- ; Set UBA byte offset bit if
                55    01         014E   598                  #1,R5                   ; necessary.
    84  FEDF CF    55    C9   0150   599 20$:     BISL3   R5,BOO$GL_UMR_TMPL,(R4)+; Set PFN and byte offset, valid          [022
                                 0156   600                                          ; bit, and buffered DP number
                                 0156   601                                          ; into map.
                                 0156   602
                                 0156   603 ; ****** NOTE *****  Always uses Datapath #1, IOC$PURDPR depends on this!!
                                 0156   604
                                 0156   605 ;
```

```
                     0156   606 ; MASSBUS adapter's map registers look like the following:
                     0156   607 ;
                     0156   608 ;       +-----------------------------------------+
                     0156   609 ;       | V |                 | page frame number |
                     0156   610 ;       +-----------------------------------------+
                     0156   611 ;
                     0156   612 ;
                     0156   613 ;*****
                     0156   614 ;       BISL3   R5,#MBA$M_MAP_VALID,-   ; Set the PFN and the valid bit
                     0156   615 ;               (R4)+                   ; in the map register.
                     0156   616 ;*****
                     0156   617 ;
                     0156   618
                     0156   619                                         ; Is there another page to do?          [022
          57   D7    0156   620         DECL    R7                      ; Decrement # of map registers.
          B8   14    0158   621         BGTR    COMPUTE_PFN             ; Loop to fill next map register
                     015A   622                                         ; if byte count not exhausted.
                     015A   623
                     015A   624 ;
                     015A   625 ; All map registers are set up. Set up 2 more inputs to driver code.
                     015A   626 ; Since the loaded MBA map registers are registers #0-n, the starting
                     015A   627 ; address of the transfer to be loaded into a device register by the
                     015A   628 ; device driver, is now simply the offset into the first page of the
                     015A   629 ; transfer buffer.  However, for the UBA, there may be some disabled
                     015A   630 ; map registers as a result of UNIBUS memory on the UBA.  Therefor,
                     015A   631 ; the starting address of the transfer must include the lowest enabled
                     015A   632 ; UMR in bits 9-17.
                     015A   633
        09   00   EF  015A   634         EXTZV   #VA$V_BYTE,#VA$S_BYTE,- ; Get byte offset into page
        5A   5A        015D   635                 R10,R10                 ; in R10
                     015F   636
                     015F   637 ;
                     015F   638 ; Invalidate the last UBA map register so that a wild transfer will stop
                     015F   639 ; at the end of the last valid block.
                     015F   640 ;
                     015F   641
          10 50   E9  015F   642         BLBC    R0,30$                  ; Skip invalidation for MBA.
 74   80000000 8F   CA  0162   643         BICL    #UBA$M_MAP_VALID,-(R4)  ; Invalidate last map register.
50   FEB6 CF   09   9C  0169   644         ROTL    #9,W^BOO$GL_UMR_DIS,R0  ; Form UNIBUS address of UMR            [022
        5A   50   C8  016F   645         BISL    R0,R10                  ; Set into address register             [022
                     0172   646 ;
                     0172   647 ; If it is a UNIBUS boot device, derive the address of the device's CSR.
                     0172   648 ;
                     0172   649
                     0172   650         ASSUME  RPB$L_CSRVIR  EQ  RPB$L_CSRPHY+4
                     0172   651
        50   38   DB  0172   652 30$:    MFPR    #PR$_MAPEN,R0           ; Check for mapping enabled
     57   54 A940   D0  0175   653         MOVL    RPB$L_CSRPHY(R9)[R0],R7 ; Get address of device's CSR
                     017A   654
                     017A   655 PUSH_RETRY:
             0A   DD  017A   656         PUSHL   #10                     ; Push retry count on stack
                     017C   657
        55   5B   D0  017C   658 10$:    MOVL    R11,R5                  ; Get a working copy of the block number
      50   34 A9   D0  017F   659         MOVL    RPB$L_IOVEC(R9),R0      ; Get address of boot vectors
        08 B040   16  0183   660         JSB     @8(R0)[R0]              ; Call driver thru self-relative vector
             15   E1  0187   661         BBC     #UBA$V_MAP_DPD,-        ; Branch if not using the Buffered      [022
     14 FEA8 CF        0189   662                 BOO$GL_UMR_TMPL,100$    ; data path                             [022
```

```
                50    DD   018D    663           PUSHL   R0                      ; Save driver status
                02    BB   018F    664           PUSHR   #^M<R1>                 ; Save R1 from driver
              006C    30   0191    665           BSBW    BOO$PURDPR              ; Purge Buffered Datapath for UBA
                02    BA   0194    666           POPR    #^M<R1>                 ; Restore R1
             05 50    E8   0196    667           BLBS    R0,80$                  ; Branch if success
          5E    04    C0   0199    668           ADDL    #4,SP                   ; Clear previous status from stack
                06    11   019C    669           BRB     150$                    ; Retry
                50  8ED0   019E    670 80$:      POPL    R0                      ; Get driver status back
             03 50    E8   01A1    671 100$:     BLBS    R0,200$                 ; Branch if success
             D5 6E    F5   01A4    672 150$:     SOBGTR  (SP),10$                ; Retry if count > 0
                      04   01A7    673 200$:     RET                             ; Return with final status in R0
```

```
                                01A8   675          .SBTTL  BOO$MAP - ROUTINE TO MAP DATA FOR BOO$QIO
                                01A8   676
                                01A8   677 ;**
                                01A8   678 ; FUNCTIONAL DESCRIPTION:
                                01A8   679 ;       BOO$MAP IS CALLED TO INITIALIZE THE DATA BASE FOR BOO$QIO TO PERMIT
                                01A8   680 ;       IT TO FUNCTION WITH MEMORY MANAGEMENT ENABLED.  AN AREA OF SYSTEM
                                01A8   681 ;       PAGE TABLE MUST BE PROVIDED SO THAT THE CONFIGURATION REGISTERS AND
                                01A8   682 ;       UNIBUS I/O PAGE CAN BE MAPPED.
                                01A8   683 ;
                                01A8   684 ; CALLING SEQUENCE:
                                01A8   685 ;       CALLG   ARGLIST,BOO$MAP
                                01A8   686 ;
                                01A8   687 ; INPUT PARAMETERS:
                                01A8   688 ;       SVASPT(AP) - SYSTEM VIRTUAL ADDRESS OF THE SYSTEM PAGE TABLE
                    00000004    01A8   689 ;       SVASPT  =   4
                                01A8   690 ;       VABASE(AP) - BASE VIRTUAL ADDRESS OF A 24 PAGE WINDOW TO MAP
                                01A8   691 ;                    THE ADAPTER CONFIGURATION REGISTERS AND UNIBUS
                    00000008    01A8   692 ;       VABASE  =   8
                                01A8   693 ;                    I/O PAGE.
                                01A8   694 ;       RPB(AP) -   ADDRESS OF RESTART PARAMETER BLOCK (RPB) CONTAINING
                                01A8   695 ;                    BOOTSTRAP DEVICE DESCRIPTION.
                    0000000C    01A8   696 ;       RPB     =   12
                                01A8   697 ;
                                01A8   698 ; OUTPUT PARAMETERS:
                                01A8   699 ;       NONE
                                01A8   700 ;
                                01A8   701 ;--
                                01A8   702
                        00FC    01A8   703 BOO$MAP::        .WORD   ^M<R2,R3,R4,R5,R6,R7>   ;
            57    0C AC   D0    01AA   704                 MOVL    RPB(AP),R7              ; GET BASE ADDRESS FOR RPB
            52    04 AC   D0    01AE   705                 MOVL    SVASPT(AP),R2           ; GET BASE OF SPT
            50 A7   52    D0    01B2   706                 MOVL    R2,RPB$L_SVASPT(R7)     ; AND SAVE IN DATA BASE
            53    08 AC   D0    01B6   707                 MOVL    VABASE(AP),R3           ; GET VIRTUAL ADDRESS OF WINDOW
            60 A7   53    D0    01BA   708                 MOVL    R3,RPB$L_ADPVIR(R7)     ; SET AS ADAPTER VIRTUAL ADDRESS
      54    5C A7   15    09    EF    01BE   709                 EXTZV   #VA$V_VPN,#VA$S_VPN,RPB$L_ADPPHY(R7),R4 ; GET BASE PFN
                  55    08    D0    01C4   710                 MOVL    #8,R5                   ; SET TO MAP 8 PAGES
         50   53    15    09    EF    01C7   711                 EXTZV   #VA$V_VPN,#VA$S_VPN,R3,R0       ; GET BASE VIRTUAL PAGE
               51    6240    DE    01CC   712                 MOVAL   (R2)[R0],R1             ; COMPUTE WORKING SPT POINTER
                     20    10    01D0   713                 BSBB    FILLSPT                 ; FILL SPT TO MAP CONFIGURATION REGS
                  55    10    D0    01D2   714                 MOVL    #16,R5                  ; SET FOR 16 PAGES
54    54 A7   00001FFF  8F    CB    01D5   715                 BICL3   #^X1FFF,RPB$L_CSRPHY(R7),R4     ; GET PHY ADDR OF I/O PAGE BASE
            54    54    17    9C    01DE   716                 ROTL    #<32-9>,R4,R4           ; AND CONVERT TO PAGE NUMBER
                        0E    10    01E2   717                 BSBB    FILLSPT                 ; STORE PTES INTO SPT
               50    54 A7   3C    01E4   718                 MOVZWL  RPB$L_CSRPHY(R7),R0     ; GET I/O PAGE OFFSET
   58 A7   FFFF3000 E043    9E    01E8   719                 MOVAB   <^X1000-^XE000>(R0)[R3],RPB$L_CSRVIR(R7) ; SET VIRTUAL CSR ADDR
                        04    01F1   720                 RET                             ;
                              01F2   721
                              01F2   722 ;**
                              01F2   723 ; FILLSPT
                              01F2   724 ;
                              01F2   725 ; INPUTS:
                              01F2   726 ;       R1 - POINTER TO CURRENT SPT ENTRY (UPDATED)
                              01F2   727 ;       R4 - PFN (UPDATED)
                              01F2   728 ;       R5 - COUNT OF PAGES TO FILL (UPDATED)
                              01F2   729 ;
                              01F2   730 FILLSPT:                                     ;
   81    54   90000000 8F    C9    01F2   731                 BISL3   #<PTE$M_VALID!PTE$C_KW>,R4,(R1)+ ; STORE A PTE
```

```
                54   D6  01FA   732          INCL    R4                      ; ADVANCE TO NEXT PFN
             F3 55   F5  01FC   733          SOBGTR  R5,FILLSPT              ; STORE THEM ALL
                     05  01FF   734          RSB
```

```
                                0200   736          .SBTTL  BOO$PURDPR - Purge UBA Buffered Datapath
                                0200   737
                                0200   738 ;**
                                0200   739 ; FUNCTIONAL DESCRIPTION:
                                0200   740 ;
                                0200   741 ;       This routine is called by BOOTDRIVR at the end of each boot device
                                0200   742 ;       transfer if the boot device is on the Unibus.  It purges the buffered
                                0200   743 ;       datapath and/or performs other Unibus adapter specific end-action.
                                0200   744 ;
                                0200   745 ;   NOTE: This routine contains processor specific code.
                                0200   746 ;
                                0200   747 ; CALLING SEQUENCE:
                                0200   748 ;
                                0200   749 ;       JSB     BOO$PURDPR
                                0200   750 ;
                                0200   751 ; INPUT PARAMETERS:
                                0200   752 ;
                                0200   753 ;       R3 - Address of UBA adapter configuration register
                                0200   754 ;       EXE$GB_CPUTYPE - Index specifying what CPU we are executing on
                                0200   755 ;       ** Assumes all drivers use DATAPATH 1 **
                                0200   756 ;
                                0200   757 ; OUTPUT PARAMETERS:
                                0200   758 ;
                                0200   759 ;       R0 - LBS -> Success
                                0200   760 ;            LBC -> Failure
                                0200   761 ;
                                0200   762 ;       R1,R2,R4 - Destroyed
                                0200   763 ;       All other registers preserved
                                0200   764 ;
                                0200   765 ;--
                                0200   766
                                0200   767 BOO$PURDPR:
                                0200   768
                    50    01    3C    0200   769          MOVZWL  #SS$_NORMAL,R0                  ; Assume success
                                0203   770          CPUDISP <100$,200$,300$,100$,400$,400$,100$,170$,-                      ;G:7
                                0203   771                  170$,-                          ; Not assigned                  [28]    ;G:
                                0203   772                  170$,-                          ; Not assigned                  [28]    ;G:
                                0203   773                  170$,-                          ; Not assigned                  [28]    ;G:
                                0203   774                  170$,-                          ; Not assigned                  [28]    ;G:
                                0203   775                  170$,-                          ; Not assigned                  [28]    ;G:
                                0203   776                  170$,-                          ; Not assigned                  [28]    ;G:
                                0203   777                  170$,-                          ; Not assigned                  [28]    ;G:
                                0203   778                  170$>                           ; Dispatch on EXE$GB_CPUTYPE    [218][24][28
                0F'   01    FE32 CF    8F    0203               CASEB   W^EXE$GB_CPUTYPE,#PR$_SID_TYP780,S^#<<30001$-30000$>/2>-1
                                0209       30000$:
                          0020' 0209               .SIGNED_WORD    100$-30000$
                          0039' 020B               .SIGNED_WORD    200$-30000$
                          0059' 020D               .SIGNED_WORD    300$-30000$
                          0020' 020F               .SIGNED_WORD    100$-30000$
                          0068' 0211               .SIGNED_WORD    400$-30000$
                          0068' 0213               .SIGNED_WORD    400$-30000$
                          0020' 0215               .SIGNED_WORD    100$-30000$
                          0038' 0217               .SIGNED_WORD    170$-30000$
                          0038' 0219               .SIGNED_WORD    170$-30000$
                          0038' 021B               .SIGNED_WORD    170$-30000$
                          0038' 021D               .SIGNED_WORD    170$-30000$
                          0038' 021F               .SIGNED_WORD    170$-30000$
```

```
                     0038' 0221                .SIGNED_WORD    170$-30000$
                     0038' 0223                .SIGNED_WORD    170$-30000$
                     0038' 0225                .SIGNED_WORD    170$-30000$
                     0038' 0227                .SIGNED_WORD    170$-30000$
                           0229          30001$:
                           0229    779
      52    44 A3    DE    0229    780 100$:   MOVAL   UBA$L_DPR+4(R3),R2       ; CPU type 11/780, Datapth Register
   62    01    1F    78    022D    781         ASHL    #UBA$V_DPR_BNE,#1,(R2)  ; Purge datapath
      51    62    D0    0231    782         MOVL    (R2),R1                 ; Get Datapth register contents
   09 51    1E    E1    0234    783         BBC     #UBA$V_DPR_XMTER,R1,170$ ; Branch if no error
   62    01    1E    78    0238    784         ASHL    #UBA$V_DPR_XMTER,#1,(R2) ; Clear error in datapath
   50    01F4 8F    3C    023C    785 150$:   MOVZWL  #SS$_PARITY,R0          ; Set failure status
                     05    0241    786 170$:   RSB                             ; Return to caller
                           0242    787
      52    04 A3    DE    0242    788 200$:   MOVAL   UBI$L_DPR+4(R3),R2      ; CPU type 11/750, Datapath Register
   62    01    00    78    0246    789         ASHL    #UBI$V_DPR_PUR,#1,(R2)  ; Purge Datapath
      54    0A    D0    024A    790         MOVL    #UBI$C_PURCNT,R4        ; Get max # of tries for
                           024D    791                                     ; purge done test
      51    62    D0    024D    792 230$:   MOVL    (R2),R1                 ; Get datapath register contents
   05 51    00    E1    0250    793         BBC     #UBI$V_DPR_PUR,R1,250$  ; Branch if purge done
         F6 54    F5    0254    794         SOBGTR  R4,230$                 ; Branch if more tries allowed
                     04    11    0257    795         BRB     270$            ; Return failure status
   E4 51    1F    E1    0259    796 250$:   BBC     #UBI$V_DPR_ERROR,R1,170$ ; Branch if no purge error
      62    00    D2    025D    797 270$:   MCOML   #0,(R2)                 ; Clear datapath error(s)
                     DA    11    0260    798         BRB     150$            ; Return with failure status
                           0262    799
      51    10 A3    D0    0262    800 300$:   MOVL    UBI$L_SR(R3),R1         ; Get Unibus Error Summary Register
                           0266    801                                     ; Nebula
51    8001C000 8F    D3    0266    802         BITL    #<UBI$M_SR_UWE!-        ; Any UB errors? (write error,
                           026D    803                 UBI$M_SR_MRPE!-         ;       map parity error,
                           026D    804                 UBI$M_SR_NXM!-          ;       non-existent memory,
                           026D    805                 UBI$M_SR_UCE>,R1        ; or uncorrected read error.)
                     D2    13    026D    806         BEQL    170$            ; Branch if no errors
                           026F    807 ; ****** QUESTION - Is there anything to do to clear the error status?
                     CB    11    026F    808         BRB     150$            ; Return failure status
                           0271    809
      0754 C3    01    D0    0271    810 400$:   MOVL    #BUA$M_PURGE,-          ; Purge datapath BDP #1                 [219
                           0276    811                 BUA$L_DPCSR1(R3)
      51   0720 C3    D0    0276    812         MOVL    BUA$L_CSR(R3),R1        ; Copy BUA CSR register to R1           [219
        C2 51    1F    E1    027B    813         BBC     #BUA$V_ERR,R1,170$      ; If no errors, branch to RSB           [219
                     CA    027F    814         BICL    #<BUA$M_BIF!-           ; Clear error bits, BAckplane failure bit an
                           0280    815                 BUA$M_USSTO!-           ; UNIBUS SSYN Time Out bit and          [219
                           0280    816                 BUA$M_UIE!-             ; UNIBUS Interlock Error bit and        [219
                           0280    817                 BUA$M_IMR!-             ; Invalid Map Register and              [219
                           0280    818                 BUA$M_BADBDP>,-         ; Bad Buffered Data Path in             [219
51    1F000000 8F          0280    819                 R1                      ; BUA CSR copy                          [219
      0720 C3    51    D0    0286    820         MOVL    R1,BUA$L_CSR(R3)        ; Update BUA CSR register.              [219
                     AF    11    028B    821         BRB     150$            ;                                       [218
```

```
                     0000028D  028D    823 BOO$QIOSIZ=.-BOO$AL_VECTOR              ; Size of boot QIO routine
                               028D    824
                     0000028D  028D    825 BOO$DRIVER==.                           ; Start of boot driver (after
                               028D    826                                         ; it's been moved)
                               028D    827                                         ; NOTE:  Boot drivers must be in
                               028D    828                                         ; psect BOOTDRIVR_2
                               028D    829
                           00000000    830         .PSECT  BOOTDRIVR_3
                               0000    831
                     00000000  0000    832 BOO$DRIVER_TBL=.                        ; Boot driver table
                               0000    833
                           00000000    834         .PSECT  BOOTDRIVR_5
                               0000    835
                     00000000  0000    836         .LONG   0                       ; End of boot driver table
                               0004    837
                           00000000    838         .PSECT  BOOTDRIVR_6
```

```
                     0000   840          .SBTTL  BOO$SELECT - Select boot driver
                     0000   841
                     0000   842 ;++
                     0000   843 ; FUNCTIONAL DESCRIPTION:
                     0000   844 ;
                     0000   845 ;       This routine is called the first time BOO$QIO calls a driver.
                     0000   846 ;       It searches the boot driver table to locate the proper driver.
                     0000   847 ;       This driver is then moved so that it is adjacent to BOO$QIO
                     0000   848 ;       and the correct linkage is made in BOO$AL_VECTOR.
                     0000   849 ;       RPB$L_IOVECSZ is also stored with the size of BOO$QIO plus
                     0000   850 ;       the size of the driver.  The driver is then jumped to.
                     0000   851 ;
                     0000   852 ; CALLING SEQUENCE:
                     0000   853 ;
                     0000   854 ;       JSB     BOO$SELECT      (Actually called through self-relative
                     0000   855 ;                                vector in BOO$AL_VECTOR+8)
                     0000   856 ;
                     0000   857 ; INPUT PARAMETERS:
                     0000   858 ;
                     0000   859 ;       R9      Address of the RPB
                     0000   860 ;
                     0000   861 ; OUTPUT PARAMETERS:
                     0000   862 ;
                     0000   863 ;       None
                     0000   864 ;
                     0000   865 ;--
                     0000   866
                     0000   867 BOO$RESELECT::                                       ;                                       [0220]
                     0000   868 BOO$SELECT::                                         ; Global so DS can re-init BOO$AL_VECTOR
          3E   BB    0000   869          PUSHR   #^M<R1,R2,R3,R4,R5>                ; Save registers
55   0000'CF   DE    0002   870          MOVAL   W^BOO$DRIVER_TBL,R5                ; Get address of boot driver table
  53    66 A9   9A    0007   871          MOVZBL  RPB$B_DEVTYP(R9),R3                ; Get value of boot device type
54   0039'CF   9A    000B   872          MOVZBL  W^EXE$GB_CPUTYPE,R4                ; Get cpu type
                     0010   873
                     0010   874 10$:     ;
                     0010   875          ; Determine if next driver in table is the correct one.
                     0010   876          ;
                     0010   877
     50   65   32    0010   878          CVTWL   BDT$L_CPUTYPE(R5),R0               ; Get cpu type from table
          53   13    0013   879          BEQL    80$                                ; End of table
          05   19    0015   880          BLSS    20$                                ; Driver doesn't care about cpu type
     54   50   D1    0017   881          CMPL    R0,R4                              ; Cpu types match?
          17   12    001A   882          BNEQ    40$                                ; No, try next driver
                     001C   883
  50   02 A5   32    001C   884 20$:     CVTWL   BDT$L_DEVTYPE(R5),R0               ; Get boot device type from table
          05   19    0020   885          BLSS    30$                                ; Driver doesn't care about device type
     53   50   D1    0022   886          CMPL    R0,R3                              ; Device types match?
          0C   12    0025   887          BNEQ    40$                                ; No, try next driver
                     0027   888
  50   04 A5   D0    0027   889 30$:     MOVL    BDT$L_ACTION(R5),R0                ; Get action routine offset from table
          0B   13    002B   890          BEQL    60$                                ; No action routine, this is the driver
        6540   16    002D   891          JSB     (R5)[R0]                           ; Call action routine
       05 50   E8    0030   892          BLBS    R0,60$                             ; Branch if this is the driver
     55   18   C0    0033   893 40$:     ADDL    #BDT$K_LENGTH,R5                   ; Point to next driver entry
          D8   11    0036   894          BRB     10$                                ; Try next driver
                     0038   895
                     0038   896 60$:     ;
```

```
                                0038   897          ; Have the right driver.  R5 points to driver table entry.
                                0038   898          ; Set up size in RPB, driver vector, and then move driver.
                                0038   899          ; Finally, jump to driver.
                                0038   900
          0000028D 8F    C1     0038   901          ADDL3   #BOO$QIOSIZ,-                       ; Add boot QIO size to
        38 A9    08 A5                003E   902                  BDT$L_SIZE(R5),RPB$L_IOVECSZ(R9); driver size and store in RPB
   50   55    00000000'8F    C3     0042   903          SUBL3   #BOO$AL_VECTOR, R5, R0  ; Offset from vector to header
    0008'CF    10 A5   50     C1     004A   904          ADDL3   R0,-
                                0051   905                  BDT$L_ENTRY(R5),W^BOO$AL_VECTOR+8 ; entry and store in vector
        0008'CF    0C A5      C0     0051   906          ADDL2   BDT$L_ADDR(R5),W^BOO$AL_VECTOR+8 ; Plus offset from header
    000C'CF    14 A5   50     C1     0057   907          ADDL3   R0,-                        ; Compute offset to driver
                                005E   908                  BDT$L_DRIVRNAME(R5),W^BOO$AL_VECTOR+12 ; name and store in vector
                                005E   909 ; Do not move the driver in the supervisor
                                005E   910 ;         MOVC3   BDT$L_SIZE(R5),-                    ; Move driver
                                005E   911 ;                 @BDT$L_ADDR(R5)[R5],W^BOO$DRIVER
                      3E    BA     005E   912          POPR    #^M<R1,R2,R3,R4,R5>             ; Restore registers
              50    34 A9   D0     0060   913          MOVL    RPB$L_IOVEC(R9),R0              ; Get address of vectors
                 08 B040    17     0064   914          JMP     @8(R0)[R0]                      ; Jump to driver
                                0068   915
                                0068   916
                                0068   917 80$:      ;
                                0068   918          ; No driver in the driver table accepted this QIO.
                                0068   919          ;
                                0068   920
        50   00660158 8F    D0     0068   921          MOVL    #DS$_UNSUPPDEV,R0               ; The load device is not supported i
                                05     006F   922          RSB
```

```
                0070          .SBTTL  BOO$MOVE - Select and move boot driver
                0070
                0070    ;++
                0070    ; FUNCTIONAL DESCRIPTION:
                0070    ;
                0070    ;       Not implemented for diagnostic supervisor use.
                0070    ;--
                0070
                0070    BOO$MOVE:                                       ;                       [202]
          00    0070          HALT                                      ;                       [202]
                0071          .END
```

```
BDA_MAPREGS                     ********W GX   00
BDT$K_LENGTH                  = 00000018     D
BDT$L_ACTION                    00000004     D
BDT$L_ADDR                      0000000C     D
BDT$L_CPUTYPE                   00000000     D
BDT$L_DEVTYPE                   00000002     D
BDT$L_DRIVRNAME                 00000014     D
BDT$L_ENTRY                     00000010     D
BDT$L_SIZE                      00000008     D
BIT...                        = 00660160     D
BOO$AL_VECTOR                   00000000 RG  D   02
BOO$DRIVER                    = 0000028D RG  D   02
BOO$DRIVER_TBL                = 00000000 R   D   03
BOO$GB_UMR_DP                   00000038 RG  D   02
BOO$GL_UCODE                    00000028 RG  D   02
BOO$GL_UMR_DIS                  00000024 RG  D   02
BOO$GL_UMR_TMPL                 00000034 RG  D   02
BOO$MAP                         000001A8 RG  D   02
BOO$MOVE                        00000070 R   D   05
BOO$PURDPR                      00000200 R   D   02
BOO$QIO                         00000050 RG  D   02
BOO$QIOSIZ                    = 0000028D     D
BOO$RESELECT                    00000000 RG  D   05
BOO$SELECT                      00000000 RG  D   05
BQO$B_CPUTYPE                 = 00000039     D
BQO$B_UMR_DP                  = 00000038     D
BQO$L_AUXDRNAME               = 00000020     D
BQO$L_CPUDATA                 = 0000003A     D
BQO$L_DEVNAME                 = 00000030     D
BQO$L_TENUSEC                 = 0000003E     D
BQO$L_UBDELAY                 = 00000042     D
BQO$L_UCODE                   = 00000028     D
BQO$L_UMR_DIS                 = 00000024     D
BQO$L_UMR_TMPL                = 00000034     D
BQO$L_UNIT_DISC               = 0000002C     D
BQO$L_UNIT_INIT               = 0000001C     D
BQO$W_VERSION                 = 00000010     D
BTD$K_BDA                     = 00000021     D
BTD$K_HSCCI                   = 00000020     D
BUA$L_CSR                     = 00000720     D
BUA$L_DPCSR1                  = 00000754     D
BUA$M_BADBDP                  = 01000000     D
BUA$M_BIF                     = 10000000     D
BUA$M_IMR                     = 02000000     D
BUA$M_PURGE                   = 00000001     D
BUA$M_UIE                     = 04000000     D
BUA$M_USSTO                   = 08000000     D
BUA$V_ERR                     = 0000001F     D
BUF                           = 00000004     D
COMPUTE_PFN                     00000112 R   D   02
DS$K_ERROR                    = 00000002     D
DS$K_NORMAL                   = 00000001     D
DS$K_SEVERE                   = 00000004     D
DS$K_SUBSYS                   = 00000066     D
DS$K_WARNING                  = 00000000     D
DS$_AP_NORMAL_BREAK           = 00660150     D
DS$_ARITH                     = 006600D0     D
DS$_ASBE                      = 00660118     D
DS$_BADLINK                   = 006600F0     D
DS$_BADTYPE                   = 006600E8     D
DS$_BIIC                      = 00660120     D
DS$_CHME                      = 006600A8     D
DS$_CHMK                      = 006600E0     D
DS$_DEVNAME                   = 00660108     D
DS$_ERROR                     = 00660002     D
DS$_FHWE                      = 00660068     D
DS$_FRAGBUF                   = 00660080     D
DS$_ICBUSY                    = 006600C8     D
DS$_ICERR                     = 006600C0     D
DS$_IHWE                      = 00660060     D
DS$_ILLCHAR                   = 00660018     D
DS$_ILLPAGCNT                 = 00660078     D
DS$_ILLUNIT                   = 00660100     D
DS$_INIT_FAIL                 = 00660140     D
DS$_INSFMEM                   = 00660050     D
DS$_INVCPU                    = 00660130     D
DS$_IPL2HI                    = 006600B8     D
DS$_IVADDR                    = 00660040     D
DS$_IVVECT                    = 00660038     D
DS$_KRNLSTK                   = 00660090     D
DS$_LOGIC                     = 00660070     D
DS$_MCHK                      = 00660088     D
DS$_MEM_ALLOC_ERR             = 00660138     D
DS$_MMOFF                     = 00660058     D
DS$_NEEDUNIT                  = 006600F8     D
DS$_NODE                      = 00660128     D
DS$_NOPCS                     = 00660110     D
DS$_NORMAL                    = 00660001     D
DS$_NOSUPPORT                 = 006600B1     D
DS$_NOTALLOWMP                = 00660148     D
DS$_NOTDON                    = 00660030     D
DS$_NOTIMP                    = 006600B0     D
DS$_NULLSTR                   = 00660010     D
DS$_OVERFLOW                  = 00660008     D
DS$_POWER                     = 00660098     D
DS$_PROGERR                   = 00660020     D
DS$_SEVERE                    = 00660004     D
DS$_TRANSL                    = 006600A0     D
DS$_TRUNCATE                  = 00660028     D
DS$_UNEXPINT                  = 006600D8     D
DS$_UNSUPPDEV                 = 00660158     D
DS$_VASFULL                   = 00660048     D
DS$_WARNING                   = 00660000     D
EXE$GB_CPUDATA                  0000003A RG  D   02
EXE$GB_CPUTYPE                  00000039 RG  D   02
EXE$GL_TENUSEC                  0000003E RG  D   02
EXE$GL_UBDELAY                  00000042 RG  D   02
EXE$GL_UMR_PHY                  00000048 RG  D   02
EXE$GL_UMR_VIR                  0000004C RG  D   02
FILLSPT                         000001F2 R   D   02
FUNC                          = 00000010     D
INIT_MAPREGS                    000000F6 R   D   02
LBN                           = 0000000C     D
MBA$L_MAP                     = 00000800     D
```

```
MODE                            = 00000014    D
NDT$_BLA                        = 80000103    D
NDT$_BUA                        = 80000102    D
NDT$_UBO                        = 00000028    D
PR$_MAPEN                       = 00000038    D
PR$_P0BR                        = 00000008    D
PR$_SID_TYP780                  = 00000001    D
PR$_SID_TYPRTUV2                  ********  X   02
PR$_SID_TYPUV2                  = 00000008    D
PTE$C_KW                        = 10000000    D
PTE$M_PFN                       = 001FFFFF    D
PTE$M_VALID                     = 80000000    D
PUSH_RETRY                        0000017A R  D   02
RPB                             = 0000000C    D
RPB$B_DEVTYP                    = 00000066    D
RPB$L_ADPPHY                    = 0000005C    D
RPB$L_ADPVIR                    = 00000060    D
RPB$L_CSRPHY                    = 00000054    D
RPB$L_CSRVIR                    = 00000058    D
RPB$L_IOVEC                     = 00000034    D
RPB$L_IOVECSZ                   = 00000038    D
RPB$L_SVASPT                    = 00000050    D
SIZE                            = 00000008    D
SS$_NORMAL                      = 00000001    D
SS$_PARITY                      = 000001F4    D
SVASPT                          = 00000004    D
UBA$L_DPR                       = 00000040    D
UBA$L_MAP                       = 00000800    D
UBA$M_MAP_VALID                 = 80000000    D
UBA$V_DPR_BNE                   = 0000001F    D
UBA$V_DPR_XMTER                 = 0000001E    D
UBA$V_MAP_BO                    = 00000019    D
UBA$V_MAP_DPD                   = 00000015    D
UBI$C_PURCNT                    = 0000000A    D
UBI$L_DPR                       = 00000000    D
UBI$L_MAP                       = 00000800    D
UBI$L_SR                        = 00000010    D
UBI$M_SR_MRPE                   = 00008000    D
UBI$M_SR_NXM                    = 00010000    D
UBI$M_SR_UCE                    = 80000000    D
UBI$M_SR_UWE                    = 00004000    D
UBI$V_DPR_ERROR                 = 0000001F    D
UBI$V_DPR_PUR                   = 00000000    D
VA$S_BYTE                       = 00000009    D
VA$S_VPN                        = 00000015    D
VA$V_BYTE                       = 00000000    D
VA$V_SYSTEM                     = 0000001F    D
VA$V_VPN                        = 00000009    D
VABASE                          = 00000008    D
VMB_VERSION                     = 0000000D    D
```

```
                                    +----------------+
                                    ! Psect synopsis !
                                    +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           00000018  (   24.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
BOOTDRIVR_1                     0000028D  (  653.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC LONG
BOOTDRIVR_3                     00000000  (    0.)  03 (  3.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
BOOTDRIVR_5                     00000004  (    4.)  04 (  4.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
BOOTDRIVR_6                     00000071  (  113.)  05 (  5.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
BDA_MAPREGS	00000000-XR		273 (2) 483 (4)
BDT$K_LENGTH	=00000018		#-893 (8)
BDT$L_ACTION	00000004		#-889 (8)
BDT$L_ADDR	0000000C		#-906 (8)
BDT$L_CPUTYPE	00000000		#-878 (8)
BDT$L_DEVTYPE	00000002		#-884 (8)
BDT$L_DRIVRNAME	00000014		#-908 (8)
BDT$L_ENTRY	00000010		#-905 (8)
BDT$L_SIZE	00000008		#-902 (8)
BIT...	=00660160	210 (2)	210 (2)
BOO$AL_VECTOR	00000000-R	283 (3)	284 (3) 285 (3) 286 (3) 324 (3) 326 (3) 327 (3) 328 (3) 330 (3) 333 (3) 336 (3) 339 (3) 341 (3) 343 (3) 346 (3) 349 (3) 352 (3) 355 (3) 358 (3) 368 (3) 373 (3) 823 (7) #-903 (8) #-905 (8) #-906 (8) #-908 (8)
BOO$DRIVER	=0000028D-R	825 (7)	
BOO$DRIVER_TBL	=00000000-R	832 (7)	870 (8)
BOO$GB_UMR_DP	00000038-R	347 (3)	#-578 (4)
BOO$GL_UCODE	00000028-R	337 (3)	
BOO$GL_UMR_DIS	00000024-R	334 (3)	#-544 (4) #-644 (4)
BOO$GL_UMR_TMPL	00000034-R	344 (3)	#-424 (4) 580 (4) #-599 (4) 662 (4)
BOO$MAP	000001A8-R	703 (5)	285 (3)
BOO$MOVE	00000070-R	932 (9)	327 (3)
BOO$PURDPR	00000200-R	767 (6)	#-665 (4)
BOO$QIO	00000050-R	419 (4)	284 (3)
BOO$QIOSIZ	=0000028D	823 (7)	#-901 (8)
BOO$RESELECT	00000000-R	867 (8)	326 (3)
BOO$SELECT	00000000-R	868 (8)	286 (3)
BQO$B_CPUTYPE	=00000039		349 (3)
BQO$B_UMR_DP	=00000038		346 (3)
BQO$L_AUXDRNAME	=00000020		330 (3)
BQO$L_CPUDATA	=0000003A		352 (3)
BQO$L_DEVNAME	=00000030		341 (3)
BQO$L_TENUSEC	=0000003E		355 (3)
BQO$L_UBDELAY	=00000042		358 (3)
BQO$L_UCODE	=00000028		336 (3)
BQO$L_UMR_DIS	=00000024		333 (3)
BQO$L_UMR_PHY	=00000048	368 (3)	
BQO$L_UMR_TMPL	=00000034		343 (3)
BQO$L_UMR_VIR	=0000004C	373 (3)	
BQO$L_UNIT_DISC	=0000002C		339 (3)
BQO$L_UNIT_INIT	=0000001C		328 (3)
BQO$W_VERSION	=00000010		324 (3)
BTD$K_BDA	=00000021	213 (2)	#-468 (4) #-535 (4)
BTD$K_HSCCI	=00000020		#-501 (4)
BUA$L_CSR	=00000720		#-812 (6) #-820 (6)
BUA$L_DPCSR1	=00000754		#-811 (6)
BUA$M_BADBDP	=01000000		#-818 (6)

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BUA$M_BIF                       =10000000                       #-814    (6)
BUA$M_IMR                       =02000000                       #-817    (6)
BUA$M_PURGE                     =00000001                       #-810    (6)
BUA$M_UIE                       =04000000                       #-816    (6)
BUA$M_USSTO                     =08000000                       #-815    (6)
BUA$V_ERR                       =0000001F                       #-813    (6)
BUF                             =00000004       412     (4)     #-442    (4)     #-597    (4)
COMPUTE_PFN                      00000112-R     547     (4)     #-541    (4)     #-621    (4)
DS$K_ERROR                      =00000002       210     (2)
DS$K_NORMAL                     =00000001       210     (2)
DS$K_SEVERE                     =00000004       210     (2)
DS$K_SUBSYS                     =00000066       210     (2)      210     (2)
DS$K_WARNING                    =00000000       210     (2)
DS$_AP_NORMAL_BREAK             =00660150       210     (2)
DS$_ARITH                       =006600D0       210     (2)
DS$_ASBE                        =00660118       210     (2)
DS$_BADLINK                     =006600F0       210     (2)
DS$_BADTYPE                     =006600E8       210     (2)
DS$_BIIC                        =00660120       210     (2)
DS$_CHME                        =006600A8       210     (2)
DS$_CHMK                        =006600E0       210     (2)
DS$_DEVNAME                     =00660108       210     (2)
DS$_ERROR                       =00660002       210     (2)
DS$_FHWE                        =00660068       210     (2)
DS$_FRAGBUF                     =00660080       210     (2)
DS$_ICBUSY                      =006600C8       210     (2)
DS$_ICERR                       =006600C0       210     (2)
DS$_IHWE                        =00660060       210     (2)
DS$_ILLCHAR                     =00660018       210     (2)
DS$_ILLPAGCNT                   =00660078       210     (2)
DS$_ILLUNIT                     =00660100       210     (2)
DS$_INIT_FAIL                   =00660140       210     (2)
DS$_INSFMEM                     =00660050       210     (2)
DS$_INVCPU                      =00660130       210     (2)
DS$_IPL2HI                      =006600B8       210     (2)
DS$_IVADDR                      =00660040       210     (2)
DS$_IVVECT                      =00660038       210     (2)
DS$_KRNLSTK                     =00660090       210     (2)
DS$_LOGIC                       =00660070       210     (2)
DS$_MCHK                        =00660088       210     (2)
DS$_MEM_ALLOC_ERR               =00660138       210     (2)
DS$_MMOFF                       =00660058       210     (2)
DS$_NEEDUNIT                    =006600F8       210     (2)
DS$_NODE                        =00660128       210     (2)
DS$_NOPCS                       =00660110       210     (2)
DS$_NORMAL                      =00660001       210     (2)
DS$_NOSUPPORT                   =006600B1       210     (2)
DS$_NOTALLOWMP                  =00660148       210     (2)
DS$_NOTDON                      =00660030       210     (2)
DS$_NOTIMP                      =006600B0       210     (2)      210     (2)
DS$_NULLSTR                     =00660010       210     (2)
DS$_OVERFLOW                    =00660008       210     (2)
DS$_POWER                       =00660098       210     (2)
DS$_PROGERR                     =00660020       210     (2)
DS$_SEVERE                      =00660004       210     (2)
DS$_TRANSL                      =006600A0       210     (2)
DS$_TRUNCATE                    =00660028       210     (2)
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DS$_UNEXPINT                    =006600D8      210     (2)
DS$_UNSUPPDEV                   =00660158      210     (2)     #-921     (8)
DS$_VASFULL                     =00660048      210     (2)
DS$_WARNING                     =00660000      210     (2)       210     (2)
EXE$GB_CPUDATA                   0000003A-R    353     (3)
EXE$GB_CPUTYPE                   00000039-R    350     (3)     #-470     (4)     #-472     (4)     #-778     (6)     #-872     (8)
EXE$GL_TENUSEC                   0000003E-R    356     (3)
EXE$GL_UBDELAY                   00000042-R    359     (3)
EXE$GL_UMR_PHY                   00000048-R    369     (3)     #-490     (4)       494     (4)     #-498     (4)       538     (4)
                                                               #-539     (4)
EXE$GL_UMR_VIR                   0000004C-R    374     (3)     #-486     (4)     #-497     (4)       538     (4)
FILLSPT                          000001F2-R    730     (5)     #-713     (5)     #-717     (5)     #-733     (5)
FUNC                            =00000010      415     (4)
INIT_MAPREGS                     000000F6-R    531     (4)     #-499     (4)     #-502     (4)
LBN                             =0000000C      414     (4)     #-451     (4)
MBA$L_MAP                       =00000800                        542     (4)       543     (4)       545     (4)
MODE                            =00000014      416     (4)     #-549     (4)
NDT$_BLA                        =80000103                       #-570     (4)
NDT$_BUA                        =80000102                       #-566     (4)
NDT$_UBO                        =00000028                       #-575     (4)
PR$_MAPEN                       =00000038                       #-432     (4)     #-488     (4)     #-537     (4)     #-652     (4)
PR$_POBR                        =00000008                       #-454     (4)
PR$_SID_TYP780                  =00000001                       #-778     (6)
PR$_SID_TYPRTUV2                 00000000-XR                    #-472     (4)
PR$_SID_TYPUV2                  =00000008                       #-470     (4)
PTE$C_KW                        =10000000                       #-731     (5)
PTE$M_PFN                       =001FFFFF                       #-551     (4)
PTE$M_VALID                     =80000000                       #-731     (5)
PUSH_RETRY                       0000017A-R    655     (4)     #-474     (4)     #-503     (4)
RPB                             =0000000C      696     (5)     #-431     (4)     #-704     (5)
RPB$B_DEVTYP                    =00000066                       #-467     (4)     #-500     (4)     #-534     (4)     #-871     (8)
RPB$L_ADPPHY                    =0000005C                         433     (4)     #-434     (4)       709     (5)
RPB$L_ADPVIR                    =00000060                         433     (4)     #-708     (5)
RPB$L_CSRPHY                    =00000054                         650     (4)     #-653     (4)     #-715     (5)     #-718     (5)
RPB$L_CSRVIR                    =00000058                         650     (4)     #-719     (5)
RPB$L_IOVEC                     =00000034                       #-659     (4)     #-913     (8)
RPB$L_IOVECSZ                   =00000038                       #-902     (8)
RPB$L_SVASPT                    =00000050                       #-452     (4)     #-492     (4)     #-706     (5)
SIZE                            =00000008      413     (4)     #-443     (4)
SS$_NORMAL                      =00000001                       #-769     (6)
SS$_PARITY                      =000001F4                       #-785     (6)
SVASPT                          =00000004      689     (5)     #-705     (5)
UBA$L_DPR                       =00000040                         780     (6)
UBA$L_MAP                       =00000800                         542     (4)
UBA$M_MAP_VALID                 =80000000                         345     (3)     #-423     (4)     #-643     (4)
UBA$V_DPR_BNE                   =0000001F                       #-781     (6)
UBA$V_DPR_XMTER                 =0000001E                       #-783     (6)     #-784     (6)
UBA$V_MAP_BO                    =00000019                       #-597     (4)
UBA$V_MAP_DPD                   =00000015                       #-579     (4)     #-661     (4)
UBI$C_PURCNT                    =0000000A                       #-790     (6)
UBI$L_DPR                       =00000000                         788     (6)
UBI$L_MAP                       =00000800                         543     (4)
UBI$L_SR                        =00000010                       #-800     (6)
UBI$M_SR_MRPE                   =00008000                       #-803     (6)
UBI$M_SR_NXM                    =00010000                       #-804     (6)
UBI$M_SR_UCE                    =80000000                       #-805     (6)
UBI$M_SR_UWE                    =00004000                       #-802     (6)
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UBI$V_DPR_ERROR          =0000001F                  #-796    (6)
UBI$V_DPR_PUR            =00000000                  #-789    (6)    #-793    (6)
VA$S_BYTE                =00000009                  #-446    (4)    #-634    (4)
VA$S_VPN                 =00000015                  #-455    (4)    #-491    (4)    #-493    (4)    #-709    (5)
                                                    #-711    (5)
VA$V_BYTE                =00000000                  #-446    (4)    #-634    (4)
VA$V_SYSTEM              =0000001F                  #-453    (4)
VA$V_VPN                 =00000009                  #-455    (4)    #-491    (4)    #-493    (4)    #-709    (5)
                                                    #-711    (5)
VABASE                   =00000008     692    (5)    #-707    (5)
VMB_VERSION              =0000000D     322    (3)      325    (3)

                                        +-------------------------+
                                        ! Performance indicators !
                                        +-------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    25    00:00:00.03    00:00:00.19
Command processing               926    00:00:00.32    00:00:01.01
Pass 1                           852    00:00:03.14    00:00:05.27
Symbol table sort                  0    00:00:00.44    00:00:00.43
Pass 2                            79    00:00:00.96    00:00:02.16
Symbol table output                2    00:00:00.04    00:00:00.07
Psect synopsis output              2    00:00:00.00    00:00:00.00
Cross-reference output             5    00:00:00.10    00:00:00.19
Assembler run totals            1893    00:00:05.03    00:00:09.32

The working set limit was 2900 pages.
182865 bytes (358 pages) of virtual memory were used to buffer the intermediate code.
There were 80 pages of symbol table space allocated to hold 1509 non-local and 35 local symbols.
934 source lines were read in Pass 1, producing 99 object records in Pass 2.
26 pages of virtual memory were used to define 25 macros.

                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              2
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
SYS$COMMON:[SYSLIB]LIB.MLB;2                          10
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       8
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                20

1609 GETS were required to define 20 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1)   98   RDWRTLBN - READ/WRITE LOGICAL BLOCK NUMBER
(1)   162   BOO$CACHE_INIT - INIT FILEREAD CACHE
(1)   295   BOO$IMAGE_ATT - Get image attributes from image header
(1)   341   SYS$ASSIGN, Dummy assign device system service

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element BOOTIO.MAR
0000     2 ; *3    12-MAY-1986 10:34:59 BARANSKI "Cleaning up Object Libraries."
0000     3 ; *2     7-MAY-1986 16:58:08 BARANSKI "Documentation Check."
0000     4 ; *1     6-FEB-1986 15:13:52 DS ""
0000     5 ; DEC/CMS REPLACEMENT HISTORY, Element BOOTIO.MAR
0000     6         .TITLE  BOOTIO - BOOTSTRAP FILEREAD IO MODULE
0000     7         .IDENT  "6.12-2"                                              ;G:2
0000     8 ;
0000     9 ;*****************************************************************************
0000    10 ;*                                                                           *
0000    11 ;*  COPYRIGHT (c) 1978, 1980, 1982, 1983 BY                                 * ;G:2
0000    12 ;*  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.                   *
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0000    27 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    28 ;*                                                                           *
0000    29 ;*                                                                           *
0000    30 ;*****************************************************************************
0000    31
0000    32 ;++
0000    33 ; FACILITY:     SYSTEM BOOTSTRAPPING
0000    34 ;
0000    35 ; ABSTRACT:
0000    36 ;
0000    37 ;       THIS MODULE PERFORMS LOGICAL BLOCK I/O FOR FILEREAD
0000    38 ;
0000    39 ; ENVIRONMENT:  KERNEL MODE, UNMAPPED, IPL=31
0000    40 ;
0000    41 ; AUTHOR: RICHARD I. HUSTVEDT    , CREATION DATE: 14-APR-78
0000    42 ;
0000    43 ; MODIFIED BY:
0000    44 ;
0000    45 ;       02      Bob Bergazzi    June 29,1983    Version 6.12
0000    46 ;               Adapted to run for supervisor.
0000    47 ;
0000    48 ;       V03-001 KTA0091         Kerbey T. Altmann       30-Mar-1982
0000    49 ;               Redo some entries in the file cache table.  Make the
0000    50 ;               page allocation part of BOO$CACHE_INIT a subroutine.
0000    51 ;               Divide it into two pieces.
0000    52 ;
0000    53 ;       V02-003 PHL0012         Peter H. Lipman         02-Aug-1981
0000    54 ;               Explicitly initialize the FILEREAD cache pointer.
0000    55 ;       Must not allow assembly time initialization since VMB can restart.
0000    56 ;               Fix PSECT so that VMB can overlay most of itself with
0000    57 ;       the secondary boot file.  Remove BOO$GL_RPBBASE.
```

```
                        0000     58 ;
                        0000     59 ;       V02-002 PHL0011         Peter H. Lipman         31-Jul-1981
                        0000     60 ;               The page at which the FILEREAD cache is located
                        0000     61 ;       should be relative to the RPB not absolute.
                        0000     62 ;
                        0000     63 ;       V02-001 PHL0007         Peter H. Lipman         14-Mar-1981
                        0000     64 ;               Extend parmeter list to FIL$RDWRTLBN to make it
                        0000     65 ;       possible to read more than one block at a time.  This
                        0000     66 ;       enhancement was made in conjunction with the cacheing
                        0000     67 ;       feature in FILEREAD.
                        0000     68 ;               Add new BOO$CACHE_INIT routine for VMB and SYSBOOT to
                        0000     69 ;       init the FILEREAD cache.
                        0000     70 ;               Move other common FILEREAD pieces into this module thus
                        0000     71 ;       avoiding them being in two places.
                        0000     72 ;               Add new BOO$IMAGE_ATT routine to fetch certain image
                        0000     73 ;       attributes from an image header.
                        0000     74 ;
                        0000     75 ;--
```

```
                     0000     77 ;
                     0000     78 ; INCLUDE FILES:
                     0000     79 ;
                     0000     80          $IHDDEF                                 ; IMAGE HEADER DEFINITIONS
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     81          $IHSDEF                                 ; IMAGE HEADER SYMBOL TABLE DEFS
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     82          $IHPDEF                                 ; IMAGE HEADER PATCH CONTROL DEFS
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     83          $RPBDEF                                 ; DEFINE RESTART PARAMETER BLOCK
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     84 ;
                     0000     85 ; MACROS:
                     0000     86 ;
                     0000     87 ; Define Memory Size to File Cache Parameter table entry
                     0000     88 ;
                     0000     89          .MACRO  MEM_FILE_CACHE MEM_PAGE_CNT,CACHE_PAGE_NUM,CACHE_PAGE_CNT,MAX_PAGE
                     0000     90          .LONG   MEM_PAGE_CNT-<MEM_PAGE_CNT/10>
                     0000     91          .WORD   CACHE_PAGE_NUM
                     0000     92          .WORD   <<CACHE_PAGE_CNT+3>&^C<3>>
                     0000     93          .LONG   MAX_PAGE
                     0000     94          .ENDM   MEM_FILE_CACHE
```

```
                        00000000     96          .PSECT  code, exe, nowrt, shr, long     ;                                   [02]
                            0000     97
                            0000     98          .SBTTL  RDWRTLBN - READ/WRITE LOGICAL BLOCK NUMBER
                            0000     99 ;++
                            0000    100 ; FUNCTIONAL DESCRIPTION:
                            0000    101 ;
                            0000    102 ;       THIS ROUTINE READS/WRITES N BYTES FROM/TO THE SPECIFIED
                            0000    103 ; LOGICAL BLOCK NUMBER OF THE VOLUME ASSIGNED TO THE SPECIFIED CHANNEL
                            0000    104 ;
                            0000    105 ; CALLING SEQUENCE:
                            0000    106 ;
                            0000    107 ;       CALLG   ARGLIST,FIL$RDWRITLBN
                            0000    108 ;
                            0000    109 ; INPUT PARAMETERS:
                            0000    110 ;
                            0000    111 ;       CHAN(AP)        =               ;CHANNEL ASSIGNED TO THE VOLUME TO READ
                            0000    112 ;       LBN(AP)         =               ;LOGICAL BLOCK NUMBER TO READ
                            0000    113 ;       BUFADR(AP)      =               ;ADDRESS OF BUFFER TO READ INTO
                            0000    114 ;       IOFUNC(AP)      =               ;I/O FUNCTION CODE
                            0000    115 ;       BYTCNT(AP)      =               ;NUMBER OF BYTES TO TRANSFER
                            0000    116 ;
                            0000    117 ; IMPLICIT INPUTS:
                            0000    118 ;
                            0000    119 ;       NONE
                            0000    120 ;
                            0000    121 ; OUTPUT PARAMETERS:
                            0000    122 ;
                            0000    123 ;       R0 = SYSTEM STATUS CODE
                            0000    124 ;
                            0000    125 ; IMPLICIT OUTPUTS:
                            0000    126 ;
                            0000    127 ;       NONE
                            0000    128 ;
                            0000    129 ; COMPLETION CODES:
                            0000    130 ;
                            0000    131 ;       NONE
                            0000    132 ;
                            0000    133 ; SIDE EFFECTS:
                            0000    134 ;
                            0000    135 ;       NONE
                            0000    136 ;
                            0000    137 ; EQUATED SYMBOLS:
                            0000    138 ;
                            0000    139 ;    OFFSETS FROM AP
                            0000    140 ;
                        00000004    141          CHAN            =       4       ;CHANNEL TO WHICH VOLUME IS ASSIGNED
                        00000008    142          LBN             =       8       ;LOGICAL BLOCK NUMBER
                        0000000C    143          BUFADR          =       12      ;BUFFER ADDRESS TO READ INTO
                        00000010    144          IOFUNC          =       16      ;FUNCTION CODE FOR THE QIO
                        00000014    145          BYTCNT          =       20      ;NUMBER OF BYTES TO TRANSFER
                            0000    146 ;
                            0000    147 ;--
                            0000    148
                            0000    149 FIL$RDWRTLBN::
                            0000    150          .WORD   0
                      04 AC   DD    0002    151          PUSHL   CHAN(AP)                ; ADDRESS OF RPB
                   50   6E   D0    0005    152          MOVL    (SP),R0                 ; GET ADDRESS OF RPB
```

```
                50   34 A0    D0  0008   153          MOVL    RPB$L_IOVEC(R0),R0      ; GET POINTER TO I/O ROUTINE VECTOR
                       00    DD  000C   154          PUSHL   #0                      ; SET MODE TO PHYSICAL ADDRESS
                     10 AC   DD  000E   155          PUSHL   IOFUNC(AP)              ; SET FUNCTION
                     08 AC   DD  0011   156          PUSHL   LBN(AP)                 ; LOGICAL BLOCK NUMBER
                     14 AC   DD  0014   157          PUSHL   BYTCNT(AP)              ; SET NUMBER OF BYTES
                     0C BC   DF  0017   158          PUSHAL  @BUFADR(AP)             ; SET BUFFER ADDRESS
              00 B040    06   FB  001A   159          CALLS   #6,@(R0)[R0]            ; CALL BOOTSTRAP DRIVER
                             04  001F   160          RET
```

```
0020   162          .SBTTL  BOO$CACHE_INIT - INIT FILEREAD CACHE
0020   163 ;++
0020   164 ;
0020   165 ; Functional description:
0020   166 ;
0020   167 ;       This routine establishes a desired FILEREAD cache size and
0020   168 ;       base address according to the size of memory.  It finds
0020   169 ;       good contiguous pages at or near the desired place and
0020   170 ;       calls the FIL$CACHE_INIT routine to initialize the cache.
0020   171 ;       The routine is further divided into two pieces: one to do
0020   172 ;       cache allocation, and one to do the actual mount and open.
0020   173 ;       This is necessary for VMB needs to allocate the cache long
0020   174 ;       befor it is ready to accept IO to the device.
0020   175 ;
0020   176 ; Calling Sequence:
0020   177 ;
0020   178 ;       BSBW    BOO$CACHE_INIT
0020   179 ;
0020   180 ; Inputs:
0020   181 ;
0020   182 ;       R11                         - RPB base address
0020   183 ;       RPB$L_PFNCNT(R11)           - actual number of good pages in memory
0020   184 ;       RPB$Q_PFNMAP+4(R11)         - base address of PFN bitmap
0020   185 ;
0020   186 ; Implicit inputs:
0020   187 ;
0020   188 ;       none
0020   189 ;
0020   190 ; Outputs:
0020   191 ;
0020   192 ;       R0-R4 altered
0020   193 ;       FIL$GQ_CACHE set up with size and address of cache
0020   194 ;
0020   195 ; Implicit outputs:
0020   196 ;
0020   197 ;--
0020   198 ;
0020   199 ; Table of memory sizes to file cache parameters
0020   200 ;
0020   201 ; NOTE: If this table is modified, a corresponding table in VMB around
0020   202 ;       label MEM_TAB should be checked for consitency.
0020   203 ;
0020   204 ;MEM_CACHE_TABLE:                                                    begin   [2]
0020   205 ;       MEM_FILE_CACHE 16384,2048,64,4096       ; More than 8 megabyte
0020   206 ;       MEM_FILE_CACHE  8192,1024,64,2048       ; More than 4 megabyte
0020   207 ;       MEM_FILE_CACHE  4096, 640,64,1024       ; More than 2 megabyte
0020   208 ;       MEM_FILE_CACHE  2048, 512,64, 768       ; More than 1 megabyte
0020   209 ;       MEM_FILE_CACHE  1024, 256,32, 512       ; More than 512k bytes
0020   210 ;       MEM_FILE_CACHE   512, 256,16, 256       ; More than 256k bytes
0020   211 ;       MEM_FILE_CACHE   384, 256, 8, 192       ; More than 192k bytes
0020   212 ;       MEM_FILE_CACHE   256, 128, 4, 128       ; More than 128k bytes
0020   213 ;       MEM_FILE_CACHE     0,   0, 0,   0       ;
```

```
0020    215 ;
0020    216 ; BOO$CACHE_ALLOC - The piece that does the allocation.
0020    217 ;
0020    218 ; Outputs:
0020    219 ;       FIL$GQ_CACHE filled in with size/address in blocks
0020    220 ;
0020    221 ;BOO$CACHE_ALLOC::
0020    222 ;       PUSHL   R5                              ; Save a register
0020    223 ;       CLRQ    W^FIL$GQ_CACHE                  ; Assume no cache available
0020    224 ;       MOVAL   B^MEM_CACHE_TABLE,R0            ; Adr of memory size to cache params tbl
0020    225 ;10$:   MOVQ    (R0)+,R1                        ; Get the next table entry
0020    226 ;       BEQL    20$                             ; Branch if memory too small for cache
0020    227 ;       MOVL    (R0)+,R5                        ; Max page
0020    228 ;       CMPL    RPB$L_PFNCNT(R11),R1            ; More memory than this entry?
0020    229 ;       BLSS    10$                             ; Branch if not, get next one
0020    230 ;       MOVZWL  R2,R0                           ; Starting relative bit (page) in PFNMAP
0020    231 ;       ASHL    #-16,R2,R1                      ; Count of bits (pages) to look for
0020    232 ;       ASHL    #-1,R1,R4                       ; Settle for half if can't find all
0020    233 ;       BSBB    BOO$ALLOC_PAGES                 ; Go get the pages
0020    234 ;       BLSS    20$                             ; Failed
0020    235 ;       MOVQ    R2,W^FIL$GQ_CACHE               ; Success, record the values
0020    236 ;20$:   POPL    R5                              ; Restore a register
0020    237 ;       RSB
0020    238 ;
0020    239 ;
0020    240 ; BOO$CACHE_INIT - Full routine to both allocate and open the cache
0020    241 ;
0020    242 ;BOO$CACHE_INIT::
0020    243 ;       BSBB    BOO$CACHE_ALLOC                 ; Allocate the cache
0020    244 ;                                               ; Fall thru to finish
0020    245 ;
0020    246 ;
0020    247 ; BOO$CACHE_OPEN - Actually mount the device and fill the cache
0020    248 ;
0020    249 ;BOO$CACHE_OPEN::
0020    250 ;       MOVL    W^FIL$GQ_CACHE,R2               ; Pick up size
0020    251 ;       BEQL    10$                             ; Zero length implies none
0020    252 ;       SUBL    #4,SP                           ; Location to store channel
0020    253 ;       MOVL    SP,R0                           ; Address to store channel
0020    254 ;       SUBL3   #2,R2,-(SP)                     ; Blocks in directory LBN cache
0020    255 ;       PUSHL   S^#<<1024-FIL$C_SIZE>/FIL$C_DIR_SIZE> ; No. of dir cache entries
0020    256 ;       ASHL    #9,W^FIL$GQ_CACHE+4,-(SP) ; Byte address from page number
0020    257 ;       ASHL    #9,R2,-(SP)                     ; Size of cache in bytes
0020    258 ;       CLRL    -(SP)                           ; Null device name string descriptor
0020    259 ;       PUSHL   R0                              ; Address to store channel
0020    260 ;       CALLS   #6,W^FIL$CACHE_INIT             ; Init the FIL$OPENFILE cache
0020    261 ;                                               ; descriptor returned in FIL$GQ_CACHE
0020    262 ;       ADDL    #4,SP                           ; Clean off channel
0020    263 ;10$:   RSB
0020    264
0020    265 ;
0020    266 ; BOO$ALLOC_PAGES - Find a run of contiguous, good pages
0020    267 ;
0020    268 ; Inputs:
0020    269 ;       R0 - Page to start at
0020    270 ;       R1 - Number of pages needed
0020    271 ;       R4 - Number willing to settle for
```

```
0020   272 ;       R5 - Maximum page
0020   273 ; Outputs:
0020   274 ;       CC - Status (BLSS to an error routine)
0020   275 ;       R2 - Number found
0020   276 ;       R3 - Starting page number
0020   277 ;
0020   278 ;BOO$ALLOC_PAGES::
0020   279 ;       ROTL    #<32-9>,R11,R2          ; PFN of the RPB
0020   280 ;       ADDL    R2,R0                   ; Convert relative PFN to absolute
0020   281 ;       MOVL    R0,R3                   ; Make a copy of starting bit
0020   282 ;30$:   CMPL    R5,R0                   ; Less than max page
0020   283 ;       BLSS    50$                     ; No, failure
0020   284 ;       BBS     R0,@RPB$Q_PFNMAP+4(R11),40$ ; Branch if this is a good page
0020   285 ;       SUBL3   R3,R0,R2                ; Count of bits (pages) found
0020   286 ;       CMPL    R2,R4                   ; Found enough?
0020   287 ;       BGEQ    50$                     ; Branch if yes
0020   288 ;       ADDL3   #1,R0,R3                ; No, reset starting base
0020   289 ;40$:   INCL    R0                      ; Next bit (page)
0020   290 ;       SOBGTR  R1,30$                  ; Branch if more to check
0020   291 ;       SUBL3   R3,R0,R2                ; Count of bits (pages) found
0020   292 ;       CMPL    R2,R4                   ; Found enough?
0020   293 ;50$:   RSB                             ; Return (Status in CC)        end     [2]
```

```
                     0020   295          .SBTTL  BOO$IMAGE_ATT - Get image attributes from image header
                     0020   296 ;++
                     0020   297 ; Functional Description:
                     0020   298 ;
                     0020   299 ;       BOO$IMAGE_ATT returns to the caller some attributes of the image
                     0020   300 ;
                     0020   301 ; Calling Sequence:
                     0020   302 ;
                     0020   303 ;       BSBW    BOO$IMAGE_ATT
                     0020   304 ;
                     0020   305 ; Inputs:
                     0020   306 ;
                     0020   307 ;       R2 = Size of file in blocks
                     0020   308 ;       R3 = Address of image header block (first one only)
                     0020   309 ;
                     0020   310 ; Outputs:
                     0020   311 ;
                     0020   312 ;       R1 = Number of image header blocks at the front of the image
                     0020   313 ;       R2 = Size of image in blocks excluding the blocks at the end
                     0020   314 ;            containing local symbols, global symbols, or patch text
                     0020   315 ;
                     0020   316 ;--
                     0020   317
                     0020   318 BOO$IMAGE_ATT::
          50   04 A3   3C   0020   319          MOVZWL  IHD$W_SYMDBGOFF(R3),R0  ; ANY SYMBOL TABLE INFORMATION?
                 0D   13   0024   320          BEQL    20$                     ; BRANCH IF NOT
           51   6043   9E   0026   321          MOVAB   IHS$L_DSTVBN(R0)[R3],R1 ; ADR OF 1ST VBN IN DEBUG SYMBOL TABLE
                 19   10   002A   322          BSBB    40$                     ; PROCESS IT
        51   04 A043   9E   002C   323          MOVAB   IHS$L_GSTVBN(R0)[R3],R1 ; ADR OF 1ST VBN IN GLOBAL SYMBOL TABLE
                 12   10   0031   324          BSBB    40$                     ; PROCESS IT
          50   08 A3   3C   0033   325 20$:     MOVZWL  IHD$W_PATCHOFF(R3),R0   ; ANY PATCH CONTROL INFORMATION?
                 07   13   0037   326          BEQL    30$                     ; BRANCH IF NOT
        51   20 A043   9E   0039   327          MOVAB   IHP$L_PATCOMTXT(R0)[R3],R1 ; ADR OF 1ST VBN OF PATCH COMMAND TEXT
                 05   10   003E   328          BSBB    40$                     ; PROCESS IT
          51   10 A3   9A   0040   329 30$:     MOVZBL  IHD$B_HDRBLKCNT(R3),R1  ; GET IMAGE HEADER BLOCK COUNT
                 05   0044   330          RSB
                      0045   331 ;
                      0045   332 ; SEE IF VBN IS NON ZERO AND THEN IF IT IS SMALLER THAN THE CURRENT SMALLEST
                      0045   333 ;
        51   61   01   C3   0045   334 40$:     SUBL3   #1,(R1),R1              ; FETCH VBN - 1
                 08   19   0049   335          BLSS    50$                     ; BRANCH IF NO VBN IS PRESENT
             51   52   D1   004B   336          CMPL    R2,R1                   ; IS IT SMALLER THAN THE CURRENT ONE
                 03   15   004E   337          BLEQ    50$                     ; BRANCH IF NOT
             52   51   D0   0050   338          MOVL    R1,R2                   ; YES, USE IT
                       05   0053   339 50$:     RSB
```

```
0054   341          .SBTTL  SYS$ASSIGN, Dummy assign device system service
0054   342
0054   343 ;++
0054   344 ;
0054   345 ; Functional description:
0054   346 ;
0054   347 ;       SYS$ASSIGN is a dummy routine to satisfy the requirements of
0054   348 ;       FIL$OPENFILE.
0054   349 ;
0054   350 ; Inputs:
0054   351 ;
0054   352 ;       CHAN(AP)        - address at which to return channel
0054   353 ;
0054   354 ; Implicit inputs:
0054   355 ;
0054   356 ;       The label BOO$GL_RPBBASE contains the physical address of the RPB.
0054   357 ;
0054   358 ; Outputs:
0054   359 ;
0054   360 ;       R0      - success status code
0054   361 ;
0054   362 ; Implicit outputs:
0054   363 ;
0054   364 ;       The channel returned is not a channel. It is instead the base
0054   365 ;       address of the RPB.
0054   366 ;
0054   367 ;--
0054   368 ;                                                                    begin   [2]
0054   369 ;CHAN    = 8
0054   370 ;
0054   371 ;SYS$ASSIGN::                                  ; Dummy system service.
0054   372 ;       .WORD   0
0054   373 ;
0054   374 ;       MOVL    W^BOO$GL_RPBBASE,@CHAN(AP) ; Store RPB address as channel.
0054   375 ;       MOVL    S^#SS$_NORMAL,R0            ; Return success status.
0054   376 ;       RET                                 ; Return to caller.
0054   377 ;       .PAGE
0054   378 ;       .SBTTL  Common Globals for VMB and SYSBOOT
0054   379 ;
0054   380 ; The following globals are common to VMB and SYSBOOT and are
0054   381 ; defined here to avoid replicate definitions.
0054   382 ;
0054   383 ;FIL$GT_DDSTRING::                            ; Default directory string.
0054   384 ;       .ASCIC  /[SYSEXE]/
0054   385 ;FIL$GT_DDDEV::                               ; Default device name
0054   386 ;       .BYTE   0                           ; Null ASCIC string
0054   387
0054   388          .END
```

```
BOO$IMAGE_ATT                     00000020 RG D  02
BUFADR                          = 0000000C     D
BYTCNT                          = 00000014     D
CHAN                            = 00000004     D
FIL$RDWRTLBN                      00000000 RG D  02
IHD$B_HDRBLKCNT                 = 00000010     D
IHD$W_PATCHOFF                  = 00000008     D
IHD$W_SYMDBGOFF                 = 00000004     D
IHP$L_PATCOMTXT                 = 00000020     D
IHS$L_DSTVBN                    = 00000000     D
IHS$L_GSTVBN                    = 00000004     D
IOFUNC                          = 00000010     D
LBN                             = 00000008     D
RPB$L_IOVEC                     = 00000034     D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	00000000 (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
CODE	00000054 (84.)	02 (2.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
BOO$IMAGE_ATT	00000020-R	318 (1)	
BUFADR	=0000000C	143 (1)	158 (1)
BYTCNT	=00000014	145 (1)	#-157 (1)
CHAN	=00000004	141 (1)	#-151 (1)
FIL$RDWRTLBN	00000000-R	149 (1)	
IHD$B_HDRBLKCNT	=00000010		#-329 (1)
IHD$W_PATCHOFF	=00000008		#-325 (1)
IHD$W_SYMDBGOFF	=00000004		#-319 (1)
IHP$L_PATCOMTXT	=00000020		327 (1)
IHS$L_DSTVBN	=00000000		321 (1)
IHS$L_GSTVBN	=00000004		323 (1)
IOFUNC	=00000010	144 (1)	#-155 (1)
LBN	=00000008	142 (1)	#-156 (1)
RPB$L_IOVEC	=00000034		#-153 (1)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	26	00:00:00.03	00:00:00.36
Command processing	929	00:00:00.28	00:00:00.89
Pass 1	362	00:00:00.56	00:00:01.41
Symbol table sort	0	00:00:00.03	00:00:00.04
Pass 2	26	00:00:00.19	00:00:00.45
Symbol table output	2	00:00:00.00	00:00:00.00
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	4	00:00:00.01	00:00:00.01
Assembler run totals	1353	00:00:01.11	00:00:03.17

The working set limit was 1900 pages.
26769 bytes (53 pages) of virtual memory were used to buffer the intermediate code.
There were 20 pages of symbol table space allocated to hold 197 non-local and 4 local symbols.
388 source lines were read in Pass 1, producing 24 object records in Pass 2.
12 pages of virtual memory were used to define 11 macros.

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                       Macros defined
------------------                       --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1             0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1           0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1          0
SYS$COMMON:[SYSLIB]LIB.MLB;2                        4
SYS$COMMON:[SYSLIB]STARLET.MLB;2                    3
SYS$COMMON:[SYSLIB]STARLET.MLB;2                    0
TOTALS (all libraries)                              7

261 GETS were required to define 7 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 72 GET ONE BYTE OF DATA FROM USER BUFFER
(1) 108 PUT ONE BYTE OF DATA INTO USER'S BUFFER
(1) 142 INITIALIZE FOR SINGLE BYTE TRANSFERS
(1) 164 MOVE FROM USER BUFFER
(1) 197 MOVE TO USER BUFFER
(1) 230 FILL SYSTEM PTE WITH TRANSFER PTE

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element BUFCTL.MAR
0000     2 ; *3    12-MAY-1986 10:40:47 BARANSKI "Cleaning up Object Libraries."
0000     3 ; *2     7-MAY-1986 17:12:04 BARANSKI "Documentation Check."
0000     4 ; *1     6-FEB-1986 15:13:55 DS ""
0000     5 ; DEC/CMS REPLACEMENT HISTORY, Element BUFCTL.MAR
0000     6         .TITLE  BUFCTL  *** BUFCTL QIO buffer control
0000     7         .IDENT  "5.4-3"                                                ;G:2
0000     8
0000     9 ;
0000    10 ;******************************************************************************
0000    11 ;*                                                                            *
0000    12 ;*  COPYRIGHT (c) 1977, 1978, 1979, 1980                                      *
0000    13 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                          *
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0000    23 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT   *
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0000    26 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS    *
0000    27 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                   *
0000    28 ;*                                                                            *
0000    29 ;******************************************************************************
0000    30 ;
0000    31 ; D. N. CUTLER 9-AUG-76
0000    32 ;
0000    33 ; MODIFIED BY:
0000    34 ;
0000    35 ;                   NICK HOWGATE    28-MAR-78       VERSION 02 (ESSAA-4.01).
0000    36 ;       01          INCLUDED IN DIAGNOSTIC SUPERVISOR FOR QIO SUPPORT
0000    37 ;                                                                          ;G:2
0000    38 ;       02          CAM001          C. MONIA                  15-FEB-1979 ;G:2
0000    39 ;                   ADD IOC$PUTBYTE AND IOC$GETBYTE ROUTINES FOR TU-58 SUPPORT ;G:2
0000    40 ;                                                                          ;G:2
0000    41 ;                   Roger Riggs     9 April 1979    Version 5.0
0000    42 ;       02          Changed MOVFRUSER and MOVTOUSER not to use SVPN,
0000    43 ;                   instead just address it directly.
0000    44 ;                                                                          ;G:2
0000    45 ;       03          STJ0001         S. JEFFREYS               26-SEP-1979 ;G:2
0000    46 ;                   MODIFY IOC$PUTBYTE AND IOC$GETBYTE TO WORK CORRECTLY FOR   ;G:2
0000    47 ;                   BUFFERS THAT ARE PAGE ALIGNED.                         ;G:2
0000    48 ;                                                                          ;G:2
0000    49 ;       04          STJ0002         S. JEFFREYS               29-FEB-1980
0000    50 ;                   ADD ALTERNATE ENTRY POINTS FOR IOC$MOVTOUSER AND IOC$MOVFRUSER. ;G:2
0000    51 ;
0000    52 ;                   Dave Butenhof   13-may-1980, Version 5.4              ;G:2
0000    53 ;       03          Upgrade to VMS V2.0 level: add routines IOC$GETBYTE and ;G:2
0000    54 ;                   IOC$PUTBYTE, dummy IOC$INITBUFWIND and IOC$FILSPT for   ;G:2
0000    55 ;                   code centralization, and extra entry points to          ;G:2
0000    56 ;                   IOC$MOVTOUSER and IOC$MOVFRUSER.                        ;G:2
0000    57 ;
```

```
                        0000     58 ;
                        0000     59 ; I/O BUFFER CONTROL ROUTINES
                        0000     60 ;
                        0000     61 ; MACRO LIBRARY CALLS
                        0000     62 ;
                        0000     63
                        0000     64          $PRDEF                              ;DEFINE PROCESSOR REGISTERS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .RESTORE
                        0000     65          $PTEDEF                             ;PAGE TABLE ENTRY DEFINITIONS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .RESTORE
                        0000     66          $UCBDEF                             ;DEFINE UCB OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                        0000                 .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
                        0000                         .BLKL   1
                        0004                 .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                        0004                 .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
                        0004                         .BLKL   1
                        0008                 .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
                        0008                         .BLKW   1
                        000A                 .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
                        000A                         .BLKB   1
                        000B                 .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
                        000B                         .BLKB   1
                        000C                 .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                        000C                 .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                        000C                 .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
                        000C                         .BLKB   1
                        000D                         .BLKB   3
                        0010                 .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                        0010                 .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
                        0010                         .BLKL   1
                        0014                 .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                        0014                 .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                        0014                 .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
                        0014                         .BLKW   1
                        0016                 .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
                        0016                         .BLKW   1
                        0018                 .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                        0018                 .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
                        0018                         .BLKW   1
                        001A                 .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                        001A                 .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
                        001A                         .BLKW   1
                        001C                 .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
                        001C                         .BLKL   1
                        0020                 .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
                        0020                         .BLKL   1
                        0024                 .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
                        0024                         .BLKL   1
                        0028                 .IIF    NB,UCB$L_PID,   UCB$L_PID:
                        0028                         .BLKL   1
                        002C                 .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
                        002C                         .BLKL   1
                        0030                 .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
```

```
                00000034  0030                    .BLKL   1
                          0034          .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
                00000038  0034                    .BLKL   1
                          0038          .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
                00000039  0038                    .BLKB   1
                          0039          .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
                0000003A  0039                    .BLKB   1
                          003A          .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
                0000003C  003A                    .BLKW   1
                          003C          .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
                          003C          .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
                          003C          .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
                0000003D  003C                    .BLKB   1
                          003D          .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
                          003D          .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
                0000003E  003D                    .BLKB   1
                          003E          .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
                          003E          .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
                0000003F  003E                    .BLKB   1
                          003F          .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
                00000040  003F                    .BLKB   1
                          0040          .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
                00000044  0040                    .BLKL   1
                          0044          .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
                00000048  0044                    .BLKL   1
                          0048          .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
                0000004A  0048                    .BLKW   1
                          004A          .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
                          004A          .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
                0000004B  004A                    .BLKB   1
                          004B          .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
                0000004C  004B                    .BLKB   1
                          004C          .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
                00000050  004C                    .BLKL   1
                          0050          .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
                00000052  0050                    .BLKW   1
                          0052          .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
                          0052          .IIF    NB,UCB$B_STATE, UCB$B_STATE:
                00000053  0052                    .BLKB   1
                          0053          .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
                00000054  0053                    .BLKB   1
                          0054          .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
                00000058  0054                    .BLKL   1
                          0058          .IIF    NB,UCB$W_STS,   UCB$W_STS:
                0000005A  0058                    .BLKW   1
                          005A          .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
                0000005C  005A                    .BLKW   1
                          005C          .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
                          005C          .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
                00000060  005C                    .BLKL   1
                          0060          .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
                00000064  0060                    .BLKL   1
                          0064          .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
                          0064          .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
                00000068  0064                    .BLKL   1
                          0068          .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
                0000006C  0068                    .BLKL   1
```

```
                     006C                .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
0000006E             006C                        .BLKW   1
                     006E                .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
00000070             006E                        .BLKW   1
                     0070                .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
00000071             0070                        .BLKB   1
                     0071                .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
00000072             0071                        .BLKB   1
                     0072                .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074             0072                        .BLKW   1
                     0074                .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
                     0074                .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000             0074                . = 0
                     0000                .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002             0000                        .BLKW   1
00000074             0002                . = 116
                     0074                .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078             0074                        .BLKL   1
                     0078                .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C             0078                        .BLKL   1
                     007C                .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080             007C                        .BLKL   1
                     0080                .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084             0080                        .BLKL   1
                     0084                .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088             0084                        .BLKL   1
                     0088                .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C             0088                        .BLKL   1
                     008C                .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090             008C                        .BLKL   1
                     0090                .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
                     0090                .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074             0090                . = 116
                     0074                .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075             0074                        .BLKB   1
                     0075                .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076             0075                        .BLKB   1
                     0076                .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077             0076                        .BLKB   1
                     0077                .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078             0077                        .BLKB   1
                     0078                .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C             0078                        .BLKL   1
0000007E             007C                        .BLKW   1
                     007E                .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080             007E                        .BLKW   1
                     0080                .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084             0080                        .BLKL   1
00000080             0084                . = 128
00000084             0080                        .BLKL   1
                     0084                .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088             0084                        .BLKL   1
                     0088                .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A             0088                        .BLKW   1
                     008A                .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C             008A                        .BLKW   1
                     008C                .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
```

```
                        008C            .IIF    NB,UCB$W_DA,    UCB$W_DA:
                0000008E  008C                  .BLKW   1
                        008E            .IIF    NB,UCB$W_DC,    UCB$W_DC:
                00000090  008E                  .BLKW   1
                        0090            .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
                00000092  0090                  .BLKW   1
                        0092            .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
                00000094  0092                  .BLKW   1
                        0094            .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
                00000095  0094                  .BLKB   1
                        0095            .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
                00000096  0095                  .BLKB   1
                        0096            .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
                00000098  0096                  .BLKW   1
                00000096  0098          . = 150
                00000098  0096                  .BLKW   1
                        0098            .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
                0000009C  0098                  .BLKL   1
                        009C            .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
                000000A0  009C                  .BLKL   1
                        00A0            .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
                000000A4  00A0                  .BLKL   1
                        00A4            .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
                000000A6  00A4                  .BLKW   1
                        00A6            .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
                000000A7  00A6                  .BLKB   1
                000000A8  00A7                  .BLKB   1
                00000074  00A8          . = 116
                00000078  0074                  .BLKL   1
                0000007C  0078                  .BLKL   1
                00000080  007C                  .BLKL   1
                00000084  0080                  .BLKL   1
                00000088  0084                  .BLKL   1
                0000008C  0088                  .BLKL   1
                        008C            .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
                00000090  008C                  .BLKL   1
                00000094  0090                  .BLKL   1
                00000098  0094                  .BLKL   1
                0000009C  0098                  .BLKL   1
                        009C            .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
                0000009D  009C                  .BLKB   1
                        009D            .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
                0000009E  009D                  .BLKB   1
                        009E            .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
                0000009F  009E                  .BLKB   1
                000000A0  009F                  .BLKB   1
                        00A0            .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
                000000A1  00A0                  .BLKB   1
                        00A1            .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
                000000A2  00A1                  .BLKB   1
                        00A2            .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
                000000A3  00A2                  .BLKB   1
                000000A4  00A3                  .BLKB   1
                        00A4            .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
                000000A5  00A4                  .BLKB   1
                        00A5            .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
                000000A7  00A5                  .BLKW   1
```

```
000000A8  00A7                                  .BLKB   1
          00A8                  .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
000000AC  00A8                                  .BLKL   1
000000B0  00AC                                  .BLKL   1
000000B4  00B0                                  .BLKL   1
000000B8  00B4                                  .BLKL   1
          00B8                  .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
000000BC  00B8                                  .BLKL   1
          00BC                  .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
          00BC                  .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
00000074  00BC                  . = 116
          0074                  .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
00000078  0074                                  .BLKL   1
          0078                  .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
0000007C  0078                                  .BLKL   1
          007C                  .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
0000007E  007C                                  .BLKW   1
00000080  007E                                  .BLKW   1
          0000                  .RESTORE
          0000    67 ;
          0000    68 ; OWN STORAGE
          0000    69 ;
      00000000    70            .PSECT  SEP,    SHR,    EXE,    WRT,    LONG
```

```
                     0000     72          .SBTTL  GET ONE BYTE OF DATA FROM USER BUFFER
                     0000     73 ;+
                     0000     74 ; IOC$GETBYTE - GET ONE BYTE OF DATA FROM USER'S BUFFER
                     0000     75 ;
                     0000     76 ; THIS ROUTINE IS CALLED BY AN I/O DRIVER TO GET A SINGLE BYTE  FROM THE
                     0000     77 ; USER'S BUFFER.
                     0000     78 ;
                     0000     79 ; PRIOR TO CALLING THIS ROUTINE, A CALL TO IOC$INITBUFWIND MUST BE MADE TO
                     0000     80 ; MAP THE SYSTEM PAGE TABLE ENTRY INTO THE USER'S BUFFER
                     0000     81 ;
                     0000     82 ; INPUTS:
                     0000     83 ;
                     0000     84 ;       R0 = SYSTEM VIRTUAL ADDRESS OF ONE-PAGE WINDOW INTO USER'S BUFFER.
                     0000     85 ;       R5 = ADDRESS OF UCB.
                     0000     86 ;
                     0000     87 ; OUTPUTS:
                     0000     88 ;
                     0000     89 ;       R0 = UPDATED SYSTEM VIRTUAL ADDRESS
                     0000     90 ;       R1 = ONE BYTE OF DATA (ZERO EXTENDED)
                     0000     91 ;
                     0000     92 ;       UCB$L_SVAPTE IS UPDATED WHENEVER A PAGE BOUNDARY IS CROSSED
                     0000     93 ;
                     0000     94 ; THE DRIVER IS EXPECTED TO SAVE THE VALUE OF R0 FOR SUBSEQUENT CALLS.
                     0000     95 ;
                     0000     96 ;-
                     0000     97
                     0000     98
                     0000     99
                     0000    100 IOC$GETBYTE::                                   ;
     51   80   90   0000    101          MOVB    (R0)+,R1                       ;GET BYTE FROM USER'S BUFFER
50   01FF 8F   B3   0003    102          BITW    #^X01FF,R0                     ;OVERFLOW PAGE BOUNDARY?
          06   12   0008    103          BNEQ    10$                            ;IF NEQ NO
  68 A5   04   C0   000A    104          ADDL    #4,UCB$L_SVAPTE(R5)            ;UPDATE ADDRESS OF PROCESS PTE
          49   10   000E    105          BSBB    IOC$FILSPT                     ;FILL SPT, COMPUTE SYSTEM ADDRESS OF PAGE
               05   0010    106 10$:     RSB                                    ;RETURN
```

```
                     0011   108          .SBTTL  PUT ONE BYTE OF DATA INTO USER'S BUFFER
                     0011   109 ;+
                     0011   110 ; IOC$PUTBYTE - PUT ONE BYTE OF DATA IN USER'S BUFFER
                     0011   111 ;
                     0011   112 ; THIS ROUTINE IS CALLED BY AN I/O DRIVER TO PUT A SINGLE BYTE OF DATA
                     0011   113 ; INTO THE USER'S BUFFER.
                     0011   114 ;
                     0011   115 ; PRIOR TO CALLING THIS ROUTINE, A CALL TO IOC$INITBUFWIND MUST BE MADE TO
                     0011   116 ; MAP THE SYSTEM PAGE TABLE ENTRY INTO THE USER'S BUFFER.
                     0011   117 ;
                     0011   118 ; INPUTS:
                     0011   119 ;
                     0011   120 ;       R0 = SYSTEM VIRTUAL ADDRESS OF ONE-PAGE WINDOW INTO USER'S BUFFER
                     0011   121 ;       R1 LOW BYTE = DATA TO BE TRANSFERRED TO USER
                     0011   122 ;       R5 = ADDRESS OF UCB
                     0011   123 ;
                     0011   124 ; OUTPUTS:
                     0011   125 ;
                     0011   126 ;       R0 = UPDATED SYSTEM VIRTUAL ADDRESS OF BUFFER WINDOW
                     0011   127 ;
                     0011   128 ;       UCB$L_SVAPTE IS UPDATED WHENEVER A PAGE BOUNDARY IS CROSSED
                     0011   129 ;
                     0011   130 ; THE DRIVER IS EXPECTED TO SAVE THE VALUE OF R0 FOR SUBSEQUENT CALLS.
                     0011   131 ;
                     0011   132 ;-
                     0011   133
                     0011   134 IOC$PUTBYTE::                                ;
     80    51    90  0011   135          MOVB    R1,(R0)+                    ;PUT BYTE INTO USERS'S BUFFER
50   01FF  8F    B3  0014   136          BITW    #^X01FF,R0                  ;OVERFLOW PAGE BOUNDARY?
           06    12  0019   137          BNEQ    10$                         ;IF NEQ NO
  68 A5    04    C0  001B   138          ADDL    #4,UCB$L_SVAPTE(R5)         ;UPDATE ADDRESS OF PROCESS PTE
           38    10  001F   139          BSBB    IOC$FILSPT                  ;FILL SPT, COMPUTE SYSTEM ADDRESS OF PAGE
                 05  0021   140 10$:     RSB                                 ;RETURN
```

```
                     0022   142          .SBTTL  INITIALIZE FOR SINGLE BYTE TRANSFERS
                     0022   143 ;+
                     0022   144 ; IOC$INITBUFWIND - INITIALIZE ONE-PAGE WINDOW INTO USER'S BUFFER
                     0022   145 ;
                     0022   146 ; THIS ROUTINE MUST BE CALLED BY A DRIVER TO SETUP THE INITIAL ONE-
                     0022   147 ; PAGE WINDOW INTO A USER'S BUFFER BEFORE CALLING IOC$GETBYTE OR
                     0022   148 ; IOC$PUTBYTE.
                     0022   149 ;
                     0022   150 ; INPUTS:
                     0022   151 ;
                     0022   152 ;       R5 = ADDRESS OF UCB
                     0022   153 ;
                     0022   154 ; OUTPUTS:
                     0022   155 ;
                     0022   156 ;       R0 = SYSTEM VIRTUAL ADDRESS OF WINDOW INTO USER'S BUFFER
                     0022   157 ;-
                     0022   158
                     0022   159 IOC$INITBUFWIND::                                ;
          35   10    0022   160          BSBB    IOC$FILSPT                      ;FILL SPT, COMPUTE VIRTUAL ADDRESS OF PAGE
    50    6C A5     0024   161          BISW    UCB$W_BOFF(R5),R0               ;MERGE BYTE OFFSET INTO ADDRESS
          05        0028   162          RSB                                     ;
```

```
                                0029   164          .SBTTL  MOVE FROM USER BUFFER
                                0029   165 ;+
                                0029   166 ; IOC$MOVFRUSER - MOVE FROM USER BUFFER
                                0029   167 ;
                                0029   168 ; THIS ROUTINE IS CALLED BY AN I/O DRIVER TO MOVE A STRING FROM A USER
                                0029   169 ; BUFFER TO AN INTERNAL BUFFER.
                                0029   170 ;
                                0029   171 ; INPUTS:
                                0029   172 ;
                                0029   173 ;       R1 = ADDRESS OF INTERNAL BUFFER.
                                0029   174 ;       R2 = NUMBER OF BYTES TO BE MOVED.
                                0029   175 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                                0029   176 ;
                                0029   177 ; OUTPUTS:
                                0029   178 ;
                                0029   179 ;       ***TBS***
                                0029   180 ;-
                                0029   181
                                0029   182          .ENABLE LSB
                                0029   183 IOC$MOVFRUSER::                          ;MOVE FROM USER BUFFER
                      F7   10   0029   184          BSBB    IOC$INITBUFWIND        ;SETUP WINDOW INTO BUFFER
                      0D   11   002B   185          BRB     20$                    ;
                                002D   186 IOC$MOVFRUSER2::
                50    01FF 8F   B3   002D   187 10$:    BITW    #^X01FF,R0             ;OVERFLOW PAGE BOUNDRY?
                            06   12   0032   188          BNEQ    20$                    ;IF NEQ NO
                  68 A5     04   C0   0034   189          ADDL    #4,UCB$L_SVAPTE(R5)    ;UPDATE ADDRESS OF USER PTE
                            1F   10   0038   190          BSBB    IOC$FILSPT             ;FILL SYSTEM PTE WITH PROPER RELOCATION
                                003A   191 IOC$MOVFRUSER1::
                81    80    90   003A   192 20$:    MOVB    (R0)+,(R1)+            ;MOVE BYTE TO INTERNAL BUFFER
                  ED  52    F5   003D   193          SOBGTR  R2,10$                 ;ANY MORE BYTES TO MOVE?
                            05   0040   194          RSB                            ;
                                0041   195          .DSABL  LSB
```

```
                        0041   197          .SBTTL  MOVE TO USER BUFFER
                        0041   198 ;+
                        0041   199 ; IOC$MOVTOUSER - MOVE TO USER BUFFER
                        0041   200 ;
                        0041   201 ; THIS ROUTINE IS CALLED BY AN I/O DRIVER TO MOVE A STRING FROM AN INTERNAL
                        0041   202 ; BUFFER TO A USER BUFFER.
                        0041   203 ;
                        0041   204 ; INPUTS:
                        0041   205 ;
                        0041   206 ;       R1 = ADDRESS OF INTERNAL BUFFER.
                        0041   207 ;       R2 = NUMBER OF BYTES TO BE MOVED.
                        0041   208 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                        0041   209 ;
                        0041   210 ; OUTPUTS:
                        0041   211 ;
                        0041   212 ; ***TBS***
                        0041   213 ;-
                        0041   214
                        0041   215          .ENABLE LSB
                        0041   216 IOC$MOVTOUSER::                              ;MOVE TO USER BUFFER
            DF   10     0041   217          BSBB    IOC$INITBUFWIND             ;INITIALIZE WINDOW INTO BUFFER
            0D   11     0043   218          BRB     20$                         ;
                        0045   219 IOC$MOVTOUSER2::
      50    01FF 8F     B3     0045   220 10$:    BITW    #^X01FF,R0              ;OVERFLOW PAGE BOUNDRY?
                  06    12     004A   221          BNEQ    20$                 ;IF NEQ NO
        68 A5     04    C0     004C   222          ADDL    #4,UCB$L_SVAPTE(R5) ;UPDATE ADDRESS OF USER PTE
                  07    10     0050   223          BSBB    IOC$FILSPT          ;FILL SYSTEM PTE WITH PROPER RELOCATION
                        0052   224 IOC$MOVTOUSER1::
            80    81    90     0052   225 20$:    MOVB    (R1)+,(R0)+             ;MOVE BYTE TO USER BUFFER
              ED  52    F5     0055   226          SOBGTR  R2,10$               ;ANY MORE BYTES TO MOVE?
                  05    0058   227          RSB                                 ;
                        0059   228          .DSABL  LSB
```

```
                                0059   230          .SBTTL  FILL SYSTEM PTE WITH TRANSFER PTE
                                0059   231 ;+
                                0059   232 ; IOC$FILSPT - FILL SYSTEM PTE WITH TRANSFER PTE
                                0059   233 ;
                                0059   234 ; This routine extracts the PFN from current PTE and creates a virtual
                                0059   235 ; address from it.
                                0059   236 ;
                                0059   237 ; INPUTS:
                                0059   238 ;
                                0059   239 ;       R5 = DEVICE UNIT UCB ADDRESS.
                                0059   240 ;
                                0059   241 ; OUTPUTS:
                                0059   242 ;
                                0059   243 ;       R0 = SYSTEM VIRTUAL ADDRESS OF START OF PAGE CONTAINING THE BUFFER.
                                0059   244 ;
                                0059   245 ;       REGISTERS R1, R2, AND R3 ARE PRESERVED ACROSS CALL.
                                0059   246 ;-
                                0059   247
                                0059   248 IOC$FILSPT::                                ;FILL SYSTEM PTE WITH TRANSFER PTE
     50   68 B5   15   00   EF  0059   249          EXTZV   #PTE$V_PFN, #PTE$S_PFN, -
                                005F   250                  @UCB$L_SVAPTE(R5), R0     ; Get PFN of user buffer
          50   50   09   78   005F   251          ASHL    #9, R0, R0                    ; Re-make virtual address
                              05   0063   252          RSB                           ;
                                0064   253
                                0064   254          .END
```

IOC$FILSPT	00000059	RG	D	02	UCB$L_DPC	00000080	D	UCB$W_FUNC	0000007E	D	
IOC$GETBYTE	00000000	RG	D	02	UCB$L_DUETIM	0000005C	D	UCB$W_MB_SEED	00000000	D	
IOC$INITBUFWIND	00000022	RG	D	02	UCB$L_DX_BFPNT	0000009C	D	UCB$W_MSGCNT	00000016	D	
IOC$MOVFRUSER	00000029	RG	D	02	UCB$L_DX_BUF	00000098	D	UCB$W_MSGMAX	00000014	D	
IOC$MOVFRUSER1	0000003A	RG	D	02	UCB$L_DX_RXDB	000000A0	D	UCB$W_NT_CHAN	0000007C	D	
IOC$MOVFRUSER2	0000002D	RG	D	02	UCB$L_EMB	00000078	D	UCB$W_OFFSET	0000008A	D	
IOC$MOVTOUSER	00000041	RG	D	02	UCB$L_FIRST	00000014	D	UCB$W_REFC	00000050	D	
IOC$MOVTOUSER1	00000052	RG	D	02	UCB$L_FPC	0000000C	D	UCB$W_SIZE	00000008	D	
IOC$MOVTOUSER2	00000045	RG	D	02	UCB$L_FQBL	00000004	D	UCB$W_SRCADDR	0000001A	D	
IOC$PUTBYTE	00000011	RG	D	02	UCB$L_FQFL	00000000	D	UCB$W_STS	00000058	D	
PTE$S_PFN	= 00000015		D		UCB$L_FR3	00000010	D	UCB$W_TT_DESIZE	000000A5	D	
PTE$V_PFN	= 00000000		D		UCB$L_FR4	00000014	D	UCB$W_UNIT	00000048	D	
SIZ...	= 00000002		D		UCB$L_IOQBL	00000044	D	UCB$W_VPROT	0000001A	D	
UCB$B_AMOD	00000053		D		UCB$L_IOQFL	00000040	D				
UCB$B_CEX	00000077		D		UCB$L_IRP	0000004C	D				
UCB$B_CM1	0000004A		D		UCB$L_LINK	0000002C	D				
UCB$B_CM2	0000004B		D		UCB$L_LOGADR	00000064	D				
UCB$B_DEVCLASS	00000038		D		UCB$L_MAXBLOCK	00000084	D				
UCB$B_DEVTYPE	00000039		D		UCB$L_MB_MBX	0000007C	D				
UCB$B_DIPL	00000052		D		UCB$L_MB_PORT	0000008C	D				
UCB$B_DX_SCTCNT	000000A6		D		UCB$L_MB_RAST	00000078	D				
UCB$B_ERTCNT	00000070		D		UCB$L_MB_SHB	00000080	D				
UCB$B_ERTMAX	00000071		D		UCB$L_MB_WAST	00000074	D				
UCB$B_FEX	00000076		D		UCB$L_MB_WIOQBL	00000088	D				
UCB$B_FIPL	0000000B		D		UCB$L_MB_WIOQFL	00000084	D				
UCB$B_LOCSRV	0000003C		D		UCB$L_MEDIA	0000008C	D				
UCB$B_OFFNDX	00000094		D		UCB$L_NT_DATSSB	00000074	D				
UCB$B_OFFRTC	00000095		D		UCB$L_NT_INTSSB	00000078	D				
UCB$B_REMSRV	0000003D		D		UCB$L_OPCNT	00000060	D				
UCB$B_SECTORS	0000003C		D		UCB$L_OWNUIC	0000001C	D				
UCB$B_SLAVE	00000074		D		UCB$L_PID	00000028	D				
UCB$B_SPR	00000075		D		UCB$L_RQBL	00000004	D				
UCB$B_STATE	00000052		D		UCB$L_RQFL	00000000	D				
UCB$B_TRACKS	0000003D		D		UCB$L_SVAPTE	00000068	D				
UCB$B_TT_CRFILL	0000009D		D		UCB$L_SVPN	00000064	D				
UCB$B_TT_DECRF	000000A1		D		UCB$L_TT_DECHAR	000000A8	D				
UCB$B_TT_DELFF	000000A2		D		UCB$L_TT_RDUE	0000008C	D				
UCB$B_TT_DESPEE	000000A0		D		UCB$L_TT_RTIMOU	000000B8	D				
UCB$B_TT_DETYPE	000000A4		D		UCB$L_VCB	00000030	D				
UCB$B_TT_LFFILL	0000009E		D		UCB$T_PARTNER	0000000C	D				
UCB$B_TT_SPEED	0000009C		D		UCB$W_BCNT	0000006E	D				
UCB$B_TYPE	0000000A		D		UCB$W_BCR	00000096	D				
UCB$B_VERTSZ	0000003F		D		UCB$W_BOFF	0000006C	D				
UCB$C_LENGTH	00000074		D		UCB$W_BUFQUO	00000018	D				
UCB$C_MB_LENGTH	00000090		D		UCB$W_BYTESTOGO	0000003E	D				
UCB$C_TT_LENGTH	000000BC		D		UCB$W_CHARGE	0000004A	D				
UCB$K_LENGTH	00000074		D		UCB$W_CYLINDERS	0000003E	D				
UCB$K_MB_LENGTH	00000090		D		UCB$W_DA	0000008C	D				
UCB$K_TT_LENGTH	000000BC		D		UCB$W_DC	0000008E	D				
UCB$L_AMB	00000054		D		UCB$W_DEVBUFSIZ	0000003A	D				
UCB$L_ASTQBL	00000010		D		UCB$W_DEVSTS	0000005A	D				
UCB$L_ASTQFL	0000000C		D		UCB$W_DIRSEQ	00000088	D				
UCB$L_CPID	0000005C		D		UCB$W_DSTADDR	00000018	D				
UCB$L_CRB	00000020		D		UCB$W_DX_BCR	000000A4	D				
UCB$L_DDB	00000024		D		UCB$W_EC1	00000090	D				
UCB$L_DEVCHAR	00000034		D		UCB$W_EC2	00000092	D				
UCB$L_DEVDEPEND	0000003C		D		UCB$W_ERRCNT	00000072	D				

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	000000BC (188.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
SEP	00000064 (100.)	02 (2.)	NOPIC USR CON REL LCL SHR EXE RD WRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
IOC$FILSPT	00000059-R	248 (1)	#-105 (1) #-139 (1) #-160 (1) #-190 (1) #-223 (1)
IOC$GETBYTE	00000000-R	100 (1)	
IOC$INITBUFWIND	00000022-R	159 (1)	#-184 (1) #-217 (1)
IOC$MOVFRUSER	00000029-R	183 (1)	
IOC$MOVFRUSER1	0000003A-R	191 (1)	
IOC$MOVFRUSER2	0000002D-R	186 (1)	
IOC$MOVTOUSER	00000041-R	216 (1)	
IOC$MOVTOUSER1	00000052-R	224 (1)	
IOC$MOVTOUSER2	00000045-R	219 (1)	
IOC$PUTBYTE	00000011-R	134 (1)	
PTE$S_PFN	=00000015		#-249 (1)
PTE$V_PFN	=00000000		#-249 (1)
UCB$L_SVAPTE	00000068		#-104 (1) #-138 (1) #-189 (1) #-222 (1) 250 (1)
UCB$W_BOFF	0000006C		#-161 (1)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	39	00:00:00.01	00:00:00.28
Command processing	956	00:00:00.27	00:00:01.30
Pass 1	324	00:00:00.94	00:00:01.92
Symbol table sort	0	00:00:00.08	00:00:00.08
Pass 2	19	00:00:00.28	00:00:00.48
Symbol table output	2	00:00:00.03	00:00:00.12
Psect synopsis output	0	00:00:00.00	00:00:00.00
Cross-reference output	2	00:00:00.01	00:00:00.01
Assembler run totals	1344	00:00:01.62	00:00:04.19

The working set limit was 2400 pages.
54476 bytes (107 pages) of virtual memory were used to buffer the intermediate code.
There were 20 pages of symbol table space allocated to hold 352 non-local and 6 local symbols.
254 source lines were read in Pass 1, producing 31 object records in Pass 2.
13 pages of virtual memory were used to define 12 macros.

```
                          +---------------------------+
                          ! Macro library statistics !
                          +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              1
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           1
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       6
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                 8

529 GETS were required to define 8 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1)   81   DECLARATIONS
(2)   115   GET A VERTUAL MEMORY BUFFER.
(4)   216   RELEASE A MEMORY BUFFER.

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element BUFFER.MAR
0000     2 ; *6    17-JUL-1986 11:06:39 MARTIN "FIXED"
0000     3 ; *5     9-JUL-1986 10:47:15 MARTIN "<no reason given>"
0000     4 ; *4     8-JUL-1986 15:51:33 MARTIN "IT WORKS."
0000     5 ; *3     2-JUN-1986 07:29:21 ANDELLA "<no reason given>"
0000     6 ; *2     7-MAY-1986 17:14:11 BARANSKI "Documentation Check."
0000     7 ; *1     6-FEB-1986 15:13:57 DS ""
0000     8 ; DEC/CMS REPLACEMENT HISTORY, Element BUFFER.MAR
0000     9         .TITLE  BUFFER  *** BUFFER GETBUF/RELBUF routines
0000    10         .IDENT  "10.2-10"                                              ;G:6
0000    11         .LIST   MEB
0000    12         .NLIST  CND
0000    13
0000    14 ;
0000    15 ; COPYRIGHT (C) 1977, 1980, 1983, 1985, 1986                           ;G:3
0000    16 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    17 ;
0000    18 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0000    19 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
0000    20 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
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0000    22 ; EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
0000    23 ; TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
0000    24 ; REMAIN IN DEC.
0000    25 ;
0000    26 ; THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
0000    27 ; AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
0000    28 ; CORPORATION.
0000    29 ;
0000    30 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0000    31 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    32
0000    33 ;++
0000    34 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR.
0000    35 ;
0000    36 ; ABSTRACT:
0000    37 ;
0000    38 ; ENVIRONMENT:
0000    39 ;
0000    40 ; AUTHOR:       KEN CHAPMAN     10-NOV-77       VERSION 01.
0000    41 ;
0000    42 ; MODIFIED BY:
0000    43 ;              KEN CHAPMAN     24-MAR-78       VERSION 02 (ESSAA-4.01).
0000    44 ;       01     ADDED 'REGION' ARGUMENT TO "GETBUF" AND "RELBUF".
0000    45 ;                                                                     ;G:2
0000    46 ;       02     PUT PAGE COUNT CHECK IN "RELBUF".
0000    47 ;
0000    48 ;       03     - Jack Stansbury, 21-Oct-1981, Version 6.-
0000    49 ;              Added .LIBRARY statements for $DIAG and $DS.
0000    50 ;
0000    51 ;       04     Bob Bergazzi    May 16,1983     Version 6.11
0000    52 ;              Changed the order of .LIB statements.
0000    53 ;
0000    54 ;       05     Richard Brown   12-August-83    Version 6.13
0000    55 ;              Changed $DS_RELBUF so that it will ignore DS$_FRAGBUF
0000    56 ;              errors returned from $CNTREG.  Eliminates problem of
0000    57 ;              RELBUF returning an error if part of the buffer space
```

```
0000    ;                 being deallocated is above the VDS and part is below.
0000    ;
0000    ;        06       Bob Bergazzi    21-Oct-1983     Version 6.13
0000    ;                 Added # sign to SS$_NORMAL in edit number 05.
0000    ;
0000    ;        07       Domenic Andella 29-Jan-1985     Version 8.1
0000    ;                 Add two entry points, DSX$GETSYSBUF and DSX$RELSYSBUF
0000    ;                 to support new services.
0000    ;
0000    ;        08       M. Baggett      23-May-1985     Version 8.2
0000    ;                 Fixed trucation errors caused by adding module ULTRIX.
0000    ;
0000    ;        09       Domenic Andella 29-May-1986     Version 10.2                    ;G:3
0000    ;                 Modify routines DSX$GETBUF and DSX$RELBUF to check that         ;G:3
0000    ;                 the _PAGCNT is GTR zero, else return _ILLPAGCNT.                ;G:3
0000    ;                                                                                 ;G:3
0000    ;        10       I. Martin/S. Meier  09-Jul-1986 Version 10.2                    ;G:6
0000    ;                 Modify Rel_Common to handle case when net amount of pages       ;G:6
0000    ;                 to be deallocated, using DSX$RELBUF, is equal to zero.          ;G:6
0000    ;                 If it is zero, then return _ILLPAGCNT.                          ;G:6
0000    ;                                                                                 ;G:3
0000    ;--
```

```
                     0000     81          .SBTTL  DECLARATIONS
                     0000     82 ;
                     0000     83 ; INCLUDE FILES:
                     0000     84 ;
                     0000     85          .LIBRARY        /$DS/                   ;                               [4]
                     0000     86          .LIBRARY        /$DIAG/                 ;                               [4]
                     0000     87
                     0000     88 ;
                     0000     89 ; MACROS:
                     0000     90 ;
                     0000     91
                     0000     92 ;
                     0000     93 ; EQUATED SYMBOLS:
                     0000     94 ;
                     0000     95          $DS_DSADEF
                     0000     96          $DS_DSDEF
                     0000     97          $DS_GETBUF_DEF
                     0000     98          $DS_RELBUF_DEF
                     0000     99
                     0000    100 ;
                     0000    101 ; CONSTANTS:
                     0000    102 ;
                     0000    103
00200000             0000    104          PTE$K_INTERNAL_VDS = ^X200000   ; Sets PTE<21> for $DS_GETSYSBUF   [7]
00000000             0000    105          PTE$K_EXTERNAL_USER = 0         ; Clears PTE<21> for $DS_GETBUF    [7]
00000010             0000    106          RELSYSBUF$_START_VA = ^X10      ; AP offset for starting VA used in DS$_RELS
                     0000    107
                     0000    108 ; OWN STORAGE:
                     0000    109 ;
                 00000000    110          .PSECT  WORK, NOSHR, NOEXE, WRT, LONG
00000008  0000   0000    111 DS$GQ_PHYADR::  .BLKL   2               ; TEMPORARY PHYADR.
00000018  0008   0008    112 DS$GL_BUFCNT::  .BLKL   4               ; KEEPS TRACK OF BUFFER ALLOCATIONS.
00000020  0018   0018    113 Q_RETADR:       .BLKL   2               ; TEMPORARY RETADR.
```

```
                     0020   115          .SBTTL  GET A VERTUAL MEMORY BUFFER.
                 00000000   116          .PSECT  CODE, SHR, EXE, NOWRT, BYTE
                     0000   117 ;++
                     0000   118 ; FUNCTIONAL DESCRIPTION:
                     0000   119 ;
                     0000   120 ;       GET A MEMORY BUFFER IS FUNCTIONALLY SIMILAR TO STARTLET $EXPREG.
                     0000   121 ;       IT ALLOCATES MEMORY FOR THE PROGRAM TO USE AS BUFFER.
                     0000   122 ;       IN THE REPAIR ENVIRONMENT, THE PHYSICAL MEMORY IS GUARANTEED TO
                     0000   123 ;       BE CONTIGUOUS.
                     0000   124 ;
                     0000   125 ;
                     0000   126 ; SPECIAL USAGE:
                     0000   127 ;       If this routine is called via "$DS_GETSYSBUF" from internal
                     0000   128 ;       VDS code, a PTE code argument is pushed which results in
                     0000   129 ;       each allocated page's PTE<21> being set.
                     0000   130 ;
                     0000   131 ; CALLING SEQUENCE:
                     0000   132 ;
                     0000   133 ;       STANDARD PROCEDURE CALL.  ($DS_GETBUF or $DS_GETSYSBUF)
                     0000   134 ;
                     0000   135 ; INPUT PARAMETERS:
                     0000   136 ;
                     0000   137 ;       GETBUF$_PAGCNT(AP) =    NUMBER OF PAGES TO BE ALLOCATED.
                     0000   138 ;       GETBUF$_RETADR(AP) =    ADDRESS OF TWO LONGWORD ARRAY TO RECEIVE
                     0000   139 ;                               VIRTUAL LIMITS.
                     0000   140 ;       GETBUF$_PHYADR(AP) =    ADDRESS OF TWO LONGWORD ARRAY TO RECEIVE
                     0000   141 ;                               PHYSICAL LIMITS.
                     0000   142 ;       GETBUF$_REGION(AP) =    REGION INDICATOR:
                     0000   143 ;                                       0 = PROGRAM (P0) REGION
                     0000   144 ;                                       1 = CONTROL (P1) REGION
                     0000   145 ;                                       2 = SYSTEM REGION.
                     0000   146 ;
                     0000   147 ; IMPLICIT INPUTS:
                     0000   148 ;
                     0000   149 ;       NONE
                     0000   150 ;
                     0000   151 ; OUTPUT PARAMETERS:
                     0000   152 ;
                     0000   153 ;       NONE
                     0000   154 ;
                     0000   155 ; IMPLICIT OUTPUTS:
                     0000   156 ;
                     0000   157 ;       NONE
                     0000   158 ;
                     0000   159 ; COMPLETION CODES:
                     0000   160 ;
                     0000   161 ;       SEE $EXPREG (IN MEMMGT MODULE).
                     0000   162 ;
                     0000   163 ; SIDE EFFECTS:
                     0000   164 ;
                     0000   165 ;       NONE
                     0000   166 ;
                     0000   167 ;--
```

```
                        001C  0000  .ENTRY  DSX$GETSYSBUF,^M<R2,R3,R4>       ; Registers to save.
     54   00200000 8F    D0  0002          MOVL    #PTE$K_INTERNAL_VDS,R4   ; Code to mark PTE<21>=1 for $DS_GETSYSBUF
                  05     11  0009          BRB     GET_COMMON               ; Branch to common
                             000B
                        001C  000B  .ENTRY  DSX$GETBUF,^M<R2,R3,R4>          ; Registers to save
              54   00    D0  000D          MOVL    #PTE$K_EXTERNAL_USER,R4  ; Set PTE<21> =0 for $DS_GETBUF
                             0010
                             0010  GET_COMMON:                                          ;[7]                    ;G:3
                             0010                                                                               ;G:3
                 04 AC     D5  0010          TSTL    GETBUF$_PAGCNT(AP)       ; Check the page count.        [9]   ;G:3
                    08     14  0013          BGTR    10$                      ; Branch if count GTR 0.       [9]   ;G:3
           50   0000'8F    3C  0015          MOVZWL  #SS$_ILLPAGCNT,R0        ; Bad page count, rtn error.   [9]   ;G:3
                  0052     31  001A          BRW     50$                      ; Exit with error status       [9]   ;G:3
                             001D                                                                               ;G:3
  53   10 AC   02   00    EF  001D  10$:    EXTZV   #0, #2, GETBUF$_REGION(AP), -;                        [7][9] ;G:3
                             0023                   R3                        ; REGION AVAILABLE.
              50   7E    7E  0023          MOVAQ   -(SP),R0                  ; Point to QUADWORD for start,end
                   54    DD  0026          PUSHL   R4                        ; Pass code to mark PTE<21>
                   53    DD  0028          PUSHL   R3                        ; Pass region code
                   00    DD  002A          PUSHL   #0                        ;
                   60    7F  002C          PUSHAQ  (R0)                      ; Pass locations to store VA limits
                 04 AC   DD  002E          PUSHL   GETBUF$_PAGCNT(AP)        ; Pass page count
     00000000'GF   05    FB  0031          CALLS   #5,G^SYS$EXPREG           ; Go get a block of virtual memory
                 0C AC   D5  0038          TSTL    GETBUF$_PHYADR(AP)        ; CHECK PHYSICAL ADDRESS ARG.
                   08    13  003B          BEQL    20$
  0C BC   00000000'EF    7D  003D          MOVQ    L^DS$GQ_PHYADR, -         ; COPY ADDRESS ARRAY.
                             0045                    @GETBUF$_PHYADR(AP)
                             0045
              51   8E    7D  0045  20$:    MOVQ    (SP)+,R1                  ; Get first and last address
              52   51    D1  0048          CMPL    R1,R2                     ; First really smaller?
                   07    15  004B          BLEQ    30$                       ; Branch if so
                   52    DD  004D          PUSHL   R2                        ; Save smaller
              52   51    D0  004F          MOVL    R1,R2                     ; copy larger to higher register
                   02    BA  0052          POPR    #^M<R1>                   ; Put smaller in lower register
                             0054
                 08 AC   D5  0054  30$:    TSTL    GETBUF$_RETADR(AP)        ; CHECK FOR RETURN WANTED.
                   04    13  0057          BEQL    40$                       ; SKIP IF NOT.
           08 BC   51    7D  0059          MOVQ    R1, @GETBUF$_RETADR(AP)   ; STORE BUFFER ADDRESSES.
                             005D
              52   51    C2  005D  40$:    SUBL    R1,R2                     ; Compute buffer size
                   52    D6  0060          INCL    R2                        ; make it a count [10]                ;G:6
     52   52   F7 8F    78  0062          ASHL    #-9, R2, R2               ; IN PAGES. [10]                      ;G:6
  00000008'EF43   52    C0  0067          ADDL2   R2,L^DS$GL_BUFCNT[R3]     ; KEEP TRACK.
                             006F
                 FF8E'   30  006F  50$:    BSBW    KB_CHECK                  ; ALLOW ^C.     [9]                   ;G:3
                         04  0072          RET
```

```
                     0073   216          .SBTTL  RELEASE A MEMORY BUFFER.
                     0073   217 ;++
                     0073   218 ; FUNCTIONAL DESCRIPTION:
                     0073   219 ;
                     0073   220 ;       This routine releases memory allocated via a $DS_GETBUF or $DS_GETSYSBUF
                     0073   221 ;
                     0073   222 ; CALLING SEQUENCE:
                     0073   223 ;
                     0073   224 ;       STANDARD PROCEDURE CALL ($DS_RELBUF or $DS_RELSYSBUF)
                     0073   225 ;
                     0073   226 ; INPUT PARAMETERS:
                     0073   227 ;
                     0073   228 ;       RELBUF$_PAGCNT(AP) =    NUMBER OF PAGES TO BE ALLOCATED.
                     0073   229 ;       RELBUF$_RETADR(AP) =    ADDRESS OF TWO LONGWORD ARRAY TO RECEIVE
                     0073   230 ;                               VIRTUAL LIMITS.
                     0073   231 ;       RELBUF$_REGION(AP) =    REGION INDICATOR:
                     0073   232 ;                                       0 = PROGRAM (P0) REGION
                     0073   233 ;                                       1 = CONTROL (P1) REGION
                     0073   234 ;                                       2 = SYSTEM REGION.
                     0073   235 ;
                     0073   236 ;       RELSYSBUF$_START_VA(AP) = STARTING VIRTUAL ADDRESS OF FIRST PAGE TO BE DEALL
                     0073   237 ;
                     0073   238 ; IMPLICIT INPUTS:
                     0073   239 ;
                     0073   240 ;       NONE
                     0073   241 ;
                     0073   242 ; OUTPUT PARAMETERS:
                     0073   243 ;
                     0073   244 ;       NONE
                     0073   245 ;
                     0073   246 ; IMPLICIT OUTPUTS:
                     0073   247 ;
                     0073   248 ;       NONE
                     0073   249 ;
                     0073   250 ; COMPLETION CODES:
                     0073   251 ;
                     0073   252 ;       SEE $CNTREG (IN MEMMGT MODULE).
                     0073   253 ;
                     0073   254 ; SIDE EFFECTS:
                     0073   255 ;
                     0073   256 ;       NONE
                     0073   257 ;
                     0073   258 ;--
```

```
                        000C  0073  .ENTRY  DSX$RELSYSBUF,^M<R2,R3>                  ; ENTRY MASK              [7]
          53   10 AC     D0  0075          MOVL    RELSYSBUF$_START_VA(AP),R3        ; PASS STARTING VA        [7]
                  04     11  0079          BRB     REL_COMMON                        ; BRANCH TO COMMON        [7]
                             007B
                        000C  007B  .ENTRY  DSX$RELBUF,^M<R2,R3>                     ; ENTRY MASK.             [7]
                  53     D4  007D          CLRL    R3                                ; INDICATES $DS_RELBUF    [7]
                             007F
                             007F  REL_COMMON:                                                                  ;[7]
                             007F                                                                                  ;G:3
  52   0C AC   02   00   EF  007F          EXTZV   #0,#2,RELBUF$_REGION(AP), R2      ; REGION AVAILABLE. [7][9][10] ;G:6
          51   04 AC     D0  0085          MOVL    RELBUF$_PAGCNT(AP), R1            ; USE CALLER PAGE COUNT.[10]  ;G:6
  51   00000008'EF42     D1  0089          CMPL    L^DS$GL_BUFCNT[R2], R1            ; CHECK FOR TOO LARGE PAGCNT.[10] ;G
                  08     18  0091          BGEQ    10$                               ; SKIP IF NOT TOO LARGE.[10]  ;G:6
  51   00000008'EF42     D0  0093          MOVL    L^DS$GL_BUFCNT[R2], R1            ; GET MAXIMUM PAGE COUNT.[10] ;G:6
                             009B                                                                                  ;G:3
                  51     D5  009B  10$:    TSTL    R1                                ; zero pages to be deallocated? [10]
                  08     14  009D          BGTR    20$                               ; yes, exit with error status [10] ;
        50   0000'8F     3C  009F          MOVZWL  #SS$_ILLPAGCNT,R0                 ; Bad page count, rtn error.    [9][
                0053     31  00A4          BRW     40$                               ; Exit with error status        [9][
                             00A7
            50   7E      7E  00A7  20$:    MOVAQ   -(SP),R0                          ; Address of desc
                  53     DD  00AA          PUSHL   R3                                ; PASS STARTING VA IF DS$_RELSYSBUF
                  52     DD  00AC          PUSHL   R2                                ; PASS REGION
                  00     DD  00AE          PUSHL   #0                                ;
                  60     7F  00B0          PUSHAQ  (R0)                              ; PASS ADDRESS TO STORE VA
                  51     DD  00B2          PUSHL   R1                                ; PASS NUMBER OF PAGES
   00000000'GF    05     FB  00B4          CALLS   #5,G^SYS$CNTREG                   ; GO RELEASE A BLOCK OF VIRTUAL MEMO
   00660080 8F    50     D1  00BB          CMPL    R0,#DS$_FRAGBUF                   ; IF FRAGBUF error code [5]
                  07     12  00C2          BNEQ    25$                               ; THEN                  [5]
   50   00000000'8F     D0  00C4          MOVL    #SS$_NORMAL,R0                    ;    ignore it.         [06]
                             00CB  25$:                                              ;                       [5]
              08 AC     D5  00CB          TSTL    RELBUF$_RETADR(AP)                ; CHECK FOR RETURN WANTED.
                  04     13  00CE          BEQL    30$                               ; SKIP IF NOT.
        08 BC    6E      7D  00D0          MOVQ    (SP), @RELBUF$_RETADR(AP)         ; STORE BUFFER ADDRESSES.
                             00D4
      51   8E    8E      C3  00D4  30$:    SUBL3   (SP)+,(SP)+, R1                   ; COMPUTE BUFFER SIZE.
                  03     18  00D8          BGEQ    35$                               ; Branch if positive
            51    51     CE  00DA          MNEGL   R1,R1                             ; Make it positive
                             00DD
                  51     D6  00DD  35$:    INCL    R1                                ; MAKE INTO COUNT.[11]        ;G:6
   51   51   F7 8F      78  00DF          ASHL    #-9, R1, R1                       ; IN PAGES.[11]               ;G:6
 00000008'EF42    51     C2  00E4          SUBL2   R1, L^DS$GL_BUFCNT[R2]            ; KEEP TRACK.
              0B 50      E9  00EC          BLBC    R0, 40$                           ; SKIP IF ALREADY ERROR.
        04 AC    51     D1  00EF          CMPL    R1, RELBUF$_PAGCNT(AP)            ; CHECK IF TOTAL SUCCESS.
                  05     13  00F3          BEQL    40$                               ; SKIP IF OK.
      50   0000'8F      3C  00F5          MOVZWL  #SS$_PAGOWNVIO, R0                ; ERROR CODE.
                             00FA
                FF03'    30  00FA  40$:    BSBW    KB_CHECK                          ; ALLOW ^C.
                  04     00FD              RET
                             00FE
                             00FE          .END
```

```
$$ARGS                          = 00000003    D
$$T1                            = 00000010    D
BIT...                          = 00660160    D
DS$GL_BUFCNT                      00000008 RG D  02
DS$GQ_PHYADR                      00000000 RG D  02
DS$K_ERROR                      = 00000002    D
DS$K_NORMAL                     = 00000001    D
DS$K_SEVERE                     = 00000004    D
DS$K_SUBSYS                     = 00000066    D
DS$K_WARNING                    = 00000000    D
DS$_AP_NORMAL_BREAK             = 00660150    D
DS$_ARITH                       = 006600D0    D
DS$_ASBE                        = 00660118    D
DS$_BADLINK                     = 006600F0    D
DS$_BADTYPE                     = 006600E8    D
DS$_BIIC                        = 00660120    D
DS$_CHME                        = 006600A8    D
DS$_CHMK                        = 006600E0    D
DS$_DEVNAME                     = 00660108    D
DS$_ERROR                       = 00660002    D
DS$_FHWE                        = 00660068    D
DS$_FRAGBUF                     = 00660080    D
DS$_ICBUSY                      = 006600C8    D
DS$_ICERR                       = 006600C0    D
DS$_IHWE                        = 00660060    D
DS$_ILLCHAR                     = 00660018    D
DS$_ILLPAGCNT                   = 00660078    D
DS$_ILLUNIT                     = 00660100    D
DS$_INIT_FAIL                   = 00660140    D
DS$_INSFMEM                     = 00660050    D
DS$_INVCPU                      = 00660130    D
DS$_IPL2HI                      = 006600B8    D
DS$_IVADDR                      = 00660040    D
DS$_IVVECT                      = 00660038    D
DS$_KRNLSTK                     = 00660090    D
DS$_LOGIC                       = 00660070    D
DS$_MCHK                        = 00660088    D
DS$_MEM_ALLOC_ERR               = 00660138    D
DS$_MMOFF                       = 00660058    D
DS$_NEEDUNIT                    = 006600F8    D
DS$_NODE                        = 00660128    D
DS$_NOPCS                       = 00660110    D
DS$_NORMAL                      = 00660001    D
DS$_NOSUPPORT                   = 006600B1    D
DS$_NOTALLOWMP                  = 00660148    D
DS$_NOTDON                      = 00660030    D
DS$_NOTIMP                      = 006600B0    D
DS$_NULLSTR                     = 00660010    D
DS$_OVERFLOW                    = 00660008    D
DS$_POWER                       = 00660098    D
DS$_PROGERR                     = 00660020    D
DS$_SEVERE                      = 00660004    D
DS$_TRANSL                      = 006600A0    D
DS$_TRUNCATE                    = 00660028    D
DS$_UNEXPINT                    = 006600D8    D
DS$_UNSUPPDEV                   = 00660158    D
DS$_VASFULL                     = 00660048    D
DS$_WARNING                     = 00660000    D
DSA$AL_APTMAIL                    0000FE00    D
DSA$AT_APTTXT                     0000FA00    D
DSA$GL_APTCOM                     0000FE04    D
DSA$GL_DEVLEN                     0000FE58    D
DSA$GL_ERRNO                      0000FE44    D
DSA$GL_EVENT                      0000FE48    D
DSA$GL_FLAGS                      0000FE00    D
DSA$GL_MSGTYP                     0000FE40    D
DSA$GL_PASSES                     0000FE08    D
DSA$GL_PASSNO                     0000FE54    D
DSA$GL_SECTNO                     0000FE10    D
DSA$GL_SID                        0000FE14    D
DSA$GL_SUBTNO                     0000FE4C    D
DSA$GL_TESTNO                     0000FE50    D
DSA$GL_UNITS                      0000FE0C    D
DSA$GQ_MSGPTR                     0000FE68    D
DSA$GT_DEVNAM                     0000FE5C    D
DSX$GETBUF                        0000000B RG D  03
DSX$GETSYSBUF                     00000000 RG D  03
DSX$RELBUF                        0000007B RG D  03
DSX$RELSYSBUF                     00000073 RG D  03
GETBUF$_NARGS                   = 00000004    D
GETBUF$_PAGCNT                  = 00000004    D
GETBUF$_PHYADR                  = 0000000C    D
GETBUF$_REGION                  = 00000010    D
GETBUF$_RETADR                  = 00000008    D
GET_COMMON                        00000010 R  D  03
KB_CHECK                          ********    X  03
PTE$K_EXTERNAL_USER             = 00000000    D
PTE$K_INTERNAL_VDS              = 00200000    D
Q_RETADR                          00000018 R  D  02
RELBUF$_NARGS                   = 00000003    D
RELBUF$_PAGCNT                  = 00000004    D
RELBUF$_REGION                  = 0000000C    D
RELBUF$_RETADR                  = 00000008    D
RELSYSBUF$_START_VA             = 00000010    D
REL_COMMON                        0000007F R  D  03
SIZ...                          = 00000001    D
SS$_ILLPAGCNT                     ********    X  03
SS$_NORMAL                        ********    X  03
SS$_PAGOWNVIO                     ********    X  03
SYS$CNTREG                        ********    X  03
SYS$EXPREG                        ********    X  03
```

```
                                    +----------------+
                                    ! Psect synopsis !
                                    +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           0000FE70  (65136.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
WORK                            00000020  (   32.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR NOEXE   RD    WRT NOVEC LONG
CODE                            000000FE  (  254.)  03 (  3.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD  NOWRT NOVEC BYTE
```

```
                                        +-------------------------+
                                        ! Symbol Cross Reference !
                                        +-------------------------+

SYMBOL                          VALUE        DEFINITION      REFERENCES...
------                          -----        ----------      -------------
$$ARGS                         =00000003     98     (1)      97     (1)      98     (1)
$$T1                           =00000010     98     (1)      97     (1)      98     (1)
BIT...                         =00660160     96     (1)      96     (1)
DS$GL_BUFCNT                    00000008-R   112    (1)    #-211    (3)    #-271    (5)    #-273    (5)    #-301    (5)
DS$GQ_PHYADR                    00000000-R   111    (1)    #-194    (3)
DS$K_ERROR                     =00000002     96     (1)
DS$K_NORMAL                    =00000001     96     (1)
DS$K_SEVERE                    =00000004     96     (1)
DS$K_SUBSYS                    =00000066     96     (1)      96     (1)
DS$K_WARNING                   =00000000     96     (1)
DS$_AP_NORMAL_BREAK            =00660150     96     (1)
DS$_ARITH                      =006600D0     96     (1)
DS$_ASBE                       =00660118     96     (1)
DS$_BADLINK                    =006600F0     96     (1)
DS$_BADTYPE                    =006600E8     96     (1)
DS$_BIIC                       =00660120     96     (1)
DS$_CHME                       =006600A8     96     (1)
DS$_CHMK                       =006600E0     96     (1)
DS$_DEVNAME                    =00660108     96     (1)
DS$_ERROR                      =00660002     96     (1)
DS$_FHWE                       =00660068     96     (1)
DS$_FRAGBUF                    =00660080     96     (1)    #-287    (5)
DS$_ICBUSY                     =006600C8     96     (1)
DS$_ICERR                      =006600C0     96     (1)
DS$_IHWE                       =00660060     96     (1)
DS$_ILLCHAR                    =00660018     96     (1)
DS$_ILLPAGCNT                  =00660078     96     (1)
DS$_ILLUNIT                    =00660100     96     (1)
DS$_INIT_FAIL                  =00660140     96     (1)
DS$_INSFMEM                    =00660050     96     (1)
DS$_INVCPU                     =00660130     96     (1)
DS$_IPL2HI                     =006600B8     96     (1)
DS$_IVADDR                     =00660040     96     (1)
DS$_IVVECT                     =00660038     96     (1)
DS$_KRNLSTK                    =00660090     96     (1)
DS$_LOGIC                      =00660070     96     (1)
DS$_MCHK                       =00660088     96     (1)
DS$_MEM_ALLOC_ERR              =00660138     96     (1)
DS$_MMOFF                      =00660058     96     (1)
DS$_NEEDUNIT                   =006600F8     96     (1)
DS$_NODE                       =00660128     96     (1)
DS$_NOPCS                      =00660110     96     (1)
DS$_NORMAL                     =00660001     96     (1)
DS$_NOSUPPORT                  =006600B1     96     (1)
DS$_NOTALLOWMP                 =00660148     96     (1)
DS$_NOTDON                     =00660030     96     (1)
DS$_NOTIMP                     =006600B0     96     (1)      96     (1)
DS$_NULLSTR                    =00660010     96     (1)
DS$_OVERFLOW                   =00660008     96     (1)
DS$_POWER                      =00660098     96     (1)
```

```
DS$_PROGERR                     =00660020      96     (1)
DS$_SEVERE                      =00660004      96     (1)
DS$_TRANSL                      =006600A0      96     (1)
DS$_TRUNCATE                    =00660028      96     (1)
DS$_UNEXPINT                    =006600D8      96     (1)
DS$_UNSUPPDEV                   =00660158      96     (1)
DS$_VASFULL                     =00660048      96     (1)
DS$_WARNING                     =00660000      96     (1)       96     (1)
DSX$GETBUF                       0000000B-R   173     (3)
DSX$GETSYSBUF                    00000000-R   169     (3)
DSX$RELBUF                       0000007B-R   264     (5)
DSX$RELSYSBUF                    00000073-R   260     (5)
GETBUF$_NARGS                   =00000004      97     (1)
GETBUF$_PAGCNT                  =00000004      97     (1)      #-178   (3)     #-190   (3)
GETBUF$_PHYADR                  =0000000C      97     (1)      #-192   (3)     #-195   (3)
GETBUF$_REGION                  =00000010      97     (1)       183    (3)
GETBUF$_RETADR                  =00000008      97     (1)      #-204   (3)     #-206   (3)
GET_COMMON                       00000010-R   176     (3)      #-171   (3)
KB_CHECK                         00000000-XR                   #-213   (3)     #-307   (5)
PTE$K_EXTERNAL_USER             =00000000      105    (1)      #-174   (3)
PTE$K_INTERNAL_VDS              =00200000      104    (1)      #-170   (3)
Q_RETADR                         00000018-R   113     (1)
RELBUF$_NARGS                   =00000003      98     (1)
RELBUF$_PAGCNT                  =00000004      98     (1)      #-270   (5)     #-303   (5)
RELBUF$_REGION                  =0000000C      98     (1)       269    (5)
RELBUF$_RETADR                  =00000008      98     (1)      #-291   (5)     #-293   (5)
RELSYSBUF$_START_VA             =00000010      106    (1)      #-261   (5)
REL_COMMON                       0000007F-R   267     (5)      #-262   (5)
SS$_ILLPAGCNT                    00000000-XR                   #-180   (3)     #-277   (5)
SS$_NORMAL                       00000000-XR                   #-289   (5)
SS$_PAGOWNVIO                    00000000-XR                   #-305   (5)
SYS$CNTREG                       00000000-XR                    286    (5)
SYS$EXPREG                       00000000-XR                    191    (3)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	30	00:00:00.03	00:00:00.18
Command processing	880	00:00:00.24	00:00:00.96
Pass 1	308	00:00:00.82	00:00:02.13
Symbol table sort	0	00:00:00.02	00:00:00.03
Pass 2	8	00:00:00.20	00:00:00.42
Symbol table output	0	00:00:00.02	00:00:00.06
Psect synopsis output	0	00:00:00.00	00:00:00.00
Cross-reference output	1	00:00:00.05	00:00:00.05
Assembler run totals	1227	00:00:01.38	00:00:03.83

```
The working set limit was 2900 pages.
47658 bytes (94 pages) of virtual memory were used to buffer the intermediate code.
There were 10 pages of symbol table space allocated to hold 158 non-local and 11 local symbols.
310 source lines were read in Pass 1, producing 35 object records in Pass 2.
13 pages of virtual memory were used to define 12 macros.
```

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              4
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       6
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                10

222 GETS were required to define 10 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element CALLFRAME.B32
;    0002  0      ! *2    12-MAY-1986 10:42:45 BARANSKI "Cleaning up Object Libraries."
;    0003  0      ! *1     6-FEB-1986 15:13:59 DS ""
;    0004  0      ! DEC/CMS REPLACEMENT HISTORY, Element CALLFRAME.B32
;    0005  0      %TITLE '*** CallFrame Module'
;    0006  0      MODULE CallFrame (                      ! Routines to access the call frames
;    0007  0                        IDENT = '01-01'
;    0008  0                        ) =
;    0009  0      !++
;    0010  0      ! COPYRIGHT (c) 1983
;    0011  0      ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
;    0012  0      !
;    0013  0      ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
;    0014  0      ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
;    0015  0      ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
;    0016  0      ! MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
;    0017  0      ! EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
;    0018  0      ! TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
;    0019  0      ! REMAIN IN DEC.
;    0020  0      !
;    0021  0      ! THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
;    0022  0      ! AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
;    0023  0      ! CORPORATION.
;    0024  0      !
;    0025  0      ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
;    0026  0      ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
;    0027  0      !-
```

```
;    0029  0      !++
;    0030  0      ! Facility:
;    0031  0      !
;    0032  0      !       Diagnostic Supervisor
;    0033  0      !
;    0034  0      ! Abstract:
;    0035  0      !
;    0036  0      !       This module contains rutines to access the call frames on the stack.
;    0037  0      !
;    0038  0      ! Author:
;    0039  0      !
;    0040  0      !       Jack Stansbury
;    0041  0      !
;    0042  0      ! Creation Date:
;    0043  0      !
;    0044  0      !       March 8, 1983
;    0045  0      !
;    0046  0      ! Version:
;    0047  0      !
;    0048  0      !       6.11
;    0049  0      !
;    0050  0      ! Modified By:
;    0051  0      !
;    0052  0      !       01      Bob Bergazzi    May 17, 1983    Version 6.11
;    0053  0      !               Changed the order of searching libraries
;    0054  0      !--
```

```
;    0056  0     %SBTTL  'Libraries'
;    0057  1     BEGIN                           ! Begin the CallFrame module
;    0058  1
;    0059  1     LIBRARY
;    0060  1             '$Diag';                ! Use Diag.L32 first
;    0061  1
;    0062  1     LIBRARY
;    0063  1             '$DS';                  ! Use Ds.L32 second
;    0064  1
;    0065  1     LIBRARY
;    0066  1             '$CRD';                 ! Use CRD.L32 third
;    0067  1
;    0068  1     LIBRARY
;    0069  1             'Sys$Library:Lib';      ! Use Lib as last resort
```

```
;    0071  1     %SBTTL  'Table of Contents'
;    0072  1
;    0073  1     FORWARD ROUTINE
;    0074  1             VRShow_Calls                    : NOVALUE JSB_Cli ADDRESSING_MODE (LONG_RELATIVE),
;    0075  1                                             ! Show the last 'n' call frames and PCs.
;    0076  1
;    0077  1             DSR$Find_User_PC                : ADDRESSING_MODE (LONG_RELATIVE);
;    0078  1                                             ! Find the first user PC on the call frame stack.
```

```
;    0080  1     %SBTTL  'External Routines'
;    0081  1
;    0082  1     EXTERNAL ROUTINE
;    0083  1              DSR$CheckLoad                  : JSB_None ADDRESSING_MODE (LONG_RELATIVE);
```

```
;    0085  1     %SBTTL  'External Own Storage'
;    0086  1
;    0087  1     EXTERNAL
;    0088  1             DS$GL_Flags                     : ADDRESSING_MODE (LONG_RELATIVE);
```

```
;   0090  1     %SBTTL  'Included Macros and Literals'
;   0091  1
;   0092  1             $DS_TypeDef;                    ! Typecodes for the $Print statements
```

```
;    0094  1      %SBTTL  'Psect Definitions'
;    0095  1
;    0096  1      PSECT
;    0097  1          PLIT    = Data (NOEXECUTE,   SHARE, NOWRITE, ADDRESSING_MODE (LONG_RELATIVE));
;    0098  1
;    0099  1      PSECT
;    0100  1          CODE    = Code (  EXECUTE,   SHARE, NOWRITE, ADDRESSING_MODE (LONG_RELATIVE));
;    0101  1
;    0102  1      PSECT
;    0103  1          OWN     = Work (NOEXECUTE, NOSHARE,   WRITE, ADDRESSING_MODE (LONG_RELATIVE));
;    0104  1
;    0105  1      PSECT
;    0106  1          GLOBAL  = Work (NOEXECUTE, NOSHARE,   WRITE, ADDRESSING_MODE (LONG_RELATIVE));
```

```
;   0108  1     %SBTTL  'Module-Global Static Storage'
;   0109  1
;   0110  1             ModNam ('CallFrame');           ! Module name for ErrSup macro
```

```
;    0112  1      %SBTTL  'VRShow_Calls Routine'
;    0113  1
;    0114  1      GLOBAL ROUTINE VRShow_Calls (CLI_Buffer) : NOVALUE JSB_Cli =
;    0115  1
;    0116  1      !++
;    0117  1      ! Functional Description:
;    0118  1      !
;    0119  1      !       Print 'Number_Of_Frames' from the call frame stack. The PC from each of the frames is printed.
;    0120  1      !
;    0121  1      ! Formal Parameters:
;    0122  1      !
;    0123  1      !       CLI_Buffer:       The address of the start of the CLI buffer. This buffer contains the following data
;    0124  1      !                         at the CLI$K_Data location:
;    0125  1      !       Number_Of_Frames: The number of frames to print. If this is 0 (zero), print all the frames.
;    0126  1      !
;    0127  1      ! Implicit Inputs:
;    0128  1      !
;    0129  1      !       None
;    0130  1      !
;    0131  1      ! Side Effects:
;    0132  1      !
;    0133  1      !       None
;    0134  1      !
;    0135  1      ! Completion Codes:
;    0136  1      !
;    0137  1      !       None
;    0138  1      !--
```

```
;    0140  2      BEGIN                                          ! Start of routine VRShow_Calls
;    0141  2              MAP
;    0142  2                      CLI_Buffer : REF BLOCK [, BYTE];       ! The CLI_Buffer is a block of bytes
;    0143  2
;    0144  2              BUILTIN
;    0145  2                      PROBER,                        ! Probe read-accessability
;    0146  2                      PROBEW,                        ! Probe write-accessability
;    0147  2                      MOVPSL,                        ! Move from PSL
;    0148  2                      AP,                            ! Argument pointer
;    0149  2                      FP;                            ! Frame pointer
;    0150  2
;    0151  2              LOCAL
;    0152  2                      Psw,                           ! Processor Status Word (low word)
;    0153  2                      Number_Of_Frames,              ! The number of frames to print
;    0154  2                      Program_Counter,               ! PC from the current frame
;    0155  2                      Argument_Pointer,              ! Pointer to the argument array
;    0156  2                      Frame_Ptr;                     ! Points to current call frame
;    0157  2
;    0158  2              Number_Of_Frames = .CLI_Buffer [CLI$L_Data];    ! Get the data from the CLI buffer
;    0159  2
;    0160  2              IF (.Number_Of_Frames LEQ 0) THEN
;    0161  2                      Number_Of_Frames = 30;         ! Assume 30 is the most we will print
;    0162  2
;    0163  2              MOVPSL (Psw);                          ! Get the Psl (use the current PSL for the first line - belo
;    0164  2              Program_Counter = VRShow_Calls + 2;    ! Get the PC for this routine (skip over register save mask)
;    0165  2
; P  0166  2              $Print (DS$K_Type_General, DS$K_PrintF,
;    0167  2                      $ASCIC ('!/!/Call Frame Stack Dump (starting with the current frame):!/'));
; P  0168  2              $Print (DS$K_Type_General, DS$K_PrintF,
; P  0169  2                      $ASCIC ('  Frame: Current        PC: !XL       AP: !XL       PSL: !XL!/'),
;    0170  2                      .Program_Counter, .AP, .Psw);
;    0171  2
;    0172  2              Frame_Ptr = .FP;                       ! Initialize to current frame
;    0173  2
;    0174  2              INCR Frame FROM 0 TO (.Number_Of_Frames - 1) DO
;    0175  3                      BEGIN
;    0176  3                      Program_Counter  = .(.Frame_Ptr + 16);  ! Pick out PC from next frame
;    0177  3                      Argument_Pointer = .(.Frame_Ptr + 8);   ! Pick out AP from next frame
;    0178  3                      Psw = .(.Frame_Ptr + 4) <5, 11, 0>;     ! Get the saved Psw from next frame
;    0179  3
; P  0180  3                      $Print (DS$K_Type_General, DS$K_PrintF,
; P  0181  3                              $ASCIC ('  Frame: !XL Saved PC: !XL Saved AP: !XL Saved PSW: !3XL!/'),
;    0182  3                              .Frame_Ptr, .Program_Counter, .Argument_Pointer, .Psw);
;    0183  3
;    0184  3                      Frame_Ptr = .(.Frame_Ptr + 12);         ! Get next frame pointer
;    0185  3
;    0186  3                      IF (.Frame_Ptr EQL 0) THEN              ! If at the end of the linked list of frames,
;    0187  3                              EXITLOOP;                       ! ... exit this loop
;    0188  3
;    0189  3                      IF (NOT PROBER (%REF (0), %REF (20), .Frame_Ptr)) THEN
;    0190  3                              EXITLOOP;                       ! If we can't read it, exit this loop
;    0191  3
;    0192  3                      IF (NOT PROBEW (%REF (0), %REF (20), .Frame_Ptr)) THEN
;    0193  3                              EXITLOOP;                       ! If we can't write to it, exit this loop
;    0194  2                      END;
;    0195  2
;    0196  2              IF ((DSR$CheckLoad()) AND (.DS$GL_Flags <DS$V_StrFlg, 0>)) THEN
```

```
;    0197  3                    BEGIN
;    0198  3                    !+
;    0199  3                    ! A program is loaded and has been started. Check to see if there is a user PC on the
;    0200  3                    ! stack from the registers pushed on for the DS$Cli routine.
;    0201  3                    !-
;    0202  3                    BIND
;    0203  3                            Argument_Array = (.AP) : VECTOR [, LONG];
;    0204  3
;    0205  3                    LOCAL
;    0206  3                            User_PC;
;    0207  3
;    0208  3                    !+
;    0209  3                    ! The 15th longword in the argument array is the user's PC. See the KB_Check routine in the
;    0210  3                    ! Kernel.Mar module to see what gets pushed onto the stack for the DS$Cli routine.
;    0211  3                    !-
;    0212  3
;    0213  3                    User_PC = .Argument_Array [15];          ! Get the 15th longword
;    0214  3                    If (.User_PC GTR %X'00000200') AND (.User_PC LSS %X'0000FA00') THEN
;    0215  4                            BEGIN
;    0216  4                            !+
;    0217  4                            ! The user's PC is within the diagnostic load region (from 200 to FA00 hex).
;    0218  4                            !-
;    0219  4                            $Print (DS$K_Type_General, DS$K_PrintF, $ASCIC ('!/  User return PC = !XL(X)!/'), .User_PC);
;    0220  3                            END;
;    0221  2                    END;
;    0222  1    END;                                                  ! End of routine VRShow_Calls


                                                                     .TITLE  CALLFRAME *** CallFrame Module
                                                                     .IDENT  \01-01\

                                                                     .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                                  65  6D  61  72  46  6C  6C  61  43  09  00000 P.AAA:  .ASCII  <9>\CallFrame\                    ;
65  6D  61  72  46  20  6C  6C  61  43  2F  21  2F  21  3E  0000A P.AAB:  .ASCII  \>!/!/Call Frame Stack Dump (starting wit\  ;
74  73  28  20  70  6D  75  44  20  6B  63  61  74  53  20  00019                                                            ;
                      74  69  77  20  67  6E  69  74  72  61  00028                                                            ;
66  20  74  6E  65  72  72  75  63  20  65  68  74  20  68  00032          .ASCII  \h the current frame):!/\                   ;
                          2F  21  3A  29  65  6D  61  72  00041                                                            ;
65  72  72  75  43  20  3A  65  6D  61  72  46  20  20  3E  00049 P.AAC:  .ASCII  \>  Frame: Current        PC: !XL       A\  ;
21  20  3A  43  50  20  20  20  20  20  20  20  20  74  6E  00058                                                            ;
                      41  20  20  20  20  20  20  20  20  4C  58  00067                                                        ;
53  50  20  20  20  20  20  20  20  20  4C  58  21  20  3A  50  00071          .ASCII  \P: !XL       PSL: !XL!/\               ;
                          2F  21  4C  58  21  20  3A  4C  00080                                                            ;
53  20  4C  58  21  20  3A  65  6D  61  72  46  20  20  3A  00088 P.AAD:  .ASCII  \:  Frame: !XL Saved PC: !XL Saved AP: !X\  ;
61  53  20  4C  58  21  20  3A  43  50  20  64  65  76  61  00097                                                            ;
                      58  21  20  3A  50  41  20  64  65  76  000A6                                                            ;
33  21  20  3A  57  53  50  20  64  65  76  61  53  20  4C  000B0          .ASCII  \L Saved PSW: !3XL!/\                       ;
                                          2F  21  4C  58  000BF                                                            ;
72  75  74  65  72  20  72  65  73  55  20  20  2F  21  1D  000C3 P.AAE:  .ASCII  <29>\!/  User return PC = !XL(X)!/\       ;
2F  21  29  58  28  4C  58  21  20  3D  20  43  50  20  6E  000D2                                                            ;

                                                          $MODULE=          P.AAA
                                                                     .EXTRN  DSR$CHECKLOAD, DS$GL_FLAGS
                                                                     .EXTRN  DSX$PRINT

                                                                     .PSECT  CODE,NOWRT,  SHR,2
```

```
                                  00FC   8F  BB 00000 VRSHOW_CALLS::
                                                      PUSHR   #^M<R2,R3,R4,R5,R6,R7>                      ; 0114
                          57        1C   A2  D0 00004       MOVL    28(CLI_BUFFER), NUMBER_OF_FRAMES            ; 0158
                                         57  D5 00008       TSTL    NUMBER_OF_FRAMES                            ; 0160
                                         03  14 0000A       BGTR    1$                                          ;
                          57             1E  D0 0000C       MOVL    #30, NUMBER_OF_FRAMES                       ; 0161
                                         54  DC 0000F 1$:   MOVPSL  PSW                                         ; 0163
                          53        EE   AF  9E 00011       MOVAB   VRSHOW_CALLS+2, PROGRAM_COUNTER             ; 0164
                             00000000'   EF  9F 00015       PUSHAB  P.AAB                                       ; 0167
                                         01  DD 0001B       PUSHL   #1                                          ;
                                         7E  D4 0001D       CLRL    -(SP)                                       ;
                 00000000G  9F           03  FB 0001F       CALLS   #3, @#DSX$PRINT                             ;
                                         54  DD 00026       PUSHL   PSW                                         ; 0170
                                  1008   8F  BB 00028       PUSHR   #^M<R3,AP>                                  ;
                             00000000'   EF  9F 0002C       PUSHAB  P.AAC                                       ;
                                         01  DD 00032       PUSHL   #1                                          ;
                                         7E  D4 00034       CLRL    -(SP)                                       ;
                 00000000G  9F           06  FB 00036       CALLS   #6, @#DSX$PRINT                             ;
                          52             5D  D0 0003D       MOVL    FP, FRAME_PTR                               ; 0172
                          55             01  CE 00040       MNEGL   #1, FRAME                                   ; 0174
                                         37  11 00043       BRB     3$                                          ;
                          53        10   A2  D0 00045 2$:   MOVL    16(FRAME_PTR), PROGRAM_COUNTER              ; 0176
                          56        08   A2  D0 00049       MOVL    8(FRAME_PTR), ARGUMENT_POINTER              ; 0177
     54       04   A2     0B             05  EF 0004D       EXTZV   #5, #11, 4(FRAME_PTR), PSW                  ; 0178
                                         54  DD 00053       PUSHL   PSW                                         ; 0182
                                  004C   8F  BB 00055       PUSHR   #^M<R2,R3,R6>                               ;
                             00000000'   EF  9F 00059       PUSHAB  P.AAD                                       ;
                                         01  DD 0005F       PUSHL   #1                                          ;
                                         7E  D4 00061       CLRL    -(SP)                                       ;
                 00000000G  9F           07  FB 00063       CALLS   #7, @#DSX$PRINT                             ;
                          52        0C   A2  D0 0006A       MOVL    12(FRAME_PTR), FRAME_PTR                    ; 0184
                                         10  13 0006E       BEQL    4$                                          ; 0186
                 62       14             00  0C 00070       PROBER  #0, #20, (FRAME_PTR)                        ; 0189
                                         0A  13 00074       BEQL    4$                                          ;
                 62       14             00  0D 00076       PROBEW  #0, #20, (FRAME_PTR)                        ; 0192
                                         04  13 0007A       BEQL    4$                                          ;
                 C5       55             57  F2 0007C 3$:   AOBLSS  NUMBER_OF_FRAMES, FRAME, 2$                 ; 0174
                             00000000G   EF  16 00080 4$:   JSB     DSR$CHECKLOAD                               ; 0196
                          31             50  E9 00086       BLBC    R0, 5$                                      ;
                 29 00000000G  EF        02  E1 00089       BBC     #2, DS$GL_FLAGS, 5$                         ;
                          50        3C   AC  D0 00091       MOVL    60(AP), USER_PC                             ; 0213
                 00000200  8F            50  D1 00095       CMPL    USER_PC, #512                               ; 0214
                                         1C  15 0009C       BLEQ    5$                                          ;
                 0000FA00  8F            50  D1 0009E       CMPL    USER_PC, #64000                             ;
                                         13  18 000A5       BGEQ    5$                                          ;
                                         50  DD 000A7       PUSHL   USER_PC                                     ; 0219
                             00000000'   EF  9F 000A9       PUSHAB  P.AAE                                       ;
                                         01  DD 000AF       PUSHL   #1                                          ;
                                         7E  D4 000B1       CLRL    -(SP)                                       ;
                 00000000G  9F           04  FB 000B3       CALLS   #4, @#DSX$PRINT                             ;
                                  00FC   8F  BA 000BA 5$:   POPR    #^M<R2,R3,R4,R5,R6,R7>                      ; 0222
                                         05  000BE          RSB                                                 ;

; Routine Size:  191 bytes,    Routine Base:  CODE + 0000
```

```
;    0224  1      %SBTTL  'DSR$Find_User_PC Routine'
;    0225  1
;    0226  1      GLOBAL ROUTINE DSR$Find_User_PC =
;    0227  1
;    0228  1      !++
;    0229  1      ! Functional description:
;    0230  1      !
;    0231  1      !       This routine is used to find a user program PC for typing.
;    0232  1      !
;    0233  1      ! Calling sequence:
;    0234  1      !
;    0235  1      !       CALLS   #0, DSR$Find_User_PC
;    0236  1      !
;    0237  1      ! Input Parameters:
;    0238  1      !
;    0239  1      !       None
;    0240  1      !
;    0241  1      ! Implicit Inputs:
;    0242  1      !
;    0243  1      !       None
;    0244  1      !
;    0245  1      ! Output Parameters:
;    0246  1      !
;    0247  1      !       None
;    0248  1      !
;    0249  1      ! Implicit Outputs:
;    0250  1      !
;    0251  1      !       None
;    0252  1      !
;    0253  1      ! Completion Codes:
;    0254  1      !
;    0255  1      !       The user PC is returned in R0. If no user PC can be found, a 0 is returned.
;    0256  1      !
;    0257  1      ! Side Effects:
;    0258  1      !
;    0259  1      !       None
;    0260  1      !--
```

```
;   0262  2     BEGIN                                   ! Routine DSR$Find_User_PC
;   0263  2             LOCAL
;   0264  2                     Frame_Pointer,
;   0265  2                     Program_Counter;
;   0266  2
;   0267  2             BUILTIN
;   0268  2                     PROBER,
;   0269  2                     PROBEW,
;   0270  2                     FP;
;   0271  2
;   0272  2             Frame_Pointer   = .FP;
;   0273  2             Program_Counter = .(.Frame_Pointer + 16);       ! Pick out the PC from the current frame
;   0274  2
;   0275  2             WHILE (.Program_Counter GEQ %X'00010000') DO
;   0276  3                     BEGIN
;   0277  3                     Frame_Pointer = .(.Frame_Pointer + 12); ! Get next frame pointer
;   0278  3
;   0279  3                     IF (.Frame_Pointer EQLA 0) THEN         ! If at the end of the linked list of frames,
;   0280  3                             EXITLOOP;                       ! ... exit this loop
;   0281  3
;   0282  3                     IF (NOT PROBER (%REF (0), %REF (20), .Frame_Pointer)) THEN
;   0283  3                             EXITLOOP;                       ! If we can't read it, exit this loop
;   0284  3
;   0285  3                     IF (NOT PROBEW (%REF (0), %REF (20), .Frame_Pointer)) THEN
;   0286  3                             EXITLOOP;                       ! If we can't write to it, exit this loop
;   0287  3
;   0288  3                     Program_Counter = .(.Frame_Pointer + 16);
;   0289  3                                                             ! Pick out PC from next frame
;   0290  2                     END;
;   0291  2
;   0292  2             IF (.Program_Counter LSSA %X'00010000') THEN
;   0293  3                     RETURN (.Program_Counter)
;   0294  2             ELSE
;   0295  2                     RETURN (0);
;   0296  1     END;                                    ! Routine DSR$Find_User_PC


                                                  0000 00000          .ENTRY  DSR$FIND_USER_PC, Save nothing                  ; 0226
                                  51            5D  D0 00002          MOVL    FP, FRAME_POINTER                               ; 0272
                                  50      10    A1  D0 00005 1$:      MOVL    16(FRAME_POINTER), PROGRAM_COUNTER              ; 0273
                        00010000  8F            50  D1 00009          CMPL    PROGRAM_COUNTER, #65536                         ; 0275
                                                12  19 00010          BLSS    2$                                              ;
                                  51      0C    A1  D0 00012          MOVL    12(FRAME_POINTER), FRAME_POINTER                ; 0277
                                                0C  13 00016          BEQL    2$                                              ; 0279
                  61              14            00  0C 00018          PROBER  #0, #20, (FRAME_POINTER)                        ; 0282
                                                06  13 0001C          BEQL    2$                                              ;
                  61              14            00  0D 0001E          PROBEW  #0, #20, (FRAME_POINTER)                        ; 0285
                                                E1  12 00022          BNEQ    1$                                              ;
                        00010000  8F            50  D1 00024 2$:      CMPL    PROGRAM_COUNTER, #65536                         ; 0292
                                                02  1F 0002B          BLSSU   3$                                              ;
                                                50  D4 0002D          CLRL    R0                                              ; 0295
                                                    04 0002F 3$:      RET                                                     ;

; Routine Size:  48 bytes,    Routine Base:  CODE + 00BF
```

```
;   0298  1     END                                 ! End of CallFrame module
;   0299  0     ELUDOM
```

```
;                                   PSECT SUMMARY
;
;       Name                    Bytes                           Attributes
;
;  DATA                          225  NOVEC,NOWRT,  RD ,NOEXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  CODE                          239  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
```

Symbol	Type	Defined	Referenced ...			
$ASCIC	Macro	Lib01	167	169	181	219
$DS_TYPEDEF	Macro	Lib01	92			
$EQULST	Macro	Lib04	92			
$ER	Comptime	110				
$MODULE	Bind	110				
$PRINT	Macro	Lib02	166	168	180	219
AP	Builtin	148	170.	203.		
ARGUMENT_ARRAY	Bind	203	213.			
ARGUMENT_POINTER	Local	155	177=	182.		
CLI$L_DATA	Macro	Lib02	158			
CLI_BUFFER	RoutForm	114	142m	158a.		
DS$GL_FLAGS	External	88	196.			
DS$K_PRINTB	Literal	92				
DS$K_PRINTF	Literal	92	167	170	182	219
DS$K_PRINTI	Literal	92				
DS$K_PRINTX	Literal	92				
DS$K_TYPE_ABORT_PROGRAM	Literal	92				
DS$K_TYPE_ABORT_TEST	Literal	92				
DS$K_TYPE_COMMAND_ERR	Literal	92				
DS$K_TYPE_COMMAND_OUT	Literal	92				
DS$K_TYPE_CRD_AUTOTEST	Literal	92				
DS$K_TYPE_DS_PROMPT	Literal	92				
DS$K_TYPE_DS_START	Literal	92				
DS$K_TYPE_ERRDEV	Literal	92				
DS$K_TYPE_ERRHARD	Literal	92				
DS$K_TYPE_ERROR_BODY	Literal	92				
DS$K_TYPE_ERROR_END	Literal	92				
DS$K_TYPE_ERRPREP	Literal	92				
DS$K_TYPE_ERRSOFT	Literal	92				
DS$K_TYPE_ERRSUP	Literal	92				
DS$K_TYPE_ERRSYS	Literal	92				
DS$K_TYPE_ERR_HALT	Literal	92				
DS$K_TYPE_EXCEPTION	Literal	92				
DS$K_TYPE_EXCEPTION_HEAD	Literal	92				
DS$K_TYPE_FIRST_PASS	Literal	92				
DS$K_TYPE_GENERAL	Literal	92	167	170	182	219

Symbol	Type	Defined	Referenced ...
DS$K_TYPE_GENERAL_ERROR	Literal	92	
DS$K_TYPE_NO_TESTS	Literal	92	
DS$K_TYPE_PARAM_ERROR	Literal	92	
DS$K_TYPE_PROGRAM_END	Literal	92	
DS$K_TYPE_PROGRAM_INFO	Literal	92	
DS$K_TYPE_PROGRAM_START	Literal	92	
DS$K_TYPE_QIO_INVADP	Literal	92	
DS$K_TYPE_QIO_NODRIVER	Literal	92	
DS$K_TYPE_QIO_WRONGVER	Literal	92	
DS$K_TYPE_SCRIPT_ECHO	Literal	92	
DS$K_TYPE_SCRIPT_PNF	Literal	92	
DS$K_TYPE_SCRIPT_PROMPT	Literal	92	
DS$K_TYPE_SCRIPT_SKIP	Literal	92	
DS$K_TYPE_SEQUENCE_ERROR	Literal	92	
DS$K_TYPE_START_ERR	Literal	92	
DS$K_TYPE_START_LIST	Literal	92	
DS$K_TYPE_SUMMARY	Literal	92	
DS$K_TYPE_USER_PROMPT	Literal	92	
DS$V_STRFLG	Macro Lib02	196	
DSR$CHECKLOAD	ExtRout 83	196c	
DSR$FIND_USER_PC	GlobRout 226	77f	
DSX$PRINT	ExtRout 167	167c	170e 170c 182e 182c 219e 219c
FP	Builtin 149	172.	
	Builtin 270	272.	
FRAME	Local 174		
FRAME_POINTER	Local 264	272=	273. 277= 277. 279. 282. 285. 288.
FRAME_PTR	Local 156	172=	176. 177. 178. 182. 184= 184. 186. 189. 192.
GET1ST_	Macro Lib04	92	
GET2ND_	Unbound	92	
JSB_CLI	Linkage Lib02	74	114
JSB_NONE	Linkage Lib02	83	
MODNAM	Macro Lib02	110	
MOVPSL	Builtin 147	163	
NUL2ND_	Macro Lib04	92	
NUMBER_OF_FRAMES	Local 153	158=	160. 161= 174.
PROBER	Builtin 145	189	
	Builtin 268	282	
PROBEW	Builtin 146	192	
	Builtin 269	285	
PROGRAM_COUNTER	Local 154	164=	170. 176= 182.
	Local 265	273=	275. 288= 292. 293.
PSW	Local 152	163=	170. 178= 182.
USER_PC	Local 206	213=	214. 219.
VRSHOW_CALLS	GlobRout 114	74f	164a

CROSS REFERENCE MAP

Line #	Event	File ...
1	Source (start)	DISK$DS:[DS.LOCAL.RELEASE.WORK]CALLFRAME.B32;1
6	Module CALLFRAME	
60	Library #1	DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
63	Library #2	DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1

```
  14  Library #3       DISK$DS:[DS.LOCAL.RELEASE.WORK]CRD.L32;1
  69  Library #4       SYS$COMMON:[SYSLIB]LIB.L32;3
 299  Eludom CALLFRAME


       KEY TO REFERENCE TYPE FLAGS

            .   Fetch
            =   Store
            c   Routine call
            a   Address use
            @   Indirect use
            e   External, external routine, or external literal declaration
            f   Forward or forward routine declaration
            h   Condition handler enabling
            m   Map declaration
            u   Undeclare declaration


;                          Library Statistics
;
;                                        -------- Symbols --------      Pages       Processing
;       File                             Total    Loaded   Percent      Mapped      Time
;
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
;                                          942         2         0        96          00:00.0
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
;                                          675         6         0        47          00:00.0
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]CRD.L32;1
;                                          486         0         0        62          00:00.0
;  SYS$COMMON:[SYSLIB]LIB.L32;3          21522         3         0      1156          00:01.0




;                                  COMMAND QUALIFIERS

;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:CALLFRAME.B32

; Size:          239 code + 225 data bytes
; Run Time:         00:02.7
; Elapsed Time:     00:05.1
; Lines/CPU Min:     6719
; Lexemes/CPU-Min: 83662
; Memory Used:  117 pages
; Compilation Complete
```

Table of contents

(1) 81 CANCEL I/O ON CHANNEL

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element CANCEL.MAR
0000     2 ; *2    12-MAY-1986 10:45:42 BARANSKI "Cleaning up Object Libraries."
0000     3 ; *1     6-FEB-1986 15:14:01 DS ""
0000     4 ; DEC/CMS REPLACEMENT HISTORY, Element CANCEL.MAR
0000     5         .TITLE  CANCEL  *** CANCEL cancel QIO
0000     6         .IDENT  /05-04/
0000     7
0000     8 ;
0000     9 ;*****************************************************************************
0000    10 ;*                                                                           *
0000    11 ;*  COPYRIGHT (c) 1977, 1978, 1979, 1980                                     *
0000    12 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
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0000    26 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    27 ;*                                                                           *
0000    28 ;*****************************************************************************
0000    29 ;
0000    30 ; D. N. CUTLER 4-AUG-77
0000    31 ;
0000    32 ; SYSTEM SERVICE CANCEL I/O ON CHANNEL
0000    33 ;
0000    34 ; MODIFIED BY:
0000    35 ;
0000    36 ;                   N. HOWGATE      20-FEB-78       VERSION 02 (ESSAA-4.00).
0000    37 ;       01          DIAGNOSTIC SUPERVISOR INTEGRATION
0000    38 ;
0000    39 ;                   Dave Butenhof   13-may-1980, Version 5.4
0000    40 ;       02          Modify VMS V2.0 source for Supervisor environment
0000    41 ;                   Roger Riggs, 23-July-1980, Version 5.5
0000    42 ;       03          Changed word offset to long
0000    43 ;
0000    44 ;       04          M. Baggett      13-May-1983     Version 6.11
0000    45 ;                   Fixed trucation error.
0000    46 ;
0000    47 ;       V0002   ACG0047         Andrew C. Goldstein,    16-Aug-1979  18:37
0000    48 ;                   Add access rights block, protection interface changes
0000    49 ;
0000    50 ;**
0000    51 ;
0000    52 ; MACRO LIBRARY CALLS
0000    53 ;
0000    54
0000    55         $CADEF                          ;DEFINE CONDIATIONAL ASSEMBLY PARAMETERS
0000               .SAVE   LOCAL_BLOCK
0000               .RESTORE
```

```
                     0000     56          $CCBDEF                         ;DEFINE CCB OFFSETS
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .IIF    NB,CCB$L_UCB,   CCB$L_UCB:
00000004             0000                         .BLKL   1
                     0004                 .IIF    NB,CCB$L_WIND,  CCB$L_WIND:
00000008             0004                         .BLKL   1
                     0008                 .IIF    NB,CCB$B_STS,   CCB$B_STS:
00000009             0008                         .BLKB   1
                     0009                 .IIF    NB,CCB$B_AMOD,  CCB$B_AMOD:
0000000A             0009                         .BLKB   1
                     000A                 .IIF    NB,CCB$W_IOC,   CCB$W_IOC:
0000000C             000A                         .BLKW   1
                     000C                 .IIF    NB,CCB$L_DIRP,  CCB$L_DIRP:
00000010             000C                         .BLKL   1
                     0010                 .IIF    NB,CCB$C_LENGTH,        CCB$C_LENGTH:
                     0010                 .IIF    NB,CCB$K_LENGTH,        CCB$K_LENGTH:
                     0000                 .RESTORE
                     0000     57          $DDBDEF                         ;DEFINE DDB OFFSETS
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .PSECT  $ABS$,ABS
00000000             0010                 .=0
                     0000                 .IIF    NB,DDB$L_LINK,  DDB$L_LINK:
00000004             0000                         .BLKL   1
                     0004                 .IIF    NB,DDB$L_UCB,   DDB$L_UCB:
00000008             0004                         .BLKL   1
                     0008                 .IIF    NB,DDB$W_SIZE,  DDB$W_SIZE:
0000000A             0008                         .BLKW   1
                     000A                 .IIF    NB,DDB$B_TYPE,  DDB$B_TYPE:
0000000B             000A                         .BLKB   1
0000000C             000B                         .BLKB   1
                     000C                 .IIF    NB,DDB$L_DDT,   DDB$L_DDT:
00000010             000C                         .BLKL   1
                     0010                 .IIF    NB,DDB$L_ACPD,  DDB$L_ACPD:
00000013             0010                         .BLKB   3
                     0013                 .IIF    NB,DDB$B_ACPCLASS,      DDB$B_ACPCLASS:
00000014             0013                         .BLKB   1
                     0014                 .IIF    NB,DDB$T_NAME,  DDB$T_NAME:
00000015             0014                         .BLKB   1
00000024             0015                         .BLKB   15
                     0024                 .IIF    NB,DDB$T_DRVNAME,       DDB$T_DRVNAME:
00000025             0024                         .BLKB   1
00000034             0025                         .BLKB   15
                     0034                 .IIF    NB,DDB$C_LENGTH,        DDB$C_LENGTH:
                     0034                 .IIF    NB,DDB$K_LENGTH,        DDB$K_LENGTH:
                     0000                 .RESTORE
                     0000     58          $DDTDEF                         ;DEFINE DDT OFFSETS
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .PSECT  $ABS$,ABS
00000000             0034                 .=0
                     0000                 .IIF    NB,DDT$L_START, DDT$L_START:
00000004             0000                         .BLKL   1
                     0004                 .IIF    NB,DDT$L_UNSOLINT,      DDT$L_UNSOLINT:
00000008             0004                         .BLKL   1
                     0008                 .IIF    NB,DDT$L_FDT,   DDT$L_FDT:
0000000C             0008                         .BLKL   1
                     000C                 .IIF    NB,DDT$L_CANCEL,        DDT$L_CANCEL:
00000010             000C                         .BLKL   1
```

```
                        0010                .IIF    NB,DDT$L_REGDUMP,       DDT$L_REGDUMP:
00000014                0010                                .BLKL   1
                        0014                .IIF    NB,DDT$W_DIAGBUF,       DDT$W_DIAGBUF:
00000016                0014                                .BLKW   1
                        0016                .IIF    NB,DDT$W_ERRORBUF,      DDT$W_ERRORBUF:
00000018                0016                                .BLKW   1
                        0018                .IIF    NB,DDT$L_UNITINIT,      DDT$L_UNITINIT:
0000001C                0018                                .BLKL   1
                        001C                .IIF    NB,DDT$L_ALTSTART,      DDT$L_ALTSTART:
00000020                001C                                .BLKL   1
                        0000                .RESTORE
                        0000        59      $DEVDEF                         ;DEFINE DEVICE CHARACTERISTIC BITS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000                0034                .=0
                        0000                .RESTORE
                        0000        60      $DYNDEF                         ;DEFINE DATA STRUCTURE TYPE CODES
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000                0034                .=0
                        0000                .RESTORE
                        0000        61      $IODEF                          ;DEFINE I/O FUNCTION CODES
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000                0034                .=0
                        0000                .RESTORE
                        0000        62      $IPLDEF                         ;DEFINE INTERRUPT PRIORITY LEVELS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000                0034                .=0
                        0000                .RESTORE
                        0000        63      $IRPDEF                         ;DEFINE IRP OFFSETS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000                0034                .=0
                        0000                .IIF    NB,IRP$L_IOQFL, IRP$L_IOQFL:
00000004                0000                        .BLKL   1
                        0004                .IIF    NB,IRP$L_IOQBL, IRP$L_IOQBL:
00000008                0004                        .BLKL   1
                        0008                .IIF    NB,IRP$W_SIZE,  IRP$W_SIZE:
0000000A                0008                        .BLKW   1
                        000A                .IIF    NB,IRP$B_TYPE,  IRP$B_TYPE:
0000000B                000A                        .BLKB   1
                        000B                .IIF    NB,IRP$B_RMOD,  IRP$B_RMOD:
0000000C                000B                        .BLKB   1
                        000C                .IIF    NB,IRP$L_PID,   IRP$L_PID:
00000010                000C                        .BLKL   1
                        0010                .IIF    NB,IRP$L_AST,   IRP$L_AST:
00000014                0010                        .BLKL   1
                        0014                .IIF    NB,IRP$L_ASTPRM,        IRP$L_ASTPRM:
00000018                0014                        .BLKL   1
                        0018                .IIF    NB,IRP$L_WIND,  IRP$L_WIND:
0000001C                0018                        .BLKL   1
                        001C                .IIF    NB,IRP$L_UCB,   IRP$L_UCB:
00000020                001C                        .BLKL   1
                        0020                .IIF    NB,IRP$W_FUNC,  IRP$W_FUNC:
00000022                0020                        .BLKW   1
```

```
                        0022                .IIF    NB,IRP$B_EFN,   IRP$B_EFN:
00000023  0022                                      .BLKB   1
                        0023                .IIF    NB,IRP$B_PRI,   IRP$B_PRI:
00000024  0023                                      .BLKB   1
                        0024                .IIF    NB,IRP$L_IOSB,  IRP$L_IOSB:
00000028  0024                                      .BLKL   1
                        0028                .IIF    NB,IRP$W_CHAN,  IRP$W_CHAN:
0000002A  0028                                      .BLKW   1
                        002A                .IIF    NB,IRP$W_STS,   IRP$W_STS:
0000002C  002A                                      .BLKW   1
                        002C                .IIF    NB,IRP$L_SVAPTE,        IRP$L_SVAPTE:
00000030  002C                                      .BLKL   1
                        0030                .IIF    NB,IRP$W_BOFF,  IRP$W_BOFF:
00000032  0030                                      .BLKW   1
                        0032                .IIF    NB,IRP$W_BCNT,  IRP$W_BCNT:
00000034  0032                                      .BLKW   1
                        0034                .IIF    NB,IRP$L_IOST1, IRP$L_IOST1:
                        0034                .IIF    NB,IRP$L_MEDIA, IRP$L_MEDIA:
00000038  0034                                      .BLKL   1
                        0038                .IIF    NB,IRP$L_IOST2, IRP$L_IOST2:
                        0038                .IIF    NB,IRP$L_TT_TERM,       IRP$L_TT_TERM:
                        0038                .IIF    NB,IRP$B_CARCON,        IRP$B_CARCON:
00000039  0038                                      .BLKB   1
0000003C  0039                                      .BLKB   3
                        003C                .IIF    NB,IRP$Q_NT_PRVMSK,     IRP$Q_NT_PRVMSK:
                        003C                .IIF    NB,IRP$W_ABCNT, IRP$W_ABCNT:
                        003C                .IIF    NB,IRP$W_TT_PRMPT,      IRP$W_TT_PRMPT:
0000003E  003C                                      .BLKW   1
                        003E                .IIF    NB,IRP$W_OBCNT, IRP$W_OBCNT:
00000040  003E                                      .BLKW   1
                        0040                .IIF    NB,IRP$L_SEGVBN,        IRP$L_SEGVBN:
00000044  0040                                      .BLKL   1
                        0044                .IIF    NB,IRP$L_DIAGBUF,       IRP$L_DIAGBUF:
00000048  0044                                      .BLKL   1
                        0048                .IIF    NB,IRP$L_SEQNUM,        IRP$L_SEQNUM:
0000004C  0048                                      .BLKL   1
                        004C                .IIF    NB,IRP$L_EXTEND,        IRP$L_EXTEND:
00000050  004C                                      .BLKL   1
                        0050                .IIF    NB,IRP$L_ARB,   IRP$L_ARB:
00000054  0050                                      .BLKL   1
00000058  0054                                      .BLKL   1
0000005C  0058                                      .BLKL   1
                        005C                .IIF    NB,IRP$C_LENGTH,        IRP$C_LENGTH:
                        005C                .IIF    NB,IRP$K_LENGTH,        IRP$K_LENGTH:
                        0000                .RESTORE
                        0000    64          $PCBDEF                         ;DEFINE PCB OFFSETS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000  005C                              .=0
                        0000                .IIF    NB,PCB$L_SQFL,  PCB$L_SQFL:
00000004  0000                                      .BLKL   1
                        0004                .IIF    NB,PCB$L_SQBL,  PCB$L_SQBL:
00000008  0004                                      .BLKL   1
                        0008                .IIF    NB,PCB$W_SIZE,  PCB$W_SIZE:
0000000A  0008                                      .BLKW   1
                        000A                .IIF    NB,PCB$B_TYPE,  PCB$B_TYPE:
0000000B  000A                                      .BLKB   1
```

```
                    000B            .IIF    NB,PCB$B_PRI,   PCB$B_PRI:
0000000C  000B                              .BLKB   1
                    000C            .IIF    NB,PCB$B_ASTACT,        PCB$B_ASTACT:
0000000D  000C                              .BLKB   1
                    000D            .IIF    NB,PCB$B_ASTEN, PCB$B_ASTEN:
0000000E  000D                              .BLKB   1
                    000E            .IIF    NB,PCB$W_MTXCNT,        PCB$W_MTXCNT:
00000010  000E                              .BLKW   1
                    0010            .IIF    NB,PCB$L_ASTQFL,        PCB$L_ASTQFL:
00000014  0010                              .BLKL   1
                    0014            .IIF    NB,PCB$L_ASTQBL,        PCB$L_ASTQBL:
00000018  0014                              .BLKL   1
                    0018            .IIF    NB,PCB$L_PHYPCB,        PCB$L_PHYPCB:
0000001C  0018                              .BLKL   1
                    001C            .IIF    NB,PCB$L_OWNER, PCB$L_OWNER:
00000020  001C                              .BLKL   1
                    0020            .IIF    NB,PCB$L_WSSWP, PCB$L_WSSWP:
00000024  0020                              .BLKL   1
                    0024            .IIF    NB,PCB$L_STS,   PCB$L_STS:
00000028  0024                              .BLKL   1
                    0028            .IIF    NB,PCB$L_WTIME, PCB$L_WTIME:
0000002C  0028                              .BLKL   1
                    002C            .IIF    NB,PCB$W_STATE, PCB$W_STATE:
0000002E  002C                              .BLKW   1
                    002E            .IIF    NB,PCB$B_WEFC,  PCB$B_WEFC:
0000002F  002E                              .BLKB   1
                    002F            .IIF    NB,PCB$B_PRIB,  PCB$B_PRIB:
00000030  002F                              .BLKB   1
                    0030            .IIF    NB,PCB$W_APTCNT,        PCB$W_APTCNT:
00000032  0030                              .BLKW   1
                    0032            .IIF    NB,PCB$W_TMBU,  PCB$W_TMBU:
00000034  0032                              .BLKW   1
                    0034            .IIF    NB,PCB$W_GPGCNT,        PCB$W_GPGCNT:
00000036  0034                              .BLKW   1
                    0036            .IIF    NB,PCB$W_PPGCNT,        PCB$W_PPGCNT:
00000038  0036                              .BLKW   1
                    0038            .IIF    NB,PCB$W_ASTCNT,        PCB$W_ASTCNT:
0000003A  0038                              .BLKW   1
                    003A            .IIF    NB,PCB$W_BIOCNT,        PCB$W_BIOCNT:
0000003C  003A                              .BLKW   1
                    003C            .IIF    NB,PCB$W_BIOLM, PCB$W_BIOLM:
0000003E  003C                              .BLKW   1
                    003E            .IIF    NB,PCB$W_DIOCNT,        PCB$W_DIOCNT:
00000040  003E                              .BLKW   1
                    0040            .IIF    NB,PCB$W_DIOLM, PCB$W_DIOLM:
00000042  0040                              .BLKW   1
                    0042            .IIF    NB,PCB$W_PRCCNT,        PCB$W_PRCCNT:
00000044  0042                              .BLKW   1
                    0044            .IIF    NB,PCB$T_TERMINAL,      PCB$T_TERMINAL:
0000004C  0044                              .BLKB   8
                    004C            .IIF    NB,PCB$L_PQB,   PCB$L_PQB:
                    004C            .IIF    NB,PCB$L_EFWM,  PCB$L_EFWM:
00000050  004C                              .BLKL   1
                    0050            .IIF    NB,PCB$L_EFCS,  PCB$L_EFCS:
00000054  0050                              .BLKL   1
                    0054            .IIF    NB,PCB$L_EFCU,  PCB$L_EFCU:
00000058  0054                              .BLKL   1
```

```
                        0058                .IIF    NB,PCB$L_EFC2P, PCB$L_EFC2P:
0000005C                0058                        .BLKL   1
                        005C                .IIF    NB,PCB$L_EFC3P, PCB$L_EFC3P:
00000060                005C                        .BLKL   1
                        0060                .IIF    NB,PCB$L_PID,   PCB$L_PID:
00000064                0060                        .BLKL   1
                        0064                .IIF    NB,PCB$L_PHD,   PCB$L_PHD:
00000068                0064                        .BLKL   1
                        0068                .IIF    NB,PCB$T_LNAME, PCB$T_LNAME:
00000078                0068                        .BLKB   16
                        0078                .IIF    NB,PCB$L_JIB,   PCB$L_JIB:
0000007C                0078                        .BLKL   1
                        007C                .IIF    NB,PCB$Q_PRIV,  PCB$Q_PRIV:
00000084                007C                        .BLKQ   1
                        0084                .IIF    NB,PCB$L_ARB,   PCB$L_ARB:
00000088                0084                        .BLKL   1
                        0088                .IIF    NB,PCB$L_UIC,   PCB$L_UIC:
                        0088                .IIF    NB,PCB$W_MEM,   PCB$W_MEM:
0000008A                0088                        .BLKW   1
                        008A                .IIF    NB,PCB$W_GRP,   PCB$W_GRP:
0000008C                008A                        .BLKW   1
                        008C                .IIF    NB,PCB$C_LENGTH,        PCB$C_LENGTH:
                        008C                .IIF    NB,PCB$K_LENGTH,        PCB$K_LENGTH:
                        0000                .RESTORE
                        0000    65          $PRDEF                          ;DEFINE PROCESSOR REGISTERS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000                008C                .=0
                        0000                .RESTORE
                        0000    66          $RSNDEF                         ;DEFINE RESOURCE WAIT NUMBERS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000                008C                .=0
                        0000                .RESTORE
                        0000    67          $UCBDEF                         ;DEFINE UCB OFFSETS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000                008C                .=0
                        0000                .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                        0000                .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
00000004                0000                        .BLKL   1
                        0004                .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                        0004                .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
00000008                0004                        .BLKL   1
                        0008                .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
0000000A                0008                        .BLKW   1
                        000A                .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
0000000B                000A                        .BLKB   1
                        000B                .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
0000000C                000B                        .BLKB   1
                        000C                .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                        000C                .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                        000C                .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
0000000D                000C                        .BLKB   1
00000010                000D                        .BLKB   3
                        0010                .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                        0010                .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
```

```
00000014  0010                                  .BLKL   1
          0014                  .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
          0014                  .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
          0014                  .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
00000016  0014                                  .BLKW   1
          0016                  .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
00000018  0016                                  .BLKW   1
          0018                  .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
          0018                  .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
0000001A  0018                                  .BLKW   1
          001A                  .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
          001A                  .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
0000001C  001A                                  .BLKW   1
          001C                  .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
00000020  001C                                  .BLKL   1
          0020                  .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
00000024  0020                                  .BLKL   1
          0024                  .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
00000028  0024                                  .BLKL   1
          0028                  .IIF    NB,UCB$L_PID,   UCB$L_PID:
0000002C  0028                                  .BLKL   1
          002C                  .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
00000030  002C                                  .BLKL   1
          0030                  .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
00000034  0030                                  .BLKL   1
          0034                  .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
00000038  0034                                  .BLKL   1
          0038                  .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
00000039  0038                                  .BLKB   1
          0039                  .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
0000003A  0039                                  .BLKB   1
          003A                  .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
0000003C  003A                                  .BLKW   1
          003C                  .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
          003C                  .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
          003C                  .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
0000003D  003C                                  .BLKB   1
          003D                  .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
          003D                  .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
0000003E  003D                                  .BLKB   1
          003E                  .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
          003E                  .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
0000003F  003E                                  .BLKB   1
          003F                  .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
00000040  003F                                  .BLKB   1
          0040                  .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
00000044  0040                                  .BLKL   1
          0044                  .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
00000048  0044                                  .BLKL   1
          0048                  .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
0000004A  0048                                  .BLKW   1
          004A                  .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
          004A                  .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
0000004B  004A                                  .BLKB   1
          004B                  .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
0000004C  004B                                  .BLKB   1
          004C                  .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
```

```
00000050  004C                        .BLKL   1
                  0050      .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
00000052  0050                        .BLKW   1
                  0052      .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
                  0052      .IIF    NB,UCB$B_STATE, UCB$B_STATE:
00000053  0052                        .BLKB   1
                  0053      .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
00000054  0053                        .BLKB   1
                  0054      .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
00000058  0054                        .BLKL   1
                  0058      .IIF    NB,UCB$W_STS,   UCB$W_STS:
0000005A  0058                        .BLKW   1
                  005A      .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
0000005C  005A                        .BLKW   1
                  005C      .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
                  005C      .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
00000060  005C                        .BLKL   1
                  0060      .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
00000064  0060                        .BLKL   1
                  0064      .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
                  0064      .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
00000068  0064                        .BLKL   1
                  0068      .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
0000006C  0068                        .BLKL   1
                  006C      .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
0000006E  006C                        .BLKW   1
                  006E      .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
00000070  006E                        .BLKW   1
                  0070      .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
00000071  0070                        .BLKB   1
                  0071      .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
00000072  0071                        .BLKB   1
                  0072      .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074  0072                        .BLKW   1
                  0074      .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
                  0074      .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000  0074              . = 0
                  0000      .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002  0000                        .BLKW   1
00000074  0002              . = 116
                  0074      .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078  0074                        .BLKL   1
                  0078      .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C  0078                        .BLKL   1
                  007C      .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080  007C                        .BLKL   1
                  0080      .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084  0080                        .BLKL   1
                  0084      .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088  0084                        .BLKL   1
                  0088      .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C  0088                        .BLKL   1
                  008C      .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090  008C                        .BLKL   1
                  0090      .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
                  0090      .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074  0090              . = 116
```

```
                        0074            .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075  0074                                    .BLKB   1
                        0075            .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076  0075                                    .BLKB   1
                        0076            .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077  0076                                    .BLKB   1
                        0077            .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078  0077                                    .BLKB   1
                        0078            .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C  0078                                    .BLKL   1
0000007E  007C                                    .BLKW   1
                        007E            .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080  007E                                    .BLKW   1
                        0080            .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084  0080                                    .BLKL   1
00000080  0084          . = 128
00000084  0080                                    .BLKL   1
                        0084            .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088  0084                                    .BLKL   1
                        0088            .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A  0088                                    .BLKW   1
                        008A            .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C  008A                                    .BLKW   1
                        008C            .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
                        008C            .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E  008C                                    .BLKW   1
                        008E            .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090  008E                                    .BLKW   1
                        0090            .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092  0090                                    .BLKW   1
                        0092            .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
00000094  0092                                    .BLKW   1
                        0094            .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095  0094                                    .BLKB   1
                        0095            .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096  0095                                    .BLKB   1
                        0096            .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098  0096                                    .BLKW   1
00000096  0098          . = 150
00000098  0096                                    .BLKW   1
                        0098            .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C  0098                                    .BLKL   1
                        009C            .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0  009C                                    .BLKL   1
                        00A0            .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
000000A4  00A0                                    .BLKL   1
                        00A4            .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
000000A6  00A4                                    .BLKW   1
                        00A6            .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
000000A7  00A6                                    .BLKB   1
000000A8  00A7                                    .BLKB   1
00000074  00A8          . = 116
00000078  0074                                    .BLKL   1
0000007C  0078                                    .BLKL   1
00000080  007C                                    .BLKL   1
00000084  0080                                    .BLKL   1
00000088  0084                                    .BLKL   1
```

```
0000008C  0088                                  .BLKL   1
          008C                  .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
00000090  008C                                  .BLKL   1
00000094  0090                                  .BLKL   1
00000098  0094                                  .BLKL   1
0000009C  0098                                  .BLKL   1
          009C                  .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
0000009D  009C                                  .BLKB   1
          009D                  .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
0000009E  009D                                  .BLKB   1
          009E                  .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
0000009F  009E                                  .BLKB   1
000000A0  009F                                  .BLKB   1
          00A0                  .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
000000A1  00A0                                  .BLKB   1
          00A1                  .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
000000A2  00A1                                  .BLKB   1
          00A2                  .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
000000A3  00A2                                  .BLKB   1
000000A4  00A3                                  .BLKB   1
          00A4                  .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
000000A5  00A4                                  .BLKB   1
          00A5                  .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
000000A7  00A5                                  .BLKW   1
000000A8  00A7                                  .BLKB   1
          00A8                  .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
000000AC  00A8                                  .BLKL   1
000000B0  00AC                                  .BLKL   1
000000B4  00B0                                  .BLKL   1
000000B8  00B4                                  .BLKL   1
          00B8                  .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
000000BC  00B8                                  .BLKL   1
          00BC                  .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
          00BC                  .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
00000074  00BC                  . = 116
          0074                  .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
00000078  0074                                  .BLKL   1
          0078                  .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
0000007C  0078                                  .BLKL   1
          007C                  .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
0000007E  007C                                  .BLKW   1
00000080  007E                                  .BLKW   1
          0000                  .RESTORE
          0000     68           $VCBDEF                         ;DEFINE VCB OFFSETS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  00BC                  .=0
          0000                  .IIF    NB,VCB$L_FCBFL, VCB$L_FCBFL:
00000004  0000                                  .BLKL   1
          0004                  .IIF    NB,VCB$L_FCBBL, VCB$L_FCBBL:
00000008  0004                                  .BLKL   1
          0008                  .IIF    NB,VCB$W_SIZE,  VCB$W_SIZE:
0000000A  0008                                  .BLKW   1
          000A                  .IIF    NB,VCB$B_TYPE,  VCB$B_TYPE:
0000000B  000A                                  .BLKB   1
          000B                  .IIF    NB,VCB$C_MRKLEN,        VCB$C_MRKLEN:
          000B                  .IIF    NB,VCB$K_MRKLEN,        VCB$K_MRKLEN:
```

```
                    000B            .IIF    NB,VCB$B_STATUS,        VCB$B_STATUS:
0000000C  000B                              .BLKB   1
                    000C            .IIF    NB,VCB$W_TRANS, VCB$W_TRANS:
0000000E  000C                              .BLKW   1
                    000E            .IIF    NB,VCB$W_RVN,   VCB$W_RVN:
00000010  000E                              .BLKW   1
                    0010            .IIF    NB,VCB$L_AQB,   VCB$L_AQB:
00000014  0010                              .BLKL   1
                    0014            .IIF    NB,VCB$T_VOLNAME,       VCB$T_VOLNAME:
00000020  0014                              .BLKB   12
                    0020            .IIF    NB,VCB$L_RVT,   VCB$L_RVT:
00000024  0020                              .BLKL   1
                    0024            .IIF    NB,VCB$C_COMLEN,        VCB$C_COMLEN:
                    0024            .IIF    NB,VCB$K_COMLEN,        VCB$K_COMLEN:
                    0024            .IIF    NB,VCB$L_HOMELBN,       VCB$L_HOMELBN:
00000028  0024                              .BLKL   1
                    0028            .IIF    NB,VCB$L_HOME2LBN,      VCB$L_HOME2LBN:
0000002C  0028                              .BLKL   1
                    002C            .IIF    NB,VCB$L_IXHDR2LBN,     VCB$L_IXHDR2LBN:
00000030  002C                              .BLKL   1
                    0030            .IIF    NB,VCB$L_IBMAPLBN,      VCB$L_IBMAPLBN:
00000034  0030                              .BLKL   1
                    0034            .IIF    NB,VCB$L_SBMAPLBN,      VCB$L_SBMAPLBN:
00000038  0034                              .BLKL   1
                    0038            .IIF    NB,VCB$B_IBMAPSIZE,     VCB$B_IBMAPSIZE:
00000039  0038                              .BLKB   1
                    0039            .IIF    NB,VCB$B_SBMAPSIZE,     VCB$B_SBMAPSIZE:
0000003A  0039                              .BLKB   1
                    003A            .IIF    NB,VCB$B_IBMAPVBN,      VCB$B_IBMAPVBN:
0000003B  003A                              .BLKB   1
                    003B            .IIF    NB,VCB$B_SBMAPVBN,      VCB$B_SBMAPVBN:
0000003C  003B                              .BLKB   1
                    003C            .IIF    NB,VCB$W_CLUSTER,       VCB$W_CLUSTER:
0000003E  003C                              .BLKW   1
                    003E            .IIF    NB,VCB$W_EXTEND,        VCB$W_EXTEND:
00000040  003E                              .BLKW   1
                    0040            .IIF    NB,VCB$L_FREE,  VCB$L_FREE:
00000044  0040                              .BLKL   1
                    0044            .IIF    NB,VCB$L_MAXFILES,      VCB$L_MAXFILES:
00000048  0044                              .BLKL   1
                    0048            .IIF    NB,VCB$B_WINDOW,        VCB$B_WINDOW:
00000049  0048                              .BLKB   1
                    0049            .IIF    NB,VCB$B_LRU_LIM,       VCB$B_LRU_LIM:
0000004A  0049                              .BLKB   1
                    004A            .IIF    NB,VCB$W_FILEPROT,      VCB$W_FILEPROT:
0000004C  004A                              .BLKW   1
                    004C            .IIF    NB,VCB$W_MCOUNT,        VCB$W_MCOUNT:
0000004E  004C                              .BLKW   1
                    004E            .IIF    NB,VCB$B_EOFDELTA,      VCB$B_EOFDELTA:
0000004F  004E                              .BLKB   1
                    004F            .IIF    NB,VCB$B_RESFILES,      VCB$B_RESFILES:
00000050  004F                              .BLKB   1
                    0050            .IIF    NB,VCB$W_RECORDSZ,      VCB$W_RECORDSZ:
00000052  0050                              .BLKW   1
                    0052            .IIF    NB,VCB$B_BLOCKFACT,     VCB$B_BLOCKFACT:
00000053  0052                              .BLKB   1
                    0053            .IIF    NB,VCB$B_STATUS2,       VCB$B_STATUS2:
```

```
00000054  0053                                  .BLKB   1
          0054                  .IIF    NB,VCB$L_QUOTAFCB,      VCB$L_QUOTAFCB:
00000058  0054                                  .BLKL   1
          0058                  .IIF    NB,VCB$L_CACHE, VCB$L_CACHE:
0000005C  0058                                  .BLKL   1
          005C                  .IIF    NB,VCB$L_QUOCACHE,      VCB$L_QUOCACHE:
00000060  005C                                  .BLKL   1
          0060                  .IIF    NB,VCB$W_QUOSIZE,       VCB$W_QUOSIZE:
00000062  0060                                  .BLKW   1
          0062                  .IIF    NB,VCB$W_PENDERR,       VCB$W_PENDERR:
00000064  0062                                  .BLKW   1
          0064                  .IIF    NB,VCB$C_LENGTH,        VCB$C_LENGTH:
          0064                  .IIF    NB,VCB$K_LENGTH,        VCB$K_LENGTH:
00000000  0064                  . = 0
          0000                  .IIF    NB,VCB$L_BLOCKFL,       VCB$L_BLOCKFL:
00000004  0000                                  .BLKL   1
          0004                  .IIF    NB,VCB$L_BLOCKBL,       VCB$L_BLOCKBL:
00000008  0004                                  .BLKL   1
0000000B  0008                  . = 11
00000024  000B                  . = 36
          0024                  .IIF    NB,VCB$L_CUR_FID,       VCB$L_CUR_FID:
          0024                  .IIF    NB,VCB$W_CUR_NUM,       VCB$W_CUR_NUM:
00000026  0024                                  .BLKW   1
          0026                  .IIF    NB,VCB$W_CUR_SEQ,       VCB$W_CUR_SEQ:
00000028  0026                                  .BLKW   1
          0028                  .IIF    NB,VCB$L_START_FID,     VCB$L_START_FID:
          0028                  .IIF    NB,VCB$W_START_NUM,     VCB$W_START_NUM:
0000002A  0028                                  .BLKW   1
          002A                  .IIF    NB,VCB$W_START_SEQ,     VCB$W_START_SEQ:
0000002C  002A                                  .BLKW   1
          002C                  .IIF    NB,VCB$W_MODE,  VCB$W_MODE:
0000002E  002C                                  .BLKW   1
          002E                  .IIF    NB,VCB$B_TM,    VCB$B_TM:
0000002F  002E                                  .BLKB   1
          002F                  .IIF    NB,VCB$B_CUR_RVN,       VCB$B_CUR_RVN:
00000030  002F                                  .BLKB   1
          0030                  .IIF    NB,VCB$L_ST_RECORD,     VCB$L_ST_RECORD:
00000034  0030                                  .BLKL   1
          0034                  .IIF    NB,VCB$L_MVL,   VCB$L_MVL:
00000038  0034                                  .BLKL   1
          0038                  .IIF    NB,VCB$L_WCB,   VCB$L_WCB:
0000003C  0038                                  .BLKL   1
          003C                  .IIF    NB,VCB$L_VPFL,  VCB$L_VPFL:
00000040  003C                                  .BLKL   1
          0040                  .IIF    NB,VCB$L_VPBL,  VCB$L_VPBL:
00000044  0040                                  .BLKL   1
          0044                  .IIF    NB,VCB$L_USRLBLAST,     VCB$L_USRLBLAST:
00000048  0044                                  .BLKL   1
0000000B  0048                  . = 11
          000B                  .IIF    NB,VCB$B_QNAMECNT,      VCB$B_QNAMECNT:
0000000C  000B                                  .BLKB   1
          000C                  .IIF    NB,VCB$T_QNAME, VCB$T_QNAME:
00000020  000C                                  .BLKB   20
          0000                  .RESTORE
          0000      69          $WCBDEF                         ;DEFINE WCB OFFSETS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
```

```
                    00000000  00BC              .=0
                              0000              .IIF    NB,WCB$L_WLFL,  WCB$L_WLFL:
                    00000004  0000                              .BLKL   1
                              0004              .IIF    NB,WCB$L_WLBL,  WCB$L_WLBL:
                    00000008  0004                              .BLKL   1
                              0008              .IIF    NB,WCB$W_SIZE,  WCB$W_SIZE:
                    0000000A  0008                              .BLKW   1
                              000A              .IIF    NB,WCB$B_TYPE,  WCB$B_TYPE:
                    0000000B  000A                              .BLKB   1
                              000B              .IIF    NB,WCB$B_ACCESS,        WCB$B_ACCESS:
                    0000000C  000B                              .BLKB   1
                              000C              .IIF    NB,WCB$L_PID,   WCB$L_PID:
                    0000000E  000C                              .BLKB   2
                              000E              .IIF    NB,WCB$W_REFCNT,        WCB$W_REFCNT:
                    00000010  000E                              .BLKW   1
                              0010              .IIF    NB,WCB$L_ORGUCB,        WCB$L_ORGUCB:
                    00000014  0010                              .BLKL   1
                              0014              .IIF    NB,WCB$W_ACON,  WCB$W_ACON:
                    00000016  0014                              .BLKW   1
                              0016              .IIF    NB,WCB$W_NMAP,  WCB$W_NMAP:
                    00000018  0016                              .BLKW   1
                              0018              .IIF    NB,WCB$L_FCB,   WCB$L_FCB:
                    0000001C  0018                              .BLKL   1
                              001C              .IIF    NB,WCB$L_RVT,   WCB$L_RVT:
                    00000020  001C                              .BLKL   1
                              0020              .IIF    NB,WCB$L_STVBN, WCB$L_STVBN:
                    00000024  0020                              .BLKL   1
                              0024              .IIF    NB,WCB$C_MAP,   WCB$C_MAP:
                              0024              .IIF    NB,WCB$K_MAP,   WCB$K_MAP:
                              0024              .IIF    NB,WCB$C_LENGTH,        WCB$C_LENGTH:
                              0024              .IIF    NB,WCB$K_LENGTH,        WCB$K_LENGTH:
                              0024              .IIF    NB,WCB$W_P1_COUNT,      WCB$W_P1_COUNT:
                    00000026  0024                              .BLKW   1
                              0026              .IIF    NB,WCB$L_P1_LBN,        WCB$L_P1_LBN:
                    0000002A  0026                              .BLKL   1
                              002A              .IIF    NB,WCB$W_P2_COUNT,      WCB$W_P2_COUNT:
                    0000002C  002A                              .BLKW   1
                              002C              .IIF    NB,WCB$L_P2_LBN,        WCB$L_P2_LBN:
                    00000030  002C                              .BLKL   1
                    00000000  0030              . = 0
                              0000              .IIF    NB,WCB$W_COUNT, WCB$W_COUNT:
                    00000002  0000                              .BLKW   1
                              0002              .IIF    NB,WCB$L_LBN,   WCB$L_LBN:
                    00000006  0002                              .BLKL   1
                    00000000  0006              . = 0
                    FFFFFFFA  0000                              .BLKB   -6
                              FFFA              .IIF    NB,WCB$W_PREVCOUNT,     WCB$W_PREVCOUNT:
                    FFFFFFFC  FFFA                              .BLKW   1
                              FFFC              .IIF    NB,WCB$L_PREVLBN,       WCB$L_PREVLBN:
                    00000000  FFFC                              .BLKL   1
                              0000              .RESTORE
                              0000      70
                              0000      71 ;
                              0000      72 ; LOCAL SYMBOLS
                              0000      73 ;
                              0000      74 ; ARGUMENT LIST OFFSET DEFINITIONS
                              0000      75 ;
```

```
                          0000    76
                  00000004  0000    77 CHAN=4                                   ;I/O CHANNEL NUMBER
                        00000000    78          .PSECT  SEP,    SHR,    EXE,    WRT,    LONG
                          0000    79          MODNAM  CANCEL
        4C 45 43 4E 41 43 00' 0000       $MODULE:        .ASCIC  \CANCEL\
                        06  0000
```

```
                                0007     81          .SBTTL  CANCEL I/O ON CHANNEL
                                0007     82 ;+
                                0007     83 ; EXE$CANCEL - CANCEL I/O ON CHANNEL
                                0007     84 ;
                                0007     85 ; THIS SERVICE CANCELS ALL I/O ISSUED TO A DEVICE FORM THE SPECIFIED CHANNEL.
                                0007     86 ;
                                0007     87 ; INPUTS:
                                0007     88 ;
                                0007     89 ;       CHAN(AP) = NUMBER OF THE I/O CHANNEL TO CANCEL I/O FOR.
                                0007     90 ;
                                0007     91 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                                0007     92 ;
                                0007     93 ; OUTPUTS:
                                0007     94 ;
                                0007     95 ;       R0 LOW BIT CLEAR INDICATES FAILURE TO CANCEL I/O.
                                0007     96 ;
                                0007     97 ;               SS$_EXQUOTA - DIRECT I/O QUOTA EXCEEDED WHILE TRYING TO
                                0007     98 ;                       CANCEL FILE I/O.
                                0007     99 ;
                                0007    100 ;               SS$_INSFMEM - INSUFFICIENT MEMORY AVAILABLE TO ALLOCATE I/O
                                0007    101 ;                       PACKET.
                                0007    102 ;
                                0007    103 ;               SS$_IVCHAN - INVALID CHANNEL NUMBER SPECIFIED.
                                0007    104 ;
                                0007    105 ;               SS$_NOPRIV - SPECIFIED CHANNEL IS NOT ASSIGNED TO A DEVICE
                                0007    106 ;                       OR THE CALLER DOES NOT HAVE SUFFICIENT PRIVILEGE TO
                                0007    107 ;                       ACCESS THE CHANNEL.
                                0007    108 ;
                                0007    109 ;       R0 LOW BIT SET INDICATES SUCCESSFUL COMPLETION.
                                0007    110 ;
                                0007    111 ;               SS$_NORMAL - NORMAL COMPLETION.
                                0007    112 ;-
                                0007    113
                          00FC  0007    114          .ENTRY  EXE$CANCEL,^M<R2,R3,R4,R5,R6,R7>
54  00000000'EF     9E    0009    115          MOVAB   DS$AX_SOFTPCB,R4        ;SOFTWARE PCB TO R4
    50     04 AC    3C    0010    116          MOVZWL  CHAN(AP),R0             ;GET I/O CHANNEL NUMBER
    00000000'EF     16    0014    117          JSB     IOC$VERIFYCHAN          ;VERIFY I/O CHANNEL NUMBER
           60 50    E9    001A    118          BLBC    R0,50$                  ;IF LBC INVALID CHANNEL
        57    52    D0    001D    119          MOVL    R2,R7                   ;SAVE CHANNEL INDEX
        56    51    D0    0020    120          MOVL    R1,R6                   ;SAVE ADDRESS OF CCB
        55    66    D0    0023    121          MOVL    CCB$L_UCB(R6),R5        ;GET ASSIGNED DEVICE UCB ADDRESS
              7E    DC    0026    122 10$:     MOVPSL  -(SP)                   ;SAVE CURRENT PROCESSOR STATUS
                    DA    0028    123          SETIPL  #IPL$_ASTDEL            ;RAISE TO AST DELIVERY LEVEL
                                                        MTPR    #IPL$_ASTDEL,S^#PR$_IPL
        12    02    DA    0028
           0A A6    B5    002B    124          TSTW    CCB$W_IOC(R6)           ;ANY I/O OUTSTANDING?
              51    13    002E    125          BEQL    60$                     ;IF EQL NO
        53    40 A5    9E    0030    126          MOVAB   UCB$L_IOQFL(R5),R3      ;GET ADDRESS OF I/O QUEUE LISTHEAD
           52    53    D0    0034    127          MOVL    R3,R2                   ;COPY ADDRESS OF I/O QUEUE LISTHEAD
                       0037    128          SETIPL  UCB$B_FIPL(R5)          ;RAISE TO DRIVER FORK IPL
        12    0B A5    DA    0037
                                                        MTPR    UCB$B_FIPL(R5),S^#PR$_IPL
           52    62    D0    003B    129 20$:     MOVL    IRP$L_IOQFL(R2),R2      ;GET ADDRESS OF NEXT I/O PACKET IN QUEUE
           53    52    D1    003E    130          CMPL    R2,R3                   ;END OF QUEUE?
              3E    13    0041    131          BEQL    60$                     ;IF EQL YES
    F3 2A A2    04    E0    0043    132          BBS     #IRP$V_VIRTUAL,IRP$W_STS(R2),20$ ;IF SET, VIRTUAL I/O REQUEST
    60 A4    0C A2    D1    0048    133          CMPL    IRP$L_PID(R2),PCB$L_PID(R4) ;PROCESS ID MATCH?
              EC    12    004D    134          BNEQ    20$                     ;IF NEQ NO
        28 A2    57    B1    004F    135          CMPW    R7,IRP$W_CHAN(R2)       ;I/O CHANNEL NUMBER MATCH?
```

```
                     E6   12  0053   136          BNEQ    20$                             ;IF NEQ NO
                  52   04 A2  D0  0055   137          MOVL    IRP$L_IOQBL(R2),R2              ;GET BACKWARD LINK OF CURRENT ENTRY
                  51   00 B2  0F  0059   138          REMQUE  @IRP$L_IOQFL(R2),R1             ;REMOVE I/O PACKET FROM QUEUE
               04 2A A1   00  E1  005D   139          BBC     #IRP$V_BUFIO,IRP$W_STS(R1),30$ ;IF CLR, DIRECT I/O REQUEST
               2A A1   02  AA  0062   140          BICW    #IRP$M_FUNC,IRP$W_STS(R1) ;CLEAR BUFFERED READ
            34 A1   0000'8F  3C  0066   141 30$:    MOVZWL  #SS$_CANCEL,IRP$L_MEDIA(R1) ;SET COMPLETION STATUS
         00000000'FF   61  0E  006C   142          INSQUE  IRP$L_IOQFL(R1),@L^IOC$GL_PSBL ;INSERT PACKET IN POST PROCESS QUEUE
                     C6   12  0073   143          BNEQ    20$                             ;IF NEQ NOT FIRST ENTRY IN QUEUE
                          0075   144          SOFTINT #IPL$_IOPOST                    ;INITIATE SOFTWARE INTERRUPT
                  14   04  DA  0075                       MTPR    #IPL$_IOPOST,S^#PR$_SIRR
                     C1   11  0078   145          BRB     20$                             ;
                  50   00' 3C  007A   146 40$:    MOVZWL  S^#SS$_NORMAL,R0                ;SET NORMAL COMPLETION STATUS
                          007D   147 50$:    SETIPL  #0                              ;ALLOW INTERRUPTS
                  12   00  DA  007D                       MTPR    #0,S^#PR$_IPL
                          0080   148          RET                                     ;
                          0081   149 60$:    SETIPL  UCB$B_FIPL(R5)                  ;RAISE TO DRIVER FORK LEVEL
               12   0B A5  DA  0081                       MTPR    UCB$B_FIPL(R5),S^#PR$_IPL
               50   24 A5  D0  0085   150          MOVL    UCB$L_DDB(R5),R0                ;GET ADDRESS OF DDB
               50   0C A0  D0  0089   151          MOVL    DDB$L_DDT(R0),R0                ;GET ADDRESS OF DDT
               53   4C A5  D0  008D   152          MOVL    UCB$L_IRP(R5),R3                ;GET CURRENT I/O PACKET ADDRESS
                  52   57  D0  0091   153          MOVL    R7,R2                           ;SET CHANNEL INDEX
               51   0C A0  D0  0094   154          MOVL    DDT$L_CANCEL(R0),R1             ;GET ADDRESS OF CANCEL I/O ENTRY POINT
                     E3   13  0098   155          BEQL    50$                             ;IF EQL NONE
               03 51   10  E0  009A   156          BBS     #16,R1,70$                      ;++++ BRANCH IF SUPERVISOR ABSOLUTE
                  51   50  C0  009E   157          ADDL    R0,R1                           ;++++ OFFSET BY DDT BASE
                     61   16  00A1   158 70$:    JSB     (R1)                            ;CALL CANCEL I/O ROUTINE
               50   0A A6  3C  00A3   159          MOVZWL  CCB$W_IOC(R6),R0                ;GET OUTSTANDING I/O COUNT
               50   04 A6  C8  00A7   160          BISL    CCB$L_WIND(R6),R0               ;OUTSTANDING I/O OR FILE ACTIVITY?
                     CD   13  00AB   161          BEQL    40$                             ;IF EQL NO
            C8 34 A5   13  E1  00AD   162          BBC     #DEV$V_MNT,UCB$L_DEVCHAR(R5),40$ ;IF CLR, DEVICE DISMOUNTED
            C3 34 A5   18  E0  00B2   163          BBS     #DEV$V_FOR,UCB$L_DEVCHAR(R5),40$ ;IF SET, MOUNTED FOREIGN
               51   5C 8F  9A  00B7   164          MOVZBL  #IRP$C_LENGTH,R1                ;SET LENGTH OF I/O PACKET
             00000000'EF   16  00BB   165          JSB     EXE$ALONONPAGED                 ;ALLOCATE I/O PACKET                    [04]
                     0B 50  E8  00C1   166          BLBS    R0,100$                         ;IF LBS SUCCESSFUL ALLOCATION
            51   0000'8F   3C  00C4   167          MOVZWL  #SS$_INSFMEM,R1                 ;SET INSUFFICIENT MEMORY STATUS
                  50   03  3C  00C9   168          MOVZWL  #RSN$_NPDYNMEM,R0               ;SET NONPAGED DYNAMIC MEMORY RESOURCE NUMBER
                     FF57   31  00CC   169 90$:    BRW     10$
                        3A A4  B7  00CF   170 100$:   DECW    PCB$W_BIOCNT(R4)                ;UPDATE BUFFERED I/O COUNT
                        0A A6  B6  00D2   171          INCW    CCB$W_IOC(R6)                   ;INCREMENT I/O COUNT
                  53   52  D0  00D5   172          MOVL    R2,R3                           ;COPY ADDRESS OF I/O PACKET
                  52   08  C0  00D8   173          ADDL    #IRP$W_SIZE,R2                  ;CALCULATE ADDRESS OF PACKET SIZE
               82   5C 8F  9B  00DB   174          MOVZBW  #IRP$C_LENGTH,(R2)+             ;INSERT SIZE OF I/O REQUEST PACKET
                  82   0A  9B  00DF   175          MOVZBW  #DYN$C_IRP,(R2)+                ;INSERT DATA STRUCTURE TYPE AND ZERO MODE
               82   60 A4  D0  00E2   176          MOVL    PCB$L_PID(R4),(R2)+             ;INSERT CURRENT PROCESS ID
                     82   7C  00E6   177          CLRQ    (R2)+                           ;CLEAR AST ADDRESS AND PARAMETER
               82   04 A6  D0  00E8   178          MOVL    CCB$L_WIND(R6),(R2)+            ;INSERT ADDRESS OF WINDOW
                  82   55  D0  00EC   179          MOVL    R5,(R2)+                        ;INSERT DEVICE UCB ADDRESS
                  82   38  B0  00EF   180          MOVW    #IO$_ACPCONTROL,(R2)+           ;INSERT I/O FUNCTION CODE
                  82   1F  90  00F2   181          MOVB    #31,(R2)+                       ;SET EVENT FLAG NUMBER
                  82   00  90  00F5   182          MOVB    #0,(R2)+                        ;INSERT PROCESS BASE PRIORITY
                     82   D4  00F8   183          CLRL    (R2)+                           ;CLEAR I/O STATUS BLOCK ADDRESS
                  82   57  3C  00FA   184          MOVZWL  R7,(R2)+                        ;INSERT CHANNEL NUMBER AND CLEAR STATUS
                     82   7C  00FD   185          CLRQ    (R2)+                           ;CLEAR BUFFER PARAMETERS
               50   30 A5  D0  00FF   186          MOVL    UCB$L_VCB(R5),R0                ;GET ADDRESS OF VCB
                     0C A0  B6  0103   187          INCW    VCB$W_TRANS(R0)                 ;UPDATE TRANSACTION COUNT
                          0106   188
                          0106   189
```

```
                    FEF7'  31  0106   190          BRW     EXE$QIOACPPKT           ;QUEUE ACP PACKET
                               0109   191
                               0109   192          .END
```

```
$ER                             = 00000001    D
$MODULE                           00000000 R  D  02
CCB$B_AMOD                        00000009    D
CCB$B_STS                         00000008    D
CCB$C_LENGTH                      00000010    D
CCB$K_LENGTH                      00000010    D
CCB$L_DIRP                        0000000C    D
CCB$L_UCB                         00000000    D
CCB$L_WIND                        00000004    D
CCB$W_IOC                         0000000A    D
CHAN                            = 00000004    D
DDB$B_ACPCLASS                    00000013    D
DDB$B_TYPE                        0000000A    D
DDB$C_LENGTH                      00000034    D
DDB$K_LENGTH                      00000034    D
DDB$L_ACPD                        00000010    D
DDB$L_DDT                         0000000C    D
DDB$L_LINK                        00000000    D
DDB$L_UCB                         00000004    D
DDB$T_DRVNAME                     00000024    D
DDB$T_NAME                        00000014    D
DDB$W_SIZE                        00000008    D
DDT$L_ALTSTART                    0000001C    D
DDT$L_CANCEL                      0000000C    D
DDT$L_FDT                         00000008    D
DDT$L_REGDUMP                     00000010    D
DDT$L_START                       00000000    D
DDT$L_UNITINIT                    00000018    D
DDT$L_UNSOLINT                    00000004    D
DDT$W_DIAGBUF                     00000014    D
DDT$W_ERRORBUF                    00000016    D
DEV$V_FOR                       = 00000018    D
DEV$V_MNT                       = 00000013    D
DS$AX_SOFTPCB                     ********    X    02
DYN$C_IRP                       = 0000000A    D
EXE$ALONONPAGED                   ********    X    02
EXE$CANCEL                        00000007 RG D    02
EXE$QIOACPPKT                     ********    X    02
IO$_ACPCONTROL                  = 00000038    D
IOC$GL_PSBL                       ********    X    02
IOC$VERIFYCHAN                    ********    X    02
IPL$_ASTDEL                     = 00000002    D
IPL$_IOPOST                     = 00000004    D
IRP$B_CARCON                      00000038    D
IRP$B_EFN                         00000022    D
IRP$B_PRI                         00000023    D
IRP$B_RMOD                        0000000B    D
IRP$B_TYPE                        0000000A    D
IRP$C_LENGTH                      0000005C    D
IRP$K_LENGTH                      0000005C    D
IRP$L_ARB                         00000050    D
IRP$L_AST                         00000010    D
IRP$L_ASTPRM                      00000014    D
IRP$L_DIAGBUF                     00000044    D
IRP$L_EXTEND                      0000004C    D
IRP$L_IOQBL                       00000004    D
IRP$L_IOQFL                       00000000    D
IRP$L_IOSB                        00000024    D
IRP$L_IOST1                       00000034    D
IRP$L_IOST2                       00000038    D
IRP$L_MEDIA                       00000034    D
IRP$L_PID                         0000000C    D
IRP$L_SEGVBN                      00000040    D
IRP$L_SEQNUM                      00000048    D
IRP$L_SVAPTE                      0000002C    D
IRP$L_TT_TERM                     00000038    D
IRP$L_UCB                         0000001C    D
IRP$L_WIND                        00000018    D
IRP$M_FUNC                    = 00000002    D
IRP$Q_NT_PRVMSK                   0000003C    D
IRP$V_BUFIO                   = 00000000    D
IRP$V_VIRTUAL                 = 00000004    D
IRP$W_ABCNT                       0000003C    D
IRP$W_BCNT                        00000032    D
IRP$W_BOFF                        00000030    D
IRP$W_CHAN                        00000028    D
IRP$W_FUNC                        00000020    D
IRP$W_OBCNT                       0000003E    D
IRP$W_SIZE                        00000008    D
IRP$W_STS                         0000002A    D
IRP$W_TT_PRMPT                    0000003C    D
PCB$B_ASTACT                      0000000C    D
PCB$B_ASTEN                       0000000D    D
PCB$B_PRI                         0000000B    D
PCB$B_PRIB                        0000002F    D
PCB$B_TYPE                        0000000A    D
PCB$B_WEFC                        0000002E    D
PCB$C_LENGTH                      0000008C    D
PCB$K_LENGTH                      0000008C    D
PCB$L_ARB                         00000084    D
PCB$L_ASTQBL                      00000014    D
PCB$L_ASTQFL                      00000010    D
PCB$L_EFC2P                       00000058    D
PCB$L_EFC3P                       0000005C    D
PCB$L_EFCS                        00000050    D
PCB$L_EFCU                        00000054    D
PCB$L_EFWM                        0000004C    D
PCB$L_JIB                         00000078    D
PCB$L_OWNER                       0000001C    D
PCB$L_PHD                         00000064    D
PCB$L_PHYPCB                      00000018    D
PCB$L_PID                         00000060    D
PCB$L_PQB                         0000004C    D
PCB$L_SQBL                        00000004    D
PCB$L_SQFL                        00000000    D
PCB$L_STS                         00000024    D
PCB$L_UIC                         00000088    D
PCB$L_WSSWP                       00000020    D
PCB$L_WTIME                       00000028    D
PCB$Q_PRIV                        0000007C    D
PCB$T_LNAME                       00000068    D
PCB$T_TERMINAL                    00000044    D
PCB$W_APTCNT                      00000030    D
PCB$W_ASTCNT                      00000038    D
```

PCB$W_BIOCNT	0000003A	D		UCB$L_ASTQBL	00000010	D
PCB$W_BIOLM	0000003C	D		UCB$L_ASTQFL	0000000C	D
PCB$W_DIOCNT	0000003E	D		UCB$L_CPID	0000005C	D
PCB$W_DIOLM	00000040	D		UCB$L_CRB	00000020	D
PCB$W_GPGCNT	00000034	D		UCB$L_DDB	00000024	D
PCB$W_GRP	0000008A	D		UCB$L_DEVCHAR	00000034	D
PCB$W_MEM	00000088	D		UCB$L_DEVDEPEND	0000003C	D
PCB$W_MTXCNT	0000000E	D		UCB$L_DPC	00000080	D
PCB$W_PPGCNT	00000036	D		UCB$L_DUETIM	0000005C	D
PCB$W_PRCCNT	00000042	D		UCB$L_DX_BFPNT	0000009C	D
PCB$W_SIZE	00000008	D		UCB$L_DX_BUF	00000098	D
PCB$W_STATE	0000002C	D		UCB$L_DX_RXDB	000000A0	D
PCB$W_TMBU	00000032	D		UCB$L_EMB	00000078	D
PR$_IPL	= 00000012	D		UCB$L_FIRST	00000014	D
PR$_SIRR	= 00000014	D		UCB$L_FPC	0000000C	D
RSN$_NPDYNMEM	= 00000003	D		UCB$L_FQBL	00000004	D
SIZ...	= 00000001	D		UCB$L_FQFL	00000000	D
SS$_CANCEL	********	X	02	UCB$L_FR3	00000010	D
SS$_INSFMEM	********	X	02	UCB$L_FR4	00000014	D
SS$_NORMAL	********	X	02	UCB$L_IOQBL	00000044	D
UCB$B_AMOD	00000053	D		UCB$L_IOQFL	00000040	D
UCB$B_CEX	00000077	D		UCB$L_IRP	0000004C	D
UCB$B_CM1	0000004A	D		UCB$L_LINK	0000002C	D
UCB$B_CM2	0000004B	D		UCB$L_LOGADR	00000064	D
UCB$B_DEVCLASS	00000038	D		UCB$L_MAXBLOCK	00000084	D
UCB$B_DEVTYPE	00000039	D		UCB$L_MB_MBX	0000007C	D
UCB$B_DIPL	00000052	D		UCB$L_MB_PORT	0000008C	D
UCB$B_DX_SCTCNT	000000A6	D		UCB$L_MB_RAST	00000078	D
UCB$B_ERTCNT	00000070	D		UCB$L_MB_SHB	00000080	D
UCB$B_ERTMAX	00000071	D		UCB$L_MB_WAST	00000074	D
UCB$B_FEX	00000076	D		UCB$L_MB_WIOQBL	00000088	D
UCB$B_FIPL	0000000B	D		UCB$L_MB_WIOQFL	00000084	D
UCB$B_LOCSRV	0000003C	D		UCB$L_MEDIA	0000008C	D
UCB$B_OFFNDX	00000094	D		UCB$L_NT_DATSSB	00000074	D
UCB$B_OFFRTC	00000095	D		UCB$L_NT_INTSSB	00000078	D
UCB$B_REMSRV	0000003D	D		UCB$L_OPCNT	00000060	D
UCB$B_SECTORS	0000003C	D		UCB$L_OWNUIC	0000001C	D
UCB$B_SLAVE	00000074	D		UCB$L_PID	00000028	D
UCB$B_SPR	00000075	D		UCB$L_RQBL	00000004	D
UCB$B_STATE	00000052	D		UCB$L_RQFL	00000000	D
UCB$B_TRACKS	0000003D	D		UCB$L_SVAPTE	00000068	D
UCB$B_TT_CRFILL	0000009D	D		UCB$L_SVPN	00000064	D
UCB$B_TT_DECRF	000000A1	D		UCB$L_TT_DECHAR	000000A8	D
UCB$B_TT_DELFF	000000A2	D		UCB$L_TT_RDUE	0000008C	D
UCB$B_TT_DESPEE	000000A0	D		UCB$L_TT_RTIMOU	000000B8	D
UCB$B_TT_DETYPE	000000A4	D		UCB$L_VCB	00000030	D
UCB$B_TT_LFFILL	0000009E	D		UCB$T_PARTNER	0000000C	D
UCB$B_TT_SPEED	0000009C	D		UCB$W_BCNT	0000006E	D
UCB$B_TYPE	0000000A	D		UCB$W_BCR	00000096	D
UCB$B_VERTSZ	0000003F	D		UCB$W_BOFF	0000006C	D
UCB$C_LENGTH	00000074	D		UCB$W_BUFQUO	00000018	D
UCB$C_MB_LENGTH	00000090	D		UCB$W_BYTESTOGO	0000003E	D
UCB$C_TT_LENGTH	000000BC	D		UCB$W_CHARGE	0000004A	D
UCB$K_LENGTH	00000074	D		UCB$W_CYLINDERS	0000003E	D
UCB$K_MB_LENGTH	00000090	D		UCB$W_DA	0000008C	D
UCB$K_TT_LENGTH	000000BC	D		UCB$W_DC	0000008E	D
UCB$L_AMB	00000054	D		UCB$W_DEVBUFSIZ	0000003A	D

UCB$W_DEVSTS	0000005A	D	VCB$L_RVT	00000020	D
UCB$W_DIRSEQ	00000088	D	VCB$L_SBMAPLBN	00000034	D
UCB$W_DSTADDR	00000018	D	VCB$L_START_FID	00000028	D
UCB$W_DX_BCR	000000A4	D	VCB$L_ST_RECORD	00000030	D
UCB$W_EC1	00000090	D	VCB$L_USRLBLAST	00000044	D
UCB$W_EC2	00000092	D	VCB$L_VPBL	00000040	D
UCB$W_ERRCNT	00000072	D	VCB$L_VPFL	0000003C	D
UCB$W_FUNC	0000007E	D	VCB$L_WCB	00000038	D
UCB$W_MB_SEED	00000000	D	VCB$T_QNAME	0000000C	D
UCB$W_MSGCNT	00000016	D	VCB$T_VOLNAME	00000014	D
UCB$W_MSGMAX	00000014	D	VCB$W_CLUSTER	0000003C	D
UCB$W_NT_CHAN	0000007C	D	VCB$W_CUR_NUM	00000024	D
UCB$W_OFFSET	0000008A	D	VCB$W_CUR_SEQ	00000026	D
UCB$W_REFC	00000050	D	VCB$W_EXTEND	0000003E	D
UCB$W_SIZE	00000008	D	VCB$W_FILEPROT	0000004A	D
UCB$W_SRCADDR	0000001A	D	VCB$W_MCOUNT	0000004C	D
UCB$W_STS	00000058	D	VCB$W_MODE	0000002C	D
UCB$W_TT_DESIZE	000000A5	D	VCB$W_PENDERR	00000062	D
UCB$W_UNIT	00000048	D	VCB$W_QUOSIZE	00000060	D
UCB$W_VPROT	0000001A	D	VCB$W_RECORDSZ	00000050	D
VCB$B_BLOCKFACT	00000052	D	VCB$W_RVN	0000000E	D
VCB$B_CUR_RVN	0000002F	D	VCB$W_SIZE	00000008	D
VCB$B_EOFDELTA	0000004E	D	VCB$W_START_NUM	00000028	D
VCB$B_IBMAPSIZE	00000038	D	VCB$W_START_SEQ	0000002A	D
VCB$B_IBMAPVBN	0000003A	D	VCB$W_TRANS	0000000C	D
VCB$B_LRU_LIM	00000049	D	WCB$B_ACCESS	0000000B	D
VCB$B_QNAMECNT	0000000B	D	WCB$B_TYPE	0000000A	D
VCB$B_RESFILES	0000004F	D	WCB$C_LENGTH	00000024	D
VCB$B_SBMAPSIZE	00000039	D	WCB$C_MAP	00000024	D
VCB$B_SBMAPVBN	0000003B	D	WCB$K_LENGTH	00000024	D
VCB$B_STATUS	0000000B	D	WCB$K_MAP	00000024	D
VCB$B_STATUS2	00000053	D	WCB$L_FCB	00000018	D
VCB$B_TM	0000002E	D	WCB$L_LBN	00000002	D
VCB$B_TYPE	0000000A	D	WCB$L_ORGUCB	00000010	D
VCB$B_WINDOW	00000048	D	WCB$L_P1_LBN	00000026	D
VCB$C_COMLEN	00000024	D	WCB$L_P2_LBN	0000002C	D
VCB$C_LENGTH	00000064	D	WCB$L_PID	0000000C	D
VCB$C_MRKLEN	0000000B	D	WCB$L_PREVLBN	FFFFFFFC	D
VCB$K_COMLEN	00000024	D	WCB$L_RVT	0000001C	D
VCB$K_LENGTH	00000064	D	WCB$L_STVBN	00000020	D
VCB$K_MRKLEN	0000000B	D	WCB$L_WLBL	00000004	D
VCB$L_AQB	00000010	D	WCB$L_WLFL	00000000	D
VCB$L_BLOCKBL	00000004	D	WCB$W_ACON	00000014	D
VCB$L_BLOCKFL	00000000	D	WCB$W_COUNT	00000000	D
VCB$L_CACHE	00000058	D	WCB$W_NMAP	00000016	D
VCB$L_CUR_FID	00000024	D	WCB$W_P1_COUNT	00000024	D
VCB$L_FCBBL	00000004	D	WCB$W_P2_COUNT	0000002A	D
VCB$L_FCBFL	00000000	D	WCB$W_PREVCOUNT	FFFFFFFA	D
VCB$L_FREE	00000040	D	WCB$W_REFCNT	0000000E	D
VCB$L_HOME2LBN	00000028	D	WCB$W_SIZE	00000008	D
VCB$L_HOMELBN	00000024	D			
VCB$L_IBMAPLBN	00000030	D			
VCB$L_IXHDR2LBN	0000002C	D			
VCB$L_MAXFILES	00000044	D			
VCB$L_MVL	00000034	D			
VCB$L_QUOCACHE	0000005C	D			
VCB$L_QUOTAFCB	00000054	D			

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	FFFFFFFC (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
SEP	00000109 (265.)	02 (2.)	NOPIC USR CON REL LCL SHR EXE RD WRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$ER	=00000001	79 (1)	
$MODULE	00000000-R	79 (1)	
CCB$L_UCB	00000000		#-121 (1)
CCB$L_WIND	00000004		#-160 (1) #-178 (1)
CCB$W_IOC	0000000A		#-124 (1) #-159 (1) #-171 (1)
CHAN	=00000004	77 (1)	#-116 (1)
DDB$L_DDT	0000000C		#-151 (1)
DDT$L_CANCEL	0000000C		#-154 (1)
DEV$V_FOR	=00000018		#-163 (1)
DEV$V_MNT	=00000013		#-162 (1)
DS$AX_SOFTPCB	00000000-XR		115 (1)
DYN$C_IRP	=0000000A		#-175 (1)
EXE$ALONONPAGED	00000000-XR		165 (1)
EXE$CANCEL	00000007-R	114 (1)	
EXE$QIOACPPKT	00000000-XR		#-190 (1)
IO$_ACPCONTROL	=00000038		#-180 (1)
IOC$GL_PSBL	00000000-XR		142 (1)
IOC$VERIFYCHAN	00000000-XR		117 (1)
IPL$_ASTDEL	=00000002		#-123 (1)
IPL$_IOPOST	=00000004		#-144 (1)
IRP$C_LENGTH	0000005C		#-164 (1) #-174 (1)
IRP$L_IOQBL	00000004		#-137 (1)
IRP$L_IOQFL	00000000		#-129 (1) 138 (1) 142 (1)
IRP$L_MEDIA	00000034		#-141 (1)
IRP$L_PID	0000000C		#-133 (1)
IRP$M_FUNC	=00000002		#-140 (1)
IRP$V_BUFIO	=00000000		#-139 (1)
IRP$V_VIRTUAL	=00000004		#-132 (1)
IRP$W_CHAN	00000028		#-135 (1)
IRP$W_SIZE	00000008		#-173 (1)
IRP$W_STS	0000002A		132 (1) 139 (1) #-140 (1)
PCB$L_PID	00000060		#-133 (1) #-176 (1)
PCB$W_BIOCNT	0000003A		#-170 (1)
PR$_IPL	=00000012		#-123 (1) #-128 (1) #-147 (1) #-149 (1)
PR$_SIRR	=00000014		#-144 (1)
RSN$_NPDYNMEM	=00000003		#-168 (1)
SS$_CANCEL	00000000-XR		#-141 (1)
SS$_INSFMEM	00000000-XR		#-167 (1)
SS$_NORMAL	00000000-XR		#-146 (1)
UCB$B_FIPL	0000000B		#-128 (1) #-149 (1)
UCB$L_DDB	00000024		#-150 (1)
UCB$L_DEVCHAR	00000034		162 (1) 163 (1)
UCB$L_IOQFL	00000040		126 (1)
UCB$L_IRP	0000004C		#-152 (1)
UCB$L_VCB	00000030		#-186 (1)
VCB$W_TRANS	0000000C		#-187 (1)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	22	00:00:00.03	00:00:00.21
Command processing	906	00:00:00.28	00:00:01.69
Pass 1	770	00:00:03.03	00:00:05.14
Symbol table sort	0	00:00:00.27	00:00:00.27
Pass 2	82	00:00:00.88	00:00:01.53
Symbol table output	2	00:00:00.07	00:00:00.21
Psect synopsis output	2	00:00:00.00	00:00:00.01
Cross-reference output	3	00:00:00.03	00:00:00.03
Assembler run totals	1789	00:00:04.59	00:00:09.09

The working set limit was 2400 pages.
191815 bytes (375 pages) of virtual memory were used to buffer the intermediate code.
There were 60 pages of symbol table space allocated to hold 1052 non-local and 9 local symbols.
192 source lines were read in Pass 1, producing 70 object records in Pass 2.
28 pages of virtual memory were used to define 27 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	11
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	4
SYS$COMMON:[SYSLIB]STARLET.MLB;2	7
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	23

1496 GETS were required to define 23 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(2)	82	DECLARATIONS
(6)	288	$CHANNEL CALL
(7)	355	$CHANNEL CALL - ADAPTER INIT FUNCTION
(8)	403	$CHANNEL CALL - BUS INIT FUNCTION
(9)	451	$CHANNEL CALL - ABORT FUNCTION
(10)	506	$CHANNEL CALL - ENABLE INTERRUPTS
(11)	584	$CHANNEL CALL - PURGE
(12)	632	$CHANNEL CALL - DISABLE INTERRUPTS
(13)	696	$CHANNEL CALL - CLEAR ADAPTER
(14)	758	$CHANNEL CALL - GET ADAPTER STATUS
(15)	808	$CHANNEL CALL - SET DEFEAT PARITY
(16)	856	$CHANNEL CALL - CLEAR DEFEAT PARITY
(17)	904	$CHANNEL CALL - COMMON CALL RETURN
(18)	949	$SETMAP CALL
(20)	1335	DSP$SHOWMBA
(21)	1378	DSP$SHOWUBI
(22)	1422	$SHOWCHAN CALL
(23)	1481	SHOW_MBA STATUS
(24)	1544	SHOW_UBI STATUS
(25)	1591	SHOWBITS
(26)	1629	DETERMINE ADAPTER SPECIFIC STATUS
(27)	1716	DETERMINE GENERAL ADAPTER STATUS
(28)	1761	DETERMINE ADAPTER HARDWARE ERROR STATUS
(30)	1849	BUILD THE CHANNEL DATA BLOCK
(31)	1923	SET ADAPTER VECTOR(S)
(32)	1985	CLEAR ADAPTER VECTOR(S)
(33)	2038	INTERRUPT PRE-PROCESS

```
                        0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element CHAN750.MAR
                        0000     2 ; *2    12-MAY-1986 10:51:52 BARANSKI "Cleaning up Object Libraries."
                        0000     3 ; *1     6-FEB-1986 15:14:12 DS ""
                        0000     4 ; DEC/CMS REPLACEMENT HISTORY, Element CHAN750.MAR
                        0000     5         .TITLE  CHAN750 *** CHAN750 Channel services for COMET
                        0000     6         .IDENT  /07-12/
                        0000     7         .NLIST  CND
                        0000     8         .LIST   MEB
                    00000000     9         .PSECT  SEP, SHR, EXE, WRT, LONG
                        0000    10
                        0000    11 ;
                        0000    12 ; Copyright (c) 1977, 1981, 1983
                        0000    13 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
                        0000    14 ;
                        0000    15 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
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                        0000    25 ; CORPORATION.
                        0000    26 ;
                        0000    27 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
                        0000    28 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
                        0000    29
                        0000    30 ;++
                        0000    31 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR
                        0000    32 ;
                        0000    33 ; ABSTRACT:
                        0000    34 ;
                        0000    35 ; ENVIRONMENT:
                        0000    36 ;
                        0000    37 ; AUTHOR:       NICK HOWGATE    11-DEC-78       VERSION 01
                        0000    38 ;
                        0000    39 ; MODIFIED BY:
                        0000    40 ;               NICK HOWGATE    2-FEB-79        VERSION 02 (ESSAA-5.00)
                        0000    41 ;       01      ADDED NEW P-TABLE SUPPORT
                        0000    42 ;               ROGER RIGGS     14-MAY-1979
                        0000    43 ;       02      Changed entry points to use .ENTRY and .VECTOR in ENTRY.
                        0000    44 ;               Roger Riggs, 14-Jan-1979, Version 5.2
                        0000    45 ;       03      Added lists for CVT$T_.... strings referenced in CVTREG
                        0000    46 ;               Also fixed bug near SYSUB1 regarding stack level for RSB.
                        0000    47 ;               Dave Butenhof, 21-Feb-1980
                        0000    48 ;       04      Made sure DSINT routine disables interrupts on MBA before
                        0000    49 ;                clearing the vectors.
                        0000    50 ;               Roger Riggs, 21-MAY-1980,       Version 5.4
                        0000    51 ;       05      Fixed bug causing last map not to get cleared
                        0000    52 ;               in CLRMAP both for UBA and MBA.
                        0000    53 ;               Also fixed algorithm for determining how many maps to set
                        0000    54 ;               from starting address and byte count
                        0000    55 ;               Roger Riggs, 26-Jun-1980, Version 5.41
                        0000    56 ;       06      Fixed bug in calculating number of map registers required
                        0000    57 ;               Dave Butenhof, 15-May-1981, version 6.4
```

```
                0000     58 ;       07      The UBI csr has a mass of 'MBZ' bits which
                0000     59 ;               actually come up 'unpredictable' on a read:
                0000     60 ;               to spare people confusion, mask them out.
                0000     61 ;       08      - dave butenhof, 15-Sep-1981, version 6.5
                0000     62 ;               Fix to set MASSbus write check error status.  Also to
                0000     63 ;               set UNIBUS nxm status.
                0000     64 ;
                0000     65 ;       09      - Jack Stansbury, 26-Oct-1981, Version 6.-
                0000     66 ;               Took out the $DS_BERROR macros and replaced them with BLBC's.
                0000     67 ;               Took out the $DS_BNERROR macros and replaced them with BLBS's.
                0000     68 ;               The Supervisor should not use these two macros.
                0000     69 ;
                0000     70 ;       10      - Jack Stansbury, 26-Oct-1981, Version 6.-
                0000     71 ;               Replaced the .PSECT SEP with WORK, CODE, and DATA where appropriate.
                0000     72 ;
                0000     73 ;       11      - Dave Butenhof, 24-Nov-1981, version 6.5
                0000     74 ;               Fix some truncation errors
                0000     75 ;
                0000     76 ;       12      Bob Bergazzi    May 16,1983     Version 6.11
                0000     77 ;               Changed the order of the .LIB statements.
                0000     78 ;
                0000     79 ;--
```

```
                     0000     82          .SBTTL  DECLARATIONS
                     0000     83 ;
                     0000     84 ; INCLUDE FILES:
                     0000     85 ;
                     0000     86          .library        /sys$library:lib/       ;                       [07]
                     0000     87          .library        /$ds/                   ;                       [07]
                     0000     88          .library        /$diag/                 ;                       [07]
                     0000     89
                     0000     90 ;
                     0000     91 ; MACROS:
                     0000     92 ;
                     0000     93
                     0000     94 .MACRO   JMPUBI  ADR
                     0000     95          BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
                     0000     96          BNEQ    ADR                             ; YES-
                     0000     97 .ENDM    JMPUBI
                     0000     98 .MACRO   JMPMBA  ADR
                     0000     99          BITL    #CDB$M_MBA,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A MBA ?
                     0000    100          BNEQ    ADR                             ; YES-
                     0000    101 .ENDM    JMPMBA
                     0000    102 .MACRO   $CHNDEF
                     0000    103          $OFFDEF CHN,<UNIT,FUNC,ADR1,ADR2>
                     0000    104 .ENDM    $CHNDEF
                     0000    105 .MACRO   $STMDEF
                     0000    106          $OFFDEF STM,<UNIT,FUNC,PHY,BAS,CNT,PTH>
                     0000    107 .ENDM    $STMDEF
                     0000    108 .MACRO   $SHWDEF
                     0000    109          $OFFDEF SHW,<UNIT>
                     0000    110 .ENDM    $SHWDEF
                     0000    111
                     0000    112 ;
                     0000    113 ; EQUATED SYMBOLS:
                     0000    114 ;
                     0000    115
                     0000    119 $DS_DSDEF
                     0000    120 $MBADEF                                         ; MBA REGISTER DEFINITIONS
                     0000                 .SAVE   LOCAL_BLOCK
                 00000000                 .RESTORE
                     0000    121 $UBADEF                                         ; UBA REGISTER DEFINITIONS
                     0000                 .SAVE   LOCAL_BLOCK
                 00000000                 .RESTORE
                     0000    122 $ubidef                                             ; UBI register definitions      [08]
                     0000                 .SAVE   LOCAL_BLOCK
                 00000000                 .RESTORE
            0000001F 0000    123 UBI$V_MAP_VALID =        31
            80000000 0000    124 UBI$M_MAP_VALID = 1 @ UBI$V_MAP_VALID
            00000019 0000    125 UBI$V_MAP_BO    =        25
            02000000 0000    126 UBI$M_MAP_BO    = 1 @ UBI$V_MAP_BO
            00000001 0000    127 UBI$S_MAP_BO    =        1
            00000015 0000    128 UBI$V_MAP_DPD   =        21
            00000002 0000    129 UBI$S_MAP_DPD   =        2
            00000000 0000    130 UBI$V_MAP_PFN   =        0
            0000000F 0000    131 UBI$S_MAP_PFN   =        15
                     0000    132
                     0000    133 $SSDEF                                          ; SYSTEM SERVICE COMPLETION CODES
                     0000                 .SAVE   LOCAL_BLOCK
                 00000000                 .RESTORE
```

```
                        0000    134
006600B1                0000    135 DS$_NOSUPPORT   =       DS$_NOTIMP!SS$_CONTINUE ; ALLOW UNSUPPORTED
                        0000    136                                                     ; FUNCTIONS TO SUCCEDE FOR NOW
                        0000    137 ; END OF TEMPORARY DEFINITIONS
                        0000    138 $DS_BITDEF                                          ; BIT DEFINITIONS
                        0000    139 $DS_DSDEF                                           ; PROCEDURE RETURN CODE DEFINITIONS
                        0000    140 $DS_PARDEF                                          ; PARAMETER ARG DEFINITIONS
                        0000    141 $DS_HPODEF                                          ; HARDWARE P-TABLE DEFINITIONS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .IIF    NB,HP$Q_DEVICE, HP$Q_DEVICE:
00000008                0000                .IIF    NB,.BLKQ,       .BLKQ   1
                        0008                .IIF    NB,HP$W_SIZE,   HP$W_SIZE:
0000000A                0008                .IIF    NB,.BLKW,       .BLKW   1
                        000A                .IIF    NB,HP$B_FLAGS,  HP$B_FLAGS:
0000000B                000A                .IIF    NB,.BLKB,       .BLKB   1
                        000B                .IIF    NB,HP$B_DRIVE,  HP$B_DRIVE:
0000000C                000B                .IIF    NB,.BLKB,       .BLKB   1
                        000C                .IIF    NB,HP$T_DEVICE, HP$T_DEVICE:
00000018                000C                .IIF    NB,.BLKB,       .BLKB   12
                        0018                .IIF    NB,HP$A_DEVICE, HP$A_DEVICE:
0000001C                0018                .IIF    NB,.BLKL,       .BLKL   1
                        001C                .IIF    NB,HP$A_DVA,    HP$A_DVA:
00000020                001C                .IIF    NB,.BLKL,       .BLKL   1
                        0020                .IIF    NB,HP$A_LINK,   HP$A_LINK:
00000024                0020                .IIF    NB,.BLKL,       .BLKL   1
                        0024                .IIF    NB,HP$W_VECTOR, HP$W_VECTOR:
00000026                0024                .IIF    NB,.BLKW,       .BLKW   1
                        0026                .IIF    NB,HP$T_TYPE,   HP$T_TYPE:
00000032                0026                .IIF    NB,.BLKB,       .BLKB   12
                        0032                .IIF    NB,HP$A_DEPENDENT,      HP$A_DEPENDENT:
                00000000                    .RESTORE
                        0000    142 $DS_CHDEF                                           ; CHANNEL SERVICE DEFINITIONS
                        0000    143 $CHMDEF                                             ; $DS_CHANNEL CALL
                        0000    144 $PRDEF                                              ; PROCESSOR REGISTERS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000                0032                .=0
                00000000                    .RESTORE
                        0000    145 $STMDEF                                             ; $DS_SETMAP CALL
                        0000    146 $SHWDEF                                             ; $DS_SHOWCHAN CALL
                        0000    150
00000080                0000    151 SHW$K_BUFSIZ    =       128                         ; $SHOWCHAN BUFFER SIZE
                        0000    152
                        0000    153 ; INTERNAL FLAG WORD DEFINITIONS
                        0000    154
00000000                0000    155 CDB$V_MBA     = 0                                   ; ADAPTER IS MBA (11/750,11/780)
00000001                0000    156 CDB$V_UBA     = 1                                   ; ADAPTER IS UBA (11/780)
00000002                0000    157 CDB$V_UBI     = 2                                   ; ADAPTER IS UBI (11/750)
00000003                0000    158 CDB$V_OFFSET  = 3                                   ; OFFSET MODE
00000004                0000    159 CDB$V_REV     = 4                                   ; REVERSE OPERATION
00000005                0000    160 CDB$V_IE      = 5                                   ; INTERRUPTS ENABLED
00000001                0000    161 CDB$M_MBA     = 1 @ CDB$V_MBA
00000002                0000    162 CDB$M_UBA     = 1 @ CDB$V_UBA
00000004                0000    163 CDB$M_UBI     = 1 @ CDB$V_UBI
00000008                0000    164 CDB$M_OFFSET  = 1 @ CDB$V_OFFSET
00000010                0000    165 CDB$M_REV     = 1 @ CDB$V_REV
00000020                0000    166 CDB$M_IE      = 1 @ CDB$V_IE
```

```
                    0000   167
                    0000   168 ; STATUS BIT DEFINITIONS FOR CDB$L_ST1
                    0000   169
0000000F            0000   170 CHS$M_ERRANY    =       CHS$M_SYSERR!CHS$M_CHNERR!CHS$M_DEVERR!CHS$M_PGMERR
                    0000   171
                    0000   172
                    0000   173 ; STATUS MASKS
                    0000   174
EC000000            0000   175 MBA_CSR_SYSER1  =       MBA$M_CSR_PE!MBA$M_CSR_WS!MBA$M_CSR_URD!MBA$M_CSR_MT!-
                    0000   176                         MBA$M_CSR_XMFLT
                    0000   177 MBA_SR_SYSER2   =       MBA$M_SR_NRCONF!MBA$M_SR_CRD!MBA$M_SR_DLT!MBA$M_SR_ERCONF!-
6000080F            0000   178                         MBA$M_SR_RDS!MBA$M_SR_ISTO!MBA$M_SR_RDTO
                    0000   179
00E00000            0000   180 MBA_CSR_CHNER1  =       MBA$M_CSR_PD!MBA$M_CSR_PU!MBA$M_CSR_OT
00000020            0000   181 MBA_SR_CHNER2   =       MBA$M_SR_MAPPE
00000600            0000   182 MBA_SR_CHNER3   =       MBA$M_SR_WCKUPR!MBA$M_SR_WCKLWR
                    0000   183
00040000            0000   184 MBA_SR_DEVER1   =       MBA$M_SR_NED
                    0000   185 MBA_SR_DEVER2   =       MBA$M_SR_MCPE!MBA$M_SR_MBEXC!MBA$M_SR_MDPE!-
000219C0            0000   186                         MBA$M_SR_DTABT!MBA$M_SR_DLT!MBA$M_SR_MXF
                    0000   187
00080010            0000   188 MBA_SR_PGMER1   =       MBA$M_SR_PGE!MBA$M_SR_INVMAP
                    0000   189
80000000            0000   190 MBA$M_MAP_VALID =       BIT31                       ; MAP ENTRY VALID
                    0000   191
                    0000   192 MBA$M_CSR_CLR    =       MBA$M_CSR_PE!MBA$M_CSR_WS!MBA$M_CSR_URD!MBA$M_CSR_MT!-
ECE00000            0000   193                         MBA$M_CSR_XMFLT!MBA$M_CSR_PD!MBA$M_CSR_PU!MBA$M_CSR_OT
                    0000   194
                    0000   195 MBA$M_SR_CLR     =       MBA$M_SR_DTBUSY!MBA$M_SR_NRCONF!MBA$M_SR_CRD!MBA$M_SR_PGE!-
                    0000   196                         MBA$M_SR_MCPE!MBA$M_SR_DTCOMP!MBA$M_SR_DTABT!-
                    0000   197                         MBA$M_SR_DLT!MBA$M_SR_WCKUPR!MBA$M_SR_WCKLWR!-
                    0000   198                         MBA$M_SR_MXF!MBA$M_SR_MBEXC!MBA$M_SR_MDPE!-
                    0000   199                         MBA$M_SR_MAPPE!MBA$M_SR_INVMAP!MBA$M_SR_ERCONF!-
E00A3FFF            0000   200                         MBA$M_SR_RDS!MBA$M_SR_ISTO!MBA$M_SR_RDTO
                    0000   201
E0000000            0000   202 ubi_csr_syser1  =       ubi$m_dpr_error!ubi$m_dpr_nxm!ubi$m_dpr_uce ;          [08]
60000000            0000   203 ubi$m_csr_clr   =       ubi$m_dpr_nxm!ubi$m_dpr_uce     ;                      [08]
                    0000   204
```

```
                                00000000   206          .PSECT  Work, NoExe, NoShr, Wrt, Long          ;                    [10]
                                    0000   207
                                    0000   208 ;
                                    0000   209 ; OWN STORAGE:
                                    0000   210 ;
                                    0000   211
                                    0000   212 .SAVE
                                    0000   213 .PSECT  $ABS$,ABS
                           00000000 0032   214 .=0
                           00000004 0000   215 CDB$L_FLAGS:     .BLKL   1               ; INTERNAL FLAGS
                           00000008 0004   216 CDB$A_TBL:       .BLKL   1               ; HARDWARE P-TABLE ADDRESS
                           0000000C 0008   217 CDB$A_VEC:       .BLKL   1               ; INTERRUPT VECTOR ADDRESS
                           00000010 000C   218 CDB$A_STORE:     .BLKL   1               ; CALLER STATUS ADDRESS
                           00000014 0010   219 CDB$A_ADDR:      .BLKL   1               ; CHANNEL VECTOR ADDRESS
                           00000018 0014   220 CDB$L_ST1:       .BLKL   1               ; STATUS (HARDWARE ERROR)
                           0000001A 0018   221 CDB$W_ST2:       .BLKW   1               ; STATUS (GENERAL)
                           0000001C 001A   222 CDB$W_RVR:       .BLKW   1               ; RECEIVE VECTOR
                           00000020 001C   223 CDB$L_PTH:       .BLKL   1               ; DATA PATH NUMBER
                           00000020 0020   224 CDBSIZ=.
                                 00000000  225 .RESTORE
                                    0000   226 CDB$BLOCK::                              ; CHANNEL CONTROL BLOCK
                           00000020 0000   227 .BLKB   CDBSIZ
                                    0020   228
                                    0020   229 ;       ARGLISTS FOR $CVTREG AND $PRINTB
                                    0020   230 FMT_CVT_ARG:    $DS_CVTREG_L    31,0,0,SHWBUF,SHW$K_BUFSIZ
00000000 00000000 0000001F 0000000B 0020                       .LONG   11, 31, 0, 0
00000000 00000000 00000080 00000060' 0030                      .LONG    SHWBUF, SHW$K_BUFSIZ, 0, 0
00000000 00000000 00000000 00000000  0040                      .LONG    0, 0, 0, 0
                                    0050   231
                                    0050   232 CVT$T_MBASR::
                           0000011B' 0050   233          .ADDRESS        MBA_SR_BIT      ; Address of Bit mnemonics
                                    0054   234                                          ; No additional arguments needed
                                    0054   235 CVT$T_MBAMAP::
                           000001A0' 0054   236          .ADDRESS        MBA_MAP_BIT     ; Address of Bit mnemonics
                                    0058   237                                          ; No additional arguments needed
                                    0058   238 CVT$T_UBADPR::
                           000001F3' 0058   239          .ADDRESS        UBI_DPR_BIT     ; Address of Bit mnemonics
                                    005C   240                                          ; No additional arguments needed
                                    005C   241 CVT$T_UBAMAP::
                           00000221' 005C   242          .ADDRESS        UBI_MAP_BIT     ; Address of Bit mnemonics
                                    0060   243                                          ; No additional arguments needed
```

```
                                00000000   245          .PSECT  Data, NoExe, Shr, NoWrt, Long          ;                [10]
                                    0000   246
                                    0000   247 ; COMMON ERROR MESSAGE FOR DEBUG
                                    0000   248
                                    0000   249 MODNAM  CHANNEL                              ; DEFINE MODULE NAME FOR ERRSUP
                4C 45 4E 4E 41 48 43 00' 0000      $MODULE:        .ASCIC  \CHANNEL\
                                    07   0000
                                    0008   250
                                    0008   251 ; STORAGE FOR $SHOWCHAN - CHANNEL STATUS DUMP
                                    0008   252
4E 4E 41 48 43 20 41 42 4D 2F 21 00' 0008   253 FMT_MBA_HDR:    .ASCIC  .!/MBA CHANNEL STATUS DUMP!/.
55 44 20 53 55 54 41 54 53 20 4C 45  0014
                     2F 21 50 4D     0020
                                    1B   0008
                        2F 21 00' 0024   254 FMT_CRLF:       .ASCIC  .!/.
                                    02   0024
5B 3A 52 53 43 5F 41 42 4D 2F 21 00' 0027   255 FMT_MBA_CSR:    .ASCIC  .!/MBA_CSR:[!XL]!_!XL(X);!_!AC.
29 58 28 4C 58 21 5F 21 5D 4C 58 21  0033
                  43 41 21 5F 21 3B  003F
                                    1D   0027
21 5B 3A 52 43 5F 41 42 4D 2F 21 00' 0045   256 FMT_MBA_CR:     .ASCIC  .!/MBA_CR:[!XL]!_!XL(X);!_!AC.
3B 29 58 28 4C 58 21 5F 21 5D 4C 58  0051
                     43 41 21 5F 21  005D
                                    1C   0045
21 5B 3A 52 53 5F 41 42 4D 2F 21 00' 0062   257 FMT_MBA_SR:     .ASCIC  .!/MBA_SR:[!XL]!_!XL(X);!_!AC.
3B 29 58 28 4C 58 21 5F 21 5D 4C 58  006E
                     43 41 21 5F 21  007A
                                    1C   0062
5B 3A 52 41 56 5F 41 42 4D 2F 21 00' 007F   258 FMT_MBA_VAR:    .ASCIC  .!/MBA_VAR:[!XL]!_!XL(X);.
29 58 28 4C 58 21 5F 21 5D 4C 58 21  008B
                                    3B   0097
                                    18   007F
21 28 50 41 4D 5F 41 42 4D 2F 21 00' 0098   259 FMT_MBA_MAP:    .ASCIC  .!/MBA_MAP(!XB):!_!XL(X);.
29 58 28 4C 58 21 5F 21 3A 29 42 58  00A4
                                    3B   00B0
                                    18   0098
3A 54 4E 43 42 5F 41 42 4D 2F 21 00' 00B1   260 FMT_MBA_CNT:    .ASCIC  .!/MBA_BCNT:[!XL]!_!XL(X);.
58 28 4C 58 21 5F 21 5D 4C 58 21 5B  00BD
                                 3B 29   00C9
                                    19   00B1
2C 2C 44 52 55 2C 53 57 2C 45 50 00' 00CB   261 MBA_CSR_BIT:    .ASCIC  .PE,WS,URD,,MT,XMTFLT,,,PD,PU,OT.
2C 2C 2C 54 4C 46 54 4D 58 2C 54 4D  00D7
               54 4F 2C 55 50 2C 44 50  00E3
                                    1F   00CB
2C 2C 2C 2C 2C 2C 2C 2C 2C 2C 2C 00' 00EB   262 MBA_CR_BIT:     .ASCIC  ...........................,IBC,.-
2C 2C 2C 2C 2C 2C 2C 2C 2C 2C 2C 2C  00F7
               2C 43 42 49 2C 2C 2C 2C  0103
2C 54 52 4F 42 41 2C 45 49 2C 4D 4D  010B   263                             .MM,IE,ABORT,INIT.
                        54 49 4E 49  0117
                                    2F   00EB
4F 43 52 4E 2C 59 53 55 42 54 44 00' 011B   264 MBA_SR_BIT:     .ASCIC  .DTBUSY,NRCONF,CRD,,,,,,CBHUNG,,,,PGE,NED,MCPE,.-
2C 2C 2C 2C 2C 2C 44 52 43 2C 46 4E  0127
47 50 2C 2C 2C 2C 47 4E 55 48 42 43  0133
   2C 45 50 43 4D 2C 44 45 4E 2C 45  013F
4D 4F 43 54 44 2C 2C 2C 4E 54 54 41  014A   265                             .ATTN,,,DTCOMP,DTABT,DLT,WCKUPR,WCKLWR,.-
2C 54 4C 44 2C 54 42 41 54 44 2C 50  0156
57 4C 4B 43 57 2C 52 50 55 4B 43 57  0162
```

```
                                                2C 52   016E
44 4D 2C 43 58 45 42 4D 2C 46 58 4D   0170    266                     .MXF,MBEXC,MDPE,MAPPE,INVMAP,ERCONF,RDS,.-
56 4E 49 2C 45 50 50 41 4D 2C 45 50   017C
52 2C 46 4E 4F 43 52 45 2C 50 41 4D   0188
                                  2C 53 44   0194
         4F 54 44 52 2C 4F 54 53 49   0197    267                     .ISTO,RDTO.
                                  84   011B
                                       01A0    268 MBA_MAP_BIT:
2C 2C 2C 2C 2C 2C 44 49 4C 41 56 00'  01A0    269             .ASCIC  "VALID,,,,,,,,,,,PFN=21^X"
5E 31 32 3D 4E 46 50 2C 2C 2C 2C 2C   01AC
                                  58   01B8
                                  18   01A0
                                       01B9    270
4E 4E 41 48 43 20 49 42 55 2F 21 00'  01B9    271 FMT_UBI_HDR:        .ASCIC  .!/UBI CHANNEL STATUS DUMP!/.
55 44 20 53 55 54 41 54 53 20 4C 45   01C5
                        2F 21 50 4D   01D1
                              1B      01B9
5B 3A 52 53 43 5F 49 42 55 2F 21 00'  01D5    272 FMT_UBI_CSR:        .ASCIC  .!/UBI_CSR:[!XL]!_!XL(X);!_!AC.
29 58 28 4C 58 21 5F 21 5D 4C 58 21   01E1
                  43 41 21 5F 21 3B   01ED
                                  1D   01D5
                                       01F3    273 UBI_DPR_BIT:
45 43 55 2C 4D 58 4E 2C 52 52 45 00'  01F3    274 UBI_CSR_BIT:        .ASCIC  .ERR,NXM,UCE,,,,,,,,,,,,,,,,,,,,,,,,,,,PURGE.
2C 2C 2C 2C 2C 2C 2C 2C 2C 2C 2C 2C   01FF
2C 2C 2C 2C 2C 2C 2C 2C 2C 2C 2C 2C   020B
      45 47 52 55 50 2C 2C 2C 2C 2C   0217
                                  2D   01F3
                                       0221    275 UBI_MAP_BIT:
2C 2C 2C 2C 2C 2C 44 49 4C 41 56 00'  0221    276             .ASCIC  "VALID,,,,,,BO,,,DP=2^D,,,,,,,PFN=15^X"
2C 44 5E 32 3D 50 44 2C 2C 2C 4F 42   022D
35 31 3D 4E 46 50 2C 2C 2C 2C 2C 2C   0239
                              58 5E   0245
                                 25   0221
```

```
                    00000060   278          .PSECT  Work, NoExe, NoShr, Wrt, Long          ;                    [10]
                        0060   279
                        0060   280 ;                                                                              [10]
                        0060   281 ; More OWN Storage                                                            [10]
                        0060   282 ;                                                                              [10]
                        0060   283
           000000E1     0060   284 SHWBUF: .BLKB   SHW$K_BUFSIZ+1          ; $SHOWCHAN BUFFER
           000000E5     00E1   285 JMPADR: .BLKL   1                        ; DISPATCH VECTOR FOR ADAPTER/DEVICE INTERRU
           000000E9     00E5   286 UBIVEC: .BLKL   1                        ; TEMP FOR UBI VECTOR
```

```
                     00E9   288          .SBTTL  $CHANNEL CALL
                 00000000   289          .PSECT  Code, Exe, Shr, NoWrt, Long            ;                    [10]
                     0000   290 ;++
                     0000   291 ; FUNCTIONAL DESCRIPTION:
                     0000   292 ;
                     0000   293 ;       CHANNEL ADAPTER INTERFACE SERVICE
                     0000   294 ;
                     0000   295 ; CALLING SEQUENCE:
                     0000   296 ;
                     0000   297 ;       CALLG   ARGLST, a#DS$CHANNEL
                     0000   298 ;         OR
                     0000   299 ;       CALLS   #4,     a#DS$CHANNEL
                     0000   300 ;
                     0000   301 ; INPUT PARAMETERS:
                     0000   302 ;
                     0000   303 ;       4(AP)   LOGICAL UNIT NUMBER
                     0000   304 ;       8(AP)   FUNCTION CODE
                     0000   305 ;       12(AP)  VECTOR ADDRESS
                     0000   306 ;       16(AP)  STATUS STORE ADDRESS(ADDRESS OF QWORD)
                     0000   307 ;
                     0000   308 ; IMPLICIT INPUTS:
                     0000   309 ;
                     0000   310 ;       NONE
                     0000   311 ;
                     0000   312 ; OUTPUT PARAMETERS:
                     0000   313 ;
                     0000   314 ;       NONE
                     0000   315 ;
                     0000   316 ; IMPLICIT OUTPUTS:
                     0000   317 ;
                     0000   318 ;       NONE
                     0000   319 ;
                     0000   320 ; COMPLETION CODES:
                     0000   321 ;
                     0000   322 ;       NONE
                     0000   323 ;
                     0000   324 ; SIDE EFFECTS:
                     0000   325 ;
                     0000   326 ;       NONE
                     0000   327 ;
                     0000   328 ;--
```

```
                     007C  0000   330 .ENTRY  DSX$CHANNEL,^M<R2,R3,R4,R5,R6>
                           0002   331
          52   04 AC     D0  0002   332         MOVL    CHN$_UNIT(AP),R2                ; GET THE UNIT NUMBER
                06D1     30  0006   333         BSBW    BLDCDB                          ; FIND/CREATE THE CDB
               03 50     E8  0009   334         BLBS    R0, CHN_DSP             ; IF ERROR,  RETURN WITH                [09]
                           000C   335                                         ; ERROR CODE FROM BLDCDB                [09]
                 019C    31  000C   336         BRW     CHN_CALL_RTN                    ; RETURN
                           000F   337
                           000F   338 CHN_DSP:
          52   08 AC     D0  000F   339         MOVL    CHN$_FUNC(AP),R2                ; FUNCTION CODE TO R2
                           0013   340         CASE    R2,LIMIT=#0,< -                 ; DISPATCH ON FUNCTION
                           0013   341                 CHN_INITA, -                    ; INITA
                           0013   342                 CHN_INITB, -                    ; INITB
                           0013   343                 CHN_ABORT, -                    ; ABORT
                           0013   344                 CHN_PURGE, -                    ; PURGE
                           0013   345                 CHN_ENINT, -                    ; ENINT
                           0013   346                 CHN_DSINT, -                    ; DSINT
                           0013   347                 CHN_CLEAR, -                    ; CLEAR
                           0013   348                 CHN_STATUS, -                   ; STATUS
                           0013   349                 CHN_SETDFT, -                   ; SET DEFEAT PARITY
                           0013   350                 CHN_CLRDFT, -                   ; CLEAR DEFEAT PARITY
                           0013   351                 >
    09'    00    52   AF  0013   352         CASEW   R2,#0,S^#<<30001$-30000$>/2>-1
                           0017   353 30000$:
                  001E'    0017   354         .SIGNED_WORD    CHN_INITA-30000$
                  0030'    0019   355         .SIGNED_WORD    CHN_INITB-30000$
                  0045'    001B   356         .SIGNED_WORD    CHN_ABORT-30000$
                  00B9'    001D   357         .SIGNED_WORD    CHN_PURGE-30000$
                  005F'    001F   358         .SIGNED_WORD    CHN_ENINT-30000$
                  00CC'    0021   359         .SIGNED_WORD    CHN_DSINT-30000$
                  00FD'    0023   360         .SIGNED_WORD    CHN_CLEAR-30000$
                  0143'    0025   361         .SIGNED_WORD    CHN_STATUS-30000$
                  0169'    0027   362         .SIGNED_WORD    CHN_SETDFT-30000$
                  017B'    0029   363         .SIGNED_WORD    CHN_CLRDFT-30000$
                           002B   364 30001$:
    50  00660020 8F     D0  002B   365         MOVL    #DS$_PROGERR,R0                 ; INVALID FUNCTION
                   0176    31  0032   366         BRW     CHN_CALL_RTN                    ; RETURN
```

```
0035   355          .SBTTL  $CHANNEL CALL - ADAPTER INIT FUNCTION
0035   356 ;++
0035   357 ; FUNCTIONAL DESCRIPTION:
0035   358 ;
0035   359 ; INITIALIZE ADAPTER HARDWARE
0035   360 ;
0035   361 ; CALLING SEQUENCE:
0035   362 ;
0035   363 ; BRW   CHN_INITA
0035   364 ;
0035   365 ; INPUT PARAMETERS:
0035   366 ;
0035   367 ;       R5      =       CHANNEL DATA BLOCK
0035   368 ;       R6      =       CHANNEL CSR REGISTER ADDRESS
0035   369 ;
0035   370 ; IMPLICIT INPUTS:
0035   371 ;
0035   372 ;       NONE
0035   373 ;
0035   374 ; OUTPUT PARAMETERS:
0035   375 ;
0035   376 ;       R0      =       COMPLETION CODE
0035   377 ;
0035   378 ; IMPLICIT OUTPUTS:
0035   379 ;
0035   380 ;       NONE
0035   381 ;
0035   382 ; COMPLETION CODES:
0035   383 ;
0035   384 ;       DS$_NORMAL      =       SUCCESS
0035   385 ;
0035   386 ; SIDE EFFECTS:
0035   387 ;
0035   388 ;       NONE
0035   389 ;
0035   390 ;--
```

```
                        0035   392 CHN_INITA:
                        0035   393          JMPUBI  INITA_UBI
      65   04   D3      0035               BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
           07   12      0038               BNEQ    INITA_UBI                       ; YES-
                        003A   394
                        003A   395 INITA_MBA:
   04 A6   01   C8      003A   396          BISL    #MBA$M_CR_INIT,MBA$L_CR(R6)     ; SET MBA INIT
         0163   31      003E   397          BRW     CHN_NORMAL_RTN                  ; RETURN
                        0041   398
                        0041   399 INITA_UBI:
      37   01   DA      0041   400          MTPR    #1,#^X37                        ; I/O CLEAR
         015D   31      0044   401          BRW     CHN_NORMAL_RTN                  ; RETURN
```

```
0047    403          .SBTTL  $CHANNEL CALL - BUS INIT FUNCTION
0047    404 ;++
0047    405 ; FUNCTIONAL DESCRIPTION:
0047    406 ;
0047    407 ; INITIALIZE MASSBUS/UNIBUS
0047    408 ;
0047    409 ; CALLING SEQUENCE:
0047    410 ;
0047    411 ; BRW    CHN_INITB
0047    412 ;
0047    413 ; INPUT PARAMETERS:
0047    414 ;
0047    415 ;        R5      =       CHANNEL DATA BLOCK
0047    416 ;        R6      =       CHANNEL CSR REGISTER ADDRESS
0047    417 ;
0047    418 ; IMPLICIT INPUTS:
0047    419 ;
0047    420 ;        NONE
0047    421 ;
0047    422 ; OUTPUT PARAMETERS:
0047    423 ;
0047    424 ;        R0      =       COMPLETION CODE
0047    425 ;
0047    426 ; IMPLICIT OUTPUTS:
0047    427 ;
0047    428 ;        NONE
0047    429 ;
0047    430 ; COMPLETION CODES:
0047    431 ;
0047    432 ;        DS$_NORMAL      =       SUCCESS
0047    433 ;        DS$_NOSUPPORT   =       NOT SUPPORTED FOR 11/750 UBI
0047    434 ;
0047    435 ; SIDE EFFECTS:
0047    436 ;
0047    437 ;        NONE
0047    438 ;
0047    439 ;--
```

```
                          0047   441 CHN_INITB:
                          0047   442          JMPUBI  INITB_UBI
                    65    04  D3  0047          BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
                          03  12  004A          BNEQ    INITB_UBI                       ; YES-
                          004C   443
                          004C   444 INITB_MBA:
                        0155  31  004C   445          BRW     CHN_NORMAL_RTN                  ; RETURN
                          004F   446 INITB_UBI:
                      37  01  DA  004F   447          MTPR    #1,#^X37                        ; I/O CLEAR FOR NOW !!!!!!
                50  006600B1 8F  D0  0052   448          MOVL    #DS$_NOSUPPORT,R0               ; FUNCTION NOT SUPPORTED FOR THIS SY
                        014F  31  0059   449          BRW     CHN_CALL_RTN                    ; RETURN
```

```
                                005C          .SBTTL  $CHANNEL CALL - ABORT FUNCTION
                                005C    ;++
                                005C    ; FUNCTIONAL DESCRIPTION:
                                005C    ;
                                005C    ; ABORT MBA DATA TRANSFER
                                005C    ; NOP FOR UBI
                                005C    ;
                                005C    ; CALLING SEQUENCE:
                                005C    ;
                                005C    ;       BRW     CHN_ABORT
                                005C    ;
                                005C    ; INPUT PARAMETERS:
                                005C    ;
                                005C    ;       R5      =       CHANNEL DATA BLOCK
                                005C    ;       R6      =       CHANNEL CSR REGISTER ADDRESS
                                005C    ;
                                005C    ; IMPLICIT INPUTS:
                                005C    ;
                                005C    ;       NONE
                                005C    ;
                                005C    ; OUTPUT PARAMETERS:
                                005C    ;
                                005C    ;       R0      =       COMPLETION CODE
                                005C    ;
                                005C    ; IMPLICIT OUTPUTS:
                                005C    ;
                                005C    ;       NONE
                                005C    ;
                                005C    ; COMPLETION CODES:
                                005C    ;
                                005C    ;       DS$_NORMAL      =       SUCCESS
                                005C    ;       DS$_NOSUPPORT   =       FUNCTION NOT SUPPORTED
                                005C    ;       DS$_LOGIC       =       BIT SET/CLEAR FAILURE
                                005C    ;                               DTABT DID NOT SET
                                005C    ;                               ABORT DID NOT CLEAR
                                005C    ;
                                005C    ; SIDE EFFECTS:
                                005C    ;
                                005C    ;       WILL CAUSE MBA ADPATER INTERRUPT IF ENABLED
                                005C    ;
                                005C    ;--
                                005C
                                005C    CHN_ABORT:
                                005C            JMPUBI  ABORT_UBI
          65    04    D3        005C            BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
                0B    12        005F            BNEQ    ABORT_UBI                       ; YES-
                                0061
                                0061    ABORT_MBA:
       04 A6    02    C8        0061            BISL    #MBA$M_CR_ABORT,MBA$L_CR(R6)    ; SET THE ABORT BIT
       04 A6    02    CA        0065            BICL    #MBA$M_CR_ABORT,MBA$L_CR(R6)    ; CLEAR THE ABORT BIT
             0138    31        0069            BRW     CHN_NORMAL_RTN                  ; RETURN
                                006C
                                006C    ABORT_UBI:
50    006600B1 8F    D0        006C            MOVL    #DS$_NOSUPPORT,R0               ; INDICATE NO SUPPORT
             0135    31        0073            BRW     CHN_CALL_RTN                    ; RETURN
                                0076
```

```
0076    506          .SBTTL  $CHANNEL CALL - ENABLE INTERRUPTS
0076    507 ;++
0076    508 ; FUNCTIONAL DESCRIPTION:
0076    509 ;
0076    510 ;       ENABLE ADAPTER INTERRUPTS
0076    511 ;
0076    512 ; CALLING SEQUENCE:
0076    513 ;
0076    514 ;       BRW     CHN_ENINT
0076    515 ;
0076    516 ; INPUT PARAMETERS:
0076    517 ;
0076    518 ;       R5      =       CHANNEL DATA BLOCK
0076    519 ;       R6      =       CHANNEL CSR REGISTER ADDRESS
0076    520 ;
0076    521 ; IMPLICIT INPUTS:
0076    522 ;
0076    523 ;       NONE
0076    524 ;
0076    525 ; OUTPUT PARAMETERS:
0076    526 ;
0076    527 ;       R0      =       COMPLETION CODE
0076    528 ;
0076    529 ; IMPLICIT OUTPUTS:
0076    530 ;
0076    531 ;       NONE
0076    532 ;
0076    533 ; COMPLETION CODES:
0076    534 ;
0076    535 ;       DS$_NORMAL      =       SUCCESS
0076    536 ;       DS$_IHWE        =       INITIAL HARDWARE ERROR
0076    537 ;                                ADAPTER ERROR(S) PRESENT
0076    538 ;       DS$_LOGIC       =       BIT SET/CLEAR FAILURE
0076    539 ;                                ENABLE BIT DID NOT SET
0076    540 ;       DS$_IVVECT      =       INVALID VECTOR ($SETVEC)
0076    541 ;       DS$_IVADDR      =       INVALID ADDRESS ($SETVEC)
0076    542 ;
0076    543 ; SIDE EFFECTS:
0076    544 ;
0076    545 ;       CALLS $SETVEC TO POINT ADAPTER/UUT INTERRUPTS INTO CHANNEL SERVICE
0076    546 ;
0076    547 ;--
```

```
                                0076   CHN_ENINT:
                  05C0   30     0076           BSBW    HDWSTS                          ; GET THE STATUS
             50     0F   D3     0079           BITL    #CHS$M_ERRANY,R0                ; IS IT GOOD ?
                    0A   13     007C           BEQL    10$                             ; YES-
   50   00660060 8F     D0     007E           MOVL    #DS$_IHWE,R0                    ; NO -
                  0123   31     0085           BRW     CHN_CALL_RTN                    ; RETURN
                                0088   10$:
                  06A5   30     0088           BSBW    SETVEC                          ; SET THE VECTOR'S
                 03 50   E8     008B           BLBS    R0, 20$                 ; IF ERROR RETURN WITH                [09]
                  011A   31     008E           BRW     CHN_CALL_RTN                    ; $SETVEC ERROR CODE IN R0
                                0091   20$:
                 0C AC   D5     0091           TSTL    CHN$_ADR1(AP)                   ; VECTOR ADDRESS IS REQUIRED
                    07   15     0094           BLEQ    30$                             ; ZERO OR NEGATIVE IS NOGOOD
                 10 AC   D5     0096           TSTL    CHN$_ADR2(AP)                   ; STATUS STORE ADDRESS IS REQUIRED
                    02   15     0099           BLEQ    30$                             ; ZERO OR NEGATIVE IS NOGOOD
                    0A   11     009B           BRB     40$                             ; ADDRESS CHECK OK
                                009D   30$:
   50   00660020 8F     D0     009D           MOVL    #DS$_PROGERR,R0                 ; ADDRESS CHECK FAILED
                  0104   31     00A4           BRW     CHN_CALL_RTN                    ; RETURN
                                00A7   40$:
      08 A5    0C AC   D0     00A7           MOVL    CHN$_ADR1(AP),CDB$A_VEC(R5)     ; SAVE CALLERS VECTOR
      0C A5    10 AC   D0     00AC           MOVL    CHN$_ADR2(AP),CDB$A_STORE(R5)   ; SAVE CALLERS STORE ADDRESS
                                00B1           JMPUBI  ENINT_UBI
             65     04   D3     00B1           BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
                    17   12     00B4           BNEQ    ENINT_UBI                       ; YES-
                                00B6
                                00B6   ENINT_MBA:
         04 A6     04   C8     00B6           BISL    #MBA$M_CR_IE,MBA$L_CR(R6)       ; SET THE ENABLE BIT
         04 A6     04   D3     00BA           BITL    #MBA$M_CR_IE,MBA$L_CR(R6)       ; DID IT SET ?
                    0A   12     00BE           BNEQ    10$                             ; YES
   50   00660070 8F     D0     00C0           MOVL    #DS$_LOGIC,R0                   ; INDICATE LOGIC FAILURE
                  00E1   31     00C7           BRW     CHN_CALL_RTN                    ; RETURN
                  00D7   31     00CA   10$:    BRW     CHN_NORMAL_RTN                  ; SUCCESS
                                00CD
                                00CD   ENINT_UBI:
                  00DB   31     00CD           BRW     CHN_CALL_RTN                    ; RETURN
```

```
                     00D0    584          .SBTTL  $CHANNEL CALL - PURGE
                     00D0    585 ;++
                     00D0    586 ; FUNCTIONAL DESCRIPTION:
                     00D0    587 ;
                     00D0    588 ;       PURGE DATA PATH (UBI)
                     00D0    589 ;       NOP FOR MBA
                     00D0    590 ;
                     00D0    591 ; CALLING SEQUENCE:
                     00D0    592 ;
                     00D0    593 ;       BRW     CHN_PURGE
                     00D0    594 ;
                     00D0    595 ; INPUT PARAMETERS:
                     00D0    596 ;
                     00D0    597 ;       R5      =       CHANNEL DATA BLOCK
                     00D0    598 ;       R6      =       CHANNEL CSR REGISTER ADDRESS
                     00D0    599 ;
                     00D0    600 ; IMPLICIT INPUTS:
                     00D0    601 ;
                     00D0    602 ;       WILL PURGE DATA PATH SPECIFIED BY LAST $SETMAP CALL
                     00D0    603 ;
                     00D0    604 ; OUTPUT PARAMETERS:
                     00D0    605 ;
                     00D0    606 ;       R0      =       COMPLETION CODE
                     00D0    607 ;
                     00D0    608 ; IMPLICIT OUTPUTS:
                     00D0    609 ;
                     00D0    610 ;       NONE
                     00D0    611 ;
                     00D0    612 ; COMPLETION CODES:
                     00D0    613 ;
                     00D0    614 ;       DS$_NORMAL      =       SUCCESS
                     00D0    615 ;
                     00D0    616 ; SIDE EFFECTS:
                     00D0    617 ;
                     00D0    618 ;
                     00D0    619 ;--
                     00D0    620
                     00D0    621 CHN_PURGE:
                     00D0    622          JMPUBI  PURGE_UBI
   65    04    D3    00D0                 BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
         03    12    00D3                 BNEQ    PURGE_UBI                       ; YES-
                     00D5    623
                     00D5    624 PURGE_MBA:
      00CC    31    00D5    625          BRW     CHN_NORMAL_RTN                  ; RETURN
                     00D8    626
                     00D8    627 PURGE_UBI:
   50    1C  A5    9A    00D8    628          MOVZBL  CDB$L_PTH(R5),R0                ; DATA PATH NUMBER
 6640    01    C8    00DC    629          bisl    #ubi$m_dpr_pur,ubi$l_dpr(r6)[r0]; Set buffer not empty          [08]
      00C1    31    00E0    630          BRW     CHN_NORMAL_RTN                  ; RETURN
```

```
00E3    632          .SBTTL  $CHANNEL CALL - DISABLE INTERRUPTS
00E3    633 ;++
00E3    634 ; FUNCTIONAL DESCRIPTION:
00E3    635 ;
00E3    636 ;       DISABLE ADAPTER INTERRUPT PROCESSING
00E3    637 ;
00E3    638 ; CALLING SEQUENCE:
00E3    639 ;
00E3    640 ;       BRW     CHN_DSINT
00E3    641 ;
00E3    642 ; INPUT PARAMETERS:
00E3    643 ;
00E3    644 ;       R5      =       CHANNEL DATA BLOCK
00E3    645 ;       R6      =       CHANNEL CSR REGISTER ADDRESS
00E3    646 ;
00E3    647 ; IMPLICIT INPUTS:
00E3    648 ;
00E3    649 ;       NONE
00E3    650 ;
00E3    651 ; OUTPUT PARAMETERS:
00E3    652 ;
00E3    653 ;       R0      =       COMPLETION CODE
00E3    654 ;
00E3    655 ; IMPLICIT OUTPUTS:
00E3    656 ;
00E3    657 ;       NONE
00E3    658 ;
00E3    659 ; COMPLETION CODES:
00E3    660 ;
00E3    661 ;       DS$_NORMAL      =       SUCCESS
00E3    662 ;       DS$_IHWE        =       INITIAL ADPATER HARDWARE ERROR DETECTED
00E3    663 ;       DS$_LOGIC       =       BIT SET/CLEAR FAILURE
00E3    664 ;                                INTERRUPT ENABLE BIT FAILED TO CLEAR
00E3    665 ;       DS$_IVVECT      =       INVALID VECTOR ($CLRVEC)
00E3    666 ;
00E3    667 ; SIDE EFFECTS:
00E3    668 ;
00E3    669 ;       CALLS $CLRVEC
00E3    670 ;
00E3    671 ;--
```

```
                                00E3   CHN_DSINT:
                    0553   30   00E3           BSBW    HDWSTS                          ; GET THE STATUS
                 50   0F   D3   00E6           BITL    #CHS$M_ERRANY,R0                ; GOOD STATUS ?
                      0A   13   00E9           BEQL    20$                             ; YES-
      50   00660060 8F   D0   00EB           MOVL    #DS$_IHWE,R0                    ; NO - INDICATE INITIAL HARDWARE ERR
                    00B6   31   00F2           BRW     CHN_CALL_RTN                    ; AND RETURN
                                00F5   20$:
                                00F5           JMPUBI  DSINT_UBI
                 65   04   D3   00F5           BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
                      14   12   00F8           BNEQ    DSINT_UBI                       ; YES-
                                00FA
                                00FA   DSINT_MBA:
              04 A6   04   CA   00FA           BICL    #MBA$M_CR_IE,MBA$L_CR(R6)       ; CLEAR THE ENABLE BIT
              04 A6   04   D3   00FE           BITL    #MBA$M_CR_IE,MBA$L_CR(R6)       ; DID THE ENABLE CLEAR ?
                      0A   11   0102           BRB     DSINT_CLR                       ; Ok, clear vectors
      50   00660070 8F   D0   0104           MOVL    #DS$_LOGIC,R0                   ; NO - INDICATE LOGIC FAILURE
                    009D   31   010B           BRW     CHN_CALL_RTN                    ; RETURN
                                010E
                                010E
                                010E   DSINT_UBI:
                                010E
                                010E   DSINT_CLR:
                    066D   30   010E           BSBW    CLRVEC                          ; Actually clear vectors
                    0097   31   0111           BRW     CHN_CALL_RTN                    ; Return with CLRVEC code
```

```
0114    696          .SBTTL  $CHANNEL CALL - CLEAR ADAPTER
0114    697 ;++
0114    698 ; FUNCTIONAL DESCRIPTION:
0114    699 ;
0114    700 ;       CLEAR ADAPTER STATUS
0114    701 ;
0114    702 ; CALLING SEQUENCE:
0114    703 ;
0114    704 ;       BRW     CHN_CLEAR
0114    705 ;
0114    706 ; INPUT PARAMETERS:
0114    707 ;
0114    708 ;       R5      =       CHANNEL DATA BLOCK
0114    709 ;       R6      =       CHANNEL CSR REGISTER ADDRESS
0114    710 ;
0114    711 ; IMPLICIT INPUTS:
0114    712 ;
0114    713 ;       NONE
0114    714 ;
0114    715 ; OUTPUT PARAMETERS:
0114    716 ;
0114    717 ;       R0      =       COMPLETION CODE
0114    718 ;
0114    719 ; IMPLICIT OUTPUTS:
0114    720 ;
0114    721 ;       NONE
0114    722 ;
0114    723 ; COMPLETION CODES:
0114    724 ;
0114    725 ;       DS$_NORMAL      =       SUCCESS
0114    726 ;       DS$_LOGIC       =       BIT SET/CLEAR FAILURE
0114    727 ;                                ONE OF THE STATUS BIT(S) FAILED TO CLEAR
0114    728 ;
0114    729 ; SIDE EFFECTS:
0114    730 ;
0114    731 ;       NONE
0114    732 ;
0114    733 ;--
```

```
                                0114   735 CHN_CLEAR:
                                0114   736         JMPUBI  CLEAR_UBI
                 65    04   D3  0114               BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
                       2F   12  0117               BNEQ    CLEAR_UBI                       ; YES-
                                0119   737
                                0119   738 CLEAR_MBA:
      66   ECE00000 8F   C8  0119   739         BISL    #MBA$M_CSR_CLR,MBA$L_CSR(R6)    ; CLEAR THE CONFIGURATION REGISTER
   08 A6   E00A3FFF 8F   C8  0120   740         BISL    #MBA$M_SR_CLR,MBA$L_SR(R6)      ; CLEAR THE STATUS REGISTER
      66   ECE00000 8F   D3  0128   741         BITL    #MBA$M_CSR_CLR,MBA$L_CSR(R6)    ; DID ALL BITS CLEAR ?
                       0D   12  012F   742         BNEQ    10$                             ; NO, ERROR
   08 A6   E00A3FFF 8F   D3  0131   743         BITL    #MBA$M_SR_CLR,MBA$L_SR(R6)      ; DID ALL BITS CLEAR ?
                       03   12  0139   744         BNEQ    10$                             ; NO
                     0066   31  013B   745         BRW     CHN_NORMAL_RTN                  ; RETURN OK
                                013E   746
      50   00660070 8F   D0  013E   747 10$:    MOVL    #DS$_LOGIC,R0                   ; NO - ERROR
                     0063   31  0145   748         BRW     CHN_CALL_RTN                    ; RETURN
                                0148   749
                                0148   750 CLEAR_UBI:
                 50    01   9A  0148   751         MOVZBL  #1,R0                           ; START AT DATA PATH #1
                                014B   752 10$:
           60000000 8F   C8  014B   753         bisl    #ubi$m_dpr_nxm!ubi$m_dpr_uce,-  ;                                [08]
                     6640       0151   754                 ubi$l_dpr(r6)[r0]               ; Clear csr                      [08]
            F4 50    03   F3  0153   755         AOBLEQ  #3,R0,10$                       ; DO CSR1, CSR2, CSR3
                     004A   31  0157   756         BRW     CHN_NORMAL_RTN                  ; RETURN
```

```
                     015A   758          .SBTTL  $CHANNEL CALL - GET ADAPTER STATUS
                     015A   759 ;++
                     015A   760 ; FUNCTIONAL DESCRIPTION:
                     015A   761 ;
                     015A   762 ;       PASS ADAPTER STATUS TO CALLER
                     015A   763 ;
                     015A   764 ; CALLING SEQUENCE:
                     015A   765 ;
                     015A   766 ;       BRW     CHN_STATUS
                     015A   767 ;
                     015A   768 ; INPUT PARAMETERS:
                     015A   769 ;
                     015A   770 ;       R5      =       CHANNEL DATA BLOCK
                     015A   771 ;       R6      =       CHANNEL CSR REGISTER ADDRESS
                     015A   772 ;
                     015A   773 ; IMPLICIT INPUTS:
                     015A   774 ;
                     015A   775 ;       NONE
                     015A   776 ;
                     015A   777 ; OUTPUT PARAMETERS:
                     015A   778 ;
                     015A   779 ;       R0      =       COMPLETION CODE
                     015A   780 ;
                     015A   781 ; IMPLICIT OUTPUTS:
                     015A   782 ;
                     015A   783 ;       NONE
                     015A   784 ;
                     015A   785 ; COMPLETION CODES:
                     015A   786 ;
                     015A   787 ;       DS$_NORMAL      =       SUCCESS
                     015A   788 ;
                     015A   789 ; SIDE EFFECTS:
                     015A   790 ;
                     015A   791 ;       NONE
                     015A   792 ;
                     015A   793 ;--
                     015A   794
                     015A   795 CHN_STATUS:
     04DC   30       015A   796          BSBW    HDWSTS                          ; GET HARDWARE ERROR STATUS
51    50   D0       015D   797          MOVL    R0,R1                           ; SAVE THE STATUS
     0419   30       0160   798          BSBW    ADPSTS                          ; GET ADPATER SPECIFIC STATUS
50    51   C8       0163   799          BISL    R1,R0                           ; COMBINE HARDWARE/ADAPTER SPECIFIC
14 A5 50   D0       0166   800          MOVL    R0,CDB$L_ST1(R5)                ; SAVE THE COMBINED STATUS
     04C6   30       016A   801          BSBW    GENSTS                          ; GET GENERAL STATUS
18 A5 50   3C       016D   802          MOVZWL  R0,CDB$W_ST2(R5)                ; GENERAL STATUS AND CLEAR RVR
51   10 AC D0       0171   803          MOVL    CHN$_ADR2(AP),R1                ; GET THE CALLERS STATUS ADDRESS
81   14 A5 D0       0175   804          MOVL    CDB$L_ST1(R5),(R1)+             ; PASS STATUS 1
61   18 A5 D0       0179   805          MOVL    CDB$W_ST2(R5),(R1)              ; PASS STATUS 2
     0024   31       017D   806          BRW     CHN_NORMAL_RTN                  ; RETURN
```

```
                     0180   808          .SBTTL  $CHANNEL CALL - SET DEFEAT PARITY
                     0180   809 ;++
                     0180   810 ; FUNCTIONAL DESCRIPTION:
                     0180   811 ;
                     0180   812 ;       SET DEFEAT DATA PATH PARITY
                     0180   813 ;
                     0180   814 ; CALLING SEQUENCE:
                     0180   815 ;
                     0180   816 ;       BSBW    CHN_SETDFT
                     0180   817 ;
                     0180   818 ; INPUT PARAMETERS:
                     0180   819 ;
                     0180   820 ;       R5      =       CHANNEL DATA BLOCK
                     0180   821 ;       R6      =       CHANNEL CSR REGISTER ADDRESS
                     0180   822 ;
                     0180   823 ; IMPLICIT INPUTS:
                     0180   824 ;
                     0180   825 ;       NONE
                     0180   826 ;
                     0180   827 ; OUTPUT PARAMETERS:
                     0180   828 ;
                     0180   829 ;       R0      =       COMPLETION CODE
                     0180   830 ;
                     0180   831 ; IMPLICIT OUTPUTS:
                     0180   832 ;
                     0180   833 ;       NONE
                     0180   834 ;
                     0180   835 ; COMPLETION CODES:
                     0180   836 ;
                     0180   837 ;       DS$_NORMAL      =       SUCCESS
                     0180   838 ;       DS$_NOSUPPORT   =       FUNCTION NOT SUPPORTED FOR 11/750 UBI
                     0180   839 ;
                     0180   840 ; SIDE EFFECTS:
                     0180   841 ;
                     0180   842 ;       NONE
                     0180   843 ;
                     0180   844 ;--
                     0180   845
                     0180   846 CHN_SETDFT:
                     0180   847          JMPUBI  SETDFT_UBI
          65   04   D3   0180                  BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
               03   12   0183                  BNEQ    SETDFT_UBI                      ; YES-
                     0185   848
                     0185   849 SETDFT_MBA:
               001C   31   0185   850          BRW     CHN_NORMAL_RTN                  ; RETURN
                     0188   851
                     0188   852 SETDFT_UBI:
     50   006600B1 8F   D0   0188   853          MOVL    #DS$_NOSUPPORT,R0               ; INDICATE NO SUPPORT
               0019   31   018F   854          BRW     CHN_CALL_RTN                    ; RETURN
```

```
                                0192          .SBTTL  $CHANNEL CALL - CLEAR DEFEAT PARITY
                                0192  ;++
                                0192  ; FUNCTIONAL DESCRIPTION:
                                0192  ;
                                0192  ;       CLEAR DEFEAT DATA PATH PARITY (UBI ONLY)
                                0192  ;
                                0192  ; CALLING SEQUENCE:
                                0192  ;
                                0192  ;       BRW     CHN_CLRDFT
                                0192  ;
                                0192  ; INPUT PARAMETERS:
                                0192  ;
                                0192  ;       R5      =       CHANNEL DATA BLOCK
                                0192  ;       R6      =       CHANNEL CSR REGISTER ADDRESS
                                0192  ;
                                0192  ; IMPLICIT INPUTS:
                                0192  ;
                                0192  ;       NONE
                                0192  ;
                                0192  ; OUTPUT PARAMETERS:
                                0192  ;
                                0192  ;       R0      =       COMPLETION CODE
                                0192  ;
                                0192  ; IMPLICIT OUTPUTS:
                                0192  ;
                                0192  ;       NONE
                                0192  ;
                                0192  ; COMPLETION CODES:
                                0192  ;
                                0192  ;       DS$_NORMAL      =       SUCCESS
                                0192  ;       DS$_NOSUPPORT   =       NOT SUPPORTED (11/750 UBI)
                                0192  ;
                                0192  ; SIDE EFFECTS:
                                0192  ;
                                0192  ;       NONE
                                0192  ;
                                0192  ;--
                                0192
                                0192  CHN_CLRDFT:
                                0192          JMPUBI  CLRDFT_UBI
          65    04    D3        0192          BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
                03    12        0195          BNEQ    CLRDFT_UBI                      ; YES-
                                0197
                                0197  CLRDFT_MBA:
             000A    31         0197          BRW     CHN_NORMAL_RTN                  ; RETURN
                                019A
                                019A  CLRDFT_UBI:
50    006600B1 8F    D0        019A          MOVL    #DS$_NOSUPPORT,R0               ; NOT SUPPORTED FOR 11/750 UBI
             0007    31        01A1          BRW     CHN_CALL_RTN                    ; RETURN
```

```
                        01A4    904          .SBTTL  $CHANNEL CALL - COMMON CALL RETURN
                        01A4    905 ;++
                        01A4    906 ; FUNCTIONAL DESCRIPTION:
                        01A4    907 ;
                        01A4    908 ;       COMMON CALL RETURN
                        01A4    909 ;
                        01A4    910 ; CALLING SEQUENCE:
                        01A4    911 ;
                        01A4    912 ;       BRW     CHN_CALL_RTN
                        01A4    913 ;
                        01A4    914 ; INPUT PARAMETERS:
                        01A4    915 ;
                        01A4    916 ;       R0      =       COMPLETION CODE
                        01A4    917 ;       R5      =       CHANNEL DATA BLOCK
                        01A4    918 ;       R6      =       CHANNEL CSR REGISTER ADDRESS
                        01A4    919 ;
                        01A4    920 ; IMPLICIT INPUTS:
                        01A4    921 ;
                        01A4    922 ;       NONE
                        01A4    923 ;
                        01A4    924 ; OUTPUT PARAMETERS:
                        01A4    925 ;
                        01A4    926 ;       R0      =       COMPLETION CODE
                        01A4    927 ;
                        01A4    928 ; IMPLICIT OUTPUTS:
                        01A4    929 ;
                        01A4    930 ;       NONE
                        01A4    931 ;
                        01A4    932 ; COMPLETION CODES:
                        01A4    933 ;
                        01A4    934 ;       NONE
                        01A4    935 ;
                        01A4    936 ; SIDE EFFECTS:
                        01A4    937 ;
                        01A4    938 ;       NONE
                        01A4    939 ;
                        01A4    940 ;--
                        01A4    941
                        01A4    942 CHN_NORMAL_RTN:
50  00660001 8F   D0    01A4    943         MOVL    #DS$_NORMAL,R0                  ; FLAG NORMAL RETURN
                        01AB    944
                        01AB    945 CHN_CALL_RTN:
                  04    01AB    946         RET                                     ; RETURN
                        01AC    947
```

```
01AC    949          .SBTTL  $SETMAP CALL
01AC    950 ;++
01AC    951 ; FUNCTIONAL DESCRIPTION:
01AC    952 ;
01AC    953 ;       SET ADPATER MAPPING
01AC    954 ;
01AC    955 ; CALLING SEQUENCE:
01AC    956 ;
01AC    957 ;       CALLG   ARGLST, a#DSX$SETMAP
01AC    958 ;         OR
01AC    959 ;       CALLS   #6,     a#DSX$SETMAP
01AC    960 ;
01AC    961 ; INPUT PARAMETERS:
01AC    962 ;
01AC    963 ;       4(AP)   LOGICAL UNIT NUMBER
01AC    964 ;       8(AP)   FUNCTION CODE
01AC    965 ;       12(AP)  PHYSICAL ADDRESS(POINTER TO QWORD)
01AC    966 ;       16(AP)  BASE ADDRESS(TO START MAPPING)
01AC    967 ;       20(AP)  BYTE COUNT
01AC    968 ;       24(AP)  DATA PATH NUMBER
01AC    969 ;
01AC    970 ; IMPLICIT INPUTS:
01AC    971 ;
01AC    972 ;       NONE
01AC    973 ;
01AC    974 ; OUTPUT PARAMETERS:
01AC    975 ;
01AC    976 ;       R0      =       COMPLETION CODE
01AC    977 ;
01AC    978 ; IMPLICIT OUTPUTS:
01AC    979 ;
01AC    980 ;       NONE
01AC    981 ;
01AC    982 ; COMPLETION CODES:
01AC    983 ;
01AC    984 ;       DS$_NORMAL      =       SUCCESS
01AC    985 ;       DS$_PROGERR     =       PROGRAM ERROR
01AC    986 ;                                MISSING/INVALID P-TABLE
01AC    987 ;                                ADDRESS/BYTE COUNT INVALID
01AC    988 ;                                INVALID DATA PATH
01AC    989 ;       DS$_IHWE        =       INITIAL ADAPTER HARDWARE ERROR ENCOUNTERED
01AC    990 ;
01AC    991 ; SIDE EFFECTS:
01AC    992 ;
01AC    993 ;       NONE
01AC    994 ;
01AC    995 ;--
```

```
                        0FFC  01AC    997 .ENTRY  DSX$SETMAP,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>
                              01AE    998
            52   04 AC    D0  01AE    999         MOVL    STM$_UNIT(AP),R2                ; LOGICAL UNIT TO R2
                  0525    30  01B2   1000         BSBW    BLDCDB                          ; BUILD THE CDB
                 03 50    E8  01B5   1001         BLBS    R0, 10$                 ; ERROR ?                       [09]
                  026C    31  01B8   1002         BRW     STM_CALL_RTN                    ; YES - RETURN
                              01BB   1003 10$:
         50   00660020 8F    D0  01BB   1004         MOVL    #DS$_PROGERR,R0                 ; PRIME FOR ERROR
            03   18 AC    D1  01C2   1005         CMPL    STM$_PTH(AP),#3                 ; VALID DATA PATH ?
                    03    15  01C6   1006         BLEQ    15$                             ; YES- LEQ
                  FFE0    31  01C8   1007         BRW     CHN_CALL_RTN                    ; NO - ERROR
                              01CB   1008 15$:
            52   0C AC    D0  01CB   1009         MOVL    STM$_PHY(AP),R2                 ; GET THE Q-WORD DESCRIPTER FOR PHYS
                  021C    30  01CF   1010         BSBW    RNGCHK                          ; RANGE CHECK
                 03 50    E8  01D2   1011         BLBS    R0, 20$                 ; RANGE CHECK ERROR ?           [09]
                  024F    31  01D5   1012         BRW     STM_CALL_RTN                    ; YES-
                              01D8   1013 20$:
                  045E    30  01D8   1014         BSBW    HDWSTS                          ; GET THE HARDWARE STATUS
               50   0F    D3  01DB   1015         BITL    #CHS$M_ERRANY,R0                ; GOOD STATUS ?
                    0A    13  01DE   1016         BEQL    30$                             ; YES-
         50   00660060 8F    D0  01E0   1017         MOVL    #DS$_IHWE,R0                    ; NO -
                  023D    31  01E7   1018         BRW     STM_CALL_RTN                    ; RETURN
                              01EA   1019 30$:
      1C A5   18 AC    D0  01EA   1020         MOVL    STM$_PTH(AP),CDB$L_PTH(R5)      ; REMEMBER THE DATA PATH
         52   10 AC    D0  01EF   1021         MOVL    STM$_BAS(AP),R2                 ; YES- BASE ADDRESS TO R2
         53   0C BC    D0  01F3   1022         MOVL    @STM$_PHY(AP),R3                ; START PHYSICAL ADDRESS TO R3
         5A   14 AC    D0  01F7   1023         MOVL    STM$_CNT(AP),R10                ; BYTE COUNT TO R10
   50   53   17   09    EF  01FB   1024         EXTZV   #9,#23,R3,R0                    ; Get PFN of start page
      58   01FF CA43    9E  0200   1025         MOVAB   511(R10)[R3],R8                 ; Last byte R10+R3-1 round to page
   58   58   17   09    EF  0206   1026         EXTZV   #9,#23,R8,R8                    ; Get PFN of last page
            58   50    C2  020B   1027         SUBL    R0,R8                           ; End-start = maps to alloc
                 0199    30  020E   1028         BSBW    BASCHK                          ; CHECK BASE
                03 50    E8  0211   1029         BLBS    R0,60$                          ; IF ERROR RETURN WITH
                 0210    31  0214   1030         BRW     STM_CALL_RTN                    ; BASCHK COMPLETION CODE
                              0217   1031 60$:
                 01DC    30  0217   1032         BSBW    CNTCHK                          ; CHECK COUNT
                03 50    E8  021A   1033         BLBS    R0,70$                          ; IF ERROR RETURN WITH
                 0207    31  021D   1034         BRW     STM_CALL_RTN                    ; CNTCHK COMPLETION CODE
                              0220   1035 70$:
            50   08 AC    D0  0220   1036         MOVL    STM$_FUNC(AP),R0                ; GET THE FUNCTION CODE
                              0224   1037         CASE    R0,LIMIT=#0,TYPE=L,<-           ;
                              0224   1038         NFWDN,-                         ; NOMAP-FORWARD-NOVALIDATE
                              0224   1039         INVALIDATE,-                    ; Invalidate map regs only
                              0224   1040         MFWDN,-                         ; MAP-FORWARD-NOVALIDATE
                              0224   1041         MFWDV,-                         ; MAP-FORWARD-VALIDATE
                              0224   1042         NREVN,-                         ; NOMAP-REVERSE-NOVALIDATE
                              0224   1043         INVALID,-                       ; INVALID
                              0224   1044         MREVN,-                         ; MAP-REVERSE-NOVALIDATE
                              0224   1045         MREVV,-                         ; MAP-REVERSE-VALIDATE
                              0224   1046         INVALID,-                       ; INVALID
                              0224   1047         INVALID,-                       ; INVALID
                              0224   1048         MFWDNO,-                        ; MAP-FORWARD-NOVALIDATE-OFFSET
                              0224   1049         MFWDVO,-                        ; MAP-FORWARD-VALIDATE-OFFSET
                              0224   1050         INVALID,-                       ; INVALID
                              0224   1051         INVALID,-                       ; INVALID
                              0224   1052         MREVNO,-                        ; MAP-REVERSE-NOVALIDATE-OFFSET
                              0224   1053         MREVVO,-                        ; MAP-REVERSE-VALIDATE-OFFSET
```

```
                                0224  1054          >
          0F'  00    50    CF   0224                CASEL   R0,#0,S^#<<30003$-30002$>/2>-1
                                0228        30002$:
                          0054' 0228                .SIGNED_WORD    NFWDN-30002$
                          002A' 022A                .SIGNED_WORD    INVALIDATE-30002$
                          0045' 022C                .SIGNED_WORD    MFWDN-30002$
                          0033' 022E                .SIGNED_WORD    MFWDV-30002$
                          0087' 0230                .SIGNED_WORD    NREVN-30002$
                          0020' 0232                .SIGNED_WORD    INVALID-30002$
                          0075' 0234                .SIGNED_WORD    MREVN-30002$
                          0060' 0236                .SIGNED_WORD    MREVV-30002$
                          0020' 0238                .SIGNED_WORD    INVALID-30002$
                          0020' 023A                .SIGNED_WORD    INVALID-30002$
                          00AB' 023C                .SIGNED_WORD    MFWDNO-30002$
                          0096' 023E                .SIGNED_WORD    MFWDVO-30002$
                          0020' 0240                .SIGNED_WORD    INVALID-30002$
                          0020' 0242                .SIGNED_WORD    INVALID-30002$
                          00CF' 0244                .SIGNED_WORD    MREVNO-30002$
                          00BD' 0246                .SIGNED_WORD    MREVVO-30002$
                                0248        30003$:
                                0248  1055  INVALID:
    50    00660020 8F    D0    0248  1056          MOVL    #DS$_PROGERR,R0                 ; INVALID FUNCTION CODE
                  01D5   31    024F  1057          BRW     STM_CALL_RTN                    ; RETURN
                                0252  1058  INVALIDATE:
                    18   CA    0252  1059          BICL    #CDB$M_OFFSET!CDB$M_REV,-
                    65         0254  1060                  CDB$L_FLAGS(R5)                 ;
                  0104   30    0255  1061          BSBW    CLRMAP                          ; Clear all map regs
                  01C5   31    0258  1062          BRW     STM_NORMAL_RTN                  ; RTN
                                025B  1063  MFWDV:
                    18   CA    025B  1064          BICL    #CDB$M_OFFSET!CDB$M_REV,-
                    65         025D  1065                  CDB$L_FLAGS(R5)                 ; CLEAR OFFSET AND REVERSE FLAGS
                  00FB   30    025E  1066          BSBW    CLRMAP                          ; CLEAR ALL MAPS
                  00A2   30    0261  1067          BSBW    SETMAP                          ; SET MAPS FOR FORWARD TRANSFER
                  011C   30    0264  1068          BSBW    SETVAR                          ; SET VAR IF MBA
                  0136   30    0267  1069          BSBW    SETCNT                          ; SET BYTE COUNT IF MBA
                  01B3   31    026A  1070          BRW     STM_NORMAL_RTN                  ; RETURN
                                026D  1071
                                026D  1072  MFWDN:
                    18   CA    026D  1073          BICL    #CDB$M_OFFSET!CDB$M_REV,-
                    65         026F  1074                  CDB$L_FLAGS(R5)                 ; CLEAR OFFSET AND REVERSE FLAGS
                  0093   30    0270  1075          BSBW    SETMAP                          ; SET MAPS FOR FORWARD TRANSFER
                  010D   30    0273  1076          BSBW    SETVAR                          ; SET VAR IF MBA
                  0127   30    0276  1077          BSBW    SETCNT                          ; SET BYTE COUNT IF MBA
                  01A4   31    0279  1078          BRW     STM_NORMAL_RTN                  ; RETURN
                                027C  1079
                                027C  1080  NFWDN:
                    18   CA    027C  1081          BICL    #CDB$M_OFFSET!CDB$M_REV,-
                    65         027E  1082                  CDB$L_FLAGS(R5)                 ; CLEAR OFFSET AND REVERSE FLAGS
                  0101   30    027F  1083          BSBW    SETVAR                          ; SET VAR IF MBA
                  011B   30    0282  1084          BSBW    SETCNT                          ; SET BYTE COUNT IF MBA
                  0198   31    0285  1085          BRW     STM_NORMAL_RTN                  ; RETURN
                                0288  1086
                                0288  1087  MREVV:
              65    08   CA    0288  1088          BICL    #CDB$M_OFFSET,CDB$L_FLAGS(R5)   ; CLEAR OFFSET FLAG
              65    10   C8    028B  1089          BISL    #CDB$M_REV,CDB$L_FLAGS(R5)      ; SET REVERSE FLAG
                  00CB   30    028E  1090          BSBW    CLRMAP                          ; CLEAR ALL MAP ENTRIES
                  0072   30    0291  1091          BSBW    SETMAP                          ; SET MAPS FOR REVERSE OPERATION
```

```
                     00EC   30  0294  1092          BSBW    SETVAR                                  ; SET VAR IF MBA
                     0106   30  0297  1093          BSBW    SETCNT                                  ; SET BYTE COUNT IF MBA
                     0183   31  029A  1094          BRW     STM_NORMAL_RTN                          ; RETURN
                                029D  1095
                                029D  1096 MREVN:
                65     08   CA  029D  1097          BICL    #CDB$M_OFFSET,CDB$L_FLAGS(R5)           ; CLEAR OFFSET FLAG
                65     10   C8  02A0  1098          BISL    #CDB$M_REV,CDB$L_FLAGS(R5)              ; SET REVERSE FLAG
                     0060   30  02A3  1099          BSBW    SETMAP                                  ; SET MAPPING
                     00DA   30  02A6  1100          BSBW    SETVAR                                  ; SET VAR IF MBA
                     00F4   30  02A9  1101          BSBW    SETCNT                                  ; SET BYTE COUNT IF MBA
                     0171   31  02AC  1102          BRW     STM_NORMAL_RTN                          ; RETURN
                                02AF  1103
                                02AF  1104 NREVN:
                65     08   CA  02AF  1105          BICL    #CDB$M_OFFSET,CDB$L_FLAGS(R5)           ; CLEAR OFFSET FLAG
                65     10   C8  02B2  1106          BISL    #CDB$M_REV,CDB$L_FLAGS(R5)              ; SET REVERSE FLAG
                     00CB   30  02B5  1107          BSBW    SETVAR                                  ; SET VAR IF MBA
                     00E5   30  02B8  1108          BSBW    SETCNT                                  ; SET BYTE COUNT IF MBA
                     0162   31  02BB  1109          BRW     STM_NORMAL_RTN                          ; RETURN
                                02BE  1110
                                02BE  1111 MFWDVO:
                65     10   CA  02BE  1112          BICL    #CDB$M_REV,CDB$L_FLAGS(R5)              ; CLEAR REVERSE FLAG
                65     08   C8  02C1  1113          BISL    #CDB$M_OFFSET,CDB$L_FLAGS(R5)           ; SET OFFSET FLAG
                     0095   30  02C4  1114          BSBW    CLRMAP                                  ; INVALIDATE MAPS
                     003C   30  02C7  1115          BSBW    SETMAP                                  ; SET MAPS
                     00B6   30  02CA  1116          BSBW    SETVAR                                  ; SET VAR IF MBA
                     00D0   30  02CD  1117          BSBW    SETCNT                                  ; SET BYTE COUNT IF MBA
                     014D   31  02D0  1118          BRW     STM_NORMAL_RTN                          ; RETURN
                                02D3  1119
                                02D3  1120 MFWDNO:
                65     10   CA  02D3  1121          BICL    #CDB$M_REV,CDB$L_FLAGS(R5)              ; CLEAR REVERSE FLAG
                65     08   C8  02D6  1122          BISL    #CDB$M_OFFSET,CDB$L_FLAGS(R5)           ; SET OFFSET FLAG
                   002A   30  02D9  1123          BSBW    SETMAP                                  ; SET MAPPING
                   00A4   30  02DC  1124          BSBW    SETVAR                                  ; SET VAR IF MBA
                   00BE   30  02DF  1125          BSBW    SETCNT                                  ; SET BYTE COUNT IF MBA
                   013B   31  02E2  1126          BRW     STM_NORMAL_RTN                          ; RETURN
                              02E5  1127
                              02E5  1128 MREVVO:
                     18   C8  02E5  1129          BISL    #CDB$M_OFFSET!CDB$M_REV,-
                     65       02E7  1130                  CDB$L_FLAGS(R5)                         ; SET OFFSET AND REVERSE FLAGS
                   0071   30  02E8  1131          BSBW    CLRMAP                                  ; CLEAR MAPS
                   0018   30  02EB  1132          BSBW    SETMAP                                  ; SET MAPPING
                   0092   30  02EE  1133          BSBW    SETVAR                                  ; SET VAR IF MBA
                   00AC   30  02F1  1134          BSBW    SETCNT                                  ; SET BYTE COUNT IF MBA
                   0129   31  02F4  1135          BRW     STM_NORMAL_RTN                          ; RETURN
                              02F7  1136
                              02F7  1137 MREVNO:
                     18   C8  02F7  1138          BISL    #CDB$M_OFFSET!CDB$M_REV,-
                     65       02F9  1139                  CDB$L_FLAGS(R5)                         ; SET OFFSET AND REVERSE FLAGS
                   0009   30  02FA  1140          BSBW    SETMAP                                  ; SET MAPPING
                   0083   30  02FD  1141          BSBW    SETVAR                                  ; SET VAR IF MBA
                   009D   30  0300  1142          BSBW    SETCNT                                  ; SET BYTE COUNT IF MBA
                   011A   31  0303  1143          BRW     STM_NORMAL_RTN                          ; RETURN
                              0306  1144
```

```
                     0306  1146 ;+
                     0306  1147 ; ROUTINE TO SET ADAPTER MAP REGISTERS
                     0306  1148 ; CALLED BY: BSBW SETMAP
                     0306  1149 ; R2 = BASE ADDRESS TO START MAPPING
                     0306  1150 ; R3 = START PHYSICAL ADDRESS
                     0306  1151 ; R6 = ADAPTER CSR ADDRESS
                     0306  1152 ; R8 = NUMBER OF PAGES TO MAP
                     0306  1153 ;-
                     0306  1154 SETMAP:
          51   52    D0  0306  1155          MOVL    R2,R1                           ; BASE TO R1
                     0309  1156          JMPUBI  SETMAP_UBI
          65   04    D3  0309            BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
               1C    12  030C            BNEQ    SETMAP_UBI                      ; YES-
                     030E  1157 SETMAP_MBA:
     50   53   F7 8F    78  030E  1158          ASHL    #-9,R3,R0                       ; SHIFT PFN
   50   80000000 8F    C8  0313  1159          BISL    #MBA$M_MAP_VALID,R0             ; MERGE WITH VALID BIT
                     031A  1160 10$:
    0800 C641    50    D0  031A  1161          MOVL    R0,MBA$L_MAP(R6)[R1]            ; WRITE THE MAP REGISTER
                 50    D6  0320  1162          INCL    R0                              ; NEXT MAP
                 51    D6  0322  1163          INCL    R1                              ; NEXT MAP ENTRY
              F3 58    F5  0324  1164          SOBGTR  R8,10$                          ; DECREMENT MAP COUNT
               0031    31  0327  1165          BRW     SETMAP_RTN                      ; RETURN
                     032A  1166
                     032A  1167 SETMAP_UBI:
                 08    BB  032A  1168          PUSHR   #^M<R3>                         ; SAVE R3
     53   53   F7 8F    78  032C  1169          ASHL    #-9,R3,R3                       ; SHIFT PFN
        50   01    1F    78  0331  1170          ashl    #31, #1, r0                     ; Set valid bit in R0           [08]
             1C A5    F0  0335  1171          INSV    CDB$L_PTH(R5),-                 ; INSERT THE DATA PATH
                 15        0338  1172                  #UBI$V_MAP_DPD,-
              50   02        0339  1173                  #UBI$S_MAP_DPD,R0
              65   08    D3  033B  1174          BITL    #CDB$M_OFFSET,CDB$L_FLAGS(R5)   ; OFFSET MODE ?
                   07    13  033E  1175          BEQL    10$                             ; NO -
   50   02000000 8F    C8  0340  1176          BISL    #UBI$M_MAP_BO,R0                ; YES- SET THE BIT
                     0347  1177 10$:
              00   53    F0  0347  1178          INSV    R3,#UBA$V_MAP_ADDR,-            ; INSERT THE PFN
              50   15        034A  1179                  #UBA$S_MAP_ADDR,R0              ; INTO R0
    0800 C641    50    D0  034C  1180          MOVL    R0,UBI$L_MAP(R6)[R1]            ; CREATE THE MAP
                 53    D6  0352  1181          INCL    R3                              ; INC THE ENTRY
                 51    D6  0354  1182          INCL    R1                              ; INC THE POINTER
               EE 58    F5  0356  1183          SOBGTR  R8,10$                          ; DO ALL PAGES
                 08    BA  0359  1184          POPR    #^M<R3>                         ; RESTORE R3
                     035B  1185 ;        BRB     SETMAP_RTN                      ; RETURN
                     035B  1186
                     035B  1187 SETMAP_RTN:
                 05  035B  1188          RSB                                     ; RETURN
                     035C  1189
```

```
                        035C  1191 ;+
                        035C  1192 ; ROUTINE TO INVALIDATE ALL ADAPTER MAP ENTRIES
                        035C  1193 ; CALLED BY: BSBW CLRMAP
                        035C  1194 ; R6 = ADAPTER CSR ADDRESS
                        035C  1195 ;-
                        035C  1196 CLRMAP:
                        035C  1197          JMPUBI  CLRMAP_UBI
          65    04  D3  035C              BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
                12  12  035F              BNEQ    CLRMAP_UBI                      ; YES-
                        0361  1198
                        0361  1199 CLRMAP_MBA:
                50  D4  0361  1200          CLRL    R0                              ; CLEAR R0
          0800 C640  D4  0363  1201 10$:    CLRL    MBA$L_MAP(R6)[R0]               ; CLEAR THE MAP ENTRY
F3 50  000000FF 8F  F3  0368  1202          AOBLEQ  #255,R0,10$                     ; Clear all 256 entries
              000F  31  0370  1203          BRW     CLRMAP_RTN                      ; RETURN
                        0373  1204
                        0373  1205 CLRMAP_UBI:
                50  D4  0373  1206          CLRL    R0                              ; CLEAR R0
          0800 C640  D4  0375  1207 10$:    CLRL    UBI$L_MAP(R6)[R0]               ; CLEAR THE MAP ENTRY
F3 50  000001FF 8F  F3  037A  1208          AOBLEQ  #511,R0,10$                     ; Clear all 496 entries
                        0382  1209 ;        BRW     CLRMAP_RTN                      ; RETURN
                        0382  1210
                        0382  1211 CLRMAP_RTN:
                05  0382  1212          RSB                                     ; RETURN
                        0383  1213
```

```
                        0383  1215 ;+
                        0383  1216 ; ROUTINE TO SET ADAPTER VIRTUAL ADDRESS REGISTER
                        0383  1217 ; CALLED BY BSBW SETVAR
                        0383  1218 ; R2 = BASE ADDRESS
                        0383  1219 ; R3 = START PHYSICAL ADDRESS
                        0383  1220 ; R6 = ADAPTER CSR ADDRESS
                        0383  1221 ; R10 = BYTE COUNT
                        0383  1222 ;-
                        0383  1223 SETVAR:
                        0383  1224              JMPUBI  SETVAR_UBI                              ;
              65  04 D3 0383                    BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
                  17 12 0386                    BNEQ    SETVAR_UBI                      ; YES-
                        0388  1225
                        0388  1226 SETVAR_MBA:
           50 52  09 78 0388  1227              ASHL    #9,R2,R0                        ; SHIFT MAP POINTER
     50 09 00 53  F0 038C  1228              INSV    R3,#0,#9,R0                     ; INSERT BYTE #
              65  10 D3 0391  1229              BITL    #CDB$M_REV,CDB$L_FLAGS(R5)      ; IS THIS A REVERSE OPERATION ?
                  05 13 0394  1230              BEQL    10$                             ; NO -
              50  5A C0 0396  1231              ADDL    R10,R0                          ; YES- MAKE ADJUSTMENT
                        0399  1232                                                      ; TO POINT VAR AT END OF TRANSFER
                  50 D7 0399  1233              DECL    R0              ; (BASE + START PHYSICAL ADDRESS(BYTE) + COUNT)-1
                        039B  1234 10$:
            0C A6 50 D0 039B  1235              MOVL    R0,MBA$L_VAR(R6)                ; SET THE VAR
                        039F  1236 ;            BRW     SETVAR_RTN                      ; RETURN
                        039F  1237
                        039F  1238 SETVAR_UBI:                                          ; SETVAR IS NOP FOR UBI
                        039F  1239 SETVAR_RTN:
                  05    039F  1240              RSB                                     ; RETURN
                        03A0  1241
```

```
                        03A0  1243 ;+
                        03A0  1244 ; ROUTINE TO SET THE ADAPTER BYTE COUNT REGISTER
                        03A0  1245 ; CALLED BY: BSBW SETCNT
                        03A0  1246 ; R6 = ADAPTER CSR ADDRESS
                        03A0  1247 ; R10 = BYTE COUNT
                        03A0  1248 ;-
                        03A0  1249 SETCNT:
                        03A0  1250         JMPUBI  SETCNT_UBI
                65 04 D3 03A0               BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
                   04 12 03A3               BNEQ    SETCNT_UBI                      ; YES-
                        03A5  1251
                        03A5  1252 SETCNT_MBA:
             10 A6 5A CE 03A5  1253         MNEGL   R10,MBA$L_BCR(R6)               ; SET THE BYTE COUNT REGISTER
                        03A9  1254 ;        BRW     SETCNT_RTN                      ; RETURN
                        03A9  1255
                        03A9  1256 SETCNT_UBI:                                      ; SETCNT IS NOP FOR UBI
                        03A9  1257 SETCNT_RTN:
                   05   03A9  1258         RSB                                     ; RETURN
                        03AA  1259
                        03AA  1260 ;+
                        03AA  1261 ; ROUTINE TO VERIFY THAT THE BASE ADDRESS
                        03AA  1262 ; PLUS THE NUMBER OF PAGES REQUIRED WILL
                        03AA  1263 ; FIT WITHIN THE MAPPING SPACE
                        03AA  1264 ; R2 = MAP BASE
                        03AA  1265 ; R8 = TOTAL PAGES TO MAP
                        03AA  1266 ;-
                        03AA  1267 BASCHK:
                        03AA  1268         JMPUBI  BASCHK_UBI                      ;
                65 04 D3 03AA               BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
                   1F 12 03AD               BNEQ    BASCHK_UBI                      ; YES-
                        03AF  1269
                        03AF  1270 BASCHK_MBA:
          50 52 58 C1 03AF  1271         ADDL3   R8,R2,R0                        ; BASE + TOTAL PAGES
00000100 8F 50 D1 03B3  1272         CMPL    R0,#256                         ; Is it within range ?
                   09 15 03BA  1273         BLEQ    10$                             ; YES-
50 00660020 8F D0 03BC  1274         MOVL    #DS$_PROGERR,R0                 ; NO - ERROR
                   28 11 03C3  1275         BRB     BASCHK_RTN                      ; RETURN
                        03C5  1276 10$:
50 00660001 8F D0 03C5  1277         MOVL    #DS$_NORMAL,R0                  ; INDICATE SUCCESS
                   1F 11 03CC  1278         BRB     BASCHK_RTN                      ; RETURN
                        03CE  1279
                        03CE  1280 BASCHK_UBI:
          50 52 58 C1 03CE  1281         ADDL3   R8,R2,R0                        ; BASE + TOTAL PAGES
00000200 8F 50 D1 03D2  1282         CMPL    R0,#512                         ; Is it within range ?
                   09 15 03D9  1283         BLEQ    10$                             ; YES-
50 00660020 8F D0 03DB  1284         MOVL    #DS$_PROGERR,R0                 ; NO - ERROR
                   09 11 03E2  1285         BRB     BASCHK_RTN                      ; RETURN
                        03E4  1286 10$:
50 00660001 8F D0 03E4  1287         MOVL    #DS$_NORMAL,R0                  ; INDICATE SUCCESS
                   00 11 03EB  1288         BRB     BASCHK_RTN                      ; RETURN
                        03ED  1289
                        03ED  1290 BASCHK_RTN:
                   05   03ED  1291         RSB                                     ; RETURN
                        03EE  1292
                        03EE  1293 ;+
                        03EE  1294 ; ROUTINE TO VALIDATE TRANSFER ADDRESS
                        03EE  1295 ; NOT IMPLEMENTED
```

```
                                03EE  1296 ;-
                                03EE  1297 RNGCHK:
                                03EE  1298
                                03EE  1299 RNGCHK_RTN:
        50   00660001 8F   D0   03EE  1300          MOVL    #DS$_NORMAL,R0                  ; INDICATE SUCCESS
                           05   03F5  1301          RSB                                     ; RETURN
                                03F6  1302
                                03F6  1303 ;+
                                03F6  1304 ; ROUTINE TO VERIFY THAT REQUESTED BYTE COUNT
                                03F6  1305 ; WILL FIT IN REQUESTED BUFFER SIZE
                                03F6  1306 ;-
                                03F6  1307 CNTCHK:
                     0E    BB   03F6  1308          PUSHR   #^M<R1,R2,R3>                   ; SAVE R1 - R3
          52    0C BC    7D   03F8  1309          MOVQ    @STM$_PHY(AP),R2                ; BEGIN ADDR-> R2, END -> R3
      53   01FF 8F    A8   03FC  1310          BISW2   #^X1FF,R3                       ; FORCE TO END OF PAGE
           53   52    C2   0401  1311          SUBL2   R2,R3                           ; FIND NUMBER OF BYTES
                53    D6   0404  1312          INCL    R3                              ; PLUS ONE
           51   14 AC    D0   0406  1313          MOVL    STM$_CNT(AP),R1                 ; COUNT TO R1
        50   00660001 8F   D0   040A  1314          MOVL    #DS$_NORMAL,R0                  ; INITIAL COMPLETION CODE
           53   51    D1   0411  1315          CMPL    R1,R3                           ; WILL BYTE COUNT FIT ?
                07    15   0414  1316          BLEQ    CNTCHK_RTN                      ; YES-
        50   00660020 8F   D0   0416  1317          MOVL    #DS$_PROGERR,R0                 ; NO -
                                041D  1318
                                041D  1319 CNTCHK_RTN:
                     0E    BA   041D  1320          POPR    #^M<R1,R2,R3>                   ; RESTORE REGISTERS
                           05   041F  1321          RSB                                     ; RETURN
                                0420  1322
                                0420  1323 ;+
                                0420  1324 ;
                                0420  1325 ; SETMAP  "GLOBAL" EXIT
                                0420  1326 ;
                                0420  1327 ;-
                                0420  1328
                                0420  1329 STM_NORMAL_RTN:
    50   00660001 8F   D0   0420  1330          MOVL    #DS$_NORMAL,R0                  ; IT WORKS
                                0427  1331
                                0427  1332 STM_CALL_RTN:
                           04   0427  1333          RET                                     ; RETURN TO CALLER
```

```
                     0428  1335          .SBTTL  DSP$SHOWMBA
                     0428  1336 ;++
                     0428  1337 ; FUNCTIONAL DESCRIPTION:
                     0428  1338 ;
                     0428  1339 ;       THIS ROUTINE WILL PRINT OUT THE CURRENT STATE OF OF THE MBA
                     0428  1340 ;       AS SPECIFIED BY THE ARGLIST
                     0428  1341 ;
                     0428  1342 ; CALLING SEQUENCE:
                     0428  1343 ;
                     0428  1344 ;       CALLS   #1,DSP$SHOWMBA OR
                     0428  1345 ;       CALLG   ARGLIST,DSP$SHOWMBA
                     0428  1346 ;
                     0428  1347 ; INPUT PARAMETERS:
                     0428  1348 ;
                     0428  1349 ;       4(AP)   -> ADDRESS OF MBA CSR
                     0428  1350 ;
                     0428  1351 ; IMPLICIT INPUTS:
                     0428  1352 ;
                     0428  1353 ;       NONE
                     0428  1354 ;
                     0428  1355 ; OUTPUT PARAMETERS:
                     0428  1356 ;
                     0428  1357 ;       NONE
                     0428  1358 ;
                     0428  1359 ; IMPLICIT OUTPUTS:
                     0428  1360 ;
                     0428  1361 ;       NONE
                     0428  1362 ;
                     0428  1363 ; COMPLETION CODES:
                     0428  1364 ;
                     0428  1365 ;       DS$_NORMAL      = SERVICE SUCCESSFULLY COMPLETED.
                     0428  1366 ;
                     0428  1367 ; SIDE EFFECTS:
                     0428  1368 ;
                     0428  1369 ;       NONE
                     0428  1370 ;--
                     0428  1371
                007C 0428  1372 .ENTRY  DSP$SHOWMBA,^M<R2,R3,R4,R5,R6>          ; ENTRY MASK (SAME AS SHOWCHAN)
      56    04 AC    D0  042A  1373          MOVL    4(AP),R6                   ; COPY ADDRESS OF MBA CSR
            0049     30  042E  1374          BSBW    SHOW_MBA                   ; INTERPRET CONTENTS OF REGS
50    00660001 8F    D0  0431  1375          MOVL    #DS$_NORMAL,R0
                       04  0438  1376          RET                            ; RETURN
```

```
                        0439  1378          .SBTTL  DSP$SHOWUBI
                        0439  1379 ;++
                        0439  1380 ; FUNCTIONAL DESCRIPTION:
                        0439  1381 ;
                        0439  1382 ;       THIS PROCEEDURE WILL INTERPRET THE CONTENTS OF THE UBI
                        0439  1383 ;       POINTED TO BY THE ARGLIST
                        0439  1384 ;
                        0439  1385 ; CALLING SEQUENCE:
                        0439  1386 ;
                        0439  1387 ;       PUSHL   <CSR ADDR>
                        0439  1388 ;       CALLS   #1,DSP$SHOWUBI
                        0439  1389 ; OR    CALLG   <ARGLIST>,DSP$SHOWUBI
                        0439  1390 ;
                        0439  1391 ; INPUT PARAMETERS:
                        0439  1392 ;
                        0439  1393 ;       4(AP)   -> ADDRESS OF UBI CSR
                        0439  1394 ;
                        0439  1395 ; IMPLICIT INPUTS:
                        0439  1396 ;
                        0439  1397 ;       NONE
                        0439  1398 ;
                        0439  1399 ; OUTPUT PARAMETERS:
                        0439  1400 ;
                        0439  1401 ;       NONE
                        0439  1402 ;
                        0439  1403 ; IMPLICIT OUTPUTS:
                        0439  1404 ;
                        0439  1405 ;       NONE
                        0439  1406 ;
                        0439  1407 ; COMPLETION CODES:
                        0439  1408 ;
                        0439  1409 ;       DS$_NORMAL      = SERVICE SUCCESSFULLY COMPLETED.
                        0439  1410 ;
                        0439  1411 ; SIDE EFFECTS:
                        0439  1412 ;
                        0439  1413 ;       NONE
                        0439  1414 ;--
                        0439  1415
                 007C   0439  1416 .ENTRY  DSP$SHOWUBI,^M<R2,R3,R4,R5,R6>          ; ENTRY MASK (SAME AS SHOWCHAN)
      56   04 AC    D0   043B  1417         MOVL    4(AP),R6                       ; COPY ADDRESS OF UBI CSR
           00DA    30   043F  1418         BSBW    SHOW_UBI                       ; INTERPRET THE UBI ADDRESS
50   00660001 8F    D0   0442  1419         MOVL    #DS$_NORMAL,R0
                    04   0449  1420         RET                                    ; SUCCESS OF COURSE
```

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                     044A  1422          .SBTTL  $SHOWCHAN CALL
                     044A  1423 ;++
                     044A  1424 ; FUNCTIONAL DESCRIPTION:
                     044A  1425 ;
                     044A  1426 ;       DISPLAY ADAPTER REGISTERS
                     044A  1427 ;
                     044A  1428 ; CALLING SEQUENCE:
                     044A  1429 ;
                     044A  1430 ;       CALLG   ARGLST, a#DS$SHOWCHAN
                     044A  1431 ;         OR
                     044A  1432 ;       CALLS   #1,a#DS$SHOWCHAN
                     044A  1433 ;
                     044A  1434 ; INPUT PARAMETERS:
                     044A  1435 ;
                     044A  1436 ;       4(AP) LOGICAL UNIT NUMBER
                     044A  1437 ;
                     044A  1438 ; IMPLICIT INPUTS:
                     044A  1439 ;
                     044A  1440 ;       NONE
                     044A  1441 ;
                     044A  1442 ; OUTPUT PARAMETERS:
                     044A  1443 ;
                     044A  1444 ;       R0      =       COMPLETION CODE
                     044A  1445 ;
                     044A  1446 ; IMPLICIT OUTPUTS:
                     044A  1447 ;
                     044A  1448 ;       NONE
                     044A  1449 ;
                     044A  1450 ; COMPLETION CODES:
                     044A  1451 ;
                     044A  1452 ;       DS$_NORMAL      =       SUCCESS
                     044A  1453 ;       DS$_PROGERR     =       PROGRAM ERROR
                     044A  1454 ;                                MISSING/INVALID P-TABLE
                     044A  1455 ;
                     044A  1456 ; SIDE EFFECTS:
                     044A  1457 ;
                     044A  1458 ;       NONE
                     044A  1459 ;--
                     044A  1460
             007C    044A  1461 .ENTRY  DSX$SHOWCHAN,^M<R2,R3,R4,R5,R6>
                     044C  1462
     52   04 AC     D0  044C  1463          MOVL    SHW$_UNIT(AP),R2                ; GET THE LOGICAL UNIT NUMBER
           0287     30  0450  1464          BSBW    BLDCDB                          ; BUILD THE CDB
          02 50     E8  0453  1465          BLBS    R0, 10$                 ; ANY ERROR ?                   [09]
             21     11  0456  1466          BRB     SHOW_RTN_1                      ; YES- RETURN WITH
                     0458  1467                                                  ; THE ERROR CODE FROM BLDCDB
                     0458  1468 10$:
                     0458  1469          JMPUBI  20$                             ; IS THIS AN UBI?
     65     04       D3  0458                  BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
               05     12  045B                  BNEQ    20$                     ; YES-
            001A     30  045D  1470          BSBW    SHOW_MBA                        ; INTERPRET STATUS FOR MBA
              03     11  0460  1471          BRB     SHOW_RTN                        ; EXIT
                     0462  1472
            00B7     30  0462  1473 20$:     BSBW    SHOW_UBI                        ; INTERPRET STATUS FOR UBI
                     0465  1474
                     0465  1475 SHOW_RTN:
                     0465  1476          $DS_PRINTB_S    L^FMT_CRLF                  ; SEPARATE THE SHOWCHAN         [11]
```

```
                00000024'EF   9F  0465                    PUSHAB  L^FMT_CRLF
           00000000'9F    01   FB  046B                    CALLS   #$$N, @#DS$PRINTB
           50    00660001 8F   D0  0472  1477              MOVL    #DS$_NORMAL,R0                  ; INDICATE SUCCESS
                               0479  1478 SHOW_RTN_1:
                               04  0479  1479              RET                                     ; RETURN
```

```
047A  1481          .SBTTL  SHOW_MBA STATUS
047A  1482 ;**
047A  1483 ; FUNCTIONAL DESCRIPTION:
047A  1484 ;
047A  1485 ;       SUBROUTINE TO DISPLAY MBA STATUS
047A  1486 ;
047A  1487 ; CALLING SEQUENCE:
047A  1488 ;
047A  1489 ;       BSBW    SHOW_MBA
047A  1490 ;
047A  1491 ; INPUT PARAMETERS:
047A  1492 ;
047A  1493 ;       R6=ADDRESS OF UBI CSR
047A  1494 ;
047A  1495 ; IMPLICIT INPUTS:
047A  1496 ;
047A  1497 ;       NONE
047A  1498 ;
047A  1499 ; OUTPUT PARAMETERS:
047A  1500 ;
047A  1501 ;       NONE
047A  1502 ;
047A  1503 ; IMPLICIT OUTPUTS:
047A  1504 ;
047A  1505 ;       NONE
047A  1506 ;
047A  1507 ; COMPLETION CODES:
047A  1508 ;
047A  1509 ;       NONE
047A  1510 ;
047A  1511 ; SIDE EFFECTS:
047A  1512 ;
047A  1513 ;       NONE
047A  1514 ;--
```

```
                                047A  1516 SHOW_MBA:
                                047A  1517         $DS_PRINTB_S    L^FMT_MBA_HDR              ; PRINT THE HEADER                [11]
          00000008'EF    9F     047A                       PUSHAB  L^FMT_MBA_HDR
     00000000'9F    01   FB     0480                       CALLS   #$$N, a#DS$PRINTB
     52   00000027'EF    DE     0487  1518         MOVAL   FMT_MBA_CSR,R2                     ; ADDRESS OF FAO OUTPUT
              53    66   DE     048E  1519         MOVAL   MBA$L_CSR(R6),R3                   ; ADDRESS OF CSR REGISTER
     54   000000CB'EF    DE     0491  1520         MOVAL   MBA_CSR_BIT,R4                     ; ADDRESS OF BIT DEF'S
                  00AE   30     0498  1521         BSBW    SHOWBITS                           ; EXPLAIN THE CSR BITS
                                049B  1522
     52   00000045'EF    DE     049B  1523         MOVAL   FMT_MBA_CR,R2                      ; ADDRESS OF FAO OUTPUT
           53    04 A6   DE     04A2  1524         MOVAL   MBA$L_CR(R6),R3                    ; ADDRESS OF CR REGISTER
     54   000000EB'EF    DE     04A6  1525         MOVAL   MBA_CR_BIT,R4                      ; ADDRESS OF BITS DEF'S
                  0099   30     04AD  1526         BSBW    SHOWBITS                           ; EXPLAIN THE CR BITS
                                04B0  1527
     52   00000062'EF    DE     04B0  1528         MOVAL   FMT_MBA_SR,R2                      ; ADDRESS OF FAO OUTPUT
           53    08 A6   DE     04B7  1529         MOVAL   MBA$L_SR(R6),R3                    ; ADDRESS OF SR REG REGISTER
     54   0000011B'EF    DE     04BB  1530         MOVAL   MBA_SR_BIT,R4                      ; ADDRESS OF BIT DEF'S
                  0084   30     04C2  1531         BSBW    SHOWBITS                           ; EXPLAIN THE SR BITS
                                04C5  1532
           52    0C A6   DE     04C5  1533         MOVAL   MBA$L_VAR(R6),R2                   ; YES- ADDRESS OF VAR REG TO R2
 54   52   C0000000 8F   CB     04C9  1534         BICL3   #3 @ 30, R2, R4                    ; MAKE PHYSICAL ADDR TO PRINT
                                04D1  1535         $DS_PRINTB_S    L^FMT_MBA_VAR, R4, (R2)    ; SHOW THE VA REGISTER            [11]
                    62   DD     04D1                       PUSHL   (R2)
                    54   DD     04D3                       PUSHL   R4
          0000007F'EF    9F     04D5                       PUSHAB  L^FMT_MBA_VAR
     00000000'9F    03   FB     04DB                       CALLS   #$$N, a#DS$PRINTB
     52   52    08   09   EF     04E2  1536         EXTZV   #9,#8,R2,R2                        ; EXTRACT MAP FIELD
       51    0800 C642   D0     04E7  1537         MOVL    MBA$L_MAP(R6)[R2],R1               ; MAP REGISTER TO R2
                                04ED  1538         $DS_PRINTB_S    L^FMT_MBA_MAP,R2,R1        ; SHOW THE MAP REGISTER           [11]
                    51   DD     04ED                       PUSHL   R1
                    52   DD     04EF                       PUSHL   R2
          00000098'EF    9F     04F1                       PUSHAB  L^FMT_MBA_MAP
     00000000'9F    03   FB     04F7                       CALLS   #$$N, a#DS$PRINTB
           52    10 A6   DE     04FE  1539         MOVAL   MBA$L_BCR(R6),R2                   ; BCR TO R2
 54   52   C0000000 8F   CB     0502  1540         BICL3   #3 @ 30, R2, R4                    ; PHYSICAL ADDRESS OF REGISTER
                                050A  1541         $DS_PRINTB_S    L^FMT_MBA_CNT, R4, (R2)    ; SHOW THE BYTE COUNT REGISTER    [11]
                    62   DD     050A                       PUSHL   (R2)
                    54   DD     050C                       PUSHL   R4
          000000B1'EF    9F     050E                       PUSHAB  L^FMT_MBA_CNT
     00000000'9F    03   FB     0514                       CALLS   #$$N, a#DS$PRINTB
                         05     051B  1542         RSB                                        ; RETURN
```

```
051C  1544          .SBTTL  SHOW_UBI STATUS
051C  1545 ;**
051C  1546 ; FUNCTIONAL DESCRIPTION:
051C  1547 ;
051C  1548 ;       SUBROUTINE TO PRINT UBI STATUS
051C  1549 ;
051C  1550 ; CALLING SEQUENCE:
051C  1551 ;
051C  1552 ;       BSBW    SHOW_UBI
051C  1553 ;
051C  1554 ; INPUT PARAMETERS:
051C  1555 ;
051C  1556 ;       R6=ADDRESS OF UBI CSR
051C  1557 ;
051C  1558 ; IMPLICIT INPUTS:
051C  1559 ;
051C  1560 ;       NONE
051C  1561 ;
051C  1562 ; OUTPUT PARAMETERS:
051C  1563 ;
051C  1564 ;       NONE
051C  1565 ;
051C  1566 ; IMPLICIT OUTPUTS:
051C  1567 ;
051C  1568 ;       NONE
051C  1569 ;
051C  1570 ; COMPLETION CODES:
051C  1571 ;
051C  1572 ;       NONE
051C  1573 ;
051C  1574 ; SIDE EFFECTS:
051C  1575 ;
051C  1576 ;       NONE
051C  1577 ;--
```

```
                                  051C  1579 SHOW_UBI:
                                  051C  1580         $DS_PRINTB_S    L^FMT_UBI_HDR          ; PRINT THE HEADER                [11]
            000001B9'EF    9F     051C                       PUSHAB  L^FMT_UBI_HDR
      00000000'9F    01    FB     0522                       CALLS   #$$N, a#DS$PRINTB
      52    000001D5'EF    DE     0529  1581         MOVAL   FMT_UBI_CSR,R2                 ; ADDRESS OF FAO STRING
  7E  66    1FFFFFFE 8F    CB     0530  1582         BICL3   #^x1FFFFFFE, -                 ; Mask out 'MBZ' bits,            [07]
                                  0538  1583                  ubi$l_dpr(r6), -(sp)          ;  and fetch register             [08]
                53    6E    DE     0538  1584         MOVAL   (SP), R3                       ; Address of 'register'           [07]
      54    000001F3'EF    DE     053B  1585         MOVAL   UBI_CSR_BIT,R4                 ; ADDRESS OF BIT DEF'S
                    0004    30     0542  1586         BSBW    SHOWBITS                       ; EXPLAIN REGISTER CONTENTS
                5E    04    C0     0545  1587         ADDL2   #4, SP                         ; Remove temporary                [07]
                            05     0548  1588         RSB                                    ; RETURN
                                  0549  1589
```

```
                     0549  1591          .SBTTL  SHOWBITS
                     0549  1592 ;**
                     0549  1593 ; FUNCTIONAL DESCRIPTION:
                     0549  1594 ;
                     0549  1595 ;       SUBROUTINE TO CVTREG AND PRINTB CSR BITS
                     0549  1596 ;
                     0549  1597 ; CALLING SEQUENCE:
                     0549  1598 ;
                     0549  1599 ;       BSBW    SHOWBITS
                     0549  1600 ;
                     0549  1601 ; INPUT PARAMETERS:
                     0549  1602 ;
                     0549  1603 ;       R2      ADDRESS OF FAO STRING TO BE OUTPUT
                     0549  1604 ;       R3      ADDRESS OF DEVICE REGISTER
                     0549  1605 ;       R4      ADDRESS OF ASCIC BIT DESCRIPTOR STRING
                     0549  1606 ;
                     0549  1607 ; IMPLICIT INPUTS:      NONE
                     0549  1608 ;
                     0549  1609 ; OUTPUT PARAMETERS:    NONE
                     0549  1610 ;
                     0549  1611 ; IMPLICIT OUTPUTS:     NONE
                     0549  1612 ;
                     0549  1613 ; COMPLETION CODES:     NONE
                     0549  1614 ;
                     0549  1615 ; SIDE EFFECTS:         NONE
                     0549  1616 ;--
                     0549  1617
                     0549  1618 SHOWBITS:
00000028'EF   63 D0  0549  1619          MOVL    (R3), FMT_CVT_ARG+8             ; CONVERT DEVICE REGISTER BITS
0000002C'EF   54 D0  0550  1620          MOVL    R4,FMT_CVT_ARG+12               ; USING THIS MASK
                     0557  1621          $DS_CVTREG_G  FMT_CVT_ARG
                                                 ; INTO ASCII IN SHWBUF
00000000'9F 00000020'EF FA  0557                 CALLG   FMT_CVT_ARG, a#DS$CVTREG
            00000060'EF DF  0562  1622           PUSHAL  SHWBUF                  ; PARAM 4 ADDRESS OF BIT ENCODINGS
                        63 DD  0568  1623        PUSHL   (R3)                    ; PARAM 3 IS REG CONTENTS
   7E   53  C0000000 8F CB  056A  1624           BICL3   #3 @ 30, R3, -(SP)      ; PARAM 2 IS REGISTER ADDRESS
                        62 9F  0572  1625        PUSHAB  (R2)                    ; PARAM 1 IS FAO ASCIC STRING
            00000000'9F 04 FB  0574  1626        CALLS   #4,a#DS$PRINTB          ; CALL OUTPUT ROUTINE
                        05     057B  1627        RSB                             ; RETURN
```

```
                                057C  1629          .SBTTL  DETERMINE ADAPTER SPECIFIC STATUS
                                057C  1630 ;**
                                057C  1631 ; FUNCTIONAL DESCRIPTION:
                                057C  1632 ;
                                057C  1633 ;       DETERMINE ADAPTER SPECIFIC STATUS
                                057C  1634 ;
                                057C  1635 ; CALLING SEQUENCE:
                                057C  1636 ;
                                057C  1637 ;       BSBW    ADPSTS
                                057C  1638 ;
                                057C  1639 ; INPUT PARAMETERS:
                                057C  1640 ;
                                057C  1641 ;       R5      =       CHANNEL DATA BLOCK
                                057C  1642 ;       R6      =       CHANNEL CSR REGISTER ADDRESS
                                057C  1643 ;
                                057C  1644 ; IMPLICIT INPUTS:
                                057C  1645 ;
                                057C  1646 ;       NONE
                                057C  1647 ;
                                057C  1648 ; OUTPUT PARAMETERS:
                                057C  1649 ;
                                057C  1650 ;       R0      =       STATUS
                                057C  1651 ;
                                057C  1652 ; IMPLICIT OUTPUTS:
                                057C  1653 ;
                                057C  1654 ;       NONE
                                057C  1655 ;
                                057C  1656 ; COMPLETION CODES:
                                057C  1657 ;
                                057C  1658 ;       NONE
                                057C  1659 ;
                                057C  1660 ; SIDE EFFECTS:
                                057C  1661 ;
                                057C  1662 ;       NONE
                                057C  1663 ;
                                057C  1664 ;--
                                057C  1665
                                057C  1666 ADPSTS:
                          50    D4  057C  1667          CLRL    R0                              ; CLEAR R0
                                057E  1668          jmpmba  adpsts_mba                      ; Is channel MBA?               [08]
                    65    01    D3  057E              BITL    #CDB$M_MBA,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A MBA ?
                          03    12  0581              BNEQ    adpsts_mba                      ; YES-
                       009C     31  0583  1669          brw     adpsts_ubi                      ; otherwise UBI                 [08]
                                0586  1670
                                0586  1671 ADPSTS_MBA:
08 A6     00000080 8F           D3  0586  1672          BITL    #MBA$M_SR_MBEXC,MBA$L_SR(R6)    ; IS THERE A MASSBUS EXCEPTION ?
                          07    13  058E  1673          BEQL    10$                             ; NO -
   50     00010000 8F           C8  0590  1674          BISL    #CHS$M_MBAEXC,R0                ; YES-
                                0597  1675 10$:
08 A6     00040000 8F           D3  0597  1676          BITL    #MBA$M_SR_NED,MBA$L_SR(R6)      ; NON-EXISTANT DRIVE ?
                          07    13  059F  1677          BEQL    20$                             ; NO -
   50     00020000 8F           C8  05A1  1678          BISL    #CHS$M_MBANED,R0                ; YES-
                                05A8  1679 20$:
08 A6     80000000 8F           D3  05A8  1680          BITL    #MBA$M_SR_DTBUSY,MBA$L_SR(R6)   ; DATA TRANSFER BUSY ?
                          07    13  05B0  1681          BEQL    30$                             ; NO -
   50     00040000 8F           C8  05B2  1682          BISL    #CHS$M_MBADTB,R0                ; YES-
                                05B9  1683 30$:
```

```
                08 A6   00002000 8F   D3   05B9  1684          BITL    #MBA$M_SR_DTCOMP,MBA$L_SR(R6)   ; DATA TRANSFER COMPLETE ?
                               07   13   05C1  1685          BEQL    40$                             ; NO -
                   50   00080000 8F   C8   05C3  1686          BISL    #CHS$M_MBADTC,R0                ; YES-
                                         05CA  1687 40$:
                08 A6   00010000 8F   D3   05CA  1688          BITL    #MBA$M_SR_ATTN,MBA$L_SR(R6)     ; ATTENTION ?
                               07   13   05D2  1689          BEQL    50$                             ; NO -
                   50   00100000 8F   C8   05D4  1690          BISL    #CHS$M_MBAATN,R0                ; YES-
                                         05DB  1691
                                         05DB  1692 50$:
                08 A6   00020000 8F   D3   05DB  1693          BITL    #MBA$M_SR_MCPE,MBA$L_SR(R6)     ; CONTROL PARITY ERROR ?
                               07   13   05E3  1694          BEQL    60$                             ; NO -
                   50   00200000 8F   C8   05E5  1695          BISL    #CHS$M_MBACPE,R0                ; YES-
                                         05EC  1696
                08 A6   00000600 8F   D3   05EC  1697 60$:     bitl    #mba_sr_chner3, mba$l_sr(r6)    ; Write check                   [08]
                               07   13   05F4  1698          beql    70$                             ; no -                          [08]
                   50   00000042 8F   C8   05F6  1699          bisl    #chs$m_chndpe!chs$m_chnerr, r0  ; yes -                         [08]
                08 A6   00000200 8F   D3   05FD  1700 70$:     bitl    #mba$m_sr_wcklwr, mba$l_sr(r6)  ; Write check lower             [08]
                               07   13   0605  1701          beql    80$                             ; no -                          [08]
                   50   02000002 8F   C8   0607  1702          bisl    #chs$m_mbawcklwr!chs$m_chnerr, r0       ;                       [08]
                08 A6   00000400 8F   D3   060E  1703 80$:     bitl    #mba$m_sr_wckupr, mba$l_sr(r6)  ; Write check upper             [08]
                               07   13   0616  1704          beql    90$                             ; no -                          [08]
                   50   04000002 8F   C8   0618  1705          bisl    #chs$m_mbawckupr!chs$m_chnerr, r0       ;                       [08]
                                         061F  1706 90$:                                             ;                               [08]
                            0010   31   061F  1707          BRW     ADPSTS_RTN                      ; RETURN
                                         0622  1708
                                         0622  1709 ADPSTS_UBI:
                   66   40000000 8F   D3   0622  1710          bitl    #ubi$m_dpr_nxm, ubi$l_dpr(r6)   ; Non existent memory          [08]
                               07   13   0629  1711          beql    adpsts_rtn                      ; no -                          [08]
                   50   08000002 8F   C8   062B  1712          bisl    #chs$m_busnxm!chs$m_chnerr, r0  ;                               [08]
                                         0632  1713 ADPSTS_RTN:
                                   05    0632  1714          RSB                                     ; RETURN
```

```
                     0633  1716          .SBTTL  DETERMINE GENERAL ADAPTER STATUS
                     0633  1717 ;++
                     0633  1718 ; FUNCTIONAL DESCRIPTION:
                     0633  1719 ;
                     0633  1720 ;       DETERMINE GENERAL ADAPTER STATUS
                     0633  1721 ;
                     0633  1722 ; CALLING SEQUENCE:
                     0633  1723 ;
                     0633  1724 ;       BSBW    GENSTS
                     0633  1725 ;
                     0633  1726 ; INPUT PARAMETERS:
                     0633  1727 ;
                     0633  1728 ;       R5      =       CHANNEL DATA BLOCK
                     0633  1729 ;       R6      =       CHANNEL CSR REGISTER ADDRESS
                     0633  1730 ;
                     0633  1731 ; IMPLICIT INPUTS:
                     0633  1732 ;
                     0633  1733 ;       NONE
                     0633  1734 ;
                     0633  1735 ; OUTPUT PARAMETERS:
                     0633  1736 ;
                     0633  1737 ;       R0      =       STATUS
                     0633  1738 ;
                     0633  1739 ; IMPLICIT OUTPUTS:
                     0633  1740 ;
                     0633  1741 ;       NONE
                     0633  1742 ;
                     0633  1743 ; COMPLETION CODES:
                     0633  1744 ;
                     0633  1745 ;       NONE
                     0633  1746 ;
                     0633  1747 ; SIDE EFFECTS:
                     0633  1748 ;
                     0633  1749 ;       NONE
                     0633  1750 ;
                     0633  1751 ;--
                     0633  1752
                     0633  1753 GENSTS:
       50    D4      0633  1754          CLRL    R0                      ; CLEAR R0
     0000    31      0635  1755          BRW     GENSTS_RTN              ; RETURN
                     0638  1756
                     0638  1757 GENSTS_RTN:
             05      0638  1758          RSB                             ; RETURN
                     0639  1759
```

```
                                0639  1761          .SBTTL  DETERMINE ADAPTER HARDWARE ERROR STATUS
                                0639  1762 ;++
                                0639  1763 ; FUNCTIONAL DESCRIPTION:
                                0639  1764 ;
                                0639  1765 ;       DETERMINE ADAPTER HARDWARE ERROR STATUS
                                0639  1766 ;
                                0639  1767 ; CALLING SEQUENCE:
                                0639  1768 ;
                                0639  1769 ;       BSBW    HDWSTS
                                0639  1770 ;
                                0639  1771 ; INPUT PARAMETERS:
                                0639  1772 ;
                                0639  1773 ;       R5      =       CHANNEL DATA BLOCK
                                0639  1774 ;       R6      =       CHANNEL CSR REGISTER ADDRESS
                                0639  1775 ;
                                0639  1776 ; IMPLICIT INPUTS:
                                0639  1777 ;
                                0639  1778 ;       NONE
                                0639  1779 ;
                                0639  1780 ; OUTPUT PARAMETERS:
                                0639  1781 ;
                                0639  1782 ;       R0      =       STATUS
                                0639  1783 ;
                                0639  1784 ; IMPLICIT OUTPUTS:
                                0639  1785 ;
                                0639  1786 ;       NONE
                                0639  1787 ;
                                0639  1788 ; COMPLETION CODES:
                                0639  1789 ;
                                0639  1790 ;       NONE
                                0639  1791 ;
                                0639  1792 ; SIDE EFFECTS:
                                0639  1793 ;
                                0639  1794 ;       NONE
                                0639  1795 ;
                                0639  1796 ;--
                                0639  1797
                                0639  1798 HDWSTS:
                     50   D4    0639  1799          CLRL    R0                                      ; CLEAR R0
                                063B  1800          JMPMBA  SYSMB1
                  65 01   D3    063B                BITL    #CDB$M_MBA,CDB$L_FLAGS(R5)              ; IS THE CHANNEL A MBA ?
                     03   12    063E                BNEQ    SYSMB1                          ; YES-
                   007D   31    0640  1801          BRW     SYSUB1                                  ; NO -
                                0643  1802 SYSMB1:
              66   EC000000 8F   D3    0643  1803          BITL    #MBA_CSR_SYSER1,MBA$L_CSR(R6)   ; SBI ERROR ?
                     07   13    064A  1804          BEQL    SYSMB2                                  ; NO -
              50   00000401 8F   C8    064C  1805          BISL    #CHS$M_SYSSBI!CHS$M_SYSERR,R0   ; YES-
                                0653  1806 SYSMB2:
           08 A6   6000080F 8F   D3    0653  1807          BITL    #MBA_SR_SYSER2,MBA$L_SR(R6)     ; MEMORY ERROR
                     07   13    065B  1808          BEQL    CHNMB1                                  ; NO -
              50   00000201 8F   C8    065D  1809          BISL    #CHS$M_SYSMEM!CHS$M_SYSERR,R0   ; YES-
                                0664  1810 CHNMB1:
              66   00E00000 8F   D3    0664  1811          BITL    #MBA_CSR_CHNER1,MBA$L_CSR(R6)   ; ADAPTER POWER/TEMP FAIL ?
                     07   13    066B  1812          BEQL    CHNMB2                                  ; NO -
              50   00000102 8F   C8    066D  1813          BISL    #CHS$M_CHPFOT!CHS$M_CHNERR,R0   ; YES-
                                0674  1814 CHNMB2:
                08 A6   20   D3    0674  1815          BITL    #MBA_SR_CHNER2,MBA$L_SR(R6)     ; ADAPTER MAP PARITY ERROR
```

```
                  07   13  0678  1816          BEQL    CHNMB3                          ; NO -
      50   00000082 8F   C8  067A  1817          BISL    #CHS$M_CHNMPE!CHS$M_CHNERR,R0   ; YES-
                            0681  1818 CHNMB3:
   08 A6   00000600 8F   D3  0681  1819          BITL    #MBA_SR_CHNER3,MBA$L_SR(R6)     ; ADAPTER DATA PATH ERROR
                  07   13  0689  1820          BEQL    DEVMB1                          ; NO -
      50   00000042 8F   C8  068B  1821          BISL    #CHS$M_CHNDPE!CHS$M_CHNERR,R0   ; YES-
                            0692  1822 DEVMB1:
   08 A6   00040000 8F   D3  0692  1823          BITL    #MBA_SR_DEVER1,MBA$L_SR(R6)     ; DEVICE TIMEOUT ?
                  03   13  069A  1824          BEQL    DEVMB2                          ; NO -
            50    24   C8  069C  1825          BISL    #CHS$M_DEVTO!CHS$M_DEVERR,R0    ; YES-
                            069F  1826 DEVMB2:
   08 A6   000219C0 8F   D3  069F  1827          BITL    #MBA_SR_DEVER2,MBA$L_SR(R6)     ; DEVICE BUS FAIL ?
                  03   13  06A7  1828          BEQL    PGMMB1                          ; NO -
            50    14   C8  06A9  1829          BISL    #CHS$M_DEVBUS!CHS$M_DEVERR,R0   ; YES-
                            06AC  1830 PGMMB1:
   08 A6   00080010 8F   D3  06AC  1831          BITL    #MBA_SR_PGMER1,MBA$L_SR(R6)     ; PROGRAM ERROR ?
                  23   13  06B4  1832          BEQL    STSRTN                          ; NO -
      50   00000808 8F   C8  06B6  1833          BISL    #CHS$M_PGMHDE!CHS$M_PGMERR,R0   ; YES-
                0019   31  06BD  1834          BRW     STSRTN                          ; RETURN
                            06C0  1835 SYSUB1:
                  02   BB  06C0  1836          PUSHR   #^M<R1>                         ; SAVE R1
         51    1C A5   9A  06C2  1837          MOVZBL  CDB$L_PTH(R5),R1                ; DATA PATH
    6641   E0000000 8F   D3  06C6  1838          bitl    #ubi_csr_syser1,ubi$l_dpr(r6)[r1] ; adapter data path error     [08]
                  07   13  06CE  1839          BEQL    DEVUB1                          ; NO -
      50   00000042 8F   C8  06D0  1840          BISL    #CHS$M_CHNDPE!CHS$M_CHNERR,R0   ; YES-
                            06D7  1841 DEVUB1:
                  02   BA  06D7  1842          POPR    #^M<R1>                         ; RESTORE R1
                            06D9  1843
                            06D9  1844 STSRTN:
                  05       06D9  1845          RSB                                     ; RETURN
                            06DA  1846
```

```
06DA  1848
06DA  1849          .SBTTL  BUILD THE CHANNEL DATA BLOCK
06DA  1850 ;++
06DA  1851 ; FUNCTIONAL DESCRIPTION:
06DA  1852 ;
06DA  1853 ; ROUTINE TO BUILD A CHANNEL DATA BLOCK FOR
06DA  1854 ; LOGICAL UNIT NUMBER FOUND IN R2
06DA  1855 ;
06DA  1856 ; CALLING SEQUENCE:
06DA  1857 ;
06DA  1858 ;       BSBW    BLDCDB
06DA  1859 ;
06DA  1860 ;
06DA  1861 ; INPUT PARAMETERS:
06DA  1862 ;
06DA  1863 ;       R2      =       LOGICAL UNIT NUMBER
06DA  1864 ;
06DA  1865 ; IMPLICIT INPUTS:
06DA  1866 ;
06DA  1867 ;       NONE
06DA  1868 ;
06DA  1869 ; OUTPUT PARAMETERS:
06DA  1870 ;
06DA  1871 ;       R0      =       COMPLETION CODE
06DA  1872 ;       R5      =       CDB ADDRESS
06DA  1873 ;       R6      =       ADAPTER ADDRESS
06DA  1874 ;
06DA  1875 ; IMPLICIT OUTPUTS:
06DA  1876 ;
06DA  1877 ;       NONE
06DA  1878 ;
06DA  1879 ; COMPLETION CODES:
06DA  1880 ;
06DA  1881 ;       DS$_NORMAL      =       SUCCESS
06DA  1882 ;       DS$_ERROR       =       ERROR ($GPHARD)
06DA  1883 ;                                 MISSING/INVALID P-TABLE
06DA  1884 ;
06DA  1885 ; SIDE EFFECTS:
06DA  1886 ;
06DA  1887 ;       DESTROYS R5, R6
06DA  1888 ;       SETS FLAG (CDB$M_UBI) TO INDICATE ADAPTER TYPE
06DA  1889 ;
06DA  1890 ;--
```

```
                                06DA  1892 BLDCDB:
                                06DA  1893
                                06DA  1894          $DS_GPHARD_S    R2,-(SP)                ; GET THE HARDWARE P-TABLE
                      7E   DF   06DA                      PUSHAL  -(SP)
                      52   DD   06DC                      PUSHL   R2
          00000000'9F      02   FB   06DE                      CALLS   #2, a#DS$GPHARD
                     56    8E   D0   06E5  1895          MOVL    (SP)+,R6                ; GET ADDRESS OF HP-TABLE
                   44 50   E9   06E8  1896          BLBC    R0, BLD_RTN             ; IS THERE ONE ?                [09]
          55   00000000'EF   DE   06EB  1897          MOVAL   CDB$BLOCK,R5            ; CDB TO R5
          65   FFFFFFDF 8F   CA   06F2  1898          BICL    #^CCDB$M_IE,CDB$L_FLAGS(R5)     ; INIT THE FLAG WORD
                                06F9  1899                                          ; REMEMBER INTERRUPT ENABLE ACCROSS
                                06F9  1900 10$:
                     20 A6   D5   06F9  1901          TSTL    HP$A_LINK(R6)           ; SEARCH FOR ADAPTER ENTRY
                        06   13   06FC  1902          BEQL    20$                     ; FOUND IT
                56   20 A6   D0   06FE  1903          MOVL    HP$A_LINK(R6),R6        ; KEEP LOOKING
                        F5   11   0702  1904          BRB     10$                     ;
                                0704  1905 20$:
                04 A5   56   D0   0704  1906          MOVL    R6,CDB$A_TBL(R5)        ; SAVE THE P-TABLE ADDRESS
          18 A6   40F30000 8F   D1   0708  1907          CMPL    #^X40F30000,HP$A_DEVICE(R6)     ; IS THE CHANNEL UBI0 ?
                        0A   13   0710  1908          BEQL    25$                     ; NO -
          18 A6   40F32000 8F   D1   0712  1909          CMPL    #^X40F32000,HP$A_DEVICE(R6)     ; UBI1
                        05   12   071A  1910          BNEQ    30$                     ; NO -
                                071C  1911 25$:
                     65   04   C8   071C  1912          BISL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; YES-
                        03   11   071F  1913          BRB     40$                     ;
                                0721  1914 30$:
                     65   01   C8   0721  1915          BISL    #CDB$M_MBA,CDB$L_FLAGS(R5)      ; MBA
                                0724  1916 40$:
                56   18 A6   D0   0724  1917          MOVL    HP$A_DEVICE(R6),R6      ; ADAPTER ADDRESS TO R6
          50   00660001 8F   D0   0728  1918          MOVL    #DS$_NORMAL,R0          ; INDICATE SUCCESS
                                072F  1919
                                072F  1920 BLD_RTN:
                        05   072F  1921          RSB                                 ; RETURN
```

```
0730  1923          .SBTTL  SET ADAPTER VECTOR(S)
0730  1924 ;++
0730  1925 ; FUNCTIONAL DESCRIPTION:
0730  1926 ;
0730  1927 ;       SET SCB VECTOR FOR ADAPTER/DEVICE TO POINT TO CHANNEL SERVICE
0730  1928 ;
0730  1929 ; CALLING SEQUENCE:
0730  1930 ;
0730  1931 ;       BSBW    SETVEC
0730  1932 ;
0730  1933 ; INPUT PARAMETERS:
0730  1934 ;
0730  1935 ;       R5      =       CHANNEL DATA BLOCK
0730  1936 ;       R6      =       CHANNEL CSR REGISTER ADDRESS
0730  1937 ;
0730  1938 ; IMPLICIT INPUTS:
0730  1939 ;
0730  1940 ;       NONE
0730  1941 ;
0730  1942 ; OUTPUT PARAMETERS:
0730  1943 ;
0730  1944 ;       R0      =       COMPLETION CODE
0730  1945 ;
0730  1946 ; IMPLICIT OUTPUTS:
0730  1947 ;
0730  1948 ;       NONE
0730  1949 ;
0730  1950 ; COMPLETION CODES:
0730  1951 ;
0730  1952 ;       DS$_NORMAL      =       SUCCESS
0730  1953 ;       DS$_IVVECT      =       INVALID VECTOR ($SETVEC)
0730  1954 ;       DS$_IVADDR      =       INVALID ADDRESS ($SETVEC)
0730  1955 ;
0730  1956 ; SIDE EFFECTS:
0730  1957 ;
0730  1958 ;       NONE
0730  1959 ;
0730  1960 ;--
```

```
                                  0730  1962 SETVEC:
                        04    BB  0730  1963          PUSHR   #^M<R2>                          ; SAVE A WORKING REGISTER
                                  0732  1964
                 51   04 A5    D0  0732  1965          MOVL    CDB$A_TBL(R5),R1                 ; GET THE HARDWARE P-TABLE
                      10 A5    D4  0736  1966          CLRL    CDB$A_ADDR(R5)                   ; INIT THE CHANNEL VECTOR
              10 A5   24 A1    3C  0739  1967          MOVZWL  HP$W_VECTOR(R1),CDB$A_ADDR(R5)   ; SAVE CHANNEL VECTOR
                    65   20    C8  073E  1968          BISL    #CDB$M_IE,CDB$L_FLAGS(R5)        ; INDICATE INTERRUPTS ENABLED
                                  0741  1969          JMPUBI  SETVEC_UBI                       ; DO IT DIFFERENT FOR A UBI
                    65   04    D3  0741                BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)       ; IS THE CHANNEL A UBI ?
                        14    12  0744                BNEQ    SETVEC_UBI                       ; YES-
                                  0746  1970 SETVEC_MBA:
                                  0746  1971          $DS_SETVEC_S  CDB$A_ADDR(R5),DSI$CHANNEL,#1; CAPTURE INTERRUPT ON IS
                        01    DD  0746                        PUSHL   #1
                000007AC'EF   DF  0748                        PUSHAL  DSI$CHANNEL
                      10 A5    DD  074E                        PUSHL   CDB$A_ADDR(R5)
            00000000'9F   03    FB  0751                        CALLS   #3, a#DS$SETVEC
                        21    11  0758  1972          BRB     SETVEC_RTN                       ; SUCCESS DEPENDS ON SETVEC
                                  075A  1973
                                  075A  1974 SETVEC_UBI:
                 50   0080 8F    3C  075A  1975          MOVZWL  #<512/4>,R0                      ; Start at SCB page 2
                                  075F  1976 10$:
00000000'EF40   00000000'EF40   DE  075F  1977          MOVAL   SCB_UNKINT[R0],SCB_BASE[R0]      ; Do two UBI pages
          EB 50   00000180 8F    F2  076C  1978          AOBLSS  #3*<512/4>,R0,10$                ;
            50   00660001 8F    D0  0774  1979          MOVL    #DS$_NORMAL,R0                   ; INDICATE SUCCESS
                                  077B  1980 ;        BRB     SETVEC_RTN                       ; RETURN
                                  077B  1981 SETVEC_RTN:
                        04    BA  077B  1982          POPR    #^M<R2>                          ; RESTORE REGISTERS
                              05  077D  1983          RSB
```

```
                        1985          .SBTTL  CLEAR ADAPTER VECTOR(S)
                        1986 ;++
                        1987 ; FUNCTIONAL DESCRIPTION:
                        1988 ;
                        1989 ;       CLEAR CHANNEL SERVICE POINTERS IN SCB VECTOR SPACE
                        1990 ;
                        1991 ; CALLING SEQUENCE:
                        1992 ;
                        1993 ;       BSBW    CLRVEC
                        1994 ;
                        1995 ; INPUT PARAMETERS:
                        1996 ;
                        1997 ;       R5      =       CHANNEL DATA BLOCK
                        1998 ;       R6      =       CHANNEL CSR REGISTER ADDRESS
                        1999 ;
                        2000 ; IMPLICIT INPUTS:
                        2001 ;
                        2002 ;       NONE
                        2003 ;
                        2004 ; OUTPUT PARAMETERS:
                        2005 ;
                        2006 ;       R0      =       COMPLETION CODE
                        2007 ;
                        2008 ; IMPLICIT OUTPUTS:
                        2009 ;
                        2010 ;       NONE
                        2011 ;
                        2012 ; COMPLETION CODES:
                        2013 ;
                        2014 ;       DS$_NORMAL      =       SUCCESS
                        2015 ;       DS$_IVVECT      =       INVALID VECTOR ($CLRVEC)
                        2016 ;
                        2017 ; SIDE EFFECTS:
                        2018 ;
                        2019 ;       NONE
                        2020 ;--
```

```
                                077E  2022 CLRVEC:
                      0C   BB   077E  2023          PUSHR   #^M<R2,R3>                      ; SAVE WORKING REGISTERS
                 65   20   CA   0780  2024          BICL    #CDB$M_IE,CDB$L_FLAGS(R5)       ; CLEAR IE
                                0783  2025          JMPUBI  CLRVEC_UBI                      ; DO IT FOR A UBI
                 65   04   D3   0783                BITL    #CDB$M_UBI,CDB$L_FLAGS(R5)      ; IS THE CHANNEL A UBI ?
                      0C   12   0786                BNEQ    CLRVEC_UBI                      ; YES-
                                0788  2026
                                0788  2027 CLRVEC_MBA:
                                0788  2028          $DS_CLRVEC_S  CDB$A_ADDR(R5)            ; RELEASE THE CHANNEL VECTOR
                 10   A5   DD   0788                        PUSHL   CDB$A_ADDR(R5)
        00000000'9F   01   FB   078B                        CALLS   #1, @#DS$CLRVEC
                      07   11   0792  2029          BRB     CLRVEC_RTN                      ; AND EXIT
                                0794  2030
                                0794  2031 CLRVEC_UBI:
        50   00660001 8F   D0   0794  2032          MOVL    #DS$_NORMAL,R0                  ; SUCCESS
                                079B  2033
                                079B  2034 CLRVEC_RTN:
                      0C   BA   079B  2035          POPR    #^M<R2,R3>                      ; RESTORE WORKING REGISTERS
                           05   079D  2036          RSB                                     ; RETURN WITH COMPLETION CODE
```

```
                        079E  2038          .SBTTL  INTERRUPT PRE-PROCESS
                        079E  2039 ;++
                        079E  2040 ; FUNCTIONAL DESCRIPTION:
                        079E  2041 ;
                        079E  2042 ;       THIS ROUTINE WILL PRE-PROCESS ALL CHANNEL ADAPTER INTERRUPTS
                        079E  2043 ;       AND PASS CONTROL TO THE DIAGNOSTIC PROGRAM
                        079E  2044 ;
                        079E  2045 ; CALLING SEQUENCE:
                        079E  2046 ;
                        079E  2047 ;       INTERRUPT
                        079E  2048 ;
                        079E  2049 ; INPUT PARAMETERS:
                        079E  2050 ;
                        079E  2051 ;       NONE
                        079E  2052 ;
                        079E  2053 ; IMPLICIT INPUTS:
                        079E  2054 ;
                        079E  2055 ;       CDB$A_VEC MUST HAVE BEEN PREVIOUSLY SET BY $CHANNEL CALL TO
                        079E  2056 ;       ENABLE INTERRUPTS
                        079E  2057 ;
                        079E  2058 ; OUTPUT PARAMETERS:
                        079E  2059 ;
                        079E  2060 ;       THE CHANNEL STATUS QUADWORD IS GENERATED
                        079E  2061 ;
                        079E  2062 ; IMPLICIT OUTPUTS:
                        079E  2063 ;
                        079E  2064 ;       NONE
                        079E  2065 ;
                        079E  2066 ; COMPLETION CODES:
                        079E  2067 ;
                        079E  2068 ;       NONE
                        079E  2069 ;
                        079E  2070 ; SIDE EFFECTS:
                        079E  2071 ;
                        079E  2072 ;--
```

```
                                079E  2074          .ALIGN  LONG
                                07A0  2075 DSI$CHANNEL_VEC::
01 00000000'EF    05    E0      07A0  2076          BBS     #CDB$V_IE,CDB$L_FLAGS+CDB$BLOCK,10$ ; IS INTERRUPT EXPECTED
                                05    07A8  2077          RSB                                  ; NO - RETURN TO UNEXPECTED HANDLER
                                      07A9  2078 10$:
                          03    11    07A9  2079          BRB     DSI$CHANNEL_COM              ; JOIN COMMON CODE
                                      07AB  2080
                                      07AB  2081          .ALIGN  LONG
                                      07AC  2082 DSI$CHANNEL:
                          7E    7C    07AC  2083          CLRQ    -(SP)                        ; Space for vector and ret addr
                                      07AE  2084 DSI$CHANNEL_COM:
                    0063  8F    BB    07AE  2085          PUSHR   #^M<R0,R1,R5,R6>             ; SAVE REGISTERS
                                      07B2  2086                                               ; SAVE INTERRUPT LEVEL OF DEVICE
                                      07B2  2087          DSBINT  #^X17                        ; & DISABLE DEVICE INTERRUPTS
                    7E    12    DB    07B2                      MFPR    S^#PR$_IPL,-(SP)
                    12    17    DA    07B5                      MTPR    #^X17,S^#PR$_IPL
                                      07B8  2088
              55    00000000'EF DE    07B8  2089          MOVAL   CDB$BLOCK,R5                 ; CDB ADDRESS TO R5
                    56    04 A5 D0    07BF  2090          MOVL    CDB$A_TBL(R5),R6             ; P-TABLE ADDRESS TO R6
                    56    18 A6 D0    07C3  2091          MOVL    HP$A_DEVICE(R6),R6           ; CHANNEL BASE ADDRESS TO R6
                                      07C7  2092
                       FE6F   30      07C7  2093          BSBW    HDWSTS                       ; GET HARDWARE ERROR STATUS
                    51    50    D0    07CA  2094          MOVL    R0,R1                        ; SAVE THE STATUS
                       FDAC   30      07CD  2095          BSBW    ADPSTS                       ; GET ADAPTER SPECIFIC STATUS
                    50    51    C8    07D0  2096          BISL    R1,R0                        ; COMBINE STATUS
                 14 A5    50    D0    07D3  2097          MOVL    R0,CDB$L_ST1(R5)             ; SAVE IT
                       FE59   30      07D7  2098          BSBW    GENSTS                       ; GET GENERAL STATUS
                 18 A5    50    B0    07DA  2099          MOVW    R0,CDB$W_ST2(R5)             ; SAVE IT
                                      07DE  2100
                    50    8E    D0    07DE  2101          MOVL    (SP)+,R0                     ; GET SAVED IPL OF DEVICE
           18 A5    05    02    50    F0    07E1  2102          INSV    R0,#CHI$V_IPL,#CHI$S_IPL, -  ; STORE THE IPL OF THE INTERRUPT
                                      07E7  2103                    CDB$W_ST2(R5)
                                      07E7  2104          JMPMBA  10$                          ; IF MBA SKIP THE UBI STUFF
                    65    01    D3    07E7                BITL    #CDB$M_MBA,CDB$L_FLAGS(R5)   ; IS THE CHANNEL A MBA ?
                          0C    12    07EA                BNEQ    10$                          ; YES-
                                      07EC  2105
        1A A5    14 AE    FE00  8F    AB    07EC  2106          BICW3   #^C^X1FF,20(SP),CDB$W_RVR(R5) ; SAVE THE VECTOR, 9 BITS
                 18 A5    02    A8    07F4  2107          BISW    #CHI$M_DEVINT,CDB$W_ST2(R5)  ; NO - THEN IT IS A DEVICE INTERRUPT
                                      07F8  2108 10$:
                    50    0C A5 D0    07F8  2109          MOVL    CDB$A_STORE(R5),R0           ; HANDLER'S STORE AREA TO R0
                    80    14 A5 D0    07FC  2110          MOVL    CDB$L_ST1(R5),(R0)+          ; HARDWARE ERROR STATUS
                    60    18 A5 D0    0800  2111          MOVL    CDB$W_ST2(R5),(R0)           ; RVR + GENERAL STATUS
                                      0804  2112
                 14 AE    08 A5 D0    0804  2113          MOVL    CDB$A_VEC(R5),20(SP)         ; BUILD THE HANDLER ADDRESS
                                      0809  2114
                                      0809  2115 INT_DSP:
                    0063  8F    BA    0809  2116          POPR    #^M<R0,R1,R5,R6>             ; RESTORE R0, R1, R5, R6
                          8E    D5    080D  2117          TSTL    (SP)+                        ; Remove JSB return
                                05    080F  2118          RSB                                  ; Dispatch to interrupt handler
                                      0810  2119
                                      0810  2120          .END
```

```
$$ARGS                          = 00000001     D
$$N                             = 00000001     D
$$T1                            = 00000008     D
$ER                             = 00000001     D
$MODULE                           00000000 R   D   04
ABORT_MBA                         00000061 R   D   05
ABORT_UBI                         0000006C R   D   05
ADPSTS                            0000057C R   D   05
ADPSTS_MBA                        00000586 R   D   05
ADPSTS_RTN                        00000632 R   D   05
ADPSTS_UBI                        00000622 R   D   05
BASCHK                            000003AA R   D   05
BASCHK_MBA                        000003AF R   D   05
BASCHK_RTN                        000003ED R   D   05
BASCHK_UBI                        000003CE R   D   05
BIT...                          = 0000001F     D
BIT0                            = 00000001     D
BIT1                            = 00000002     D
BIT10                           = 00000400     D
BIT11                           = 00000800     D
BIT12                           = 00001000     D
BIT13                           = 00002000     D
BIT14                           = 00004000     D
BIT15                           = 00008000     D
BIT16                           = 00010000     D
BIT17                           = 00020000     D
BIT18                           = 00040000     D
BIT19                           = 00080000     D
BIT2                            = 00000004     D
BIT20                           = 00100000     D
BIT21                           = 00200000     D
BIT22                           = 00400000     D
BIT23                           = 00800000     D
BIT24                           = 01000000     D
BIT25                           = 02000000     D
BIT26                           = 04000000     D
BIT27                           = 08000000     D
BIT28                           = 10000000     D
BIT29                           = 20000000     D
BIT3                            = 00000008     D
BIT30                           = 40000000     D
BIT31                           = 80000000     D
BIT4                            = 00000010     D
BIT5                            = 00000020     D
BIT6                            = 00000040     D
BIT7                            = 00000080     D
BIT8                            = 00000100     D
BIT9                            = 00000200     D
BLDCDB                            000006DA R   D   05
BLD_RTN                           0000072F R   D   05
CDB$A_ADDR                        00000010     D
CDB$A_STORE                       0000000C     D
CDB$A_TBL                         00000004     D
CDB$A_VEC                         00000008     D
CDB$BLOCK                         00000000 RG  D   03
CDB$L_FLAGS                       00000000     D
CDB$L_PTH                         0000001C     D
CDB$L_ST1                         00000014     D
CDB$M_IE                        = 00000020     D
CDB$M_MBA                       = 00000001     D
CDB$M_OFFSET                    = 00000008     D
CDB$M_REV                       = 00000010     D
CDB$M_UBA                       = 00000002     D
CDB$M_UBI                       = 00000004     D
CDB$V_IE                        = 00000005     D
CDB$V_MBA                       = 00000000     D
CDB$V_OFFSET                    = 00000003     D
CDB$V_REV                       = 00000004     D
CDB$V_UBA                       = 00000001     D
CDB$V_UBI                       = 00000002     D
CDB$W_RVR                         0000001A     D
CDB$W_ST2                         00000018     D
CDBSIZ                          = 00000020     D
CHC$_ABORT                      = 00000002     D
CHC$_CLEAR                      = 00000006     D
CHC$_CLRDFT                     = 00000009     D
CHC$_DSINT                      = 00000005     D
CHC$_ENINT                      = 00000004     D
CHC$_INITA                      = 00000000     D
CHC$_INITB                      = 00000001     D
CHC$_PURGE                      = 00000003     D
CHC$_SELF_TEST                  = 0000000B     D
CHC$_SETDFT                     = 00000008     D
CHC$_STATUS                     = 00000007     D
CHC$_STOP                       = 0000000A     D
CHI$M_CHNINT                    = 00000001     D
CHI$M_DEVINT                    = 00000002     D
CHI$M_IPL                       = 0000007C     D
CHI$S_IPL                       = 00000005     D
CHI$V_CHNINT                    = 00000000     D
CHI$V_DEVINT                    = 00000001     D
CHI$V_IPL                       = 00000002     D
CHM$_FORWARD                    = 00000000     D
CHM$_INVALIDATE                 = 00000001     D
CHM$_MAP                        = 00000002     D
CHM$_MFWDN                      = 00000002     D
CHM$_MFWDNO                     = 0000000A     D
CHM$_MFWDV                      = 00000003     D
CHM$_MFWDVO                     = 0000000B     D
CHM$_MREVN                      = 00000006     D
CHM$_MREVNO                     = 0000000E     D
CHM$_MREVV                      = 00000007     D
CHM$_MREVVO                     = 0000000F     D
CHM$_NFWDN                      = 00000000     D
CHM$_NREVN                      = 00000004     D
CHM$_OFFSET                     = 00000008     D
CHM$_REVERSE                    = 00000004     D
CHN$_ADR1                       = 0000000C     D
CHN$_ADR2                       = 00000010     D
CHN$_FUNC                       = 00000008     D
CHN$_NARGS                      = 00000004     D
CHN$_UNIT                       = 00000004     D
CHNMB1                            00000664 R   D   05
CHNMB2                            00000674 R   D   05
```

```
CHNMB3                          00000681 R  D  05      CHS$V_MBADTB                    =  00000012    D
CHN_ABORT                       0000005C R  D  05      CHS$V_MBADTC                    =  00000013    D
CHN_CALL_RTN                    000001AB R  D  05      CHS$V_MBAEXC                    =  00000010    D
CHN_CLEAR                       00000114 R  D  05      CHS$V_MBANED                    =  00000011    D
CHN_CLRDFT                      00000192 R  D  05      CHS$V_MBAWCKLWR                 =  00000019    D
CHN_DSINT                       000000E3 R  D  05      CHS$V_MBAWCKUPR                 =  0000001A    D
CHN_DSP                         0000000F R  D  05      CHS$V_PGMERR                    =  00000003    D
CHN_ENINT                       00000076 R  D  05      CHS$V_PGMHDE                    =  0000000B    D
CHN_INITA                       00000035 R  D  05      CHS$V_SYSERR                    =  00000000    D
CHN_INITB                       00000047 R  D  05      CHS$V_SYSMEM                    =  00000009    D
CHN_NORMAL_RTN                  000001A4 R  D  05      CHS$V_SYSSBI                    =  0000000A    D
CHN_PURGE                       000000D0 R  D  05      CHS$V_UIE                       =  0000001C    D
CHN_SETDFT                      00000180 R  D  05      CLEAR_MBA                          00000119 R  D  05
CHN_STATUS                      0000015A R  D  05      CLEAR_UBI                          00000148 R  D  05
CHS$M_BADBDP                =  20000000    D          CLRDFT_MBA                         00000197 R  D  05
CHS$M_BADPAR                =  40000000    D          CLRDFT_UBI                         0000019A R  D  05
CHS$M_BUSIC                 =  00800000    D          CLRMAP                             0000035C R  D  05
CHS$M_BUSINIT               =  00400000    D          CLRMAP_MBA                         00000361 R  D  05
CHS$M_BUSNXM                =  08000000    D          CLRMAP_RTN                         00000382 R  D  05
CHS$M_BUSPDN                =  01000000    D          CLRMAP_UBI                         00000373 R  D  05
CHS$M_CHNDPE                =  00000040    D          CLRVEC                             0000077E R  D  05
CHS$M_CHNERR                =  00000002    D          CLRVEC_MBA                         00000788 R  D  05
CHS$M_CHNMPE                =  00000080    D          CLRVEC_RTN                         0000079B R  D  05
CHS$M_CHPFOT                =  00000100    D          CLRVEC_UBI                         00000794 R  D  05
CHS$M_DEVBUS                =  00000010    D          CNTCHK                             000003F6 R  D  05
CHS$M_DEVERR                =  00000004    D          CNTCHK_RTN                         0000041D R  D  05
CHS$M_DEVTO                 =  00000020    D          CVT$T_MBAMAP                       00000054 RG D  03
CHS$M_ERRANY                =  0000000F    D          CVT$T_MBASR                        00000050 RG D  03
CHS$M_MBAATN                =  00100000    D          CVT$T_UBADPR                       00000058 RG D  03
CHS$M_MBACPE                =  00200000    D          CVT$T_UBAMAP                       0000005C RG D  03
CHS$M_MBADTB                =  00040000    D          DEVMB1                             00000692 R  D  05
CHS$M_MBADTC                =  00080000    D          DEVMB2                             0000069F R  D  05
CHS$M_MBAEXC                =  00010000    D          DEVUB1                             000006D7 R  D  05
CHS$M_MBANED                =  00020000    D          DS$CLRVEC                          ********    X  05
CHS$M_MBAWCKLWR             =  02000000    D          DS$CVTREG                          ********    X  05
CHS$M_MBAWCKUPR             =  04000000    D          DS$GPHARD                          ********    X  05
CHS$M_PGMERR                =  00000008    D          DS$K_ERROR                  =  00000002    D
CHS$M_PGMHDE                =  00000800    D          DS$K_NORMAL                 =  00000001    D
CHS$M_SYSERR                =  00000001    D          DS$K_SEVERE                 =  00000004    D
CHS$M_SYSMEM                =  00000200    D          DS$K_SUBSYS                 =  00000066    D
CHS$M_SYSSBI                =  00000400    D          DS$K_WARNING                =  00000000    D
CHS$M_UIE                   =  10000000    D          DS$PRINTB                          *********   X  05
CHS$V_BADBDP                =  0000001D    D          DS$SETVEC                          ********    X  05
CHS$V_BADPAR                =  0000001E    D          DS$_AP_NORMAL_BREAK         =  00660150    D
CHS$V_BUSIC                 =  00000017    D          DS$_ARITH                   =  006600D0    D
CHS$V_BUSINIT               =  00000016    D          DS$_ASBE                    =  00660118    D
CHS$V_BUSNXM                =  0000001B    D          DS$_BADLINK                 =  006600F0    D
CHS$V_BUSPDN                =  00000018    D          DS$_BADTYPE                 =  006600E8    D
CHS$V_CHNDPE                =  00000006    D          DS$_BIIC                    =  00660120    D
CHS$V_CHNERR                =  00000001    D          DS$_CHME                    =  006600A8    D
CHS$V_CHNMPE                =  00000007    D          DS$_CHMK                    =  006600E0    D
CHS$V_CHPFOT                =  00000008    D          DS$_DEVNAME                 =  00660108    D
CHS$V_DEVBUS                =  00000004    D          DS$_ERROR                   =  00660002    D
CHS$V_DEVERR                =  00000002    D          DS$_FHWE                    =  00660068    D
CHS$V_DEVTO                 =  00000005    D          DS$_FRAGBUF                 =  00660080    D
CHS$V_MBAATN                =  00000014    D          DS$_ICBUSY                  =  006600C8    D
CHS$V_MBACPE                =  00000015    D          DS$_ICERR                   =  006600C0    D
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DS$_IHWE	= 00660060	D		FMT_UBI_HDR		000001B9	R	D	04
DS$_ILLCHAR	= 00660018	D		GENSTS		00000633	R	D	05
DS$_ILLPAGCNT	= 00660078	D		GENSTS_RTN		00000638	R	D	05
DS$_ILLUNIT	= 00660100	D		HDWSTS		00000639	R	D	05
DS$_INIT_FAIL	= 00660140	D		HP$A_DEPENDENT		00000032		D	
DS$_INSFMEM	= 00660050	D		HP$A_DEVICE		00000018		D	
DS$_INVCPU	= 00660130	D		HP$A_DVA		0000001C		D	
DS$_IPL2HI	= 006600B8	D		HP$A_LINK		00000020		D	
DS$_IVADDR	= 00660040	D		HP$B_DRIVE		0000000B		D	
DS$_IVVECT	= 00660038	D		HP$B_FLAGS		0000000A		D	
DS$_KRNLSTK	= 00660090	D		HP$Q_DEVICE		00000000		D	
DS$_LOGIC	= 00660070	D		HP$T_DEVICE		0000000C		D	
DS$_MCHK	= 00660088	D		HP$T_TYPE		00000026		D	
DS$_MEM_ALLOC_ERR	= 00660138	D		HP$W_SIZE		00000008		D	
DS$_MMOFF	= 00660058	D		HP$W_VECTOR		00000024		D	
DS$_NEEDUNIT	= 006600F8	D		INITA_MBA		0000003A	R	D	05
DS$_NODE	= 00660128	D		INITA_UBI		00000041	R	D	05
DS$_NOPCS	= 00660110	D		INITB_MBA		0000004C	R	D	05
DS$_NORMAL	= 00660001	D		INITB_UBI		0000004F	R	D	05
DS$_NOSUPPORT	= 006600B1	D		INT_DSP		00000809	R	D	05
DS$_NOTALLOWMP	= 00660148	D		INVALID		00000248	R	D	05
DS$_NOTDON	= 00660030	D		INVALIDATE		00000252	R	D	05
DS$_NOTIMP	= 006600B0	D		JMPADR		000000E1	R	D	03
DS$_NULLSTR	= 00660010	D		MBA$L_BCR	= 00000010			D	
DS$_OVERFLOW	= 00660008	D		MBA$L_CR	= 00000004			D	
DS$_POWER	= 00660098	D		MBA$L_CSR	= 00000000			D	
DS$_PROGERR	= 00660020	D		MBA$L_MAP	= 00000800			D	
DS$_SEVERE	= 00660004	D		MBA$L_SR	= 00000008			D	
DS$_TRANSL	= 006600A0	D		MBA$L_VAR	= 0000000C			D	
DS$_TRUNCATE	= 00660028	D		MBA$M_CR_ABORT	= 00000002			D	
DS$_UNEXPINT	= 006600D8	D		MBA$M_CR_IE	= 00000004			D	
DS$_UNSUPPDEV	= 00660158	D		MBA$M_CR_INIT	= 00000001			D	
DS$_VASFULL	= 00660048	D		MBA$M_CSR_CLR	= ECE00000			D	
DS$_WARNING	= 00660000	D		MBA$M_CSR_MT	= 08000000			D	
DSI$CHANNEL	000007AC	R	D	05	MBA$M_CSR_OT	= 00200000			D
DSI$CHANNEL_COM	000007AE	R	D	05	MBA$M_CSR_PD	= 00800000			D
DSI$CHANNEL_VEC	000007A0	RG	D	05	MBA$M_CSR_PE	= 80000000			D
DSINT_CLR	0000010E	R	D	05	MBA$M_CSR_PU	= 00400000			D
DSINT_MBA	000000FA	R	D	05	MBA$M_CSR_URD	= 20000000			D
DSINT_UBI	0000010E	R	D	05	MBA$M_CSR_WS	= 40000000			D
DSP$SHOWMBA	00000428	RG	D	05	MBA$M_CSR_XMFLT	= 04000000			D
DSP$SHOWUBI	00000439	RG	D	05	MBA$M_MAP_VALID	= 80000000			D
DSX$CHANNEL	00000000	RG	D	05	MBA$M_SR_ATTN	= 00010000			D
DSX$SETMAP	000001AC	RG	D	05	MBA$M_SR_CLR	= E00A3FFF			D
DSX$SHOWCHAN	0000044A	RG	D	05	MBA$M_SR_CRD	= 20000000			D
ENINT_MBA	000000B6	R	D	05	MBA$M_SR_DLT	= 00000800			D
ENINT_UBI	000000CD	R	D	05	MBA$M_SR_DTABT	= 00001000			D
FMT_CRLF	00000024	R	D	04	MBA$M_SR_DTBUSY	= 80000000			D
FMT_CVT_ARG	00000020	R	D	03	MBA$M_SR_DTCOMP	= 00002000			D
FMT_MBA_CNT	000000B1	R	D	04	MBA$M_SR_ERCONF	= 00000008			D
FMT_MBA_CR	00000045	R	D	04	MBA$M_SR_INVMAP	= 00000010			D
FMT_MBA_CSR	00000027	R	D	04	MBA$M_SR_ISTO	= 00000002			D
FMT_MBA_HDR	00000008	R	D	04	MBA$M_SR_MAPPE	= 00000020			D
FMT_MBA_MAP	00000098	R	D	04	MBA$M_SR_MBEXC	= 00000080			D
FMT_MBA_SR	00000062	R	D	04	MBA$M_SR_MCPE	= 00020000			D
FMT_MBA_VAR	0000007F	R	D	04	MBA$M_SR_MDPE	= 00000040			D
FMT_UBI_CSR	000001D5	R	D	04	MBA$M_SR_MXF	= 00000100			D

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MBA$M_SR_NED                    = 00040000     D
MBA$M_SR_NRCONF                 = 40000000     D
MBA$M_SR_PGE                    = 00080000     D
MBA$M_SR_RDS                    = 00000004     D
MBA$M_SR_RDTO                   = 00000001     D
MBA$M_SR_WCKLWR                 = 00000200     D
MBA$M_SR_WCKUPR                 = 00000400     D
MBA_CR_BIT                        000000EB R   D   04
MBA_CSR_BIT                       000000CB R   D   04
MBA_CSR_CHNER1                  = 00E00000     D
MBA_CSR_SYSER1                  = EC000000     D
MBA_MAP_BIT                       000001A0 R   D   04
MBA_SR_BIT                        0000011B R   D   04
MBA_SR_CHNER2                   = 00000020     D
MBA_SR_CHNER3                   = 00000600     D
MBA_SR_DEVER1                   = 00040000     D
MBA_SR_DEVER2                   = 000219C0     D
MBA_SR_PGMER1                   = 00080010     D
MBA_SR_SYSER2                   = 6000080F     D
MFWDN                             0000026D R   D   05
MFWDNO                            000002D3 R   D   05
MFWDV                             0000025B R   D   05
MFWDVO                            000002BE R   D   05
MREVN                             0000029D R   D   05
MREVNO                            000002F7 R   D   05
MREVV                             00000288 R   D   05
MREVVO                            000002E5 R   D   05
NFWDN                             0000027C R   D   05
NREVN                             000002AF R   D   05
PAR$M_ATDEF                   = 00000010     D
PAR$M_ATHI                    = 00000008     D
PAR$M_ATLO                    = 00000004     D
PAR$M_NODEF                   = 00000002     D
PAR$V_ATDEF                   = 00000004     D
PAR$V_ATHI                    = 00000003     D
PAR$V_ATLO                    = 00000002     D
PAR$V_NODEF                   = 00000001     D
PAR$_BIN                      = 00000002     D
PAR$_DEC                      = 0000000A     D
PAR$_HEX                      = 00000010     D
PAR$_NO                       = 00000000     D
PAR$_OCT                      = 00000008     D
PAR$_YES                      = 00000001     D
PGMMB1                            000006AC R   D   05
PR$_IPL                       = 00000012     D
PURGE_MBA                         000000D5 R   D   05
PURGE_UBI                         000000D8 R   D   05
RNGCHK                            000003EE R   D   05
RNGCHK_RTN                        000003EE R   D   05
SCB_BASE                          ********     X   05
SCB_UNKINT                        ********     X   05
SETCNT                            000003A0 R   D   05
SETCNT_MBA                        000003A5 R   D   05
SETCNT_RTN                        000003A9 R   D   05
SETCNT_UBI                        000003A9 R   D   05
SETDFT_MBA                        00000185 R   D   05
SETDFT_UBI                        00000188 R   D   05
SETMAP                            00000306 R   D   05
SETMAP_MBA                        0000030E R   D   05
SETMAP_RTN                        0000035B R   D   05
SETMAP_UBI                        0000032A R   D   05
SETVAR                            00000383 R   D   05
SETVAR_MBA                        00000388 R   D   05
SETVAR_RTN                        0000039F R   D   05
SETVAR_UBI                        0000039F R   D   05
SETVEC                            00000730 R   D   05
SETVEC_MBA                        00000746 R   D   05
SETVEC_RTN                        0000077B R   D   05
SETVEC_UBI                        0000075A R   D   05
SHOWBITS                          00000549 R   D   05
SHOW_MBA                          0000047A R   D   05
SHOW_RTN                          00000465 R   D   05
SHOW_RTN_1                        00000479 R   D   05
SHOW_UBI                          0000051C R   D   05
SHW$K_BUFSIZ                  = 00000080     D
SHW$_NARGS                    = 00000001     D
SHW$_UNIT                     = 00000004     D
SHWBUF                            00000060 R   D   03
SIZ...                        = 00000001     D
SS$_CONTINUE                  = 00000001     D
STM$_BAS                      = 00000010     D
STM$_CNT                      = 00000014     D
STM$_FUNC                     = 00000008     D
STM$_NARGS                    = 00000006     D
STM$_PHY                      = 0000000C     D
STM$_PTH                      = 00000018     D
STM$_UNIT                     = 00000004     D
STM_CALL_RTN                      00000427 R   D   05
STM_NORMAL_RTN                    00000420 R   D   05
STSRTN                            000006D9 R   D   05
SYSMB1                            00000643 R   D   05
SYSMB2                            00000653 R   D   05
SYSUB1                            000006C0 R   D   05
UBA$S_MAP_ADDR                = 00000015     D
UBA$V_MAP_ADDR                = 00000000     D
UBI$L_DPR                     = 00000000     D
UBI$L_MAP                     = 00000800     D
UBI$M_CSR_CLR                 = 60000000     D
UBI$M_DPR_ERROR               = 80000000     D
UBI$M_DPR_NXM                 = 40000000     D
UBI$M_DPR_PUR                 = 00000001     D
UBI$M_DPR_UCE                 = 20000000     D
UBI$M_MAP_BO                  = 02000000     D
UBI$M_MAP_VALID               = 80000000     D
UBI$S_MAP_BO                  = 00000001     D
UBI$S_MAP_DPD                 = 00000002     D
UBI$S_MAP_PFN                 = 0000000F     D
UBI$V_MAP_BO                  = 00000019     D
UBI$V_MAP_DPD                 = 00000015     D
UBI$V_MAP_PFN                 = 00000000     D
UBI$V_MAP_VALID               = 0000001F     D
UBIVEC                            000000E5 R   D   03
UBI_CSR_BIT                       000001F3 R   D   04
UBI_CSR_SYSER1                = E0000000     D
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UBI_DPR_BIT                 000001F3 R  D  04
UBI_MAP_BIT                 00000221 R  D  04

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                                        ! Psect synopsis !
                                        +----------------+

PSECT name                  Allocation          PSECT No.  Attributes
----------                  ----------          ---------  ----------
.  ABS  .                   00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
SEP                         00000000  (    0.)  01 (  1.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD    WRT NOVEC LONG
$ABS$                       00000032  (   50.)  02 (  2.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
WORK                        000000E9  (  233.)  03 (  3.)  NOPIC   USR   CON   REL   LCL NOSHR NOEXE   RD    WRT NOVEC LONG
DATA                        00000247  (  583.)  04 (  4.)  NOPIC   USR   CON   REL   LCL   SHR NOEXE   RD  NOWRT NOVEC LONG
CODE                        00000810  ( 2064.)  05 (  5.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD  NOWRT NOVEC LONG
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$ARGS	=00000001	146 (2)	143 (2) 145 (2) 146 (2)
$$N	=00000001	1580 (24)	#-1476 (22) #-1517 (23) 1535 (23) 1538 (23) 1541 (23) #-1580 (24)
$$T1	=00000008	146 (2)	143 (2) 145 (2) 146 (2)
$ER	=00000001	249 (4)	
$MODULE	00000000-R	249 (4)	
ABORT_MBA	00000061-R	496 (9)	
ABORT_UBI	0000006C-R	501 (9)	#-494 (9)
ADPSTS	0000057C-R	1666 (26)	#-2095 (33) #-798 (14)
ADPSTS_MBA	00000586-R	1671 (26)	#-1668 (26)
ADPSTS_RTN	00000632-R	1713 (26)	#-1707 (26) #-1711 (26)
ADPSTS_UBI	00000622-R	1709 (26)	#-1669 (26)
BASCHK	000003AA-R	1267 (19)	#-1028 (19)
BASCHK_MBA	000003AF-R	1270 (19)	
BASCHK_RTN	000003ED-R	1290 (19)	#-1275 (19) #-1278 (19) #-1285 (19) #-1288 (19)
BASCHK_UBI	000003CE-R	1280 (19)	#-1268 (19)
BIT...	=0000001F	142 (2)	119 (2) 139 (2) 140 (2) 142 (2)
BIT0	=00000001	138 (2)	
BIT1	=00000002	138 (2)	
BIT10	=00000400	138 (2)	
BIT11	=00000800	138 (2)	
BIT12	=00001000	138 (2)	
BIT13	=00002000	138 (2)	
BIT14	=00004000	138 (2)	
BIT15	=00008000	138 (2)	
BIT16	=00010000	138 (2)	
BIT17	=00020000	138 (2)	
BIT18	=00040000	138 (2)	
BIT19	=00080000	138 (2)	
BIT2	=00000004	138 (2)	
BIT20	=00100000	138 (2)	
BIT21	=00200000	138 (2)	
BIT22	=00400000	138 (2)	
BIT23	=00800000	138 (2)	
BIT24	=01000000	138 (2)	
BIT25	=02000000	138 (2)	
BIT26	=04000000	138 (2)	
BIT27	=08000000	138 (2)	
BIT28	=10000000	138 (2)	
BIT29	=20000000	138 (2)	
BIT3	=00000008	138 (2)	
BIT30	=40000000	138 (2)	
BIT31	=80000000	138 (2)	190 (2)
BIT4	=00000010	138 (2)	
BIT5	=00000020	138 (2)	
BIT6	=00000040	138 (2)	
BIT7	=00000080	138 (2)	
BIT8	=00000100	138 (2)	
BIT9	=00000200	138 (2)	
BLDCDB	000006DA-R	1892 (30)	#-1000 (19) #-1464 (22) #-333 (6)

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BLD_RTN                         0000072F-R    1920  (30)  #-1896  (30)
CDB$A_ADDR                      00000010      219   (3)   #-1966  (31)  #-1967  (31)  #-1971  (31)  #-2028  (32)
CDB$A_STORE                     0000000C      218   (3)   #-2109  (33)  #-570   (10)
CDB$A_TBL                       00000004      216   (3)   #-1906  (30)  #-1965  (31)  #-2090  (33)
CDB$A_VEC                       00000008      217   (3)   #-2113  (33)  #-569   (10)
CDB$BLOCK                       00000000-R    226   (3)     1897  (30)    2076  (33)    2089  (33)
CDB$L_FLAGS                     00000000      215   (3)   #-1060  (19)  #-1065  (19)  #-1074  (19)  #-1082  (19)
                                                          #-1088  (19)  #-1089  (19)  #-1097  (19)  #-1098  (19)
                                                          #-1105  (19)  #-1106  (19)  #-1112  (19)  #-1113  (19)
                                                          #-1121  (19)  #-1122  (19)  #-1130  (19)  #-1139  (19)
                                                          #-1156  (19)  #-1174  (19)  #-1197  (19)  #-1224  (19)
                                                          #-1229  (19)  #-1250  (19)  #-1268  (19)  #-1469  (22)
                                                          #-1668  (26)  #-1800  (28)  #-1898  (30)  #-1912  (30)
                                                          #-1915  (30)  #-1968  (31)  #-1969  (31)  #-2024  (32)
                                                          #-2025  (32)    2076  (33)  #-2104  (33)  #-393   (7)
                                                          #-442   (8)   #-494   (9)   #-571   (10)  #-622   (11)
                                                          #-680   (12)  #-736   (13)  #-847   (15)  #-895   (16)
CDB$L_PTH                        0000001C     223   (3)   #-1020  (19)  #-1171  (19)  #-1837  (28)  #-628   (11)
CDB$L_ST1                        00000014     220   (3)   #-2097  (33)  #-2110  (33)  #-800   (14)  #-804   (14)
CDB$M_IE                       =00000020      166   (2)   #-1898  (30)  #-1968  (31)  #-2024  (32)
CDB$M_MBA                      =00000001      161   (2)   #-1668  (26)  #-1800  (28)  #-1915  (30)  #-2104  (33)
CDB$M_OFFSET                   =00000008      164   (2)   #-1059  (19)  #-1064  (19)  #-1073  (19)  #-1081  (19)
                                                          #-1088  (19)  #-1097  (19)  #-1105  (19)  #-1113  (19)
                                                          #-1122  (19)  #-1129  (19)  #-1138  (19)  #-1174  (19)
CDB$M_REV                      =00000010      165   (2)   #-1059  (19)  #-1064  (19)  #-1073  (19)  #-1081  (19)
                                                          #-1089  (19)  #-1098  (19)  #-1106  (19)  #-1112  (19)
                                                          #-1121  (19)  #-1129  (19)  #-1138  (19)  #-1229  (19)
CDB$M_UBA                      =00000002      162   (2)
CDB$M_UBI                      =00000004      163   (2)   #-1156  (19)  #-1197  (19)  #-1224  (19)  #-1250  (19)
                                                          #-1268  (19)  #-1469  (22)  #-1912  (30)  #-1969  (31)
                                                          #-2025  (32)  #-393   (7)   #-442   (8)   #-494   (9)
                                                          #-571   (10)  #-622   (11)  #-680   (12)  #-736   (13)
                                                          #-847   (15)  #-895   (16)
CDB$V_IE                       =00000005      160   (2)     166   (2)   #-2076  (33)
CDB$V_MBA                      =00000000      155   (2)     161   (2)
CDB$V_OFFSET                   =00000003      158   (2)     164   (2)
CDB$V_REV                      =00000004      159   (2)     165   (2)
CDB$V_UBA                      =00000001      156   (2)     162   (2)
CDB$V_UBI                      =00000002      157   (2)     163   (2)
CDB$W_RVR                        0000001A     222   (3)   #-2106  (33)
CDB$W_ST2                        00000018     221   (3)   #-2099  (33)    2103  (33)  #-2107  (33)  #-2111  (33)
                                                          #-802   (14)  #-805   (14)
CDBSIZ                         =00000020      224   (3)     227   (3)
CHC$_ABORT                     =00000002      142   (2)
CHC$_CLEAR                     =00000006      142   (2)
CHC$_CLRDFT                    =00000009      142   (2)
CHC$_DSINT                     =00000005      142   (2)
CHC$_ENINT                     =00000004      142   (2)
CHC$_INITA                     =00000000      142   (2)
CHC$_INITB                     =00000001      142   (2)
CHC$_PURGE                     =00000003      142   (2)
CHC$_SELF_TEST                 =0000000B      142   (2)
CHC$_SETDFT                    =00000008      142   (2)
CHC$_STATUS                    =00000007      142   (2)
CHC$_STOP                      =0000000A      142   (2)
CHI$M_CHNINT                   =00000001      142   (2)
CHI$M_DEVINT                   =00000002      142   (2)   #-2107  (33)
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CHI$M_IPL                       =0000007C     142     (2)
CHI$S_IPL                       =00000005     142     (2)     #-2102   (33)
CHI$V_CHNINT                    =00000000     142     (2)
CHI$V_DEVINT                    =00000001     142     (2)
CHI$V_IPL                       =00000002     142     (2)     #-2102   (33)
CHM$_FORWARD                    =00000000     142     (2)       142    (2)
CHM$_INVALIDATE                 =00000001     142     (2)       142    (2)
CHM$_MAP                        =00000002     142     (2)       142    (2)
CHM$_MFWDN                      =00000002     142     (2)
CHM$_MFWDNO                     =0000000A     142     (2)
CHM$_MFWDV                      =00000003     142     (2)
CHM$_MFWDVO                     =0000000B     142     (2)
CHM$_MREVN                      =00000006     142     (2)
CHM$_MREVNO                     =0000000E     142     (2)
CHM$_MREVV                      =00000007     142     (2)
CHM$_MREVVO                     =0000000F     142     (2)
CHM$_NFWDN                      =00000000     142     (2)
CHM$_NREVN                      =00000004     142     (2)
CHM$_OFFSET                     =00000008     142     (2)       142    (2)
CHM$_REVERSE                    =00000004     142     (2)       142    (2)
CHN$_ADR1                       =0000000C     143     (2)     #-560    (10)   #-569    (10)
CHN$_ADR2                       =00000010     143     (2)     #-562    (10)   #-570    (10)   #-803    (14)
CHN$_FUNC                       =00000008     143     (2)     #-339    (6)
CHN$_NARGS                      =00000004     143     (2)
CHN$_UNIT                       =00000004     143     (2)     #-332    (6)
CHNMB1                           00000664-R   1810    (28)    #-1808   (28)
CHNMB2                           00000674-R   1814    (28)    #-1812   (28)
CHNMB3                           00000681-R   1818    (28)    #-1816   (28)
CHN_ABORT                        0000005C-R   493     (9)       351    (6)
CHN_CALL_RTN                     000001AB-R   945     (17)    #-1007   (19)   #-336    (6)    #-353    (6)    #-449    (8)
                                                             #-503    (9)    #-554    (10)   #-558    (10)   #-567    (10)
                                                             #-578    (10)   #-582    (10)   #-678    (12)   #-687    (12)
                                                             #-694    (12)   #-748    (13)   #-854    (15)   #-902    (16)
CHN_CLEAR                        00000114-R   735     (13)      351    (6)
CHN_CLRDFT                       00000192-R   894     (16)      351    (6)
CHN_DSINT                        000000E3-R   673     (12)      351    (6)
CHN_DSP                          0000000F-R   338     (6)     #-334    (6)
CHN_ENINT                        00000076-R   549     (10)      351    (6)
CHN_INITA                        00000035-R   392     (7)       351    (6)
CHN_INITB                        00000047-R   441     (8)       351    (6)
CHN_NORMAL_RTN                   000001A4-R   942     (17)    #-397    (7)    #-401    (7)    #-445    (8)    #-499    (9)
                                                             #-579    (10)   #-625    (11)   #-630    (11)   #-745    (13)
                                                             #-756    (13)   #-806    (14)   #-850    (15)   #-898    (16)
CHN_PURGE                        000000D0-R   621     (11)      351    (6)
CHN_SETDFT                       00000180-R   846     (15)      351    (6)
CHN_STATUS                       0000015A-R   795     (14)      351    (6)
CHS$M_BADBDP                    =20000000     142     (2)
CHS$M_BADPAR                    =40000000     142     (2)
CHS$M_BUSIC                     =00800000     142     (2)
CHS$M_BUSINIT                   =00400000     142     (2)
CHS$M_BUSNXM                    =08000000     142     (2)     #-1712   (26)
CHS$M_BUSPDN                    =01000000     142     (2)
CHS$M_CHNDPE                    =00000040     142     (2)     #-1699   (26)   #-1821   (28)   #-1840   (28)
CHS$M_CHNERR                    =00000002     142     (2)       142    (2)    #-1699   (26)     170    (2)    #-1702   (26)
                                                             #-1705   (26)   #-1712   (26)   #-1813   (28)   #-1817   (28)
                                                             #-1821   (28)   #-1840   (28)
CHS$M_CHNMPE                    =00000080     142     (2)     #-1817   (28)
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CHS$M_CHPFOT                    =00000100     142     (2)     #-1813    (28)
CHS$M_DEVBUS                    =00000010     142     (2)     #-1829    (28)
CHS$M_DEVERR                    =00000004     142     (2)       142     (2)       170     (2)     #-1825    (28)     #-1829    (28)
CHS$M_DEVTO                     =00000020     142     (2)     #-1825    (28)
CHS$M_ERRANY                    =0000000F     170     (2)     #-1015    (19)    #-551     (10)    #-675     (12)
CHS$M_MBAATN                    =00100000     142     (2)     #-1690    (26)
CHS$M_MBACPE                    =00200000     142     (2)     #-1695    (26)
CHS$M_MBADTB                    =00040000     142     (2)     #-1682    (26)
CHS$M_MBADTC                    =00080000     142     (2)     #-1686    (26)
CHS$M_MBAEXC                    =00010000     142     (2)     #-1674    (26)
CHS$M_MBANED                    =00020000     142     (2)     #-1678    (26)
CHS$M_MBAWCKLWR                 =02000000     142     (2)     #-1702    (26)
CHS$M_MBAWCKUPR                 =04000000     142     (2)     #-1705    (26)
CHS$M_PGMERR                    =00000008     142     (2)       142     (2)       170     (2)     #-1833    (28)
CHS$M_PGMHDE                    =00000800     142     (2)     #-1833    (28)
CHS$M_SYSERR                    =00000001     142     (2)       142     (2)       170     (2)     #-1805    (28)     #-1809    (28)
CHS$M_SYSMEM                    =00000200     142     (2)     #-1809    (28)
CHS$M_SYSSBI                    =00000400     142     (2)     #-1805    (28)
CHS$M_UIE                       =10000000     142     (2)
CHS$V_BADBDP                    =0000001D     142     (2)
CHS$V_BADPAR                    =0000001E     142     (2)
CHS$V_BUSIC                     =00000017     142     (2)
CHS$V_BUSINIT                   =00000016     142     (2)
CHS$V_BUSNXM                    =0000001B     142     (2)
CHS$V_BUSPDN                    =00000018     142     (2)
CHS$V_CHNDPE                    =00000006     142     (2)
CHS$V_CHNERR                    =00000001     142     (2)
CHS$V_CHNMPE                    =00000007     142     (2)
CHS$V_CHPFOT                    =00000008     142     (2)
CHS$V_DEVBUS                    =00000004     142     (2)
CHS$V_DEVERR                    =00000002     142     (2)
CHS$V_DEVTO                     =00000005     142     (2)
CHS$V_MBAATN                    =00000014     142     (2)
CHS$V_MBACPE                    =00000015     142     (2)
CHS$V_MBADTB                    =00000012     142     (2)
CHS$V_MBADTC                    =00000013     142     (2)
CHS$V_MBAEXC                    =00000010     142     (2)
CHS$V_MBANED                    =00000011     142     (2)
CHS$V_MBAWCKLWR                 =00000019     142     (2)
CHS$V_MBAWCKUPR                 =0000001A     142     (2)
CHS$V_PGMERR                    =00000003     142     (2)
CHS$V_PGMHDE                    =0000000B     142     (2)
CHS$V_SYSERR                    =00000000     142     (2)
CHS$V_SYSMEM                    =00000009     142     (2)
CHS$V_SYSSBI                    =0000000A     142     (2)
CHS$V_UIE                       =0000001C     142     (2)
CLEAR_MBA                        00000119-R   738     (13)
CLEAR_UBI                        00000148-R   750     (13)    #-736     (13)
CLRDFT_MBA                       00000197-R   897     (16)
CLRDFT_UBI                       0000019A-R   900     (16)    #-895     (16)
CLRMAP                           0000035C-R   1196    (19)    #-1061    (19)    #-1066    (19)    #-1090    (19)    #-1114    (19)
                                                               #-1131    (19)
CLRMAP_MBA                       00000361-R   1199    (19)
CLRMAP_RTN                       00000382-R   1211    (19)    #-1203    (19)
CLRMAP_UBI                       00000373-R   1205    (19)    #-1197    (19)
CLRVEC                           0000077E-R   2022    (32)    #-693     (12)
CLRVEC_MBA                       00000788-R   2027    (32)
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CLRVEC_RTN                      0000079B-R    2034    (32)    #-2029    (32)
CLRVEC_UBI                      00000794-R    2031    (32)    #-2025    (32)
CNTCHK                          000003F6-R    1307    (19)    #-1032    (19)
CNTCHK_RTN                      0000041D-R    1319    (19)    #-1316    (19)
CVT$T_MBAMAP                    00000054-R    235     (3)
CVT$T_MBASR                     00000050-R    232     (3)
CVT$T_UBADPR                    00000058-R    238     (3)
CVT$T_UBAMAP                    0000005C-R    241     (3)
DEVMB1                          00000692-R    1822    (28)    #-1820    (28)
DEVMB2                          0000069F-R    1826    (28)    #-1824    (28)
DEVUB1                          000006D7-R    1841    (28)    #-1839    (28)
DS$CLRVEC                       00000000-XR                   2028    (32)
DS$CVTREG                       00000000-XR                   1621    (25)
DS$GPHARD                       00000000-XR                   1894    (30)
DS$K_ERROR                     =00000002      139     (2)
DS$K_NORMAL                    =00000001      139     (2)
DS$K_SEVERE                    =00000004      139     (2)
DS$K_SUBSYS                    =00000066      139     (2)     119     (2)     139     (2)
DS$K_WARNING                   =00000000      139     (2)
DS$PRINTB                       00000000-XR                   1476    (22)    1517    (23)    1535    (23)    1538    (23)
                                                              1541    (23)    1580    (24)    1626    (25)
DS$SETVEC                       00000000-XR                   1971    (31)
DS$_AP_NORMAL_BREAK            =00660150      139     (2)
DS$_ARITH                      =006600D0      139     (2)
DS$_ASBE                       =00660118      139     (2)
DS$_BADLINK                    =006600F0      139     (2)
DS$_BADTYPE                    =006600E8      139     (2)
DS$_BIIC                       =00660120      139     (2)
DS$_CHME                       =006600A8      139     (2)
DS$_CHMK                       =006600E0      139     (2)
DS$_DEVNAME                    =00660108      139     (2)
DS$_ERROR                      =00660002      139     (2)
DS$_FHWE                       =00660068      139     (2)
DS$_FRAGBUF                    =00660080      139     (2)
DS$_ICBUSY                     =006600C8      139     (2)
DS$_ICERR                      =006600C0      139     (2)
DS$_IHWE                       =00660060      139     (2)     #-1017    (19)    #-553     (10)    #-677     (12)
DS$_ILLCHAR                    =00660018      139     (2)
DS$_ILLPAGCNT                  =00660078      139     (2)
DS$_ILLUNIT                    =00660100      139     (2)
DS$_INIT_FAIL                  =00660140      139     (2)
DS$_INSFMEM                    =00660050      139     (2)
DS$_INVCPU                     =00660130      139     (2)
DS$_IPL2HI                     =006600B8      139     (2)
DS$_IVADDR                     =00660040      139     (2)
DS$_IVVECT                     =00660038      139     (2)
DS$_KRNLSTK                    =00660090      139     (2)
DS$_LOGIC                      =00660070      139     (2)     #-577     (10)    #-686     (12)    #-747     (13)
DS$_MCHK                       =00660088      139     (2)
DS$_MEM_ALLOC_ERR              =00660138      139     (2)
DS$_MMOFF                      =00660058      139     (2)
DS$_NEEDUNIT                   =006600F8      139     (2)
DS$_NODE                       =00660128      139     (2)
DS$_NOPCS                      =00660110      139     (2)
DS$_NORMAL                     =00660001      139     (2)     #-1277    (19)    #-1287    (19)    #-1300    (19)    #-1314    (19)
                                                              #-1330    (19)    #-1375    (20)    #-1419    (21)    #-1477    (22)
                                                              #-1918    (30)    #-1979    (31)    #-2032    (32)    #-943     (17)
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DS$_NOSUPPORT                   =006600B1      139    (2)    #-448    (8)    #-502    (9)    #-853    (15)   #-901    (16)
DS$_NOTALLOWMP                  =00660148      139    (2)
DS$_NOTDON                      =00660030      139    (2)
DS$_NOTIMP                      =006600B0      139    (2)     119     (2)     135     (2)     139     (2)
DS$_NULLSTR                     =00660010      139    (2)
DS$_OVERFLOW                    =00660008      139    (2)
DS$_POWER                       =00660098      139    (2)
DS$_PROGERR                     =00660020      139    (2)    #-1004   (19)   #-1056   (19)   #-1274   (19)   #-1284   (19)
                                                             #-1317   (19)   #-352    (6)    #-566    (10)
DS$_SEVERE                      =00660004      139    (2)
DS$_TRANSL                      =006600A0      139    (2)
DS$_TRUNCATE                    =00660028      139    (2)
DS$_UNEXPINT                    =006600D8      139    (2)
DS$_UNSUPPDEV                   =00660158      139    (2)
DS$_VASFULL                     =00660048      139    (2)
DS$_WARNING                     =00660000      139    (2)     119     (2)     139     (2)
DSI$CHANNEL                      000007AC-R    2082   (33)    1971    (31)
DSI$CHANNEL_COM                  000007AE-R    2084   (33)   #-2079   (33)
DSI$CHANNEL_VEC                  000007A0-R    2075   (33)
DSINT_CLR                        0000010E-R     692   (12)   #-685    (12)
DSINT_MBA                        000000FA-R     682   (12)
DSINT_UBI                        0000010E-R     690   (12)   #-680    (12)
DSP$SHOWMBA                      00000428-R    1372   (20)
DSP$SHOWUBI                      00000439-R    1416   (21)
DSX$CHANNEL                      00000000-R     330   (6)
DSX$SETMAP                       000001AC-R     997   (19)
DSX$SHOWCHAN                     0000044A-R    1461   (22)
ENINT_MBA                        000000B6-R     573   (10)
ENINT_UBI                        000000CD-R     581   (10)   #-571    (10)
FMT_CRLF                         00000024-R     254   (4)     1476    (22)
FMT_CVT_ARG                      00000020-R     230   (3)    #-1619   (25)   #-1620   (25)    1621    (25)
FMT_MBA_CNT                      000000B1-R     260   (4)     1541    (23)
FMT_MBA_CR                       00000045-R     256   (4)     1523    (23)
FMT_MBA_CSR                      00000027-R     255   (4)     1518    (23)
FMT_MBA_HDR                      00000008-R     253   (4)     1517    (23)
FMT_MBA_MAP                      00000098-R     259   (4)     1538    (23)
FMT_MBA_SR                       00000062-R     257   (4)     1528    (23)
FMT_MBA_VAR                      0000007F-R     258   (4)     1535    (23)
FMT_UBI_CSR                      000001D5-R     272   (4)     1581    (24)
FMT_UBI_HDR                      000001B9-R     271   (4)     1580    (24)
GENSTS                           00000633-R    1753   (27)   #-2098   (33)   #-801    (14)
GENSTS_RTN                       00000638-R    1757   (27)   #-1755   (27)
HDWSTS                           00000639-R    1798   (28)   #-1014   (19)   #-2093   (33)   #-550    (10)   #-674    (12)
                                                             #-796    (14)
HP$A_DEVICE                      00000018                    #-1907   (30)   #-1909   (30)   #-1917   (30)   #-2091   (33)
HP$A_LINK                        00000020                    #-1901   (30)   #-1903   (30)
HP$W_VECTOR                      00000024                    #-1967   (31)
INITA_MBA                        0000003A-R     395   (7)
INITA_UBI                        00000041-R     399   (7)    #-393    (7)
INITB_MBA                        0000004C-R     444   (8)
INITB_UBI                        0000004F-R     446   (8)    #-442    (8)
INT_DSP                          00000809-R    2115   (33)
INVALID                          00000248-R    1055   (19)    1054    (19)
INVALIDATE                       00000252-R    1058   (19)    1054    (19)
JMPADR                           000000E1-R     285   (5)
MBA$L_BCR                       =00000010                    #-1253   (19)    1539    (23)
MBA$L_CR                        =00000004                     1524    (23)   #-396    (7)    #-497    (9)    #-498    (9)
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                                                #-574    (10)   #-575    (10)   #-683    (12)   #-684    (12)
MBA$L_CSR                =00000000                1519    (23)   #-1803   (28)   #-1811   (28)   #-739    (13)
                                                #-741    (13)
MBA$L_MAP                =00000800              #-1161    (19)   #-1201   (19)   #-1537   (23)
MBA$L_SR                 =00000008                1529    (23)   #-1672   (26)   #-1676   (26)   #-1680   (26)
                                                #-1684    (26)   #-1688   (26)   #-1693   (26)   #-1697   (26)
                                                #-1700    (26)   #-1703   (26)   #-1807   (28)   #-1815   (28)
                                                #-1819    (28)   #-1823   (28)   #-1827   (28)   #-1831   (28)
                                                #-740     (13)   #-743    (13)
MBA$L_VAR                =0000000C              #-1235    (19)     1533   (23)
MBA$M_CR_ABORT           =00000002              #-497     (9)    #-498    (9)
MBA$M_CR_IE              =00000004              #-574     (10)   #-575    (10)   #-683    (12)   #-684    (12)
MBA$M_CR_INIT            =00000001              #-396     (7)
MBA$M_CSR_CLR            =ECE00000    193  (2)  #-739     (13)   #-741    (13)
MBA$M_CSR_MT             =08000000                175     (2)      192   (2)
MBA$M_CSR_OT             =00200000                180     (2)      193   (2)
MBA$M_CSR_PD             =00800000                180     (2)      193   (2)
MBA$M_CSR_PE             =80000000                175     (2)      192   (2)
MBA$M_CSR_PU             =00400000                180     (2)      193   (2)
MBA$M_CSR_URD            =20000000                175     (2)      192   (2)
MBA$M_CSR_WS             =40000000                175     (2)      192   (2)
MBA$M_CSR_XMFLT          =04000000                176     (2)      193   (2)
MBA$M_MAP_VALID          =80000000    190  (2)  #-1159    (19)
MBA$M_SR_ATTN            =00010000              #-1688    (26)
MBA$M_SR_CLR             =E00A3FFF    200  (2)  #-740     (13)   #-743    (13)
MBA$M_SR_CRD             =20000000                177     (2)      195   (2)
MBA$M_SR_DLT             =00000800                177     (2)      186   (2)      197   (2)
MBA$M_SR_DTABT           =00001000                186     (2)      196   (2)
MBA$M_SR_DTBUSY          =80000000              #-1680    (26)     195   (2)
MBA$M_SR_DTCOMP          =00002000              #-1684    (26)     196   (2)
MBA$M_SR_ERCONF          =00000008                177     (2)      199   (2)
MBA$M_SR_INVMAP          =00000010                188     (2)      199   (2)
MBA$M_SR_ISTO            =00000002                178     (2)      200   (2)
MBA$M_SR_MAPPE           =00000020                181     (2)      199   (2)
MBA$M_SR_MBEXC           =00000080              #-1672    (26)     185   (2)      198   (2)
MBA$M_SR_MCPE            =00020000              #-1693    (26)     185   (2)      196   (2)
MBA$M_SR_MDPE            =00000040                185     (2)      198   (2)
MBA$M_SR_MXF             =00000100                186     (2)      198   (2)
MBA$M_SR_NED             =00040000              #-1676    (26)     184   (2)
MBA$M_SR_NRCONF          =40000000                177     (2)      195   (2)
MBA$M_SR_PGE             =00080000                188     (2)      195   (2)
MBA$M_SR_RDS             =00000004                178     (2)      200   (2)
MBA$M_SR_RDTO            =00000001                178     (2)      200   (2)
MBA$M_SR_WCKLWR          =00000200              #-1700    (26)     182   (2)      197   (2)
MBA$M_SR_WCKUPR          =00000400              #-1703    (26)     182   (2)      197   (2)
MBA_CR_BIT                000000EB-R  262  (4)     1525    (23)
MBA_CSR_BIT               000000CB-R  261  (4)     1520    (23)
MBA_CSR_CHNER1           =00E00000    180  (2)  #-1811    (28)
MBA_CSR_SYSER1           =EC000000    176  (2)  #-1803    (28)
MBA_MAP_BIT               000001A0-R  268  (4)      236    (3)
MBA_SR_BIT                0000011B-R  264  (4)     1530    (23)      233   (3)
MBA_SR_CHNER2            =00000020    181  (2)  #-1815    (28)
MBA_SR_CHNER3            =00000600    182  (2)  #-1697    (26)   #-1819   (28)
MBA_SR_DEVER1            =00040000    184  (2)  #-1823    (28)
MBA_SR_DEVER2            =000219C0    186  (2)  #-1827    (28)
MBA_SR_PGMER1            =00080010    188  (2)  #-1831    (28)
MBA_SR_SYSER2            =6000080F    178  (2)  #-1807    (28)
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MFWDN                           0000026D-R  1072  (19)     1054  (19)
MFWDNO                          000002D3-R  1120  (19)     1054  (19)
MFWDV                           0000025B-R  1063  (19)     1054  (19)
MFWDVO                          000002BE-R  1111  (19)     1054  (19)
MREVN                           0000029D-R  1096  (19)     1054  (19)
MREVNO                          000002F7-R  1137  (19)     1054  (19)
MREVV                           00000288-R  1087  (19)     1054  (19)
MREVVO                          000002E5-R  1128  (19)     1054  (19)
NFWDN                           0000027C-R  1080  (19)     1054  (19)
NREVN                           000002AF-R  1104  (19)     1054  (19)
PAR$M_ATDEF                    =00000010    140   (2)
PAR$M_ATHI                     =00000008    140   (2)
PAR$M_ATLO                     =00000004    140   (2)
PAR$M_NODEF                    =00000002    140   (2)
PAR$V_ATDEF                    =00000004    140   (2)
PAR$V_ATHI                     =00000003    140   (2)
PAR$V_ATLO                     =00000002    140   (2)
PAR$V_NODEF                    =00000001    140   (2)
PAR$_BIN                       =00000002    140   (2)
PAR$_DEC                       =0000000A    140   (2)
PAR$_HEX                       =00000010    140   (2)
PAR$_NO                        =00000000    140   (2)
PAR$_OCT                       =00000008    140   (2)
PAR$_YES                       =00000001    140   (2)
PGMMB1                          000006AC-R  1830  (28)   #-1828  (28)
PR$_IPL                        =00000012                 #-2087  (33)
PURGE_MBA                       000000D5-R   624  (11)
PURGE_UBI                       000000D8-R   627  (11)   #-622   (11)
RNGCHK                          000003EE-R  1297  (19)   #-1010  (19)
RNGCHK_RTN                      000003EE-R  1299  (19)
SCB_BASE                        00000000-XR              #-1977  (31)
SCB_UNKINT                      00000000-XR                1977  (31)
SETCNT                          000003A0-R  1249  (19)   #-1069  (19)  #-1077  (19)  #-1084  (19)  #-1093  (19)
                                                         #-1101  (19)  #-1108  (19)  #-1117  (19)  #-1125  (19)
                                                         #-1134  (19)  #-1142  (19)
SETCNT_MBA                      000003A5-R  1252  (19)
SETCNT_RTN                      000003A9-R  1257  (19)
SETCNT_UBI                      000003A9-R  1256  (19)   #-1250  (19)
SETDFT_MBA                      00000185-R   849  (15)
SETDFT_UBI                      00000188-R   852  (15)   #-847   (15)
SETMAP                          00000306-R  1154  (19)   #-1067  (19)  #-1075  (19)  #-1091  (19)  #-1099  (19)
                                                         #-1115  (19)  #-1123  (19)  #-1132  (19)  #-1140  (19)
SETMAP_MBA                      0000030E-R  1157  (19)
SETMAP_RTN                      0000035B-R  1187  (19)   #-1165  (19)
SETMAP_UBI                      0000032A-R  1167  (19)   #-1156  (19)
SETVAR                          00000383-R  1223  (19)   #-1068  (19)  #-1076  (19)  #-1083  (19)  #-1092  (19)
                                                         #-1100  (19)  #-1107  (19)  #-1116  (19)  #-1124  (19)
                                                         #-1133  (19)  #-1141  (19)
SETVAR_MBA                      00000388-R  1226  (19)
SETVAR_RTN                      0000039F-R  1239  (19)
SETVAR_UBI                      0000039F-R  1238  (19)   #-1224  (19)
SETVEC                          00000730-R  1962  (31)   #-556   (10)
SETVEC_MBA                      00000746-R  1970  (31)
SETVEC_RTN                      0000077B-R  1981  (31)   #-1972  (31)
SETVEC_UBI                      0000075A-R  1974  (31)   #-1969  (31)
SHOWBITS                        00000549-R  1618  (25)   #-1521  (23)  #-1526  (23)  #-1531  (23)  #-1586  (24)
SHOW_MBA                        0000047A-R  1516  (23)   #-1374  (20)  #-1470  (22)
```

```
SHOW_RTN                 00000465-R  1475  (22)  #-1471  (22)
SHOW_RTN_1               00000479-R  1478  (22)  #-1466  (22)
SHOW_UBI                 0000051C-R  1579  (24)  #-1418  (21)  #-1473  (22)
SHW$K_BUFSIZ            =00000080     151  (2)     230  (3)     284  (5)
SHW$_NARGS              =00000001     146  (2)
SHW$_UNIT               =00000004     146  (2)  #-1463  (22)
SHWBUF                   00000060-R  284  (5)    1622  (25)    230  (3)
SIZ...                  =00000001     142  (2)     140  (2)     142  (2)
SS$_CONTINUE            =00000001                  135  (2)
STM$_BAS                =00000010     145  (2)  #-1021  (19)
STM$_CNT                =00000014     145  (2)  #-1023  (19)  #-1313  (19)
STM$_FUNC               =00000008     145  (2)  #-1036  (19)
STM$_NARGS              =00000006     145  (2)
STM$_PHY                =0000000C     145  (2)  #-1009  (19)  #-1022  (19)  #-1309  (19)
STM$_PTH                =00000018     145  (2)  #-1005  (19)  #-1020  (19)
STM$_UNIT               =00000004     145  (2)  #-999   (19)
STM_CALL_RTN             00000427-R  1332  (19)  #-1002  (19)  #-1012  (19)  #-1018  (19)  #-1030  (19)
                                                 #-1034  (19)  #-1057  (19)
STM_NORMAL_RTN           00000420-R  1329  (19)  #-1062  (19)  #-1070  (19)  #-1078  (19)  #-1085  (19)
                                                 #-1094  (19)  #-1102  (19)  #-1109  (19)  #-1118  (19)
                                                 #-1126  (19)  #-1135  (19)  #-1143  (19)
STSRTN                   000006D9-R  1844  (28)  #-1832  (28)  #-1834  (28)
SYSMB1                   00000643-R  1802  (28)  #-1800  (28)
SYSMB2                   00000653-R  1806  (28)  #-1804  (28)
SYSUB1                   000006C0-R  1835  (28)  #-1801  (28)
UBA$S_MAP_ADDR          =00000015                  #-1179  (19)
UBA$V_MAP_ADDR          =00000000                  #-1178  (19)
UBI$L_DPR               =00000000                  #-1583  (24)  #-1710  (26)  #-1838  (28)  #-629   (11)
                                                   #-754   (13)
UBI$L_MAP               =00000800                  #-1180  (19)  #-1207  (19)
UBI$M_CSR_CLR           =60000000     203  (2)
UBI$M_DPR_ERROR         =80000000                    202  (2)
UBI$M_DPR_NXM           =40000000                  #-1710  (26)    202  (2)    203  (2)    #-753  (13)
UBI$M_DPR_PUR           =00000001                  #-629   (11)
UBI$M_DPR_UCE           =20000000                    202  (2)    203  (2)    #-753  (13)
UBI$M_MAP_BO            =02000000     126  (2)  #-1176  (19)
UBI$M_MAP_VALID         =80000000     124  (2)
UBI$S_MAP_BO            =00000001     127  (2)
UBI$S_MAP_DPD           =00000002     129  (2)  #-1173  (19)
UBI$S_MAP_PFN           =0000000F     131  (2)
UBI$V_MAP_BO            =00000019     125  (2)    126  (2)
UBI$V_MAP_DPD           =00000015     128  (2)  #-1172  (19)
UBI$V_MAP_PFN           =00000000     130  (2)
UBI$V_MAP_VALID         =0000001F     123  (2)    124  (2)
UBIVEC                   000000E5-R  286  (5)
UBI_CSR_BIT              000001F3-R  274  (4)    1585  (24)
UBI_CSR_SYSER1          =E0000000     202  (2)  #-1838  (28)
UBI_DPR_BIT              000001F3-R  273  (4)    239  (3)
UBI_MAP_BIT              00000221-R  275  (4)    242  (3)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	24	00:00:00.03	00:00:00.19
Command processing	886	00:00:00.30	00:00:00.89
Pass 1	894	00:00:03.59	00:00:06.89
Symbol table sort	0	00:00:00.33	00:00:00.33
Pass 2	485	00:00:01.43	00:00:03.44
Symbol table output	14	00:00:00.05	00:00:00.22
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	6	00:00:00.37	00:00:00.58
Assembler run totals	2312	00:00:06.11	00:00:12.55

The working set limit was 2900 pages.
211409 bytes (413 pages) of virtual memory were used to buffer the intermediate code.
There were 60 pages of symbol table space allocated to hold 1168 non-local and 44 local symbols.
2120 source lines were read in Pass 1, producing 98 object records in Pass 2.
34 pages of virtual memory were used to define 32 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	18
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	1
SYS$COMMON:[SYSLIB]LIB.MLB;2	4
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	8
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	31

1207 GETS were required to define 31 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 67 DECLARATIONS
(2) 100 CHANGE MODE TO KERNEL ROUTINE
(3) 182 ASTEXIT SYSTEM SERVICE
(3) 208 Local intermediate dispatches

```
                                0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element CHMK.MAR
                                0000     2 ; *5    12-MAY-1986 11:09:03 BARANSKI "Cleaning up Object Libraries."
                                0000     3 ; *4     2-APR-1986 08:30:27 SHELHAMER "<no reason given>"
                                0000     4 ; *3     1-APR-1986 13:46:12 SHELHAMER "<no reason given>"
                                0000     5 ; *2     1-APR-1986 12:55:42 SHELHAMER "<no reason given>"
                                0000     6 ; *1     6-FEB-1986 15:14:49 DS ""
                                0000     7 ; DEC/CMS REPLACEMENT HISTORY, Element CHMK.MAR
                                0000     8         .TITLE  CHMK    *** CHMK Change mode to kernel handler
                                0000     9         .IDENT  /10-09/                                                 ;G:2
                                0000    10         .LIST   MEB
                                0000    11         .NLIST  CND
                                0000    12
                                0000    13 ;
                                0000    14 ; COPYRIGHT (c) 1977, 1981, 1985, 1986                               ;G:2
                                0000    15 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
                                0000    16 ;
                                0000    17 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
                                0000    18 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
                                0000    19 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
                                0000    20 ; MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
                                0000    21 ; EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
                                0000    22 ; TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
                                0000    23 ; REMAIN IN DEC.
                                0000    24 ;
                                0000    25 ; THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
                                0000    26 ; AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
                                0000    27 ; CORPORATION.
                                0000    28 ;
                                0000    29 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
                                0000    30 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
                                0000    31
                                0000    32 ;++
                                0000    33 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR.
                                0000    34 ;
                                0000    35 ; ABSTRACT:
                                0000    36 ;
                                0000    37 ; ENVIRONMENT:
                                0000    38 ;
                                0000    39 ; AUTHOR:       KEN CHAPMAN     10-NOV-77       VERSION 01.
                                0000    40 ;
                                0000    41 ; MODIFIED BY:
                                0000    42 ;                TOM SOUTTER     29-MAR-78       VERSION 02 (ESSAA-4.01)
                                0000    43 ;       01       ADDED CHMK HANDLER FOR ASTEXIT
                                0000    44 ;                D Butenhof      16-jan-80
                                0000    45 ;       02       Add dispatch for SGIPR (Store/Get Int. Proc. Reg.)
                                0000    46 ;
                                0000    47 ;                Roger Riggs,    12-Mar-1980
                                0000    48 ;       03       Removed CMK$MMON, CMK$MMOFF, added CMK$MMENABLE
                                0000    49 ;                Dave Butenhof, 23-feb-1981, version 6.3
                                0000    50 ;       04       Delete SEP psect, fix trunc. errors
                                0000    51 ;       05       Make dispatch offsets .SIGNED_WORD to report signed
                                0000    52 ;                truncation errors
                                0000    53 ;                - Dave Butenhof, 08-Jun-1981, version 6.4
                                0000    54 ;       06       Add dispatch for CHK$_SETPRT
                                0000    55 ;
                                0000    56 ;       07       - Jack Stansbury, 22-Oct-1981, Version 6.-
                                0000    57 ;                Added .LIBRARY statements for $DS and $DIAG.
```

```
0000    58 ;                Fixed a truncation error.
0000    59 ;        08      Jim Shelhamer   Jan 30, 1985    Version 8.1
0000    60 ;                Added CMK$APBOOT dispatch for booting AP.
0000    61 ;                                                                        ;G:2
0000    62 ;        09      Jim Shelhamer   March 1, 1986   Version 10.0            ;G:2
0000    63 ;                Add AP_CMKCODE for AP to use with user vector           ;G:2
0000    64 ;                and CHMK instruction.                                   ;G:2
0000    65 ;--
```

```
                        0000     67          .SBTTL  DECLARATIONS
                        0000     68 ;
                        0000     69 ; INCLUDE FILES:
                        0000     70 ;
                        0000     71          .LIBRARY        /$DS/           ;                                       [07]
                        0000     72          .LIBRARY        /$DIAG/         ;                                       [07]
                        0000     73
                        0000     74 ;
                        0000     75 ; MACROS:
                        0000     76 ;
                        0000     77
                        0000     78 ;
                        0000     79 ; EQUATED SYMBOLS:
                        0000     80 ;
                        0000     81          APDEF                                                       ;[09] ;G:4
                        0000     82          $PR8SSDEF                                                   ;[09] ;G:4
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .RESTORE
                        0000     83         CMKDEF
                        0000     84         DSFDEF
                        0000     88         $PSLDEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .RESTORE
                        0000     89         $PCBDEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .IIF    NB,PCB$L_SQFL,  PCB$L_SQFL:
 00000004               0000                        .BLKL   1
                        0004                .IIF    NB,PCB$L_SQBL,  PCB$L_SQBL:
 00000008               0004                        .BLKL   1
                        0008                .IIF    NB,PCB$W_SIZE,  PCB$W_SIZE:
 0000000A               0008                        .BLKW   1
                        000A                .IIF    NB,PCB$B_TYPE,  PCB$B_TYPE:
 0000000B               000A                        .BLKB   1
                        000B                .IIF    NB,PCB$B_PRI,   PCB$B_PRI:
 0000000C               000B                        .BLKB   1
                        000C                .IIF    NB,PCB$B_ASTACT,        PCB$B_ASTACT:
 0000000D               000C                        .BLKB   1
                        000D                .IIF    NB,PCB$B_ASTEN, PCB$B_ASTEN:
 0000000E               000D                        .BLKB   1
                        000E                .IIF    NB,PCB$W_MTXCNT,        PCB$W_MTXCNT:
 00000010               000E                        .BLKW   1
                        0010                .IIF    NB,PCB$L_ASTQFL,        PCB$L_ASTQFL:
 00000014               0010                        .BLKL   1
                        0014                .IIF    NB,PCB$L_ASTQBL,        PCB$L_ASTQBL:
 00000018               0014                        .BLKL   1
                        0018                .IIF    NB,PCB$L_PHYPCB,        PCB$L_PHYPCB:
 0000001C               0018                        .BLKL   1
                        001C                .IIF    NB,PCB$L_OWNER, PCB$L_OWNER:
 00000020               001C                        .BLKL   1
                        0020                .IIF    NB,PCB$L_WSSWP, PCB$L_WSSWP:
 00000024               0020                        .BLKL   1
                        0024                .IIF    NB,PCB$L_STS,   PCB$L_STS:
 00000028               0024                        .BLKL   1
                        0028                .IIF    NB,PCB$L_WTIME, PCB$L_WTIME:
 0000002C               0028                        .BLKL   1
                        002C                .IIF    NB,PCB$W_STATE, PCB$W_STATE:
 0000002E               002C                        .BLKW   1
```

```
                    002E                .IIF    NB,PCB$B_WEFC,  PCB$B_WEFC:
0000002F  002E                                  .BLKB   1
                    002F                .IIF    NB,PCB$B_PRIB,  PCB$B_PRIB:
00000030  002F                                  .BLKB   1
                    0030                .IIF    NB,PCB$W_APTCNT,        PCB$W_APTCNT:
00000032  0030                                  .BLKW   1
                    0032                .IIF    NB,PCB$W_TMBU,  PCB$W_TMBU:
00000034  0032                                  .BLKW   1
                    0034                .IIF    NB,PCB$W_GPGCNT,        PCB$W_GPGCNT:
00000036  0034                                  .BLKW   1
                    0036                .IIF    NB,PCB$W_PPGCNT,        PCB$W_PPGCNT:
00000038  0036                                  .BLKW   1
                    0038                .IIF    NB,PCB$W_ASTCNT,        PCB$W_ASTCNT:
0000003A  0038                                  .BLKW   1
                    003A                .IIF    NB,PCB$W_BIOCNT,        PCB$W_BIOCNT:
0000003C  003A                                  .BLKW   1
                    003C                .IIF    NB,PCB$W_BIOLM, PCB$W_BIOLM:
0000003E  003C                                  .BLKW   1
                    003E                .IIF    NB,PCB$W_DIOCNT,        PCB$W_DIOCNT:
00000040  003E                                  .BLKW   1
                    0040                .IIF    NB,PCB$W_DIOLM, PCB$W_DIOLM:
00000042  0040                                  .BLKW   1
                    0042                .IIF    NB,PCB$W_PRCCNT,        PCB$W_PRCCNT:
00000044  0042                                  .BLKW   1
                    0044                .IIF    NB,PCB$T_TERMINAL,      PCB$T_TERMINAL:
0000004C  0044                                  .BLKB   8
                    004C                .IIF    NB,PCB$L_PQB,   PCB$L_PQB:
                    004C                .IIF    NB,PCB$L_EFWM,  PCB$L_EFWM:
00000050  004C                                  .BLKL   1
                    0050                .IIF    NB,PCB$L_EFCS,  PCB$L_EFCS:
00000054  0050                                  .BLKL   1
                    0054                .IIF    NB,PCB$L_EFCU,  PCB$L_EFCU:
00000058  0054                                  .BLKL   1
                    0058                .IIF    NB,PCB$L_EFC2P, PCB$L_EFC2P:
0000005C  0058                                  .BLKL   1
                    005C                .IIF    NB,PCB$L_EFC3P, PCB$L_EFC3P:
00000060  005C                                  .BLKL   1
                    0060                .IIF    NB,PCB$L_PID,   PCB$L_PID:
00000064  0060                                  .BLKL   1
                    0064                .IIF    NB,PCB$L_PHD,   PCB$L_PHD:
00000068  0064                                  .BLKL   1
                    0068                .IIF    NB,PCB$T_LNAME, PCB$T_LNAME:
00000078  0068                                  .BLKB   16
                    0078                .IIF    NB,PCB$L_JIB,   PCB$L_JIB:
0000007C  0078                                  .BLKL   1
                    007C                .IIF    NB,PCB$Q_PRIV,  PCB$Q_PRIV:
00000084  007C                                  .BLKQ   1
                    0084                .IIF    NB,PCB$L_ARB,   PCB$L_ARB:
00000088  0084                                  .BLKL   1
                    0088                .IIF    NB,PCB$L_UIC,   PCB$L_UIC:
                    0088                .IIF    NB,PCB$W_MEM,   PCB$W_MEM:
0000008A  0088                                  .BLKW   1
                    008A                .IIF    NB,PCB$W_GRP,   PCB$W_GRP:
0000008C  008A                                  .BLKW   1
                    008C                .IIF    NB,PCB$C_LENGTH,        PCB$C_LENGTH:
                    008C                .IIF    NB,PCB$K_LENGTH,        PCB$K_LENGTH:
                    0000                .RESTORE
```

```
ZZ-ECSAA-10.11  DECLARATIONS                                    3-MAY-1988       Fiche 4 Frame H3          Sequence 651
CHMK                    *** CHMK Change mode to kernel handler   21-MAR-1988 17:47:30  VAX/VMS Macro V04-00        Page   5
10-09                   DECLARATIONS                              1-APR-1986 15:50:04  CHMK.MAR;1                        (1)

                             0000     93
                             0000     94 ;
                             0000     95 ; OWN STORAGE:
                             0000     96 ;
                         00000000     97          .PSECT  DATA, NOEXE, SHR, NOWRT, LONG
                             0000     98          MODNAM  CHMK
                  4B 4D 48 43 00' 0000        $MODULE:        .ASCIC  \CHMK\
                                  04  0000
```

```
0005    100          .SBTTL  CHANGE MODE TO KERNEL ROUTINE
0005    101 ;++
0005    102 ; FUNCTIONAL DESCRIPTION:
0005    103 ;
0005    104 ;       THIS ROUTINE DISPATCHES TO THE PROPER PRIVILEGED ROUTINE.
0005    105 ;
0005    106 ; CALLING SEQUENCE:
0005    107 ;
0005    108 ;       NONE
0005    109 ;
0005    110 ; INPUT PARAMETERS:
0005    111 ;
0005    112 ;       NONE
0005    113 ;
0005    114 ; IMPLICIT INPUTS:
0005    115 ;
0005    116 ;       NONE
0005    117 ;
0005    118 ; OUTPUT PARAMETERS:
0005    119 ;
0005    120 ;       NONE
0005    121 ;
0005    122 ; IMPLICIT OUTPUTS:
0005    123 ;
0005    124 ;       NONE
0005    125 ;
0005    126 ; COMPLETION CODES:
0005    127 ;
0005    128 ;       NONE
0005    129 ;
0005    130 ; SIDE EFFECTS:
0005    131 ;
0005    132 ;       NONE
0005    133 ;
0005    134 ;--
```

```
                          00000000          .PSECT  WORK, NOEXE, NOSHR, WRT, LONG
                              0000
                    00000000  0000  CMKCODE:        .LONG   0                   ; SAVED CODE FOR USER VECTOR.
                    00000000  0004  AP_CMKCODE:     .LONG   0                   ; Saved code for user vector on AP. [09] ;G:
                              0008
                          00000000          .PSECT  CODE, EXE, SHR, NOWRT, LONG
                              0000          .ALIGN  LONG,0
                              0000  EXE_CMODKRNL::
                              0000          BR_IF_AP 5$                         ; Use AP_CMKCODE if on AP        [09]  ;G:2
   12 00000000'EF   08   E1   0000          BBC     #AP$V_AP_Running,AP$GW_Data,30000$
      7E   0000005E 8F   DB   0008          MFPR    #PR8SS$_BINID,-(SP)                 ; Get our node id
 00000000'EF   04   04   ED   000F          CMPZV   #AP$V_AP_Node_Id,#AP$S_AP_Node_Id, - ; Our node = AP?
                    8E        0017                  AP$GW_Data, (SP)+
                    09   13   0018          BEQL    5$                                  ; Yes, branch
                              001A  30000$:                                             ; No, continue
      00000000'EF   6E   D0   001A          MOVL    (SP), CMKCODE               ; Save code                          ;G:2
                    07   11   0021          BRB     7$                          ; Go do dispatch                 [09]  ;G:2
      00000004'EF   6E   D0   0023  5$:     MOVL    (SP), AP_CMKCODE            ; Save code                      [09]  ;G:2
                              002A                                                                                       ;G:2
         0D   00    8E   CF   002A  7$:     CASEL   (SP)+, #0, #CMK$_LAST-1 ; DISPATCH.                                ;G:2
                       008E'  002E  10$:            .SIGNED_WORD    CMK$ASTEXIT-10$
                       FFD2'  0030                  .SIGNED_WORD    CMK$RCONSOLE-10$
                       FFD2'  0032                  .SIGNED_WORD    CMK$TCONSOLE-10$
                       00AB'  0034                  .SIGNED_WORD    MMENABLE-10$
                       00C3'  0036                  .SIGNED_WORD    APBOOT-10$      ; AP boot routine        [08]
                       FFD2'  0038                  .SIGNED_WORD    CMK$REFRESH-10$
                       001C'  003A                  .SIGNED_WORD    20$-10$
                       FFD2'  003C                  .SIGNED_WORD    CMK$HIBER-10$
                       00B1'  003E                  .SIGNED_WORD    INITSCB-10$
                       00B7'  0040                  .SIGNED_WORD    SETIPL-10$
                       FFD2'  0042                  .SIGNED_WORD    CMK$SGIPR-10$
                       FFD2'  0044                  .SIGNED_WORD    CMK$CANTIM-10$  ; Cancel timer kernel mode rtn
                       FFD2'  0046                  .SIGNED_WORD    CMK$SETIMR-10$  ; Setimr kernel mode routine
                       00BD'  0048                  .SIGNED_WORD    SETPRT-10$      ; Set page protection
                              004A
          00000000'EF   D5   004A  20$:    TSTL    L^DS$GA_CHMKVEC             ; Check for soft vector
                    3C   12   0050          BNEQ    30$
                              0052          BR_IF_AP 25$                        ; AP uses AP_CMKCODE             [09]  ;G:2
   12 00000000'EF   08   E1   0052          BBC     #AP$V_AP_Running,AP$GW_Data,30001$
      7E   0000005E 8F   DB   005A          MFPR    #PR8SS$_BINID,-(SP)                 ; Get our node id
 00000000'EF   04   04   ED   0061          CMPZV   #AP$V_AP_Node_Id,#AP$S_AP_Node_Id, - ; Our node = AP?
                    8E        0069                  AP$GW_Data, (SP)+
                    09   13   006A          BEQL    25$                                 ; Yes, branch
                              006C  30001$:                                             ; No, continue
      50   00000000'EF   D0   006C          MOVL    CMKCODE,R0                  ; Get code so ERRSUP prints it
                    07   11   0073          BRB     27$                         ; Go do errsup                   [09]  ;G:2
      50   00000004'EF   D0   0075  25$:    MOVL    AP_CMKCODE,R0               ; Get ap's code for errsup       [09]  ;G:2
                              007C                                                                                       ;G:2
                              007C  27$:    ERRSUP_S                                                                     ;G:2
          00000000'EF   DF   007C                  PUSHAL  $MODULE
                    00   DD   0082                  PUSHL   #0
                    01   DD   0084                  PUSHL   #$ER
      00000000'EF   03   FB   0086                  CALLS   #3, DS_ERRSUP
                    02        008D          REI
                              008E
                              008E  30$:    BR_IF_AP 40$                        ; AP uses AP_CMKCODE             [09]  ;G:2
   12 00000000'EF   08   E1   008E          BBC     #AP$V_AP_Running,AP$GW_Data,30002$
```

```
        7E   0000005E 8F   DB  0096                MFPR    #PR8SS$_BINID,-(SP)                ; Get our node id
  00000000'EF    04   04   ED  009D                CMPZV   #AP$V_AP_Node_Id,#AP$S_AP_Node_Id, - ; Our node = AP?
                      8E       00A5                        AP$GW_Data, (SP)+
                      08   13  00A6                BEQL    40$                                ; Yes, branch
                               00A8        30002$:                                            ; No, continue
            00000000'EF   DD  00A8   176           PUSHL   CMKCODE                  ; RESTORE CODE ON STACK.                ;G:2
                      06   11  00AE   177           BRB     50$                      ; Go do jump                    [09]    ;G:2
            00000004'EF   DD  00B0   178 40$:      PUSHL   AP_CMKCODE               ; Get ap's code onto stack      [09]    ;G:2
                               00B6   179                                                                                      ;G:2
            00000000'FF   17  00B6   180 50$:      JMP     @L^DS$GA_CHMKVEC         ; Go through user vector                ;G:2
```

```
                                  00BC          .SBTTL  ASTEXIT SYSTEM SERVICE
                                  00BC    ;+
                                  00BC    ; CMK$ASTEXIT - SERVICE TO EXIT AN ACTIVE AST AND ALLOW PENDING ASTS TO
                                  00BC    ;               BE DELIVERED.
                                  00BC    ;
                                  00BC    ; THIS SYSTEM SERVICE IS INVOKED WITH A "CMK ASTEXIT" NOT CONTAINED IN
                                  00BC    ; A STANDARD SYSTEM SERVICE VECTOR TO AVOID CLUTTERING THE STACK WITH AN
                                  00BC    ; ADDITIONAL CALL FRAME DURING AST EXIT PROCESSING.
                                  00BC    ;
                                  00BC    ; INPUTS:
                                  00BC    ;       NONE
                                  00BC    ;
                                  00BC    ; OUTPUTS:
                                  00BC    ;       PCB$B_ASTACT IS CLEARED FOR THE ISSUING MODE
                                  00BC    ;
                                  00BC    ;-
                                  00BC
                                  00BC    CMK$ASTEXIT::                                   ;EXIT ACTIVE AST
50   04 AE   02   16   EF         00BC            EXTZV   #PSL$V_PRVMOD,#PSL$S_PRVMOD,4(SP),R0 ;GET PREVIOUS MODE
                  14   BB         00C2            PUSHR   #^M<R2,R4>                      ;SAVE R2,R4
     54   00000000'EF   DE         00C4            MOVAL   DS$AX_SOFTPCB,R4                ;GET PCB CURRENT PCB ADDRESS
        00 0C A4   50   E7         00CB            BBCCI   R0,PCB$B_ASTACT(R4),10$         ;CLEAR AST ACTIVE BIT FOR MODE
          00000000'EF   16         00D0    10$:    JSB     SCH$NEWLVL                      ;COMPUTE NEW AST LEVEL SETTING          [07]
                  14   BA         00D6            POPR    #^M<R2,R4>                      ;RESTORE REGISTERS<R2,R4>
                       02         00D8            REI                                     ;AND EXIT
```

```
                        00D9   208          .SBTTL  Local intermediate dispatches
                        00D9   209 ;+
                        00D9   210 ; Since CASE offsets have to be word relative, to fix truncation errors,
                        00D9   211 ; dispatch to local JMP L^ way-stations.
                        00D9   212 ;-
                        00D9   213
                        00D9   214 MMENABLE:
00000000'EF   17        00D9   215          JMP     L^CMK$MMENABLE          ; Dispatch memory management on
                        00DF   216
                        00DF   217 INITSCB:
00000000'EF   17        00DF   218          JMP     L^CMK$INITSCB           ; Dispatch initialize SCB
                        00E5   219
00000000'EF   17        00E5   220 SETIPL: JMP      L^CMK$SETIPL            ; Dispatch set IPL
                        00EB   221
                        00EB   222 SETPRT:
00000000'EF   17        00EB   223          JMP     L^CMK$SETPRT            ; Dispatch the trap
                        00F1   224 APBOOT:                                                          ;[08
00000000'EF   17        00F1   225          JMP     L^CMK$APBOOT            ; Dispatch AP boot      [08]
                        00F7   226
                        00F7   227          .END
```

```
$ER                             = 00000002    D
$MODULE                           00000000 R  D   02
AP$GK_PROMPT_WAIT               = 00FFFFFF    D
AP$GW_DATA                        ********    X   04
AP$M_AP_NODE_ID                 = 000000F0    D
AP$M_AP_RUNNING                 = 00000100    D
AP$M_BUFFER_FULL                = 00000800    D
AP$M_DATA_READY                 = 00000200    D
AP$M_PP_NODE_ID                 = 0000000F    D
AP$M_REQUEST                    = 00000400    D
AP$S_AP_NODE_ID                 = 00000004    D
AP$S_PP_NODE_ID                 = 00000004    D
AP$V_AP_NODE_ID                 = 00000004    D
AP$V_AP_RUNNING                 = 00000008    D
AP$V_BUFFER_FULL                = 0000000B    D
AP$V_DATA_READY                 = 00000009    D
AP$V_PP_NODE_ID                 = 00000000    D
AP$V_REQUEST                    = 0000000A    D
AP$_REQ_CONSRX                  = 00000000  G D
AP$_REQ_RXCDVEC                 = 00000001  G D
APBOOT                            000000F1 R  D   04
AP_CMKCODE                        00000004 R  D   03
CMK$APBOOT                        ********    X   04
CMK$ASTEXIT                       000000BC RG D   04
CMK$CANTIM                        ********    X   04
CMK$HIBER                         ********    X   04
CMK$INITSCB                       ********    X   04
CMK$MMENABLE                      ********    X   04
CMK$RCONSOLE                      ********    X   04
CMK$REFRESH                       ********    X   04
CMK$SETIMR                        ********    X   04
CMK$SETIPL                        ********    X   04
CMK$SETPRT                        ********    X   04
CMK$SGIPR                         ********    X   04
CMK$TCONSOLE                      ********    X   04
CMK$_APBOOT                     = 00000004    D
CMK$_ASTEXIT                    = 00000000    D
CMK$_CANTIM                     = 0000000B    D
CMK$_HIBER                      = 00000007    D
CMK$_INITSCB                    = 00000008    D
CMK$_LAST                       = 0000000E    D
CMK$_MMENABLE                   = 00000003    D
CMK$_RCONSOLE                   = 00000001    D
CMK$_REFRESH                    = 00000005    D
CMK$_SCHDWK                     = 00000006    D
CMK$_SETIMR                     = 0000000C    D
CMK$_SETIPL                     = 00000009    D
CMK$_SETPRT                     = 0000000D    D
CMK$_SGIPR                      = 0000000A    D
CMK$_TCONSOLE                   = 00000002    D
CMKCODE                           00000000 R  D   03
DS$AX_SOFTPCB                     ********    X   04
DS$GA_CHMKVEC                     ********    X   04
DS$M_ABRTFLG                    = 00000040    D
DS$M_BADTIME                    = 00100000    D
DS$M_BATCH                      = 00400000    D
DS$M_BRKCLR                     = 00001000    D
DS$M_BRKPT                      = 00000800    D
DS$M_CHARFLG                    = 00000100    D
DS$M_CMDFLG                     = 00000080    D
DS$M_CTRLC                      = 00000001    D
DS$M_CTRLO                      = 00010000    D
DS$M_DEVFLG                     = 00000200    D
DS$M_DISABLCC                   = 01000000    D
DS$M_DONFLG                     = 00002000    D
DS$M_ERRFLG                     = 00000010    D
DS$M_EXCEPT                     = 00080000    D
DS$M_EXETST                     = 00040000    D
DS$M_HLTFLG                     = 00000008    D
DS$M_LODFLG                     = 00000002    D
DS$M_MEMMGT                     = 00008000    D
DS$M_NI                         = 04000000    D
DS$M_OUTPUT                     = 00800000    D
DS$M_RUBFLG                     = 00000020    D
DS$M_SCRIPT                     = 00200000    D
DS$M_SETIMR                     = 02000000    D
DS$M_STRFLG                     = 00000004    D
DS$M_SUBT                       = 00004000    D
DS$M_SYSFLG                     = 00000400    D
DS$M_TIMED                      = 02000000    D
DS$M_TIMED_OUT                  = 08000000    D
DS$M_TIMRON                     = 00020000    D
DS$V_ABRTFLG                    = 00000006    D
DS$V_BADTIME                    = 00000014    D
DS$V_BATCH                      = 00000016    D
DS$V_BRKCLR                     = 0000000C    D
DS$V_BRKPT                      = 0000000B    D
DS$V_CHARFLG                    = 00000008    D
DS$V_CMDFLG                     = 00000007    D
DS$V_CTRLC                      = 00000000    D
DS$V_CTRLO                      = 00000010    D
DS$V_DEVFLG                     = 00000009    D
DS$V_DISABLCC                   = 00000018    D
DS$V_DONFLG                     = 0000000D    D
DS$V_ERRFLG                     = 00000004    D
DS$V_EXCEPT                     = 00000013    D
DS$V_EXETST                     = 00000012    D
DS$V_HLTFLG                     = 00000003    D
DS$V_LODFLG                     = 00000001    D
DS$V_MEMMGT                     = 0000000F    D
DS$V_NI                         = 0000001A    D
DS$V_OUTPUT                     = 00000017    D
DS$V_RUBFLG                     = 00000005    D
DS$V_SCRIPT                     = 00000015    D
DS$V_SETIMR                     = 00000019    D
DS$V_STRFLG                     = 00000002    D
DS$V_SUBT                       = 0000000E    D
DS$V_SYSFLG                     = 0000000A    D
DS$V_TIMED                      = 00000019    D
DS$V_TIMED_OUT                  = 0000001B    D
DS$V_TIMRON                     = 00000011    D
DS_ERRSUP                         ********    X   04
EXE_CMODKRNL                      00000000 RG D   04
INITSCB                           000000DF R  D   04
```

```
MMENABLE                        000000D9 R   D  04
PCB$B_ASTACT                    0000000C     D
PCB$B_ASTEN                     0000000D     D
PCB$B_PRI                       0000000B     D
PCB$B_PRIB                      0000002F     D
PCB$B_TYPE                      0000000A     D
PCB$B_WEFC                      0000002E     D
PCB$C_LENGTH                    0000008C     D
PCB$K_LENGTH                    0000008C     D
PCB$L_ARB                       00000084     D
PCB$L_ASTQBL                    00000014     D
PCB$L_ASTQFL                    00000010     D
PCB$L_EFC2P                     00000058     D
PCB$L_EFC3P                     0000005C     D
PCB$L_EFCS                      00000050     D
PCB$L_EFCU                      00000054     D
PCB$L_EFWM                      0000004C     D
PCB$L_JIB                       00000078     D
PCB$L_OWNER                     0000001C     D
PCB$L_PHD                       00000064     D
PCB$L_PHYPCB                    00000018     D
PCB$L_PID                       00000060     D
PCB$L_PQB                       0000004C     D
PCB$L_SQBL                      00000004     D
PCB$L_SQFL                      00000000     D
PCB$L_STS                       00000024     D
PCB$L_UIC                       00000088     D
PCB$L_WSSWP                     00000020     D
PCB$L_WTIME                     00000028     D
PCB$Q_PRIV                      0000007C     D
PCB$T_LNAME                     00000068     D
PCB$T_TERMINAL                  00000044     D
PCB$W_APTCNT                    00000030     D
PCB$W_ASTCNT                    00000038     D
PCB$W_BIOCNT                    0000003A     D
PCB$W_BIOLM                     0000003C     D
PCB$W_DIOCNT                    0000003E     D
PCB$W_DIOLM                     00000040     D
PCB$W_GPGCNT                    00000034     D
PCB$W_GRP                       0000008A     D
PCB$W_MEM                       00000088     D
PCB$W_MTXCNT                    0000000E     D
PCB$W_PPGCNT                    00000036     D
PCB$W_PRCCNT                    00000042     D
PCB$W_SIZE                      00000008     D
PCB$W_STATE                     0000002C     D
PCB$W_TMBU                      00000032     D
PR8SS$_BINID                  = 0000005E     D
PSL$S_PRVMOD                  = 00000002     D
PSL$V_PRVMOD                  = 00000016     D
SCH$NEWLVL                      ********   X   04
SETIPL                          000000E5 R   D  04
SETPRT                          000000EB R   D  04
SIZ...                        = 00000001     D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000008C (140.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
DATA	00000005 (5.)	02 (2.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC LONG
WORK	00000008 (8.)	03 (3.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC LONG
CODE	000000F7 (247.)	04 (4.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$ER	=00000002	172 (3)	#-172 (3)
$MODULE	00000000-R	98 (1)	172 (3)
AP$GK_PROMPT_WAIT	=0FFFFFFF	81 (1)	
AP$GW_DATA	00000000-XR		144 (3) 167 (3) 175 (3)
AP$M_AP_NODE_ID	=000000F0	81 (1)	
AP$M_AP_RUNNING	=00000100	81 (1)	
AP$M_BUFFER_FULL	=00000800	81 (1)	
AP$M_DATA_READY	=00000200	81 (1)	
AP$M_PP_NODE_ID	=0000000F	81 (1)	
AP$M_REQUEST	=00000400	81 (1)	
AP$S_AP_NODE_ID	=00000004	81 (1)	#-144 (3) #-167 (3) #-175 (3)
AP$S_PP_NODE_ID	=00000004	81 (1)	
AP$V_AP_NODE_ID	=00000004	81 (1)	#-144 (3) #-167 (3) #-175 (3)
AP$V_AP_RUNNING	=00000008	81 (1)	#-144 (3) #-167 (3) #-175 (3)
AP$V_BUFFER_FULL	=0000000B	81 (1)	
AP$V_DATA_READY	=00000009	81 (1)	
AP$V_PP_NODE_ID	=00000000	81 (1)	
AP$V_REQUEST	=0000000A	81 (1)	
AP$_REQ_CONSRX	=00000000	81 (1)	
AP$_REQ_RXCDVEC	=00000001	81 (1)	
APBOOT	000000F1-R	224 (3)	154 (3)
AP_CMKCODE	00000004-R	139 (3)	#-147 (3) #-170 (3) #-178 (3)
BIT...	=00000018	84 (1)	81 (1) 83 (1) 84 (1)
CMK$APBOOT	00000000-XR		225 (3)
CMK$ASTEXIT	000000BC-R	199 (3)	150 (3)
CMK$CANTIM	00000000-XR		161 (3)
CMK$HIBER	00000000-XR		157 (3)
CMK$INITSCB	00000000-XR		218 (3)
CMK$MMENABLE	00000000-XR		215 (3)
CMK$RCONSOLE	00000000-XR		151 (3)
CMK$REFRESH	00000000-XR		155 (3)
CMK$SETIMR	00000000-XR		162 (3)
CMK$SETIPL	00000000-XR		220 (3)
CMK$SETPRT	00000000-XR		223 (3)
CMK$SGIPR	00000000-XR		160 (3)
CMK$TCONSOLE	00000000-XR		152 (3)
CMK$_APBOOT	=00000004	83 (1)	
CMK$_ASTEXIT	=00000000	83 (1)	
CMK$_CANTIM	=0000000B	83 (1)	
CMK$_HIBER	=00000007	83 (1)	
CMK$_INITSCB	=00000008	83 (1)	
CMK$_LAST	=0000000E	83 (1)	#-149 (3)
CMK$_MMENABLE	=00000003	83 (1)	
CMK$_RCONSOLE	=00000001	83 (1)	
CMK$_REFRESH	=00000005	83 (1)	
CMK$_SCHDWK	=00000006	83 (1)	
CMK$_SETIMR	=0000000C	83 (1)	
CMK$_SETIPL	=00000009	83 (1)	
CMK$_SETPRT	=0000000D	83 (1)	
CMK$_SGIPR	=0000000A	83 (1)	

```
CMK$_TCONSOLE                   =00000002     83     (1)
CMKCODE                          00000000-R   138    (3)    #-145    (3)    #-168    (3)    #-176    (3)
DS$AX_SOFTPCB                    00000000-XR           202    (3)
DS$GA_CHMKVEC                    00000000-XR          #-165    (3)      180    (3)
DS$M_ABRTFLG                    =00000040     84     (1)
DS$M_BADTIME                    =00100000     84     (1)
DS$M_BATCH                      =00400000     84     (1)
DS$M_BRKCLR                     =00001000     84     (1)
DS$M_BRKPT                      =00000800     84     (1)
DS$M_CHARFLG                    =00000100     84     (1)
DS$M_CMDFLG                     =00000080     84     (1)
DS$M_CTRLC                      =00000001     84     (1)
DS$M_CTRLO                      =00010000     84     (1)
DS$M_DEVFLG                     =00000200     84     (1)
DS$M_DISABLCC                   =01000000     84     (1)
DS$M_DONFLG                     =00002000     84     (1)
DS$M_ERRFLG                     =00000010     84     (1)
DS$M_EXCEPT                     =00080000     84     (1)
DS$M_EXETST                     =00040000     84     (1)
DS$M_HLTFLG                     =00000008     84     (1)
DS$M_LODFLG                     =00000002     84     (1)
DS$M_MEMMGT                     =00008000     84     (1)
DS$M_NI                         =04000000     84     (1)
DS$M_OUTPUT                     =00800000     84     (1)
DS$M_RUBFLG                     =00000020     84     (1)
DS$M_SCRIPT                     =00200000     84     (1)
DS$M_SETIMR                     =02000000     84     (1)
DS$M_STRFLG                     =00000004     84     (1)
DS$M_SUBT                       =00004000     84     (1)
DS$M_SYSFLG                     =00000400     84     (1)
DS$M_TIMED                      =02000000     84     (1)
DS$M_TIMED_OUT                  =08000000     84     (1)
DS$M_TIMRON                     =00020000     84     (1)
DS$V_ABRTFLG                    =00000006     84     (1)
DS$V_BADTIME                    =00000014     84     (1)
DS$V_BATCH                      =00000016     84     (1)
DS$V_BRKCLR                     =0000000C     84     (1)
DS$V_BRKPT                      =0000000B     84     (1)
DS$V_CHARFLG                    =00000008     84     (1)
DS$V_CMDFLG                     =00000007     84     (1)
DS$V_CTRLC                      =00000000     84     (1)
DS$V_CTRLO                      =00000010     84     (1)
DS$V_DEVFLG                     =00000009     84     (1)
DS$V_DISABLCC                   =00000018     84     (1)
DS$V_DONFLG                     =0000000D     84     (1)
DS$V_ERRFLG                     =00000004     84     (1)
DS$V_EXCEPT                     =00000013     84     (1)
DS$V_EXETST                     =00000012     84     (1)
DS$V_HLTFLG                     =00000003     84     (1)
DS$V_LODFLG                     =00000001     84     (1)
DS$V_MEMMGT                     =0000000F     84     (1)
DS$V_NI                         =0000001A     84     (1)
DS$V_OUTPUT                     =00000017     84     (1)
DS$V_RUBFLG                     =00000005     84     (1)
DS$V_SCRIPT                     =00000015     84     (1)
DS$V_SETIMR                     =00000019     84     (1)
DS$V_STRFLG                     =00000002     84     (1)
```

```
DS$V_SUBT                       =0000000E      84      (1)
DS$V_SYSFLG                     =0000000A      84      (1)
DS$V_TIMED                      =00000019      84      (1)
DS$V_TIMED_OUT                  =0000001B      84      (1)
DS$V_TIMRON                     =00000011      84      (1)
DS_ERRSUP                        00000000-XR                    172     (3)
EXE_CMODKRNL                     00000000-R    143     (3)
INITSCB                          000000DF-R    217     (3)      158     (3)
MMENABLE                         000000D9-R    214     (3)      153     (3)
PCB$B_ASTACT                     0000000C                       203     (3)
PR0SS$_BINID                    =0000005E                     #-144    (3)    #-167    (3)    #-175    (3)
PSL$S_PRVMOD                    =00000002                     #-200    (3)
PSL$V_IS                        =0000001A      83      (1)
PSL$V_PRVMOD                    =00000016                     #-200    (3)
SCH$NEWLVL                       00000000-XR                    204     (3)
SETIPL                           000000E5-R    220     (3)      159     (3)
SETPRT                           000000EB-R    222     (3)      163     (3)
SIZ...                          =00000001      84      (1)      81      (1)      84      (1)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.00	00:00:00.32
Command processing	928	00:00:00.25	00:00:01.02
Pass 1	521	00:00:01.15	00:00:02.92
Symbol table sort	0	00:00:00.09	00:00:00.08
Pass 2	24	00:00:00.26	00:00:00.43
Symbol table output	2	00:00:00.03	00:00:00.07
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	4	00:00:00.06	00:00:00.16
Assembler run totals	1508	00:00:01.85	00:00:05.01

The working set limit was 2400 pages.
67430 bytes (132 pages) of virtual memory were used to buffer the intermediate code.
There were 20 pages of symbol table space allocated to hold 321 non-local and 13 local symbols.
227 source lines were read in Pass 1, producing 34 object records in Pass 2.
21 pages of virtual memory were used to define 18 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	7
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	8
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	16

```
436 GETS were required to define 16 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1)   552   Libraries, Macros, Equated Symbols
(1)   597   Work Psect Storage
(1)   631   Data Psect Storage
(1)   639   Error & Status Messages Text
(1)   700   COMMANDS A-C
(1)   755   DIRECTORY, DEATTACH, DESELECT
(1)   806   DEPOSIT, EXIT, EXAMINE
(1)   843   LOAD, NEXT, RUN, HELP, INITPCS
(1)   881   SET, SELECT, SHOW, START, SUMMARY, XDELTA, a
(1)   934   END OF LINE & ILLEGAL Processing
(1)   982   INCOMPLETE, BAD LIST & BAD QUAL Processing
(1)   1033   Flag list
(1)   1089   Device Names, Event Flags
(1)   1132   File Specifications
(1)   1233   ADDRESS Parrameter.
(1)   1288   Start and Run Qualifiers
(1)   1351   BREAKPOINT Start or Run Qualifiers, DEVICE Qualifiers.
(1)   1397   EXAMINE & DEPOSIT Qualifiers
(1)   1452   DEATTACH, DESELECT, and SELECT Parameters.
(1)   1508   Show Parameters and Qualifiers
(1)   1726   Clear Parameters and Qualifiers
(1)   1789   Set Parameters and Qualifiers
(1)   1959   Set Default Parameters
(1)   2018   DS$Cli Routine - Command Line Interpreter
(1)   2182   CLI Action Routines.
(1)   2363   Null and Context-Saving Action Routines
(1)   2399   Success, Failure, Notnuf, Enuf Action Routincs
(1)   2430   Commands A-C Action Routines
(1)   2503   Commands D-E Action Routines
(1)   2595   Commands H-R Action Routines
(1)   2674   Commands S-Z Action Routines
(1)   2911   CRD command
(1)   2996   Filespec, Optional, Required Action Routines
(1)   3029   Start and Run Qualifier Action Routines
(1)   3142   Event and Flags Action Routines
(1)   3211   Base, Address, Break Action Routines
(1)   3255   Base_Qual, Nobase Action Routines   ;[107]
(1)   3277   All, Default Action Routines
(1)   3317   Show Calls Routine   ;   [70]
(1)   3329   CRDTrace Action Routines   ;   [65]
(1)   3373   Ask_prompt, Bell, Binary, Halt, IEx Action Routines
(1)   3439   Loop, Oper, Prompt Quick Action Routines
(1)   3473   Search, Trace, Verify Action Routines
(1)   3499   Set/Show Page, Width Action Routine
(1)   3535   Set/Show QA Action Routines
(1)   3583   QADef Action Routine
(1)   3609   Efn, Next, Ascii Action Routines
(1)   3646   Register Action Routines
(1)   3686   Backup, Advance, Data Action Routines
(1)   3722   Long, Word, Byte, Hex, Dec, Oct Action Routines
(1)   3772   IF Action Routines
(1)   3865   Xdelta Action Routines
(1)   3887   Device, Brief, Adaptor Action Routines
(1)   3940   Show Select, Do_Cmd, Set Load, Show Load Action Routines
(1)   3977   MM On, Off, and Show Action Routines
(1)   4045   Show Status, Show Support

```
                                0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element CLI.MAR
                                0000     2 ;  31    7-MAR-1988 15:35:49 MEIER "Changed 9cc to VAX 6200"
                                0000     3 ; *30   26-JAN-1988 08:00:41 MEIER "added support for ka9cc fro set CPU command"
                                0000     4 ; *29    9-DEC-1987 09:21:27 BARANSKI "merge 27a1"
                                0000     5 ; *28   12-OCT-1987 11:59:57 MARTIN "KA888 -> KA884 PERMENENTLY"
                                0000     6 ;  27A1 30-JUL-1987 17:10:41 MARTIN "FIX"
                                0000     7 ; *27    2-JUN-1987 09:41:32 MI "FIXED BUG IN FILE DIRECTORY SPECIFICATION"
                                0000     8 ; *26   29-APR-1987 16:05:50 MARTIN "MODIFIED FOR PSTAR"
                                0000     9 ; *25    5-SEP-1986 11:11:25 BARANSKI "<no reason given>"
                                0000    10 ; *24    5-SEP-1986 11:06:01 BARANSKI "TESTING UPDATE"
                                0000    11 ; *23    4-SEP-1986 18:08:14 BARANSKI "<no reason given>"
                                0000    12 ; *22    4-SEP-1986 18:02:50 BARANSKI "<no reason given>"
                                0000    13 ; *21    4-SEP-1986 18:00:25 BARANSKI "<no reason given>"
                                0000    14 ; *20    4-SEP-1986 17:58:30 BARANSKI "<no reason given>"
                                0000    15 ; *19    4-SEP-1986 17:52:55 BARANSKI "<no reason given>"
                                0000    16 ; *18    4-SEP-1986 17:49:05 BARANSKI "<no reason given>"
                                0000    17 ; *17    4-SEP-1986 17:45:36 BARANSKI "UPDATE TEST."
                                0000    18 ; *16   22-JUL-1986 10:12:42 MARTIN "FIXED SHO MM - SET MM ON/OFF CONTROVERSY"
                                0000    19 ; *15   10-JUN-1986 13:50:59 BAGGETT "<no reason given>"
                                0000    20 ; *14   26-MAY-1986 13:30:43 BARANSKI "Done fixing SET LOAD []"
                                0000    21 ; *13   20-MAY-1986 10:26:37 BERGAZZI "/TIME"
                                0000    22 ; *12   19-MAY-1986 16:51:03 BARANSKI "TESTING UPDATE"
                                0000    23 ; *11   19-MAY-1986 15:20:14 BERGAZZI "ADD SUPPPORT FOR /TIME"
                                0000    24 ; *10   12-MAY-1986 11:14:21 BARANSKI "Cleaning up Object Libraries."
                                0000    25 ; *9    18-APR-1986 15:37:07 SHELHAMER "<no reason given>"
                                0000    26 ; *8    14-APR-1986 12:42:47 SHELHAMER "<no reason given>"
                                0000    27 ; *7    14-APR-1986 12:24:08 SHELHAMER "<no reason given>"
                                0000    28 ; *6    14-APR-1986 11:58:49 SHELHAMER "<no reason given>"
                                0000    29 ; *5    14-APR-1986 11:19:58 ANDELLA "<no reason given>"
                                0000    30 ; *4    11-MAR-1986 14:03:00 BAGGETT "FINISHED"
                                0000    31 ; *3    10-MAR-1986 10:47:38 ANDELLA "<no reason given>"
                                0000    32 ; *2    14-FEB-1986 11:05:34 BERGAZZI "CRD ONLINE MESSAGE RESTORED"
                                0000    33 ; *1     6-FEB-1986 15:14:51 DS ""
                                0000    34 ; DEC/CMS REPLACEMENT HISTORY, Element CLI.MAR
                                0000    35         .Title  CLI     DIAGNOSTIC SUPERVISOR COMMAND LINE INTERPRETER
                                0000    36         .Ident  "10.11-30"                                                ;G:30
                                0000    37         .NoShow Conditionals
                                0000    38
                                0000    39 ;++
                                0000    40 ; Copyright (c) 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985,          ;G:26
                                0000    41 ;                 1986, 1987                                                   ;G:26
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```

```
                                0000     58 ;
                                0000     59 ; NOTE:  The following Notations apply to the Comments concerning what commands
                                0000     60 ; are legal to be parsed:
                                0000     61 ;
                                0000     62 ;     1 space  = optional spaces
                                0000     63 ;     2 spaces = required spaces
                                0000     64 ;     WOrd     = abbreviatable to WO
                                0000     65 ;     word     = a parameter
                                0000     66 ;     [word]   = optional word
                                0000     67
                                0000     68 ;++
                                0000     69 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR.
                                0000     70 ;
                                0000     71 ; ABSTRACT:
                                0000     72 ;
                                0000     73 ; ENVIRONMENT:
                                0000     74 ;
                                0000     75 ; AUTHOR:       KEN CHAPMAN     31-OCT-77       VERSION 01.
                                0000     76 ;
                                0000     77 ; MODIFIED BY:
                                0000     78 ;                NICK HOWGATE    06-NOV-77       VERSION 02
                                0000     79 ;       01       APT INTERFACE
                                0000     80 ;
                                0000     81 ;                TOM SOUTTER     17-NOV-77       VERSION 03.
                                0000     82 ;       02       DSPR #7 - FIX FOR SHOW EVENT FLAGS.
                                0000     83 ;       03       MAKE 'ILLEGAL COMMAND' MESSAGE GLOBAL.
                                0000     84 ;
                                0000     85 ;                KEN CHAPMAN     05-DEC-77       VERSION 04 (ESSAA-3.05)
                                0000     86 ;       04       DSPR #45 - REMOVE HALTI.
                                0000     87 ;
                                0000     88 ;                KEN CHAPMAN     12-JAN-78       VERSION 05 (ESSAA-3.06)
                                0000     89 ;       05       DSPR #77 - FIXED VERSION NUMBER BRANCH OF TREE.
                                0000     90 ;       06       DSPR #100 - FIXED HALT BRANCH OF TREE.
                                0000     91 ;
                                0000     92 ;                KEN CHAPMAN     16-FEB-78       VERSION 06 (ESSAA-3.07)
                                0000     93 ;       07       DSPR #104 - FIXED CLEAR BREAK BRANCH OF TREE.
                                0000     94 ;       08       ADDED 'COMPAT' FLAG.
                                0000     95 ;       09       CODE COMPRESSION USING CLI$_STRING MECHANISM.
                                0000     96 ;
                                0000     97 ;                KEN CHAPMAN     28-FEB-78       VERSION 07 (ESSAA-4.00)
                                0000     98 ;       10       SET COMMAND MODE FLAG ON ENTERING CLI.
```

```
                                0000    100 ;                   NICK HOWGATE    29-MAR-78       VERSION 08 (ESSAA-4.01)
                                0000    101 ;           11      FIXED 'CONTINUE' IN APT MODE
                                0000    102 ;           12      ADDED PROPER SPELLING OF "HEXADECIMAL".
                                0000    103 ;           13      CHANGED 'VRRUN' & 'VRLOAD' TO 'DSV$RUN' & 'DSV$LOAD'
                                0000    104 ;                   KEN CHAPMAN     06-APR-78
                                0000    105 ;           14      MADE 'COMPAT' COMMANDS CONDITIONAL ON 'VM11' DEFINED.
                                0000    106 ;
                                0000    107 ;                   NICK HOWGATE    09-JUN-78       VERSION 09 (ESSAA-4.03).
                                0000    108 ;           15      FIX APT ^C PROBLEM
                                0000    109 ;
                                0000    110 ;                   Roger Riggs     17-JUL-78       VERSION 10 (ESSAA-5.00).
                                0000    111 ;           16      Fix to let SUPERLINE do the prompt, clean up APT
                                0000    112 ;                   stuff in area of prompt.
                                0000    113 ;
                                0000    114 ;                   Roger Riggs     21-SEP-78
                                0000    115 ;           17      Insert support for new device selection commands.
                                0000    116 ;
                                0000    117 ;                   Roger Riggs     04-FEB-79
                                0000    118 ;           18      Insert "SET LOAD <filespec>" command for default load device
                                0000    119 ;           22      Add SHOW LOAD command
                                0000    120 ;           23      Fix SET LOAD, SET LOOP, SET LOCK interaction
                                0000    121 ;                   fix SELECT and DESELECT
                                0000    122 ;                   Fix SE AMBIGIOUS error
                                0000    123 ;           24      Raise ASTLVL in command mode to prevent AST delivery
                                0000    124 ;                   in command mode
                                0000    125 ;
                                0000    126 ;                   Roger Riggs     4-Sept-1979
                                0000    127 ;           25      Made command tree and command action routine global for APT
                                0000    128 ;
                                0000    129 ;                   Roger Riggs     6-Nov-1979
                                0000    130 ;           26      Changed version number on filespec to be decimal instead
                                0000    131 ;                   of octal.
                                0000    132 ;                   Changed MTPR x,PR$_IPL to call set so it's done in KERNEL mode
                                0000    133 ;
                                0000    134 ;           27      MARION BAGGETT  14-DEC-79
                                0000    135 ;                   ALLOW SETTING OF MEMORY MANAGEMENT ON OR OFF
                                0000    136 ;                   ALLOW EXAMINE AND DEPOSIT OF PROCESSOR REGISTERS
                                0000    137 ;
                                0000    138 ;           28      David Butenhof  09-Jan-80
                                0000    139 ;                   Fix exam/deposit of processor registers
                                0000    140 ;
                                0000    141 ;           29      David Butenhof  06-feb-80
                                0000    142 ;                   Be sure all possible AST levels are disabled to prevent
                                0000    143 ;                   interrupt-driven diagnostic from continuing after ^C or
                                0000    144 ;                   breakpoint.
                                0000    145 ;
                                0000    146 ;           30      David Butenhof  15-feb-80
                                0000    147 ;                   Add SEARCH operator flag
                                0000    148 ;
                                0000    149 ;                   Roger Riggs, 17-Jan-1980, Version 5.2
                                0000    150 ;           31      Corrected handling of command mode for APT, made sure
                                0000    151 ;                   it typed "DS> " after ^C and processing of any command.
                                0000    152 ;           32      Fixed saved IPL to save all 5 bits of IPL instead of just 4.
                                0000    153 ;           33      Remove disable of ASTs in CLI so that WAITMS works and
                                0000    154 ;                   ^C ASTs are delivered.
```

```
                     0000   156 ;          Dave Butenhof   30-jun-1980, version 5.5
                     0000   157 ;     34   Add HELP command in PARSE tree, and ACT_HELP action routine
                     0000   158 ;
                     0000   159 ;          Dave Butenhof, 02-oct-1980, Version 6.1
                     0000   160 ;     35   Add DIRECTORY command
                     0000   161 ;     36   Alter filespec parsing to recognise [000000] form as well as
                     0000   162 ;          [0,0] for UIC.
                     0000   163 ;
                     0000   164 ;          Dave Butenhof, 13-feb-1981, version 6.3
                     0000   165 ;     37   Change /SECTION:xxx so xxx can be symbol (inc. $ and _).
                     0000   166 ;     38   Add SET WIDTH command, and alter filespec parse to allow
                     0000   167 ;          subdirectories in user mode.
                     0000   168 ;
                     0000   169 ;     39   Dave Butenhof, 06-Oct-1981, version 6.5
                     0000   170 ;          Implement SHOW STATUS command
                     0000   171 ;
                     0000   172 ;     40   Jack Stansbury, 21-Oct-1981, Version 6.5
                     0000   173 ;          Added calls to QA$Main for the QA enhancement.
                     0000   174 ;          Also added .LIBRARY statements for $DIAG, $DS, and LIB.
                     0000   175 ;
                     0000   176 ;     41   Jack Stansbury, 22-Oct-1981, Version 6.5
                     0000   177 ;          Fixed truncation errors.
                     0000   178 ;
                     0000   179 ;     42   Jack Stansbury, 25-Oct-1981, Version 6.5
                     0000   180 ;          Many changes for the /QA qualifier on the
                     0000   181 ;          RUN and START commands, additional SET and SHOW
                     0000   182 ;          changes for the QA flags.
                     0000   183 ;
                     0000   184 ;     43   Jack Stansbury, 3-Nov-1981, Version 6.5
                     0000   185 ;          Major revisions to the parse tree. Renumbered all the labels,
                     0000   186 ;          moved things around, ... Also incorporated checks so that a
                     0000   187 ;          SET FLAG WIDTH 130 is not allowed (as it was before). Also
                     0000   188 ;          changed the error messages to mixed case. Also took out T_CRLF,
                     0000   189 ;          because it was not used. Most of these changes are not marked
                     0000   190 ;          since so much was done. Also made use of the new CLI$K_SLASH,
                     0000   191 ;          CLI$K_VALUE, and CLI$K_COMMA character values in calls to
                     0000   192 ;          $DS_CLI. These allow "/", ":" or "=", and ",", respectively,
                     0000   193 ;          with optional spaces on either side of them. They were added
                     0000   194 ;          to PARSE.MAR by Dave Butenhof. Also added /ADAPTER qualifier
                     0000   195 ;          to the SHOW DEVICE, SELECT, and DESELECT commands. This
                     0000   196 ;          qualifier
                     0000   197 ;          requires an adaptor name as its value. Also added SHOW DEFAULT
                     0000   198 ;          and SHOW BASE commands. Also added DCL-like printout of portion
                     0000   199 ;          of command line in error. That is,
                     0000   200 ;                  ?? error message
                     0000   201 ;                     \portion in error\
                     0000   202 ;
                     0000   203 ;     44   Marion Baggett, Jack Stansbury, 05-Oct-1981, Version 6.5
                     0000   204 ;          Enhanced the SHOW DEVICE AND SHOW SELECTED command to allow
                     0000   205 ;          the qualifier and print only the device type and name.
                     0000   206 ;          Added a new command SHOW SUPPORT to show the devices a diag
                     0000   207 ;          will support.
```

```
                     0000   209 ;       45      Jack Stansbury, 11-Nov-1981, Version 6.5
                     0000   210 ;               Changed the DS$PARSE call to DSX$SUPERPARSE. SUPERPARSE does not
                     0000   211 ;               return when it encounters EOL. Rather, it follows the
                     0000   212 ;               parse tree until it encounters CLI$K_EXIT. This fixes the
                     0000   213 ;               problem with SET BASE 0, where DS$PARSE saw EOL, and returned to
                     0000   214 ;               here with the NOTNUF flag still set. Thus, it was not continuing
                     0000   215 ;               in the parse tree, where it would have executed the ENUF action
                     0000   216 ;               routine, and then gone to EOL in the parse tree. DSX$SUPERPARSE
                     0000   217 ;               does continue, and thus will execute ENUF, and then go to EOL.
                     0000   218 ;               Also: changed the error handling and reporting. Established
                     0000   219 ;               different action routines for Illegal command versus Incomplete
                     0000   220 ;               commands. Checked return from DSX$PARSE and various CLI flags
                     0000   221 ;               and printed appropriate error messages.
                     0000   222 ;               Also: changed the DCL-like printout of the command line in error
                     0000   223 ;               to print the part of the line that was good. This was done
                     0000   224 ;               because of the strange results from doing it the previous way!
                     0000   225 ;               Also: added action routines ACT_OPTIONAL, ACT_REQUIRED,
                     0000   226 ;               ACT_IF_REQUIRED, ACT_IF_FILE_SPEC, ACT_BINARY, and ACT_VERIFY.
                     0000   227 ;               Also: added recognition of SET BINARY, SET VERIFY, CLEAR BINARY,
                     0000   228 ;               and CLEAR VERIFY. These are new control flags.
                     0000   229 ;               Also added ADVANCE action routine. It functions exactly
                     0000   230 ;               opposite of BACKUP.
                     0000   231 ;
                     0000   232 ;       46      Jack Stansbury, 13-Nov-1981, Version 6.5
                     0000   233 ;               Added CLI$K_CALL, CLI$K_RETURN, and CLI$K_BIFS to various places
                     0000   234 ;               in parse tree. Dave Butenhof added these new character codes.
                     0000   235 ;               They are to be used for one-level-deep subr calls. Also added
                     0000   236 ;               SUCCESS and FAILURE action routines to be used in with
                     0000   237 ;               the above. Also added a new DS command: EXIT.  Also altered
                     0000   238 ;               ACT_DO_CMD to avoid dispatching if CLI$L_COMMAND(R2) is 0; this
                     0000   239 ;               allows ATTACH to 'kill' the command when the /Adapter value is
                     0000   240 ;               bad. Also added the SHOW SECTIONS command.
                     0000   241 ;
                     0000   242 ;       47      Jack Stansbury, 17-Nov-1981, Version 6.5
                     0000   243 ;               Changed all BSBW's to JSB's.
                     0000   244 ;
                     0000   245 ;       48      Dave Butenhof, 18-Nov-1981, version 6.5
                     0000   246 ;               Add DEATTACH command, and typecodes in messages
                     0000   247 ;
                     0000   248 ;       49      Jack Stansbury, 21-Nov-1981, Version 6.5
                     0000   249 ;               Took out the DSQA constants and the calls to QA_MAIN.
                     0000   250 ;               It appears these will not be needed for the 6.5 DS version.
                     0000   251 ;
                     0000   252 ;       50      Dave Butenhof, 04-Feb-1982, Version 6.6
                     0000   253 ;               Use the new CLI$K_FILE parse code for filename/type parse
                     0000   254 ;
                     0000   255 ;       51      Dave Butenhof, 05-Feb-1982, Version 6.6
                     0000   256 ;               Add new command SHOW MEMORY.
```

```
0000    258 ;       52      Jack Stansbury, 18-Feb-1982, Version 6.6
0000    259 ;               Changed the HELP command parsing so that HSOW will not result
0000    260 ;               in the HELP command looking for DS command SOW! That is, if
0000    261 ;               spaces are not found after the minimum characters for HELP
0000    262 ;               (H in this case), then there must be an EOL. If not EOL, it
0000    263 ;               is an error. Also, I added the VSDP Supervisor command. This
0000    264 ;               is for CRD use. Right now, it simply prints "Command not
0000    265 ;               implemented".
0000    266 ;
0000    267 ;       53      Dave Butenhof, 09-Mar-1982, version 6.6
0000    268 ;               Change file parsing to accept subdirectories in standalone.
0000    269 ;
0000    270 ;       54      Dave Butenhof, 10-Mar-1982, version 6.6
0000    271 ;               Correct HELP parsing to accept 'H<CR>' as well as 'H '.
0000    272 ;
0000    273 ;       55      Jack Stansbury, 23-Mar-1982, Version 6.7
0000    274 ;               Added some macros (Br_If_Not_...) and took out some .LIST
0000    275 ;               statements.
0000    276 ;
0000    277 ;       56      Jack Stansbury, 10-Apr-1982, Version 6.7
0000    278 ;               Added support for running CRD-AutoTest on-line via the VSDP
0000    279 ;               CLI command.
0000    280 ;
0000    281 ;       57      Dave Butenhof, 13-Apr-1982, version 6.7
0000    282 ;               Add command to enable/disable generic name enforcement,
0000    283 ;               as backup. 'Set/Clear Enforce'
0000    284 ;
0000    285 ;       58      Jack Stansbury, 6-May-1982, Version 6.8
0000    286 ;               Added code in DS$Cli to not clear the ^C bit in the DS flags
0000    287 ;               longword if CRD-AutoTest was running. This is to allow ^C's
0000    288 ;               to be caught faster and easier by CRD.
0000    289 ;
0000    290 ;       59      Richard Brown, 19-May_82, Version 6.8
0000    291 ;               Addition of DEBUG command.  This involves placing the command
0000    292 ;               in the command line interpreter decision tree and adding an
0000    293 ;               action routine for the command.
0000    294 ;
0000    295 ;       60      Jack Stansbury, 24-May-1982, Version 6.8
0000    296 ;               Changed the "VSDP" command to "CRD".
0000    297 ;
0000    298 ;       61      Dave Butenhof, 25-May-1982, version 6.8
0000    299 ;               Restore poor SHOW MM command, which got kicked out by
0000    300 ;               SHOW MEMORY (note, however, that SHOW MEMORY did not
0000    301 ;               intend to do this, and should not be accused of bullying).
0000    302 ;
0000    303 ;       62      Richard Brown, 7-July-82, Version 6.8
0000    304 ;               Addition of /DEBUG qualifier to RUN and START commands.
0000    305 ;
0000    306 ;       63      Jack Stansbury, 15-July-1982, Version 6.9
0000    307 ;               Added code to call CRD Menu Test when the CRD command is typed.
```

```
0000    309 ;       64      Jack Stansbury, 24-July-1982, Version 6.9
0000    310 ;               Added code (commented out for now) that will check to see if the
0000    311 ;               CRD Menu Test command (CRD) is being called in user mode. If so,
0000    312 ;               it will print an error message. NOTE: this will have to be taken
0000    313 ;               out before the Supervisor is frozen for 6.9!!!!
0000    314 ;
0000    315 ;       65      Jack Stansbury, 8-September-1982, Version 6.9
0000    316 ;               Added three new commands: SET CRDTRACE, CLEAR CRDTRACE, and
0000    317 ;               SHOW CRDTRACE. These three all have to do with a new DSA bit
0000    318 ;               called DSA$V_CRD_Trace. This bit, when set, will cause the CRD
0000    319 ;               routines to print trace and debugging information for the user.
0000    320 ;
0000    321 ;       66      Jack Stansbury, 15-September-1982, Version 6.9
0000    322 ;               Added code in the ACT_CRD routine that clears the ^C handlers
0000    323 ;               and the ^C DS flag, and disable ^C's.
0000    324 ;
0000    325 ;       67      Jack Stansbury, 23-September-1982, Version 6.9
0000    326 ;               Changed the CRDTRACE qualifier to CRD/TRACE. The command are
0000    327 ;               now:
0000    328 ;               SET CRD/TRACE, CLEAR CRD/TRACE, and SHOW CRD.
0000    329 ;               Also changed the code
0000    330 ;               a bit at the activation of CRD - if CRD's initialization routine
0000    331 ;               returns failure, the DSR$Unload_CRD routine is now called.
0000    332 ;
0000    333 ;       68      Richard Brown, 27-Sep-82, Version 6.9
0000    334 ;               Changed default debugger name from DELTA to VDSDEBUG.
0000    335 ;
0000    336 ;       69      Jack Stansbury, March 3, 1983, Version 6.11
0000    337 ;               Added the SET CRD/DEBUG/TRACE command. This exact syntax
0000    338 ;               is required to minimize the number of people finding out
0000    339 ;               about and using this command. It turns on debugging mode in
0000    340 ;               CRD, and a LOT of output results!
0000    341 ;
0000    342 ;       70      Jack Stansbury, March 7, 1983, Version 6.11
0000    343 ;               Added the SHOW CALLS command. The routine is in the CRDImage
0000    344 ;               module.
0000    345 ;
0000    346 ;       71      Bob Bergazzi    28-March-1983   Version 6.11
0000    347 ;               Added the SET/SHOW PAGE command for video console terminals
0000    348 ;               in standalone mode. Routines are in PRINT.
0000    349 ;
0000    350 ;       72      John Ciukaj     4-April-1983    version 6.11
0000    351 ;               - Changed CRD Command Action routine (ACT_CRD) to
0000    352 ;                 allow online debugging of CRD AUTO Offline
0000    353 ;                 test package and offline initiation of
0000    354 ;                 CRD AUTO Offline by CRD Command.
0000    355 ;               - Changed references to CRD bits in DSA Flags to
0000    356 ;                 distinguish between online and offline.
0000    357 ;
0000    358 ;       73      Bob Bergazzi    8-Apr-1983      Version 6.11
0000    359 ;               Cleared Line_count when we put out a DS>, so that if we are SET
0000    360 ;               PAGEing, our first screen isn't wasted with stuff already seen.
0000    361 ;
0000    362 ;       74      Bob Bergazzi    May 16,1983     Version 6.11
0000    363 ;               Changed the order of the .LIB statements.
0000    364 ;
0000    365 ;       75      Bob Bergazzi    29-Aug-1983     Version 6.13
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                        0000   366 ;                Added the SET MEMORY command.
```

```
0000   368 ;        76      Bob Bergazzi    20-Sep-1983     Version 6.13
0000   369 ;                Added the /TIME switch to the RUN and START commands.
0000   370 ;                Commented out for release 13 and 14.
0000   371 ;
0000   372 ;        77      Bob Bergazzi    21-Oct-1983     Version 6.13
0000   373 ;                Added the INITPCS command.
0000   374 ;
0000   375 ;        78      Domenic Andella 8-Nov-83        Version 6.14
0000   376 ;                Added branches to tree at GET_FILE_SPEC, and
0000   377 ;                START_AND_RUN routines. These modifications
0000   378 ;                are to allow '$' and '_' to be included in the
0000   379 ;                directory, filename, and file type when using
0000   380 ;                a script filename, SET LOAD cmd, LOAD cmd, RUN,
0000   381 ;                and DIRECTORY cmd. These changes are necessary
0000   382 ;                for VDS to run under VMS V4.
0000   383 ;
0000   384 ;        79      RE MUSE         8 MAY 1984      Version 7.0
0000   385 ;                allow device names of the form 'node$ggan'
0000   386 ;
0000   387 ;        80      Bob Bergazzi    May 21, 1984    Version 7.0
0000   388 ;                Added /WIDE switch to the DIRECTORY command so
0000   389 ;                that filenames will be displayed one per line.
0000   390 ;                This fixes the problem of truncation of long filenames.
0000   391 ;
0000   392 ;        81      Ted Salem       Aug. 2, 1984    Version 7.1
0000   393 ;                Added SHOW TESTS command which will print the number
0000   394 ;                and title of each test of the current diag. program.
0000   395 ;
0000   396 ;        82      Ted Salem       Aug. 6, 1984    Version 7.1
0000   397 ;                Added /NOALLOCATE switch to the SELECT commmand so
0000   398 ;                that a device does not have to be allocated.
0000   399 ;
0000   400 ;        83      Jim Shelhamer   20 AUG 1984     Version 7.1
0000   401 ;                Corrected fuctioning of EXAMINE for address A or F by
0000   402 ;                eliminating a 'backup' of the input string.
0000   403 ;
0000   404 ;        84      M. Baggett      27-Sep-1984     Version 7.1
0000   405 ;                Temporary fix to allow CRD to run online.
0000   406 ;
0000   407 ;        85      Ron Parker      1-NOV-1984      Version 7.1
0000   408 ;                Changed GT_MENU ... message to elimate 11/730 reference
0000   409 ;
0000   410 ;        86      Ron Parker      6-NOV-1984
0000   411 ;                Cleaned up ACT_CRD routine and added Menutest_Online
0000   412 ;                function.
0000   413 ;
0000   414 ;        87      M. Baggett      14-Nov-1984
0000   415 ;                Allow generic name formats for form '$m$ggan'/.
0000   416 ;
0000   417 ;        88      Jim Shelhamer   21-Nov-1984     Version 8.0
0000   418 ;                Add Boot command for starting attached processor.
0000   419 ;                Only works for Scorpio, all others return error message.
0000   420 ;
0000   421 ;        89      Amy Iorio       29-Nov-1984     Version 8.0
0000   422 ;                Add SHOW ENFORCE command.
```

```
0000   424 ;        90      Bob Bergazzi    2-Jan-1985      Version 8.1
0000   425 ;                Fix conflict between SET PROMPT and SET PAGE.
0000   426 ;
0000   427 ;        91      Ted Salem       22-Jan-1985     Version 8.1
0000   428 ;                Fixed /noallocate bug.
0000   429 ;
0000   430 ;        92      Jim Shelhamer   Jan 30, 1985    Version 8.1
0000   431 ;                Modified Boot action routine to give error message in user-mode.
0000   432 ;                Also, added dispatch via CMK to CMK$APBOOT.
0000   433 ;
0000   434 ;        93      Jim Shelhamer   Feb 20, 1984    Version 8.1
0000   435 ;                Modified Boot action routine to save node id of Ap
0000   436 ;                to be booted.
0000   437 ;
0000   438 ;        94      M. Baggett      20-FEB-1985     Version 8.1
0000   439 ;                Added commands SET ULTRIX,SET ODS and change file parser
0000   440 ;                to recognize ULTRIX structure.
0000   441 ;
0000   442 ;        95      Bob Bergazzi    Feb. 26, 1985   Version 8.1
0000   443 ;                Enable edit [76] (/TIME).
0000   444 ;
0000   445 ;        96      Bob Bergazzi    Mar. 4, 1985    Version 8.1
0000   446 ;                Disable edit 95.
0000   447 ;
0000   448 ;        97      Ted Salem       Mar. 5, 1985    Version 8.1
0000   449 ;                Added DUMP command - for the NI only.
0000   450 ;
0000   451 ;        98      Bob Bergazzi    Mar. 12, 1985   Version 8.1
0000   452 ;                ACT_MMON does a MOVL into a byte field. Fix.
0000   453 ;
0000   454 ;        99      Domenic Andella 28-March-1985   Version 8.2
0000   455 ;                Add CLI 'next' flag to be set upon receipt
0000   456 ;                of NEXT command for use by MP.
0000   457 ;
0000   458 ;        100     Jim Shelhamer   Apr 10, 1985    Version 8.2
0000   459 ;                Moved saving of AP node number to after it has
0000   460 ;                been parsed.
0000   461 ;
0000   462 ;        101     Ted Salem       April 30, 1985  Version 8.2
0000   463 ;                Added SET CPU xxx command for MP systems.
0000   464 ;
0000   465 ;        102     M. Baggett      20-May-1985     Version 8.2
0000   466 ;                Correct ULTRIX load string spec.
0000   467 ;                Added ULTRIX flags for key commands.
0000   468 ;
0000   469 ;        103     Domenic Andella 22-May-1985     Version 8.2
0000   470 ;                Added clear mp condition flag in ACT_run,
0000   471 ;                start,next, and continue routines.
0000   472 ;
0000   473 ;        104     M. Baggett      23-May-1985     Version 8.2
0000   474 ;                Fixed ULTRIX parsing.
0000   475 ;
0000   476 ;        105     M. Baggett      29 -May-1985    Version 8.2
0000   477 ;                Fix bugs in RUN and START file parsing routines.
0000   478 ;
0000   479 ;        106     M. Baggett      4-Jun-1985      Version 8.3
0000   480 ;                Corrected ultrix parsing.
```

```
0000    481 ;
0000    482 ;       107     J. Baranski     21-Jun-1985     Version 8.3
0000    483 ;               Added /BASE and /NOBASE qualifiers to SET BREAKPOINTS,
0000    484 ;               CLEAR BREAKPOINTS, EXAMINE and DEPOSIT.
0000    485 ;
0000    486 ;       108     A. Iorio        18-July-1985    Version 8.3
0000    487 ;               Added SET ASK_PROMPT, CLEAR ASK_PROMPT, and ACT_ASK_PROMPT.
0000    488 ;
0000    489 ;       109     J. Baranski     26-Jun-1985     Version 8.3
0000    490 ;               General Comments & code Cleanup.
0000    491 ;
0000    492 ;       110     J. Baranski      1-Nov-1985     Version 9.1
0000    493 ;               Un Comment Out START/TIME.
0000    494 ;
0000    495 ;       111     Domenic Andella 15-Nov-1085     Version 9.2
0000    496 ;               Fixed some SET CPU bugs, modified ACT_CONTINUE to
0000    497 ;               prohibit printing of pc on an active mp system.
0000    498 ;
0000    499 ;       112     J. Baranski     21-Nov-1985     Version 9.1
0000    500 ;               Fix $DS_CLI CLI$K_FILE,... To accept $ and _.
0000    501 ;
0000    502 ;       113     Jim Shelhamer   Dec 5, 1985     Version 9.0
0000    503 ;               Fix parsing of Ultrix file specifiers.
0000    504 ;
0000    505 ;       114     Jim Shelhamer   Jan 13, 1986    Version 9.1
0000    506 ;               Remove saving of ap node number. It is now done
0000    507 ;               in APBOOT8200.
0000    508 ;
0000    509 ;       115     Bob Bergazzi    12-Feb-1986     Version 10.0            ;G:2
0000    510 ;               Added back the message about not running CRD online     ;G:2
0000    511 ;                                                                       ;G:3
0000    512 ;       116     Domenic Andella 20-Feb-1986     Version 10.0            ;G:3
0000    513 ;               Add SHOW CPU command to be used in concert with the     ;G:3
0000    514 ;               Set Cpu command to indicate which cpu's (primary or     ;G:3
0000    515 ;               KAn) gpr's or ipr's are to be referenced.               ;G:3
0000    516 ;                                                                       ;G:3
0000    517 ;       117     M. Baggett      11-March-1986   Version 10              ;G:4
0000    518 ;               Allow alpha value in ULTRIX partition field and         ;G:4
0000    519 ;               remove the SET ODS and SET ULTRIX command.              ;G:4
0000    520 ;                                                                       ;G:4
0000    521 ;       118     Domenic Andella 10-April-1986   Version 10              ;G:5
0000    522 ;               Fix some SHOW/SET CPU bugs, (1)-change kaaaa            ;G:5
0000    523 ;               to ka880, (2)-shorten mp$gt_device_name field,          ;G:5
0000    524 ;               and, (3)-reinit "primary" cpu in ACT_SETCPU.            ;G:5
0000    525 ;                                                                       ;G:5
0000    526 ;       119     Jim Shelhamer   14-Apr-1986     Version 10.0            ;G:6
0000    527 ;               Added check for AP on SET MEMORY command.               ;G:6
0000    528 ;                                                                       ;G:6
0000    529 ;       120     Bob Bergazzi    16-May-1986     Version 10.1            ;G:11
0000    530 ;               Added support for /TIME.                                ;G:11
0000    531 ;                                                                       ;G:14
0000    532 ;       121     Jim Baranski    21-May-1986     Version 10.1            ;G:14
0000    533 ;               Fix "SET LOAD []", and "EXAMINE A".                     ;G:14
0000    534 ;                                                                       ;G:16
0000    535 ;       122     I.Martin/S. Meier 14-July-1986  Version 10.2            ;G:16
0000    536 ;               In ACT_SHOWMM, replaced TSTB DS$GB_MM_ENB with          ;G:16
0000    537 ;               a TSTL IPR 38.                                          ;G:16
```

```
0000   538 ;                                                                                  ;G:16
0000   539 ;       123     Ingrid Martin   7-April-1987    Version 10.7                       ;G:26
0000   540 ;               Updates to allow KArrr to be attached CPU                          ;G:28
0000   541 ;                                                                                  ;G:27
0000   542 ;               Jason Mi        27-May-1987     Version 10.9                       ;G:27
0000   543 ;               Fixed bug in file directory specification.                         ;G:27
0000   544 ;                                                                                  ;G:28
0000   545 ;               Ingrid Martin   5-OCt-1987      Version 10.10                      ;G:28
0000   546 ;               KARRR is now KA884 (permenently).                                  ;G:28
0000   547 ;                                                                                  ;G:30
0000   548 ;               Stephen Meier   13-Jan-1988     Version 10.11                      ;G:30
0000   549 ;               Added Support for KA9CC in the SET CPU command.                    ;G:30
0000   550 ;--
```

```
                     0000    552          .SBTTL  Libraries, Macros, Equated Symbols
                     0000    553 ;
                     0000    554 ; INCLUDE FILES:
                     0000    555 ;
                     0000    556          .LIBRARY        /SYS$LIBRARY:LIB/       ;                       [40]  ;G:2
                     0000    557          .Library        /$CRD/                  ;                       [56]  ;G:2
                     0000    558          .LIBRARY        /$DS/                   ;                       [40]  ;G:2
                     0000    559          .LIBRARY        /$DIAG/                 ;                       [40]  ;G:2
                     0000    560 ;
                     0000    561 ; EXTERNAL ROUTINES
                     0000    562 ;
                     0000    563          .EXTRN          DUMP_SELF               ; [97]
                     0000    564          .WEAK           DUMP_SELF               ; [97]
                     0000    565
                     0000    566
                     0000    567          .WEAK   MP$GL_CONDITION_FLAGS           ; [103]
                     0000    568 ;
                     0000    569 ; MACROS:
                     0000    570 ;
                     0000    571 .MACRO  CASEDEF ACT, N
                     0000    572          $$N=$$N+1
                     0000    573          ACT     = N
                     0000    574          .WORD   ACT_'ACT - 10$
                     0000    575 .ENDM   CASEDEF
                     0000    576 ;
                     0000    577 ; EQUATED SYMBOLS:
                     0000    578 ;
00000001             0000    579 SS$_NORMAL = 1
                     0000    580
                     0000    581          $DS_CLIDEF                      ; CLI opcode defs
                     0000    582          $DS_HPODEF                      ; PTABLE offset defs.     [101]
                     0000            .SAVE   LOCAL_BLOCK
                     0000            .IIF    NB,HP$Q_DEVICE, HP$Q_DEVICE:
00000008             0000            .IIF    NB,.BLKQ,       .BLKQ   1
                     0008            .IIF    NB,HP$W_SIZE,   HP$W_SIZE:
0000000A             0008            .IIF    NB,.BLKW,       .BLKW   1
                     000A            .IIF    NB,HP$B_FLAGS,  HP$B_FLAGS:
0000000B             000A            .IIF    NB,.BLKB,       .BLKB   1
                     000B            .IIF    NB,HP$B_DRIVE,  HP$B_DRIVE:
0000000C             000B            .IIF    NB,.BLKB,       .BLKB   1
                     000C            .IIF    NB,HP$T_DEVICE, HP$T_DEVICE:
00000018             000C            .IIF    NB,.BLKB,       .BLKB   12
                     0018            .IIF    NB,HP$A_DEVICE, HP$A_DEVICE:
0000001C             0018            .IIF    NB,.BLKL,       .BLKL   1
                     001C            .IIF    NB,HP$A_DVA,    HP$A_DVA:
00000020             001C            .IIF    NB,.BLKL,       .BLKL   1
                     0020            .IIF    NB,HP$A_LINK,   HP$A_LINK:
00000024             0020            .IIF    NB,.BLKL,       .BLKL   1
                     0024            .IIF    NB,HP$W_VECTOR, HP$W_VECTOR:
00000026             0024            .IIF    NB,.BLKW,       .BLKW   1
                     0026            .IIF    NB,HP$T_TYPE,   HP$T_TYPE:
00000032             0026            .IIF    NB,.BLKB,       .BLKB   12
                     0032            .IIF    NB,HP$A_DEPENDENT,      HP$A_DEPENDENT:
                     0000            .RESTORE
                     0000    583          $DS_DSADEF                      ; APT mail box defs
                     0000    584          $DS_DSDEF                       ; Supervisor return codes
                     0000    585          CLIDEF                          ; CLI data structure
```

```
                        0000   586          DSFDEF                          ; Supervisor internal flags
                        0000   587          $IPLDEF                         ; IPL level defs
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000  FE70              .=0
                        0000                .RESTORE
                        0000   588          $PRDEF                          ; Processor register defs
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000  FE70              .=0
                        0000                .RESTORE
                        0000   589          $PSLDEF                         ; PSL field defs
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000  FE70              .=0
                        0000                .RESTORE
                        0000   590          $DS_TypeDef                     ; Define type codes                    [48]
                        0000   591          $CRD_Literals                   ; Define CRD equated symbols           [56]
                        0000   592          CMKDEF                          ; CMK dispatch codes                   [92]
                        0000   593          APDEF                           ; AP offsets in AP$GW_DATA             [93]
                        0000   594          $PR8SSDEF                       ; Scorpio defs                         [119
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000  FE70              .=0
                        0000                .RESTORE
                        0000   595
```

```
                                  0000          .SUBTITLE       Work Psect Storage
                                  0000  ;
                                  0000  ; OWN STORAGE:
                                  0000  ;
                              00000000          .PSECT  WORK, NOSHR, NOEXE, WRT, LONG
                                  0000
                                  0000  DS$GL_CLIBASE::
                      0000044C    0000          .BLKB   CLI$K_SIZE
                                  044C
                                  044C  Q_GOOD_CMD:                                ; The portion of the command line that  [43]
                      00000454    044C          .BLKQ   1                          ;   that is good. This is a descriptor. [43]
                                  0454
                                  0454  B_SUCCESS:                                 ; Used to store SUCCESS or FAILURE      [46]
                      00000455    0454          .BLKB   1                          ; for CLI subroutines                   [46]
                                  0455
                                  0455
                                  0455
          59 52 41 4D 49 52 50    0455  PRIMARY_NAME: .ASCII    \PRIMARY\          ; Used as an argument in set cpu command [10
                                  045C
             43 43 39 41 4B 00'   045C  KA9CC_CPU :   .ASCIC    \KA9CC\            ; Valid processor type to be attached [123]
                            05    045C
             34 38 38 41 4B 00'   0462  KA884_CPU :   .ASCIC    \KA884\            ; Valid processor type to be attached [123]
                            05    0462
             30 38 38 41 4B 00'   0468  KA880_CPU :   .ASCIC    \KA880\            ; Valid procssor type to be attached [118] ;
                            05    0468
             30 32 38 41 4B 00'   046E  KA820_CPU :   .ASCIC    \KA820\            ; Valid procssor type to be attached [111] ;
                            05    046E
                                  0474
                      00000000    0474  PTABLE: .LONG   0                          ; Storage for the address of a p-table [101]
                                  0478
                            00    0478  MP$GB_SETCPU :: .BYTE   0                  ; Set CPU flag                    [101] ;G:5
                                  0479
                      00000000    0479  MP$GL_LUN ::    .LONG   0                  ; Storage for Logical unit number [101] ;G:5
                                  047D
                            08    047D  MP$GT_DEVICE_NAME::     .byte  8           ;                                 [118] ;G:5
       20 59 52 41 4D 49 52 50    047E          .ASCII \PRIMARY \ ; Preload SHOW CPU to indicate primary [118]       ;G:5
                                  0486
```

```
                                    0486   631          .SUBTITLE       Data Psect Storage
                                    0486   632 ;
                                    0486   633 ; STRING STORAGE
                                    0486   634 ;
                                00000000   635          .PSECT  DATA, SHR, NOEXE, NOWRT, BYTE
                                    0000   636
                                    0000   637          MODNAM  CLI
                         49 4C 43 00'  0000       $MODULE:        .ASCIC  \CLI\
                                    03  0000
                                    0004   638
                                    0004   639          .SUBTITLE       Error & Status Messages Text
                                    0004   640
                                    0004   641 T_PRGERR:
6D 6D 61 72 67 6F 72 50 20 3F 3F 00'  0004   642          .ASCIC  "?? Programming error!!"                        ;[43
   21 21 72 6F 72 72 65 20 67 6E 69   0010
                                   16  0004
                                    001B   643
                                    001B   644 T_ILLCMD:
20 6C 61 67 65 6C 6C 49 20 3F 3F 00'  001B   645          .ASCIC  "?? Illegal command!/   \!AS\!/"               ;[43
20 20 20 2F 21 64 6E 61 6D 6D 6F 63   0027
              2F 21 5C 53 41 21 5C    0033
                                   1E  001B
                                    003A   646
                                    003A   647 T_INCOMPLETE:
65 6C 70 6D 6F 63 6E 49 20 3F 3F 00'  003A   648          .ASCIC  "?? Incomplete command line!/   \!AS\!/"        ;[43
6C 20 64 6E 61 6D 6D 6F 63 20 65 74   0046
53 41 21 5C 20 20 20 2F 21 65 6E 69   0052
                        2F 21 5C      005E
                                   26  003A
                                    0061   649
                                    0061   650 T_ILLEFN:                                                        ;[45
20 6C 61 67 65 6C 6C 49 20 3F 3F 00'  0061   651          .ASCIC  "?? Illegal event flag number. Must be 1 to 23.!/"  ;[45
6E 20 67 61 6C 66 20 74 6E 65 76 65   006D
20 74 73 75 4D 20 2E 72 65 62 6D 75   0079
21 2E 33 32 20 6F 74 20 31 20 65 62   0085
                                   2F  0091
                                   30  0061
                                    0092   652
                                    0092   653 T_CONT:
69 75 6E 69 74 6E 6F 43 20 2E 2E 00'  0092   654          .ASCIC  ".. Continuing from !XL!/"                      ;[43
21 4C 58 21 20 6D 6F 72 66 20 67 6E   009E
                                   2F  00AA
                                   18  0092
                                    00AB   655
                                    00AB   656 T_MP_CONT:
75 6E 69 74 6E 6F 43 20 2E 2E 2E 00'  00AB   657          .ASCIC  "... Continuing !/"                             ;[11
                  2F 21 20 67 6E 69   00B7
                                   11  00AB
                                    00BD   658
                                    00BD   659 T_EMESSG1::
20 64 6E 61 6D 6D 6F 43 20 3F 3F 00'  00BD   660          .ASCIC "?? Command not valid in user mode !/"           ;[43
6E 69 20 64 69 6C 61 76 20 74 6F 6E   00C9
21 20 65 64 6F 6D 20 72 65 73 75 20   00D5
                                   2F  00E1
                                   24  00BD
                                    00E2   661
                                    00E2   662 T_EMESSG2:
```

```
20 64 6E 61 6D 6D 6F 43 20 3F 3F 00'  00E2   663          .ASCIC "?? Command only valid when running VDS Via NI !/"                ;[97
77 20 64 69 6C 61 76 20 79 6C 6E 6F   00EE
20 67 6E 69 6E 6E 75 72 20 6E 65 68   00FA
21 20 49 4E 20 61 69 56 20 53 44 56   0106
                                 2F   0112
                                 30   00E2
                                      0113   664
                                      0113   665 T_EMESSG3:
21 20 65 63 69 76 65 44 20 3F 3F 00'  0113   666          .ASCIC "?? Device !AS is not attached or diagnostic has not been started. !/
74 61 20 74 6F 6E 20 73 69 20 53 41   011F
69 64 20 72 6F 20 64 65 68 63 61 74   012B
73 61 68 20 63 69 74 73 6F 6E 67 61   0137
74 73 20 6E 65 65 62 20 74 6F 6E 20   0143
20 20 20 2F 21 20 2E 64 65 74 72 61   014F
69 76 65 64 20 68 63 61 74 74 41 20   015B
20 74 72 61 74 73 20 72 6F 20 65 63   0167
20 2E 63 69 74 73 6F 6E 67 61 69 64   0173
                           2F 21      017F
                              6D      0113
                                      0181   667                  "   Attach device or start diagnostic. !/"                  ;[10
                                      0181   668
                                      0181   669 T_EMESSG4:
74 20 65 63 69 76 65 44 20 3F 3F 00'  0181   670          .ASCIC "?? Device type must be !AC, !AC, !AC, or !AC. !/"
20 65 62 20 74 73 75 6D 20 65 70 79   018D
41 21 20 2C 43 41 21 20 2C 43 41 21   0199
21 20 2E 43 41 21 20 72 6F 20 2C 43   01A5
                                 2F   01B1
                                 30   0181
                                      01B2   671
                                      01B2   672 T_EMESSG5:                                                    ;[119] ;G:6
20 64 6E 61 6D 6D 6F 43 20 3F 3F 00'  01B2   673          .ASCIC "?? Command not valid from AP. !/"                ;[119] ;G:6
72 66 20 64 69 6C 61 76 20 74 6F 6E   01BE
         2F 21 20 2E 50 41 20 6D 6F   01CA
                                 20   01B2
                                      01D3   674                                                                ;G:6
                                      01D3   675 T_SHOWMM:
61 6E 61 6D 20 79 72 6F 6D 65 4D 00'  01D3   676          .ASCIC  "Memory management is !AC.!/"                      ;[43
41 21 20 73 69 20 74 6E 65 6D 65 67   01DF
                        2F 21 2E 43   01EB
                              1B      01D3
                                      01EF   677
                                      01EF   678 T_ON:
                           6E 6F 00'  01EF   679          .ASCIC  "on"                                               ;[43
                                 02   01EF
                                      01F2   680
                                      01F2   681 T_OFF:
                        66 66 6F 00'  01F2   682          .ASCIC  "off"                                              ;[43
                                 03   01F2
                                      01F6   683
                                      01F6   684 GT_Menu_Error::                                                 ; [67]
6E 69 20 72 6F 72 72 45 20 3F 3F 00'  01F6   685          .Ascic  "?? Error in starting the CRD MENU TEST!!!/"       ;       [85]
68 74 20 67 6E 69 74 72 61 74 73 20   0202
54 20 55 4E 45 4D 20 44 52 43 20 65   020E
            2F 21 21 21 54 53 45      021A
                                 2A   01F6
                                      0221   686
                                      0221   687 T_User_Mode_Menu_Error:                                          ; [115] ;G:2
```

```
6E 6E 61 63 20 75 6F 59 20 3F 3F 00'  0221    688          .Ascic  "?? You cannot run VAX-11/730 CRD MENU TEST in user mode!/"   ;G:2
31 2D 58 41 56 20 6E 75 72 20 74 6F   022D
45 4D 20 44 52 43 20 30 33 37 2F 31   0239
75 20 6E 69 20 54 53 45 54 20 55 4E   0245
       2F 21 65 64 6F 6D 20 72 65 73  0251
                                 39   0221
                                      025B    689                                                                  ;G:2
                                      025B    690 T_CRD_Trace_Output:                                              ; [65]
61 72 54 20 44 52 43 20 65 68 54 00'  025B    691          .Ascic  "The CRD Trace flag is !AC.!/"                  ; [65]
21 20 73 69 20 67 61 6C 66 20 65 63   0267
                     2F 21 2E 43 41   0273
                                 1C   025B
                                      0278    692
                                      0278    693 T_ShowEnforce:                                   ; [89]
65 63 72 6F 66 6E 65 20 65 68 54 00'  0278    694          .Ascic  "The enforce flag is !AC.!/"    ; [89]
43 41 21 20 73 69 20 67 61 6C 66 20   0284
                           2F 21 2E   0290
                                 1A   0278
                                      0293    695                                                                  ;G:3
                                      0293    696 T_SHOWCPU:                                       ;[116]          ;G:3
21 74 65 73 20 73 69 20 43 41 21 00'  0293    697          .ASCIC  "!AC is set!/"                  ;[116]          ;G:3
                                 2F   029F
                                 0C   0293
                                      02A0    698                                                                  ;G:3
```

```
                        02A0    700          .SUBTITLE COMMANDS A-C
                        02A0    701 ;+
                        02A0    702 ; Command line interpretor decision tree.
                        02A0    703 ;-
                        02A0    704
                        02A0    705 ;
                        02A0    706 ; Basic commands.
                        02A0    707 ;
                        02A0    708 COMMAND_TREE::
                        02A0    709          $DS_CLI CLI$K_SPACE,    0,      100$                    ; Optional <SP>'s
                  00 84 02A0                 .BYTE   CLI$K_SPACE,0
                   0004' 02A2                .WORD   100$-<.-2>
                        02A4    710
                        02A4    711 100$:    $DS_CLI <^A"A">,        NOTNUF, 115$                    ; A             [88]
                  18'41 02A4                 .BYTE   ^A"A",NOTNUF
                   001F' 02A6                .WORD   115$-<.-2>
                        02A8    712 ;
                        02A8    713 ; ABort
                        02A8    714 ;
                        02A8    715          $DS_CLI CLI$K_STRING,   ABORT,  110$,   <'BORT'>        ; ABORT
                  06'8B 02A8                 .BYTE   CLI$K_STRING,ABORT
                   000D' 02AA                .WORD   110$-<.-2>
            54 52 4F 42 00' 02AC            .ASCIC  'BORT'
                      04 02AC
                        02B1    716          $DS_CLI CLI$K_BR,       ENUF,   EOL
                  17'82 02B1                 .BYTE   CLI$K_BR,ENUF
                   0209' 02B3                .WORD   EOL-<.-2>
                        02B5    717 ;
                        02B5    718 ; ATtach<not parsed by CLI>
                        02B5    719 ;
                        02B5    720 110$:    $DS_CLI CLI$K_STRING,   ATTACH, ILLEGAL,<'TTACH'>       ; ATTACH
                  07'8B 02B5                 .BYTE   CLI$K_STRING,ATTACH
                   021D' 02B7                .WORD   ILLEGAL-<.-2>
         48 43 41 54 54 00' 02B9            .ASCIC  'TTACH'
                      05 02B9
                        02BF    721          $DS_CLI CLI$K_EXIT,     ENUF                            ; Enough input gotte
                  17'81 02BF                 .BYTE   CLI$K_EXIT,ENUF
                   0004' 02C1                .WORD   30005$-<.-2>
                        02C3        30005$:
                        02C3    722 ;
                        02C3    723 ;
                        02C3    724 ; Boot  num_node
                        02C3    725 ;
                        02C3    726 115$:    $DS_CLI CLI$K_STRING,   BOOT,   120$,   <'BOOT'>        ; BOOT          [88]
                  08'8B 02C3                 .BYTE   CLI$K_STRING,BOOT
                   0015' 02C5                .WORD   120$-<.-2>
            54 4F 4F 42 00' 02C7            .ASCIC  'BOOT'
                      04 02C7
                        02CC    727          $DS_CLI CLI$K_SPACE,    NOTNUF, ILLEGAL                 ; Need more     [88]
                  18'84 02CC                 .BYTE   CLI$K_SPACE,NOTNUF
                   0206' 02CE                .WORD   ILLEGAL-<.-2>
                        02D0    728          $DS_CLI CLI$K_NUM,      DATA,   ILLEGAL                 ; Get node number [8
                  66'85 02D0                 .BYTE   CLI$K_NUM,DATA
                   0202' 02D2                .WORD   ILLEGAL-<.-2>
                        02D4    729          $DS_CLI CLI$K_BR,       ENUF,   EOL                     ;               [88]
                  17'82 02D4                 .BYTE   CLI$K_BR,ENUF
                   01E6' 02D6                .WORD   EOL-<.-2>
```

```
                        02D8    730 ;
                        02D8    731 ;+
                        02D8    732 ;       The Commands Starting with C:
                        02D8    733 ;                                                                       [65]
                        02D8    734 ;       CLear                                                           [65]
                        02D8    735 ;       COntinue                                                        [65]
                        02D8    736 ;       CRd                                                             [65]
                        02D8    737 ;-
                        02D8    738 120$:   $DS_CLI <^A"C">,        NOTNUF, 140$                    ; C
              18'43     02D8                .BYTE   ^A"C",NOTNUF
               002C'    02DA                .WORD   140$-<.-2>
                        02DC    739 ;
                        02DC    740 ; CLear...
                        02DC    741 ;
                        02DC    742         $DS_CLI CLI$K_STRING,   CLEAR,  130$,   <'LEAR'>        ; CLEAR
              09'8B     02DC                .BYTE   CLI$K_STRING,CLEAR
               000D'    02DE                .WORD   130$-<.-2>
        52 41 45 4C 00' 02E0                .ASCIC  'LEAR'
                  04    02E0
                        02E5    743         $DS_CLI CLI$K_BR,       NOTNUF, CLEAR_PARAMS            ; Get rest of line
              18'82     02E5                .BYTE   CLI$K_BR,NOTNUF
               099E'    02E7                .WORD   CLEAR_PARAMS-<.-2>
                        02E9    744 ;
                        02E9    745 ; COntinue
                        02E9    746 ;
                        02E9    747 130$:   $DS_CLI CLI$K_STRING,   CONTINUE,135$,<'ONTINUE'>       ; CONTINUE      [60]
              0A'8B     02E9                .BYTE   CLI$K_STRING,CONTINUE
               0010'    02EB                .WORD   135$-<.-2>
     45 55 4E 49 54 4E 4F 00' 02ED          .ASCIC  'ONTINUE'
                  07    02ED
                        02F5    748         $DS_CLI CLI$K_BR,       ENUF,   EOL
              17'82     02F5                .BYTE   CLI$K_BR,ENUF
               01C5'    02F7                .WORD   EOL-<.-2>
                        02F9    749 ;                                                                       [60]
                        02F9    750 ; CRd                                                                   [60]
                        02F9    751 ;                                                                       [60]
                        02F9    752 135$:   $DS_Cli CLI$K_String,   CRD,    Illegal,<'RD'>          ; CRD           [65]
              27'8B     02F9                .BYTE   CLI$K_String,CRD
               01D9'    02FB                .WORD   Illegal-<.-2>
           44 52 00'    02FD                .ASCIC  'RD'
                  02    02FD
                        0300    753         $DS_Cli CLI$K_BR,       ENUF,   EOL                     ; Must be EOL   [65]
              17'82     0300                .BYTE   CLI$K_BR,ENUF
               01BA'    0302                .WORD   EOL-<.-2>
```

```
                                0304   755          .SUBTITLE       DIRECTORY, DEATTACH, DESELECT
                                0304   756 ;
                                0304   757 ;        The Commands Starting with D:
                                0304   758 ;
                                0304   759 ;        Deposit
                                0304   760 ;        DIrectory
                                0304   761 ;        DEAttach                                                        [48]
                                0304   762 ;        DEBug                                                           [59]
                                0304   763 ;        DESelect
                                0304   764 ;        DUmp
                                0304   765 ;
                                0304   766 140$:    $DS_CLI <^A"D">,      NOTNUF,   200$                    ; D
                        18'44   0304                        .BYTE   ^A"D",NOTNUF
                         00AA'  0306                        .WORD   200$-<.-2>
                                0308   767 ;
                                0308   768 ; DIrectory[ / Wide]  <get_file_spec>
                                0308   769 ;
                                0308   770          $DS_CLI CLI$K_STRING,   DIRECTORY,150$, <'IRECTORY'>    ; DIRECTORY
                        10'8B   0308                        .BYTE   CLI$K_STRING,DIRECTORY
                         0026'  030A                        .WORD   150$-<.-2>
     59 52 4F 54 43 45 52 49 00'  030C                        .ASCIC  'IRECTORY'
                           08   030C
                                0315   771          $DS_CLI CLI$K_SLASH,    NOTNUF, 145$                    ; /             [80]
                        18'90   0315                        .BYTE   CLI$K_SLASH,NOTNUF
                         000D'  0317                        .WORD   145$-<.-2>
                                0319   772          $DS_CLI CLI$K_STRING,   DIR_WIDE,BAD_QUAL,<'WIDE'>      ; /WIDE         [80]
                        8C'8B   0319                        .BYTE   CLI$K_STRING,DIR_WIDE
                         01ED'  031B                        .WORD   BAD_QUAL-<.-2>
                 45 44 49 57 00'  031D                        .ASCIC  'WIDE'
                           04   031D
                                0322   773 145$:    $DS_CLI CLI$K_SPACE,    0,      EOL                     ; If not <SP>'s, EOL
                        00 84   0322                        .BYTE   CLI$K_SPACE,0
                         0198'  0324                        .WORD   EOL-<.-2>
                                0326   774          $DS_CLI CLI$K_CALL,     OPTIONAL,GET_FILE_SPEC          ; Optional file-spec
                        2A'92   0326                        .BYTE   CLI$K_CALL,OPTIONAL
                         0333'  0328                        .WORD   GET_FILE_SPEC-<.-2>
                                032A   775          $DS_CLI CLI$K_BR,       ENUF,   EOL                     ; Done with command
                        17'82   032A                        .BYTE   CLI$K_BR,ENUF
                         0190'  032C                        .WORD   EOL-<.-2>
                                032E   776 ;
                                032E   777 ; DUmp[  num_node]
                                032E   778 ;
                                032E   779 150$:    $DS_CLI CLI$K_STRING,   DUMP,   160$,   <'UMP'>         ; DUMP          [97]
                        11'8B   032E                        .BYTE   CLI$K_STRING,DUMP
                         001C'  0330                        .WORD   160$-<.-2>
                 50 4D 55 00'   0332                        .ASCIC  'UMP'
                           03   0332
                                0336   780          $DS_CLI CLI$K_SPACE,    0,      155$                    ; Optional:     [97]
                        00 84   0336                        .BYTE   CLI$K_SPACE,0
                         000C'  0338                        .WORD   155$-<.-2>
                                033A   781          $DS_CLI CLI$K_NUM,      DATA,   ILLEGAL                 ;
                        66'85   033A                        .BYTE   CLI$K_NUM,DATA
                         0198'  033C                        .WORD   ILLEGAL-<.-2>
                                033E   782          $DS_CLI CLI$K_BR,       ENUF,   EOL                     ;
                        17'82   033E                        .BYTE   CLI$K_BR,ENUF
                         017C'  0340                        .WORD   EOL-<.-2>
                                0342   783 155$:    $DS_CLI CLI$K_NUM,      NULL_DATA,EOL                   ; More  ?       [97]
```

```
                     67'85  0342                        .BYTE   CLI$K_NUM,NULL_DATA
                      0178' 0344                        .WORD   EOL-<.-2>
                            0346   784          $DS_CLI CLI$K_BR,       ENUF,   EOL                     ;                       [97]
                     17'82  0346                        .BYTE   CLI$K_BR,ENUF
                      0174' 0348                        .WORD   EOL-<.-2>
                            034A   785
                            034A   786 160$:    $DS_CLI <^A"E">,        0,      191$                    ; DE
                     00 45  034A                        .BYTE   ^A"E",0
                      0044' 034C                        .WORD   191$-<.-2>
                            034E   787 ;
                            034E   788 ; DEAttach...
                            034E   789 ;
                            034E   790          $DS_CLI CLI$K_STRING,   DEATTACH,170$,  <'ATTACH'>      ; DEATTACH      [48]
                     0B'8B  034E                        .BYTE   CLI$K_STRING,DEATTACH
                      000F' 0350                        .WORD   170$-<.-2>
          48 43 41 54 54 41 00' 0352                    .ASCIC  'ATTACH'
                        06  0352
                            0359   791          $DS_CLI CLI$K_BR,       NOTNUF, DEATTACH_PARAMS         ; Get params    [48]
                     18'82  0359                        .BYTE   CLI$K_BR,NOTNUF
                      0653' 035B                        .WORD   DEATTACH_PARAMS-<.-2>
                            035D   792 ;                                                               [59]
                            035D   793 ; DEBug[=<file_spec>]                                           [59]
                            035D   794 ;
                            035D   795 170$:    $DS_CLI CLI$K_STRING,   DEBUG,  180$,   <'BUG'>         ; DEBUG         [59]
                     0C'8B  035D                        .BYTE   CLI$K_STRING,DEBUG
                      0018' 035F                        .WORD   180$-<.-2>
                47 55 42 00' 0361                       .ASCIC  'BUG'
                        03  0361
                            0365   796          $DS_CLI <^A/=/>,        0,      175$                    ; IF NOT '=', EOL[59
                     00 3D  0365                        .BYTE   ^A/=/,0
                      000C' 0367                        .WORD   175$-<.-2>
                            0369   797          $DS_CLI CLI$K_CALL,     OPTIONAL,GET_FILE_SPEC          ; OPT. FILENAME [59]
                     2A'92  0369                        .BYTE   CLI$K_CALL,OPTIONAL
                      02F0' 036B                        .WORD   GET_FILE_SPEC-<.-2>
                            036D   798          $DS_CLI CLI$K_BR,       ENUF,   EOL                     ; Done with Command
                     17'82  036D                        .BYTE   CLI$K_BR,ENUF
                      014D' 036F                        .WORD   EOL-<.-2>
                            0371   799 175$:    $DS_CLI CLI$K_BR,       DEFAULT_DBG,EOL                 ; USE DEFLT NAME[59]
                     0E'82  0371                        .BYTE   CLI$K_BR,DEFAULT_DBG
                      0149' 0373                        .WORD   EOL-<.-2>
                            0375   800 ;
                            0375   801 ; DESelect...
                            0375   802 ;
                            0375   803 180$:    $DS_CLI CLI$K_STRING,   DESELECT,190$,  <'SELECT'>      ; DESELECT
                     7A'8B  0375                        .BYTE   CLI$K_STRING,DESELECT
                      000F' 0377                        .WORD   190$-<.-2>
    54 43 45 4C 45 53 00' 0379                          .ASCIC  'SELECT'
                        06  0379
                            0380   804          $DS_CLI CLI$K_BR,       NOTNUF, DESELECT_PARAMS         ; Get qualifiers
                     18'82  0380                        .BYTE   CLI$K_BR,NOTNUF
                      0674' 0382                        .WORD   DESELECT_PARAMS-<.-2>
```

```
                        0384   806          .SUBTITLE       DEPOSIT, EXIT, EXAMINE
                        0384   807
                        0384   808 ; Deposit<qualifiers>  address<qualifiers>  data<qualifiers>
                        0384   809 ;
                        0384   810 190$:   $DS_CLI CLI$K_STRING,   0,      191$,   <'POSIT'>       ; DEPOSIT
                     00 8B  0384                  .BYTE   CLI$K_STRING,0
                      000A' 0386                  .WORD   191$-<.-2>
           54 49 53 4F 50 00' 0388                  .ASCIC  'POSIT'
                        05  0388
                        038E   811 191$:   $DS_CLI CLI$K_CALL,     DEPOSIT,EXA_DEP_QUALS          ; Get Qualifiers
                     0F'92  038E                  .BYTE   CLI$K_CALL,DEPOSIT
                      056E' 0390                  .WORD   EXA_DEP_QUALS-<.-2>
                        0392   812          $DS_CLI CLI$K_SPACE,    0,      ILLEGAL                 ; Required Space
                     00 84  0392                  .BYTE   CLI$K_SPACE,0
                      0140' 0394                  .WORD   ILLEGAL-<.-2>
                        0396   813          $DS_CLI CLI$K_CALL,     0,      GET_ADDRESS             ; Get Address
                     00 92  0396                  .BYTE   CLI$K_CALL,0
                      03E7' 0398                  .WORD   GET_ADDRESS-<.-2>
                        039A   814          $DS_CLI CLI$K_CALL,     0,      EXA_DEP_QUALS           ; Get Qualifiers
                     00 92  039A                  .BYTE   CLI$K_CALL,0
                      0562' 039C                  .WORD   EXA_DEP_QUALS-<.-2>
                        039E   815          $DS_CLI CLI$K_SPACE,    0,      ILLEGAL                 ; Required Space
                     00 84  039E                  .BYTE   CLI$K_SPACE,0
                      0134' 03A0                  .WORD   ILLEGAL-<.-2>
                        03A2   816          $DS_CLI CLI$K_NUM,      DATA,   ILLEGAL                 ; Get Data
                     66'85  03A2                  .BYTE   CLI$K_NUM,DATA
                      0130' 03A4                  .WORD   ILLEGAL-<.-2>
                        03A6   817          $DS_CLI CLI$K_CALL,     0,      EXA_DEP_QUALS           ; Get Qualifiers
                     00 92  03A6                  .BYTE   CLI$K_CALL,0
                      0556' 03A8                  .WORD   EXA_DEP_QUALS-<.-2>
                        03AA   818          $DS_CLI CLI$K_BR,       0,      EOL                     ; End Of Line
                     00 82  03AA                  .BYTE   CLI$K_BR,0
                      0110' 03AC                  .WORD   EOL-<.-2>
                        03AE   819 ;
                        03AE   820 ;        The Commands Starting with E:
                        03AE   821 ;
                        03AE   822 ;        Examine
                        03AE   823 ;        EXIt
                        03AE   824 ;
                        03AE   825 200$:   $DS_CLI <^A"E">,         NOTNUF, 235$                    ; E
                     18'45  03AE                  .BYTE   ^A"E",NOTNUF
                      0031' 03B0                  .WORD   235$-<.-2>
                        03B2   826          $DS_CLI <^A"X">,         NOTNUF, 220$                    ; EX
                     18'58  03B2                  .BYTE   ^A"X",NOTNUF
                      000F' 03B4                  .WORD   220$-<.-2>
                        03B6   827
                        03B6   828 ;
                        03B6   829 ; EXIt
                        03B6   830 ;
                        03B6   831          $DS_CLI CLI$K_STRING,   EXIT,   220$,   <'IT'>          ; EXIT
                     13'8B  03B6                  .BYTE   CLI$K_STRING,EXIT
                      000B' 03B8                  .WORD   220$-<.-2>
                  54 49 00' 03BA                  .ASCIC  'IT'
                        02  03BA
                        03BD   832          $DS_CLI CLI$K_BR,       ENUF,   EOL                     ; EXIT <EOL>
                     17'82  03BD                  .BYTE   CLI$K_BR,ENUF
                      00FD' 03BF                  .WORD   EOL-<.-2>
```

```
                         03C1    833 ;
                         03C1    834 ; Examine<qualifiers>  num_address<qualifiers>
                         03C1    835 ;
                         03C1    836 220$:   $DS_CLI CLI$K_STRING,   0,      230$,   <'AMINE'>       ; EXAMINE
                   00 8B 03C1                        .BYTE   CLI$K_STRING,0
                    000A' 03C3                       .WORD   230$-<.-2>
          45 4E 49 4D 41 00' 03C5                    .ASCIC  'AMINE'
                      05  03C5
                         03CB    837 230$:   $DS_CLI CLI$K_CALL,     EXAMINE,EXA_DEP_QUALS
                 12'92  03CB                        .BYTE   CLI$K_CALL,EXAMINE
                  0531' 03CD                        .WORD   EXA_DEP_QUALS-<.-2>
                         03CF    838         $DS_CLI CLI$K_SPACE,    0,      ILLEGAL                 ; Required Space
                 00 84  03CF                        .BYTE   CLI$K_SPACE,0
                  0103' 03D1                        .WORD   ILLEGAL-<.-2>
                         03D3    839         $DS_CLI CLI$K_CALL,     0,      GET_ADDRESS
                 00 92  03D3                        .BYTE   CLI$K_CALL,0
                  03AA' 03D5                        .WORD   GET_ADDRESS-<.-2>
                         03D7    840         $DS_CLI CLI$K_CALL,     0,      EXA_DEP_QUALS
                 00 92  03D7                        .BYTE   CLI$K_CALL,0
                  0525' 03D9                        .WORD   EXA_DEP_QUALS-<.-2>
                         03DB    841         $DS_CLI CLI$K_BR,       0,      EOL                     ; End Of Line
                 00 82  03DB                        .BYTE   CLI$K_BR,0
                  00DF' 03DD                        .WORD   EOL-<.-2>
```

```
                        03DF    843          .SUBTITLE LOAD, NEXT, RUN, HELP, INITPCS
                        03DF    844 ;
                        03DF    845 ; Help<not_parsed_by_cli>
                        03DF    846 ;
                        03DF    847 235$:   $DS_CLI CLI$K_STRING,   HELP,   240$,   <'HELP'>        ; HELP
              14'8B     03DF                        .BYTE   CLI$K_STRING,HELP
               0019'    03E1                        .WORD   240$-<.-2>
50 4C 45 48 00'         03E3                        .ASCIC  'HELP'
                  04    03E3
                        03E8    848          $DS_CLI CLI$K_EOL,      0,      237$                    ; 'H<CR>'
              00 91     03E8                        .BYTE   CLI$K_EOL,0
               0008'    03EA                        .WORD   237$-<.-2>
                        03EC    849          $DS_CLI CLI$K_EXIT,     ENUF                            ;
              17'81     03EC                        .BYTE   CLI$K_EXIT,ENUF
               0004'    03EE                        .WORD   30061$-<.-2>
                        03F0        30061$:
                        03F0    850 237$:   $DS_CLI CLI$K_SPACE,    HELP,   ILLEGAL                 ; Required space(s)
              14'84     03F0                        .BYTE   CLI$K_SPACE,HELP
               00E2'    03F2                        .WORD   ILLEGAL-<.-2>
                        03F4    851          $DS_CLI CLI$K_EXIT,     ENUF                            ; Enough input gotte
              17'81     03F4                        .BYTE   CLI$K_EXIT,ENUF
               0004'    03F6                        .WORD   30063$-<.-2>
                        03F8        30063$:
                        03F8    852 ;
                        03F8    853 ; Initpcs                                                       begi
                        03F8    854 ;
                        03F8    855 240$:   $DS_CLI CLI$K_STRING,   INITPCS,245$,   <'INITPCS'>     ; INITPCS
              8B'8B     03F8                        .BYTE   CLI$K_STRING,INITPCS
               0010'    03FA                        .WORD   245$-<.-2>
53 43 50 54 49 4E 49 00' 03FC                       .ASCIC  'INITPCS'
                  07    03FC
                        0404    856          $DS_CLI CLI$K_BR,       ENUF,   EOL                     ;                   end
              17'82     0404                        .BYTE   CLI$K_BR,ENUF
               00B6'    0406                        .WORD   EOL-<.-2>
                        0408    857 ;
                        0408    858 ; Load  <file_spec>
                        0408    859 ;
                        0408    860 245$:   $DS_CLI CLI$K_STRING,   LOAD,   250$,   <'LOAD'>        ; LOAD
              15'8B     0408                        .BYTE   CLI$K_STRING,LOAD
               0015'    040A                        .WORD   250$-<.-2>
         44 41 4F 4C 00' 040C                       .ASCIC  'LOAD'
                  04    040C
                        0411    861          $DS_CLI CLI$K_SPACE,    NOTNUF, ILLEGAL                 ; <SP>'s req.
              18'84     0411                        .BYTE   CLI$K_SPACE,NOTNUF
               00C1'    0413                        .WORD   ILLEGAL-<.-2>
                        0415    862          $DS_CLI CLI$K_CALL,     REQUIRED,GET_FILE_SPEC          ; File-spec required
              2B'92     0415                        .BYTE   CLI$K_CALL,REQUIRED
               0244'    0417                        .WORD   GET_FILE_SPEC-<.-2>
                        0419    863          $DS_CLI CLI$K_BR,       ENUF,   EOL
              17'82     0419                        .BYTE   CLI$K_BR,ENUF
               00A1'    041B                        .WORD   EOL-<.-2>
                        041D    864 ;
                        041D    865 ; Next[  <dec_mnumber>]
                        041D    866 ;
                        041D    867 250$:   $DS_CLI CLI$K_STRING,   NEXT_INST,260$, <'NEXT'>        ; NEXT
              16'8B     041D                        .BYTE   CLI$K_STRING,NEXT_INST
               0015'    041F                        .WORD   260$-<.-2>
```

```
                54 58 45 4E 00' 0421                    .ASCIC  'NEXT'
                      04  0421
                          0426   868        $DS_CLI CLI$K_SPACE,    0,      EOL
                    00 84  0426                       .BYTE   CLI$K_SPACE,0
                     0094' 0428                       .WORD   EOL-<.-2>
                          042A   869        $DS_CLI CLI$K_DEC,      DATA,   ILLEGAL                 ; If not dec., ILLEG
                    66'8A  042A                       .BYTE   CLI$K_DEC,DATA
                     00A8' 042C                       .WORD   ILLEGAL-<.-2>
                          042E   870        $DS_CLI CLI$K_BR,       ENUF,   EOL
                    17'82  042E                       .BYTE   CLI$K_BR,ENUF
                     008C' 0430                       .WORD   EOL-<.-2>
                          0432   871 ;
                          0432   872 ; Run[<qualifiers>]  <file_spec>[<qualifiers>]
                          0432   873 ;
                          0432   874 260$:   $DS_CLI CLI$K_STRING,   RUN,    270$,   <'RUN'>         ; RUN
                    19'8B  0432                       .BYTE   CLI$K_STRING,RUN
                     001C' 0434                       .WORD   270$-<.-2>
                4E 55 52 00' 0436                       .ASCIC  'RUN'
                      03  0436
                          043A   875        $DS_CLI CLI$K_CALL,     0,      START_RUN_QUALS         ; Read Qaulifiers
                    00 92  043A                       .BYTE   CLI$K_CALL,0
                     039E' 043C                       .WORD   START_RUN_QUALS-<.-2>
                          043E   876        $DS_CLI CLI$K_SPACE,    0,      ILLEGAL                 ; Required spaces.
                    00 84  043E                       .BYTE   CLI$K_SPACE,0
                     0094' 0440                       .WORD   ILLEGAL-<.-2>
                          0442   877        $DS_CLI CLI$K_CALL,     0,      GET_FILE_SPEC           ; Read File Specific
                    00 92  0442                       .BYTE   CLI$K_CALL,0
                     0217' 0444                       .WORD   GET_FILE_SPEC-<.-2>
                          0446   878        $DS_CLI CLI$K_CALL,     0,      START_RUN_QUALS         ; Read Qualifiers
                    00 92  0446                       .BYTE   CLI$K_CALL,0
                     0392' 0448                       .WORD   START_RUN_QUALS-<.-2>
                          044A   879        $DS_CLI CLI$K_BR,       ENUF,   EOL                     ; Done With CoMMAND
                    17'82  044A                       .BYTE   CLI$K_BR,ENUF
                     0070' 044C                       .WORD   EOL-<.-2>
```

```
                    044E   881          .SUBTITLE       SET, SELECT, SHOW, START, SUMMARY, XDELTA, a
                    044E   882 ;
                    044E   883 ;        The Commands Starting with S:
                    044E   884 ;
                    044E   885 ;        SET
                    044E   886 ;        SELect
                    044E   887 ;        SHow
                    044E   888 ;        STart
                    044E   889 ;        SUmmary
                    044E   890 ;
                    044E   891 270$:    $DS_CLI <^A"S">,        NOTNUF, 320$                    ; S                [60]
           18'53    044E                        .BYTE   ^A"S",NOTNUF
            0049'   0450                        .WORD   320$-<.-2>
                    0452   892 ;
                    0452   893 ; SET...
                    0452   894 ;
                    0452   895          $DS_CLI <^A"E">,        NOTNUF, 290$                    ; SE
           18'45    0452                        .BYTE   ^A"E",NOTNUF
            0019'   0454                        .WORD   290$-<.-2>
                    0456   896          $DS_CLI <^A"T">,        SET,    280$                    ; SET
           1B'54    0456                        .BYTE   ^A"T",SET
            0008'   0458                        .WORD   280$-<.-2>
                    045A   897          $DS_CLI CLI$K_BR,       NOTNUF, SET_PARAMS              ; Get parameters
           18'82    045A                        .BYTE   CLI$K_BR,NOTNUF
            08C5'   045C                        .WORD   SET_PARAMS-<.-2>
                    045E   898 ;
                    045E   899 ; SELect...
                    045E   900 ;                                                                        ;G:27
                    045E   901 280$:    $DS_CLI CLI$K_STRING,   SELECT, ILLEGAL,<'LECT'>        ; SELECT
           7B'8B    045E                        .BYTE   CLI$K_STRING,SELECT
            0074'   0460                        .WORD   ILLEGAL-<.-2>
   54 43 45 4C 00'  0462                        .ASCIC  'LECT'
              04    0462
                    0467   902          $DS_CLI CLI$K_BR,       NOTNUF, SELECT_PARAMS
           18'82    0467                        .BYTE   CLI$K_BR,NOTNUF
            05AD'   0469                        .WORD   SELECT_PARAMS-<.-2>
                    046B   903 ;
                    046B   904 ; SHow...
                    046B   905 ;
                    046B   906 290$:    $DS_CLI CLI$K_STRING,   SHOW,   300$,   <'HOW'>         ; SHOW
           1D'8B    046B                        .BYTE   CLI$K_STRING,SHOW
            000C'   046D                        .WORD   300$-<.-2>
      57 4F 48 00'  046F                        .ASCIC  'HOW'
              03    046F
                    0473   907          $DS_CLI CLI$K_BR,       NOTNUF, SHOW_PARAMS
           18'82    0473                        .BYTE   CLI$K_BR,NOTNUF
            05D8'   0475                        .WORD   SHOW_PARAMS-<.-2>
                    0477   908 ;
                    0477   909 ; STart[<qualifiers>]
                    0477   910 ;
                    0477   911 300$:    $DS_CLI CLI$K_STRING,   START,  310$,   <'TART'>        ; START
           25'8B    0477                        .BYTE   CLI$K_STRING,START
            0011'   0479                        .WORD   310$-<.-2>
   54 52 41 54 00'  047B                        .ASCIC  'TART'
              04    047B
                    0480   912          $DS_CLI CLI$K_CALL,     0,      START_RUN_QUALS         ; Read Qualifiers
           00 92    0480                        .BYTE   CLI$K_CALL,0
```

```
                     0358' 0482                         .WORD   START_RUN_QUALS-<.-2>
                           0484   913          $DS_CLI CLI$K_BR,       ENUF,   EOL
                    17'82  0484                         .BYTE   CLI$K_BR,ENUF
                     0036' 0486                         .WORD   EOL-<.-2>
                           0488   914 ;
                           0488   915 ; SUmmary
                           0488   916 ;
                           0488   917 310$:    $DS_CLI CLI$K_STRING,   SUMMARY,ILLEGAL,<'UMMARY'>      ; SUMMARY
                    26'8B  0488                         .BYTE   CLI$K_STRING,SUMMARY
                     004A' 048A                         .WORD   ILLEGAL-<.-2>
          59 52 41 4D 4D 55 00' 048C                    .ASCIC  'UMMARY'
                       06  048C
                           0493   918          $DS_CLI CLI$K_BR,       ENUF,   EOL
                    17'82  0493                         .BYTE   CLI$K_BR,ENUF
                     0027' 0495                         .WORD   EOL-<.-2>
                           0497   919
                           0497   920 ;
                           0497   921 ; Xdeltaa <file_spec>
                           0497   922 ;
                           0497   923 320$:    $DS_CLI CLI$K_BIF,      IF_XDELTA,330$
                    74'83  0497                         .BYTE   CLI$K_BIF,IF_XDELTA
                     0013' 0499                         .WORD   330$-<.-2>
                           049B   924          $DS_CLI CLI$K_STRING,   XDELTA, 330$,   <'XDELTA'>      ; XDELTA
                    75'8B  049B                         .BYTE   CLI$K_STRING,XDELTA
                     000F' 049D                         .WORD   330$-<.-2>
          41 54 4C 45 44 58 00' 049F                    .ASCIC  'XDELTA'
                       06  049F
                           04A6   925          $DS_CLI CLI$K_BR,       ENUF,   EOL
                    17'82  04A6                         .BYTE   CLI$K_BR,ENUF
                     0014' 04A8                         .WORD   EOL-<.-2>
                           04AA   926 ;
                           04AA   927 ; a <file-spec>
                           04AA   928 ;
                           04AA   929 330$:    $DS_CLI <^A"a">,        SCRIPT, EOL                     ; a
                    1A'40  04AA                         .BYTE   ^A"a",SCRIPT
                     0010' 04AC                         .WORD   EOL-<.-2>
                           04AE   930          $DS_CLI CLI$K_SPACE,    NOTNUF, 340$                    ; Optional <SP>'s
                    18'84  04AE                         .BYTE   CLI$K_SPACE,NOTNUF
                     0004' 04B0                         .WORD   340$-<.-2>
                           04B2   931 340$:    $DS_CLI CLI$K_CALL      REQUIRED,GET_FILE_SPEC          ; File-spec required
                    2B'92  04B2                         .BYTE   CLI$K_CALL,REQUIRED
                     01A7' 04B4                         .WORD   GET_FILE_SPEC-<.-2>
                           04B6   932          $DS_CLI CLI$K_BR,       ENUF,   EOL                     ; Done With Command
                    17'82  04B6                         .BYTE   CLI$K_BR,ENUF
                     0004' 04B8                         .WORD   EOL-<.-2>
```

```
                        04BA    934          .SUBTITLE       END OF LINE & ILLEGAL Processing
                        04BA    935 ;
                        04BA    936 ; END OF LINE.
                        04BA    937 ;
                        04BA    938 ; If really EOL, return SUCCESSfully. If not, advance past the next character
                        04BA    939 ; (the one that is illegal), save the context at this point, and return.
                        04BA    940 ;
                        04BA    941
                        04BA    942 EOL:     $DS_CLI CLI$K_SPACE,    0,      100$                    ; Jump past spaces
                 00 84  04BA                         .BYTE   CLI$K_SPACE,0
                  0004' 04BC                         .WORD   100$-<.-2>
                        04BE    943 100$:    $DS_CLI CLI$K_EOL,      0,      110$                    ; If not EOL, branch
                 00 91  04BE                         .BYTE   CLI$K_EOL,0
                  0008' 04C0                         .WORD   110$-<.-2>
                        04C2    944          $DS_CLI CLI$K_EXIT                                      ; Exit successfully
                 00 81  04C2                         .BYTE   CLI$K_EXIT,0
                  0004' 04C4                         .WORD   30102$-<.-2>
                        04C6        30102$:
                        04C6    945
                        04C6    946 110$:    $DS_CLI CLI$K_BR,       ADVANCE,120$                    ; Jump past illegal
                 65'82  04C6                         .BYTE   CLI$K_BR,ADVANCE
                  0004' 04C8                         .WORD   120$-<.-2>
                        04CA    947 120$:    $DS_CLI CLI$K_BR,       ILL_CMD,130$                    ; Save current point
                 01'82  04CA                         .BYTE   CLI$K_BR,ILL_CMD
                  0004' 04CC                         .WORD   130$-<.-2>
                        04CE    948 130$:    $DS_CLI CLI$K_ERROR                                     ; Indicate ILLEGAL
                 00 80  04CE                         .BYTE   CLI$K_ERROR,0
                  0004' 04D0                         .WORD   30105$-<.-2>
                        04D2        30105$:
                        04D2    949 ;
                        04D2    950 ; Errors.
                        04D2    951 ;
                        04D2    952
                        04D2    953 ILLEGAL:
                        04D2    954
                        04D2    955 ;
                        04D2    956 ; Illegal command error:
                        04D2    957 ;
                        04D2    958 ; This is called with the parse character pointer pointing to the illegal
                        04D2    959 ; character. This will usually be a character within an unrecognized
                        04D2    960 ; qualifier or parameter such as the "X" in "SET WIDTX". It is possible
                        04D2    961 ; for this to be called when a command is actually INCOMPLETE. This
                        04D2    962 ; happens, for example, in recognizing "SET BREAKPOINTS" but failing
                        04D2    963 ; to see any (required) spaces after the "BREAKPOINTS". If no spaces
                        04D2    964 ; are seen, ILLEGAL is called even though the next symbol could
                        04D2    965 ; actually be EOL (implying INCOMPLETE). If it is not an EOL, then there
                        04D2    966 ; is an illegal character (e.g., the "X" above) and the command is
                        04D2    967 ; ILLEGAL. If it is an EOL, then the required address is missing and the
                        04D2    968 ; command is INCOMPLETE. Therefore, EOL is checked below to make a
                        04D2    969 ; determination about the kind of error that has occurred.
                        04D2    970 ;
                        04D2    971 100$:    $DS_CLI CLI$K_EOL,      0,      110$                    ; If not EOL, branch
                 00 91  04D2                         .BYTE   CLI$K_EOL,0
                  0008' 04D4                         .WORD   110$-<.-2>
                        04D6    972          $DS_CLI CLI$K_ERROR     INC_CMD                         ; If EOL, exit w/INC
                 02'80  04D6                         .BYTE   CLI$K_ERROR,INC_CMD
                  0004' 04D8                         .WORD   30107$-<.-2>
```

```
                        04DA        30107$:
                        04DA    973 ;
                        04DA    974 ;
                        04DA    975 ; Not really EOL, somthing illegal is there. First, get rid of any spaces
                        04DA    976 ; that are there and then advance past the illegal character.
                        04DA    977 ;
                        04DA    978 110$:   $DS_CLI CLI$K_SPACE,    0,      115$                    ; Jump past any spac
                  00 84 04DA                .BYTE   CLI$K_SPACE,0
                   0004' 04DC               .WORD   115$-<.-2>
                        04DE    979 115$:   $DS_CLI CLI$K_BR,       ADVANCE,120$                    ; Jump past illegal
                  65'82 04DE                .BYTE   CLI$K_BR,ADVANCE
                   0004' 04E0               .WORD   120$-<.-2>
                        04E2    980 120$:   $DS_CLI CLI$K_ERROR,    ILL_CMD                         ; Print error mess.
                  01'80 04E2                .BYTE   CLI$K_ERROR,ILL_CMD
                   0004' 04E4               .WORD   30110$-<.-2>
                        04E6        30110$:
```

```
                        04E6    982          .SUBTITLE       INCOMPLETE, BAD LIST & BAD QUAL Processing
                        04E6    983 INCOMPLETE:
                        04E6    984 ;
                        04E6    985 ;
                        04E6    986 ; Incomplete command error:
                        04E6    987 ;
                        04E6    988          $DS_CLI CLI$K_ERROR,    INC_CMD                         ; Print error mess.
              02'80     04E6                         .BYTE   CLI$K_ERROR,INC_CMD
               0004'    04E8                         .WORD   30111$-<.-2>
                        04EA        30111$:
                        04EA    989
                        04EA    990
                        04EA    991 BAD_LIST:
                        04EA    992 ;
                        04EA    993 ; We have a bad list. This is branched to at the end of a
                        04EA    994 ; name recognition list if a name is unrecognized. This
                        04EA    995 ; checks for cases of
                        04EA    996 ;
                        04EA    997 ;       ,,      => INCOMPLETE
                        04EA    998 ;       ,<EOL>  => INCOMPLETE
                        04EA    999 ;       ,???    => ILLEGAL
                        04EA   1000 ;
                        04EA   1001          $DS_CLI CLI$K_COMMA,    0,      110$                    ; If not comma, bran
              00 8E     04EA                         .BYTE   CLI$K_COMMA,0
               0008'    04EC                         .WORD   110$-<.-2>
                        04EE   1002          $DS_CLI CLI$K_ERROR,    INC_CMD                         ; ,,
              02'80     04EE                         .BYTE   CLI$K_ERROR,INC_CMD
               0004'    04F0                         .WORD   30113$-<.-2>
                        04F2        30113$:
                        04F2   1003
                        04F2   1004 110$:   $DS_CLI CLI$K_EOL,      0,      120$                    ; If not EOL, branch
              00 91     04F2                         .BYTE   CLI$K_EOL,0
               0008'    04F4                         .WORD   120$-<.-2>
                        04F6   1005          $DS_CLI CLI$K_ERROR     INC_CMD                         ; ,<EOL>
              02'80     04F6                         .BYTE   CLI$K_ERROR,INC_CMD
               0004'    04F8                         .WORD   30115$-<.-2>
                        04FA        30115$:
                        04FA   1006
                        04FA   1007 120$:   $DS_CLI CLI$K_SPACE,    0,      130$                    ; Jump past any spac
              00 84     04FA                         .BYTE   CLI$K_SPACE,0
               0004'    04FC                         .WORD   130$-<.-2>
                        04FE   1008 130$:   $DS_CLI CLI$K_BR,       ADVANCE,140$                    ; Jump past illegal
              65'82     04FE                         .BYTE   CLI$K_BR,ADVANCE
               0004'    0500                         .WORD   140$-<.-2>
                        0502   1009 140$:   $DS_CLI CLI$K_ERROR,    ILL_CMD                         ; ILLEGAL
              01'80     0502                         .BYTE   CLI$K_ERROR,ILL_CMD
               0004'    0504                         .WORD   30118$-<.-2>
                        0506        30118$:
                        0506   1010
                        0506   1011
                        0506   1012 BAD_QUAL:
                        0506   1013 ;
                        0506   1014 ; We have a bad qualifier. This is branched to at the end of a
                        0506   1015 ; qualifier recognition sub-tree if a qualifier is not
                        0506   1016 ; recognized. This checks for cases of
                        0506   1017 ;
                        0506   1018 ;       //      => INCOMPLETE
```

```
                     0506  1019 ;       /<EOL> => INCOMPLETE
                     0506  1020 ;       /???   => ILLEGAL
                     0506  1021 ;
                     0506  1022 ;
                     0506  1023          $DS_CLI CLI$K_SLASH,    0,      110$                    ; If not /, branch
            00 90    0506                        .BYTE   CLI$K_SLASH,0
             0008'   0508                        .WORD   110$-<.-2>
                     050A  1024          $DS_CLI CLI$K_ERROR,    INC_CMD                         ; //
            02'80    050A                        .BYTE   CLI$K_ERROR,INC_CMD
             0004'   050C                        .WORD   30120$-<.-2>
                     050E       30120$:
                     050E  1025
                     050E  1026 110$:    $DS_CLI CLI$K_EOL,      0,      120$                    ; /???
            00 91    050E                        .BYTE   CLI$K_EOL,0
             0008'   0510                        .WORD   120$-<.-2>
                     0512  1027          $DS_CLI CLI$K_ERROR     INC_CMD                         ; /<EOL>
            02'80    0512                        .BYTE   CLI$K_ERROR,INC_CMD
             0004'   0514                        .WORD   30122$-<.-2>
                     0516       30122$:
                     0516  1028
                     0516  1029 120$:    $DS_CLI CLI$K_SPACE,    0,      130$                    ; Jump past any spac
            00 84    0516                        .BYTE   CLI$K_SPACE,0
             0004'   0518                        .WORD   130$-<.-2>
                     051A  1030 130$:    $DS_CLI CLI$K_BR,       ADVANCE,140$                    ; Jump past illegal
            65'82    051A                        .BYTE   CLI$K_BR,ADVANCE
             0004'   051C                        .WORD   140$-<.-2>
                     051E  1031 140$:    $DS_CLI CLI$K_ERROR,    ILL_CMD                         ; ILLEGAL
            01'80    051E                        .BYTE   CLI$K_ERROR,ILL_CMD
             0004'   0520                        .WORD   30125$-<.-2>
                     0522       30125$:
```

```
                                0522  1033          .SUBTITLE        Flag list
                                0522  1034 ;
                                0522  1035 ; Read Flags list for SET FLAGS and CLEAR FLAGS.  The flags are:  ALl,
                                0522  1036 ; ASk_prompt, BEll, BInary, Halt, IE1, IE2, IE3, IES, Loop, Operator, Prompt,
                                0522  1037 ; Quick, Search, Trace, Verify.
                                0522  1038 ;
                                0522  1039 ; FLAGS_LIST:  [Flags  ]x , x , ...
                                0522  1040 ;
                                0522  1041 FLAGS_LIST:
                                0522  1042          $DS_CLI CLI$K_STRING,   0,      FLAGS_LOOP,<'FLAGS'>    ; Optional FLAGS
                          00 8B 0522                        .BYTE   CLI$K_STRING,0
                           000E' 0524                        .WORD   FLAGS_LOOP-<.-2>
                53 47 41 4C 46 00' 0526                        .ASCIC  'FLAGS'
                             05 0526
                                052C  1043          $DS_CLI CLI$K_SPACE,    0,      ILLEGAL                 ;
                          00 84 052C                        .BYTE   CLI$K_SPACE,0
                           FFA6 052E                        .WORD   ILLEGAL-<.-2>
                                0530  1044
                                0530  1045 FLAGS_LOOP:
                                0530  1046          $DS_CLI <^A"A">,        NOTNUF, 100$                    ; ALl           [108
                          18'41 0530                        .BYTE   ^A"A",NOTNUF
                           0021' 0532                        .WORD   100$-<.-2>
                                0534  1047          $DS_CLI CLI$K_STRING,   ALL,    90$,    <'LL'>          ;
                          41'8B 0534                        .BYTE   CLI$K_STRING,ALL
                           000B' 0536                        .WORD   90$-<.-2>
                       4C 4C 00' 0538                        .ASCIC  'LL'
                             02 0538
                                053B  1048          $DS_CLI CLI$K_BR,       0,      END_FLAGS_LOOP          ;
                          00 82 053B                        .BYTE   CLI$K_BR,0
                           00CC' 053D                        .WORD   END_FLAGS_LOOP-<.-2>
                                053F  1049
                                053F  1050 90$:     $DS_CLI CLI$K_STRING,   ASK_PROMPT,100$,<'SK_PROMPT'>   ; ASk_prompt    [108
                          42'8B 053F                        .BYTE   CLI$K_STRING,ASK_PROMPT
                           0012' 0541                        .WORD   100$-<.-2>
 54 50 4D 4F 52 50 5F 4B 53 00' 0543                        .ASCIC  'SK_PROMPT'
                             09 0543
                                054D  1051          $DS_CLI CLI$K_BR,       0,      END_FLAGS_LOOP          ;
                          00 82 054D                        .BYTE   CLI$K_BR,0
                           00BA' 054F                        .WORD   END_FLAGS_LOOP-<.-2>
                                0551  1052
                                0551  1053 100$:    $DS_CLI <^A"B">,        NOTNUF, 120$                    ; BEll
                          18'42 0551                        .BYTE   ^A"B",NOTNUF
                           001E' 0553                        .WORD   120$-<.-2>
                                0555  1054          $DS_CLI CLI$K_STRING,   BELL,   110$,   <'ELL'>         ;
                          44'8B 0555                        .BYTE   CLI$K_STRING,BELL
                           000C' 0557                        .WORD   110$-<.-2>
                    4C 4C 45 00' 0559                        .ASCIC  'ELL'
                             03 0559
                                055D  1055          $DS_CLI CLI$K_BR,       0,      END_FLAGS_LOOP          ;
                          00 82 055D                        .BYTE   CLI$K_BR,0
                           00AA' 055F                        .WORD   END_FLAGS_LOOP-<.-2>
                                0561  1056
                                0561  1057 110$:    $DS_CLI CLI$K_STRING,   BINARY, BAD_LIST,<'INARY'>      ; BInary        [45]
                          45'8B 0561                        .BYTE   CLI$K_STRING,BINARY
                           FF89 0563                        .WORD   BAD_LIST-<.-2>
                59 52 41 4E 49 00' 0565                        .ASCIC  'INARY'
                             05 0565
```

```
                        056B  1058          $DS_CLI CLI$K_BR,       0,      END_FLAGS_LOOP          ;                [45]
                 00 82  056B                        .BYTE   CLI$K_BR,0
                  009C' 056D                        .WORD   END_FLAGS_LOOP-<.-2>
                        056F  1059
                        056F  1060 120$:    $DS_CLI CLI$K_STRING,   HALT,   130$,   <'HALT'>        ; Halt
                 46'8B  056F                        .BYTE   CLI$K_STRING,HALT
                  000D' 0571                        .WORD   130$-<.-2>
           54 4C 41 48 00' 0573                     .ASCIC  'HALT'
                    04  0573
                        0578  1061          $DS_CLI CLI$K_BR,       0,      END_FLAGS_LOOP          ;
                 00 82  0578                        .BYTE   CLI$K_BR,0
                  008F' 057A                        .WORD   END_FLAGS_LOOP-<.-2>
                        057C  1062
                        057C  1063 130$:    $DS_CLI <^A"I">,        NOTNUF, 170$                    ; IE1
                 18'49  057C                        .BYTE   ^A"I",NOTNUF
                  0028' 057E                        .WORD   170$-<.-2>
                        0580  1064          $DS_CLI <^A"E">,        NOTNUF, BAD_LIST                ;
                 18'45  0580                        .BYTE   ^A"E",NOTNUF
                  FF6A  0582                        .WORD   BAD_LIST-<.-2>
                        0584  1065          $DS_CLI <^A"1">,        IE1,    140$                    ;
                 47'31  0584                        .BYTE   ^A"1",IE1
                  0008' 0586                        .WORD   140$-<.-2>
                        0588  1066          $DS_CLI CLI$K_BR,       0,      END_FLAGS_LOOP          ;
                 00 82  0588                        .BYTE   CLI$K_BR,0
                  007F' 058A                        .WORD   END_FLAGS_LOOP-<.-2>
                        058C  1067
                        058C  1068 140$:    $DS_CLI <^A"2">,        IE2,    150$                    ; IE2
                 48'32  058C                        .BYTE   ^A"2",IE2
                  0008' 058E                        .WORD   150$-<.-2>
                        0590  1069          $DS_CLI CLI$K_BR,       0,      END_FLAGS_LOOP          ;
                 00 82  0590                        .BYTE   CLI$K_BR,0
                  0077' 0592                        .WORD   END_FLAGS_LOOP-<.-2>
                        0594  1070
                        0594  1071 150$:    $DS_CLI <^A"3">,        IE3,    160$                    ; IE3
                 49'33  0594                        .BYTE   ^A"3",IE3
                  0008' 0596                        .WORD   160$-<.-2>
                        0598  1072          $DS_CLI CLI$K_BR,       0,      END_FLAGS_LOOP          ;
                 00 82  0598                        .BYTE   CLI$K_BR,0
                  006F' 059A                        .WORD   END_FLAGS_LOOP-<.-2>
                        059C  1073
                        059C  1074 160$:    $DS_CLI <^A"S">,        IES,    BAD_LIST                ; IES
                 4A'53  059C                        .BYTE   ^A"S",IES
                  FF4E  059E                        .WORD   BAD_LIST-<.-2>
                        05A0  1075          $DS_CLI CLI$K_BR,       0,      END_FLAGS_LOOP          ;
                 00 82  05A0                        .BYTE   CLI$K_BR,0
                  0067' 05A2                        .WORD   END_FLAGS_LOOP-<.-2>
                        05A4  1076
                        05A4  1077 170$:    $DS_CLI CLI$K_STRING,   LOOP,   180$,   <'LOOP'>        ; Loop
                 4B'8B  05A4                        .BYTE   CLI$K_STRING,LOOP
                  000D' 05A6                        .WORD   180$-<.-2>
        50 4F 4F 4C 00' 05A8                        .ASCIC  'LOOP'
                    04  05A8
                        05AD  1078          $DS_CLI CLI$K_BR,       0,      END_FLAGS_LOOP          ;
                 00 82  05AD                        .BYTE   CLI$K_BR,0
                  005A' 05AF                        .WORD   END_FLAGS_LOOP-<.-2>
                        05B1  1079
                        05B1  1080 180$:    $DS_CLI CLI$K_STRING,   OPER,   190$,   <'OPERATOR'>    ; Operator
```

```
                          4C'8B  05B1                    .BYTE   CLI$K_STRING,OPER
                           0011' 05B3                    .WORD   190$-<.-2>
        52 4F 54 41 52 45 50 4F 00' 05B5                 .ASCIC  'OPERATOR'
                             08  05B5
                                 05BE  1081      $DS_CLI CLI$K_BR,       0,      END_FLAGS_LOOP          ;
                          00 82  05BE                    .BYTE   CLI$K_BR,0
                           0049' 05C0                    .WORD   END_FLAGS_LOOP-<.-2>
                                 05C2  1082
                                 05C2  1083 190$: $DS_CLI CLI$K_STRING,   PROMPT, 200$,   <'PROMPT'>      ; Prompt
                          4D'8B  05C2                    .BYTE   CLI$K_STRING,PROMPT
                           000F' 05C4                    .WORD   200$-<.-2>
              54 50 4D 4F 52 50 00' 05C6                 .ASCIC  'PROMPT'
                             06  05C6
                                 05CD  1084      $DS_CLI CLI$K_BR,       0,      END_FLAGS_LOOP          ;
                          00 82  05CD                    .BYTE   CLI$K_BR,0
                           003A' 05CF                    .WORD   END_FLAGS_LOOP-<.-2>
                                 05D1  1085
                                 05D1  1086 200$: $DS_CLI CLI$K_STRING,   QUICK,  210$,   <'QUICK'>       ; Quick         [42]
                          4E'8B  05D1                    .BYTE   CLI$K_STRING,QUICK
                           000E' 05D3                    .WORD   210$-<.-2>
                 4B 43 49 55 51 00' 05D5                 .ASCIC  'QUICK'
                             05  05D5
                                 05DB  1087      $DS_CLI CLI$K_BR,       0,      END_FLAGS_LOOP          ;
                          00 82  05DB                    .BYTE   CLI$K_BR,0
                           002C' 05DD                    .WORD   END_FLAGS_LOOP-<.-2>
```

```
                        05DF  1089          .SUBTITLE       Device Names,  Event Flags
                        05DF  1090
                        05DF  1091 210$:    $DS_CLI CLI$K_STRING,   SEARCH, 220$,   <'SEARCH'>      ; Search
                 4F'8B  05DF                        .BYTE   CLI$K_STRING,SEARCH
                  000F' 05E1                        .WORD   220$-<.-2>
     48 43 52 41 45 53 00' 05E3                     .ASCIC  'SEARCH'
                     06  05E3
                        05EA  1092          $DS_CLI CLI$K_BR,       0,      END_FLAGS_LOOP          ;
                 00 82  05EA                        .BYTE   CLI$K_BR,0
                  001D' 05EC                        .WORD   END_FLAGS_LOOP-<.-2>
                        05EE  1093
                        05EE  1094 220$:    $DS_CLI CLI$K_STRING,   TRACE,  230$,   <'TRACE'>       ; Trace         [42]
                 50'8B  05EE                        .BYTE   CLI$K_STRING,TRACE
                  000E' 05F0                        .WORD   230$-<.-2>
        45 43 41 52 54 00' 05F2                     .ASCIC  'TRACE'
                     05  05F2
                        05F8  1095          $DS_CLI CLI$K_BR,       0,      END_FLAGS_LOOP          ;               [42]
                 00 82  05F8                        .BYTE   CLI$K_BR,0
                  000F' 05FA                        .WORD   END_FLAGS_LOOP-<.-2>
                        05FC  1096
                        05FC  1097 230$:    $DS_CLI CLI$K_STRING,   VERIFY, BAD_LIST,<'VERIFY'>     ; Verify        [45]
                 51'8B  05FC                        .BYTE   CLI$K_STRING,VERIFY
                  FEEE  05FE                        .WORD   BAD_LIST-<.-2>
     59 46 49 52 45 56 00' 0600                     .ASCIC  'VERIFY'
                     06  0600
                        0607  1098
                        0607  1099 END_FLAGS_LOOP:
                        0607  1100          $DS_CLI CLI$K_COMMA,    NOTNUF, EOL                     ; ,
                 18'8E  0607                        .BYTE   CLI$K_COMMA,NOTNUF
                  FEB3  0609                        .WORD   EOL-<.-2>
                        060B  1101          $DS_CLI CLI$K_BR,       0,      FLAGS_LOOP              ; Get another flag
                 00 82  060B                        .BYTE   CLI$K_BR,0
                  FF25  060D                        .WORD   FLAGS_LOOP-<.-2>
                        060F  1102 ;
                        060F  1103 ; Finish scanning SELECT... and DESELECT... and SHOW DEVICE...
                        060F  1104 ; DEVICE NAME LIST:  device_name , device_name , ...
                        060F  1105 ;
                        060F  1106 DEVICE_NAMES:
                        060F  1107          $DS_CLI CLI$K_SPACE,    0,      140$                    ; Required/Optional
                 00 84  060F                        .BYTE   CLI$K_SPACE,0
                  0018' 0611                        .WORD   140$-<.-2>
                        0613  1108 109$:    $DS_CLI CLI$K_BR,       FILESPEC,110$
                 28'82  0613                        .BYTE   CLI$K_BR,FILESPEC
                  0004' 0615                        .WORD   110$-<.-2>
                        0617  1109 110$:    $DS_CLI CLI$K_SYMBOL,   FILEND, 140$                    ; Alpha-nums
                 29'8D  0617                        .BYTE   CLI$K_SYMBOL,FILEND
                  0010' 0619                        .WORD   140$-<.-2>
                        061B  1110          $DS_CLI <^A":">,        0,      120$                    ; Optional :
                 00 3A  061B                        .BYTE   ^A":",0
                  0004' 061D                        .WORD   120$-<.-2>
                        061F  1111 120$:    $DS_CLI CLI$K_COMMA,    DO_CMD, 150$                    ; Do comm. for each
                 7E'8E  061F                        .BYTE   CLI$K_COMMA,DO_CMD
                  000C' 0621                        .WORD   150$-<.-2>
                        0623  1112          $DS_CLI CLI$K_BR,       0,      109$                    ; Get next one
                 00 82  0623                        .BYTE   CLI$K_BR,0
                  FFF0  0625                        .WORD   109$-<.-2>
                        0627  1113
```

```
                          0627  1114 140$:   $DS_CLI CLI$K_BIF,      IF_REQUIRED,ILLEGAL             ; If name req., bran
                 6F'83    0627                       .BYTE   CLI$K_BIF,IF_REQUIRED
                  FEAB    0629                       .WORD   ILLEGAL-<.-2>
                          062B  1115 150$:   $DS_CLI CLI$K_BR,       ENUF,   EOL                     ; Assume EOL
                 17'82    062B                       .BYTE   CLI$K_BR,ENUF
                  FE8F    062D                       .WORD   EOL-<.-2>
                          062F  1116 ;
                          062F  1117 ; EVENT FLAGS:  [  Flags]  flag_num , flag_num , ...
                          062F  1118 ;               [  Flags]  All
                          062F  1119 ;
                          062F  1120 EVENT_FLAGS:
                          062F  1121         $DS_CLI CLI$K_SPACE,    0,      ILLEGAL                 ; Required <SP>'s
                 00 84    062F                       .BYTE   CLI$K_SPACE,0
                  FEA3    0631                       .WORD   ILLEGAL-<.-2>
                          0633  1122         $DS_CLI CLI$K_STRING,   FLAGS,  130$,   <'FLAGS'>       ; "EVENT FLAGS"
                 3B'8B    0633                       .BYTE   CLI$K_STRING,FLAGS
                  000E'   0635                       .WORD   130$-<.-2>
        53 47 41 4C 46 00' 0637                       .ASCIC  'FLAGS'
                    05    0637
                          063D  1123         $DS_CLI CLI$K_SPACE,    0,      ILLEGAL                 ; Required <SP>'s
                 00 84    063D                       .BYTE   CLI$K_SPACE,0
                  FE95    063F                       .WORD   ILLEGAL-<.-2>
                          0641  1124
                          0641  1125 130$:   $DS_CLI CLI$K_STRING,   ALL,    140$,   <'ALL'>         ; "EVENT FLAGS ALL"
                 41'8B    0641                       .BYTE   CLI$K_STRING,ALL
                  000C'   0643                       .WORD   140$-<.-2>
              4C 4C 41 00' 0645                       .ASCIC  'ALL'
                    03    0645
                          0649  1126 135$:   $DS_CLI CLI$K_BR,       0,      EOL
                 00 82    0649                       .BYTE   CLI$K_BR,0
                  FE71    064B                       .WORD   EOL-<.-2>
                          064D  1127
                          064D  1128 140$:   $DS_CLI CLI$K_DEC,      EFN,    BAD_LIST                ; "EVENT FLAGS xx"
                 58'8A    064D                       .BYTE   CLI$K_DEC,EFN
                  FE9D    064F                       .WORD   BAD_LIST-<.-2>
                          0651  1129         $DS_CLI CLI$K_COMMA,    NOTNUF, 135$                    ; ,
                 18'8E    0651                       .BYTE   CLI$K_COMMA,NOTNUF
                  FFF8    0653                       .WORD   135$-<.-2>
                          0655  1130         $DS_CLI CLI$K_BR,       0,      140$
                 00 82    0655                       .BYTE   CLI$K_BR,0
                  FFF8    0657                       .WORD   140$-<.-2>
```

```
                        0659  1132          .SUBTITLE       File Specifications
                        0659  1133 ;
                        0659  1134 ;       ODS file specifier                                                      ;G:4
                        0659  1135 ;                                                                               ;G:4
                        0659  1136 ;       [device_name:][directory_name]file_name.file_type;file_version           ;G:14
                        0659  1137 ;
                        0659  1138 ;       ULTRIX file specifier                                                   ;G:4
                        0659  1139 ;                                                                               ;G:4
                        0659  1140 ;       [device_name][(0,partition)][name1/name2 - - -]                         ;G:4
                        0659  1141 ;                                                                               ;G:4
                        0659  1142 GET_FILE_SPEC:
                        0659  1143          $DS_CLI CLI$K_BR,       FILESPEC,100$
                28'82   0659                        .BYTE   CLI$K_BR,FILESPEC
                 0004'  065B                        .WORD   100$-<.-2>
                        065D  1144 100$:    $DS_CLI CLI$K_BIF,      ULTRIX_ODS, 300$                        ; Check if U
                1C'83   065D                        .BYTE   CLI$K_BIF,ULTRIX_ODS
                 005C'  065F                        .WORD   300$-<.-2>
                        0661  1145
                        0661  1146          $DS_CLI CLI$K_FILE,     0,      110$                            ; Could be Device, o
                00 95   0661                        .BYTE   CLI$K_FILE,0
                 0008'  0663                        .WORD   110$-<.-2>
                        0665  1147          $DS_CLI <^A":">,        0,      140$                            ; Was Device Name.
                00 3A   0665                        .BYTE   ^A":",0
                 0034'  0667                        .WORD   140$-<.-2>
                        0669  1148
                        0669  1149 110$:    $DS_CLI <^A"[">,        0,      130$                            ; Get Directory Coul
                00 5B   0669                        .BYTE   ^A"[",0
                 002C'  066B                        .WORD   130$-<.-2>
                        066D  1150          $DS_CLI CLI$K_FILE,     0,      120$                            ; FILE spec fits bot
                00 95   066D                        .BYTE   CLI$K_FILE,0
                 0024'  066F                        .WORD   120$-<.-2>
                        0671  1151          $DS_CLI CLI$K_COMMA,    0,      115$                            ; for an UIC. ;G:27
                00 8E   0671                        .BYTE   CLI$K_COMMA,0
                 0014'  0673                        .WORD   115$-<.-2>
                        0675  1152          $DS_CLI CLI$K_FILE,     0,      ILLEGAL                         ;               ;G:28
                00 95   0675                        .BYTE   CLI$K_FILE,0
                 FE5D   0677                        .WORD   ILLEGAL-<.-2>
                        0679  1153          $DS_CLI CLI$K_BR,       0,      120$
                00 82   0679                        .BYTE   CLI$K_BR,0
                 0018'  067B                        .WORD   120$-<.-2>
                        067D  1154
                        067D  1155 112$:    $DS_CLI <^A"]">,        0,      117$                            ; Check for [] Direc
                00 5D   067D                        .BYTE   ^A"]",0
                 000C'  067F                        .WORD   117$-<.-2>
                        0681  1156          $DS_CLI CLI$K_BR,       0,      130$                            ; Go Get File Name.
                00 82   0681                        .BYTE   CLI$K_BR,0
                 0014'  0683                        .WORD   130$-<.-2>
                                                                                                                ;G:14
                        0685  1157
                        0685  1158 115$:    $DS_CLI <^A".">,        0,      120$                            ; Check for more Dir
                00 2E   0685                        .BYTE   ^A".",0
                 000C'  0687                        .WORD   120$-<.-2>
                        0689  1159 117$:    $DS_CLI CLI$K_FILE,     0,      ILLEGAL                         ; Get Next Dir Name.
                00 95   0689                        .BYTE   CLI$K_FILE,0
                 FE49   068B                        .WORD   ILLEGAL-<.-2>
                        068D  1160          $DS_CLI CLI$K_BR,       0,      115$                            ; Get More.
                00 82   068D                        .BYTE   CLI$K_BR,0
                 FFF8   068F                        .WORD   115$-<.-2>
```

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                0691  1161
                0691  1162 120$:   $DS_CLI <^A"]">,        0,      ILLEGAL                  ; End the Dir.
        00 5D   0691                       .BYTE   ^A"]",0
         FE41   0693                       .WORD   ILLEGAL-<.-2>
                0695  1163
                0695  1164 130$:   $DS_CLI CLI$K_FILE,     0,      140$                     ; Get File Name. [11
        00 95   0695                       .BYTE   CLI$K_FILE,0
         0004'  0697                       .WORD   140$-<.-2>
                0699  1165
                0699  1166 140$:   $DS_CLI <^A".">,        0,      150$                     ; Check for Type.
        00 2E   0699                       .BYTE   ^A".",0
         0008'  069B                       .WORD   150$-<.-2>
                069D  1167         $DS_CLI CLI$K_FILE,     0,      150$                     ; Get Type. [112]
        00 95   069D                       .BYTE   CLI$K_FILE,0
         0004'  069F                       .WORD   150$-<.-2>
                06A1  1168
                06A1  1169 150$:   $DS_CLI <^A";">,        0,      190$                     ; Check for Version.
        00 3B   06A1                       .BYTE   ^A";",0
         0008'  06A3                       .WORD   190$-<.-2>
                06A5  1170         $DS_CLI CLI$K_DEC,      0,      190$
        00 8A   06A5                       .BYTE   CLI$K_DEC,0
         0004'  06A7                       .WORD   190$-<.-2>
                06A9  1171
                06A9  1172 190$:   $DS_CLI CLI$K_BR,       FILEND,191$                      ; End Of File String
        29'82   06A9                       .BYTE   CLI$K_BR,FILEND
         0004'  06AB                       .WORD   191$-<.-2>
                06AD  1173 191$:   $DS_CLI CLI$K_BIF,      IF_FILE_SPEC,200$                ; If file-spec, bran
        70'83   06AD                       .BYTE   CLI$K_BIF,IF_FILE_SPEC
         0008'  06AF                       .WORD   200$-<.-2>
                06B1  1174         $DS_CLI CLI$K_BIF,      IF_REQUIRED,INCOMPLETE           ; If required, branc
        6F'83   06B1                       .BYTE   CLI$K_BIF,IF_REQUIRED
         FE35   06B3                       .WORD   INCOMPLETE-<.-2>
                06B5  1175 200$:   $DS_CLI CLI$K_RETURN,   ENUF                             ; Done, Return to Co
        17'93   06B5                       .BYTE   CLI$K_RETURN,ENUF
         0004'  06B7                       .WORD   30204$-<.-2>
                06B9       30204$:
                06B9  1176 ;
                06B9  1177 ; ULTRIX FILES STRING PARSE
                06B9  1178 ;
                06B9  1179 300$:   $DS_CLI CLI$K_FILE,     0,      308$                     ; Alpha-nums    [106
        00 95   06B9                       .BYTE   CLI$K_FILE,0
         0008'  06BB                       .WORD   308$-<.-2>
                06BD  1180         $DS_CLI <^A":">,        0,      350$                     ; :
        00 3A   06BD                       .BYTE   ^A":",0
         008C'  06BF                       .WORD   350$-<.-2>
                06C1  1181 308$:   $DS_CLI <^A"(">,        0,      350$                     ; Partition.    [106
        00 28   06C1                       .BYTE   ^A"(",0
         0088'  06C3                       .WORD   350$-<.-2>
                06C5  1182 309$:   $DS_CLI CLI$K_DEC,      0,      INCOMPLETE               ; Search for    [106
        00 8A   06C5                       .BYTE   CLI$K_DEC,0
         FE21   06C7                       .WORD   INCOMPLETE-<.-2>
                06C9  1183 310$:   $DS_CLI CLI$K_COMMA,    0,      INCOMPLETE               ; (##,##)       [94]
        00 8E   06C9                       .BYTE   CLI$K_COMMA,0
         FE1D   06CB                       .WORD   INCOMPLETE-<.-2>
                06CD  1184         $DS_CLI CLI$K_DEC,      0,      320$                     ;               [117
        00 8A   06CD                       .BYTE   CLI$K_DEC,0
         0008'  06CF                       .WORD   320$-<.-2>
```

```
                 06D1  1185          $DS_CLI CLI$K_BR,       0,      338$                    ;                [117
00 82            06D1                        .BYTE   CLI$K_BR,0
 0070'           06D3                        .WORD   338$-<.-2>
                 06D5  1186 320$:    $DS_CLI <^A"A">,        0,      321$                    ;                [117
00 41            06D5                        .BYTE   ^A"A",0
 0008'           06D7                        .WORD   321$-<.-2>
                 06D9  1187          $DS_CLI CLI$K_BR,       0,      338$                    ;                [117
00 82            06D9                        .BYTE   CLI$K_BR,0
 0068'           06DB                        .WORD   338$-<.-2>
                 06DD  1188 321$:    $DS_CLI <^A"a">,        0,      322$                    ;                [117
00 61            06DD                        .BYTE   ^A"a",0
 0008'           06DF                        .WORD   322$-<.-2>
                 06E1  1189          $DS_CLI CLI$K_BR,       0,      338$                    ;                [117
00 82            06E1                        .BYTE   CLI$K_BR,0
 0060'           06E3                        .WORD   338$-<.-2>
                 06E5  1190 322$:    $DS_CLI <^A"B">,        0,      323$                    ;                [117
00 42            06E5                        .BYTE   ^A"B",0
 0008'           06E7                        .WORD   323$-<.-2>
                 06E9  1191          $DS_CLI CLI$K_BR,       0,      338$                    ;                [117
00 82            06E9                        .BYTE   CLI$K_BR,0
 0058'           06EB                        .WORD   338$-<.-2>
                 06ED  1192 323$:    $DS_CLI <^A"b">,        0,      324$                    ;                [117
00 62            06ED                        .BYTE   ^A"b",0
 0008'           06EF                        .WORD   324$-<.-2>
                 06F1  1193          $DS_CLI CLI$K_BR,       0,      338$                    ;                [117
00 82            06F1                        .BYTE   CLI$K_BR,0
 0050'           06F3                        .WORD   338$-<.-2>
                 06F5  1194 324$:    $DS_CLI <^A"C">,        0,      325$                    ;                [117
00 43            06F5                        .BYTE   ^A"C",0
 0008'           06F7                        .WORD   325$-<.-2>
                 06F9  1195          $DS_CLI CLI$K_BR,       0,      338$                    ;                [117
00 82            06F9                        .BYTE   CLI$K_BR,0
 0048'           06FB                        .WORD   338$-<.-2>
                 06FD  1196 325$:    $DS_CLI <^A"c">,        0,      326$                    ;                [117
00 63            06FD                        .BYTE   ^A"c",0
 0008'           06FF                        .WORD   326$-<.-2>
                 0701  1197          $DS_CLI CLI$K_BR,       0,      338$                    ;                [117
00 82            0701                        .BYTE   CLI$K_BR,0
 0040'           0703                        .WORD   338$-<.-2>
                 0705  1198 326$:    $DS_CLI <^A"D">,        0,      327$                    ;                [117
00 44            0705                        .BYTE   ^A"D",0
 0008'           0707                        .WORD   327$-<.-2>
                 0709  1199          $DS_CLI CLI$K_BR,       0,      338$                    ;                [117
00 82            0709                        .BYTE   CLI$K_BR,0
 0038'           070B                        .WORD   338$-<.-2>
                 070D  1200 327$:    $DS_CLI <^A"d">,        0,      328$                    ;                [117
00 64            070D                        .BYTE   ^A"d",0
 0008'           070F                        .WORD   328$-<.-2>
                 0711  1201          $DS_CLI CLI$K_BR,       0,      338$                    ;                [117
00 82            0711                        .BYTE   CLI$K_BR,0
 0030'           0713                        .WORD   338$-<.-2>
                 0715  1202 328$:    $DS_CLI <^A"E">,        0,      329$                    ;                [117
00 45            0715                        .BYTE   ^A"E",0
 0008'           0717                        .WORD   329$-<.-2>
                 0719  1203          $DS_CLI CLI$K_BR,       0,      338$                    ;                [117
00 82            0719                        .BYTE   CLI$K_BR,0
 0028'           071B                        .WORD   338$-<.-2>
```

```
                071D  1204 329$:   $DS_CLI <^A"e">,        0,      330$                    ;                [117
        00 65   071D                        .BYTE   ^A"e",0
         0008'  071F                        .WORD   330$-<.-2>
                0721  1205         $DS_CLI CLI$K_BR,       0,      338$                    ;                [117
        00 82   0721                        .BYTE   CLI$K_BR,0
         0020'  0723                        .WORD   338$-<.-2>
                0725  1206 330$:   $DS_CLI <^A"F">,        0,      331$                    ;                [117
        00 46   0725                        .BYTE   ^A"F",0
         0008'  0727                        .WORD   331$-<.-2>
                0729  1207         $DS_CLI CLI$K_BR,       0,      338$                    ;                [117
        00 82   0729                        .BYTE   CLI$K_BR,0
         0018'  072B                        .WORD   338$-<.-2>
                072D  1208 331$:   $DS_CLI <^A"f">,        0,      332$                    ;                [117
        00 66   072D                        .BYTE   ^A"f",0
         0008'  072F                        .WORD   332$-<.-2>
                0731  1209         $DS_CLI CLI$K_BR,       0,      338$                    ;                [117
        00 82   0731                        .BYTE   CLI$K_BR,0
         0010'  0733                        .WORD   338$-<.-2>
                0735  1210 332$:   $DS_CLI <^A"G">,        0,      333$                    ;                [117
        00 47   0735                        .BYTE   ^A"G",0
         0008'  0737                        .WORD   333$-<.-2>
                0739  1211         $DS_CLI CLI$K_BR,       0,      338$                    ;                [117
        00 82   0739                        .BYTE   CLI$K_BR,0
         0008'  073B                        .WORD   338$-<.-2>
                073D  1212 333$:   $DS_CLI <^A"g">,        0,      INCOMPLETE              ;                [117
        00 67   073D                        .BYTE   ^A"g",0
         FDA9   073F                        .WORD   INCOMPLETE-<.-2>
                0741  1213 338$:   $DS_CLI <^A")">,        0,      INCOMPLETE              ; Partition.     [94]
        00 29   0741                        .BYTE   ^A")",0
         FDA5   0743                        .WORD   INCOMPLETE-<.-2>
                0745  1214 ;                                                                                [113
                0745  1215 ; file [/file---] [. [file]]                                                     [113
                0745  1216 ;  "." and .file are also accepted - these are allowable Ultrix file names       [113
                0745  1217 ;                                                                                [113
                0745  1218 340$:   $DS_CLI CLI$K_FILE,     0,      350$                    ; file           [113
        00 95   0745                        .BYTE   CLI$K_FILE,0
         0004'  0747                        .WORD   350$-<.-2>
                0749  1219 350$:   $DS_CLI CLI$K_EOL,      0,      360$                    ; file eol       [113
        00 91   0749                        .BYTE   CLI$K_EOL,0
         0008'  074B                        .WORD   360$-<.-2>
                074D  1220         $DS_CLI CLI$K_BR,       0,      190$                    ; ok, exit       [113
        00 82   074D                        .BYTE   CLI$K_BR,0
         FF5C   074F                        .WORD   190$-<.-2>
                0751  1221 360$:   $DS_CLI <^A"/">,        0,      380$                    ; file/          [113
        00 2F   0751                        .BYTE   ^A"/",0
         0014'  0753                        .WORD   380$-<.-2>
                0755  1222         $DS_CLI CLI$K_EOL,      NOTNUF, 370$                    ; get rest       [113
        18'91   0755                        .BYTE   CLI$K_EOL,NOTNUF
         0008'  0757                        .WORD   370$-<.-2>
                0759  1223         $DS_CLI CLI$K_BR,       0,      ILLEGAL                 ;  else error    [113
        00 82   0759                        .BYTE   CLI$K_BR,0
         FD79   075B                        .WORD   ILLEGAL-<.-2>
                075D  1224 370$:   $DS_CLI CLI$K_FILE,     0,      ILLEGAL                 ; file/file      [113
        00 95   075D                        .BYTE   CLI$K_FILE,0
         FD75   075F                        .WORD   ILLEGAL-<.-2>
                0761  1225         $DS_CLI CLI$K_BR,       0,      350$                    ; look for more [113
        00 82   0761                        .BYTE   CLI$K_BR,0
```

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                FFE8  0763                              .WORD   350$-<.-2>
                      0765  1226 380$:    $DS_CLI <^A".">,        0,      ILLEGAL                 ; file.         [113
              00 2E   0765                              .BYTE   ^A".",0
                FD6D  0767                              .WORD   ILLEGAL-<.-2>
                      0769  1227          $DS_CLI CLI$K_EOL,      0,      390$                    ; file. eol     [113
              00 91   0769                              .BYTE   CLI$K_EOL,0
                0008' 076B                              .WORD   390$-<.-2>
                      076D  1228          $DS_CLI CLI$K_BR,       0,      190$                    ; ok, exit      [113
              00 82   076D                              .BYTE   CLI$K_BR,0
                FF3C  076F                              .WORD   190$-<.-2>
                      0771  1229 390$:    $DS_CLI CLI$K_FILE,     0,      ILLEGAL                 ; file.file     [113
              00 95   0771                              .BYTE   CLI$K_FILE,0
                FD61  0773                              .WORD   ILLEGAL-<.-2>
                      0775  1230          $DS_CLI CLI$K_EOL,      0,      ILLEGAL                 ; nothing more  [113
              00 91   0775                              .BYTE   CLI$K_EOL,0
                FD5D  0777                              .WORD   ILLEGAL-<.-2>
                      0779  1231          $DS_CLI CLI$K_BR,       0,      190$                    ; exit          [113
              00 82   0779                              .BYTE   CLI$K_BR,0
                FF30  077B                              .WORD   190$-<.-2>
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                     077D  1233          .SUBTITLE ADDRESS Parrameter.
                     077D  1234 ;
                     077D  1235 ; Read a generic address for Examine, Deposit...
                     077D  1236 ; ADDRESS:   address
                     077D  1237 ; address is one of: AP, FP, PC, PSI, Pxx, Rxx, SP, number
                     077D  1238 ;
                     077D  1239 GET_ADDRESS:
                     077D  1240 ;
                     077D  1241 ; AP    This could be AP, or it could be Axxx = address.
                     077D  1242 ;
                     077D  1243          $DS_CLI <^A"A">,      REG12,    120$                    ; AP
           5E'41     077D                .BYTE   ^A"A",REG12
            000C'    077F                .WORD   120$-<.-2>
                     0781  1244          $DS_CLI <^A"P">,      REGP,     200$                    ; [121]       ;G:14
           63'50     0781                .BYTE   ^A"P",REGP
            0053'    0783                .WORD   200$-<.-2>
                     0785  1245          $DS_CLI CLI$K_RETURN                                    ; Return      ;G:14
           00 93     0785                .BYTE   CLI$K_RETURN,0
            0004'    0787                .WORD   30256$-<.-2>
                     0789       30256$:
                     0789  1246 ;
                     0789  1247 ; FP    This could be FP, or it could be Fxxx = address.
                     0789  1248 ;
                     0789  1249
                     0789  1250 120$:    $DS_CLI <^A"F">,      REG13,    130$                    ; FP
           5F'46     0789                .BYTE   ^A"F",REG13
            000C'    078B                .WORD   130$-<.-2>
                     078D  1251          $DS_CLI <^A"P">,      REGP,     200$                    ; [121]       ;G:14
           63'50     078D                .BYTE   ^A"P",REGP
            0047'    078F                .WORD   200$-<.-2>
                     0791  1252          $DS_CLI CLI$K_RETURN                                    ; Return
           00 93     0791                .BYTE   CLI$K_RETURN,0
            0004'    0793                .WORD   30259$-<.-2>
                     0795       30259$:
                     0795  1253 ;
                     0795  1254 ; PC
                     0795  1255 ;
                     0795  1256 130$:    $DS_CLI <^A"P">,        0,      160$                    ; PC
           00 50     0795                .BYTE   ^A"P",0
            001F'    0797                .WORD   160$-<.-2>
                     0799  1257          $DS_CLI <^A"C">,      REG15,    140$                    ;
           61'43     0799                .BYTE   ^A"C",REG15
            0008'    079B                .WORD   140$-<.-2>
                     079D  1258          $DS_CLI CLI$K_RETURN                                    ; Return
           00 93     079D                .BYTE   CLI$K_RETURN,0
            0004'    079F                .WORD   30262$-<.-2>
                     07A1       30262$:
                     07A1  1259 ;
                     07A1  1260 ; PSL
                     07A1  1261 ;
                     07A1  1262 140$:    $DS_CLI CLI$K_STRING, REG16,    150$,   <'SL'>          ; PSL
        62'8B        07A1                .BYTE   CLI$K_STRING,REG16
            000B'    07A3                .WORD   150$-<.-2>
     4C 53 00'       07A5                .ASCIC  'SL'
           02        07A5
                     07A8  1263          $DS_CLI CLI$K_RETURN                                    ; Return
           00 93     07A8                .BYTE   CLI$K_RETURN,0
```

```
                0004' 07AA                      .WORD   30264$-<.-2>
                      07AC              30264$:
                      07AC  1264 ;
                      07AC  1265 ; Pxx   processor register
                      07AC  1266 ;
                      07AC  1267 150$:  $DS_CLI CLI$K_NUM,    PREGN,    ILLEGAL                 ; Pxx
              32'85   07AC                      .BYTE   CLI$K_NUM,PREGN
               FD26   07AE                      .WORD   ILLEGAL-<.-2>
                      07B0  1268        $DS_CLI CLI$K_RETURN                                    ; Return
              00 93   07B0                      .BYTE   CLI$K_RETURN,0
               0004'  07B2                      .WORD   30266$-<.-2>
                      07B4              30266$:
                      07B4  1269 ;
                      07B4  1270 ; Rnum  general register
                      07B4  1271 ;
                      07B4  1272 160$:  $DS_CLI <^A"R">,      REGN,     170$                  ; Rxx
              5D'52   07B4                      .BYTE   ^A"R",REGN
               000C'  07B6                      .WORD   170$-<.-2>
                      07B8  1273        $DS_CLI CLI$K_DEC,    ADDRESS,  ILLEGAL               ;
              3D'8A   07B8                      .BYTE   CLI$K_DEC,ADDRESS
               FD1A   07BA                      .WORD   ILLEGAL-<.-2>
                      07BC  1274        $DS_CLI CLI$K_RETURN                                    ; Return
              00 93   07BC                      .BYTE   CLI$K_RETURN,0
               0004'  07BE                      .WORD   30269$-<.-2>
                      07C0              30269$:
                      07C0  1275 ;
                      07C0  1276 ; SP
                      07C0  1277 ;
                      07C0  1278 170$:  $DS_CLI <^A"S">,      REG14,    180$                  ; SP
              60'53   07C0                      .BYTE   ^A"S",REG14
               000C'  07C2                      .WORD   180$-<.-2>
                      07C4  1279        $DS_CLI <^A"P">,      REGP,     ILLEGAL               ;
              63'50   07C4                      .BYTE   ^A"P",REGP
               FD0E   07C6                      .WORD   ILLEGAL-<.-2>
                      07C8  1280        $DS_CLI CLI$K_RETURN                                    ; Return
              C0 93   07C8                      .BYTE   CLI$K_RETURN,0
               0004'  07CA                      .WORD   30272$-<.-2>
                      07CC              30272$:
                      07CC  1281 ;
                      07CC  1282 ; address
                      07CC  1283 ;
                      07CC  1284 180$:  $DS_CLI CLI$K_NUM,    ADDRESS,  ILLEGAL               ; Address is data
              3D'85   07CC                      .BYTE   CLI$K_NUM,ADDRESS
               FD06   07CE                      .WORD   ILLEGAL-<.-2>
                      07D0  1285 190$:  $DS_CLI CLI$K_RETURN                                    ; Return.
              00 93   07D0                      .BYTE   CLI$K_RETURN,0
               0004'  07D2                      .WORD   30274$-<.-2>
                      07D4              30274$:
                      07D4  1286 200$:  $DS_CLI CLI$K_BR,     BACKUP,   180$                  ; Backup  and try re
              64'82   07D4                      .BYTE   CLI$K_BR,BACKUP
               FFF8   07D6                      .WORD   180$-<.-2>
```

```
                        07D8  1288          .SUBTITLE       Start and Run Qualifiers
                        07D8  1289 ;
                        07D8  1290 START_RUN_QUALS:
                        07D8  1291 ;
                        07D8  1292 ; Qualifiers for the START and RUN commands.
                        07D8  1293 ; This allows optional spaces before and after the :'s and the /'s.
                        07D8  1294 ;
                        07D8  1295          $DS_CLI CLI$K_SLASH,    NOTNUF, 200$                    ; Read Qualifiers
                 18'90  07D8                        .BYTE   CLI$K_SLASH,NOTNUF
                  00C2' 07DA                        .WORD   200$-<.-2>
                        07DC  1296 ;                                                                                [62]
                        07DC  1297 ; Start or Run Qualifier:  / Debug                                               [62]
                        07DC  1298 ;                                                                                [62]
                        07DC  1299          $DS_CLI CLI$K_STRING,   DEBUG_SWITCH,90$,<'DEBUG'>      ; /DEBUG       [62]
                 0D'8B  07DC                        .BYTE   CLI$K_STRING,DEBUG_SWITCH
                  000E' 07DE                        .WORD   90$-<.-2>
        47 55 42 45 44 00' 07E0                     .ASCIC  'DEBUG'
                     05  07E0
                        07E6  1300          $DS_CLI CLI$K_BR,       0,      START_RUN_QUALS         ; NEXT QUALIFIER[62]
                 00 82  07E6                        .BYTE   CLI$K_BR,0
                  FFF2  07E8                        .WORD   START_RUN_QUALS-<.-2>
                        07EA  1301 ;
                        07EA  1302 ; Start or Run Qualifier:  / Passes : dec_passes
                        07EA  1303 ;
                        07EA  1304 90$:     $DS_CLI CLI$K_STRING,   NOTNUF, 100$,   <'PASSES'>      ; /PASSES      [42]
                 18'8B  07EA                        .BYTE   CLI$K_STRING,NOTNUF
                  0017' 07EC                        .WORD   100$-<.-2>
     53 45 53 53 41 50 00' 07EE                     .ASCIC  'PASSES'
                     06  07EE
                        07F5  1305          $DS_CLI CLI$K_VALUE,    NOTNUF, ILLEGAL                 ; : or =
                 18'8F  07F5                        .BYTE   CLI$K_VALUE,NOTNUF
                  FCDD  07F7                        .WORD   ILLEGAL-<.-2>
                        07F9  1306          $DS_CLI CLI$K_DEC,      PASS,   ILLEGAL                 ; /PASSES:decmal
                 34'8A  07F9                        .BYTE   CLI$K_DEC,PASS
                  FCD9  07FB                        .WORD   ILLEGAL-<.-2>
                        07FD  1307          $DS_CLI CLI$K_BR,       0,      START_RUN_QUALS
                 00 82  07FD                        .BYTE   CLI$K_BR,0
                  FFDB  07FF                        .WORD   START_RUN_QUALS-<.-2>
                        0801  1308 ;
                        0801  1309 ; Start or Run Qualifier:  / Qa
                        0801  1310 ;
                        0801  1311 100$:    $DS_CLI CLI$K_STRING    QA,     110$,   <'QA'>          ; /QA          [42]
                 35'8B  0801                        .BYTE   CLI$K_STRING,QA
                  000B' 0803                        .WORD   110$-<.-2>
              41 51 00' 0805                        .ASCIC  'QA'
                     02  0805
                        0808  1312          $DS_CLI CLI$K_BR        0,      START_RUN_QUALS         ;              [42]
                 00 82  0808                        .BYTE   CLI$K_BR,0
                  FFD0  080A                        .WORD   START_RUN_QUALS-<.-2>
                        080C  1313 ;
                        080C  1314 ; Start or Run Qualifier:  / SEction : sym_secname
                        080C  1315 ;
                        080C  1316 110$:    $DS_CLI <^A"S">,        NOTNUF, 125$                    ; S
                 18'53  080C                        .BYTE   ^A"S",NOTNUF
                  0032' 080E                        .WORD   125$-<.-2>
                        0810  1317
                        0810  1318          $DS_CLI CLI$K_STRING,   NOTNUF, 120$,   <'ECTION'>      ; /SECTION
```

```
                    18'8B  0810                        .BYTE   CLI$K_STRING,NOTNUF
                     0017' 0812                        .WORD   120$-<.-2>
          4E 4F 49 54 43 45 00' 0814                   .ASCIC  'ECTION'
                       06  0814
                           081B  1319          $DS_CLI CLI$K_VALUE,    NOTNUF, ILLEGAL                 ; : or =
                    18'8F  081B                        .BYTE   CLI$K_VALUE,NOTNUF
                     FCB7  081D                        .WORD   ILLEGAL-<.-2>
                           081F  1320          $DS_CLI CLI$K_SYMBOL,   SECTION,ILLEGAL                 ;                [37]
                    33'8D  081F                        .BYTE   CLI$K_SYMBOL,SECTION
                     FCB3  0821                        .WORD   ILLEGAL-<.-2>
                           0823  1321          $DS_CLI CLI$K_BR,       0,      START_RUN_QUALS         ;                [42]
                    00 82  0823                        .BYTE   CLI$K_BR,0
                     FFB5  0825                        .WORD   START_RUN_QUALS-<.-2>
                           0827  1322 ;
                           0827  1323 ; Start or Run Qualifier:  / SUbtest : dec_nsubtest
                           0827  1324 ;
                           0827  1325 120$:   $DS_CLI CLI$K_STRING,   NOTNUF, BAD_QUAL,<'UBTEST'>      ; /SUBTEST
                    18'8B  0827                        .BYTE   CLI$K_STRING,NOTNUF
                     FCDF  0829                        .WORD   BAD_QUAL-<.-2>
          54 53 45 54 42 55 00' 082B                   .ASCIC  'UBTEST'
                       06  082B
                           0832  1326          $DS_CLI CLI$K_VALUE,    NOTNUF, ILLEGAL                 ; : or =
                    18'8F  0832                        .BYTE   CLI$K_VALUE,NOTNUF
                     FCA0  0834                        .WORD   ILLEGAL-<.-2>
                           0836  1327          $DS_CLI CLI$K_DEC,      SUBTEST,ILLEGAL
                    2E'8A  0836                        .BYTE   CLI$K_DEC,SUBTEST
                     FC9C  0838                        .WORD   ILLEGAL-<.-2>
                           083A  1328          $DS_CLI CLI$K_BR,       0,      START_RUN_QUALS         ;                [42]
                    00 82  083A                        .BYTE   CLI$K_BR,0
                     FF9E  083C                        .WORD   START_RUN_QUALS-<.-2>
                           083E  1329 ;
                           083E  1330 ; Start or Run Qualifier:  /TIME:dddd-hh:mm:ss.cc                 ; begin      [76]
                           083E  1331 ;
                           083E  1332 125$:   $DS_CLI <^A"T">,         NOTNUF, BAD_QUAL                ; T          [37]
                    18'54  083E                        .BYTE   ^A"T",NOTNUF
                     FCC8  0840                        .WORD   BAD_QUAL-<.-2>
                           0842  1333
                           0842  1334 130$:   $DS_CLI CLI$K_STRING,   NOTNUF, 140$,<'IME'>           ; /TIME      [76]
                    18'8B  0842                        .BYTE   CLI$K_STRING,NOTNUF
                     003C' 0844                        .WORD   140$-<.-2>
          45 4D 49 00' 0846                            .ASCIC  'IME'
                       03  0846
                           084A  1335          $DS_CLI CLI$K_VALUE,    NOTNUF, ILLEGAL                 ; : or =     [76]
                    18'8F  084A                        .BYTE   CLI$K_VALUE,NOTNUF
                     FC88  084C                        .WORD   ILLEGAL-<.-2>
                           084E  1336          $DS_CLI CLI$K_BR,       BEGINTIME, 131$                 ; Mark start[76]
                    8D'82  084E                        .BYTE   CLI$K_BR,BEGINTIME
                     0004' 0850                        .WORD   131$-<.-2>
                           0852  1337                                                                  ; of string [76]
                           0852  1338 131$:   $DS_CLI CLI$K_DEC,      0,      133$                    ; dddd       [76]
                    00 8A  0852                        .BYTE   CLI$K_DEC,0
                     000C' 0854                        .WORD   133$-<.-2>
                           0856  1339          $DS_CLI <^A"-">,        0,      133$                    ; SP         [76]
                    00 2D  0856                        .BYTE   ^A"-",0
                     0008' 0858                        .WORD   133$-<.-2>
                           085A  1340 132$:   $DS_CLI CLI$K_DEC,      0,      133$                    ; hh         [76]
                    00 8A  085A                        .BYTE   CLI$K_DEC,0
```

```
                0004' 085C                              .WORD   133$-<.-2>
                      085E  1341 133$:   $DS_CLI CLI$K_VALUE,    0,      134$                    ; : or =    [76]
             00 8F    085E                              .BYTE   CLI$K_VALUE,0
                0004' 0860                              .WORD   134$-<.-2>
                      0862  1342 134$:   $DS_CLI CLI$K_DEC,      0,      135$                    ; mm        [76]
             00 8A    0862                              .BYTE   CLI$K_DEC,0
                0004' 0864                              .WORD   135$-<.-2>
                      0866  1343 135$:   $DS_CLI CLI$K_VALUE,    0,      136$                    ; : or =    [76]
             00 8F    0866                              .BYTE   CLI$K_VALUE,0
                0004' 0868                              .WORD   136$-<.-2>
                      086A  1344 136$:   $DS_CLI CLI$K_DEC,      0,      137$                    ; ss        [76]
             00 8A    086A                              .BYTE   CLI$K_DEC,0
                0004' 086C                              .WORD   137$-<.-2>
                      086E  1345 137$:   $DS_CLI <^A".">,        0,      138$                    ; .         [76]
             00 2E    086E                              .BYTE   ^A".",0
                0004' 0870                              .WORD   138$-<.-2>
                      0872  1346 138$:   $DS_CLI CLI$K_DEC,      0,      139$                    ; cc        [76]
             00 8A    0872                              .BYTE   CLI$K_DEC,0
                0004' 0874                              .WORD   139$-<.-2>
                      0876  1347 139$:   $DS_CLI CLI$K_BIF,      TIME,   ILLEGAL                 ; Check the [76]
             8E'83    0876                              .BYTE   CLI$K_BIF,TIME
              FC5C    0878                              .WORD   ILLEGAL-<.-2>
                      087A  1348
                                                                                                  ; string    [76]
                      087A  1349        $DS_CLI CLI$K_BR,       0,      START_RUN_QUALS
             00 82    087A                              .BYTE   CLI$K_BR,0
              FF5E    087C                              .WORD   START_RUN_QUALS-<.-2>
```

```
                                087E  1351          .SUBTITLE       BREAKPOINT Start or Run Qualifiers, DEVICE Qualifiers.
                                087E  1352 ;
                                087E  1353 ; Start or Run Qualifier:  / TEst : dec_start : dec_end
                                087E  1354 ;
                                087E  1355 140$:    $DS_CLI CLI$K_STRING,   NOTNUF, 141$,   <'EST'>          ; /TEST          [37]
                          18'8B 087E                        .BYTE   CLI$K_STRING,NOTNUF
                           0008' 0880                       .WORD   141$-<.-2>
                  54 53 45 00' 0882                        .ASCIC  'EST'
                             03 0882
                                0886  1356 141$:    $DS_CLI CLI$K_VALUE,    NOTNUF, ILLEGAL                  ; : or =
                          18'8F 0886                        .BYTE   CLI$K_VALUE,NOTNUF
                           FC4C 0888                        .WORD   ILLEGAL-<.-2>
                                088A  1357          $DS_CLI CLI$K_DEC,      TEST,   ILLEGAL                  ; /TEST:x
                          2C'8A 088A                        .BYTE   CLI$K_DEC,TEST
                           FC48 088C                        .WORD   ILLEGAL-<.-2>
                                088E  1358          $DS_CLI CLI$K_VALUE,    NOTNUF, START_RUN_QUALS          ; : or =
                          18'8F 088E                        .BYTE   CLI$K_VALUE,NOTNUF
                           FF4A 0890                        .WORD   START_RUN_QUALS-<.-2>
                                0892  1359          $DS_CLI CLI$K_DEC,      LAST,   ILLEGAL                  ; /TEST:x:y
                          2D'8A 0892                        .BYTE   CLI$K_DEC,LAST
                           FC40 0894                        .WORD   ILLEGAL-<.-2>
                                0896  1360          $DS_CLI CLI$K_BR,       0,      START_RUN_QUALS          ;
                          00 82 0896                        .BYTE   CLI$K_BR,0
                           FF42 0898                        .WORD   START_RUN_QUALS-<.-2>
                                089A  1361
                                089A  1362 200$:    $DS_CLI CLI$K_RETURN,   ENUF                             ; End of Qualifiers
                          17'93 089A                        .BYTE   CLI$K_RETURN,ENUF
                           0004' 089C                       .WORD   30315$-<.-2>
                                089E       30315$:
                                089E  1363 ;
                                089E  1364 ; <break_qual> = [ / Nobase]
                                089E  1365 ;                 [ / Base : num_base]
                                089E  1366 ;
                                089E  1367 BREAK_QUALS:
                                089E  1368          $DS_CLI CLI$K_SLASH,    0,      110$                     ; Look For A Qualifi
                          00 90 089E                        .BYTE   CLI$K_SLASH,0
                           0028' 08A0                       .WORD   110$-<.-2>
                                08A2  1369
                                08A2  1370          $DS_CLI CLI$K_STRING,   0,      100$,   <'BASE'>         ; Look For / Base
                          00 8B 08A2                        .BYTE   CLI$K_STRING,0
                           0015' 08A4                       .WORD   100$-<.-2>
                45 53 41 42 00' 08A6                        .ASCIC  'BASE'
                             04 08A6
                                08AB  1371          $DS_CLI CLI$K_VALUE,    0,      ILLEGAL                  ;
                          00 8F 08AB                        .BYTE   CLI$K_VALUE,0
                           FC27 08AD                        .WORD   ILLEGAL-<.-2>
                                08AF  1372          $DS_CLI CLI$K_NUM,      BASE_QUAL,ILLEGAL                ; Read Temp Base
                          3F'85 08AF                        .BYTE   CLI$K_NUM,BASE_QUAL
                           FC23 08B1                        .WORD   ILLEGAL-<.-2>
                                08B3  1373          $DS_CLI CLI$K_BR,       0,      BREAK_QUALS              ; Look For Next Qual
                          00 82 08B3                        .BYTE   CLI$K_BR,0
                           FFEB 08B5                        .WORD   BREAK_QUALS-<.-2>
                                08B7  1374
                                08B7  1375 100$:    $DS_CLI CLI$K_STRING,   NOBASE, BAD_QUAL,<'NOBASE'>      ; Look For / Nobase
                          40'8B 08B7                        .BYTE   CLI$K_STRING,NOBASE
                           FC4F 08B9                        .WORD   BAD_QUAL-<.-2>
        45 53 41 42 4F 4E 00' 08BB                        .ASCIC  'NOBASE'
```

```
                          06  08BB
                              08C2  1376          $DS_CLI CLI$K_BR,       0,      BREAK_QUALS             ; Look For Next Qual
                        00 82 08C2                        .BYTE   CLI$K_BR,0
                         FFDC 08C4                        .WORD   BREAK_QUALS-<.-2>
                              08C6  1377
                              08C6  1378 110$:    $DS_CLI CLI$K_RETURN                                    ; No More Qualifiers
                        00 93 08C6                        .BYTE   CLI$K_RETURN,0
                         0004' 08C8                       .WORD   30323$-<.-2>
                              08CA       30323$:
                              08CA  1379 ;
                              08CA  1380 ; <device_qual> = [ / Brief]
                              08CA  1381 ;                 [ / Adapter : alnum_adpater[:]]
                              08CA  1382 ;
                              08CA  1383 DEVICE_QUALS:
                              08CA  1384          $DS_CLI CLI$K_SLASH,    NOTNUF, 130$                    ; /
                        18'90 08CA                        .BYTE   CLI$K_SLASH,NOTNUF
                         002E' 08CC                       .WORD   130$-<.-2>
                              08CE  1385
                              08CE  1386          $DS_CLI CLI$K_STRING,   0,      120$,   <'ADAPTER'>     ; / ADAPTER
                        00 8B 08CE                        .BYTE   CLI$K_STRING,0
                         001C' 08D0                       .WORD   120$-<.-2>
          52 45 54 50 41 44 41 00' 08D2                   .ASCIC  'ADAPTER'
                          07  08D2
                              08DA  1387          $DS_CLI CLI$K_VALUE,    BEGINADAPTER,ILLEGAL                    ; / ADAPTER
                        78'8F 08DA                        .BYTE   CLI$K_VALUE,BEGINADAPTER
                         FBF8 08DC                        .WORD   ILLEGAL-<.-2>
                              08DE  1388          $DS_CLI CLI$K_ALNUM,    ADAPTER,ILLEGAL                 ; Required name
                        79'87 08DE                        .BYTE   CLI$K_ALNUM,ADAPTER
                         FBF4 08E0                        .WORD   ILLEGAL-<.-2>
                              08E2  1389          $DS_CLI <^A":">,        0,      110$                    ; Optional :
                        00 3A 08E2                        .BYTE   ^A":",0
                         0004' 08E4                       .WORD   110$-<.-2>
                              08E6  1390 110$:    $DS_CLI CLI$K_BR,       ENUF,   DEVICE_QUALS            ; Any more quals?
                        17'82 08E6                        .BYTE   CLI$K_BR,ENUF
                         FFE4 08E8                        .WORD   DEVICE_QUALS-<.-2>
                              08EA  1391
                              08EA  1392 120$:    $DS_CLI CLI$K_STRING,   BRIEF,  BAD_QUAL,<'BRIEF'>      ; DEVICE / BRIEF
                        77'8B 08EA                        .BYTE   CLI$K_STRING,BRIEF
                         FC1C 08EC                        .WORD   BAD_QUAL-<.-2>
          46 45 49 52 42 00' 08EE                       .ASCIC  'BRIEF'
                          05  08EE
                              08F4  1393          $DS_CLI CLI$K_BR,       ENUF,   DEVICE_QUALS                    ; Any more q
                        17'82 08F4                        .BYTE   CLI$K_BR,ENUF
                         FFD6 08F6                        .WORD   DEVICE_QUALS-<.-2>
                              08F8  1394
                              08F8  1395 130$:    $DS_CLI CLI$K_RETURN
                        00 93 08F8                        .BYTE   CLI$K_RETURN,0
                         0004' 08FA                       .WORD   30332$-<.-2>
                              08FC       30332$:
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                        08FC  1397          .SUBTITLE EXAMINE & DEPOSIT Qualifiers
                        08FC  1398 ;
                        08FC  1399 ; Read EXAMINE and DEPOSIT Qualifiers.  Qualifiers are:
                        08FC  1400 ;
                        08FC  1401 ;        / Base : number
                        08FC  1402 ;        / NObase
                        08FC  1403 ;        / Byte
                        08FC  1404 ;        / Word
                        08FC  1405 ;        / Longword
                        08FC  1406 ;        / Octal
                        08FC  1407 ;        / Hexadecimal
                        08FC  1408 ;        / Ascii
                        08FC  1409 ;        / Next : number
                        08FC  1410 ;
                        08FC  1411 EXA_DEP_QUALS:
                        08FC  1412          $DS_CLI CLI$K_SLASH,    0,      210$                    ; /
                  00 90 08FC                .BYTE   CLI$K_SLASH,0
                   00AC' 08FE               .WORD   210$-<.-2>
                        0900  1413
                        0900  1414          $DS_CLI CLI$K_STRING,   ASCII,  110$,   <'ASCII'>       ; / ASCII
                  5C'8B 0900                .BYTE   CLI$K_STRING,ASCII
                   000E' 0902               .WORD   110$-<.-2>
         49 49 43 53 41 00' 0904            .ASCIC  'ASCII'
                     05  0904
                        090A  1415          $DS_CLI CLI$K_BR,       0,      EXA_DEP_QUALS           ; Look For More Qual
                  00 82 090A                .BYTE   CLI$K_BR,0
                   FFF2 090C                .WORD   EXA_DEP_QUALS-<.-2>
                        090E  1416
                        090E  1417 110$:    $DS_CLI <^A"B">,        0,      130$                    ; / BASE
                  00 42 090E                .BYTE   ^A"B",0
                   0024' 0910               .WORD   130$-<.-2>
                        0912  1418          $DS_CLI CLI$K_STRING,   0,      120$,   <'ASE'>         ;
                  00 8B 0912                .BYTE   CLI$K_STRING,0
                   0014' 0914               .WORD   120$-<.-2>
               45 53 41 00' 0916            .ASCIC  'ASE'
                     03  0916
                        091A  1419          $DS_CLI CLI$K_VALUE,    0,      ILLEGAL                 ;
                  00 8F 091A                .BYTE   CLI$K_VALUE,0
                   FBB8 091C                .WORD   ILLEGAL-<.-2>
                        091E  1420          $DS_CLI CLI$K_NUM,      BASE_QUAL,ILLEGAL               ; Read Temp Base
                  3F'85 091E                .BYTE   CLI$K_NUM,BASE_QUAL
                   FBB4 0920                .WORD   ILLEGAL-<.-2>
                        0922  1421          $DS_CLI CLI$K_BR,       0,      EXA_DEP_QUALS           ; Look For More Qual
                  00 82 0922                .BYTE   CLI$K_BR,0
                   FFDA 0924                .WORD   EXA_DEP_QUALS-<.-2>
                        0926  1422
                        0926  1423 120$:    $DS_CLI CLI$K_STRING,   0,      121$    ,<'YTE'>        ; / B OR / BYTE
                  00 8B 0926                .BYTE   CLI$K_STRING,0
                   0008' 0928               .WORD   121$-<.-2>
               45 54 59 00' 092A            .ASCIC  'YTE'
                     03  092A
                        092E  1424 121$:    $DS_CLI CLI$K_BR,       BYTE,   EXA_DEP_QUALS           ; Look For More Qual
                  6A'82 092E                .BYTE   CLI$K_BR,BYTE
                   FFCE 0930                .WORD   EXA_DEP_QUALS-<.-2>
                        0932  1425
                        0932  1426 130$:    $DS_CLI CLI$K_STRING, DEC,      140$,   <'DECIMAL'>     ; / DECIMAL
                  6C'8B 0932                .BYTE   CLI$K_STRING,DEC
```

```
                        0010' 0934                      .WORD   140$-<.-2>
          4C 41 4D 49 43 45 44 00' 0936                 .ASCIC  'DECIMAL'
                           07  0936
                               093E  1427          $DS_CLI CLI$K_BR,       0,      EXA_DEP_QUALS           ; Look For More Qual
                        00 82  093E                      .BYTE   CLI$K_BR,0
                         FFBE  0940                      .WORD   EXA_DEP_QUALS-<.-2>
                               0942  1428
                               0942  1429 140$:   $DS_CLI CLI$K_STRING, HEX,      150$,   <'HEXADECIMAL'> ; / HEXADECIMAL
                        6B'8B  0942                      .BYTE   CLI$K_STRING,HEX
                         0014' 0944                      .WORD   150$-<.-2>
4C 41 4D 49 43 45 44 41 58 45 48 00' 0946                .ASCIC  'HEXADECIMAL'
                           0B  0946
                               0952  1430          $DS_CLI CLI$K_BR,       0,      EXA_DEP_QUALS           ; Look For More Qual
                        00 82  0952                      .BYTE   CLI$K_BR,0
                         FFAA  0954                      .WORD   EXA_DEP_QUALS-<.-2>
                               0956  1431
                               0956  1432 150$:   $DS_CLI CLI$K_STRING, LONG,      160$,   <'LONGWORD'>    ; / LONGWORD
                        68'8B  0956                      .BYTE   CLI$K_STRING,LONG
                         0011' 0958                      .WORD   160$-<.-2>
          44 52 4F 57 47 4E 4F 4C 00' 095A               .ASCIC  'LONGWORD'
                           08  095A
                               0963  1433          $DS_CLI CLI$K_BR,       0,      EXA_DEP_QUALS           ; Look For More Qual
                        00 82  0963                      .BYTE   CLI$K_BR,0
                         FF99  0965                      .WORD   EXA_DEP_QUALS-<.-2>
                               0967  1434
                               0967  1435 160$:   $DS_CLI <^A"N">,       0,      190$                    ; / NObase
                        00 4E  0967                      .BYTE   ^A"N",0
                         0026' 0969                      .WORD   190$-<.-2>
                               096B  1436          $DS_CLI CLI$K_STRING,   NOBASE, 170$,   <'OBASE'>       ;
                        40'8B  096B                      .BYTE   CLI$K_STRING,NOBASE
                         000E' 096D                      .WORD   170$-<.-2>
                45 53 41 42 4F 00' 096F                 .ASCIC  'OBASE'
                           05  096F
                               0975  1437          $DS_CLI CLI$K_BR,       0,      EXA_DEP_QUALS           ; Look For More Qual
                        00 82  0975                      .BYTE   CLI$K_BR,0
                         FF87  0977                      .WORD   EXA_DEP_QUALS-<.-2>
                               0979  1438
                               0979  1439 170$:   $DS_CLI CLI$K_STRING,   0,      171$,   <'EXT'>         ; /N OR /NEXT
                        00 8B  0979                      .BYTE   CLI$K_STRING,0
                         0008' 097B                      .WORD   171$-<.-2>
                    54 58 45 00' 097D                   .ASCIC  'EXT'
                           03  097D
                               0981  1440 171$:   $DS_CLI CLI$K_VALUE,  NOTNUF,   ILLEGAL                  ;
                        18'8F  0981                      .BYTE   CLI$K_VALUE,NOTNUF
                         FB51  0983                      .WORD   ILLEGAL-<.-2>
                               0985  1441          $DS_CLI CLI$K_DEC,    NEXT,     ILLEGAL                 ;
                        59'8A  0985                      .BYTE   CLI$K_DEC,NEXT
                         FB4D  0987                      .WORD   ILLEGAL-<.-2>
                               0989  1442          $DS_CLI CLI$K_BR,       0,      EXA_DEP_QUALS           ; Look For More Qual
                        00 82  0989                      .BYTE   CLI$K_BR,0
                         FF73  098B                      .WORD   EXA_DEP_QUALS-<.-2>
                               098D  1443
                               098D  1444 190$:   $DS_CLI CLI$K_STRING, OCT,      200$,   <'OCTAL'>       ; / OCTAL
                        6D'8B  098D                      .BYTE   CLI$K_STRING,OCT
                         000E' 098F                      .WORD   200$-<.-2>
                4C 41 54 43 4F 00' 0991                 .ASCIC  'OCTAL'
                           05  0991
```

```
                         0997  1445          $DS_CLI CLI$K_BR,       0,      EXA_DEP_QUALS           ; Look For More Qual
                   00 82 0997                        .BYTE   CLI$K_BR,0
                    FF65 0999                        .WORD   EXA_DEP_QUALS-<.-2>
                         099B  1446
                         099B  1447 200$:    $DS_CLI CLI$K_STRING, WORD,     BAD_QUAL,<'WORD'>       ; / WORD
                   69'8B 099B                        .BYTE   CLI$K_STRING,WORD
                    FB6B 099D                        .WORD   BAD_QUAL-<.-2>
               44 52 4F 57 00' 099F                  .ASCIC  'WORD'
                      04 099F
                         09A4  1448          $DS_CLI CLI$K_BR,       0,      EXA_DEP_QUALS           ; Look For More Qual
                   00 82 09A4                        .BYTE   CLI$K_BR,0
                    FF58 09A6                        .WORD   EXA_DEP_QUALS-<.-2>
                         09A8  1449
                         09A8  1450 210$:    $DS_CLI CLI$K_RETURN                                    ; No More Qualifiers
                   00 93 09A8                        .BYTE   CLI$K_RETURN,0
                    0004' 09AA                       .WORD   30360$-<.-2>
                         09AC        30360$:
```

```
                        09AC  1452          .SUBTITLE       DEATTACH, DESELECT, and SELECT Parameters.
                        09AC  1453 ;
                        09AC  1454 ;        DEAttach / Adapter : <adapter>  <filespec>
                        09AC  1455 ;        DEAttach  <filespec> / Adapter : <adapter>
                        09AC  1456 ;
                        09AC  1457 DEATTACH_PARAMS:                                                     ;
                        09AC  1458          $DS_CLI CLI$K_SLASH,    NOTNUF, 110$                        ; If not /, get name
              18'90     09AC                        .BYTE   CLI$K_SLASH,NOTNUF
               0020'    09AE                        .WORD   110$-<.-2>
                        09B0  1459
                        09B0  1460          $DS_CLI CLI$K_STRING,   0,      BAD_QUAL,<'ADAPTER'>        ; / ADAPTER
              00 8B     09B0                        .BYTE   CLI$K_STRING,0
               FB56     09B2                        .WORD   BAD_QUAL-<.-2>
 52 45 54 50 41 44 41 00' 09B4                      .ASCIC  'ADAPTER'
                  07    09B4
                        09BC  1461          $DS_CLI CLI$K_VALUE,    NOTNUF, ILLEGAL                     ; Required :
              18'8F     09BC                        .BYTE   CLI$K_VALUE,NOTNUF
               FB16     09BE                        .WORD   ILLEGAL-<.-2>
                        09C0  1462          $DS_CLI CLI$K_BR,       BEGINADAPTER,100$                   ; Start of name
              78'82     09C0                        .BYTE   CLI$K_BR,BEGINADAPTER
               0004'    09C2                        .WORD   100$-<.-2>
                        09C4  1463 100$:    $DS_CLI CLI$K_ALNUM,    ADAPTER,        ILLEGAL             ; Required alpha-num
              79'87     09C4                        .BYTE   CLI$K_ALNUM,ADAPTER
               FB0E     09C6                        .WORD   ILLEGAL-<.-2>
                        09C8  1464          $DS_CLI <^A":">,        0,      110$                        ; Optional :
              00 3A     09C8                        .BYTE   ^A":",0
               0004'    09CA                        .WORD   110$-<.-2>
                        09CC  1465
                        09CC  1466 110$:    $DS_CLI CLI$K_BIF,      IF_FILE_SPEC,140$                   ; End if device
              70'83     09CC                        .BYTE   CLI$K_BIF,IF_FILE_SPEC
               0020'    09CE                        .WORD   140$-<.-2>
                        09D0  1467          $DS_CLI CLI$K_SPACE,    FILESPEC,ILLEGAL                    ; Required <SP>'s, I
              28'84     09D0                        .BYTE   CLI$K_SPACE,FILESPEC
               FB02     09D2                        .WORD   ILLEGAL-<.-2>
                        09D4  1468 120$:    $DS_CLI CLI$K_ALNUM,    FILEND, INCOMPLETE                  ; Device name
              29'87     09D4                        .BYTE   CLI$K_ALNUM,FILEND
               FB12     09D6                        .WORD   INCOMPLETE-<.-2>
                        09D8  1469          $DS_CLI <^A"$">,        FILEND, 125$                        ; Optional '$
              29'24     09D8                        .BYTE   ^A"$",FILEND
               0008'    09DA                        .WORD   125$-<.-2>
                        09DC  1470          $DS_CLI CLI$K_BR,       0,      120$                        ;
              00 82     09DC                        .BYTE   CLI$K_BR,0
               FFF8     09DE                        .WORD   120$-<.-2>
                        09E0  1471
                        09E0  1472 125$:    $DS_CLI <^A":">,        0,      130$                        ; Optional ':'
              00 3A     09E0                        .BYTE   ^A":",0
               0004'    09E2                        .WORD   130$-<.-2>
                        09E4  1473 130$:    $DS_CLI CLI$K_BIF,      IF_ADAPTER,140$                     ; End if adapter
              71'83     09E4                        .BYTE   CLI$K_BIF,IF_ADAPTER
               0008'    09E6                        .WORD   140$-<.-2>
                        09E8  1474          $DS_CLI CLI$K_BR,       NOTNUF, DEATTACH_PARAMS             ; Get adapter
              18'82     09E8                        .BYTE   CLI$K_BR,NOTNUF
               FFC4     09EA                        .WORD   DEATTACH_PARAMS-<.-2>
                        09EC  1475 140$:    $DS_CLI CLI$K_BIF,      IF_ADAPTER,EOL                      ; EOL
              71'83     09EC                        .BYTE   CLI$K_BIF,IF_ADAPTER
               FACE     09EE                        .WORD   EOL-<.-2>
                        09F0  1476          $DS_CLI CLI$K_BR,       0,      INCOMPLETE                  ; No good
```

```
                     00 82  09F0                        .BYTE   CLI$K_BR,0
                      FAF6  09F2                        .WORD   INCOMPLETE-<.-2>
                            09F4  1477 ;
                            09F4  1478 ; DESelect[ / Adapter : link_name[:]]  <device_names>
                            09F4  1479 ;
                            09F4  1480 DESELECT_PARAMS:
                            09F4  1481          $DS_CLI CLI$K_SLASH,    NOTNUF, 100$                    ; Look for Qualifier
                     18'90  09F4                        .BYTE   CLI$K_SLASH,NOTNUF
                      001C' 09F6                        .WORD   100$-<.-2>
                            09F8  1482          $DS_CLI CLI$K_STRING,   0,      BAD_QUAL,<'ADAPTER'>    ; /ADAPTER:<adapter>
                     00 8B  09F8                        .BYTE   CLI$K_STRING,0
                      FB0E  09FA                        .WORD   BAD_QUAL-<.-2>
         52 45 54 50 41 44 41 00' 09FC                  .ASCIC  'ADAPTER'
                        07  09FC
                            0A04  1483          $DS_CLI CLI$K_VALUE,    BEGINADAPTER,ILLEGAL            ; Required :
                     78'8F  0A04                        .BYTE   CLI$K_VALUE,BEGINADAPTER
                      FACE  0A06                        .WORD   ILLEGAL-<.-2>
                            0A08  1484          $DS_CLI CLI$K_ALNUM,    ADAPTER,ILLEGAL                 ; Adapter Name.
                     79'87  0A08                        .BYTE   CLI$K_ALNUM,ADAPTER
                      FACA  0A0A                        .WORD   ILLEGAL-<.-2>
                            0A0C  1485          $DS_CLI <^A":">,        0,      100$                    ; Optional :
                     00 3A  0A0C                        .BYTE   ^A":",0
                      0004' 0A0E                        .WORD   100$-<.-2>
                            0A10  1486
                            0A10  1487 100$:    $DS_CLI CLI$K_BR,       REQUIRED,DEVICE_NAMES           ; Get device names
                     2B'82  0A10                        .BYTE   CLI$K_BR,REQUIRED
                      FBFF  0A12                        .WORD   DEVICE_NAMES-<.-2>
                            0A14  1488 ;
                            0A14  1489 ; SELect<qualifiers>  <device_names>
                            0A14  1490 ;
                            0A14  1491 ; <qualifier> = [ / Noallocate]
                            0A14  1492 ;               [ / Adapter : link_name[:]]
                            0A14  1493 ;
                            0A14  1494 SELECT_PARAMS:
                            0A14  1495          $DS_CLI CLI$K_SLASH,    NOTNUF, 300$                    Look for Qualifiers
                     18'90  0A14                        .BYTE   CLI$K_SLASH,NOTNUF
                      0033' 0A16                        .WORD   300$-<.-2>
                            0A18  1496
                            0A18  1497          $DS_CLI CLI$K_STRING,   0,      200$,   <'ADAPTER'>     ; /ADAPTER:<adapter>
                     00 8B  0A18                        .BYTE   CLI$K_STRING,0
                      001C' 0A1A                        .WORD   200$-<.-2>
         52 45 54 50 41 44 41 00' 0A1C                  .ASCIC  'ADAPTER'
                        07  0A1C
                            0A24  1498          $DS_CLI CLI$K_VALUE,    BEGINADAPTER,ILLEGAL            ; Required :
                     78'8F  0A24                        .BYTE   CLI$K_VALUE,BEGINADAPTER
                      FAAE  0A26                        .WORD   ILLEGAL-<.-2>
                            0A28  1499          $DS_CLI CLI$K_ALNUM,    ADAPTER,ILLEGAL                 ; Adapter Name.
                     79'87  0A28                        .BYTE   CLI$K_ALNUM,ADAPTER
                      FAAA  0A2A                        .WORD   ILLEGAL-<.-2>
                            0A2C  1500          $DS_CLI <^A":">,        0,      100$                    ; Optional :
                     00 3A  0A2C                        .BYTE   ^A":",0
                      0004' 0A2E                        .WORD   100$-<.-2>
                            0A30  1501 100$:    $DS_CLI CLI$K_BR,       0,      SELECT_PARAMS           ; Look for more
                     00 82  0A30                        .BYTE   CLI$K_BR,0
                      FFE4  0A32                        .WORD   SELECT_PARAMS-<.-2>
                            0A34  1502
                            0A34  1503 200$:    $DS_CLI CLI$K_STRING,   NO_ALLOC,BAD_QUAL,<'NOALLOCATE'>; /NOALLOCATE
```

```
                          7C'8B  0A34                        .BYTE   CLI$K_STRING,NO_ALLOC
                           FAD2  0A36                        .WORD   BAD_QUAL-<.-2>
45 54 41 43 4F 4C 4C 41 4F 4E 00' 0A38                        .ASCIC  'NOALLOCATE'
                             0A  0A38
                                 0A43  1504          $DS_CLI CLI$K_BR,       0,      SELECT_PARAMS           ; Look for more
                          00 82  0A43                        .BYTE   CLI$K_BR,0
                           FFD1  0A45                        .WORD   SELECT_PARAMS-<.-2>
                                 0A47  1505
                                 0A47  1506 300$:   $DS_CLI CLI$K_BR,       REQUIRED,DEVICE_NAMES           ; Get Device Names
                          2B'82  0A47                        .BYTE   CLI$K_BR,REQUIRED
                           FBC8  0A49                        .WORD   DEVICE_NAMES-<.-2>
```

```
                     0A4B  1508          .SUBTITLE       Show Parameters and Qualifiers
                     0A4B  1509 ;
                     0A4B  1510 ; SHow parameters:
                     0A4B  1511 ;
                     0A4B  1512 ;        SHow  BAse
                     0A4B  1513 ;        SHow  BReakpoints
                     0A4B  1514 ;        SHow  CAlls                                                 [70]          ;G:3
                     0A4B  1515 ;        SHow  CRd                                                   [67]          ;G:3
                     0A4B  1516 ;        SHow  CPU                                                   [116]         ;G:3
                     0A4B  1517 ;        SHow  DEFaults
                     0A4B  1518 ;        SHow  DEVice
                     0A4B  1519 ;        SHow  ENforce                                               [89]          ;G:3
                     0A4B  1520 ;        SHow  EVent[  Flags]
                     0A4B  1521 ;        SHow  FLags
                     0A4B  1522 ;        SHow  Load
                     0A4B  1523 ;        SHow  MEmory
                     0A4B  1524 ;        SHow  MM
                     0A4B  1525 ;        SHow  Page
                     0A4B  1526 ;        SHow  QACkloop
                     0A4B  1527 ;        SHow  QADefaults
                     0A4B  1528 ;        SHow  QAErrorprints
                     0A4B  1529 ;        SHow  QAMultiplepass
                     0A4B  1530 ;        SHow  QASubtestloops
                     0A4B  1531 ;        SHow  QATestloops
                     0A4B  1532 ;        SHow  SECtions
                     0A4B  1533 ;        SHow  SElected
                     0A4B  1534 ;        SHow  STatus
                     0A4B  1535 ;        SHow  SUpport
                     0A4B  1536 ;        SHow  Tests                                                                 [81]
                     0A4B  1537 ;        SHow  Width
                     0A4B  1538 ;        SHow<qualifiers>  Device
                     0A4B  1539 ;        SHow<qualifiers>  Selected
                     0A4B  1540 ;
                     0A4B  1541 SHOW_PARAMS:
                     0A4B  1542          $DS_CLI CLI$K_SPACE,    0,      310$                        ; If no <SP>'s, chec
           00 84     0A4B                        .BYTE   CLI$K_SPACE,0
            0210'    0A4D                        .WORD   310$-<.-2>
                     0A4F  1543          $DS_CLI <^A"B">,        NOTNUF, 110$                        ; B
          18'42      0A4F                        .BYTE   ^A"B",NOTNUF
            0023'    0A51                        .WORD   110$-<.-2>
                     0A53  1544 ;
                     0A53  1545 ; SHow  BAse
                     0A53  1546 ;
                     0A53  1547          $DS_CLI CLI$K_STRING,   BASE,   100$,   <'ASE'>         ; BAse
          3C'8B      0A53                        .BYTE   CLI$K_STRING,BASE
            000C'    0A55                        .WORD   100$-<.-2>
 45 53 41 00'        0A57                        .ASCIC  'ASE'
              03     0A57
                     0A5B  1548          $DS_CLI CLI$K_BR,       ENUF,   EOL
          17'82      0A5B                        .BYTE   CLI$K_BR,ENUF
            FA5F     0A5D                        .WORD   EOL-<.-2>
                     0A5F  1549 ;
                     0A5F  1550 ; SHow  BReakpoints
                     0A5F  1551 ;
                     0A5F  1552 100$:    $DS_CLI CLI$K_STRING,   BREAK,  ILLEGAL,<'REAKPOINTS'>  ; BReakpoints
          3E'8B      0A5F                        .BYTE   CLI$K_STRING,BREAK
            FA73     0A61                        .WORD   ILLEGAL-<.-2>
```

```
   53 54 4E 49 4F 50 4B 41 45 52 00' 0A63                        .ASCIC  'REAKPOINTS'
                                  0A  0A63
                                      0A6E  1553          $DS_CLI CLI$K_BR,       ENUF,   EOL
                                 17'82  0A6E                     .BYTE   CLI$K_BR,ENUF
                                  FA4C  0A70                     .WORD   EOL-<.-2>
                                      0A72  1554 ;
                                      0A72  1555 ; SHow  CRd                                                          [67]
                                      0A72  1556 ;
                                      0A72  1557 110$:    $DS_CLI <^A"C">,        NOTNUF, 115$                    ; SHow C        [70]
                                 18'43  0A72                     .BYTE   ^A"C",NOTNUF
                                  0027' 0A74                     .WORD   115$-<.-2>
                                      0A76  1558          $DS_CLI CLI$K_STRING,   SHOW_CRD_TRACE,112$,<'RD'>      ; SHow CRd      [70]
                                 22'8B  0A76                     .BYTE   CLI$K_STRING,SHOW_CRD_TRACE
                                  000B' 0A78                     .WORD   112$-<.-2>
                               44 52 00' 0A7A                    .ASCIC  'RD'
                                     02  0A7A
                                      0A7D  1559          $DS_CLI CLI$K_BR,       ENUF,   EOL                     ;               [65]
                                 17'82  0A7D                     .BYTE   CLI$K_BR,ENUF
                                  FA3D  0A7F                     .WORD   EOL-<.-2>
```

```
                        0A81  1561 ;
                        0A81  1562 ; SHow  CAlls
                        0A81  1563 ;
                        0A81  1564 112$:   $DS_CLI CLI$K_STRING,   SHOW_CALLS,113$,<'ALLS'>  ; SHow CAlls [116]  ;G:3
                 23'8B  0A81                       .BYTE   CLI$K_STRING,SHOW_CALLS
                  000D' 0A83                       .WORD   113$-<.-2>
           53 4C 4C 41 00' 0A85                    .ASCIC  'ALLS'
                    04  0A85
                        0A8A  1565         $DS_CLI CLI$K_BR,       ENUF,   EOL                 ;             [70]  ;G:3
                 17'82  0A8A                       .BYTE   CLI$K_BR,ENUF
                  FA30  0A8C                       .WORD   EOL-<.-2>
                        0A8E  1566                                                                                ;G:3
                        0A8E  1567 ;                                                                              ;G:3
                        0A8E  1568 ; SHow Cpu                                                 ; SHOW CPU [116]    ;G:3
                        0A8E  1569 ;                                                                              ;G:3
                        0A8E  1570 113$:   $DS_CLI CLI$K_STRING,   SHOWCPU,ILLEGAL,<'PU'>     ; [116]             ;G:3
                 24'8B  0A8E                       .BYTE   CLI$K_STRING,SHOWCPU
                  FA44  0A90                       .WORD   ILLEGAL-<.-2>
                 55 50 00' 0A92                    .ASCIC  'PU'
                    02  0A92
                        0A95  1571         $DS_CLI CLI$K_BR,       ENUF,   EOL                 ; [116]             ;G:3
                 17'82  0A95                       .BYTE   CLI$K_BR,ENUF
                  FA25  0A97                       .WORD   EOL-<.-2>
                        0A99  1572                                                                                ;G:3
                        0A99  1573 ;
                        0A99  1574 ;
                        0A99  1575 ; SHow  D . . .
                        0A99  1576 ;
                        0A99  1577 115$:   $DS_CLI <^A"D">,        NOTNUF, 150$                   ; D
                 18'44  0A99                       .BYTE   ^A"D",NOTNUF
                  0028' 0A9B                       .WORD   150$-<.-2>
                        0A9D  1578         $DS_CLI <^A"E">,        NOTNUF, ILLEGAL                ; DE
                 18'45  0A9D                       .BYTE   ^A"E",NOTNUF
                  FA35  0A9F                       .WORD   ILLEGAL-<.-2>
                        0AA1  1579 ;
                        0AA1  1580 ; SHow  DEFaults
                        0AA1  1581 ;
                        0AA1  1582         $DS_CLI CLI$K_STRING,   DEFAULT,        120$,   <'FAULTS'>      ; DEFaults
                 43'8B  0AA1                       .BYTE   CLI$K_STRING,DEFAULT
                  000F' 0AA3                       .WORD   120$-<.-2>
        53 54 4C 55 41 46 00' 0AA5                 .ASCIC  'FAULTS'
                    06  0AA5
                        0AAC  1583         $DS_CLI CLI$K_BR,       ENUF,   EOL
                 17'82  0AAC                       .BYTE   CLI$K_BR,ENUF
                  FA0E  0AAE                       .WORD   EOL-<.-2>
                        0AB0  1584 ;
                        0AB0  1585 ; SHow  DEVice[<device_quals>][  <device_names>]                ; See end of SHOW se
                        0AB0  1586 ;
                        0AB0  1587 120$:   $DS_CLI CLI$K_STRING,   DEVICE, ILLEGAL,<'VICE'>       ; DEVice
                 76'8B  0AB0                       .BYTE   CLI$K_STRING,DEVICE
                  FA22  0AB2                       .WORD   ILLEGAL-<.-2>
              45 43 49 56 00' 0AB4                 .ASCIC  'VICE'
                    04  0AB4
                        0AB9  1588         $DS_CLI CLI$K_CALL,     0,      DEVICE_QUALS           ; Read Device Quals
                 00 92  0AB9                       .BYTE   CLI$K_CALL,0
                  FE11  0ABB                       .WORD   DEVICE_QUALS-<.-2>
                        0ABD  1589         $DS_CLI CLI$K_BR,       OPTIONAL,DEVICE_NAMES          ; Get optional names
```

```
                    2A'82  0ABD                          .BYTE   CLI$K_BR,OPTIONAL
                     FB52  0ABF                          .WORD   DEVICE_NAMES-<.-2>
                           0AC1  1590 ;
                           0AC1  1591 ; SHow  ENforce
                           0AC1  1592 ;
                           0AC1  1593 150$:   $DS_CLI <^A"E">,        NOTNUF, 160$                    ; E (skip to 'F')
                    18'45  0AC1                          .BYTE   ^A"E",NOTNUF
                     002E' 0AC3                          .WORD   160$-<.-2>
                           0AC5  1594          $DS_CLI CLI$K_STRING,   SHOWENFORCE,155$,<'NFORCE'>     ; ENforce
                    38'8B  0AC5                          .BYTE   CLI$K_STRING,SHOWENFORCE
                     000F' 0AC7                          .WORD   155$-<.-2>
          45 43 52 4F 46 4E 00' 0AC9                     .ASCIC  'NFORCE'
                       06  0AC9
                           0AD0  1595          $DS_CLI CLI$K_BR,       ENUF,   EOL                     ;
                    17'82  0AD0                          .BYTE   CLI$K_BR,ENUF
                     F9EA  0AD2                          .WORD   EOL-<.-2>
                           0AD4  1596 ;
                           0AD4  1597 ; SHow  EVent[  Flags]
                           0AD4  1598 ;
                           0AD4  1599 155$:   $DS_CLI CLI$K_STRING,   EVENT,  160$,   <'VENT'>        ; EVent
                    3A'8B  0AD4                          .BYTE   CLI$K_STRING,EVENT
                     001B' 0AD6                          .WORD   160$-<.-2>
             54 4E 45 56 00' 0AD8                        .ASCIC  'VENT'
                       04  0AD8
                           0ADD  1600          $DS_CLI CLI$K_SPACE,    ENUF,   EOL                     ;
                    17'84  0ADD                          .BYTE   CLI$K_SPACE,ENUF
                     F9DD  0ADF                          .WORD   EOL-<.-2>
                           0AE1  1601          $DS_CLI CLI$K_STRING,   ENUF,   EOL,    <'FLAGS'>       ; EVent  Flags
                    17'8B  0AE1                          .BYTE   CLI$K_STRING,ENUF
                     F9D9  0AE3                          .WORD   EOL-<.-2>
          53 47 41 4C 46 00' 0AE5                        .ASCIC  'FLAGS'
                       05  0AE5
                           0AEB  1602          $DS_CLI CLI$K_BR,       ENUF,   EOL
                    17'82  0AEB                          .BYTE   CLI$K_BR,ENUF
                     F9CF  0AED                          .WORD   EOL-<.-2>
                           0AEF  1603 ;
                           0AEF  1604 ; SHow Flags
                           0AEF  1605 ;
                           0AEF  1606 160$:   $DS_CLI CLI$K_STRING,   FLAGS,  170$,   <'FLAGS'>        ; Flags
                    3B'8B  0AEF                          .BYTE   CLI$K_STRING,FLAGS
                     000E' 0AF1                          .WORD   170$-<.-2>
          53 47 41 4C 46 00' 0AF3                        .ASCIC  'FLAGS'
                       05  0AF3
                           0AF9  1607          $DS_CLI CLI$K_BR,       ENUF,   EOL
                    17'82  0AF9                          .BYTE   CLI$K_BR,ENUF
                     F9C1  0AFB                          .WORD   EOL-<.-2>
                           0AFD  1608 ;
                           0AFD  1609 ; SHow Load
                           0AFD  1610 ;
                           0AFD  1611 170$:   $DS_CLI CLI$K_STRING,   SHOWLOAD,180$,  <'LOAD'>        ; Load
                    80'8B  0AFD                          .BYTE   CLI$K_STRING,SHOWLOAD
                     000D' 0AFF                          .WORD   180$-<.-2>
             44 41 4F 4C 00' 0B01                        .ASCIC  'LOAD'
                       04  0B01
                           0B06  1612          $DS_CLI CLI$K_BR,       ENUF,   EOL
                    17'82  0B06                          .BYTE   CLI$K_BR,ENUF
                     F9B4  0B08                          .WORD   EOL-<.-2>
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                                  0B0A  1614 ;
                                  0B0A  1615 ; SHow M...
                                  0B0A  1616 ;
                                  0B0A  1617 180$:   $DS_Cli <^A"M">,        0,      190$                    ; Show  M       [62]
                          00 4D   0B0A                        .BYTE   ^A"M",0
                           005A'  0B0C                        .WORD   190$-<.-2>
                                  0B0E  1618 ;
                                  0B0E  1619 ; SHow  MEmory<qualifiers>
                                  0B0E  1620 ;
                                  0B0E  1621         $DS_CLI CLI$K_STRING,   SHOWMEM,189$,   <'EMORY'>       ; MEmory        [62]
                          85'8B   0B0E                        .BYTE   CLI$K_STRING,SHOWMEM
                           004C'  0B10                        .WORD   189$-<.-2>
                 59 52 4F 4D 45 00'  0B12                        .ASCIC  'EMORY'
                             05   0B12
                                  0B18  1622 185$:   $DS_CLI CLI$K_SLASH,    NOTNUF, EOL
                          18'90   0B18                        .BYTE   CLI$K_SLASH,NOTNUF
                           F9A2   0B1A                        .WORD   EOL-<.-2>
                                  0B1C  1623
                                  0B1C  1624         $DS_CLI CLI$K_STRING,   SHOMEMALL,186$, <'ALL'>         ; / All
                          89'8B   0B1C                        .BYTE   CLI$K_STRING,SHOMEMALL
                           000C'  0B1E                        .WORD   186$-<.-2>
                     4C 4C 41 00'  0B20                        .ASCIC  'ALL'
                             03   0B20
                                  0B24  1625         $DS_CLI CLI$K_BR,       ENUF,   185$
                          17'82   0B24                        .BYTE   CLI$K_BR,ENUF
                           FFF4   0B26                        .WORD   185$-<.-2>
                                  0B28  1626
                                  0B28  1627 186$:   $DS_CLI CLI$K_STRING,   SHOMEMBUF,187$, <'BUFFER'>      ; / Buffer
                          87'8B   0B28                        .BYTE   CLI$K_STRING,SHOMEMBUF
                           000F'  0B2A                        .WORD   187$-<.-2>
              52 45 46 46 55 42 00'  0B2C                        .ASCIC  'BUFFER'
                             06   0B2C
                                  0B33  1628         $DS_CLI CLI$K_BR,       ENUF,   185$
                          17'82   0B33                        .BYTE   CLI$K_BR,ENUF
                           FFE5   0B35                        .WORD   185$-<.-2>
                                  0B37  1629
                                  0B37  1630 187$:   $DS_CLI CLI$K_STRING,   SHOMEMDAT,188$, <'DATA_STRUCTURE'>; / Data_structure
                          88'8B   0B37                        .BYTE   CLI$K_STRING,SHOMEMDAT
                           0017'  0B39                        .WORD   188$-<.-2>
54 43 55 52 54 53 5F 41 54 41 44 00'  0B3B                        .ASCIC  'DATA_STRUCTURE'
                        45 52 55   0B47
                             0E   0B3B
                                  0B4A  1631         $DS_CLI CLI$K_BR,       ENUF,   185$
                          17'82   0B4A                        .BYTE   CLI$K_BR,ENUF
                           FFCE   0B4C                        .WORD   185$-<.-2>
                                  0B4E  1632
                                  0B4E  1633 188$:   $DS_CLI CLI$K_STRING,   SHOMEMMAP,BAD_QUAL,<'MAP'>      ; / Map
                          86'8B   0B4E                        .BYTE   CLI$K_STRING,SHOMEMMAP
                           F9B8   0B50                        .WORD   BAD_QUAL-<.-2>
                     50 41 4D 00'  0B52                        .ASCIC  'MAP'
                             03   0B52
                                  0B56  1634         $DS_CLI CLI$K_BR,       ENUF,   185$
                          17'82   0B56                        .BYTE   CLI$K_BR,ENUF
                           FFC2   0B58                        .WORD   185$-<.-2>
                                  0B5A  1635 ;
                                  0B5A  1636 ; SHow MM
                                  0B5A  1637 ;
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                                0B5A  1638 189$:   $DS_CLI CLI$K_STRING,   SHOWMM,ILLEGAL, <'M'>          ; MM            [62]
                          31'8B  0B5A                       .BYTE   CLI$K_STRING,SHOWMM
                           F978  0B5C                       .WORD   ILLEGAL-<.-2>
                          4D 00' 0B5E                       .ASCIC  'M'
                             01  0B5E
                                0B60  1639         $DS_CLI CLI$K_BR,       ENUF,   EOL
                          17'82  0B60                       .BYTE   CLI$K_BR,ENUF
                           F95A  0B62                       .WORD   EOL-<.-2>
                                0B64  1640 ;
                                0B64  1641 ; SHow PAGE
                                0B64  1642 ;
                                0B64  1643 190$:   $DS_CLI CLI$K_STRING,   PAGE,   195$,   <'PAGE'>        ; Page          [71]
                          5A'8B  0B64                       .BYTE   CLI$K_STRING,PAGE
                           000D' 0B66                       .WORD   195$-<.-2>
                 45 47 41 50 00' 0B68                       .ASCIC  'PAGE'
                             04  0B68
                                0B6D  1644         $DS_CLI CLI$K_BR        ENUF,   EOL                    ;               [71]
                          17'82  0B6D                       .BYTE   CLI$K_BR,ENUF
                           F94D  0B6F                       .WORD   EOL-<.-2>
                                0B71  1645 ;
                                0B71  1646 ; SHow  QACklooploops
                                0B71  1647 ;
                                0B71  1648 195$:   $DS_CLI <^A"Q">         NOTNUF, 250$                   ; Q             [42]
                          18'51  0B71                       .BYTE   ^A"Q",NOTNUF
                           007D' 0B73                       .WORD   250$-<.-2>
                                0B75  1649         $DS_CLI <^A"A">         NOTNUF, ILLEGAL                ; QA            [42]
                          18'41  0B75                       .BYTE   ^A"A",NOTNUF
                           F95D  0B77                       .WORD   ILLEGAL-<.-2>
                                0B79  1650         $DS_CLI CLI$K_STRING    QACL,   200$,   <'CKLOOPLOOPS'> ; QACklooploops [42]
                          53'8B  0B79                       .BYTE   CLI$K_STRING,QACL
                           0014' 0B7B                       .WORD   200$-<.-2>
53 50 4F 4F 4C 50 4F 4F 4C 4B 43 00' 0B7D                       .ASCIC  'CKLOOPLOOPS'
                             0B  0B7D
                                0B89  1651         $DS_CLI CLI$K_BR        ENUF,   EOL                    ;               [42]
                          17'82  0B89                       .BYTE   CLI$K_BR,ENUF
                           F931  0B8B                       .WORD   EOL-<.-2>
                                0B8D  1652 ;
                                0B8D  1653 ; SHow  QADefaults
                                0B8D  1654 ;
                                0B8D  1655 200$:   $DS_CLI CLI$K_STRING    QADEF,  210$,   <'DEFAULTS'>    ; QADefaults    [42]
                          57'8B  0B8D                       .BYTE   CLI$K_STRING,QADEF
                           0011' 0B8F                       .WORD   210$-<.-2>
        53 54 4C 55 41 46 45 44 00' 0B91                       .ASCIC  'DEFAULTS'
                             08  0B91
                                0B9A  1656         $DS_CLI CLI$K_BR        ENUF,   EOL                    ;               [42]
                          17'82  0B9A                       .BYTE   CLI$K_BR,ENUF
                           F920  0B9C                       .WORD   EOL-<.-2>
                                0B9E  1657 ;
                                0B9E  1658 ; SHow  QAErrorprints
                                0B9E  1659 ;
                                0B9E  1660 210$:   $DS_CLI CLI$K_STRING    QAEP,   220$,   <'ERRORPRINTS'> ; QAErrorprints [42]
                          52'8B  0B9E                       .BYTE   CLI$K_STRING,QAEP
                           0014' 0BA0                       .WORD   220$-<.-2>
53 54 4E 49 52 50 52 4F 52 52 45 00' 0BA2                       .ASCIC  'ERRORPRINTS'
                             0B  0BA2
                                0BAE  1661         $DS_CLI CLI$K_BR        ENUF,   EOL                    ;               [42]
                          17'82  0BAE                       .BYTE   CLI$K_BR,ENUF
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                     F90C  0BB0                        .WORD   EOL-<.-2>
                           0BB2  1662 ;
                           0BB2  1663 ; SHow QAMultiplepass
                           0BB2  1664 ;
                           0BB2  1665 220$:   $DS_CLI CLI$K_STRING    QAMP,   230$,   <'MULTIPLEPASS'>; QAMultpilepass[42]
                    56'8B  0BB2                        .BYTE   CLI$K_STRING,QAMP
                     0015' 0BB4                        .WORD   230$-<.-2>
53 41 50 45 4C 50 49 54 4C 55 4D 00' 0BB6              .ASCIC  'MULTIPLEPASS'
                       53  0BC2
                       0C  0BB6
                           0BC3  1666         $DS_CLI CLI$K_BR        ENUF,   EOL                     ;               [42]
                    17'82  0BC3                        .BYTE   CLI$K_BR,ENUF
                     F8F7  0BC5                        .WORD   EOL-<.-2>
                           0BC7  1667 ;
                           0BC7  1668 ; SHow  QASubtestloops
                           0BC7  1669 ;
                           0BC7  1670 230$:   $DS_CLI CLI$K_STRING    QASL,   240$,   <'SUBTESTLOOPS'>; QASubtestloops[42]
                    55'8B  0BC7                        .BYTE   CLI$K_STRING,QASL
                     0015' 0BC9                        .WORD   240$-<.-2>
50 4F 4F 4C 54 53 45 54 42 55 53 00' 0BCB              .ASCIC  'SUBTESTLOOPS'
                       53  0BD7
                       0C  0BCB
                           0BD8  1671         $DS_CLI CLI$K_BR        ENUF,   EOL                     ;               [42]
                    17'82  0BD8                        .BYTE   CLI$K_BR,ENUF
                     F8E2  0BDA                        .WORD   EOL-<.-2>
                           0BDC  1672 ;
                           0BDC  1673 ; SHow QATestloops
                           0BDC  1674 ;
                           0BDC  1675 240$:   $DS_CLI CLI$K_STRING    QATL,   ILLEGAL,<'TESTLOOPS'>   ; QATestloops   [42]
                    54'8B  0BDC                        .BYTE   CLI$K_STRING,QATL
                     F8F6  0BDE                        .WORD   ILLEGAL-<.-2>
53 50 4F 4F 4C 54 53 45 54 00' 0BE0                    .ASCIC  'TESTLOOPS'
                       09  0BE0
                           0BEA  1676         $DS_CLI CLI$K_BR        ENUF,   EOL                     ;               [42]
                    17'82  0BEA                        .BYTE   CLI$K_BR,ENUF
                     F8D0  0BEC                        .WORD   EOL-<.-2>
                           0BEE  1677 ;
                           0BEE  1678 ; SHow  SECtions
                           0BEE  1679 ;
                           0BEE  1680 250$:   $DS_CLI <^A"S">,        NOTNUF, 300$                    ; S
                    18'53  0BEE                        .BYTE   ^A"S",NOTNUF
                     0051' 0BF0                        .WORD   300$-<.-2>
                           0BF2  1681         $DS_CLI <^A"E">,        NOTNUF, 280$                    ; SE
                    18'45  0BF2                        .BYTE   ^A"E",NOTNUF
                     0030' 0BF4                        .WORD   280$-<.-2>
                           0BF6  1682 252$:   $DS_CLI CLI$K_STRING,   SHOWSECTIONS,255$,<'CTIONS'>    ; SECtions
                    83'8B  0BF6                        .BYTE   CLI$K_STRING,SHOWSECTIONS
                     000F' 0BF8                        .WORD   255$-<.-2>
         53 4E 4F 49 54 43 00' 0BFA                    .ASCIC  'CTIONS'
                       06  0BFA
                           0C01  1683         $DS_CLI CLI$K_BR,       ENUF,   EOL
                    17'82  0C01                        .BYTE   CLI$K_BR,ENUF
                     F8B9  0C03                        .WORD   EOL-<.-2>
                           0C05  1684 ;
                           0C05  1685 ; SHow  SElected[ / Brief]                                      ; See end of SHOW se
                           0C05  1686 ;
                           0C05  1687 255$:   $DS_CLI CLI$K_STRING,   0,      258$,   <'LECTED'>      ; SElected      [39]
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                     00 8B  0C05                        .BYTE   CLI$K_STRING,0
                      000B' 0C07                        .WORD   258$-<.-2>
          44 45 54 43 45 4C 00' 0C09                    .ASCIC  'LECTED'
                        06  0C09
                            0C10  1688 258$:    $DS_CLI CLI$K_SLASH,    NOTNUF, 260$                    ; /
                     18'90  0C10                        .BYTE   CLI$K_SLASH,NOTNUF
                      000E' 0C12                        .WORD   260$-<.-2>
                            0C14  1689          $DS_CLI CLI$K_STRING,   BRIEF,  BAD_QUAL,<'BRIEF'>      ; SELected /BRIEF
                     77'8B  0C14                        .BYTE   CLI$K_STRING,BRIEF
                      F8F2  0C16                        .WORD   BAD_QUAL-<.-2>
             46 45 49 52 42 00' 0C18                    .ASCIC  'BRIEF'
                        05  0C18
                            0C1E  1690 260$:    $DS_CLI CLI$K_BR,       SHOWSEL,EOL
                     7D'82  0C1E                        .BYTE   CLI$K_BR,SHOWSEL
                      F89C  0C20                        .WORD   EOL-<.-2>
                            0C22  1691 ;
                            0C22  1692 ; SHow  STatus
                            0C22  1693 ;
                            0C22  1694 280$:    $DS_CLI CLI$K_STRING,   SHOWSTATUS,290$,<'TATUS'>       ; STatus        [39]
                     82'8B  0C22                        .BYTE   CLI$K_STRING,SHOWSTATUS
                      000E' 0C24                        .WORD   290$-<.-2>
             53 55 54 41 54 00' 0C26                    .ASCIC  'TATUS'
                        05  0C26
                            0C2C  1695          $DS_CLI CLI$K_BR,       ENUF,   EOL                     ;               [39]
                     17'82  0C2C                        .BYTE   CLI$K_BR,ENUF
                      F88E  0C2E                        .WORD   EOL-<.-2>
                            0C30  1696 ;
                            0C30  1697 ; SHow  SUpport
                            0C30  1698 ;
                            0C30  1699 290$:    $DS_CLI CLI$K_STRING,   SHOWSUP,ILLEGAL,<'UPPORT'>      ; SUpport
                     81'8B  0C30                        .BYTE   CLI$K_STRING,SHOWSUP
                      F8A2  0C32                        .WORD   ILLEGAL-<.-2>
          54 52 4F 50 50 55 00' 0C34                    .ASCIC  'UPPORT'
                        06  0C34
                            0C3B  1700          $DS_CLI CLI$K_BR,       ENUF,   EOL
                     17'82  0C3B                        .BYTE   CLI$K_BR,ENUF
                      F87F  0C3D                        .WORD   EOL-<.-2>
                            0C3F  1701 ;
                            0C3F  1702 ; SHow  Tests
                            0C3F  1703 ;
                            0C3F  1704 300$:    $DS_CLI CLI$K_STRING,   SHOWTESTS,305$, <'TESTS'>       ; Tests         [81]
                     84'8B  0C3F                        .BYTE   CLI$K_STRING,SHOWTESTS
                      000E' 0C41                        .WORD   305$-<.-2>
             53 54 53 45 54 00' 0C43                    .ASCIC  'TESTS'
                        05  0C43
                            0C49  1705          $DS_CLI CLI$K_BR,       ENUF,   EOL                     ;               [81]
                     17'82  0C49                        .BYTE   CLI$K_BR,ENUF
                      F871  0C4B                        .WORD   EOL-<.-2>
                            0C4D  1706 ;
                            0C4D  1707 ; SHow  Width
                            0C4D  1708 ;
                            0C4D  1709 305$:    $DS_CLI CLI$K_STRING,   WIDTH,  310$,   <'WIDTH'>       ; Width         [38]
                     5B'8B  0C4D                        .BYTE   CLI$K_STRING,WIDTH
                      000E' 0C4F                        .WORD   310$-<.-2>
          48 54 44 49 57 00' 0C51                    .ASCIC  'WIDTH'
                        05  0C51
                            0C57  1710          $DS_CLI CLI$K_BR,       ENUF,   EOL                     ;               [38]
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                     17'82  0C57                        .BYTE   CLI$K_BR,ENUF
                      F863  0C59                        .WORD   EOL-<.-2>
                            0C5B  1711 ;
                            0C5B  1712 ; SHow<device_quals>  <option>  <device_names>
                            0C5B  1713 ;
                            0C5B  1714 310$:   $DS_CLI CLI$K_CALL,     0,      DEVICE_QUALS            ; Read Quals
                     00 92  0C5B                        .BYTE   CLI$K_CALL,0
                      FC6F  0C5D                        .WORD   DEVICE_QUALS-<.-2>
                            0C5F  1715 330$:   $DS_CLI CLI$K_SPACE,    NOTNUF, ILLEGAL                 ; Required spaces
                     18'84  0C5F                        .BYTE   CLI$K_SPACE,NOTNUF
                      F873  0C61                        .WORD   ILLEGAL-<.-2>
                            0C63  1716
                            0C63  1717         $DS_CLI CLI$K_STRING,   DEVICE, 340$,   <'DEVICE'>      ; Device
                     76'8B  0C63                        .BYTE   CLI$K_STRING,DEVICE
                      000F' 0C65                        .WORD   340$-<.-2>
      45 43 49 56 45 44 00' 0C67                        .ASCIC  'DEVICE'
                        06  0C67
                            0C6E  1718         $DS_CLI CLI$K_BR,       OPTIONAL,DEVICE_NAMES           ; Optional device na
                     2A'82  0C6E                        .BYTE   CLI$K_BR,OPTIONAL
                      F9A1  0C70                        .WORD   DEVICE_NAMES-<.-2>
                            0C72  1719
                            0C72  1720 340$:   $DS_CLI CLI$K_STRING,   SHOWSEL,ILLEGAL,<'SELECTED'>    ; Selected      [39]
                     7D'8B  0C72                        .BYTE   CLI$K_STRING,SHOWSEL
                      F860  0C74                        .WORD   ILLEGAL-<.-2>
   44 45 54 43 45 4C 45 53 00' 0C76                     .ASCIC  'SELECTED'
                        08  0C76
                            0C7F  1721         $DS_CLI CLI$K_BR,       ENUF,   EOL
                     17'82  0C7F                        .BYTE   CLI$K_BR,ENUF
                      F83B  0C81                        .WORD   EOL-<.-2>
                            0C83  1722 ;
                            0C83  1723 ; End of SHOW.
                            0C83  1724 ;
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                        0C83  1726          .SUBTITLE       Clear Parameters and Qualifiers
                        0C83  1727 ;
                        0C83  1728 ; CLEAR parameters.
                        0C83  1729 ;
                        0C83  1730 ;       CLear  BReakpoints  ...
                        0C83  1731 ;       CLear  Crd  ...
                        0C83  1732 ;       CLear  ENforce
                        0C83  1733 ;       CLear  EVent  ...
                        0C83  1734 ;       CLear  Flags  ...
                        0C83  1735 ;       CLear  ...
                        0C83  1736 ;
                        0C83  1737
                        0C83  1738 CLEAR_PARAMS:
                        0C83  1739          $DS_CLI CLI$K_SPACE,    0,      ILLEGAL                 ; Required <SP>'s
                 00 84  0C83                        .BYTE   CLI$K_SPACE,0
                  F84F  0C85                        .WORD   ILLEGAL-<.-2>
                        0C87  1740          $DS_CLI <^A"B">,        NOTNUF, 116$                    ;"BREAKPOINTS" OR "B
                18'42   0C87                        .BYTE   ^A"B",NOTNUF
                 003E'  0C89                        .WORD   116$-<.-2>
                        0C8B  1741 ;
                        0C8B  1742 ; CLear  BReakpoints<qualifiers>  num_address<qualifiers>
                        0C8B  1743 ; CLear  BReakpoints<qualifiers>  ALl<qualifiers>
                        0C8B  1744 ;
                        0C8B  1745          $DS_CLI CLI$K_STRING,   BREAK,  115$,   <'REAKPOINTS'>  ;
                3E'8B   0C8B                        .BYTE   CLI$K_STRING,BREAK
                 0036'  0C8D                        .WORD   115$-<.-2>
53 54 4E 49 4F 50 4B 41 45 52 00'  0C8F             .ASCIC  'REAKPOINTS'
                   0A   0C8F
                        0C9A  1746          $DS_CLI CLI$K_CALL,     0,      BREAK_QUALS             ; Look For Qualifier
                 00 92  0C9A                        .BYTE   CLI$K_CALL,0
                  FC04  0C9C                        .WORD   BREAK_QUALS-<.-2>
                        0C9E  1747          $DS_CLI CLI$K_SPACE,    0,      ILLEGAL
                 00 84  0C9E                        .BYTE   CLI$K_SPACE,0
                  F834  0CA0                        .WORD   ILLEGAL-<.-2>
                        0CA2  1748
                        0CA2  1749          $DS_CLI <^A"A">,        0,      105$                    ;"All" Or Address
                 00 41  0CA2                        .BYTE   ^A"A",0
                  0013' 0CA4                        .WORD   105$-<.-2>
                        0CA6  1750          $DS_CLI CLI$K_STRING,   ALL,    100$,   <'LL'>
                41'8B   0CA6                        .BYTE   CLI$K_STRING,ALL
                 000B'  0CA8                        .WORD   100$-<.-2>
             4C 4C 00'  0CAA                        .ASCIC  'LL'
                   02   0CAA
                        0CAD  1751          $DS_CLI CLI$K_BR,       0,      110$                    ; Go Look For Quals
                 00 82  0CAD                        .BYTE   CLI$K_BR,0
                  000C' 0CAF                        .WORD   110$-<.-2>
                        0CB1  1752
                        0CB1  1753 100$:    $DS_CLI CLI$K_BR,       BACKUP, 105$                    ;Back Up Over A
                64'82   0CB1                        .BYTE   CLI$K_BR,BACKUP
                 0004'  0CB3                        .WORD   105$-<.-2>
                        0CB5  1754 105$:    $DS_CLI CLI$K_NUM,      ADDRESS,ILLEGAL                 ;Read Address
                3D'85   0CB5                        .BYTE   CLI$K_NUM,ADDRESS
                 F81D   0CB7                        .WORD   ILLEGAL-<.-2>
                        0CB9  1755
                        0CB9  1756 110$:    $DS_CLI CLI$K_CALL,     0,      BREAK_QUALS             ; Look For Qualifier
                 00 92  0CB9                        .BYTE   CLI$K_CALL,0
                  FBE5  0CBB                        .WORD   BREAK_QUALS-<.-2>
```

```
                        0CBD  1757          $DS_CLI CLI$K_BR,        0,      EOL                      ; Done Parsing
                  00 82  0CBD                          .BYTE   CLI$K_BR,0
                   F7FD  0CBF                          .WORD   EOL-<.-2>
                        0CC1  1758
                        0CC1  1759 115$:    $DS_CLI CLI$K_BR,        BACKUP, 170$                     ; Backup over Bell
                  64'82  0CC1                          .BYTE   CLI$K_BR,BACKUP
                   005A' 0CC3                          .WORD   170$-<.-2>
                        0CC5  1760 ;
                        0CC5  1761 ; CLear  Crd<qualifiers>                                          ; NOTE: CL C = CL C/
                        0CC5  1762 ;
                        0CC5  1763 116$:    $DS_CLI CLI$K_STRING,    0,      120$,   <'CRD'>          ; CRD            [69]
                  00 8B  0CC5                          .BYTE   CLI$K_STRING,0
                   0036' 0CC7                          .WORD   120$-<.-2>
            44 52 43 00' 0CC9                          .ASCIC  'CRD'
                     03  0CC9
                        0CCD  1764          $DS_Cli CLI$K_SLASH,     0,      117$,                    ; CRD/           [69]
                  00 90  0CCD                          .BYTE   CLI$K_SLASH,0
                   000E' 0CCF                          .WORD   117$-<.-2>
                        0CD1  1765          $DS_Cli CLI$K_STRING,    0,      118$,   <'TRACE'>        ; CRD/TRACE      [69]
                  00 8B  0CD1                          .BYTE   CLI$K_STRING,0
                   000E' 0CD3                          .WORD   118$-<.-2>
      45 43 41 52 54 00' 0CD5                          .ASCIC  'TRACE'
                     05  0CD5
                        0CDB  1766 117$:    $DS_CLI CLI$K_BR,        CLEAR_CRD_TRACE,EOL                      ;
                  1E'82  0CDB                          .BYTE   CLI$K_BR,CLEAR_CRD_TRACE
                   F7DF  0CDD                          .WORD   EOL-<.-2>
                        0CDF  1767
                        0CDF  1768 118$:    $DS_CLI CLI$K_STRING,    NOTNUF, BAD_QUAL,<'DEBUG'>       ; CRD/DEBUG      [69]
                  18'8B  0CDF                          .BYTE   CLI$K_STRING,NOTNUF
                   F827  0CE1                          .WORD   BAD_QUAL-<.-2>
      47 55 42 45 44 00' 0CE3                          .ASCIC  'DEBUG'
                     05  0CE3
                        0CE9  1769          $DS_CLI CLI$K_SLASH,     NOTNUF, BAD_QUAL,                ; CRD/DEBUG/     [69]
                  18'90  0CE9                          .BYTE   CLI$K_SLASH,NOTNUF
                   F81D  0CEB                          .WORD   BAD_QUAL-<.-2>
                        0CED  1770          $DS_CLI CLI$K_STRING,    0,      BAD_QUAL,<'TRACE'>       ; CRD/DEBUG/TRACE[69
                  00 8B  0CED                          .BYTE   CLI$K_STRING,0
                   F819  0CEF                          .WORD   BAD_QUAL-<.-2>
      45 43 41 52 54 00' 0CF1                          .ASCIC  'TRACE'
                     05  0CF1
                        0CF7  1771          $DS_CLI CLI$K_BR,        CLEAR_CRD_DEBUG,EOL              ;                [69]
                  21'82  0CF7                          .BYTE   CLI$K_BR,CLEAR_CRD_DEBUG
                   F7C3  0CF9                          .WORD   EOL-<.-2>
                        0CFB  1772 ;
                        0CFB  1773 ; CLear  ENforce
                        0CFB  1774 ;
                        0CFB  1775 120$:    $DS_CLI <^A"E">,         0,      170$                     ; an E?
                  00 45  0CFB                          .BYTE   ^A"E",0
                   0020' 0CFD                          .WORD   170$-<.-2>
                        0CFF  1776          $DS_CLI CLI$K_STRING,    CLEARENFORCE,125$, <'NFORCE'>    ; ENFORCE
                  37'8B  0CFF                          .BYTE   CLI$K_STRING,CLEARENFORCE
                   000F' 0D01                          .WORD   125$-<.-2>
   45 43 52 4F 46 4E 00' 0D03                          .ASCIC  'NFORCE'
                     06  0D03
                        0D0A  1777          $DS_CLI CLI$K_BR,        0,      EOL                      ;
                  00 82  0D0A                          .BYTE   CLI$K_BR,0
                   F7B0  0D0C                          .WORD   EOL-<.-2>
```

```
                        0D0E  1778 ;
                        0D0E  1779 ; CLear  EVent  [Flags  ]flag_num , flag_num , ...
                        0D0E  1780 ; CLear  EVent  [Flags  ]All
                        0D0E  1781 ;
                        0D0E  1782 125$:   $DS_CLI CLI$K_STRING,   EVENT,  Illegal,<'VENT'>        ; EVENT
                3A'8B   0D0E                       .BYTE   CLI$K_STRING,EVENT
                 F7C4   0D10                       .WORD   Illegal-<.-2>
      54 4E 45 56 00'   0D12                       .ASCIC  'VENT'
                   04   0D12
                        0D17  1783         $DS_CLI CLI$K_BR,       0,      EVENT_FLAGS             ; Go To Generic Pars
                00 82   0D17                       .BYTE   CLI$K_BR,0
                 F918   0D19                       .WORD   EVENT_FLAGS-<.-2>
                        0D1B  1784 ;
                        0D1B  1785 ; CLear  [FLAGS  ]x , x , x , ...
                        0D1B  1786 ;
                        0D1B  1787 170$:   $DS_CLI CLI$K_BR,       0,      FLAGS_LIST              ; Read Flags list
                00 82   0D1B                       .BYTE   CLI$K_BR,0
                 F807   0D1D                       .WORD   FLAGS_LIST-<.-2>
```

```
                        0D1F  1789          .SUBTITLE       Set Parameters and Qualifiers
                        0D1F  1790 ;
                        0D1F  1791 ; SET parameters and qualifiers.
                        0D1F  1792 ;
                        0D1F  1793 ;        SET  BASE
                        0D1F  1794 ;        SET  BREAKPOINTS...
                        0D1F  1795 ;        SET  CPU
                        0D1F  1796 ;        SET  CRD/TRACE
                        0D1F  1797 ;        SET  DEFAULTS
                        0D1F  1798 ;        SET  ENFORCE
                        0D1F  1799 ;        SET  EVENT...
                        0D1F  1800 ;        SET  FLAGS...
                        0D1F  1801 ;        SET  y,y,y,...
                        0D1F  1802 ;        SET  LOAD
                        0D1F  1803 ;        SET  MEMORY...
                        0D1F  1804 ;        SET  MM...
                        0D1F  1805 ;        SET  PAGE
                        0D1F  1806 ;        SET  QA...
                        0D1F  1807 ;        SET  WIDTH
                        0D1F  1808 ;
                        0D1F  1809 SET_PARAMS:
                        0D1F  1810          $DS_CLI CLI$K_SPACE,    0,      ILLEGAL                 ; Required <SP>'s
                  00 84 0D1F                        .BYTE   CLI$K_SPACE,0
                   F7B3 0D21                        .WORD   ILLEGAL-<.-2>
                        0D23  1811          $DS_CLI <^A"B">,        NOTNUF, 101$                    ; B             [65]
                 18'42  0D23                        .BYTE   ^A"B",NOTNUF
                  003F' 0D25                        .WORD   101$-<.-2>
                        0D27  1812 ;
                        0D27  1813 ; SET  BAse  address
                        0D27  1814 ;
                        0D27  1815          $DS_CLI CLI$K_STRING,   BASE,   90$,    <'ASE'>          ; BASE
                     3C'8B  0D27                        .BYTE   CLI$K_STRING,BASE
                      0014' 0D29                        .WORD   90$-<.-2>
               45 53 41 00' 0D2B                        .ASCIC  'ASE'
                        03  0D2B
                        0D2F  1816          $DS_CLI CLI$K_SPACE,    NOTNUF, ILLEGAL                 ; Required <SP>'s
                     18'84  0D2F                        .BYTE   CLI$K_SPACE,NOTNUF
                      F7A3  0D31                        .WORD   ILLEGAL-<.-2>
                        0D33  1817          $DS_CLI CLI$K_NUM,      ADDRESS,ILLEGAL                 ; BASE Address
                     3D'85  0D33                        .BYTE   CLI$K_NUM,ADDRESS
                      F79F  0D35                        .WORD   ILLEGAL-<.-2>
                        0D37  1818          $DS_CLI CLI$K_BR,       ENUF,   EOL
                     17'82  0D37                        .BYTE   CLI$K_BR,ENUF
                      F783  0D39                        .WORD   EOL-<.-2>
                        0D3B  1819 ;
                        0D3B  1820 ; SET  BReakpoints<qualifiers>  num_address<qualifiers>
                        0D3B  1821 ;
                        0D3B  1822 90$:     $DS_CLI CLI$K_STRING,   BREAK,  115$,   <'REAKPOINTS'>  ;
                     3E'8B  0D3B                        .BYTE   CLI$K_STRING,BREAK
                      0023' 0D3D                        .WORD   115$-<.-2>
53 54 4E 49 4F 50 4B 41 45 52 00' 0D3F                  .ASCIC  'REAKPOINTS'
                        0A  0D3F
                        0D4A  1823          $DS_CLI CLI$K_CALL,     0,      BREAK_QUALS             ; Look For Qualifier
                     00 92  0D4A                        .BYTE   CLI$K_CALL,0
                      FB54  0D4C                        .WORD   BREAK_QUALS-<.-2>
                        0D4E  1824          $DS_CLI CLI$K_SPACE,    0,      ILLEGAL
                     00 84  0D4E                        .BYTE   CLI$K_SPACE,0
```

```
                F784  0D50                              .WORD   ILLEGAL-<.-2>
                      0D52  1825          $DS_CLI CLI$K_NUM,      ADDRESS,ILLEGAL                 ;Read Address
              3D'85   0D52                              .BYTE   CLI$K_NUM,ADDRESS
                F780  0D54                              .WORD   ILLEGAL-<.-2>
                      0D56  1826          $DS_CLI CLI$K_CALL,     0,      BREAK_QUALS             ; Look For Qualifier
              00 92   0D56                              .BYTE   CLI$K_CALL,0
                FB48  0D58                              .WORD   BREAK_QUALS-<.-2>
                      0D5A  1827          $DS_CLI CLI$K_BR,       0,      EOL                     ; Done Parsing
              00 82   0D5A                              .BYTE   CLI$K_BR,0
                F760  0D5C                              .WORD   EOL-<.-2>
                      0D5E  1828
                      0D5E  1829 115$:    $DS_CLI CLI$K_BR,       BACKUP, 350$                    ; Backup over Bell
              64'82   0D5E                              .BYTE   CLI$K_BR,BACKUP
               01A9'  0D60                              .WORD   350$-<.-2>
                      0D62  1830 ;
                      0D62  1831 ; SET  CPu  name
                      0D62  1832 ;
                      0D62  1833 101$:    $DS_CLI <^A"C">,        NOTNUF, 120$                    ; C
              18'43   0D62                              .BYTE   ^A"C",NOTNUF
                0054' 0D64                              .WORD   120$-<.-2>
                      0D66  1834          $DS_CLI CLI$K_STRING,   0,      112$,   <'PU'>          ; CPU
              00 8B   0D66                              .BYTE   CLI$K_STRING,0
                001B' 0D68                              .WORD   112$-<.-2>
           55 50 00'  0D6A                              .ASCIC  'PU'
                 02   0D6A
                      0D6D  1835          $DS_CLI CLI$K_SPACE,    NOTNUF, ILLEGAL                 ; Required <SP>'s
              18'84   0D6D                              .BYTE   CLI$K_SPACE,NOTNUF
                F765  0D6F                              .WORD   ILLEGAL-<.-2>
                      0D71  1836          $DS_CLI CLI$K_BR,       FILESPEC,110$                   ; Put device name in
              28'82   0D71                              .BYTE   CLI$K_BR,FILESPEC
                0004' 0D73                              .WORD   110$-<.-2>
                      0D75  1837 110$:    $DS_CLI CLI$K_ALNUM,    FILEND, 118$                    ; CLI$Q_FILE quadwor
              29'87   0D75                              .BYTE   CLI$K_ALNUM,FILEND
                0025' 0D77                              .WORD   118$-<.-2>
                      0D79  1838          $DS_CLI <^A":">,        0,      111$                    ; Optional :
              00 3A   0D79                              .BYTE   ^A":",0
                0004' 0D7B                              .WORD   111$-<.-2>
                      0D7D  1839 111$:    $DS_CLI CLI$K_BR,       SETCPU, EOL                     ; stop here     [101
              39'82   0D7D                              .BYTE   CLI$K_BR,SETCPU
                F73D  0D7F                              .WORD   EOL-<.-2>
                      0D81  1840 ;
                      0D81  1841 ; SET  Crd[ / Trace]
                      0D81  1842 ; SET  Crd[ / Debug / Trace ]
                      0D81  1843 ;
                      0D81  1844 112$:    $DS_CLI CLI$K_STRING,   0,      120$,   <'RD'>          ; CRD           [69]
              00 8B   0D81                              .BYTE   CLI$K_STRING,0
                0035' 0D83                              .WORD   120$-<.-2>
           44 52 00'  0D85                              .ASCIC  'RD'
                 02   0D85
                      0D88  1845          $DS_Cli CLI$K_SLASH,    0,      117$,                   ; CRD/          [69]
              00 90   0D88                              .BYTE   CLI$K_SLASH,0
                000E' 0D8A                              .WORD   117$-<.-2>
                      0D8C  1846          $DS_Cli CLI$K_STRING,   0,      118$,   <'TRACE'>       ; CRD/TRACE     [69]
              00 8B   0D8C                              .BYTE   CLI$K_STRING,0
                000E' 0D8E                              .WORD   118$-<.-2>
45 43 41 52 54 00'  0D90                              .ASCIC  'TRACE'
                 05   0D90
```

```
                                0D96  1847 117$:   $DS_CLI CLI$K_BR,       SET_CRD_TRACE,EOL                ;                [69]
                          1F'82  0D96                        .BYTE   CLI$K_BR,SET_CRD_TRACE
                           F724  0D98                        .WORD   EOL-<.-2>
                                0D9A  1848
                                0D9A  1849 118$:   $DS_CLI CLI$K_STRING,   NOTNUF, BAD_QUAL,<'DEBUG'>       ; CRD/DEBUG      [69]
                          18'8B  0D9A                        .BYTE   CLI$K_STRING,NOTNUF
                           F76C  0D9C                        .WORD   BAD_QUAL-<.-2>
                47 55 42 45 44 00' 0D9E                        .ASCIC  'DEBUG'
                             05  0D9E
                                0DA4  1850         $DS_CLI CLI$K_SLASH,    NOTNUF, BAD_QUAL,                ; CRD/DEBUG/     [69]
                          18'90  0DA4                        .BYTE   CLI$K_SLASH,NOTNUF
                           F762  0DA6                        .WORD   BAD_QUAL-<.-2>
                                0DA8  1851         $DS_CLI CLI$K_STRING,   0,      BAD_QUAL,<'TRACE'>       ; CRD/DEBUG/TRACE[69
                          00 8B  0DA8                        .BYTE   CLI$K_STRING,0
                           F75E  0DAA                        .WORD   BAD_QUAL-<.-2>
                45 43 41 52 54 00' 0DAC                        .ASCIC  'TRACE'
                             05  0DAC
                                0DB2  1852         $DS_CLI CLI$K_BR,       SET_CRD_DEBUG,EOL                ;                [69]
                          20'82  0DB2                        .BYTE   CLI$K_BR,SET_CRD_DEBUG
                           F708  0DB4                        .WORD   EOL-<.-2>
                                0DB6  1853 ;
                                0DB6  1854 ; SET  Defaults...
                                0DB6  1855 ;
                                0DB6  1856 120$:   $DS_CLI CLI$K_STRING,   DEFAULT,130$,   <'DEFAULTS'>    ; DEFAULTS
                          43'8B  0DB6                        .BYTE   CLI$K_STRING,DEFAULT
                           0011' 0DB8                        .WORD   130$-<.-2>
        53 54 4C 55 41 46 45 44 00' 0DBA                        .ASCIC  'DEFAULTS'
                             08  0DBA
                                0DC3  1857         $DS_CLI CLI$K_BR,       NOTNUF, SET_DEFAULT_PARAMS       ; Get parameters
                          18'82  0DC3                        .BYTE   CLI$K_BR,NOTNUF
                           0148' 0DC5                        .WORD   SET_DEFAULT_PARAMS-<.-2>
                                0DC7  1858 ;
                                0DC7  1859 ; SET  ENforce
                                0DC7  1860 ;
                                0DC7  1861 130$:   $Ds_Cli <^A"E">,        0,      190$                     ; an E?
                          00 45  0DC7                        .BYTE   ^A"E",0
                           0020' 0DC9                        .WORD   190$-<.-2>
                                0DCB  1862         $DS_CLI CLI$K_STRING,   0,      135$, <'NFORCE'>         ; ENFORCE
                          00 8B  0DCB                        .BYTE   CLI$K_STRING,0
                           000F' 0DCD                        .WORD   135$-<.-2>
            45 43 52 4F 46 4E 00' 0DCF                        .ASCIC  'NFORCE'
                             06  0DCF
                                0DD6  1863         $DS_CLI CLI$K_BR,       SETENFORCE,EOL                   ;
                          36'82  0DD6                        .BYTE   CLI$K_BR,SETENFORCE
                           F6E4  0DD8                        .WORD   EOL-<.-2>
                                0DDA  1864 ;
                                0DDA  1865 ; SET  EVent  [Flags  ]flag_num , flag_num , ...
                                0DDA  1866 ; SET  EVent  [Flags  ]All
                                0DDA  1867 ;
                                0DDA  1868 135$:   $DS_CLI CLI$K_STRING,   EVENT,  ILLEGAL,<'VENT'>         ; EVENT
                          3A'8B  0DDA                        .BYTE   CLI$K_STRING,EVENT
                           F6F8  0DDC                        .WORD   ILLEGAL-<.-2>
                54 4E 45 56 00' 0DDE                        .ASCIC  'VENT'
                             04  0DDE
                                0DE3  1869         $DS_CLI CLI$K_BR,       0,      EVENT_FLAGS              ; Generic Event Pars
                          00 82  0DE3                        .BYTE   CLI$K_BR,0
                           F84C  0DE5                        .WORD   EVENT_FLAGS-<.-2>
```

```
                        0DE7  1870 ;
                        0DE7  1871 ; SET  LOAd  <file-spec>
                        0DE7  1872 ;
                        0DE7  1873 190$:   $DS_CLI <^A"L">,          NOTNUF, 220$                    ; L
                 18'4C  0DE7                .BYTE   ^A"L",NOTNUF
                  0023' 0DE9                .WORD   220$-<.-2>
                        0DEB  1874         $DS_CLI <^A"O">,          NOTNUF, ILLEGAL                 ; LO
                 18'4F  0DEB                .BYTE   ^A"O",NOTNUF
                  F6E7  0DED                .WORD   ILLEGAL-<.-2>
                        0DEF  1875         $DS_CLI CLI$K_STRING,     SETLOAD,200$,   <'AD'>          ; LOAD
                 7F'8B  0DEF                .BYTE   CLI$K_STRING,SETLOAD
                  0013' 0DF1                .WORD   200$-<.-2>
              44 41 00' 0DF3                .ASCIC  'AD'
                    02  0DF3
                        0DF6  1876         $DS_CLI CLI$K_SPACE,      NOTNUF, ILLEGAL                 ; Required spaces
                 18'84  0DF6                .BYTE   CLI$K_SPACE,NOTNUF
                  F6DC  0DF8                .WORD   ILLEGAL-<.-2>
                        0DFA  1877         $DS_CLI CLI$K_CALL,       REQUIRED,GET_FILE_SPEC          ; Required file-spec
                 2B'92  0DFA                .BYTE   CLI$K_CALL,REQUIRED
                  F85F  0DFC                .WORD   GET_FILE_SPEC-<.-2>
                        0DFE  1878         $DS_CLI CLI$K_BR,         ENUF, EOL                       ; Done With Command
                 17'82  0DFE                .BYTE   CLI$K_BR,ENUF
                  F6BC  0E00                .WORD   EOL-<.-2>
                        0E02  1879
                        0E02  1880 200$:   $DS_CLI CLI$K_BR,         BACKUP, 210$                    ; Backup over "O"
                 64'82  0E02                .BYTE   CLI$K_BR,BACKUP
                  0004' 0E04                .WORD   210$-<.-2>
                        0E06  1881 210$:   $DS_CLI CLI$K_BR,         BACKUP, 350$                    ; Backup over "L", R
                 64'82  0E06                .BYTE   CLI$K_BR,BACKUP
                  0101' 0E08                .WORD   350$-<.-2>
                        0E0A  1882 ;                                                                  [75]
                        0E0A  1883 ; SET  MEmory  n
                        0E0A  1884 ;                                                                  [75]
                        0E0A  1885 220$:   $DS_CLI <^A"M">,          NOTNUF, 235$                    ; M             [75]
                 18'4D  0E0A                .BYTE   ^A"M",NOTNUF
                  003E' 0E0C                .WORD   235$-<.-2>
                        0E0E  1886         $DS_CLI CLI$K_STRING,     SETMEM, 225$,   <'EMORY'>       ; MEMORY        [75]
                 8A'8B  0E0E                .BYTE   CLI$K_STRING,SETMEM
                  0016' 0E10                .WORD   225$-<.-2>
        59 52 4F 4D 45 00' 0E12             .ASCIC  'EMORY'
                    05  0E12
                        0E18  1887         $DS_CLI CLI$K_SPACE,      0,      ILLEGAL                 ; Required <SP>'s[75
                 00 84  0E18                .BYTE   CLI$K_SPACE,0
                  F6BA  0E1A                .WORD   ILLEGAL-<.-2>
                        0E1C  1888         $DS_CLI CLI$K_DEC,        DATA,   ILLEGAL                 ; data          [75]
                 66'8A  0E1C                .BYTE   CLI$K_DEC,DATA
                  F6B6  0E1E                .WORD   ILLEGAL-<.-2>
                        0E20  1889         $DS_CLI CLI$K_BR,         ENUF,   EOL                     ;               [75]
                 17'82  0E20                .BYTE   CLI$K_BR,ENUF
                  F69A  0E22                .WORD   EOL-<.-2>
```

```
                    0E24  1891 ; SET  MM  ON
                    0E24  1892 ; SET  MM  OFf
                    0E24  1893 ;
                    0E24  1894 225$:   $DS_CLI CLI$K_STRING,   NOTNUF, 235$,   <'MM'>          ; MM            [75]
          18'8B     0E24                       .BYTE   CLI$K_STRING,NOTNUF
           0024'    0E26                       .WORD   235$-<.-2>
       4D 4D 00'    0E28                       .ASCIC  'MM'
             02     0E28
                    0E2B  1895         $DS_CLI CLI$K_SPACE,    0,      ILLEGAL                 ; Required <SP>'s
          00 84     0E2B                       .BYTE   CLI$K_SPACE,0
           F6A7     0E2D                       .WORD   ILLEGAL-<.-2>
                    0E2F  1896         $DS_CLI <^A"O">,        NOTNUF, ILLEGAL                 ; MM O
          18'4F     0E2F                       .BYTE   ^A"O",NOTNUF
           F6A3     0E31                       .WORD   ILLEGAL-<.-2>
                    0E33  1897         $DS_CLI CLI$K_STRING,   MMON,   230$,   <'N'>           ; MM ON
          2F'8B     0E33                       .BYTE   CLI$K_STRING,MMON
           000A'    0E35                       .WORD   230$-<.-2>
          4E 00'    0E37                       .ASCIC  'N'
             01     0E37
                    0E39  1898         $DS_CLI CLI$K_BR,       ENUF,   EOL
          17'82     0E39                       .BYTE   CLI$K_BR,ENUF
           F681     0E3B                       .WORD   EOL-<.-2>
                    0E3D  1899
                    0E3D  1900 230$:   $DS_CLI CLI$K_STRING,   MMOFF,  ILLEGAL,<'FF'>          ; MM OFF
          30'8B     0E3D                       .BYTE   CLI$K_STRING,MMOFF
           F695     0E3F                       .WORD   ILLEGAL-<.-2>
       46 46 00'    0E41                       .ASCIC  'FF'
             02     0E41
                    0E44  1901         $DS_CLI CLI$K_BR,       ENUF,   EOL
          17'82     0E44                       .BYTE   CLI$K_BR,ENUF
           F676     0E46                       .WORD   EOL-<.-2>
                    0E48  1902 ;
                    0E48  1903 ; SET  PAGE  n
                    0E48  1904 ;
                    0E48  1905 235$:   $DS_CLI <^A"P">,        NOTNUF, 240$                    ;               [71]
          18'50     0E48                       .BYTE   ^A"P",NOTNUF
           001C'    0E4A                       .WORD   240$-<.-2>
                    0E4C  1906         $DS_CLI CLI$K_STRING,   PAGE,   237$,   <'AGE'>         ; PAGE          [71]
          5A'8B     0E4C                       .BYTE   CLI$K_STRING,PAGE
           0014'    0E4E                       .WORD   237$-<.-2>
    45 47 41 00'    0E50                       .ASCIC  'AGE'
             03     0E50
                    0E54  1907         $DS_CLI CLI$K_SPACE,    NOTNUF, ILLEGAL                 ; required space[71]
          18'84     0E54                       .BYTE   CLI$K_SPACE,NOTNUF
           F67E     0E56                       .WORD   ILLEGAL-<.-2>
                    0E58  1908         $DS_CLI CLI$K_DEC,      DATA,   ILLEGAL                 ; data          [71]
          66'8A     0E58                       .BYTE   CLI$K_DEC,DATA
           F67A     0E5A                       .WORD   ILLEGAL-<.-2>
                    0E5C  1909         $DS_CLI CLI$K_BR,       ENUF,   EOL                     ;               [71]
          17'82     0E5C                       .BYTE   CLI$K_BR,ENUF
           F65E     0E5E                       .WORD   EOL-<.-2>
                    0E60  1910
                    0E60  1911 237$:   $DS_CLI CLI$K_BR,       BACKUP, 350$            ; Back up 'P', Check Flags L
          64'82     0E60                       .BYTE   CLI$K_BR,BACKUP
           00A7'    0E62                       .WORD   350$-<.-2>
```

```
                                  0E64  1913 ; SET  QACklooploops  x
                                  0E64  1914 ; SET  QADefaults
                                  0E64  1915 ; SET  QAErrorprints  x
                                  0E64  1916 ; SET  QAMultiplepass  x
                                  0E64  1917 ; SET  QASubtestloops  x
                                  0E64  1918 ; SET  QATestloops  x
                                  0E64  1919 ;
                                  0E64  1920 240$:   $DS_CLI <^A"Q">,        NOTNUF, 300$                    ; Q              [42]
                            18'51  0E64                      .BYTE   ^A"Q",NOTNUF
                             008D' 0E66                      .WORD   300$-<.-2>
                                  0E68  1921         $DS_CLI <^A"A">,        NOTNUF, 295$                    ; QA             [42]
                            18'41  0E68                      .BYTE   ^A"A",NOTNUF
                             0085' 0E6A                      .WORD   295$-<.-2>
                                  0E6C  1922
                                  0E6C  1923         $DS_CLI CLI$K_STRING,   QACL,   250$,   <'CKLOOPLOOPS'> ; QACKLOOPLOOPS [42]
                            53'8B  0E6C                      .BYTE   CLI$K_STRING,QACL
                             0014' 0E6E                      .WORD   250$-<.-2>
53 50 4F 4F 4C 50 4F 4F 4C 4B 43 00' 0E70                      .ASCIC  'CKLOOPLOOPS'
                               0B  0E70
                                  0E7C  1924         $DS_CLI CLI$K_BR,       0,      291$                    ; Read QA Data
                            00 82  0E7C                      .BYTE   CLI$K_BR,0
                             0065' 0E7E                      .WORD   291$-<.-2>
                                  0E80  1925
                                  0E80  1926 250$:   $DS_CLI CLI$K_STRING,   QADEF,  260$,   <'DEFAULTS'>    ; QADEFAULTS    [42]
                            57'8B  0E80                      .BYTE   CLI$K_STRING,QADEF
                             0011' 0E82                      .WORD   260$-<.-2>
        53 54 4C 55 41 46 45 44 00' 0E84                      .ASCIC  'DEFAULTS'
                               08  0E84
                                  0E8D  1927         $DS_CLI CLI$K_BR,       ENUF,   EOL                     ; No data       [42]
                            17'82  0E8D                      .BYTE   CLI$K_BR,ENUF
                             F62D  0E8F                      .WORD   EOL-<.-2>
                                  0E91  1928
                                  0E91  1929 260$:   $DS_CLI CLI$K_STRING,   QAEP,   270$,   <'ERRORPRINTS'> ; QAERRORPRINTS [42]
                            52'8B  0E91                      .BYTE   CLI$K_STRING,QAEP
                             0014' 0E93                      .WORD   270$-<.-2>
53 54 4E 49 52 50 52 4F 52 52 45 00' 0E95                      .ASCIC  'ERRORPRINTS'
                               0B  0E95
                                  0EA1  1930         $DS_CLI CLI$K_BR,       0,      291$                    ; Read QA Data
                            00 82  0EA1                      .BYTE   CLI$K_BR,0
                             0040' 0EA3                      .WORD   291$-<.-2>
                                  0EA5  1931
                                  0EA5  1932 270$:   $DS_CLI CLI$K_STRING,   QAMP,   280$,   <'MULTIPLEPASS'>; QAMULTIPLEPASS[42]
                            56'8B  0EA5                      .BYTE   CLI$K_STRING,QAMP
                             0015' 0EA7                      .WORD   280$-<.-2>
53 41 50 45 4C 50 49 54 4C 55 4D 00' 0EA9                      .ASCIC  'MULTIPLEPASS'
                               53  0EB5
                               0C  0EA9
                                  0EB6  1933         $DS_CLI CLI$K_BR,       0,      291$                    ; Read QA Data
                            00 82  0EB6                      .BYTE   CLI$K_BR,0
                             002B' 0EB8                      .WORD   291$-<.-2>
                                  0EBA  1934
                                  0EBA  1935 280$:   $DS_CLI CLI$K_STRING,   QASL,   290$,   <'SUBTESTLOOPS'>; QASUBTESTLOOPS[42]
                            55'8B  0EBA                      .BYTE   CLI$K_STRING,QASL
                             0015' 0EBC                      .WORD   290$-<.-2>
50 4F 4F 4C 54 53 45 54 42 55 53 00' 0EBE                      .ASCIC  'SUBTESTLOOPS'
                               53  0ECA
                               0C  0EBE
```

```
                        0ECB  1936          $DS_CLI CLI$K_BR,       0,      291$                    ; Read QA Data
                 00 82  0ECB                        .BYTE   CLI$K_BR,0
                  0016' 0ECD                        .WORD   291$-<.-2>
                        0ECF  1937
                        0ECF  1938 290$:    $DS_CLI CLI$K_STRING,   QATL,   ILLEGAL,<'TESTLOOPS'>   ; QATESTLOOPS   [42]
                 54'8B  0ECF                        .BYTE   CLI$K_STRING,QATL
                  F603  0ED1                        .WORD   ILLEGAL-<.-2>
53 50 4F 4F 4C 54 53 45 54 00' 0ED3                 .ASCIC  'TESTLOOPS'
                    09  0ED3
                        0EDD  1939          $DS_CLI CLI$K_BR,       0,      291$                    ; Read QA Data
                 00 82  0EDD                        .BYTE   CLI$K_BR,0
                  0004' 0EDF                        .WORD   291$-<.-2>
                        0EE1  1940
                        0EE1  1941 291$:    $DS_CLI CLI$K_SPACE,    0,      ILLEGAL                 ; Read QA Data
                 00 84  0EE1                        .BYTE   CLI$K_SPACE,0
                  F5F1  0EE3                        .WORD   ILLEGAL-<.-2>
                        0EE5  1942          $DS_CLI CLI$K_DEC,      DATA,   ILLEGAL                 ;
                 66'8A  0EE5                        .BYTE   CLI$K_DEC,DATA
                  F5ED  0EE7                        .WORD   ILLEGAL-<.-2>
                        0EE9  1943          $DS_CLI CLI$K_BR,       0,      EOL                     ;
                 00 82  0EE9                        .BYTE   CLI$K_BR,0
                  F5D1  0EEB                        .WORD   EOL-<.-2>
                        0EED  1944
                        0EED  1945 295$:    $DS_CLI CLI$K_BR,       BACKUP, 350$                    ; Back up 'Q', Check
                 64'82  0EED                        .BYTE   CLI$K_BR,BACKUP
                  001A' 0EEF                        .WORD   350$-<.-2>
                        0EF1  1946 ;
                        0EF1  1947 ;
                        0EF1  1948 ; SET WIDTH x
                        0EF1  1949 ;
                        0EF1  1950 300$:    $DS_CLI CLI$K_STRING,   WIDTH,  350$,<'WIDTH'>; WIDTH                   ;G:4
              5B'8B     0EF1                        .BYTE   CLI$K_STRING,WIDTH
               0016'    0EF3                        .WORD   350$-<.-2>
48 54 44 49 57 00'      0EF5                        .ASCIC  'WIDTH'
                   05   0EF5
                        0EFB  1951          $DS_CLI CLI$K_SPACE,    NOTNUF, ILLEGAL                 ; Required <SP>'s
              18'84     0EFB                        .BYTE   CLI$K_SPACE,NOTNUF
               F5D7     0EFD                        .WORD   ILLEGAL-<.-2>
                        0EFF  1952          $DS_CLI CLI$K_DEC,      DATA,   ILLEGAL                 ; WIDTH x
              66'8A     0EFF                        .BYTE   CLI$K_DEC,DATA
               F5D3     0F01                        .WORD   ILLEGAL-<.-2>
                        0F03  1953          $DS_CLI CLI$K_BR,       ENUF,   EOL
              17'82     0F03                        .BYTE   CLI$K_BR,ENUF
               F5B7     0F05                        .WORD   EOL-<.-2>
                        0F07  1954 ;
                        0F07  1955 ; SET  [FLAGS  ]x , x , x , ...
                        0F07  1956 ;
                        0F07  1957 350$:    $DS_CLI CLI$K_BR,       0,      FLAGS_LIST              ; Read Flags list
                 00 82  0F07                        .BYTE   CLI$K_BR,0
                  F61B  0F09                        .WORD   FLAGS_LIST-<.-2>
```

```
                     0F0B  1959          .SUBTITLE       Set Default Parameters
                     0F0B  1960 ;
                     0F0B  1961 ; SET DEFAULT parameters.
                     0F0B  1962 ;
                     0F0B  1963 ; This allows a list of sizes and radixes, each one separated
                     0F0B  1964 ; by a comma. Spaces may appear on either side of the commas.
                     0F0B  1965 ; If conflicting radixes (sizes) are given, the "biggest" one
                     0F0B  1966 ; is used. That is,
                     0F0B  1967 ;       HEXADECIMAL > DECIMAL > OCTAL
                     0F0B  1968 ;       LONGWORD > WORD > BYTE
                     0F0B  1969 ;
                     0F0B  1970
                     0F0B  1971 SET_DEFAULT_PARAMS:
                     0F0B  1972          $DS_CLI CLI$K_SPACE     0,      ILLEGAL                 ; Required <SP>'s
                00 84  0F0B                          .BYTE   CLI$K_SPACE,0
                 F5C7  0F0D                          .WORD   ILLEGAL-<.-2>
```

```
                        0F0F  1974 ;
                        0F0F  1975 ; SET DEFAULT BYTE
                        0F0F  1976 ;
                        0F0F  1977 100$:   $DS_CLI CLI$K_STRING, BYTE,     110$,   <'BYTE'>         ; BYTE
                 6A'8B  0F0F                       .BYTE   CLI$K_STRING,BYTE
                  000D' 0F11                       .WORD   110$-<.-2>
           45 54 59 42 00' 0F13                    .ASCIC  'BYTE'
                    04  0F13
                        0F18  1978         $DS_CLI CLI$K_BR,        0,      160$
                 00 82  0F18                       .BYTE   CLI$K_BR,0
                  0054' 0F1A                       .WORD   160$-<.-2>
                        0F1C  1979 ;
                        0F1C  1980 ;  SET DEFAULT DECIMAL
                        0F1C  1981 ;
                        0F1C  1982 110$:   $DS_CLI CLI$K_STRING, DEC,      120$,   <'DECIMAL'>      ; DECIMAL
                 6C'8B  0F1C                       .BYTE   CLI$K_STRING,DEC
                  0010' 0F1E                       .WORD   120$-<.-2>
     4C 41 4D 49 43 45 44 00' 0F20                 .ASCIC  'DECIMAL'
                    07  0F20
                        0F28  1983         $DS_CLI CLI$K_BR,        0,      160$
                 00 82  0F28                       .BYTE   CLI$K_BR,0
                  0044' 0F2A                       .WORD   160$-<.-2>
                        0F2C  1984 ;
                        0F2C  1985 ; SET DEFAULT HEXADECIMAL
                        0F2C  1986 ;
                        0F2C  1987 120$:   $DS_CLI CLI$K_STRING, HEX,      130$,   <'HEXADECIMAL'> ; HEXADECIMAL
                 6B'8B  0F2C                       .BYTE   CLI$K_STRING,HEX
                  0014' 0F2E                       .WORD   130$-<.-2>
4C 41 4D 49 43 45 44 41 58 45 48 00' 0F30          .ASCIC  'HEXADECIMAL'
                    0B  0F30
                        0F3C  1988         $DS_CLI CLI$K_BR,        0,      160$
                 00 82  0F3C                       .BYTE   CLI$K_BR,0
                  0030' 0F3E                       .WORD   160$-<.-2>
                        0F40  1989 ;
                        0F40  1990 ; SET DEFAULT LONGWORD
                        0F40  1991 ;
                        0F40  1992 130$:   $DS_CLI CLI$K_STRING, LONG,     140$,   <'LONGWORD'>     ; LONGWORD
                 68'8B  0F40                       .BYTE   CLI$K_STRING,LONG
                  0011' 0F42                       .WORD   140$-<.-2>
  44 52 4F 57 47 4E 4F 4C 00' 0F44                 .ASCIC  'LONGWORD'
                    08  0F44
                        0F4D  1993         $DS_CLI CLI$K_BR,        0,      160$
                 00 82  0F4D                       .BYTE   CLI$K_BR,0
                  001F' 0F4F                       .WORD   160$-<.-2>
                        0F51  1994 ;
                        0F51  1995 ; SET DEFAULT OCTAL
                        0F51  1996 ;
                        0F51  1997 140$:   $DS_CLI CLI$K_STRING, OCT,      150$,   <'OCTAL'>        ; OCTAL
                 6D'8B  0F51                       .BYTE   CLI$K_STRING,OCT
                  000E' 0F53                       .WORD   150$-<.-2>
           4C 41 54 43 4F 00' 0F55                 .ASCIC  'OCTAL'
                    05  0F55
                        0F5B  1998         $DS_CLI CLI$K_BR,        0,      160$
                 00 82  0F5B                       .BYTE   CLI$K_BR,0
                  0011' 0F5D                       .WORD   160$-<.-2>
                        0F5F  1999 ;
                        0F5F  2000 ; SET DEFAULT WORD
```

```
                        0F5F  2001 ;
                        0F5F  2002 150$:   $DS_CLI CLI$K_STRING, WORD,     BAD_LIST,<'WORD'>       ; WORD
                69'8B   0F5F                       .BYTE   CLI$K_STRING,WORD
                 F58B   0F61                       .WORD   BAD_LIST-<.-2>
          44 52 4F 57 00' 0F63                     .ASCIC  'WORD'
                   04   0F63
                        0F68  2003         $DS_CLI CLI$K_BR,        0,      160$
                00 82   0F68                       .BYTE   CLI$K_BR,0
                 0004'  0F6A                       .WORD   160$-<.-2>
                        0F6C  2004 ;
                        0F6C  2005 ; If there is a comma, get it and go back for more.
                        0F6C  2006 ; If not, it must be end of line time.
                        0F6C  2007 ;
                        0F6C  2008 160$:   $DS_CLI CLI$K_COMMA,  NOTNUF,   170$                    ; ,
                18'8E   0F6C                       .BYTE   CLI$K_COMMA,NOTNUF
                 0008'  0F6E                       .WORD   170$-<.-2>
                        0F70  2009         $DS_CLI CLI$K_BR,        0,      100$                   ; Go back for more
                00 82   0F70                       .BYTE   CLI$K_BR,0
                 FF9F   0F72                       .WORD   100$-<.-2>
                        0F74  2010 ;
                        0F74  2011 ; End of SET DEFAULT parameters. Assume EOL.
                        0F74  2012 ;
                        0F74  2013 170$:   $DS_CLI CLI$K_BR,     ENUF,     EOL                    ; Enough input
                17'82   0F74                       .BYTE   CLI$K_BR,ENUF
                 F546   0F76                       .WORD   EOL-<.-2>
                        0F78  2014 ;
                        0F78  2015 ; End of SET DEFAULT
                        0F78  2016 ;
```

```
                     0F78  2018          .SBTTL  DS$Cli Routine - Command Line Interpreter
                 00000000  2019          .PSECT  CODE, SHR, EXE, NOWRT, BYTE
                     0000  2020 ;++
                     0000  2021 ; FUNCTIONAL DESCRIPTION:
                     0000  2022 ;
                     0000  2023 ;       This routine provides the basic command interpreter for the
                     0000  2024 ;       supervisor.
                     0000  2025 ;
                     0000  2026 ; CALLING SEQUENCE:
                     0000  2027 ;
                     0000  2028 ;       DS$CLI ()
                     0000  2029 ;
                     0000  2030 ; INPUT PARAMETERS:
                     0000  2031 ;
                     0000  2032 ;       AP      Address of R0,R1,R2,R3,R4,R5,R6,R7,R8,R9,R10,R11,AP,FP,SP,PC,PSL
                     0000  2033 ;
                     0000  2034 ;
                     0000  2035 ; IMPLICIT INPUTS:
                     0000  2036 ;
                     0000  2037 ;       NONE
                     0000  2038 ;
                     0000  2039 ; OUTPUT PARAMETERS:
                     0000  2040 ;
                     0000  2041 ;       NONE
                     0000  2042 ;
                     0000  2043 ; IMPLICIT OUTPUTS:
                     0000  2044 ;
                     0000  2045 ;       NONE
                     0000  2046 ;
                     0000  2047 ; COMPLETION CODES:
                     0000  2048 ;
                     0000  2049 ;       NONE
                     0000  2050 ;
                     0000  2051 ; SIDE EFFECTS:
                     0000  2052 ;
                     0000  2053 ;       ALL COMMAND SUBROUTINES ARE ENTERED WITH R2 POINTING TO
                     0000  2054 ;       "DS$GL_CLIBASE".
                     0000  2055 ;--
```

```
                         003C  0000  2057          .ENTRY  DS$CLI,^M<R2,R3,R4,R5>
                               0002  2058 RCLI:
          00000000'EF    7C   0002  2059          clrq    L^q_adapter                     ; Clear adapter string          [48]
          00000000'EF    94   0008  2060          ClrB    L^ShowMemoryFlags               ; Clear flags for show mem
       52 0000044C'EF    DE   000E  2061          MOVAL   L^DS$GL_CLIBASE+CLI$K_SIZE,R2   ; START AT THE END
                   72    D4   0015  2069          CLRL    -(R2)                           ; AFTER THIS IT IS QUAD ALIGNED
       50 00000089 8F    D0   0017  2071          MOVL    #CLI$K_SIZE/8,R0                ; NUMBER OF QUAD WORDS REMAINING
                               001E  2072
                   72    7C   001E  2073 10$:     CLRQ    -(R2)                           ; CLEAR QUAD
                  FB 50  F5   0020  2074          SOBGTR  R0,10$                          ; CLEAR OTHER QUADWORDS
                               0023  2075
                               0023  2076 20$:     Br_If_Not_APT   CLI                     ; If not in APT mode, branch    [55]
     0000FE00'EF    1F   E1   0023               BBC     #DSA$V_Apt, -                   ; If bit not set, branch
                   47         002A                         L^DSA$GL_Flags, CLI             ;
    22 00000000'EF    00   E4   002B  2077          BBSC    #DS$V_CTRLC,DS$GL_FLAGS, 30$    ; Branch if ^C typed
          00000000'EF    16   0033  2078          JSB     APT_MSG                         ; WAIT FOR APT MESSAGE TO BE ACKED
          00000000'EF    16   0039  2079          JSB     KB_CHECK_APT                    ; CHECK APT
          0000FE04'EF    D5   003F  2080          TSTL    L^DSA$GL_APTCOM                 ; YES- IS THERE A COMMAND ?     [41]
                   DC    13   0045  2081          BEQL    20$                             ; NO - WAIT UNTIL THERE IS ONE
    04 A2 00000000'EF    DE   0047  2082          MOVAL   L^APT_COM,CLI$L_COMMAND(R2)     ; SET APT COMMAND DISPATCH      [41]
          00000000'EF    16   004F  2083          JSB     APT_COM                         ; ENTER APT COMMAND PROCESSOR
                               0055  2084
                               0055  2085 30$:     Clear_Ctrl0                     ; Clear the ^O flag                     [55]
       00000000'EF    10   E4   0055               BBSC    #DS$V_Ctrl0, -          ; Branch if CTRLO bit is set to
                   00         005C                         L^DS$GL_Flags, 30600$   ; ...
                               005D             30600$:                            ; ... here. Clear bit regardless.
                               005D  2086          $PRINT  #ds$k_type_ds_prompt, -         ; Print out the prompt          [48]
                               005D  2087                    #ds$k_printi, -               ; .. use PRINTI                 [48]
                               005D  2088                    L^DS$GT_PROMPT                ; Print "DS> " prompt, tells    [41]
             00000000'EF    9F   005D                    PUSHAB  L^DS$GT_PROMPT
                   7E    00   9A   0063                 movzbl  #ds$k_printi, -(sp)
                   7E    01   98   0066                 cvtbl   #ds$k_type_ds_prompt, -(sp)
          00000000'GF    03   FB   0069                 CALLS   #$$N+2, G^DSX$PRINT
                               0070  2089                                            ;  apt we're done               [41]
                   90    11   0070  2090          BRB     RCLI                            ; CHECK FOR ANOTHER COMMAND
```

```
                                0072  2092
                                0072  2093 CLI:
                                0072  2094          Br_If_CRD_AutoTest_Off  5$      ; If running under CRD Auto Test, branch[72]
0000FE00'EF   0B   E0           0072                BBS     #DSA$V_CRD_Autotest_Off, -      ; If bit set, branch             [36]
                12              0079                  L^DSA$GL_Flags, 5$                    ;                                [36]
                                007A  2095          Br_If_CRD_MenuTest_Off  5$      ; If running under CRD Menu Test, branch[72]
0000FE00'EF   10   E0           007A                BBS     #DSA$V_CRD_MenuTest_Off, -      ; If bit set, branch             [36]
                0A              0081                  L^DSA$GL_Flags, 5$                    ;                                [36]
                                0082  2096          Br_If_CRD_MenuTest_On   5$      ; If running under CRD Menu Test, branch[72]
0000FE00'EF   12   E0           0082                BBS     #DSA$V_CRD_MenuTest_On, -       ; If bit set, branch             [36]
                02              0089                  L^DSA$GL_Flags, 5$                    ;                                [36]
                08   11         008A  2097          Brb     10$                     ; If not CRD, branch around              [67]
                                008C  2098
     00000000'EF   16           008C  2099 5$:       Jsb     KB_Check                ; Check for any ^C's                     [67]
                08   11         0092  2100          Brb     20$                     ; Branch around clearing ^C flag         [58]
                                0094  2101
                                0094  2102 10$:      Clear_CtrlC                     ; Clear the ^C flag                      [58]
00000000'EF   00   E4           0094                BBSC    #DS$V_CtrlC, -          ; Branch if CTRLC bit is set to          [29]
                00              009B                  L^DS$GL_Flags, 30601$ ; ...                                        [29]
                                009C        30601$:                               ; ... here. Clear bit regardless.        [29]
                                009C  2103
     00000000'EF   9F           009C  2104 20$:      PUSHAB  L^DS$GT_PROMPT          ; ADDRESS OF PROMPT                      [58]
     00000100 8F   DD           00A2  2105          PUSHL   #CLI$K_BUFSIZ           ; SIZE OF BUFFER
           34 A2   DF           00A8  2106          PUSHAL  CLI$Q_BUFQWD(R2)        ; WHERE TO PUT LENGTH
           3C A2   9F           00AB  2107          PUSHAB  CLI$T_BUFFER(R2)        ; WHERE TO PUT TEXT
00000000'EF   04   FB           00AE  2108          CALLS   #4,L^DS_SUPERLINE       ; GET SUPERVISOR LINE                    [41]
                                00B5  2109
     00000000'EF   D4           00B5  2110          CLRL    L^Line_count            ; Reinit # lines output for SET PAGE     [73]
                                00BB  2111
     50   0000'8F   B1           00BB  2112          CMPW    #SS$_ENDOFFILE,R0       ; EOF?
                09   12           00C0  2113          BNEQ    70$                     ; BRANCH IF NOT EOF
                                00C2  2114          $EXIT_S                         ; RETURN TO VMS COMMAND LEVEL
                01   DD           00C2                PUSHL   #1
00000000'GF     01   FB           00C4                CALLS   #1,G^SYS$EXIT
                                00CB  2115
          03 50   E8           00CB  2116 70$:      BLBS    R0,700$                 ; If no errors, continue                 [41]
           FF31   31           00CE  2117          BRW     RCLI                    ; If error on input, try again           [41]
                                00D1  2118
                                00D1  2119 700$:                                    ;                                        [41]
             51   D5           00D1  2120          TSTL    R1                      ; CHECK FOR NULL STRING.
             03   12           00D3  2121          BNEQ    71$                     ; Don't loop if not zero                 [40]
           FF2A   31           00D5  2122          BRW     RCLI                    ; Loop if zero                           [40]
                                00D8  2123
                                00D8  2124 71$:                                     ;                                        [40]
     38 A2   3C A2   DE         00D8  2125          MOVAL   CLI$T_BUFFER(R2), -
                                00DD  2126            CLI$Q_BUFQWD+4(R2)
```

```
                                00DD  2128
                                00DD  2129 ;
                                00DD  2130 ; Parse the Supervisor line.
                                00DD  2131 ;
                                00DD  2132
          0000013D'EF    DF     00DD  2133          PUSHAL  L^CLI_ACTION            ; Call the special Supervisor          [45]
          000002A0'EF    DF     00E3  2134          PUSHAL  L^COMMAND_TREE          ;  parser. The only difference between [45]
                  34 A2  7F     00E9  2135          PUSHAQ  CLI$Q_BUFQWD(R2)        ;  it and the regular DS$PARSE is that [45]
      00000000'9F   03   FB     00EC  2136          CALLS   #3, a#DSX$SUPERPARSE    ;  it does not return when EOL (i.e.,  [45]
                                00F3  2137                                          ;  it continues parsing until CLI$K_EXIT[45]
                                00F3  2138                                          ;  is seen).                           [45]
                                00F3  2139
                  3C 50   E8    00F3  2140          BLBS    R0, 90$                 ; If parsed successfully, branch       [45]
                                00F6  2141
                                00F6  2142 ;
                                00F6  2143 ; Parsed unsuccessfully. Check NOTNUF flag. If it is set,
                                00F6  2144 ; implies an illegal command (see ACT_INC_CMD). If it is
                                00F6  2145 ; clear, implies an incomplete command (see ACT_INC_CMD).
                                00F6  2146 ;
                                00F6  2147
    1A 00000000 E2    01    E0  00F6  2148          BBS     #CLI$V_NOTNUF, -        ; If NOTNUF set, branch                [45]
                                00FE  2149                    L^CLI$L_FLAGS (R2),75$;                                  [45]
                                00FE  2150
                                00FE  2151 ;
                                00FE  2152 ; ILLEGAL COMMAND
                                00FE  2153 ;
                                00FE  2154
          0000044C'EF    9F     00FE  2155          PUSHAB  L^Q_GOOD_CMD            ; Push desc. of good part              [43]
          0000001B'EF    9F     0104  2156          PUSHAB  L^T_ILLCMD              ; Push ILLEGAL COMMAND                 [43]
                    00   DD     010A  2157          pushl   #ds$k_printi            ; use PRINTI                           [48]
                    15   DD     010C  2158          pushl   #ds$k_type_command_err  ; Command error code                  [48]
    00000000'GF     04   FB     010E  2159          CALLS   #4, G^DSX$PRINT         ;                                      [48]
              FEEA   31     0115  2160          BRW     RCLI
                                0118  2161
                                0118  2162 ;
                                0118  2163 ; INCOMPLETE COMMAND
                                0118  2164 ;
                                0118  2165
          0000044C'EF    9F     0118  2166 75$:     PUSHAB  L^Q_GOOD_CMD            ; Push desc. of good part              [43]
          0000003A'EF    9F     011E  2167          PUSHAB  L^T_INCOMPLETE          ; Push INCOMPLETE COMMAND              [43]
                    00   DD     0124  2168          pushl   #ds$k_printi            ; use PRINTI                           [48]
                    15   DD     0126  2169          pushl   #ds$k_type_command_err  ; Command error code                  [48]
    00000000'GF     04   FB     0128  2170          CALLS   #4, G^DSX$PRINT         ;                                      [48]
              FED0   31     012F  2171          BRW     RCLI
                                0132  2172
                                0132  2173 ;
                                0132  2174 ; No errors anywhere!
                                0132  2175 ;
                                0132  2176
          50  04 A2    D0     0132  2177 90$:     MOVL    CLI$L_COMMAND(R2),R0    ; TO GET ADDRESS OF EXECUTION ROUTINE.
                    02   13     0136  2178          BEQL    99$                     ; SKIP CALL IF NULL
                    60   16     0138  2179          JSB     (R0)                    ; CALL FINAL ACTION ROUTINE
              FEC5   31     013A  2180 99$:     BRW     RCLI                    ; CONTINUE COMMAND SCAN
```

```
013D  2182          .SBTTL  CLI Action Routines.
013D  2183 ;++
013D  2184 ; FUNCTIONAL DESCRIPTION:
013D  2185 ;
013D  2186 ;       THESE ROUTINES SAVE THE COMMAND LINE INFORMATION AS IT IS BEING PARSED.
013D  2187 ;
013D  2188 ; CALLING SEQUENCE:
013D  2189 ;
013D  2190 ;       SUBROUTINE CALL FROM THE "PARSE" SERVICE ROUTINE.
013D  2191 ;
013D  2192 ; INPUT PARAMETERS:
013D  2193 ;
013D  2194 ;       R0      = ACTION CODE FROM TREE.
013D  2195 ;       R1      = DATA, IF CLI$K_NUM.
013D  2196 ;       R8      = POINTER TO NEXT CHARACTER.
013D  2197 ;
013D  2198 ; IMPLICIT INPUTS:      NONE
013D  2199 ;
013D  2200 ; OUTPUT PARAMETERS:    NONE
013D  2201 ;
013D  2202 ; IMPLICIT OUTPUTS:     NONE
013D  2203 ;
013D  2204 ; COMPLETION CODES:     NONE
013D  2205 ;
013D  2206 ; SIDE EFFECTS:         NONE
013D  2207 ;--
```

```
                        013D  2209
                        013D  2210 CLI_ACTION::
            8E'8F   00   50   8F  013D  2211          CASEB   R0,#0, #$$$
                    00000000    0142  2212 10$:     $$N=0
                        0142  2213
                        0142  2214          CASEDEF NULL,\$$N                       ; Must be first         [43]
                    0134' 0142              .WORD   ACT_NULL - 10$
                        0144  2215          CASEDEF ILL_CMD,\$$N                    ;                       [43]
                    0135' 0144              .WORD   ACT_ILL_CMD - 10$
                        0146  2216          CASEDEF INC_CMD,\$$N                    ;                       [43]
                    013B' 0146              .WORD   ACT_INC_CMD - 10$
                        0148  2217          CASEDEF CONTEXT,\$$N                    ;                       [43]
                    013F' 0148              .WORD   ACT_CONTEXT - 10$
                        014A  2218          CASEDEF SUCCESS,\$$N                    ;                       [46]
                    0154' 014A              .WORD   ACT_SUCCESS - 10$
                        014C  2219          CASEDEF FAILURE,\$$N                    ;                       [46]
                    015D' 014C              .WORD   ACT_FAILURE - 10$
                        014E  2220          CASEDEF ABORT,\$$N
                    0181' 014E              .WORD   ACT_ABORT - 10$
                        0150  2221          CASEDEF ATTACH,\$$N
                    0170' 0150              .WORD   ACT_ATTACH - 10$
                        0152  2222          CASEDEF BOOT,\$$N                       ;                       [88]
                    018A' 0152              .WORD   ACT_BOOT - 10$
                        0154  2223          CASEDEF CLEAR,\$$N
                    01BD' 0154              .WORD   ACT_CLEAR - 10$
                        0156  2224          CASEDEF CONTINUE,\$$N
                    01CA' 0156              .WORD   ACT_CONTINUE - 10$
                        0158  2225          CASEDEF DEATTACH,\$$N                   ;                       [48]
                    021A' 0158              .WORD   ACT_DEATTACH - 10$
                        015A  2226          CASEDEF DEBUG,\$$N                      ;                       [59]
                    0223' 015A              .WORD   ACT_DEBUG - 10$
                        015C  2227          CASEDEF DEBUG_SWITCH,\$$N               ;                       [62]
                    067C' 015C              .WORD   ACT_DEBUG_SWITCH - 10$
                        015E  2228          CASEDEF DEFAULT_DBG,\$$N                ;                       [59]
                    022C' 015E              .WORD   ACT_DEFAULT_DBG - 10$
                        0160  2229          CASEDEF DEPOSIT,\$$N
                    0246' 0160              .WORD   ACT_DEPOSIT - 10$
                        0162  2230          CASEDEF DIRECTORY,\$$N
                    025C' 0162              .WORD   ACT_DIRECTORY - 10$
                        0164  2231          CASEDEF DUMP,\$$N                       ;                       [97]
                    0273' 0164              .WORD   ACT_DUMP - 10$
                        0166  2232          CASEDEF EXAMINE,\$$N
                    029E' 0166              .WORD   ACT_EXAMINE - 10$
                        0168  2233          CASEDEF EXIT,\$$N                       ;                       [46]
                    02AB' 0168              .WORD   ACT_EXIT - 10$
                        016A  2234          CASEDEF HELP,\$$N
                    02B4' 016A              .WORD   ACT_HELP - 10$
                        016C  2235          CASEDEF LOAD,\$$N
                    031D' 016C              .WORD   ACT_LOAD - 10$
                        016E  2236          CASEDEF NEXT_INST,\$$N
                    0330' 016E              .WORD   ACT_NEXT_INST - 10$
                        0170  2237          CASEDEF ENUF,\$$N
                    016B' 0170              .WORD   ACT_ENUF - 10$
                        0172  2238          CASEDEF NOTNUF,\$$N
                    0166' 0172              .WORD   ACT_NOTNUF - 10$
                        0174  2239          CASEDEF RUN,\$$N
                    034D' 0174              .WORD   ACT_RUN - 10$
```

```
                        0176  2240          CASEDEF SCRIPT,\$$N
0572'                   0176                .WORD   ACT_SCRIPT - 10$
                        0178  2241          CASEDEF SET,\$$N
039F'                   0178                .WORD   ACT_SET - 10$
                        017A  2242          CASEDEF ULTRIX_ODS,\$$N                                 ;               [106
0500'                   017A                .WORD   ACT_ULTRIX_ODS - 10$
                        017C  2243          CASEDEF SHOW,\$$N
0535'                   017C                .WORD   ACT_SHOW - 10$
                        017E  2244          CASEDEF Clear_CRD_Trace,\$$N                            ;               [65]
0875'                   017E                .WORD   ACT_Clear_CRD_Trace - 10$
                        0180  2245          CASEDEF Set_CRD_Trace,\$$N                              ;               [65]
086B'                   0180                .WORD   ACT_Set_CRD_Trace - 10$
                        0182  2246          CASEDEF Set_CRD_Debug,\$$N                              ;               [69]
08B1'                   0182                .WORD   ACT_Set_CRD_Debug - 10$
                        0184  2247          CASEDEF Clear_CRD_Debug,\$$N                            ;               [69]
08BA'                   0184                .WORD   ACT_Clear_CRD_Debug - 10$
                        0186  2248          CASEDEF Show_CRD_Trace,\$$N                             ;               [65]
087F'                   0186                .WORD   ACT_Show_CRD_Trace - 10$
                        0188  2249          CASEDEF Show_Calls,\$$N                                 ;               [70]
085E'                   0188                .WORD   ACT_Show_Calls - 10$
                        018A  2250          CASEDEF SHOWCPU,\$$N                                    ; [116]     ;G:3
04C6'                   018A                .WORD   ACT_SHOWCPU - 10$
                        018C  2251          CASEDEF START,\$$N
053A'                   018C                .WORD   ACT_START - 10$
                        018E  2252          CASEDEF SUMMARY,\$$N
057B'                   018E                .WORD   ACT_SUMMARY - 10$
                        0190  2253          CASEDEF CRD,\$$N                                        ;               [60]
0584'                   0190                .WORD   ACT_CRD - 10$
                        0192  2254          CASEDEF FILESPEC,\$$N
0663'                   0192                .WORD   ACT_FILESPEC - 10$
                        0194  2255          CASEDEF FILEND,\$$N
066B'                   0194                .WORD   ACT_FILEND - 10$
                        0196  2256          CASEDEF OPTIONAL,\$$N                                   ;               [45]
0672'                   0196                .WORD   ACT_OPTIONAL - 10$
                        0198  2257          CASEDEF REQUIRED,\$$N                                   ;               [45]
0677'                   0198                .WORD   ACT_REQUIRED - 10$
                        019A  2258          CASEDEF TEST,\$$N
06A1'                   019A                .WORD   ACT_TEST - 10$
                        019C  2259          CASEDEF LAST,\$$N
06A6'                   019C                .WORD   ACT_LAST - 10$
                        019E  2260          CASEDEF SUBTEST,\$$N
069C'                   019E                .WORD   ACT_SUBTEST - 10$
                        01A0  2261          CASEDEF MMON,\$$N
0B4B'                   01A0                .WORD   ACT_MMON - 10$
                        01A2  2262          CASEDEF MMOFF,\$$N
0B7A'                   01A2                .WORD   ACT_MMOFF - 10$
                        01A4  2263          CASEDEF SHOWMM,\$$N
0BA8'                   01A4                .WORD   ACT_SHOWMM - 10$
                        01A6  2264          CASEDEF PREGN,\$$N
0A05'                   01A6                .WORD   ACT_PREGN - 10$
                        01A8  2265          CASEDEF SECTION,\$$N
0692'                   01A8                .WORD   ACT_SECTION - 10$
                        01AA  2266          CASEDEF PASS,\$$N
0688'                   01AA                .WORD   ACT_PASS - 10$
                        01AC  2267          CASEDEF QA,\$$N                                         ;               [42]
068D'                   01AC                .WORD   ACT_QA - 10$
                        01AE  2268          CaseDef SetEnforce,\$$N                                 ;               [57]
```

```
                        073C' 01AE                      .WORD   ACT_SetEnforce - 10$
                              01B0  2269                CaseDef ClearEnforce,\$$N                               ;               [57]
                        0740' 01B0                      .WORD   ACT_ClearEnforce - 10$
                              01B2  2270                CASEDEF SHOWENFORCE,\$$N                                ;               [89]
                        074E' 01B2                      .WORD   ACT_SHOWENFORCE - 10$
                              01B4  2271                CASEDEF SETCPU,\$$N                                     ;               [101
                        03AC' 01B4                      .WORD   ACT_SETCPU - 10$
                              01B6  2272                CASEDEF EVENT,\$$N
                        077F' 01B6                      .WORD   ACT_EVENT - 10$
                              01B8  2273                CASEDEF FLAGS,\$$N
                        07A8' 01B8                      .WORD   ACT_FLAGS - 10$
                              01BA  2274                CASEDEF BASE,\$$N
                        07BD' 01BA                      .WORD   ACT_BASE - 10$
                              01BC  2275                CASEDEF ADDRESS,\$$N
                        07D3' 01BC                      .WORD   ACT_ADDRESS - 10$
                              01BE  2276                CASEDEF BREAK,\$$N
                        07E0' 01BE                      .WORD   ACT_BREAK - 10$
                              01C0  2277                CASEDEF BASE_QUAL,\$$N
                        0807' 01C0                      .WORD   ACT_BASE_QUAL - 10$
                              01C2  2278                CASEDEF NOBASE,\$$N
                        0813' 01C2                      .WORD   ACT_NOBASE - 10$
                              01C4  2279                CASEDEF ALL,\$$N
                        081E' 01C4                      .WORD   ACT_ALL - 10$
                              01C6  2280                CASEDEF ASK_PROMPT,\$$N                                 ;               [108
                        08C2' 01C6                      .WORD   ACT_ASK_PROMPT - 10$
                              01C8  2281                CASEDEF DEFAULT,\$$N
                        083F' 01C8                      .WORD   ACT_DEFAULT - 10$
                              01CA  2282                CASEDEF BELL,\$$N
                        08C8' 01CA                      .WORD   ACT_BELL - 10$
                              01CC  2283                CASEDEF BINARY,\$$N                                     ;               [45]
                        08CE' 01CC                      .WORD   ACT_BINARY - 10$
                              01CE  2284                CASEDEF HALT,\$$N
                        08D4' 01CE                      .WORD   ACT_HALT - 10$
                              01D0  2285                CASEDEF IE1,\$$N
                        08DA' 01D0                      .WORD   ACT_IE1 - 10$
                              01D2  2286                CASEDEF IE2,\$$N
                        08E0' 01D2                      .WORD   ACT_IE2 - 10$
                              01D4  2287                CASEDEF IE3,\$$N
                        08E6' 01D4                      .WORD   ACT_IE3 - 10$
                              01D6  2288                CASEDEF IES,\$$N
                        08EC' 01D6                      .WORD   ACT_IES - 10$
                              01D8  2289                CASEDEF LOOP,\$$N
                        08F2' 01D8                      .WORD   ACT_LOOP - 10$
                              01DA  2290                CASEDEF OPER,\$$N
                        08F8' 01DA                      .WORD   ACT_OPER - 10$
                              01DC  2291                CASEDEF PROMPT,\$$N
                        08FE' 01DC                      .WORD   ACT_PROMPT - 10$
                              01DE  2292                CASEDEF QUICK,\$$N
                        0904' 01DE                      .WORD   ACT_QUICK - 10$
                              01E0  2293                CASEDEF SEARCH,\$$N
                        090A' 01E0                      .WORD   ACT_SEARCH - 10$
                              01E2  2294                CASEDEF TRACE,\$$N
                        0910' 01E2                      .WORD   ACT_TRACE - 10$
                              01E4  2295                CASEDEF VERIFY,\$$N                                     ;               [45]
                        0916' 01E4                      .WORD   ACT_VERIFY - 10$
                              01E6  2296                CASEDEF QAEP,\$$N                                       ;               [42]
                        0958' 01E6                      .WORD   ACT_QAEP - 10$
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                        01E8  2297          CASEDEF QACL,\$$N                                       ;               [42]
095E'                   01E8                .WORD   ACT_QACL - 10$
                        01EA  2298          CASEDEF QATL,\$$N                                       ;               [42]
0964'                   01EA                .WORD   ACT_QATL - 10$
                        01EC  2299          CASEDEF QASL,\$$N                                       ;               [42]
096A'                   01EC                .WORD   ACT_QASL - 10$
                        01EE  2300          CASEDEF QAMP,\$$N                                       ;               [42]
0970'                   01EE                .WORD   ACT_QAMP - 10$
                        01F0  2301          CASEDEF QADEF,\$$N                                      ;               [42]
0992'                   01F0                .WORD   ACT_QADEF - 10$
                        01F2  2302          CASEDEF EFN,\$$N
09B4'                   01F2                .WORD   ACT_EFN - 10$
                        01F4  2303          CASEDEF NEXT,\$$N
09D4'                   01F4                .WORD   ACT_NEXT - 10$
                        01F6  2304          CASEDEF PAGE,\$$N                                       ;               [71]
091C'                   01F6                .WORD   ACT_PAGE - 10$
                        01F8  2305          CASEDEF WIDTH,\$$N                                      ;               [38]
093A'                   01F8                .WORD   ACT_WIDTH - 10$
                        01FA  2306          CASEDEF ASCII,\$$N
09D9'                   01FA                .WORD   ACT_ASCII - 10$
                        01FC  2307          CASEDEF REGN,\$$N
09DE'                   01FC                .WORD   ACT_REGN - 10$
                        01FE  2308          CASEDEF REG12,\$$N
09E3'                   01FE                .WORD   ACT_REG12 - 10$
                        0200  2309          CASEDEF REG13,\$$N
09E8'                   0200                .WORD   ACT_REG13 - 10$
                        0202  2310          CASEDEF REG14,\$$N
09ED'                   0202                .WORD   ACT_REG14 - 10$
                        0204  2311          CASEDEF REG15,\$$N
09F2'                   0204                .WORD   ACT_REG15 - 10$
                        0206  2312          CASEDEF REG16,\$$N
09F8'                   0206                .WORD   ACT_REG16 - 10$
                        0208  2313          CASEDEF REGP,\$$N
09FC'                   0208                .WORD   ACT_REGP - 10$
                        020A  2314          CASEDEF BACKUP,\$$N
0A0C'                   020A                .WORD   ACT_BACKUP - 10$
                        020C  2315          CASEDEF ADVANCE,\$$N                                    ;               [45]
0A11'                   020C                .WORD   ACT_ADVANCE - 10$
                        020E  2316          CASEDEF DATA,\$$N
0A16'                   020E                .WORD   ACT_DATA - 10$
                        0210  2317          CASEDEF NULL_DATA,\$$N                                  ;               [97]
0A1B'                   0210                .WORD   ACT_NULL_DATA - 10$
                        0212  2318          CASEDEF LONG,\$$N
0A24'                   0212                .WORD   ACT_LONG - 10$
                        0214  2319          CASEDEF WORD,\$$N
0A29'                   0214                .WORD   ACT_WORD - 10$
                        0216  2320          CASEDEF BYTE,\$$N
0A2E'                   0216                .WORD   ACT_BYTE - 10$
                        0218  2321          CASEDEF HEX,\$$N
0A33'                   0218                .WORD   ACT_HEX - 10$
                        021A  2322          CASEDEF DEC,\$$N
0A38'                   021A                .WORD   ACT_DEC - 10$
                        021C  2323          CASEDEF OCT,\$$N
0A3D'                   021C                .WORD   ACT_OCT - 10$
                        021E  2324          CASEDEF IF_RUN,\$$N
0A42'                   021E                .WORD   ACT_IF_RUN - 10$
                        0220  2325          CASEDEF IF_REQUIRED,\$$N                                ;               [45]
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                        0A50' 0220                      .WORD   ACT_IF_REQUIRED - 10$
                              0222  2326                CASEDEF IF_FILE_SPEC,\$$N                                       ;               [45]
                        0A59' 0222                      .WORD   ACT_IF_FILE_SPEC - 10$
                              0224  2327                CASEDEF IF_ADAPTER,\$$N                                         ;               [48]
                        0A63' 0224                      .WORD   ACT_IF_ADAPTER - 10$
                              0226  2328                CASEDEF IF_REG_OR_ADR,\$$N                                      ;               [43]
                        0A70' 0226                      .WORD   ACT_IF_REG_OR_ADR - 10$
                              0228  2329                CASEDEF IFNOTUSER,\$$N                                          ;               [38]
                        0A7E' 0228                      .WORD   ACT_IFNOTUSER - 10$
                              022A  2330                CASEDEF IF_XDELTA,\$$N
                        0A8B' 022A                      .WORD   ACT_IF_XDELTA - 10$
                              022C  2331                CASEDEF XDELTA,\$$N
                        0AA0' 022C                      .WORD   ACT_XDELTA - 10$
                              022E  2332                CASEDEF DEVICE,\$$N
                        0AAA' 022E                      .WORD   ACT_DEVICE - 10$
                              0230  2333                CASEDEF BRIEF,\$$N                                              ;               [44]
                        0AC0' 0230                      .WORD   ACT_BRIEF - 10$
                              0232  2334                CASEDEF BEGINADAPTER,\$$N                                       ;               [43]
                        0AF5' 0232                      .WORD   ACT_BEGINADAPTER - 10$
                              0234  2335                CASEDEF ADAPTER,\$$N                                            ;               [43]
                        0B03' 0234                      .WORD   ACT_ADAPTER - 10$
                              0236  2336                CASEDEF DESELECT,\$$N
                        0253' 0236                      .WORD   ACT_DESELECT - 10$
                              0238  2337                CASEDEF SELECT,\$$N
                        0385' 0238                      .WORD   ACT_SELECT - 10$
                              023A  2338                CASEDEF NO_ALLOC,\$$N                                           ;               [82]
                        0396' 023A                      .WORD   ACT_NO_ALLOC - 10$
                              023C  2339                CASEDEF SHOWSEL,\$$N
                        0B1A' 023C                      .WORD   ACT_SHOWSEL - 10$
                              023E  2340                CASEDEF DO_CMD,\$$N
                        0B30' 023E                      .WORD   ACT_DO_CMD - 10$
                              0240  2341                CASEDEF SETLOAD,\$$N
                        0B39' 0240                      .WORD   ACT_SETLOAD - 10$
                              0242  2342                CASEDEF SHOWLOAD,\$$N
                        0B42' 0242                      .WORD   ACT_SHOWLOAD - 10$
                              0244  2343                CASEDEF SHOWSUP,\$$N                                    ;               [44]
                        0C12' 0244                      .WORD   ACT_SHOWSUP - 10$
                              0246  2344                CASEDEF SHOWSTATUS,\$$N                                 ;               [39]
                        0C09' 0246                      .WORD   ACT_SHOWSTATUS - 10$
                              0248  2345                CASEDEF SHOWSECTIONS,\$$N                               ;               [46]
                        0C1B' 0248                      .WORD   ACT_SHOWSECTIONS - 10$
                              024A  2346                CASEDEF SHOWTESTS,\$$N                                  ;       [81]
                        0C24' 024A                      .WORD   ACT_SHOWTESTS - 10$
                              024C  2347                CaseDef ShowMem,\$$N
                        0C2D' 024C                      .WORD   ACT_ShowMem - 10$
                              024E  2348                CaseDef ShoMemMap,\$$N
                        0C36' 024E                      .WORD   ACT_ShoMemMap - 10$
                              0250  2349                CaseDef ShoMemBuf,\$$N
                        0C3A' 0250                      .WORD   ACT_ShoMemBuf - 10$
                              0252  2350                CaseDef ShoMemDat,\$$N
                        0C3F' 0252                      .WORD   ACT_ShoMemDat - 10$
                              0254  2351                CaseDef ShoMemAll,\$$N
                        0C44' 0254                      .WORD   ACT_ShoMemAll - 10$
                              0256  2352                CASEDEF SETMEM,\$$N                                     ;               [75]
                        0C50' 0256                      .WORD   ACT_SETMEM - 10$
                              0258  2353                CASEDEF INITPCS,\$$N                                    ;               [77]
                        02F5' 0258                      .WORD   ACT_INITPCS - 10$
```

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                          025A  2354          CASEDEF DIR_WIDE,\$$N                                  ;                [80]
                     026B' 025A                .WORD   ACT_DIR_WIDE - 10$
                          025C  2355          CASEDEF BEGINTIME,\$$N                                 ;        [76]
                     06AB' 025C                .WORD   ACT_BEGINTIME - 10$
                          025E  2356          CASEDEF TIME,\$$N                                      ;        [76]
                     06B5' 025E                .WORD   ACT_TIME - 10$
                          0260  2357
                 0000008E  0260  2358          $$$=$$N-1
                          0260  2359
                          0260  2360 20$:     ERRSUP_S  MSGADR=L^T_PRGERR     ;*** INVALID ACTION CODE????          [41]
        00000000'EF   DF  0260                        PUSHAL  $MODULE
        00000004'EF   DF  0266                        PUSHAL  L^T_PRGERR
                 01   DD  026C                        PUSHL   #$ER
   00000000'EF   03   FB  026E                        CALLS   #3, DS_ERRSUP
                      05  0275  2361          RSB
```

```
                                  0276          .SUBTITLE       Null and Context-Saving Action Routines
                                  0276  ;+
                                  0276  ; NULL ACTION ROUTINE.
                                  0276  ; This action routine must remain here. It is the action routine that is
                                  0276  ; done when the parser executes the 0 action routine.
                                  0276  ;-
                                  0276  ACT_NULL:
                            05    0276          RSB                             ; RETURN
                                  0277
                                  0277  ;+
                                  0277  ; ILL_CMD Action routine.
                                  0277  ;-
                                  0277  ACT_ILL_CMD:                                  ;                                [43]
          06 62    01      E5    0277          BBCC    #CLI$V_NOTNUF, -                ;                                [43]
                                  027B                    CLI$L_FLAGS (R2), ACT_CONTEXT ;                                [43]
                   04      11    027B  10$:    BRB     ACT_CONTEXT                     ;                                [43]
                                  027D
                                  027D  ;+
                                  027D  ; INC_CMD Action routine.
                                  027D  ;-
                                  027D  ACT_INC_CMD:                                  ;                                [43]
          00 62    01      E3    027D          BBCS    #CLI$V_NOTNUF, -                ;                                [43]
                                  0281                    CLI$L_FLAGS (R2), ACT_CONTEXT ;                                [43]
                                  0281
                                  0281  ;+
                                  0281  ; CONTEXT Action routine.
                                  0281  ; Branch to when error. Save descriptor of good portion of command line.
                                  0281  ;-
                                  0281
                                  0281  ACT_CONTEXT:                                  ;                                [43]
00000450'EF    38 A2      D0    0281          MOVL    CLI$Q_BUFQWD+4(R2), -           ; Address of good portion        [43]
                                  0289                    Q_GOOD_CMD+4                ;                                [43]
   58    00000450'EF      C3    0289          SUBL3   Q_GOOD_CMD+4, -                 ;                                [43]
         0000044C'EF            0290                    R8, Q_GOOD_CMD                ; Length                         [43]
                            05    0295          RSB                                   ; Return                         [43]
```

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                                0296  2399          .SUBTITLE       Success, Failure, Notnuf, Enuf Action Routines
                                0296  2400 ;+
                                0296  2401 ; SUCCESS Action routine.
                                0296  2402 ;-
                                0296  2403 ACT_SUCCESS:
      00 00000454'EF    00  E3  0296  2404          BBCS    #0, B_SUCCESS, 10$      ; Indicate SUCCESS                      [46]
                            05  029E  2405 10$:     RSB
                                029F  2406
                                029F  2407 ;+
                                029F  2408 ; FAILURE Action routine.
                                029F  2409 ;-
                                029F  2410 ACT_FAILURE:
      00 00000454'EF    00  E5  029F  2411          BBCC    #0, B_SUCCESS, 10$      ; Indicate FAILURE                      [46]
                            05  02A7  2412 10$:     RSB
                                02A8  2413
                                02A8  2414 ;+
                                02A8  2415 ; NOTNUF ACTION ROUTINE.
                                02A8  2416 ;-
                                02A8  2417 ACT_NOTNUF:
            00 62   01  E3  02A8  2418          BBCS    #CLI$V_NOTNUF, -        ; SET NOT ENOUGH FLAG.
                                02AC  2419                    CLI$L_FLAGS(R2), 10$
                            05  02AC  2420 10$:     RSB                         ; RETURN
                                02AD  2421
                                02AD  2422 ;+
                                02AD  2423 ; ENUF Action routine.
                                02AD  2424 ;-
                                02AD  2425 ACT_ENUF:
   00 62    01  E4  02AD  2426          BBSC    #CLI$V_NOTNUF, -        ; INDICATE SUFFICIENT INFO.
                                02B1  2427                    CLI$L_FLAGS(R2), 10$
                            05  02B1  2428 10$:     RSB                         ; RETURN.
```

```
                                02B2  2430          .SUBTITLE       Commands A-C Action Routines
                                02B2  2431 ;+
                                02B2  2432 ; ATTACH COMMAND.
                                02B2  2433 ;-
                                02B2  2434 ACT_ATTACH:
            08 A2    59    D0  02B2  2435          MOVL    R9,CLI$Q_FILE(R2)       ; SAVE LENGTH OF STRING
            0C A2    58    D0  02B6  2436          MOVL    R8,CLI$Q_FILE+4(R2)     ; SAVE ADDRESS OF REMAINDER
     04 A2   00000000'EF   9E  02BA  2437          MOVAB   L^DSV$ATTACH,CLI$L_COMMAND(R2) ; SET COMMAND PROCESSOR          [41]
                           05  02C2  2438          RSB
                                02C3  2439
                                02C3  2440 ;+
                                02C3  2441 ; ABORT COMMAND.
                                02C3  2442 ;-
                                02C3  2443 ACT_ABORT:
     04 A2   00000000'EF   DE  02C3  2444          MOVAL   L^VRABORT, -            ; LOAD COMMAND ROUTINE ADDRESS.        [41]
                                02CB  2445                    CLI$L_COMMAND(R2)
                           05  02CB  2446          RSB
                                02CC  2447
                                02CC  2448 ;+
                                02CC  2449 ; BOOT COMMAND
                                02CC  2450 ;-
                                02CC  2451 ACT_BOOT:
         04 A2   D2'AF    DE  02CC  2452          MOVAL   B^10$,CLI$L_COMMAND(R2)         ; Load command routine address [88]
                           05  02D1  2453          RSB                                     ;                              [88]
                                02D2  2454
                                02D2  2455 10$:     BR_IF_NOT_USER  20$                     ; If standalone, continue      [92]
      0000FE00'EF    1C   E1  02D2                BBC     #DSA$V_User, -                  ; If bit not set, branch
                        12  02D9                          L^DSA$GL_Flags, 20$             ;
          000000BD'EF   9F  02DA  2456          PUSHAB  L^T_EMESSG1                     ;                              [92]
                        01  02DD  2457          pushl   #ds$k_printf                    ; Print with PRINTF            [92]
                        15  02DD  2458          pushl   #ds$k_type_command_err          ; Command error code           [92]
     00000000'GF    03   FB  02E4  2459          CALLS   #3, G^DSX$PRINT                 ; Print                        [92]
                           05  02EB  2460          RSB                                     ;                              [92]
                                02EC  2461
                                02EC  2462 ; In order to insure the state of the PP upon stopping the AP, we will do an    [92]
                                02EC  2463 ; INIT_CONTEXT and a BRW BEGIN. Therefore, we will not return here after the   [92]
                                02EC  2464 ; CMK call. We will return here is we are not on an AP system.                  [92]
                                02EC  2465
                                02EC  2466 20$:     CMK     APBOOT                          ; Go do boot.                  [92]
                    7E  DC  02EC                MOVPSL  -(SP)
              06 6E     1A  E0  02EE                BBS     #PSL$V_IS, (SP), 30602$
                    8E  D4  02F2                CLRL    (SP)+
                    04  BC  02F4                CHMK    #CMK$_APBOOT
                    06  11  02F6                BRB     30603$
          00000000'EF   16  02F8          30602$: JSB     CMK$APBOOT
                           02FE          30603$:
                           05  02FE  2467          RSB                                     ;                              [92]
                                02FF  2468
                                02FF  2469 ;+
                                02FF  2470 ; CLEAR COMMAND.
                                02FF  2471 ;-
                                02FF  2472 ACT_CLEAR:
     04 A2   00000000'EF   DE  02FF  2473          MOVAL   L^VRCLRFLG, -           ; LOAD COMMAND ROUTINE ADDRESS.        [41]
                                0307  2474                    CLI$L_COMMAND(R2)
            00 62    02   E2  0307  2475          BBSS    #CLI$V_CLEAR, -         ; SET CLR FLG.
                                030B  2476                    CLI$L_FLAGS(R2), 10$
                           05  030B  2477 10$:     RSB                             ; RETURN.
```

```
                                  030C  2478
                                  030C  2479 ;+
                                  030C  2480 ; CONTINUE COMMAND.
                                  030C  2481 ;-
                                  030C  2482 ACT_CONTINUE:
    00000000'EF   02    8A        030C  2483          BICB2   #2,L^DEBUG$GB_FLAGS     ; CLEAR STEP FLAG                          [41]
         00000000'EF    D4        0313  2484          CLRL    MP$GL_CONDITION_FLAGS   ; Clear mp condition flags                 [103
04 A2    00000322'EF    9E        0319  2485          MOVAB   10$,CLI$L_COMMAND(R2)   ; SET COMMAND ADDRESS
                        05        0321  2486          RSB
                                  0322  2487 10$:
         00000000'EF    D5        0322  2488          TSTL MP$GR_BOOTED_PROCESSORS    ; Are we an active mp system? [111]
                  15    13        0328  2489          BEQL    20$                     ; Branch if not active mp     [111]
                                  032A  2490          $PRINT  #ds$k_type_command_out,-; Print command output        [111]
                                  032A  2491                  #ds$k_printi, -         ; .. use PRINTI               [111]
                                  032A  2492                  L^T_MP_CONT             ; .. Continue message         [111]
         000000AB'EF    9F        032A                      PUSHAB  L^T_MP_CONT
            7E    00    9A        0330                      movzbl  #ds$k_printi, -(sp)
            7E    16    98        0333                      cvtbl   #ds$k_type_command_out, -(sp)
    00000000'GF   03    FB        0336                      CALLS   #$$N+2, G^DSX$PRINT
                  16    11        033D  2493          BRB     30$                     ;...                          [111]
                                  033F  2494 20$:     $PRINT  #ds$k_type_command_out,-; Print command output     [48][111]
                                  033F  2495                  #ds$k_printf, -         ; .. use PRINTF                [48]
                                  033F  2496                  L^T_CONT, -             ; .. Continue message          [48]
                                  033F  2497                  60(AP)                  ; .. Type PC                   [48]
               3C   AC    DD        033F                      PUSHL   60(AP)
         00000092'EF    9F        0342                      PUSHAB  L^T_CONT
            7E    01    9A        0348                      movzbl  #ds$k_printf, -(sp)
            7E    16    98        034B                      cvtbl   #ds$k_type_command_out, -(sp)
    00000000'GF   04    FB        034E                      CALLS   #$$N+2, G^DSX$PRINT
         00000000'EF    16        0355  2498 30$:     JSB     SCRIPT$CONT             ; Continue script if present  [111]
                                  035B  2499
                                  035B  2500 ACT_CONT::
                        04        035B  2501 10$:     RET                             ; RETURN TO CLI'S CALLER
```

```
                                035C          .SUBTITLE       Commands D-E Action Routines
                                035C  ;+
                                035C  ; DEATTACH command
                                035C  ;-
                                035C  act_deattach:                                  ;                                        [48]
     04 A2   00000000'EF   DE   035C          moval   L^dsv$deattach, -               ; Load command routine address           [48]
                                0364                    cli$l_command(r2)             ;                                        [48]
                           05   0364          rsb                                     ; Just return                            [48]
                                0365
                                0365  ;+                                                                                        [59]
                                0365  ; DEBUG COMMAND                                                                           [59]
                                0365  ;-                                                                                        [59]
                                0365
                                0365  ACT_DEBUG:                                                ;                               [59]
     04 A2   00000000'EF   DE   0365          MOVAL   L^DSV$DEBUG,CLI$L_COMMAND(R2)           ; LOAD ADDR. OF DEBUG COMMAND   [59]
                           05   036D          RSB                                             ; RETURN                        [59]
                                036E
                                036E  ACT_DEFAULT_DBG::                                ; BUILD FILENAME DESC. FOR DEFAULT DBG  [59]
     08 A2   0000037F'EF   9A   036E          MOVZBL  DBG_NAME,CLI$Q_FILE(R2)         ; GET CHARACTER COUNT                   [59]
     0C A2   00000380'EF   DE   0376          MOVAL   DBG_NAME+1, -                   ; GET ADDRESS OF FILENAME STRING        [59]
                                037E                          CLI$Q_FILE+4(R2);                                                 [59]
                           05   037E          RSB                                     ; RETURN                                [59]
  47 55 42 45 44 53 44 56 00'   037F  DBG_NAME:       .ASCIC /VDSDEBUG/               ; DEFAULT DEBUGGER NAME                 [68]
                           08   037F
                                0388
                                0388  ;+
                                0388  ; DEPOSIT COMMAND.
                                0388  ;-
                                0388  ACT_DEPOSIT:
     04 A2   00000000'EF   DE   0388          MOVAL   L^VRDEPOSIT, -                  ; LOAD COMMAND ROUTINE ADDRESS.         [41]
                                0390                    CLI$L_COMMAND(R2)
             00 62    19   E2   0390          BBSS    #CLI$V_DEPOSIT, -               ; SET DEPOSIT FLG.
                                0394                    CLI$L_FLAGS(R2), 10$
                           05   0394  10$:    RSB
                                0395
                                0395  ;+
                                0395  ; DESELECT
                                0395  ;-
                                0395  ACT_DESELECT:
     04 A2   00000000'EF   9E   0395          MOVAB   L^DSV$DESELECT,CLI$L_COMMAND(R2) ; SET COMMAND ROUTINE                  [41]
                           05   039D          RSB
                                039E
                                039E  ;
                                039E  ; Directory command
                                039E  ;-
                                039E
                                039E  ACT_DIRECTORY:
            00000000'EF   DE   039E          MOVAL   L^DSV$DIRECTORY,-               ; Set dispatch address for command
                   04 A2        03A4                    CLI$L_COMMAND(R2)
            00000000'EF   94   03A6          CLRB    L^WIDE_FLAG                     ; WIDE_FLAG in DIRECTORY module         [80]
                           05   03AC          RSB
                                03AD
                                03AD  ACT_DIR_WIDE:                                  ;                                        [80]
       00000000'EF    01   90   03AD          MOVB    #1,L^WIDE_FLAG                  ; WIDE_FLAG in DIRECTORY module         [80]
                           05   03B4          RSB                                     ;                                        [80]
                                03B5
                                03B5  ;+
```

```
                                03B5  2559 ; DUMP COMMAND
                                03B5  2560 ;-
                                03B5  2561
                                03B5  2562 ACT_DUMP:
      04 A2    BB'AF    DE    03B5  2563          MOVAL   B^10$,CLI$L_COMMAND(R2)          ; Load command routine address  [97]
                        05    03BA  2564          RSB                                     ;                               [97]
                                03BB  2565
                                03BB  2566 10$:     BR_IF_NI        20$                     ; If network is in use, continue[97]
  00000000'EF    1A    E0    03BB                  BBS     #DS$V_NI, -                     ; If bit set, branch            [49]
                 12          03C2                    L^DS$GL_Flags, 20$                    ;                               [49]
       000000E2'EF    9F    03C3  2567          PUSHAB  L^T_EMESSG2                     ;                               [97]
                     01    DD    03C9  2568          pushl   #ds$k_printf                    ; Print with PRINTF             [97]
                     15    DD    03CB  2569          pushl   #ds$k_type_command_err          ; Command error code           [97]
  00000000'GF    03    FB    03CD  2570          CALLS   #3, G^DSX$PRINT                 ; Print                         [97]
                     05    03D4  2571          RSB                                     ;                               [97]
                                03D5  2572
                  1C A2    DD    03D5  2573 20$:     PUSHL   CLI$L_DATA(R2)                  ; Push dump size                [97]
  00000000'EF    01    FB    03D8  2574          CALLS   #1,DUMP_SELF
                     05    03DF  2575          RSB                                     ;                               [97]
                                03E0  2576
                                03E0  2577 ;+
                                03E0  2578 ; EXAMINE COMMAND.
                                03E0  2579 ;-
                                03E0  2580 ACT_EXAMINE:
    04 A2    00000000'EF    DE    03E0  2581          MOVAL   L^VREXAMINE, -          ; LOAD COMMAND ROUTINE ADDRESS.         [41]
                                03E8  2582                    CLI$L_COMMAND(R2)
       00 62    05    E2    03E8  2583          BBSS    #CLI$V_EXAM, -          ; CHECK FOR EXAMINE.
                                03EC  2584                    CLI$L_FLAGS(R2), 10$
                     05    03EC  2585 10$:     RSB
                                03ED  2586
                                03ED  2587 ;+
                                03ED  2588 ; EXIT Action routine.
                                03ED  2589 ;-
                                03ED  2590 ACT_EXIT:
  04 A2    00000000'EF    DE    03ED  2591          MOVAL   L^DSV$EXIT, -           ; Load EXIT routine address             [46]
                                03F5  2592                    CLI$L_COMMAND (R2)    ;                               [46]
                     05    03F5  2593          RSB                                     ; Return                        [46]
```

```
                                03F6  2595          .SUBTITLE       Commands H-R Action Routines
                                03F6  2596 ;+
                                03F6  2597 ; HELP Command action routine
                                03F6  2598 ;-
                                03F6  2599
                                03F6  2600 ACT_HELP:
        00000000'EF    16       03F6  2601          JSB     SCRIPT$FLUSH            ; Flush scripts if console command
        00000000'EF    16       03FC  2602          JSB     DS_CLEANUP              ; Clean up program if necessary
50      00000000'EF    9E       0402  2603          MOVAB   HELPINFO,R0             ; Place to save pointers
         04 A0   58    D0       0409  2604          MOVL    R8,4(R0)                ; Save address
            60   59    D0       040D  2605          MOVL    R9,(R0)                 ; Save length
        00000000'EF    16       0410  2606          JSB     INIT_CONTEXT            ; Re-init stacks, PCB, ...
7E      00000000'EF    7D       0416  2607          MOVQ    HELPINFO,-(SP)          ; Restore descriptor
                6E     7F       041D  2608          PUSHAQ  (SP)                    ; and set pointer to it
00000000'EF     01     FB       041F  2609          CALLS   #1,L^DSX$HELP           ; Call the HELP routine
                8E     7C       0426  2610          CLRQ    (SP)+                   ; Remove descriptor
             06 50     E8       0428  2611          BLBS    R0,20$                  ; If no HELP error, continue
        00000000'EF    16       042B  2612          JSB     DSR$COMPLETION          ; Type error text
        00000000'EF    17       0431  2613 20$:     JMP     BEGIN                   ; Can't return--so start over
                                0437  2614
                                0437  2615 ;+
                                0437  2616 ; INITPCS                                                        begin   [77]
                                0437  2617 ;-
                                0437  2618
                                0437  2619 ACT_INITPCS:
    04 A2   3D'AF    9E       0437  2620          MOVAB   B^10$,CLI$L_COMMAND(R2) ; Load command routine address
                     05       043C  2621          RSB
                              043D  2622
                              043D  2623 10$:     BR_IF_NOT_USER  20$
0000FE00'EF     1C   E1       043D               BBC     #DSA$V_User, -          ; If bit not set, branch
                12             0444                 L^DSA$GL_Flags, 20$       ;
     000000BD'EF     9F       0445  2624          PUSHAB  L^T_EMESSG1             ;
                     01       044B  2625          pushl   #ds$k_printf            ; Print with PRINTF
                     15       044D  2626          pushl   #ds$k_type_command_err  ; Command error code
00000000'GF     03   FB       044F  2627          CALLS   #3, G^DSX$PRINT         ; Print
                     05       0456  2628          RSB
                              0457  2629
00000000'EF     00   FB       0457  2630 20$:     CALLS   #0,DSV$INITPCS          ; Routine to do the work
                     05       045E  2631          RSB
                              045F  2632
                              045F  2633 ;+
                              045F  2634 ; LOAD COMMAND.
                              045F  2635 ;-
                              045F  2636 ACT_LOAD:
04 A2   00000000'EF     DE    045F  2637          MOVAL   L^DSV$LOAD, -           ; Load command routine address
                              0467  2638            CLI$L_COMMAND(R2)
         62   40 8F    88    0467  2639          BISB2   #1@CLI$V_LOAD, -
                              046B  2640            CLI$L_FLAGS(R2)               ; SET LOAD COMMAND
 18 A2   0000'8F     3C    046B  2641          MOVZWL  #DS$A_PRGBGN,CLI$L_ADDRESS(R2)  ; DEFAULT LOAD ADDRESS
                     05    0471  2642          RSB
                              0472  2643
                              0472  2644 ;+
                              0472  2645 ; NEXT Action routine.
                              0472  2646 ;-
                              0472  2647 ACT_NEXT_INST:
        00000000'EF     D4    0472  2648          CLRL    MP$GL_CONDITION_FLAGS   ; Clear mp condition flags              [103
         1C A2   01     D0    0478  2649          MOVL    #1, CLI$L_DATA(R2)      ; DEFAULT IS ONE STEP
```

```
                 0444 C2   02    88  047C  2650          BISB2   #1@CLI$V_NEXT, -          ; Set next flag                          [99]
                                   0481  2651                  CLI$L_FLAGS2(R2)          ;                                        [99]
            00000000'EF    02    88  0481  2652          BISB2   #2,L^DEBUG$GB_FLAGS       ; SET STEP FLAG                          [41]
             04 A2    FECF CF    9E  0488  2653          MOVAB   W^ACT_CONT,CLI$L_COMMAND(R2)    ; SET PROCESSING ADDRESS
                                   05  048E  2654          RSB
                                       048F  2655
                                       048F  2656 ;+
                                       048F  2657 ; RUN COMMAND.
                                       048F  2658 ;-
                                       048F  2659 ACT_RUN:                                                                        ;G:27
                 00000000'EF    D4  048F  2660          CLRL    MP$GL_CONDITION_FLAGS     ; Clear mp condition flags       [103] ;G:11
                 00000000'EF    7C  0495  2661          CLRQ    L^BIN_TIME                ; Init time to run.              [120] ;G:11
    00000000'EF    02000000 8F    CA  049B  2662          BICL2   #DS$M_TIMED,DS$GL_FLAGS ; Init /TIME flag                [120] ;G:11
                 0444 C2   08    C8  04A6  2663          BISL2   #CLI$M_START_OR_RUN, -   ; Indicate a RUN command         [120] ;G:11
                                   04AB  2664                  CLI$L_FLAGS2(R2)          ;                                [120] ;G:11
                  00 62    15    E3  04AB  2665          BBCS    #CLI$V_RUN, -
                                   04AF  2666                    CLI$L_FLAGS (R2), 5$    ; Set RUN flag                   [45]  ;G:11
         04 A2   00000000'EF    DE  04AF  2667 5$:      MOVAL   L^DSV$RUN, -              ; LOAD COMMAND ROUTINE ADDRESS.  [41]  ;G:11
                                   04B7  2668                    CLI$L_COMMAND(R2)
                  2C A2    01    D0  04B7  2669          MOVL    #1,CLI$L_PASS(R2)         ; Default pass count is 1
      03 0000FE00'EF    0E    E1  04BB  2670          BBC     #DSA$V_SEARCH,L^DSA$GL_FLAGS,10$ ; Branch if search not set[41] ;G:1
                     2C A2    D4  04C3  2671          CLRL    CLI$L_PASS(R2)            ; If in SEARCH, default to 0.
                              05  04C6  2672 10$:     RSB                               ; Return
```

```
                                04C7  2674          .SUBTITLE       Commands S-Z Action Routines
                                04C7  2675
                                04C7  2676 ;+
                                04C7  2677 ; SELECT
                                04C7  2678 ;-
                                04C7  2679 ACT_SELECT:
04 A2   00000000'EF   9E        04C7  2680          MOVAB   L^DSV$SELECT,CLI$L_COMMAND(R2)  ; SET COMMAND ROUTINE          [41]
00 00000444 E2   00   E5        04CF  2681          BBCC    #CLI$V_NOALLOC, -               ; CLEAR NO ALLOCATE FLAG       [91]
                                04D7  2682                    L^CLI$L_FLAGS2(R2),10$        ;                              [91]
                              05  04D7  2683 10$:    RSB
                                04D8  2684 ;+
                                04D8  2685 ; SELECT/NOALLOCATE                                                               [82]
                                04D8  2686 ;-
                                04D8  2687 ACT_NO_ALLOC::
00 00000444 E2   00   E2        04D8  2688          BBSS    #CLI$V_NOALLOC, -               ; SET NO ALLOCATE FLAG         [82]
                                04E0  2689                    L^CLI$L_FLAGS2(R2),10$        ;                              [82]
                              05  04E0  2690 10$:    RSB                                     ;                              [82]
                                04E1  2691 ;
                                04E1  2692 ;+
                                04E1  2693 ; SET COMMAND.
                                04E1  2694 ;-
                                04E1  2695 ACT_SET:
04 A2   00000000'EF   DE        04E1  2696          MOVAL   L^VRSETFLG, -           ; LOAD COMMAND ROUTINE ADDRESS.        [41]
                                04E9  2697                    CLI$L_COMMAND(R2)
         00 62   03   E2        04E9  2698          BBSS    #CLI$V_SET, -           ; SET SET FLG.
                                04ED  2699                    CLI$L_FLAGS(R2), 10$
                              05  04ED  2700 10$:    RSB                             ; RETURN.
                                04EE  2701
                                04EE  2702 ;                                                                                 [101
                                04EE  2703 ;+                                                                                [101
                                04EE  2704 ; SET CPU COMMAND                                                                 [101
                                04EE  2705 ;-                                                                                [101
                                04EE  2706 ;                                                                                 [101
                                04EE  2707 ACT_SETCPU:
                                04EE  2708
            00FF 8F     BB      04EE  2709          PUSHR   #^M<R0,R1,R2,R3,R4,R5,R6,R7>    ; SAVE REGISTERS       [101]
                                04F2  2710
                                04F2  2711 5$:      Br_If_Not_User  10$             ; Branch around if not user mode       [101
0000FE00'EF   1C    E1          04F2               BBC     #DSA$V_User, -                  ; If bit not set, branch
                14              04F9                         L^DSA$GL_Flags, 10$        ;
     000000BD'EF    9F          04FA  2712          PUSHAB  L^T_EMESSGI                     ;                              [101
                01   DD         0500  2713          pushl   #ds$k_printf                    ; Print with PRINTF            [101
                15   DD         0502  2714          pushl   #ds$k_type_command_err          ; Command error code           [101
00000000'GF     03   FB         0504  2715          CALLS   #3, G^DSX$PRINT                 ; Print                        [101
              00F5   31         050B  2716          BRW     500$                            ; Return                       [101
                                050E  2717
            56   52     D0      050E  2718 10$:     MOVL    R2,R6                   ; PUT BASE OF CLI IN R6                [101]
                                0511  2719
                                0511  2720 ;       1) see if name stored in cli$Q_file is 'primary'                       [101]
                                0511  2721
         55    08 A6     9A      0511  2722          MOVZBL  CLI$Q_FILE(R6),R5               ; Store string length [111]
00000455'EF    0C B6    55   29   0515  2723          CMPC3   R5,aCLI$Q_FILE+4(r6),PRIMARY_NAME       ;       [101][111]
                                051E  2724
                                051E  2725 ;       2) if so clear ap_set_flag, exit                                       [101]
                                051E  2726                                          ; else
                03   12         051E  2727                  BNEQ    90$             ; BRANCH to find Ptable of device      [101
                                0520  2728
```

```
                    00CE   31  0520  2729                  BRW     400$            ; JUMP to clear flag and exit          [101
                               0523  2730
                               0523  2731 ;       3) else search for LUN                                                  [101
                               0523  2732
          00000479'EF   D4     0523  2733 90$:    CLRL    MP$GL_LUN       ; Reset the log. unit number          [101]
                               0529  2734
                               0529  2735 100$:   $DS_GPHARD_S    MP$GL_LUN, - ; Get the Ptable for the          [101]
                               0529  2736                         PTABLE      ; specified l.u.n.                 [101]
          00000474'EF   DF     0529                  PUSHAL  PTABLE
          00000479'EF   DD     052F                  PUSHL   MP$GL_LUN
     00000000'9F   02   FB     0535                  CALLS   #2, a#DS$GPHARD
               01   50   D1   053C  2737          CMPL    R0,#SS$_NORMAL  ; If no more Ptables exist then        [101]
                               053F  2738          BNEQW   300$            ; branch to print error and exit       [101] ;G:30
                    02   12   053F                  BNEQ    30604$                                  ;[66]                 ;G:15
                    03   11   0541                  BRB     30605$                          ;[66]                 ;G:15
                  0094   31   0543        30604$: BRW     300$                                    ;[66]                 ;G:15
                               0546        30605$:                                         ;[66]                 ;G:15
                               0546  2739
     57   00000474'EF   D0     0546  2740          MOVL    PTABLE, R7      ; Else, move the Ptable address in R7  [101]
           55   08 A6   9A     054D  2741          MOVZBL  CLI$Q_FILE(R6),R5                ; Store string length [111]
   0D A7   0C B6   55   29     0551  2742          CMPC3   R5, -           ; and compare it to the generic name[101][111]
                               0557  2743                  @CLI$Q_FILE+4(r6),HP$T_DEVICE+1(R7) ; [101]
                               0557  2744
                    08   13   0557  2745          BEQL    200$            ; If found then check if valid         [101]
                               0559  2746
          00000479'EF   D6     0559  2747          INCL    MP$GL_LUN       ; Try the next log. unit number        [101]
                    C8   11   055F  2748          BRB     100$            ;                                      [101]
                               0561  2749
                               0561  2750 ;       4) if Ptable exist see if device type is a cpu. If so, set flag and exit
                               0561  2751
                               0561  2752
                               0561  2753 200$:
           55   26 A7   9A     0561  2754          MOVZBL  HP$T_TYPE(R7),R5                 ; Store string length [111][123] ;G:
0000045D'EF   27 A7   55   29  0565  2755          CMPC3   R5, -   ; and compare it to the device type  [101][111][123]  ;G:26
                               056E  2756                  HP$T_TYPE+1(r7),KA9CC_CPU+1      ;           [101][118][123]  ;G:30
                               056E  2757                                                                                ;G:30
                    58   13   056E  2758          BEQL    250$                    ; branch if device type is valid[101] ;G:30
                               0570  2759                                                                                ;G:30
           55   26 A7   9A     0570  2760          MOVZBL  HP$T_TYPE(R7),R5                 ; Store string length [111][123] ;G:
00000463'EF   27 A7   55   29  0574  2761          CMPC3   R5, -   ; and compare it to the device type  [101][111][123]  ;G:30
                               057D  2762                  HP$T_TYPE+1(r7),KA884_CPU+1      ;           [101][118][123]  ;G:28
                               057D  2763                                                                                ;G:26
                    49   13   057D  2764          BEQL    250$                    ; branch if device type is valid[101] ;G:30
                               057F  2765                                                                                ;G:26
           55   26 A7   9A     057F  2766          MOVZBL  HP$T_TYPE(R7),R5                 ; Store string length [111]
00000469'EF   27 A7   55   29  0583  2767          CMPC3   R5, -   ; and compare it to the device type  [101][111]
                               058C  2768                  HP$T_TYPE+1(r7),KA880_CPU+1      ;           [101][118]       ;G:5
                               058C  2769
                    3A   13   058C  2770          BEQL    250$                    ; branch if device type is valid[101]
                               058E  2771
           55   26 A7   9A     058E  2772          MOVZBL  HP$T_TYPE(R7),R5                 ; Store string length [111]
0000046F'EF   27 A7   55   29  0592  2773          CMPC3   R5, -   ; and compare it to the device type     [101][111]
                               059B  2774                  HP$T_TYPE+1(r7),KA820_CPU+1      ;              [101][111]
                               059B  2775
                    2B   13   059B  2776          BEQL    250$                    ; branch if device type is valid[101]
                               059D  2777                                          ; else ...                      [101]
                               059D  2778
```

```
                0000045C'EF   9F   059D  2779          PUSHAB  KA9CC_CPU                ; Push device type          [123]          ;G:30
                00000462'EF   9F   05A3  2780          PUSHAB  KA884_CPU                ; Push device type          [123]          ;G:28
                00000468'EF   9F   05A9  2781          PUSHAB  KA880_CPU                ; Push device type          [101][118]     ;G:5
                0000046E'EF   9F   05AF  2782          PUSHAB  KA820_CPU                ; Push device type          [101][111]
                00000181'EF   9F   05B5  2783          PUSHAB  L^T_EMESSG4              ; Error in device type            [101]
                          01   DD   05BB  2784          pushl   #ds$k_printf             ; Print with PRINTF               [101]
                          15   DD   05BD  2785          pushl   #ds$k_type_command_err   ; Command error code             [101]
              00000000'GF   07   FB   05BF  2786          CALLS   #7, G^DSX$PRINT          ; Print                           [101]     ;G:30
                                    05C6  2787                                                                                       ;G:30
                          29   11   05C6  2788          BRB     400$
                                    05C8  2789
                                    05C8  2790 250$:
                 0D A7    08   28   05C8  2791          MOVC3   #8,HP$T_DEVICE+1(R7),-   ; SAVE device name if we need    [118]     ;G:5
                0000047E'EF         05CC  2792                      MP$GT_DEVICE_NAME+1   ; to print it later                [101]     ;G:5
              00000478'EF   01   90   05D1  2793          MOVB    #1,MP$GB_SETCPU ; Set flag and                            [101]
                          29   11   05D8  2794          BRB     500$            ; exit error                              [101]
                                    05DA  2795
                                    05DA  2796
                                    05DA  2797 ;        5) else print error in command statement, exit.
                                    05DA  2798
                                    05DA  2799 300$:
                                    05DA  2800
                00000008 E6   9F   05DA  2801          PUSHAB  L^CLI$Q_FILE(R6)         ; PUSH the QUAD  of device name [101]
                                    05E0  2802
                00000113'EF   9F   05E0  2803          PUSHAB  L^T_EMESSG3              ;                                 [101]     ;G:5
                          01   DD   05E6  2804          pushl   #ds$k_printf             ; Print with PRINTF               [101]     ;G:5
                          15   DD   05E8  2805          pushl   #ds$k_type_command_err   ; Command error code             [101]     ;G:5
              00000000'GF   04   FB   05EA  2806          CALLS   #4, G^DSX$PRINT          ; Print                           [101]     ;G:5
                                    05F1  2807
                                    05F1  2808
                   00000478'EF   94   05F1  2809 400$:   CLRB    MP$GB_SETCPU             ; clear the flag            [101]          ;G:5
0000047E'EF   00000455'EF   08   28   05F7  2810          MOVC3   #8,PRIMARY_NAME,     -   ; Reload "primary" cpu       [118]          ;G:5
                                    0603  2811                  MP$GT_DEVICE_NAME+1      ;                           [118]          ;G:5
                                    0603  2812
                                    0603  2813 500$:
                      00FF 8F   BA  0603  2814          POPR    #^M<R0,R1,R2,R3,R4,R5,R6,R7>     ; RESTORE REGISTERS     [101]
                                    0607  2815
                                05  0607  2816          RSB                              ; RETURN.                         [101]
                                    0608  2817                                                                                       ;G:3
                                    0608  2818 ;                                                                                     ;G:3
                                    0608  2819 ;+                                                                                    ;G:3
                                    0608  2820 ; SHOW CPU COMMAND                                                 [116]               ;G:3
                                    0608  2821 ;-                                                                                    ;G:3
                                    0608  2822 ;                                                                                     ;G:3
                                    0608  2823 ACT_SHOWCPU:                                                      ;[116]              ;G:3
                   04 A2   0E'AF   9E  0608  2824          MOVAB   B^10$,CLI$L_COMMAND(R2)  ; Set command processor [116]          ;G:3
                                05  060D  2825          RSB                                                                         ;G:3
                                    060E  2826                                                                                       ;G:3
                                    060E  2827 10$:     Br_If_Not_User  20$      ; Branch around if not in user mode[116]        ;G:3
              0000FE00'EF   1C   E1  060E               BBC     #DSA$V_User, -           ; If bit not set, branch
                          14        0615                 L^DSA$GL_Flags, 20$            ;
                                    0616  2828          $PRINT  #ds$k_type_command_err, -        ; Print command error [116]   ;G:3
                                    0616  2829                    #ds$k_printf, -                ; .. use PRINTF       [116]   ;G:3
                                    0616  2830                    L^T_EMESSG1                    ; Can't do            [116]   ;G:3
                   000000BD'EF   9F   0616                 PUSHAB  L^T_EMESSG1
                         7E   01   9A  061C                 movzbl  #ds$k_printf, -(sp)
                         7E   15   98  061F                 cvtbl   #ds$k_type_command_err, -(sp)
```

```
        00000000'GF   03   FB  0622                          CALLS   #$$N+2, G^DSX$PRINT
                           05  0629  2831          RSB                                        ;                       [116]   ;G:3
                               062A  2832                                                                                      ;G:3
            0000047D'EF   9F  062A  2833 20$:     PUSHAB  MP$GT_DEVICE_NAME                  ; PRIMARY or KAn ascii[116]   ;G:3
            00000293'EF   9F  0630  2834          PUSHAB  T_SHOWCPU                          ; Address of text     [116]   ;G:3
                      01  DD  0636  2835          pushl   #ds$k_printf                       ; Print with PRINTF   [116]   ;G:3
                      16  DD  0638  2836          pushl   #ds$k_type_command_out             ; Command output code [116]   ;G:3
        00000000'GF   04   FB  063A  2837          CALLS   #4, G^DSX$PRINT                    ; Print               [116]   ;G:3
                           05  0641  2838          RSB                                        ; All done            [116]   ;G:3
                               0642  2839                                                                                      ;G:3
                               0642  2840 ;
                               0642  2841 ;+
                               0642  2842 ; Check command currently given.
                               0642  2843 ; Set flag in R0 if SET LOAD command AND  file spec should be treated as ULTRIX form
                               0642  2844 ; OR
                               0642  2845 ; Set flag if ULTRIX flag set.
                               0642  2846 ; ELSE
                               0642  2847 ; Clear R0.
                               0642  2848 ;-
                               0642  2849 ACT_ULTRIX_ODS:
                      03  BB  0642  2850          PUSHR   #^M<R0,R1>                 ; Save register                        [106
                      6E  D4  0644  2851          CLRL    (SP)                       ; Initialize                           [106
        50   00000000'EF  DE  0646  2852          MOVAL   DSV$SETLOAD, R0            ; Address of SET LOAD routine          [106
              04 A2   50  D1  064D  2853          CMPL    R0,CLI$L_COMMAND(R2)       ; Check if same command                [106
                      13  12  0651  2854          BNEQ    10$                        ; Branch if not SET LOAD command       [106
         68   59   5B 8F  3A  0653  2855          LOCC    #^A"[", R9, (R8)           ; Find how to parse filespec           [106
                      1A  12  0658  2856          BNEQ    20$                        ; Branch to treat as ODS filespec      [106
            68   59   3C  3A  065A  2857          LOCC    #^A"<", R9, (R8)           ; Find how to parse filespec           [106
                      14  12  065E  2858          BNEQ    20$                        ; Branch to treat as ODS filespec      [106
            68   59   28  3A  0660  2859          LOCC    #^A"(", R9, (R8)           ;
                      0C  12  0664  2860          BNEQ    15$                        ; Branch if ULTRIX                     [106
                               0666  2861
            00000000'8F   E1  0666  2862 10$:     BBC     #ULTRIX_V_MODE,-           ; Use current state for parsing        [106
         02 00000000'EF       066C  2863                  L^ULTRIX_FLAGS,20$         ; Test flag for ULTRIX                 [106
                      6E  D6  0672  2864 15$:     INCL    (SP)                       ; Set to indicate proceed as ULTRIX    [106
                      03  BA  0674  2865 20$:     POPR    #^M<R0,R1>                 ; Restore register                     [106
                           05  0676  2866          RSB                                ; Return                               [106
                               0677  2867 ;
                               0677  2868
                               0677  2869 ;+
                               0677  2870 ; SHOW COMMAND.
                               0677  2871 ;-
                               0677  2872 ACT_SHOW:
              00 62   04  E2  0677  2873          BBSS    #CLI$V_SHOW, -             ; SET SHOW FLG.
                               067B  2874                    CLI$L_FLAGS(R2), 10$
                           05  067B  2875 10$:     RSB                                ; RETURN.
                               067C  2876
                               067C  2877 ;+
                               067C  2878 ; START COMMAND.
                               067C  2879 ;-
                               067C  2880 ACT_START:
            00000000'EF   D4  067C  2881          CLRL    MP$GL_CONDITION_FLAGS      ; Clear mp condition flags      [103] ;G:11
            00000000'EF   7C  0682  2882          CLRQ    L^BIN_TIME                 ; Init time to run.             [120] ;G:11
00000000'EF   02000000 8F  CA  0688  2883          BICL2   #DS$M_TIMED,DS$GL_FLAGS    ; Init /TIME flag               [120] ;G:11
           0444 C2   08  C8  0693  2884          BISL2   #CLI$M_START_OR_RUN, -     ; Indicate a START command      [120] ;G:11
                               0698  2885                  CLI$L_FLAGS2(R2)           ;                               [120] ;G:11
              00 62   15  E5  0698  2886          BBCC    #CLI$V_RUN, -              ;                               [45]  ;G:11
```

```
                          069C  2887                    CLI$L_FLAGS (R2), 5$  ; Clear RUN flag                    [45]  ;G:11
04 A2   00000000'EF   DE  069C  2888 5$:      MOVAL   L^VRSTART, -          ; LOAD COMMAND ROUTINE ADDRESS. [41]  ;G:11
                          06A4  2889                    CLI$L_COMMAND(R2)
          2C A2   01  D0  06A4  2890          MOVL    #1,CLI$L_PASS(R2)     ; Default pass count is 1
03 0000FE00'EF    0E  E1  06A8  2891          BBC     #DSA$V_SEARCH,L^DSA$GL_FLAGS,10$ ; Branch if search not set[41] ;G:1
             2C A2    D4  06B0  2892          CLRL    CLI$L_PASS(R2)        ; If in SEARCH, default to 0.
                      05  06B3  2893 10$:     RSB                           ; Return
                          06B4  2894
                          06B4  2895 ;+
                          06B4  2896 ; SCRIPT COMMAND.
                          06B4  2897 ;-
                          06B4  2898 ACT_SCRIPT:
04 A2   00000000'EF   DE  06B4  2899          MOVAL   L^SCRIPT$OPEN, -      ; LOAD COMMAND ROUTINE ADDRESS.         [41]
                          06BC  2900                    CLI$L_COMMAND(R2)
                      05  06BC  2901          RSB                                                                   ;G:27
                          06BD  2902
                          06BD  2903 ;+
                          06BD  2904 ; SUMMARY COMMAND.
                          06BD  2905 ;-
                          06BD  2906 ACT_SUMMARY:
04 A2   00000000'EF   DE  06BD  2907          MOVAL   L^VRSUMMARY, -        ; LOAD COMMAND ROUTINE ADDRESS.         [41]
                          06C5  2908                    CLI$L_COMMAND(R2)
                      05  06C5  2909          RSB
```

```
                                06C6  2911          .SUBTITLE       CRD command
                                06C6  2912
                                06C6  2913 ;+                                                                          [60]  ;G:2
                                06C6  2914 ; CRD COMMAND.                                                              [60]  ;G:2
                                06C6  2915 ;-                                                                          [60]  ;G:2
                                06C6  2916                                                                                   ;G:2
                                06C6  2917 ACT_CRD:                                     ;                              [60]  ;G:2
                                06C6  2918          BR_IF_NOT_USER  50$                 ;                              [115] ;G:2
          0000FE00'EF    1C    E1  06C6                BBC     #DSA$V_User, -                  ; If bit not set, branch
                               16   06CD                  L^DSA$GL_Flags, 50$           ;
                                06CE  2919                                                                                   ;G:2
                                06CE  2920          ;+                                                                       ;G:2
                                06CE  2921          ; Print an error message since command not permitted in User mode.[115] ;G:2
                                06CE  2922          ;                                                                        ;G:27
                                06CE  2923          ;-                                                                       ;G:2
                                06CE  2924          $Print  #DS$K_Type_Command_Err,-        ; Print illegal command [115] ;G:2
                                06CE  2925                    #DS$K_PrintI, -           ; . . . use PrintI      [115] ;G:2
                                06CE  2926                    L^T_User_Mode_Menu_Error  ; . . . the format string [115] ;G:2
              00000221'EF    9F  06CE                      PUSHAB  L^T_User_Mode_Menu_Error
                   7E    00   9A  06D4                      movzbl  #DS$K_PrintI, -(sp)
                   7E    15   98  06D7                      cvtbl   #DS$K_Type_Command_Err, -(sp)
          00000000'GF    03   FB  06DA                      CALLS   #$$N+2, G^DSX$PRINT
                     00C0  31   06E1  2927          BRW     310$                            ; Exit                  [115] ;G:2
                                06E4  2928
                                06E4  2929          ;   This section sets things up
     0000FE00'EF    00050800 8F   D3  06E4  2930 50$:   BITL    #<DSA$M_CRD_Autotest_Off ! -                                 ;G:2
                                06EF  2931                    DSA$M_CRD_Menutest_Off ! -
                                06EF  2932                    DSA$M_CRD_Menutest_On>, DSA$GL_Flags                   ;[72] ;G:2
                          03    13  06EF  2933          BEQL    100$                            ; Branch if NO bits set ; [86] ;G:2
                        0094    31  06F1  2934          BRW     300$                            ; Branch to ERROR message
                                06F4  2935
          00000000'EF    01    91  06F4  2936 100$:   CMPB    #1, CRD$GL_CRD_Command_Debug                           ; [72] ;G:2
                          0D    12  06FB  2937          BNEQ    110$                            ; Branch if NOT equal  ; [86] ;G:2
     0000FE00'EF    00010000 8F   C8  06FD  2938 105$:   BISL2   #DSA$M_CRD_Menutest_Off, DSA$GL_Flags                 ; [72] ;G:2
                          2E    11  0708  2939          BRB     210$                                                   ; [86] ;G:2
                                070A  2940                                                                                   ;G:27
          00000000'EF    02    91  070A  2941 110$:   CMPB    #2,CRD$GL_CRD_Command_Debug                            ; [72] ;G:2
                          0D    12  0711  2942          BNEQ    120$                            ; Branch if NOT equal  ; [86] ;G:2
     0000FE00'EF    00000800 8F   C8  0713  2943          BISL2   #DSA$M_CRD_Autotest_Off, DSA$GL_Flags                 ; [72] ;G:2
                          18    11  071E  2944          BRB     210$                                                   ; [86] ;G:2
                                0720  2945
       03 0000FE00'EF    1C    E0  0720  2946 120$:   BBS     #DSA$V_User, DSA$GL_Flags, 130$ ; Branch IF user mode  ; [86] ;G:2
                       FFD2    31  0728  2947          BRW     105$                            ; Branch to ERROR message
     0000FE00'EF    00040000 8F   C8  072B  2948 130$:   BISL2   #DSA$M_CRD_Menutest_On,  DSA$GL_Flags                 ; [72] ;G:2
                          00    11  0736  2949          BRB     210$                                                   ; [86] ;G:2
                                0738  2950
                                0738  2951          ;   This section envokes CRD
               00000000'EF    16  0738  2952 210$:   Jsb     L^DS_Cleanup                    ; Clean up the old diagnostic  [67]  ;G:2
                                073E  2953
                                073E  2954          Br_If_User      215$                    ; If User_Mode, branch around  [67]  ;G:2
          0000FE00'EF    1C    E0  073E                BBS     #DSA$V_User, -                  ; If bit set, branch                 [28]
                               07   0745                    L^DSA$GL_Flags, 215$          ;                                    [28]
          00000000'EF    00    FB  0746  2955          Calls   #0, L^MapFree                   ; Map free memory              [67]  ;G:2
                                074D  2956
                                074D  2957          ; Clear the DS's 1st and 2cd ^C handler. Clear the user's ^C handler
               00000000'EF    D4  074D  2958 215$:   ClrL    L^DS$GA_DS_Ctrl_C_First                                        ; [67] ;G:2
               00000000'EF    D4  0753  2959          ClrL    L^DS$GA_DS_Ctrl_C_Second                                       ; [66] ;G:2
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                00000000'EF   D4  0759  2960          ClrL    L^DS$L_UserCntrlC                                          ; [66] ;G:2
                                  075F  2961
                                  075F  2962          ; Clear the ^C handler
        00 00000000'EF   00   E4  075F  2963          Bbsc    #DS$V_CtrlC, L^DS$GL_Flags, 220$                           ; [67] ;G:2
                                  0767  2964
                                  0767  2965          ; Disable ^C's for now (set the bit)
        00 00000000'EF   18   E2  0767  2966 220$:    Bbss    #DS$V_DisablCC, L^DS$GL_Flags, 230$                        ; [67] ;G:2
                                  076F  2967
                                  076F  2968          ; Load the CRD image file
           00000000'EF   00   FB  076F  2969 230$:    Calls   #0, L^DSR$Load_CRD                                         ; [67] ;G:2
                                  0776  2970
                                  0776  2971          ;+
                                  0776  2972          ; Call the CRD's initialization routine. If it returns success, we[67] ;G:2
                                  0776  2973          ; are on our way. If it returns failure, print a message and call [67] ;G:2
                                  0776  2974          ; the DSR$Unload_CRD routine so that the CRD region can be      [67]  ;G:2
                                  0776  2975          ; deallocated.                                                  [67]  ;G:2
                                  0776  2976          ;-
                        00   DD  0776  2977          PushL   #0                          ; Push 0 as param-4             [63]  ;G:2
                        00   DD  0778  2978          PushL   #0                          ; Push 0 as param-3             [63]  ;G:2
                        00   DD  077A  2979          PushL   #CRD$K_CRD_Initialization ; Push Initialization as param-2[63] ;G:2
                        00   DD  077C  2980          PushL   #CRD$K_Hook_Point           ; Push Hook_Point as param-1      [63] ;G:2
           00000000'FF   04   FB  077E  2981          CallS   #4, -                       ; Call the CRD$DS_Interface routine[63] ;G:2
                                  0785  2982                    @L^DS$GA_CRD_DS_Interface ; ... to initialize CRD        [63] ;G:2
                     1C 50   E8  0785  2983          BLBS    R0, 310$                    ; Branch if Sucess                [67] ;G:2
                                  0788  2984
                                  0788  2985          ;+
                                  0788  2986          ; Come to here if: 1. Already running CRD and the CRD command is   [67] ;G:2
                                  0788  2987          ; issued, or, 2. If the CRD imitialization routine return failure. [67] ;G:2
                                  0788  2988          ; This should never happen, but . . .                              [67] ;G:2
                                  0788  2989          ;-
                                  0788  2990 300$:    $PRINT  #DS$K_TYPE_COMMAND_ERR, #DS$K_PRINTI, L^GT_Menu_Error      ;[63] ;G:
                000001F6'EF   9F  0788                        PUSHAB  L^GT_Menu_Error
                     7E   00   9A  078E                        movzbl  #DS$K_PRINTI, -(sp)
                     7E   15   98  0791                        cvtbl   #DS$K_TYPE_COMMAND_ERR, -(sp)
           00000000'GF   03   FB  0794                        CALLS   #$$N+2, G^DSX$PRINT
                        00   DD  079B  2991          PushL   #0                          ; Don't return if CRD image loaded ;[67] ;G:
           00000000'EF   01   FB  079D  2992          Calls   #1, L^DSR$Unload_CRD                                       ;[67] ;G:
                        05        07A4  2993 310$:    RSB                                                                ;[67] ;G:
                                  07A5  2994
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                        07A5  2996          .SUBTITLE       Filespec, Optional, Required Action Routines
                        07A5  2997 ;+
                        07A5  2998 ; FILESPEC ACTION ROUTINE.
                        07A5  2999 ;-
                        07A5  3000 ACT_FILESPEC:
0C A2    68    DE       07A5  3001          MOVAL   (R8), CLI$Q_FILE+4(R2)  ; SAVE CHARACTER POINTER.
     08 A2    D4       07A9  3002          CLRL    CLI$Q_FILE(R2)          ; CLEAR LENGTH OF STRING
              05       07AC  3003          RSB                             ; RETURN
                        07AD  3004
                        07AD  3005 ;+
                        07AD  3006 ; FILEND ACTION ROUTINE.
                        07AD  3007 ;-
                        07AD  3008 ACT_FILEND:
58   0C A2    C3       07AD  3009          SUBL3   CLI$Q_FILE+4(R2), -     ; CALC CHARACTER COUNT.
     08 A2                07B1  3010                    R8, CLI$Q_FILE(R2)
              05       07B3  3011          RSB                             ; RETURN.
                        07B4  3012
                        07B4  3013 ;+
                        07B4  3014 ; OPTIONAL Action routine.
                        07B4  3015 ;-
                        07B4  3016 ACT_OPTIONAL:                            ;                               [45]
00 62    00    E5       07B4  3017          BBCC    #CLI$V_REQUIRED, -      ; Clear required bit            [45]
                        07B8  3018                    CLI$L_FLAGS (R2), 10$ ;                               [45]
              05       07B8  3019 10$:     RSB                             ; Return                        [45]
                        07B9  3020
                        07B9  3021 ;+
                        07B9  3022 ; REQUIRED Action routine.
                        07B9  3023 ;-
                        07B9  3024 ACT_REQUIRED:                            ;                               [45]
00 62    00    E3       07B9  3025          BBCS    #CLI$V_REQUIRED, -      ; Set required bit              [45]
                        07BD  3026                    CLI$L_FLAGS (R2), 10$ ;                               [45]
              05       07BD  3027 10$:     RSB                             ; Return                        [45]
```

```
                                07BE          .SUBTITLE       Start and Run Qualifier Action Routines
                                07BE
                                07BE  ;+                                                                                [62]
                                07BE  ; /DEBUG ACTION ROUTINE                                                           [62]
                                07BE  ;-                                                                                [62]
                                07BE  ACT_DEBUG_SWITCH:                                ;                                [62]
        40000000 8F      C8     07BE          BISL2   #1@DSA$V_LOAD_DEBUGGER,-;SET INDICATOR SO DS WILL LOAD           [62]
        0000FE00'EF             07C4                  DSA$GL_FLAGS                ;  DEBUGGER LATER                     [62]
                         05     07C9          RSB                                   ;RETURN                                [62]
                                07CA
                                07CA  ;+
                                07CA  ; /PASSES ACTION ROUTINE.
                                07CA  ;-
                                07CA  ACT_PASS:
         2C A2    5A      D0     07CA          MOVL    R10, CLI$L_PASS(R2)           ; SAVE NUMBER OF PASSES.
                         05     07CE          RSB                                   ; RETURN.
                                07CF
                                07CF  ;+
                                07CF  ; /QA Action routine
                                07CF  ;-
                                07CF  ACT_QA:
         00 62    07      E2     07CF          BBSS    #CLI$V_QA, -                          ; Set QA flag on          [42]
                                07D3                          CLI$L_FLAGS(R2),10$           ;                         [42]
                         05     07D3  10$:    RSB                                           ;                         [42]
                                07D4
                                07D4  ;+
                                07D4  ; /SECTION ACTION ROUTINE.
                                07D4  ;-
                                07D4  ACT_SECTION:
     10 A2    58    51      C3     07D4          SUBL3   R1, R8, -                     ; CALCULATE SECTION NAME SIZE.
                                07D9                    CLI$Q_SECTION(R2)
         14 A2    51      D0     07D9          MOVL    R1, CLI$Q_SECTION+4(R2)       ; ADDRESS OF SECTION NAME.
                         05     07DD          RSB                                   ; RETURN.
                                07DE
                                07DE  ;+
                                07DE  ; /SUBTEST ACTION ROUTINE.
                                07DE  ;-
                                07DE  ACT_SUBTEST:
         28 A2    5A      D0     07DE          MOVL    R10, CLI$L_SUBT(R2)           ; SAVE SUBTEST NUMBER.
                         05     07E2          RSB                                   ; RETURN.
                                07E3
                                07E3  ;+
                                07E3  ; /TEST ACTION ROUTINE.
                                07E3  ;-
                                07E3  ACT_TEST:
         20 A2    5A      D0     07E3          MOVL    R10, CLI$L_TEST(R2)           ; SAVE FIRST TEST NUMBER.
                         05     07E7          RSB                                   ; RETURN.
                                07E8
                                07E8  ;+
                                07E8  ; LAST ACTION ROUTINE.
                                07E8  ;-
                                07E8  ACT_LAST:
         24 A2    5A      D0     07E8          MOVL    R10, CLI$L_LAST(R2)           ; SAVE LAST TEST NUMBER.
                         05     07EC          RSB                                   ; RETURN.
                                07ED
                                07ED  ;+
                                07ED  ; BEGINTIME ACTION ROUTINE for /TIME switch     ;                                [76]
```

```
                                07ED  3086 ;-
                                07ED  3087
                                07ED  3088 ACT_BEGINTIME:                                ;                                [76]
                     0440 C2    68   DE  07ED  3089          MOVAL   (R8),CLI$Q_TIME+4(R2)   ; Save current addr of time string [76]
                          043C C2    D4  07F2  3090          CLRL    CLI$Q_TIME(R2)          ; Clear the length field        [76]
                                05   07F6  3091          RSB                             ;                                [76]
                                07F7  3092
                                07F7  3093 ;+
                                07F7  3094 ; /TIME ACTION ROUTINE                        ;                                [76]
                                07F7  3095 ;-
                                07F7  3096
                                07F7  3097 ACT_TIME:                                     ;                                [76]
                          007E 8F    BB  07F7  3098          PUSHR   #^M<R1,R2,R3,R4,R5,R6>  ; MOVC3 destroys R0-R5, LOCC    [76]
                                07FB  3099                                               ; destroys R0,R1, don't need R0 [76]
                                07FB  3100                                               ; Need R6 to hold R2 temporarily[76]
                          56    52   D0  07FB  3101          MOVL    R2,R6                   ; Save R2 (DS$GL_CLIBASE)       [76]
                043C C6   58    0440 C6   C3  07FE  3102          SUBL3   CLI$Q_TIME+4(R6),R8, -  ; Calculate length of time...   [76]
                                0806  3103                   CLI$Q_TIME(R6)          ; string                         [76]
                                0806  3104
                0440 D6    043C C6   2D   3A  0806  3105          LOCC    #^A"-",CLI$Q_TIME(R6), - ; a "-" means a value for day  [76]
                                080E  3106                   aCLI$Q_TIME+4(R6)       ; was typed.                     [76]
                                3B   12  080E  3107          BNEQ    20$                     ; Branch if found               [76]
                                0810  3108
                                0810  3109                                               ; Not found, copy string to     [76]
                                0810  3110                                               ; stack, in order to insert "0 "[76]
                                7E   B5  0810  3111 10$:     TSTW    -(SP)                   ; Allocate space for "0 "       [76]
                          5E    043C C6   C2  0812  3112          SUBL2   CLI$Q_TIME(R6),SP       ; Allocate space for string     [76]
                          6E    2030 8F   B0  0817  3113          MOVW    #^A"0 ",(SP)            ; "0 " means 0 days              [76]
02 AE           0440 D6    043C C6   28  081C  3114          MOVC3   CLI$Q_TIME(R6), -       ; Move the string from the CLI  [76]
                                0825  3115                   aCLI$Q_TIME+4(R6),2(SP) ; data structure to the stack   [76]
                     0440 C6    6E   DE  0825  3116          MOVAL   (SP),CLI$Q_TIME+4(R6)   ; Set new address of string     [76]
                     043C C6    02   C0  082A  3117          ADDL2   #2,CLI$Q_TIME(R6)       ; Add 2 to the string length    [76]
                                082F  3118          $BINTIM_S CLI$Q_TIME(R6),L^BIN_TIME ; Convert ASCII to binary time[76]
                      00000000'EF    7F  082F                PUSHAQ  L^BIN_TIME
                          043C C6    7F  0835                PUSHAQ  CLI$Q_TIME(R6)
                00000000'GF    02   FB  0839                CALLS   #2,G^SYS$BINTIM
                     5E    043C C6   C0  0840  3119          ADDL2   CLI$Q_TIME(R6),SP       ; Deallocate stack space        [76]
                          007E 8F    BA  0845  3120          POPR    #^M<R1,R2,R3,R4,R5,R6>  ; These registers matter       [76]
                                29   11  0849  3121          BRB     40$
                                084B  3122
                     51    0440 C6   D1  084B  3123 20$:     CMPL    CLI$Q_TIME+4(R6),R1     ; "-" first char in string?     [76]
                                0A   12  0850  3124          BNEQ    30$                     ; Branch if not                 [76]
                          043C C6   D7  0852  3125          DECL    CLI$Q_TIME(R6)          ; Decr string count (rid of "-")[76]
                          0440 C6   D6  0856  3126          INCL    CLI$Q_TIME+4(R6)        ; Incr string address           [76]
                                B4   11  085A  3127          BRB     10$                     ; Go pad in a "0 "              [76]
                                085C  3128
                                085C  3129                                               ; Here if a day value preceded  [76]
                                085C  3130                                               ; the dash                      [76]
                          61    20   90  085C  3131 30$:     MOVB    #^A" ",(R1)             ; Change the "-" to " "         [76]
                                085F  3132          $BINTIM_S CLI$Q_TIME(R6),L^BIN_TIME ; Convert ascii to binary time[76]
                      00000000'EF    7F  085F                PUSHAQ  L^BIN_TIME
                          043C C6    7F  0865                PUSHAQ  CLI$Q_TIME(R6)
                00000000'GF    02   FB  0869                CALLS   #2,G^SYS$BINTIM
                          007E 8F    BA  0870  3133          POPR    #^M<R1,R2,R3,R4,R5,R6>  ; These registers matter       [76]
                                0874  3134
                            04 50    E8  0874  3135 40$:     BLBS    R0,50$                  ; Branch if success             [76]
                          50    01   D0  0877  3136          MOVL    #1,R0                   ; Failure, set R0 for CLI$K_BIF [76]
```

```
          05  087A  3137          RSB                          ;                                [76]
              087B  3138
     50   D4  087B  3139 50$:     CLRL    R0                   ; Success, set R0 for CLI$K_BIF [76]
          05  087D  3140          RSB                          ;                                [76]
```

```
                                087E          .SUBTITLE       Event and Flags Action Routines
                                087E
                                087E  ;+
                                087E  ; Set/Clear Enforce action routines.  Note that 'SET ENFORCE'
                                087E  ; actually CLEARS the flag, and 'CLEAR ENFORCE' SETS the flag.
                                087E  ; The physical flag is actually 'inhibit enforce'.
                                087E  ;-
                                087E  .Enable LSB
                                087E  Act_SetEnforce:                          ;                                    [57]
                     50    94   087E          ClrB    R0                      ; Clear value                        [57]
                     03    11   0880          BrB     Common_Enforce          ;                                    [57]
                                0882  Act_ClearEnforce:                        ;                                    [57]
                50   01    90   0882          MovB    #1, R0                  ; Set value                          [57]
                                0885  Common_Enforce:                          ;                                    [57]
      00000000'EF    50    90   0885          MovB    R0, L^Ds$GB_Inhibit_Naming      ; transfer value                [57]
                04 A2    D4   088C          ClrL    Cli$L_Command(R2)       ; Make sure no command set              [57]
                         05   088F          Rsb                             ;                                    [57]
                                0890  .Disable LSB
                                0890
                                0890  ;+
                                0890  ;  SHOW ENFORCE ROUTINE.                                                      [89]
                                0890  ;-
                                0890  ACT_SHOWENFORCE:                                 ;                            [89]
      50   000001EF'EF    9E   0890          MOVAB   L^T_ON,R0                       ; Assume flag set                [89]
        07 00000000'EF    E9   0897          BLBC    L^DS$GB_INHIBIT_NAMING,10$      ; Check for set flag             [89]
      50   000001F2'EF    9E   089E          MOVAB   L^T_OFF,R0                      ; Replace with off value         [89]
                                08A5
                                08A5  10$:    $PRINT  #DS$K_TYPE_COMMAND_OUT,-        ; Print status of...             [89]
                                08A5                    #DS$K_PRINTI,-                ; enforce flag...                [89]
                                08A5                    L^T_SHOWENFORCE,-
                                08A5                    R0                            ; on or off.                     [89]
                     50    DD   08A5                  PUSHL   R0
          00000278'EF    9F   08A7                  PUSHAB  L^T_SHOWENFORCE
                7E   00    9A   08AD                  movzbl  #DS$K_PRINTI, -(sp)
                7E   16    98   08B0                  cvtbl   #DS$K_TYPE_COMMAND_OUT, -(sp)
      00000000'GF    04    FB   08B3                  CALLS   #$$N+2, G^DSX$PRINT
                                08BA
          00000004 E2    D4   08BA          CLRL    L^CLI$L_COMMAND(R2)             ; Make sure no command routine is se
                         05   08C0          RSB                                     ; Return                         [89]
                                08C1
                                08C1  ;+
                                08C1  ; EVENT ACTION ROUTINE.
                                08C1  ;-
                                08C1  ACT_EVENT:
           00 62   08    E2   08C1          BBSS    #CLI$V_EVENT, -         ; SET 'EVENT FLAG' FLAG.
                                08C5                    CLI$L_FLAGS(R2), 10$
           0A 62   03    E1   08C5  10$:    BBC     #CLI$V_SET, -           ; BR IF SET COMMAND.
                                08C9                    CLI$L_FLAGS(R2), 20$
    04 A2   00000000'EF    DE   08C9          MOVAL   L^VRSETEF, -            ; COMMAND.                           [41]
                                08D1                    CLI$L_COMMAND(R2)
                     16    11   08D1          BRB     40$
           0A 62   02    E1   08D3  20$:    BBC     #CLI$V_CLEAR, -         ; BR IF CLEAR COMMAND.
                                08D7                    CLI$L_FLAGS(R2), 30$
    04 A2   00000000'EF    DE   08D7          MOVAL   L^VRCLREF, -            ; COMMAND.                           [41]
                                08DF                    CLI$L_COMMAND(R2)
                     08    11   08DF          BRB     40$
    04 A2   00000000'EF    DE   08E1  30$:    MOVAL   L^VRSHOWEF, -           ; COMMAND.                           [41]
```

```
                                08E9                          CLI$L_COMMAND(R2)
                          05    08E9  40$:    RSB                                  ; RETURN.
                                08EA
                                08EA  ;+
                                08EA  ; FLAGS ACTION ROUTINE.
                                08EA  ;-
                                08EA  ACT_FLAGS:
          10 62    08    E0    08EA          BBS     #CLI$V_EVENT, -              ; 'EVENT FLAG' FLAG SET ?
                                08EE                    CLI$L_FLAGS(R2), 20$       ; YES, THEN DO NOTHING HERE.
          00 62    09    E2    08EE          BBSS    #CLI$V_FLAGS, -              ; SET 'FLAGS' FLAG.
                                08F2                    CLI$L_FLAGS(R2), 10$
          08 62    04    E1    08F2  10$:    BBC     #CLI$V_SHOW, -               ; BR IF NOT SHOW COMMAND.
                                08F6                    CLI$L_FLAGS(R2), 20$
    04 A2   00000000'EF   DE    08F6          MOVAL   L^VRSHOWFLG, -               ; COMMAND.                          [41]
                                08FE                    CLI$L_COMMAND(R2)
                          05    08FE  20$:    RSB                                  ; RETURN.
```

```
                                08FF  3211          .SUBTITLE       Base, Address, Break Action Routines
                                08FF  3212
                                08FF  3213 ;+
                                08FF  3214 ; BASE ACTION ROUTINE.
                                08FF  3215 ;-
                                08FF  3216 ACT_BASE:
            09 62    04    E1   08FF  3217          BBC     #CLI$V_SHOW, -          ; Branch if not SHOW command          [43]
                                0903  3218            CLI$L_FLAGS (R2), 10$ ;                                         [43]
    04 A2   00000000'EF    DE   0903  3219          MOVAL   L^VRSHOWBASE, -         ; "SHOW BASE" command                 [43]
                                090B  3220            CLI$L_COMMAND (R2)    ;                                         [43]
                           05   090B  3221          RSB                     ;                                         [43]
    04 A2   00000000'EF    DE   090C  3222 10$:     MOVAL   L^VRSETBASE, -          ; "SET BASE" COMMAND.                [41]
                                0914  3223            CLI$L_COMMAND(R2)
                           05   0914  3224          RSB                             ; RETURN.
                                0915  3225
                                0915  3226 ;+
                                0915  3227 ; ADDRESS ACTION ROUTINE.
                                0915  3228 ;-
                                0915  3229 ACT_ADDRESS:
          18 A2     5A    D0   0915  3230          MOVL    R10, CLI$L_ADDRESS(R2)
00 00000000 E2      0B    E2   0919  3231          BBSS    #CLI$V_ADR, -           ; Got address
                                0921  3232            L^CLI$L_FLAGS (R2), 10$
                           05   0921  3233 10$:     RSB
                                0922  3234
                                0922  3235 ;+
                                0922  3236 ; BREAK ACTION ROUTINE.
                                0922  3237 ;-
                                0922  3238 ACT_BREAK:
          00 62     0A    E2   0922  3239          BBSS    #CLI$V_BREAK, -          ; SET 'BREAKPOINT' FLAG.
                                0926  3240            CLI$L_FLAGS(R2), 10$
          09 62     03    E1   0926  3241 10$:     BBC     #CLI$V_SET, -            ; BR IF NOT 'SET' COMMAND.
                                092A  3242            CLI$L_FLAGS(R2), 20$
    04 A2   00000000'EF    DE   092A  3243          MOVAL   L^VRSETBRK, -           ; 'SET BREAK' COMMAND.                [41]
                                0932  3244            CLI$L_COMMAND(R2)
                           05   0932  3245          RSB                             ; RETURN.
          09 62     02    E1   0933  3246 20$:     BBC     #CLI$V_CLEAR, -          ; BR IF NOT 'CLEAR' COMMAND.
                                0937  3247            CLI$L_FLAGS(R2), 30$
    04 A2   00000000'EF    DE   0937  3248          MOVAL   L^VRCLRBRK, -           ; 'CLEAR BREAK' COMMAND.              [41]
                                093F  3249            CLI$L_COMMAND(R2)
                           05   093F  3250          RSB                             ; RETURN.
    04 A2   00000000'EF    DE   0940  3251 30$:     MOVAL   L^VRSHOWBRK, -          ; 'SHOW BREAK' COMMAND.               [41]
                                0948  3252            CLI$L_COMMAND(R2)
                           05   0948  3253          RSB
```

```
                                0949  3255          .SUBTITLE       Base_Qual, Nobase Action Routines
                                0949  3256 ;+
                                0949  3257 ; BASE_QUAL ACTION ROUTINE
                                0949  3258 ;-
                                0949  3259
                                0949  3260 ACT_BASE_QUAL:
     0448 C2    5A    D0      0949  3261          MOVL    R10, CLI$L_TEMP_BASE(R2)        ;SAVE TEMP BASE VALUE
00 0444 C2    02    E2      094E  3262          BBSS    #CLI$V_BASE_QUAL,       -
                                0954  3263                  CLI$L_FLAGS2(R2), 10$
                          05    0954  3264 10$:    RSB                                     ;RETURN
                                0955  3265
                                0955  3266
                                0955  3267 ;+
                                0955  3268 ; NOBASE QUALIFIER ACTION ROUTINE
                                0955  3269 ;-
                                0955  3270
                                0955  3271 ACT_NOBASE:
          0448 C2    D4      0955  3272          CLRL    CLI$L_TEMP_BASE(R2)             ;ZERO TEMP BASE VALUE
00 0444 C2    02    E2      0959  3273          BBSS    #CLI$V_BASE_QUAL,       -
                                095F  3274                  CLI$L_FLAGS2(R2), 10$
                          05    095F  3275 10$:    RSB                                     ;RETURN
```

```
                                0960  3277          .SUBTITLE       All, Default Action Routines
                                0960  3278 ;+
                                0960  3279 ; ALL ACTION ROUTINE.
                                0960  3280 ;-
                                0960  3281
                                0960  3282 ACT_ALL:
                1C A2    00     D2  0960  3283          MCOML   #0, CLI$L_DATA(R2)
                     04 A2     D5  0964  3284          TSTL    CLI$L_COMMAND(R2)
                         01    13  0967  3285          BEQL    10$
                               05  0969  3286          RSB
                0A 62    03     E1  096A  3287 10$:    BBC     #CLI$V_SET, -           ; BR IF NOT 'SET' COMMAND.
                                096E  3288                    CLI$L_FLAGS(R2), 20$
        04 A2   00000000'EF     DE  096E  3289          MOVAL   L^VRSETFLG, -           ;                                       [41]
                                0976  3290                    CLI$L_COMMAND(R2)
                         08     11  0976  3291          BRB     30$
        04 A2   00000000'EF     DE  0978  3292 20$:     MOVAL   L^VRCLRFLG, -           ;                                       [41]
                                0980  3293                    CLI$L_COMMAND(R2)
                               05  0980  3294 30$:     RSB                             ; RETURN.
                                0981  3295
                                0981  3296 ;+
                                0981  3297 ; DEFAULT ACTION ROUTINE.
                                0981  3298 ;-
                                0981  3299 ACT_DEFAULT:
                16 62    09     E0  0981  3300          BBS     #CLI$V_FLAGS, -         ; If "SET FLAGS", branch.               [43]
                                0985  3301                    CLI$L_FLAGS(R2), 20$
                                0985  3302
                09 62    04     E1  0985  3303          BBC     #CLI$V_SHOW, -          ; Branch if not SHOW command            [43]
                                0989  3304                    CLI$L_FLAGS (R2), 10$   ;                                       [43]
        04 A2   00000000'EF     DE  0989  3305          MOVAL   L^VRSHOWDFLT, -         ; "SHOW DEFAULT" command                [43]
                                0991  3306                    CLI$L_COMMAND (R2)      ;                                       [43]
                               05  0991  3307          RSB                             ;                                       [43]
                                0992  3308
        04 A2   00000000'EF     DE  0992  3309 10$:     MOVAL   L^VRSETDFLT, -          ; "SET DEFAULT" command.               [41]
                                099A  3310                    CLI$L_COMMAND(R2)
                               05  099A  3311          RSB                             ;                                       [43]
                                099B  3312
                00 62    0C     E2  099B  3313 20$:     BBSS    #CLI$V_DEFAULT, -       ; Set DEFAULT flag for                  [43]
                                099F  3314                    CLI$L_FLAGS(R2), 30$    ;   "SET FLAGS DEFAULT" command.        [43]
                               05  099F  3315 30$:     RSB                             ;                                       [43]
```

```
                                  09A0  3317          .SUBTITLE       Show Calls Routine                                  ;       [70]
                                  09A0  3318
                                  09A0  3319 ;+                                                                                [70]
                                  09A0  3320 ; Show Calls action routine.                                                      [70]
                                  09A0  3321 ;-                                                                                [70]
                                  09A0  3322
                                  09A0  3323 Act_Show_Calls:                                                                ;       [70]
        04 A2   00000000'EF   DE  09A0  3324          MovAL   L^VRShow_Calls, -       ; SHOW CALLS command routine                [70]
                                  09A8  3325                    CLI$L_Command (R2)    ;                                           [70]
                1C A2   00    D0  09A8  3326          MovL    #0, CLI$L_Data(R2)      ; 0 => show all call frames                 [70]
                              05  09AC  3327          Rsb                             ; Return to caller                          [70]
```

```
                                09AD          .SUBTITLE       CRDTrace Action Routines                        ;       [65]
                                09AD
                                09AD  ;+
                                09AD  ; Set/Clear/Show CRDTrace action routines.                                      [65]
                                09AD  ;-
                                09AD
                                09AD  Act_Set_CRD_Trace:                          ;                                   [65]
      0000FE00'EF   11   E3     09AD          Bbcs    #DSA$V_CRD_Trace, -         ; Set the bit on                    [65]
                    00          09B4                    L^DSA$GL_Flags, 10$       ;                                   [65]
                                09B5
                    35   11     09B5  10$:    BrB     Common_CRD_Trace_Debug      ; Branch to the common stuff        [69]
                                09B7
                                09B7  Act_Clear_CRD_Trace:                        ;                                   [65]
      0000FE00'EF   11   E5     09B7          Bbcc    #DSA$V_CRD_Trace, -         ; Clear the bit - set it off        [65]
                    00          09BE                    L^DSA$GL_Flags, 10$       ;                                   [65]
                                09BF
                    2B   11     09BF  10$:    BrB     Common_CRD_Trace_Debug      ; Branch to the common stuff        [69]
                                09C1
                                09C1  Act_Show_CRD_Trace:                         ;                                   [65]
      50   000001EF'EF   9E     09C1          MovAB   L^T_On, R0                  ; Assume the bit is turned on       [65]
      0000FE00'EF   11   E0     09C8          Bbs     #DSA$V_CRD_Trace, -         ; If the bit is turned on, . . .    [65]
                    07          09CF                    L^DSA$GL_Flags, -         ; . . . then branch to 10$, . . .   [65]
                                09D0                    10$                       ; . . . and print it.               [65]
      50   000001F2'EF   9E     09D0          MovAB   L^T_Off, R0                 ; The bit is off.                   [65]
                                09D7
                                09D7  10$:    $Print  #DS$K_Type_Command_Out,-; Print a message giving the status of [65]
                                09D7                    #DS$K_PrintI,         -; . . . the CRDTrace flag.           [65]
                                09D7                    L^T_CRD_Trace_Output,-;                                       [65]
                                09D7                    R0                        ; . . . "on" or "off".              [65]
                    50   DD     09D7                  PUSHL   R0
          0000025B'EF   9F     09D9                  PUSHAB  L^T_CRD_Trace_Output
              7E   00   9A     09DF                  movzbl  #DS$K_PrintI, -(sp)
              7E   16   98     09E2                  cvtbl   #DS$K_Type_Command_Out, -(sp)
      00000000'GF   04   FB     09E5                  CALLS   #$$N+2, G^DSX$PRINT
                                09EC
                                09EC  Common_CRD_Trace_Debug:                     ; The common stuff                  [69]
          00000004 E2   D4     09EC          ClrL    L^Cli$L_Command(R2)         ; Make sure no command routine is set [65]
                    05          09F2          Rsb                                 ; Return to the DS$Cli routine      [65]
                                09F3
                                09F3  Act_Set_CRD_Debug:                          ; Set the CRD debug bit - for CRD debug [69]
                                09F3                                              ; ... statements                    [69]
      00000000'EF   01   D0     09F3          MovL    #1, L^DS$GL_CRD_Debug       ; 1 => debug is on.                 [69]
                    B1   11     09FA          Brb     Act_Set_CRD_Trace           ; Turn Trace on also                [69]
                                09FC
                                09FC  Act_Clear_CRD_Debug:                        ; Clear the CRD debug bit - for CRD [69]
                                09FC                                              ; ... debug statements              [69]
          00000000'EF   D4     09FC          ClrL    L^DS$GL_CRD_Debug           ; 0 => no debug statements          [69]
                    B3   11     0A02          Brb     Act_Clear_CRD_Trace         ; Clear Trace also                  [69]
```

```
                                0A04          .SUBTITLE       Ask_prompt, Bell, Binary, Halt, IEx Action Routines
                                0A04
                                0A04  ;+
                                0A04  ; ASK_PROMPT ACTION ROUTINE.                                  ;                    [108
                                0A04  ;-
                                0A04  ACT_ASK_PROMPT:
        00 1C A2    13    E2    0A04          BBSS    #DSA$V_ASK_PROMPT, -
                                0A09                    CLI$L_DATA(R2), 10$
                          05    0A09  10$:    RSB
                                0A0A
                                0A0A  ;+
                                0A0A  ; BELL ACTION ROUTINE.
                                0A0A  ;-
                                0A0A  ACT_BELL:
        00 1C A2    03    E2    0A0A          BBSS    #DSA$V_BELL, -
                                0A0F                    CLI$L_DATA(R2), 10$
                          05    0A0F  10$:    RSB
                                0A10
                                0A10  ;+
                                0A10  ; BINARY ACTION ROUTINE.
                                0A10  ;-
                                0A10  ACT_BINARY:                                                   ;                    [45]
        00 1C A2    01    E2    0A10          BBSS    #DSA$V_BINARY, -                              ;                    [45]
                                0A15                    CLI$L_DATA(R2), 10$                           ;                    [45]
                          05    0A15  10$:    RSB                                                   ;                    [45]
                                0A16
                                0A16  ;+
                                0A16  ; HALT ACTION ROUTINE.
                                0A16  ;-
                                0A16  ACT_HALT:
        00 1C A2    00    E2    0A16          BBSS    #DSA$V_HALT, -
                                0A1B                    CLI$L_DATA(R2), 10$
                          05    0A1B  10$:    RSB
                                0A1C
                                0A1C  ;+
                                0A1C  ; IE1 ACTION ROUTINE.
                                0A1C  ;-
                                0A1C  ACT_IE1:
        00 1C A2    04    E2    0A1C          BBSS    #DSA$V_IE1, -
                                0A21                    CLI$L_DATA(R2), 10$
                          05    0A21  10$:    RSB
                                0A22
                                0A22  ;+
                                0A22  ; IE2 ACTION ROUTINE.
                                0A22  ;-
                                0A22  ACT_IE2:
        00 1C A2    05    E2    0A22          BBSS    #DSA$V_IE2, -
                                0A27                    CLI$L_DATA(R2), 10$
                          05    0A27  10$:    RSB
                                0A28
                                0A28  ;+
                                0A28  ; IE3 ACTION ROUTINE.
                                0A28  ;-
                                0A28  ACT_IE3:
        00 1C A2    06    E2    0A28          BBSS    #DSA$V_IE3, -
                                0A2D                    CLI$L_DATA(R2), 10$
                          05    0A2D  10$:    RSB
```

```
                          0A2E  3430
                          0A2E  3431 ;+
                          0A2E  3432 ; IES ACTION ROUTINE.
                          0A2E  3433 ;-
                          0A2E  3434 ACT_IES:
00 1C A2    07    E2      0A2E  3435          BBSS    #DSA$V_IES, -
                          0A33  3436                    CLI$L_DATA(R2), 10$
                    05    0A33  3437 10$:     RSB
```

```
                          0A34  3439          .SUBTITLE       Loop, Oper, Prompt Quick Action Routines
                          0A34  3440
                          0A34  3441 ;+
                          0A34  3442 ; LOOP ACTION ROUTINE.
                          0A34  3443 ;-
                          0A34  3444 ACT_LOOP:
00 1C A2    02    E2      0A34  3445          BBSS    #DSA$V_LOOP, -
                          0A39  3446                    CLI$L_DATA(R2), 10$
                    05    0A39  3447 10$:     RSB
                          0A3A  3448
                          0A3A  3449 ;+
                          0A3A  3450 ; OPER ACTION ROUTINE.
                          0A3A  3451 ;-
                          0A3A  3452 ACT_OPER:
00 1C A2    0C    E2      0A3A  3453          BBSS    #DSA$V_OPER, -
                          0A3F  3454                    CLI$L_DATA(R2), 10$
                    05    0A3F  3455 10$:     RSB
                          0A40  3456
                          0A40  3457 ;+
                          0A40  3458 ; PROMPT ACTION ROUTINE.
                          0A40  3459 ;-
                          0A40  3460 ACT_PROMPT:
00 1C A2    0D    E2      0A40  3461          BBSS    #DSA$V_PROMPT, -
                          0A45  3462                    CLI$L_DATA(R2), 10$
                    05    0A45  3463 10$:     RSB
                          0A46  3464
                          0A46  3465 ;+
                          0A46  3466 ; QUICK ACTION ROUTINE.
                          0A46  3467 ;-
                          0A46  3468 ACT_QUICK:
00 1C A2    08    E2      0A46  3469          BBSS    #DSA$V_QUICK, -
                          0A4B  3470                    CLI$L_DATA(R2), 10$
                    05    0A4B  3471 10$:     RSB
```

```
                          0A4C  3473          .SUBTITLE       Search, Trace, Verify Action Routines
                          0A4C  3474
                          0A4C  3475 ;+
                          0A4C  3476 ; SEARCH action routine
                          0A4C  3477 ;-
                          0A4C  3478 ACT_SEARCH:
00 1C A2    0E    E2      0A4C  3479          BBSS    #DSA$V_SEARCH, -
                          0A51  3480                    CLI$L_DATA(R2),10$
                    05    0A51  3481 10$:     RSB
                          0A52  3482
                          0A52  3483 ;+
                          0A52  3484 ; TRACE ACTION ROUTINE.
                          0A52  3485 ;-
                          0A52  3486 ACT_TRACE:
00 1C A2    0A    E2      0A52  3487          BBSS    #DSA$V_TRACE, -
                          0A57  3488                    CLI$L_DATA(R2), 10$
                    05    0A57  3489 10$:     RSB
                          0A58  3490
                          0A58  3491 ;+
                          0A58  3492 ; VERIFY ACTION ROUTINE.
                          0A58  3493 ;-
                          0A58  3494 ACT_VERIFY:                                          ;       [45]
00 1C A2    09    E2      0A58  3495          BBSS    #DSA$V_VERIFY, -                    ;       [45]
                          0A5D  3496                    CLI$L_DATA(R2), 10$             ;       [45]
                    05    0A5D  3497 10$:     RSB                                       ;       [45]
```

```
                                0A5E          .SUBTITLE       Set/Show Page, Width Action Routine
                                0A5E
                                0A5E  ;+
                                0A5E  ; SET/SHOW PAGE action routine
                                0A5E  ;-
                                0A5E  ACT_PAGE:                                 ;                                       [71]
          0D 62    04    E0     0A5E          BBS     #CLI$V_SHOW, -            ; If SHOW command                       [71]
                                0A62                   CLI$L_FLAGS(R2), 10$     ;  branch                               [71]
          12 62    03    E1     0A62          BBC     #CLI$V_SET, -             ; If not SET command                    [71]
                                0A66                   CLI$L_FLAGS(R2), 20$     ;  no command                           [71]
  04 A2   00000000'EF    9E     0A66          MOVAB   DSV$SETPAGE, -            ;                                       [71]
                                0A6E                   CLI$L_COMMAND(R2)        ; Set command address                   [71]
                         05     0A6E          RSB                               ;                                       [71]
  04 A2   00000000'EF    9E     0A6F  10$:    MOVAB   DSV$SHOWPAGE, -           ; Set SHOW command address              [71]
                                0A77                   CLI$L_COMMAND(R2)        ;                                       [71]
                         05     0A77          RSB                               ;                                       [71]
                04 A2    D4     0A78  20$:    CLRL    CLI$L_COMMAND(R2)         ; Make sure no routine address          [71]
                         05     0A7B          RSB                               ;                                       [71]
                                0A7C
                                0A7C  ;+
                                0A7C  ; SET/SHOW WIDTH action routine
                                0A7C  ;-
                                0A7C  ACT_WIDTH:                                ;                                       [38]
          0D 62    04    E0     0A7C          BBS     #CLI$V_SHOW, -            ; If SHOW command                       [38]
                                0A80                   CLI$L_FLAGS(R2), 10$     ;  branch                               [38]
          12 62    03    E1     0A80          BBC     #CLI$V_SET, -             ; If not SET command                    [38]
                                0A84                   CLI$L_FLAGS(R2), 20$     ;  no command                           [38]
  04 A2   00000000'EF    9E     0A84          MOVAB   VRSETWIDTH, -             ;                                       [38]
                                0A8C                   CLI$L_COMMAND(R2)        ; Set command address                   [38]
                         05     0A8C          RSB
  04 A2   00000000'EF    9E     0A8D  10$:    MOVAB   VRSHOWWIDTH, -            ; Set SHOW command address              [38]
                                0A95                   CLI$L_COMMAND(R2)        ;                                       [38]
                         05     0A95          RSB
                04 A2    D4     0A96  20$:    CLRL    CLI$L_COMMAND(R2)         ; Make sure no routine address          [38]
                         05     0A99          RSB                               ;                                       [38]
```

```
                                0A9A          .SUBTITLE       Set/Show QA Action Routines
                                0A9A
                                0A9A  ;                                                                                [42]
                                0A9A  ; SET/SHOW QAxxxxxxxxx flags Action routine                                      [42]
                                0A9A  ;   This is patterned after the SET/SHOW width action routine above              [42]
                                0A9A  ;                                                                                [42]
                                0A9A  ACT_QAEP:                                                  ;                     [42]
          16 62    1B    E2    0A9A          BBSS    #CLI$V_QAERRORPRINTS, -                    ; Set the bit on      [42]
                                0A9E                          CLI$L_FLAGS(R2), QA_COMMON         ;   regardless        [42]
                   16    11    0A9E          BRB     QA_COMMON                                  ; Branch to common stuff[42]
                                0AA0
                                0AA0  ACT_QACL:                                                  ;                     [42]
          12 62    1C    E2    0AA0          BBSS    #CLI$V_QACKLOOPLOOPS, -                    ; Set the bit on      [42]
                                0AA4                          CLI$L_FLAGS(R2), QA_COMMON         ;   regardless        [42]
                   10    11    0AA4          BRB     QA_COMMON                                  ; Branch to common stuff[42]
                                0AA6
                                0AA6  ACT_QATL:                                                  ;                     [42]
          0C 62    1D    E2    0AA6          BBSS    #CLI$V_QATESTLOOPS, -                      ; Set the bit on      [42]
                                0AAA                          CLI$L_FLAGS(R2), QA_COMMON         ;   regardless        [42]
                   0A    11    0AAA          BRB     QA_COMMON                                  ; Branch to common stuff[42]
                                0AAC
                                0AAC  ACT_QASL:                                                  ;                     [42]
          06 62    1E    E2    0AAC          BBSS    #CLI$V_QASUBTESTLOOPS, -                   ; Set the bit on      [42]
                                0AB0                          CLI$L_FLAGS(R2), QA_COMMON         ;   regardless        [42]
                   04    11    0AB0          BRB     QA_COMMON                                  ; Branch to common stuff[42]
                                0AB2
                                0AB2  ACT_QAMP:                                                  ;                     [42]
          00 62    1F    E2    0AB2          BBSS    #CLI$V_QAMULTIPLEPASS, -                   ; Set the bit on      [42]
                                0AB6                          CLI$L_FLAGS(R2), QA_COMMON         ;   regardless        [42]
                                0AB6                                                             ; Cont onto common stuff[42]
                                0AB6
                                0AB6  QA_COMMON:                                                 ;                     [42]
          0D 62    04    E0    0AB6          BBS     #CLI$V_SHOW, -                             ; If SHOW, branch to 10$[42]
                                0ABA                          CLI$L_FLAGS(R2), 10$               ;   If not, ...       [42]
          12 62    03    E1    0ABA          BBC     #CLI$V_SET, -                              ; If not SET or SHOW,  [42]
                                0ABE                          CLI$L_FLAGS(R2), 20$               ;    branch to 20$    [42]
                                0ABE                                                             ; If SET, ...         [42]
  04 A2   00000000'EF    9E    0ABE          MOVAB   VRSETQA, -                                 ; Move address of SETQA [42]
                                0AC6                          CLI$L_COMMAND(R2)                  ;   routine to command [42]
                                0AC6                                                             ;   address           [42]
                         05    0AC6          RSB
  04 A2   00000000'EF    9E    0AC7  10$:    MOVAB   VRSHOWQA, -                                ; Move address of SHOWQA[42]
                                0ACF                          CLI$L_COMMAND(R2)                  ;   routine to command [42]
                                0ACF                                                             ;   address
                         05    0ACF          RSB
                04 A2    D4    0AD0  20$:    CLRL    CLI$L_COMMAND(R2)                          ; No routine address  [42]
                         05    0AD3          RSB                                                ;                     [42]
```

```
                                0AD4          .SUBTITLE       QADef Action Routine
                                0AD4
                                0AD4  ACT_QADEF:                                                ;                          [42]
          DE 62    0C    E2     0AD4          BBSS    #CLI$V_DEFAULT, -                         ; Set the DEFAULT bit      [42]
                                0AD8                          CLI$L_FLAGS(R2), QA_COMMON        ;   on regardless          [42]
                                0AD8                                                            ; The DEFAULT bit isn't    [42]
                                0AD8                                                            ;   really for QA, but     [42]
                                0AD8                                                            ;   will use it anyway!    [42]
                                0AD8
          0D 62    04    E0     0AD8          BBS     #CLI$V_SHOW, -                            ; If SHOW, branch to 10$[42]
                                0ADC                          CLI$L_FLAGS(R2), 10$              ;   If not, ...            [42]
          12 62    03    E1     0ADC          BBC     #CLI$V_SET, -                             ; If not SET or SHOW,      [42]
                                0AE0                          CLI$L_FLAGS(R2), 20$              ;    branch to 20$         [42]
                                0AE0                                                            ; If SET, ...              [42]
  04 A2   00000000'EF    9E     0AE0          MOVAB   VRSETQA, -                                ; Move address of SETQA    [42]
                                0AE8                          CLI$L_COMMAND(R2)                 ;   routine to command     [42]
                                0AE8                                                            ;   address               [42]
                          05     0AE8          RSB
                                0AE9
  04 A2   00000000'EF    9E     0AE9  10$:    MOVAB   VRSHOWQA, -                               ; Move address of SHOWQA[42]
                                0AF1                          CLI$L_COMMAND(R2)                 ;   routine to command     [42]
                                0AF1                                                            ;   address
                          05     0AF1          RSB
                04 A2     D4     0AF2  20$:    CLRL    CLI$L_COMMAND(R2)                         ; No routine address       [42]
                          05     0AF5          RSB                                               ;                          [42]
```

```
                                0AF6  3609          .SUBTITLE       Efn, Next, Ascii Action Routines
                                0AF6  3610
                                0AF6  3611 ;+
                                0AF6  3612 ; EFN ACTION ROUTINE.
                                0AF6  3613 ;-
                                0AF6  3614 ACT_EFN:
                          5A    D5  0AF6  3615 10$:     TSTL    R10                     ; CHECK FOR EFN 0.
                          0A    13  0AF8  3616          BEQL    30$
                       17   5A    D1  0AFA  3617          CMPL    R10, #23                ; CHECK FOR IN RANGE.
                          05    1A  0AFD  3618          BGTRU   30$
                    11 1C A2    5A    E3  0AFF  3619 20$:     BBCS    R10, CLI$L_DATA(R2), 40$
                                0B04  3620 30$:                                         ; Print illegal event flag number       [45]
                  00000061'EF   9F  0B04  3621          PUSHAB  L^T_ILLEFN              ;                                       [45]
                          00    DD  0B0A  3622          pushl   #ds$k_printi            ; Use printi                            [48]
                          15    DD  0B0C  3623          pushl   #ds$k_type_command_err  ; Command error                         [48]
                00000000'GF   03    FB  0B0E  3624          CALLS   #3, G^DSX$PRINT         ;                                       [48]
                                0B15  3625
                                0B15  3626          ;BBCS   #CLI$V_ERROR, -         ; Illegal event flag number             [45]
                                0B15  3627          ;         CLI$L_FLAGS(R2),40$   ;                                       [45]
                                0B15  3628
                                05    0B15  3629 40$:     RSB                             ; RETURN
                                0B16  3630
                                0B16  3631 ;+
                                0B16  3632 ; NEXT ACTION ROUTINE.
                                0B16  3633 ;-
                                0B16  3634 ACT_NEXT:
                       30 A2    5A    D0  0B16  3635          MOVL    R10, CLI$L_NEXT(R2)     ; SAVE NEXT COUNT.
                                05    0B1A  3636          RSB                             ; RETURN
                                0B1B  3637
                                0B1B  3638 ;+
                                0B1B  3639 ; ASCII ACTION ROUTINE.
                                0B1B  3640 ;-
                                0B1B  3641 ACT_ASCII:
                00 62   13    E2  0B1B  3642          BBSS    #CLI$V_ASCII, -
                                0B1F  3643                    CLI$L_FLAGS(R2), 10$
                                05    0B1F  3644 10$:     RSB                             ; RETURN.
```

```
                        0B20  3646          .SUBTITLE       Register Action Routines
                        0B20  3647
                        0B20  3648 ;+
                        0B20  3649 ; REGISTER ACTION ROUTINES.
                        0B20  3650 ;-
                        0B20  3651 ACT_REGN:
00 62   14   E2         0B20  3652          BBSS    #CLI$V_REG, -
                        0B24  3653                    CLI$L_FLAGS(R2), 10$
                  05    0B24  3654 10$:     RSB                                 ; RETURN.
                        0B25  3655
                        0B25  3656 ACT_REG12:
18 A2   0C   D0         0B25  3657          MOVL    #12, CLI$L_ADDRESS(R2)      ; AP.
                  05    0B29  3658          RSB
                        0B2A  3659 ACT_REG13:
18 A2   0D   D0         0B2A  3660          MOVL    #13, CLI$L_ADDRESS(R2)      ; FP.
                  05    0B2E  3661          RSB
                        0B2F  3662 ACT_REG14:
18 A2   0E   D0         0B2F  3663          MOVL    #14, CLI$L_ADDRESS(R2)      ; SP.
                  05    0B33  3664          RSB
                        0B34  3665 ACT_REG15:
18 A2   0F   D0         0B34  3666          MOVL    #15, CLI$L_ADDRESS(R2)      ; PC.
                  04    0B38  3667          BRB     ACT_REGP
                        0B3A  3668
                        0B3A  3669 ACT_REG16:
18 A2   10   D0         0B3A  3670          MOVL    #16, CLI$L_ADDRESS(R2)      ; PSL.
                        0B3E  3671 ACT_REGP:
00 62   14   E2         0B3E  3672          BBSS    #CLI$V_REG, -
                        0B42  3673                    CLI$L_FLAGS(R2), ACT_REGNUF
                        0B42  3674 ACT_REGNUF:
00 62   0B   E2         0B42  3675          BBSS    #CLI$V_ADR, -
                        0B46  3676                    CLI$L_FLAGS(R2), 10$
                  05    0B46  3677 10$:     RSB                                 ; RETURN.
                        0B47  3678
                        0B47  3679 ;+
                        0B47  3680 ; PROCESSOR REGISTER ACTION ROUTINES
                        0B47  3681 ;-
                        0B47  3682 ACT_PREGN:
00 62   1A   E2         0B47  3683          BBSS    #CLI$V_PREG,CLI$L_FLAGS(R2),10$ ; Set command type bit
      FDC7   31         0B4B  3684 10$:     BRW     ACT_ADDRESS                     ; Store register code
```

```
                     0B4E  3686          .SUBTITLE       Backup, Advance, Data Action Routines
                     0B4E  3687
                     0B4E  3688 ;+
                     0B4E  3689 ; BACKUP ACTION ROUTINE.
                     0B4E  3690 ;-
                     0B4E  3691 ACT_BACKUP:
                58   D7  0B4E  3692          DECL    R8                      ; Backup one character in the
                59   D6  0B50  3693          INCL    R9                      ; line. Increment the remaining
                     0B52  3694                                              ; character count.
                     05  0B52  3695          RSB                             ; Return
                     0B53  3696
                     0B53  3697 ;+
                     0B53  3698 ; ADVANCE Action routine.
                     0B53  3699 ;-
                     0B53  3700 ACT_ADVANCE:
                58   D6  0B53  3701          INCL    R8                      ; Advance one character in      [45]
                59   D7  0B55  3702          DECL    R9                      ; line. Decrement the remaining [45]
                     0B57  3703                                              ; character count.              [45]
                     05  0B57  3704          RSB                             ; Return                        [45]
                     0B58  3705 ;+
                     0B58  3706 ; DATA ACTION ROUTINE.
                     0B58  3707 ;-
                     0B58  3708 ACT_DATA:
             1C A2   5A  D0  0B58  3709          MOVL    R10, CLI$L_DATA(R2)     ; SAVE THE DATA.
                     05  0B5C  3710          RSB                             ; RETURN.
```

```
                                0B5D  3712
                                0B5D  3713
                                0B5D  3714 ;+
                                0B5D  3715 ; DATA ACTION ROUTINE.
                                0B5D  3716 ;-
                                0B5D  3717 ACT_NULL_DATA:
        1C A2   FFFFFFFF 8F   D0  0B5D  3718          MOVL    #-1, CLI$L_DATA(R2)     ; Store a default value of -1   [97]
                              05  0B65  3719          RSB
                                0B66  3720
```

```
                     0B66  3722          .SUBTITLE       Long, Word, Byte, Hex, Dec, Oct Action Routines
                     0B66  3723
                     0B66  3724 ;+
                     0B66  3725 ; LONG ACTION ROUTINE.
                     0B66  3726 ;-
                     0B66  3727 ACT_LONG:
00 62   0F   E3      0B66  3728          BBCS    #CLI$V_LONG, -
                     0B6A  3729                    CLI$L_FLAGS(R2), 10$
                05   0B6A  3730 10$:     RSB                             ; RETURN.
                     0B6B  3731
                     0B6B  3732 ;+
                     0B6B  3733 ; WORD ACTION ROUTINE.
                     0B6B  3734 ;-
                     0B6B  3735 ACT_WORD:
00 62   0E   E3      0B6B  3736          BBCS    #CLI$V_WORD, -
                     0B6F  3737                    CLI$L_FLAGS(R2), 10$
                05   0B6F  3738 10$:     RSB                             ; RETURN.
                     0B70  3739
                     0B70  3740 ;+
                     0B70  3741 ; BYTE ACTION ROUTINE.
                     0B70  3742 ;-
                     0B70  3743 ACT_BYTE:
00 62   0D   E3      0B70  3744          BBCS    #CLI$V_BYTE, -
                     0B74  3745                    CLI$L_FLAGS(R2), 10$
                05   0B74  3746 10$:     RSB                             ; RETURN.
                     0B75  3747
                     0B75  3748 ;+
                     0B75  3749 ; HEX ACTION ROUTINE.
                     0B75  3750 ;-
                     0B75  3751 ACT_HEX:
00 62   12   E3      0B75  3752          BBCS    #CLI$V_HEX, -
                     0B79  3753                    CLI$L_FLAGS(R2), 10$
                05   0B79  3754 10$:     RSB                             ; RETURN.
                     0B7A  3755
                     0B7A  3756 ;+
                     0B7A  3757 ; DEC ACTION ROUTINE.
                     0B7A  3758 ;-
                     0B7A  3759 ACT_DEC:
00 62   10   E3      0B7A  3760          BBCS    #CLI$V_DEC, -
                     0B7E  3761                    CLI$L_FLAGS(R2), 10$
                05   0B7E  3762 10$:     RSB                             ; RETURN.
                     0B7F  3763
                     0B7F  3764 ;+
                     0B7F  3765 ; OCT ACTION ROUTINE.
                     0B7F  3766 ;-
                     0B7F  3767 ACT_OCT:
00 62   11   E3      0B7F  3768          BBCS    #CLI$V_OCT, -
                     0B83  3769                    CLI$L_FLAGS(R2), 10$
                05   0B83  3770 10$:     RSB                             ; RETURN.
```

```
                     0B84  3772          .SUBTITLE       IF Action Routines
                     0B84  3773
                     0B84  3774 ;+
                     0B84  3775 ; IF_RUN ACTION ROUTINE.
                     0B84  3776 ;
                     0B84  3777 ;       Returns:
                     0B84  3778 ;               1 => RUN command AND no file-spec has been gotten yet
                     0B84  3779 ;               0 => Either:
                     0B84  3780 ;                       Not the RUN command
                     0B84  3781 ;                    OR the file-spec has already been gotten
                     0B84  3782 ;-
                     0B84  3783 ACT_IF_RUN:
          50   D4   0B84  3784          CLRL    R0                          ; Assume negative.
07 62     15   E1   0B86  3785          BBC     #CLI$V_RUN, -
                     0B8A  3786                    CLI$L_FLAGS(R2), 10$      ; If not RUN, return with 0.
       08 A2   D5   0B8A  3787          TSTL    CLI$Q_FILE (R2)             ; Check the char. count for the file-spec.
          02   12   0B8D  3788          BNEQ    10$                         ; If > 0, => file-spec is there.
          50   D6   0B8F  3789          INCL    R0                          ; RUN and no file-spec found.
          05   0B91  3790 10$:    RSB                                       ; Return.
                     0B92  3791
                     0B92  3792 ;+
                     0B92  3793 ; IF_REQUIRED Action routine.
                     0B92  3794 ;
                     0B92  3795 ;       Returns:
                     0B92  3796 ;               1 => Something was required for the command
                     0B92  3797 ;               0 => Something was optional for the command
                     0B92  3798 ;-
                     0B92  3799 ACT_IF_REQUIRED:                            ;                                   [45]
          50   D4   0B92  3800          CLRL    R0                          ;                                   [45]
02 62     00   E1   0B94  3801          BBC     #CLI$V_REQUIRED, -          ;                                   [45]
                     0B98  3802                    CLI$L_FLAGS (R2), 10$   ;                                   [45]
          50   D6   0B98  3803          INCL    R0                          ;                                   [45]
          05   0B9A  3804 10$:    RSB                                       ;                                   [45]
                     0B9B  3805
                     0B9B  3806 ;+
                     0B9B  3807 ; IF_FILE_SPEC Action routine.
                     0B9B  3808 ;
                     0B9B  3809 ;       Returns:
                     0B9B  3810 ;               1 => A file-spec is present
                     0B9B  3811 ;               0 => No file-spec present
                     0B9B  3812 ;-
                     0B9B  3813 ACT_IF_FILE_SPEC:                           ;                                   [45]
          50   D4   0B9B  3814          CLRL    R0                          ; Assume no file-spec present       [45]
       08 A2   D5   0B9D  3815          TSTL    CLI$Q_FILE (R2)             ; See if the char-count is > zero   [45]
          02   13   0BA0  3816          BEQL    10$                         ; If = 0, branch and return 0       [45]
          50   D6   0BA2  3817          INCL    R0                          ; If > 0, return 1                  [45]
          05   0BA4  3818 10$:    RSB                                       ;                                   [45]
                     0BA5  3819
                     0BA5  3820 ;+
                     0BA5  3821 ; IF_ADAPTER Action routine.
                     0BA5  3822 ;
                     0BA5  3823 ;       Returns:
                     0BA5  3824 ;               1 => A adapter is present
                     0BA5  3825 ;               0 => No adapter present
                     0BA5  3826 ;-
                     0BA5  3827 ACT_IF_ADAPTER:                             ;                                   [48]
          50   D4   0BA5  3828          CLRL    R0                          ; Assume no adapter present         [48]
```

```
00000000'EF   D5  0BA7  3829          TSTL    L^q_adapter             ; See if the char-count is > zero       [48]
          02  13  0BAD  3830          BEQL    10$                     ; If = 0, branch and return 0           [48]
          50  D6  0BAF  3831          INCL    R0                      ; If > 0, return 1                      [48]
              05  0BB1  3832 10$:     RSB                             ;                                       [48]
```

```
                          0BB2  3834 ;+
                          0BB2  3835 ; IF_REG_OR_ADR Routine.
                          0BB2  3836 ;
                          0BB2  3837 ;       Returns:
                          0BB2  3838 ;               1 => A register has been given OR an address has been given
                          0BB2  3839 ;               0 => No register AND no address were given
                          0BB2  3840 ;
                          0BB2  3841 ACT_IF_REG_OR_ADR:
                    50    D4    0BB2  3842         CLRL    R0                      ; Assume not set
                03 62     14    E1    0BB4  3843         BBC     #CLI$V_REG, -           ; If not REG, branch
                                0BB8  3844                   CLI$L_FLAGS (R2), 20$
                    50    D6    0BB8  3845 10$:    INCL    R0                      ; One of them was set
                          05    0BBA  3846         RSB                             ; Leave with 1
                F9 62     0B    E0    0BBB  3847 20$:    BBS     #CLI$V_ADR, -           ; If ADR, branch
                                0BBF  3848                   CLI$L_FLAGS (R2), 10$
                          05    0BBF  3849         RSB                             ; Leave with 0
                                0BC0  3850
                                0BC0  3851 ;+
                                0BC0  3852 ; IFNOTUSER action routine
                                0BC0  3853 ;
                                0BC0  3854 ;       Returns:
                                0BC0  3855 ;               1 => Not user mode
                                0BC0  3856 ;               0 => User mode
                                0BC0  3857 ;-
                                0BC0  3858 ACT_IFNOTUSER:                          ;                                       [38]
                    50    D4    0BC0  3859         CLRL    R0                      ; Pre-assume failure                    [38]
0000FE00'EF         1C    E0    0BC2  3860         BBS     #DSA$V_USER, -          ;                                       [38]
                    02          0BC9  3861                   DSA$GL_FLAGS, 10$       ; Branch if not user mode               [38]
                    50    D6    0BCA  3862         INCL    R0                      ; Set R0 to cause branch                [38]
                          05    0BCC  3863 10$:    RSB                             ;                                       [38]
```

```
                                0BCD  3865          .SUBTITLE       Xdelta Action Routines
                                0BCD  3866
                                0BCD  3867 ;+
                                0BCD  3868 ; VAX DEBUGGER ACTION
                                0BCD  3869 ;-
                                0BCD  3870
                                0BCD  3871          .WEAK   XDELBPT,XDELTBIT
                                0BCD  3872 ACT_IF_XDELTA:
     50    00000000'8F    D0    0BCD  3873          MOVL    #XDELBPT,R0             ; Is Xdelta linked?
                     08    13    0BD4  3874          BEQL    10$                     ; Branch if not
     0000FE00'EF     1C    E1    0BD6  3875          BBC     #DSA$V_USER, -
                     03          0BDD  3876                  DSA$GL_FLAGS, 20$       ; Branch if S/A
              50     01    D0    0BDE  3877 10$:     MOVL    #1,R0                   ; Make scanner take branch to error
                           05    0BE1  3878 20$:     RSB                             ; Return
                                0BE2  3879
                                0BE2  3880 ACT_XDELTA:
  04 A2    00000000'EF    9E    0BE2  3881          MOVAB   INI$BRK, -
                                0BEA  3882                  CLI$L_COMMAND(R2)       ; Set command address, Cause breakpoint
                           05    0BEA  3883          RSB                             ; Return to scanner
                                0BEB  3884
                           05    0BEB  3885          RSB                             ; RETURN FOR NEXT COMMAND
```

```
                                0BEC  3887          .SUBTITLE       Device, Brief, Adaptor Action Routines
                                0BEC  3888
                                0BEC  3889 ;+
                                0BEC  3890 ; SHOW DEVICE and SHOW DEVICE/BRIEF
                                0BEC  3891 ;-
                                0BEC  3892 ACT_DEVICE:
                 09 62   1B  E0 0BEC  3893          BBS     #CLI$V_BRIEF,CLI$L_FLAGS(R2),5$ ; Check for brief flag.          [44]
                                0BF0  3894
          04 A2  00000000'EF  9E 0BF0  3895          MOVAB   L^DSV$SHOWDEVICE,CLI$L_COMMAND(R2) ; SHOW DEV COMMAND ROUTINE    [44]
                             05 0BF8  3896          RSB                                       ;                              [44]
                                0BF9  3897
          04 A2  00000000'EF  9E 0BF9  3898 5$:      MOVAB   L^DSV$SHOWDEVICEB,CLI$L_COMMAND(R2)     ; Show device brief     [44]
                             05 0C01  3899          RSB                                       ;                              [44]
                                0C02  3900
                                0C02  3901 ;+
                                0C02  3902 ; /BRIEF Action routine.
                                0C02  3903 ;-
                                0C02  3904 ACT_BRIEF:                                        ;                              [44]
                 00 62   1B  E2 0C02  3905          BBSS    #CLI$V_BRIEF,CLI$L_FLAGS(R2),20$        ; Set flag             [44]
                             01 BB 0C06  3906 20$:     PUSHR   #^M<R0>                           ; Save register                [44]
             50  00000000'EF  9E 0C08  3907          MOVAB   L^DSV$SHOWDEVICE,R0               ; Get address                  [44]
                 04 A2   50  D1 0C0F  3908          CMPL    R0,CLI$L_COMMAND(R2)              ; Check current command.       [44]
                             0A 12 0C13  3909          BNEQ    30$                               ; Skip if not show device.     [44]
          04 A2  00000000'EF  9E 0C15  3910          MOVAB   L^DSV$SHOWDEVICEB,CLI$L_COMMAND(R2) ; Change to BRIEF form.    [44]
                             15 11 0C1D  3911          BRB     50$                               ;                              [44]
             50  00000000'EF  9E 0C1F  3912 30$:     MOVAB   L^DSV$SHOWSELECT,R0               ; Get address                  [44]
                 04 A2   50  D1 0C26  3913          CMPL    R0,CLI$L_COMMAND(R2)              ; Check current command.       [44]
                             08 12 0C2A  3914          BNEQ    50$                               ;                              [44]
          04 A2  00000000'EF  9E 0C2C  3915          MOVAB   L^DSV$SHOWSELECTB,CLI$L_COMMAND(R2)  ; Change to BRIEF form.   [44]
                             01 BA 0C34  3916 50$:     POPR    #^M<R0>                           ; Restore register             [44]
                             05 0C36  3917          RSB                                       ;                              [44]
                                0C37  3918
                                0C37  3919 ;+
                                0C37  3920 ; BEGINADAPTER Action routine
                                0C37  3921 ; Adaptor name storage action routines for /ADAPTER qualifier
                                0C37  3922 ; on SELECT, DESELECT, and SHOW DEVICE commands.
                                0C37  3923 ;-
                                0C37  3924 ACT_BEGINADAPTER:
       00000004'EF   68  DE 0C37  3925          MOVAL   (R8), L^Q_ADAPTER+4               ; Save current pointer         [43]
            00000000'EF  D4 0C3E  3926          CLRL    L^Q_ADAPTER                       ; Clear length field           [43]
                             05 0C44  3927          RSB                                       ; Return to caller             [43]
                                0C45  3928
                                0C45  3929 ;+
                                0C45  3930 ; ADAPTER Action routine.
                                0C45  3931 ;-
                                0C45  3932 ACT_ADAPTER:
00000000'EF   58   00000004'EF  C3 0C45  3933          SUBL3   L^Q_ADAPTER+4, R8, -              ; Calculate count              [43]
                                0C51  3934                    L^Q_ADAPTER                     ;                              [43]
                             08 13 0C51  3935          BEQL    10$                               ;                              [43]
          00 00000000 E2   18 E2 0C53  3936          BBSS    #CLI$V_ADAPTER, -                 ; Set adaptor bit              [43]
                                0C5B  3937                    L^CLI$L_FLAGS (R2), 10$         ;                              [43]
                             05 0C5B  3938 10$:     RSB                                       ;                              [43]
```

```
                                0C5C  3940          .SUBTITLE       Show Select, Do_Cmd, Set Load, Show Load Action Routines
                                0C5C  3941
                                0C5C  3942 ;+
                                0C5C  3943 ; SHOW SELECT/BRIEF and SHOW SELECT
                                0C5C  3944 ;-
                                0C5C  3945 ACT_SHOWSEL:
                 09 62   1B     E0  0C5C  3946          BBS     #CLI$V_BRIEF,CLI$L_FLAGS(R2),5$ ; Check for brief flags          [44]
                                0C60  3947
          04 A2  00000000'EF    9E  0C60  3948          MOVAB   L^DSV$SHOWSELECT,CLI$L_COMMAND(R2) ; SET COMMAND ROUTINE          [41]
                                05  0C68  3949          RSB                                       ;                              [44]
                                0C69  3950
          04 A2  00000000'EF    9E  0C69  3951 5$:      MOVAB   L^DSV$SHOWSELECTB,CLI$L_COMMAND(R2)     ; Show select brief      [44]
                                05  0C71  3952          RSB                                       ;                              [44]
                                0C72  3953
                                0C72  3954 ;+
                                0C72  3955 ; DO_CoMmanD
                                0C72  3956 ;-
                                0C72  3957 ACT_DO_CMD:
                50   04 A2    D0  0C72  3958          MOVL    CLI$L_COMMAND(R2), R0           ; Check value before dispatch    [46]
                        02      13  0C76  3959          BEQL    10$                             ; Don't dispatch if 0            [46]
                        60      16  0C78  3960          JSB     (R0)                            ; Perform the routine            [46]
                                05  0C7A  3961 10$:     RSB                                     ;                                [46]
                                0C7B  3962
                                0C7B  3963 ;+
                                0C7B  3964 ; SET LOAD COMMAND
                                0C7B  3965 ;-
                                0C7B  3966 ACT_SETLOAD:
          04 A2  00000000'EF    9E  0C7B  3967          MOVAB   DSV$SETLOAD,CLI$L_COMMAND(R2)   ; Set the processor command
                                05  0C83  3968          RSB
                                0C84  3969
                                0C84  3970 ;+
                                0C84  3971 ; SHOW LOAD DEFAULTS
                                0C84  3972 ;-
                                0C84  3973 ACT_SHOWLOAD:
          04 A2  00000000'EF    9E  0C84  3974          MOVAB   DSV$SHOWLOAD,CLI$L_COMMAND(R2)  ; Set the processor address
                                05  0C8C  3975          RSB
```

```
                          0C8D  3977          .SUBTITLE       MM On, Off, and Show Action Routines
                          0C8D  3978
                          0C8D  3979 ;+
                          0C8D  3980 ; SET MEMORY MANAGEMENT ON ROUTINE
                          0C8D  3981 ;-
                          0C8D  3982 ACT_MMON:
    04 A2   93'AF    9E   0C8D  3983          MOVAB   B^5$,CLI$L_COMMAND(R2); MEMORY ON ROUTINE
                     05   0C92  3984          RSB
                          0C93  3985
                          0C93  3986 5$:      Br_If_Not_User  10$             ; Branch around if not user mode        [55]
0000FE00'EF    1C    E1   0C93               BBC     #DSA$V_User, -                  ; If bit not set, branch
               12          0C9A                 L^DSA$GL_Flags, 10$             ;
    000000BD'EF    9F   0C9B  3987          PUSHAB  L^T_EMESSG1                     ;                               [41]
               01   DD   0CA1  3988          pushl   #ds$k_printf                    ; Print with PRINTF             [48]
               15   DD   0CA3  3989          pushl   #ds$k_type_command_err          ; Command error code            [48]
00000000'GF    03   FB   0CA5  3990          CALLS   #3, G^DSX$PRINT                 ; Print                         [48]
                     05   0CAC  3991          RSB
                          0CAD  3992
00000000'EF    01   90   0CAD  3993 10$:     MOVB    #1,DS$GB_MM_ENB                 ; Flag MM ENABLED               [98]
00000000'EF    00   FB   0CB4  3994          CALLS   #0,DSX$MMON
                     05   0CBB  3995          RSB
                          0CBC  3996
                          0CBC  3997
                          0CBC  3998 ;+
                          0CBC  3999 ; SET MEMORY MANAGEMENT OFF ROUTINE
                          0CBC  4000 ;-
                          0CBC  4001 ACT_MMOFF:
    04 A2   C2'AF    9E   0CBC  4002          MOVAB   B^5$,CLI$L_COMMAND(R2); MEMORY OFF ROUTINE
                     05   0CC1  4003          RSB
                          0CC2  4004
                          0CC2  4005 5$:      Br_If_Not_User  10$             ; Branch around if not in user mode     [55]
0000FE00'EF    1C    E1   0CC2               BBC     #DSA$V_User, -                  ; If bit not set, branch
               12          0CC9                 L^DSA$GL_Flags, 10$             ;
    000000BD'EF    9F   0CCA  4006          PUSHAB  L^T_EMESSG1                     ;                               [41]
               01   DD   0CD0  4007          pushl   #ds$k_printf                    ; Print with PRINTF             [48]
               15   DD   0CD2  4008          pushl   #ds$k_type_command_err          ; Command error code            [48]
00000000'GF    03   FB   0CD4  4009          CALLS   #3, G^DSX$PRINT                 ; Print                         [48]
                     05   0CDB  4010          RSB
                          0CDC  4011
    00000000'EF    94   0CDC  4012 10$:     CLRB    DS$GB_MM_ENB                    ; Allow it to turn MM OFF
00000000'EF    00   FB   0CE2  4013          CALLS   #0,DSX$MMOFF
                     05   0CE9  4014          RSB
                          0CEA  4015
                          0CEA  4016 ;+
                          0CEA  4017 ; SHOW STATUS OF MEMORY MANAGEMENT
                          0CEA  4018 ;-
                          0CEA  4019 ACT_SHOWMM:
    04 A2   F0'AF    9E   0CEA  4020          MOVAB   B^10$,CLI$L_COMMAND(R2)         ; Set command processor
                     05   0CEF  4021          RSB
                          0CF0  4022
                          0CF0  4023 10$:     Br_If_Not_User  20$             ; Branch around if not in user mode     [55]
0000FE00'EF    1C    E1   0CF0               BBC     #DSA$V_User, -                  ; If bit not set, branch
               14          0CF7                 L^DSA$GL_Flags, 20$             ;
                          0CF8  4024          $PRINT  #ds$k_type_command_err, -       ; Print command error           [48]
                          0CF8  4025                  #ds$k_printf, -             ; .. use PRINTF                 [48]
                          0CF8  4026                  L^T_EMESSG1                 ; Can't do                      [48]
    000000BD'EF    9F   0CF8                       PUSHAB  L^T_EMESSG1
```

```
                7E   01   9A  0CFE                          movzbl  #ds$k_printf, -(sp)
                7E   15   98  0D01                          cvtbl   #ds$k_type_command_err, -(sp)
      00000000'GF    03   FB  0D04                          CALLS   #$$N+2, G^DSX$PRINT
                          05  0D0B  4027          RSB
                              0D0C  4028
          000001F2'EF    9F  0D0C  4029 20$:     PUSHAB  T_OFF                          ; Assume MM OFF
                    2A   BB  0D12  4030          PUSHR   #^M<R1,R3,R5>                  ; Save R1,R3 & R5                [122
                55   01   D0  0D14  4031          MOVL    #1,R5                          ; Pass examine code              [122
                53   38   D0  0D17  4032          MOVL    #PR$_MAPEN,R3                  ; Pass IPR number                [122
                              0D1A  4033          CMK     SGIPR                          ; Ch mode and examine IPR38      [122
                    7E   DC  0D1A                MOVPSL  -(SP)
             06 6E   1A   E0  0D1C                BBS     #PSL$V_IS, (SP), 30606$
                    8E   D4  0D20                CLRL    (SP)+
                    0A   BC  0D22                CHMK    #CMK$_SGIPR
                    06   11  0D24                BRB     30607$
          00000000'EF    16  0D26        30606$: JSB     CMK$SGIPR
                              0D2C        30607$:
                    51   95  0D2C  4034          TSTB    R1                             ; is mm on?                      [122
                    2A   BA  0D2E  4035          POPR    #^M<R1,R3,R5>                  ; Restore R1,R3 & R5             [122
                    07   13  0D30  4036          BEQL    30$                            ; Branch if not
      6E  000001EF'EF    9E  0D32  4037          MOVAB   T_ON,(SP)                      ; Change insert
                              0D39  4038
          000001D3'EF    9F  0D39  4039 30$:     PUSHAB  T_SHOWMM                       ; Address of text
                    01   DD  0D3F  4040          pushl   #ds$k_printf                   ; Print with PRINTF              [48]
                    16   DD  0D41  4041          pushl   #ds$k_type_command_out         ; Command output code            [48]
      00000000'GF    04   FB  0D43  4042          CALLS   #4, G^DSX$PRINT                ; Print                          [48]
                          05  0D4A  4043          RSB                                    ; All done
```

```
                                0D4B          .SUBTITLE       Show Status, Show Support
                                0D4B
                                0D4B  ;+
                                0D4B  ; SHOW STATUS
                                0D4B  ;-
                                0D4B  ACT_SHOWSTATUS:                                                   ;                [39]
04 A2   00000000'EF     9E      0D4B          MOVAB   VRSHOWSTATUS, CLI$L_COMMAND(R2)                   ;                [39]
                        05      0D53          RSB
                                0D54
                                0D54  ;+
                                0D54  ; SHOW SUPPORT
                                0D54  ;-
                                0D54  ACT_SHOWSUP:                                          ;                                [44]
04 A2   00000000'EF     9E      0D54          MOVAB   L^VRSUPPORT,CLI$L_COMMAND(R2)       ; Set command routine            [44]
                        05      0D5C          RSB
                                0D5D
                                0D5D  ;+                                                        ;                        [46]
                                0D5D  ; SHOW SECTIONS                                           ;                        [46]
                                0D5D  ;-                                                        ;                        [46]
                                0D5D  ACT_SHOWSECTIONS:                                         ;                        [46]
04 A2   00000000'EF     9E      0D5D          MOVAB   L^VRSHOWSECTIONS,CLI$L_COMMAND(R2)      ; Set command routine    [46]
                        05      0D65          RSB                                               ;                        [46]
                                0D66  ;
                                0D66  ;
                                0D66  ACT_SHOWTESTS:                                            ;                [81]
04 A2   00000000'EF     9E      0D66          MOVAB   L^DSV$SHOWTESTS,CLI$L_COMMAND(R2)       ; SHOW TESTS     [81]
                        05      0D6E          RSB                                               ;                [81]
                                0D6F  ;
                                0D6F  ;+
                                0D6F  ; SHOW MEMORY
                                0D6F  ;-
                                0D6F  Act_ShowMem:                                              ;                        [51]
04 A2   00000000'EF     9E      0D6F          MovAB   L^DSV$ShowMemory, Cli$L_Command(R2)     ; Show Memory address    [51]
                        05      0D77          Rsb                                               ;                        [51]
                                0D78      .Enable LSB                                           ;                        [51]
                                0D78  Act_ShoMemMap:                                            ; /Map                   [51]
                  50    D4      0D78          ClrL    R0                                        ;                        [51]
                  0D    11      0D7A          BrB     10$                                       ;                        [51]
                                0D7C  Act_ShoMemBuf:                                            ; /Buffer                [51]
            50    01    D0      0D7C          MovL    #1, R0                                    ;                        [51]
                  08    11      0D7F          BrB     10$                                       ;                        [51]
                                0D81  Act_ShoMemDat:                                            ; /Data_Structure        [51]
            50    02    D0      0D81          MovL    #2, R0                                    ;                        [51]
                  03    11      0D84          BrB     10$                                       ;                        [51]
                                0D86  Act_ShoMemAll:                                            ; /All                   [51]
            50    03    D0      0D86          MovL    #3, R0                                    ;                        [51]
00 00000000'EF    50    E2      0D89  10$:    BbsS    R0, L^ShowMemoryFlags, 20$                ; set the bit            [51]
                        05      0D91  20$:    Rsb                                               ; and return             [51]
                                0D92      .Disable LSB
                                0D92
                                0D92  ;+
                                0D92  ; SET MEMORY
                                0D92  ;-
                                0D92
                                0D92  ACT_SETMEM:                                       ;                        [75]  ;G:6
04 A2   00000D9B'EF     9E      0D92          MOVAB   5$, CLI$L_COMMAND(R2)           ; Address of following   [75]  ;G:6
                        05      0D9A          RSB                                     ; routine                [75]  ;G:6
```

```
                          0D9B  4102
                          0D9B  4103 5$:     BR_IF_NOT_USER  10$                                ;                                    [75]  ;G:6
          0000FE00'EF   1C  E1  0D9B         BBC      #DSA$V_User, -                            ; If bit not set, branch
                        12      0DA2                    L^DSA$GL_Flags, 10$                     ;
                          0DA3  4104                                                                                                 ;G:6
              000000BD'EF   9F  0DA3  4105         PUSHAB   L^T_EMESSG1                         ; Not allowed in user mode[75]  ;G:6
                        01  DD  0DA9  4106         PUSHL    #DS$K_PRINTF                        ; Tell user                  [75]  ;G:6
                        15  DD  0DAB  4107         PUSHL    #DS$K_TYPE_COMMAND_ERR              ;                            [75]  ;G:6
          00000000'GF   03  FB  0DAD  4108         CALLS    #3, G^DSX$PRINT                     ;                            [75]  ;G:6
                        05      0DB4  4109         RSB                                          ;                            [75]  ;G:6
                          0DB5  4110
     12 00000000'EF   08  E1  0DB5  4111 10$:     BBC      #AP$V_AP_RUNNING,AP$GW_DATA,20$     ; Not allowed on AP          [119] ;G:8
              000001B2'EF   9F  0DBD  4112         PUSHAB   L^T_EMESSG5                         ; Tell user                  [119] ;G:6
                        01  DD  0DC3  4113         PUSHL    #DS$K_PRINTF                        ;                            [119] ;G:6
                        15  DD  0DC5  4114         PUSHL    #DS$K_TYPE_COMMAND_ERR              ;                            [119] ;G:6
          00000000'GF   03  FB  0DC7  4115         CALLS    #3, G^DSX$PRINT                     ;                            [119] ;G:6
                        05      0DCE  4116         RSB                                          ; And exit                   [119] ;G:9
                          0DCF  4117
                          0DCF  4118 20$:                                                       ;                            [119] ;G:6
              00000000'EF   16  0DCF  4119         JSB      L^VRSETMEM                          ; Routine to do work         [75]  ;G:6
                        05      0DD5  4120         RSB                                          ;                            [75]  ;G:6
                          0DD6  4121
                          0DD6  4122         .END
```

```
$$$                     = 0000008E     D
$$N                     = 00000001     D
$ER                     = 00000002     D
$MODULE                   00000000 R   D   03
ABORT                   = 00000006     D
ACT_ABORT                 000002C3 R   D   04
ACT_ADAPTER               00000C45 R   D   04
ACT_ADDRESS               00000915 R   D   04
ACT_ADVANCE               00000B53 R   D   04
ACT_ALL                   00000960 R   D   04
ACT_ASCII                 00000B1B R   D   04
ACT_ASK_PROMPT            00000A04 R   D   04
ACT_ATTACH                000002B2 R   D   04
ACT_BACKUP                00000B4E R   D   04
ACT_BASE                  000008FF R   D   04
ACT_BASE_QUAL             00000949 R   D   04
ACT_BEGINADAPTER          00000C37 R   D   04
ACT_BEGINTIME             000007ED R   D   04
ACT_BELL                  00000A0A R   D   04
ACT_BINARY                00000A10 R   D   04
ACT_BOOT                  000002CC R   D   04
ACT_BREAK                 00000922 R   D   04
ACT_BRIEF                 00000C02 R   D   04
ACT_BYTE                  00000B70 R   D   04
ACT_CLEAR                 000002FF R   D   04
ACT_CLEARENFORCE          00000882 R   D   04
ACT_CLEAR_CRD_DEBUG       000009FC R   D   04
ACT_CLEAR_CRD_TRACE       000009B7 R   D   04
ACT_CONT                  0000035B RG  D   04
ACT_CONTEXT               00000281 R   D   04
ACT_CONTINUE              0000030C R   D   04
ACT_CRD                   000006C6 R   D   04
ACT_DATA                  00000B58 R   D   04
ACT_DEATTACH              0000035C R   D   04
ACT_DEBUG                 00000365 R   D   04
ACT_DEBUG_SWITCH          000007BE R   D   04
ACT_DEC                   00000B7A R   D   04
ACT_DEFAULT               00000981 R   D   04
ACT_DEFAULT_DBG           0000036E RG  D   04
ACT_DEPOSIT               00000388 R   D   04
ACT_DESELECT              00000395 R   D   04
ACT_DEVICE                00000BEC R   D   04
ACT_DIRECTORY             0000039E R   D   04
ACT_DIR_WIDE              000003AD R   D   04
ACT_DO_CMD                00000C72 R   D   04
ACT_DUMP                  000003B5 R   D   04
ACT_EFN                   00000AF6 R   D   04
ACT_ENUF                  000002AD R   D   04
ACT_EVENT                 000008C1 R   D   04
ACT_EXAMINE               000003E0 R   D   04
ACT_EXIT                  000003ED R   D   04
ACT_FAILURE               0000029F R   D   04
ACT_FILEND                000007AD R   D   04
ACT_FILESPEC              000007A5 R   D   04
ACT_FLAGS                 000008EA R   D   04
ACT_HALT                  00000A16 R   D   04
ACT_HELP                  000003F6 R   D   04
ACT_HEX                   00000B75 R   D   04
ACT_IE1                   00000A1C R   D   04
ACT_IE2                   00000A22 R   D   04
ACT_IE3                   00000A28 R   D   04
ACT_IES                   00000A2E R   D   04
ACT_IFNOTUSER             00000BC0 R   D   04
ACT_IF_ADAPTER            00000BA5 R   D   04
ACT_IF_FILE_SPEC          00000B9B R   D   04
ACT_IF_REG_OR_ADR         00000BB2 R   D   04
ACT_IF_REQUIRED           00000B92 R   D   04
ACT_IF_RUN                00000B84 R   D   04
ACT_IF_XDELTA             00000BCD R   D   04
ACT_ILL_CMD               00000277 R   D   04
ACT_INC_CMD               0000027D R   D   04
ACT_INITPCS               00000437 R   D   04
ACT_LAST                  000007E8 R   D   04
ACT_LOAD                  0000045F R   D   04
ACT_LONG                  00000B66 R   D   04
ACT_LOOP                  00000A34 R   D   04
ACT_MMOFF                 00000CBC R   D   04
ACT_MMON                  00000C8D R   D   04
ACT_NEXT                  00000B16 R   D   04
ACT_NEXT_INST             00000472 R   D   04
ACT_NOBASE                00000955 R   D   04
ACT_NOTNUF                000002A8 R   D   04
ACT_NO_ALLOC              000004D8 RG  D   04
ACT_NULL                  00000276 R   D   04
ACT_NULL_DATA             00000B5D R   D   04
ACT_OCT                   00000B7F R   D   04
ACT_OPER                  00000A3A R   D   04
ACT_OPTIONAL              000007B4 R   D   04
ACT_PAGE                  00000A5E R   D   04
ACT_PASS                  000007CA R   D   04
ACT_PREGN                 00000B47 R   D   04
ACT_PROMPT                00000A40 R   D   04
ACT_QA                    000007CF R   D   04
ACT_QACL                  00000AA0 R   D   04
ACT_QADEF                 00000AD4 R   D   04
ACT_QAEP                  00000A9A R   D   04
ACT_QAMP                  00000AB2 R   D   04
ACT_QASL                  00000AAC R   D   04
ACT_QATL                  00000AA6 R   D   04
ACT_QUICK                 00000A46 R   D   04
ACT_REG12                 00000B25 R   D   04
ACT_REG13                 00000B2A R   D   04
ACT_REG14                 00000B2F R   D   04
ACT_REG15                 00000B34 R   D   04
ACT_REG16                 00000B3A R   D   04
ACT_REGN                  00000B20 R   D   04
ACT_REGNUF                00000B42 R   D   04
ACT_REGP                  00000B3E R   D   04
ACT_REQUIRED              000007B9 R   D   04
ACT_RUN                   0000048F R   D   04
ACT_SCRIPT                000006B4 R   D   04
ACT_SEARCH                00000A4C R   D   04
ACT_SECTION               000007D4 R   D   04
ACT_SELECT                000004C7 R   D   04
```

```
ACT_SET                 000004E1 R   D  04      AP$_REQ_RXCDVEC                 = 00000001   G D
ACT_SETCPU              000004EE R   D  04      APT_COM                           ********     X   04
ACT_SETENFORCE          0000087E R   D  04      APT_MSG                           ********     X   04
ACT_SETLOAD             00000C7B R   D  04      ASCII                           = 0000005C     D
ACT_SETMEM              00000D92 R   D  04      ASK_PROMPT                      = 00000042     D
ACT_SET_CRD_DEBUG       000009F3 R   D  04      ATTACH                          = 00000007     D
ACT_SET_CRD_TRACE       000009AD R   D  04      BACKUP                          = 00000064     D
ACT_SHOMEMALL           00000D86 R   D  04      BAD_LIST                          000004EA R   D  03
ACT_SHOMEMBUF           00000D7C R   D  04      BAD_QUAL                          00000506 R   D  03
ACT_SHOMEMDAT           00000D81 R   D  04      BASE                            = 0000003C     D
ACT_SHOMEMMAP           00000D78 R   D  04      BASE_QUAL                       = 0000003F     D
ACT_SHOW                00000677 R   D  04      BEGIN                             ********     X   04
ACT_SHOWCPU             00000608 R   D  04      BEGINADAPTER                    = 00000078     D
ACT_SHOWENFORCE         00000890 R   D  04      BEGINTIME                       = 0000008D     D
ACT_SHOWLOAD            00000C84 R   D  04      BELL                            = 00000044     D
ACT_SHOWMEM             00000D6F R   D  04      BINARY                          = 00000045     D
ACT_SHOWMM              00000CEA R   D  04      BIN_TIME                          ********     X   04
ACT_SHOWSECTIONS        00000D5D R   D  04      BIT...                          = 0000000C     D
ACT_SHOWSEL             00000C5C R   D  04      BOOT                            = 00000008     D
ACT_SHOWSTATUS          00000D4B R   D  04      BREAK                           = 0000003E     D
ACT_SHOWSUP             00000D54 R   D  04      BREAK_QUALS                       0000089E R   D  03
ACT_SHOWTESTS           00000D66 R   D  04      BRIEF                           = 00000077     D
ACT_SHOW_CALLS          000009A0 R   D  04      BYTE                            = 0000006A     D
ACT_SHOW_CRD_TRACE      000009C1 R   D  04      B_SUCCESS                         00000454 R   D  02
ACT_START               0000067C R   D  04      CLEAR                           = 00000009     D
ACT_SUBTEST             000007DE R   D  04      CLEARENFORCE                    = 00000037     D
ACT_SUCCESS             00000296 R   D  04      CLEAR_CRD_DEBUG                 = 00000021     D
ACT_SUMMARY             000006BD R   D  04      CLEAR_CRD_TRACE                 = 0000001E     D
ACT_TEST                000007E3 R   D  04      CLEAR_PARAMS                      00000C83 R   D  03
ACT_TIME                000007F7 R   D  04      CLI                               00000072 R   D  04
ACT_TRACE               00000A52 R   D  04      CLI$K_ALNUM                     = 00000087     D
ACT_ULTRIX_ODS          00000642 R   D  04      CLI$K_ALPHA                     = 00000086     D
ACT_VERIFY              00000A58 R   D  04      CLI$K_BIF                       = 00000083     D
ACT_WIDTH               00000A7C R   D  04      CLI$K_BIFS                      = 00000094     D
ACT_WORD                00000B6B R   D  04      CLI$K_BR                        = 00000082     D
ACT_XDELTA              00000BE2 R   D  04      CLI$K_BUFSIZ                    = 00000100     D
ADAPTER                 = 00000079     D        CLI$K_CALL                      = 00000092     D
ADDRESS                 = 0000003D     D        CLI$K_COMMA                     = 0000008E     D
ADVANCE                 = 00000065     D        CLI$K_DEC                       = 0000008A     D
ALL                     = 00000041     D        CLI$K_EOL                       = 00000091     D
AP$GK_PROMPT_WAIT       = 00FFFFFF     D        CLI$K_ERROR                     = 00000080     D
AP$GW_DATA                ********   X   04      CLI$K_EXIT                      = 00000081     D
AP$M_AP_NODE_ID         = 000000F0     D        CLI$K_FILE                      = 00000095     D
AP$M_AP_RUNNING         = 00000100     D        CLI$K_HEX                       = 00000089     D
AP$M_BUFFER_FULL        = 00000800     D        CLI$K_KEYWORD                   = 0000008C     D
AP$M_DATA_READY         = 00000200     D        CLI$K_NUM                       = 00000085     D
AP$M_PP_NODE_ID         = 0000000F     D        CLI$K_OCT                       = 00000088     D
AP$M_REQUEST            = 00000400     D        CLI$K_RETURN                    = 00000093     D
AP$S_AP_NODE_ID         = 00000004     D        CLI$K_SIZE                        0000044C     D
AP$S_PP_NODE_ID         = 00000004     D        CLI$K_SLASH                     = 00000090     D
AP$V_AP_NODE_ID         = 00000004     D        CLI$K_SPACE                     = 00000084     D
AP$V_AP_RUNNING         = 00000008     D        CLI$K_STRING                    = 0000008B     D
AP$V_BUFFER_FULL        = 0000000B     D        CLI$K_SYMBOL                    = 0000008D     D
AP$V_DATA_READY         = 00000009     D        CLI$K_VALUE                     = 0000008F     D
AP$V_PP_NODE_ID         = 00000000     D        CLI$L_ADDRESS                     00000018     D
AP$V_REQUEST            = 0000000A     D        CLI$L_COMMAND                     00000004     D
AP$_REQ_CONSRX          = 00000000   G D        CLI$L_DATA                        0000001C     D
```

```
CLI$L_FLAGS                     00000000    D
CLI$L_FLAGS2                    00000444    D
CLI$L_LAST                      00000024    D
CLI$L_NEXT                      00000030    D
CLI$L_PASS                      0000002C    D
CLI$L_SUBT                      00000028    D
CLI$L_TEMP_BASE                 00000448    D
CLI$L_TEST                      00000020    D
CLI$M_START_OR_RUN            = 00000008    D
CLI$Q_BUFQWD                    00000034    D
CLI$Q_FILE                      00000008    D
CLI$Q_SECTION                   00000010    D
CLI$Q_TIME                      0000043C    D
CLI$T_BUFFER                    0000003C    D
CLI$V_ADAPTER                 = 00000018    D
CLI$V_ADR                     = 0000000B    D
CLI$V_ASCII                   = 00000013    D
CLI$V_BASE_QUAL               = 00000002    D
CLI$V_BREAK                   = 0000000A    D
CLI$V_BRIEF                   = 0000001B    D
CLI$V_BYTE                    = 0000000D    D
CLI$V_CLEAR                   = 00000002    D
CLI$V_DEC                     = 00000010    D
CLI$V_DEFAULT                 = 0000000C    D
CLI$V_DEPOSIT                 = 00000019    D
CLI$V_EVENT                   = 00000008    D
CLI$V_EXAM                    = 00000005    D
CLI$V_FLAGS                   = 00000009    D
CLI$V_HEX                     = 00000012    D
CLI$V_KERNEL                  = 00000017    D
CLI$V_LOAD                    = 00000006    D
CLI$V_LONG                    = 0000000F    D
CLI$V_NEXT                    = 00000001    D
CLI$V_NOALLOC                 = 00000000    D
CLI$V_NOTNUF                  = 00000001    D
CLI$V_OCT                     = 00000011    D
CLI$V_PREG                    = 0000001A    D
CLI$V_QA                      = 00000007    D
CLI$V_QACKLOOPLOOPS           = 0000001C    D
CLI$V_QAERRORPRINTS           = 0000001B    D
CLI$V_QAMULTIPLEPASS          = 0000001F    D
CLI$V_QASUBTESTLOOPS          = 0000001E    D
CLI$V_QATESTLOOPS             = 0000001D    D
CLI$V_REG                     = 00000014    D
CLI$V_REQUIRED                = 00000000    D
CLI$V_RUN                     = 00000015    D
CLI$V_SET                     = 00000003    D
CLI$V_SHOW                    = 00000004    D
CLI$V_START_OR_RUN            = 00000003    D
CLI$V_VALSEC                  = 00000016    D
CLI$V_WORD                    = 0000000E    D
CLI_ACTION                      0000013D RG D   04
CMK$APBOOT                      ********   X   04
CMK$SGIPR                       ********   X   04
CMK$_APBOOT                   = 00000004    D
CMK$_ASTEXIT                  = 00000000    D
CMK$_CANTIM                   = 0000000B    D
CMK$_HIBER                    = 00000007    D
CMK$_INITSCB                  = 00000008    D
CMK$_LAST                     = 0000000E    D
CMK$_MMENABLE                 = 00000003    D
CMK$_RCONSOLE                 = 00000001    D
CMK$_REFRESH                  = 00000005    D
CMK$_SCHDWK                   = 00000006    D
CMK$_SETIMR                   = 0000000C    D
CMK$_SETIPL                   = 00000009    D
CMK$_SETPRT                   = 0000000D    D
CMK$_SGIPR                    = 0000000A    D
CMK$_TCONSOLE                 = 00000002    D
COMMAND_TREE                    000002A0 RG D   03
COMMON_CRD_TRACE_DEBUG          000009EC R  D   04
COMMON_ENFORCE                  00000885 R  D   04
CONTEXT                       = 00000003    D
CONTINUE                      = 0000000A    D
CRD                           = 00000027    D
CRD$GL_CRD_COMMAND_DEBUG        ********     X   04
CRD$K_CRD_INITIALIZATION      = 00000000  G D
CRD$K_DS_CONTROL_C            = 00000001  G D
CRD$K_DS_FLAGS                = 00000000  G D
CRD$K_FAILURE                 = 00000000    D
CRD$K_HOOK_POINT              = 00000000  G D
CRD$K_LAST_ACCESS_CODE        = 00000002  G D
CRD$K_LAST_DS_VARIABLE        = 00000002  G D
CRD$K_LAST_FUNCTION           = 00000002  G D
CRD$K_LAST_HOOK_POINT         = 00000001  G D
CRD$K_READ                    = 00000000  G D
CRD$K_SUCCESS                 = 00000001    D
CRD$K_TYPECODE                = 00000001  G D
CRD$K_WRITE                   = 00000001  G D
DATA                          = 00000066    D
DBG_NAME                        0000037F R  D   04
DEATTACH                      = 0000000B    D
DEATTACH_PARAMS                 000009AC R  D   03
DEBUG                         = 0000000C    D
DEBUG$GB_FLAGS                  ********     X   04
DEBUG_SWITCH                  = 0000000D    D
DEC                           = 0000006C    D
DEFAULT                       = 00000043    D
DEFAULT_DBG                   = 0000000E    D
DEPOSIT                       = 0000000F    D
DESELECT                      = 0000007A    D
DESELECT_PARAMS                 000009F4 R  D   03
DEVICE                        = 00000076    D
DEVICE_NAMES                    0000060F R  D   03
DEVICE_QUALS                    000008CA R  D   03
DIRECTORY                     = 00000010    D
DIR_WIDE                      = 0000008C    D
DO_CMD                        = 0000007E    D
DS$A_PRGBGN                     ********     X   04
DS$CLI                          00000000 RG D   04
DS$GA_CRD_DS_INTERFACE          ********     X   04
DS$GA_DS_CTRL_C_FIRST           ********     X   04
DS$GA_DS_CTRL_C_SECOND          ********     X   04
DS$GB_INHIBIT_NAMING            ********     X   04
```

```
DS$GB_MM_ENB                    ********   X   04
DS$GL_CLIBASE                   00000000 RG  D  02
DS$GL_CRD_DEBUG                 ********   X   04
DS$GL_FLAGS                     ********   X   04
DS$GPHARD                       ********   X   04
DS$GT_PROMPT                    ********   X   04
DS$K_ERROR                    =  00000002     D
DS$K_NORMAL                   =  00000001     D
DS$K_PRINTB                   =  00000002     D
DS$K_PRINTF                   =  00000001     D
DS$K_PRINTI                   =  00000000     D
DS$K_PRINTX                   =  00000003     D
DS$K_SEVERE                   =  00000004     D
DS$K_SUBSYS                   =  00000066     D
DS$K_TYPE_ABORT_PROGRAM       =  00000014     D
DS$K_TYPE_ABORT_TEST          =  00000013     D
DS$K_TYPE_COMMAND_ERR         =  00000015     D
DS$K_TYPE_COMMAND_OUT         =  00000016     D
DS$K_TYPE_CRD_AUTOTEST        =  0000001A     D
DS$K_TYPE_DS_PROMPT           =  00000001     D
DS$K_TYPE_DS_START            =  0000001D     D
DS$K_TYPE_ERRDEV              =  00000008     D
DS$K_TYPE_ERRHARD             =  00000006     D
DS$K_TYPE_ERROR_BODY          =  00000009     D
DS$K_TYPE_ERROR_END           =  0000000A     D
DS$K_TYPE_ERRPREP             =  0000001B     D
DS$K_TYPE_ERRSOFT             =  00000007     D
DS$K_TYPE_ERRSUP              =  00000004     D
DS$K_TYPE_ERRSYS              =  00000005     D
DS$K_TYPE_ERR_HALT            =  0000000D     D
DS$K_TYPE_EXCEPTION           =  0000000C     D
DS$K_TYPE_EXCEPTION_HEAD      =  0000000B     D
DS$K_TYPE_FIRST_PASS          =  00000011     D
DS$K_TYPE_GENERAL             =  00000000     D
DS$K_TYPE_GENERAL_ERROR       =  00000003     D
DS$K_TYPE_NO_TESTS            =  00000012     D
DS$K_TYPE_PARAM_ERROR         =  0000001C     D
DS$K_TYPE_PROGRAM_END         =  00000010     D
DS$K_TYPE_PROGRAM_INFO        =  00000017     D
DS$K_TYPE_PROGRAM_START       =  0000000F     D
DS$K_TYPE_QIO_INVADP          =  00000024     D
DS$K_TYPE_QIO_NODRIVER        =  00000022     D
DS$K_TYPE_QIO_WRONGVER        =  00000023     D
DS$K_TYPE_SCRIPT_ECHO         =  00000021     D
DS$K_TYPE_SCRIPT_PNF          =  0000001E     D
DS$K_TYPE_SCRIPT_PROMPT       =  00000020     D
DS$K_TYPE_SCRIPT_SKIP         =  0000001F     D
DS$K_TYPE_SEQUENCE_ERROR      =  00000019     D
DS$K_TYPE_START_ERR           =  00000018     D
DS$K_TYPE_START_LIST          =  00000025     D
DS$K_TYPE_SUMMARY             =  0000000E     D
DS$K_TYPE_USER_PROMPT         =  00000002     D
DS$K_WARNING                  =  00000000     D
DS$L_USERCNTRLC                  ********   X   04
DS$M_ABRTFLG                  =  00000040     D
DS$M_BADTIME                  =  00100000     D
DS$M_BATCH                    =  00400000     D
DS$M_BRKCLR                   =  00001000     D
DS$M_BRKPT                    =  00000800     D
DS$M_CHARFLG                  =  00000100     D
DS$M_CMDFLG                   =  00000080     D
DS$M_CTRLC                    =  00000001     D
DS$M_CTRLO                    =  00010000     D
DS$M_DEVFLG                   =  00000200     D
DS$M_DISABLCC                 =  01000000     D
DS$M_DONFLG                   =  00002000     D
DS$M_ERRFLG                   =  00000010     D
DS$M_EXCEPT                   =  00080000     D
DS$M_EXETST                   =  00040000     D
DS$M_HLTFLG                   =  00000008     D
DS$M_LODFLG                   =  00000002     D
DS$M_MEMMGT                   =  00008000     D
DS$M_NI                       =  04000000     D
DS$M_OUTPUT                   =  00800000     D
DS$M_RUBFLG                   =  00000020     D
DS$M_SCRIPT                   =  00200000     D
DS$M_SETIMR                   =  02000000     D
DS$M_STRFLG                   =  00000004     D
DS$M_SUBT                     =  00004000     D
DS$M_SYSFLG                   =  00000400     D
DS$M_TIMED                    =  02000000     D
DS$M_TIMED_OUT                =  08000000     D
DS$M_TIMRON                   =  00020000     D
DS$V_ABRTFLG                  =  00000006     D
DS$V_BADTIME                  =  00000014     D
DS$V_BATCH                    =  00000016     D
DS$V_BRKCLR                   =  0000000C     D
DS$V_BRKPT                    =  0000000B     D
DS$V_CHARFLG                  =  00000008     D
DS$V_CMDFLG                   =  00000007     D
DS$V_CTRLC                    =  00000000     D
DS$V_CTRLO                    =  00000010     D
DS$V_DEVFLG                   =  00000009     D
DS$V_DISABLCC                 =  00000018     D
DS$V_DONFLG                   =  0000000D     D
DS$V_ERRFLG                   =  00000004     D
DS$V_EXCEPT                   =  00000013     D
DS$V_EXETST                   =  00000012     D
DS$V_HLTFLG                   =  00000003     D
DS$V_LODFLG                   =  00000001     D
DS$V_MEMMGT                   =  0000000F     D
DS$V_NI                       =  0000001A     D
DS$V_OUTPUT                   =  00000017     D
DS$V_RUBFLG                   =  00000005     D
DS$V_SCRIPT                   =  00000015     D
DS$V_SETIMR                   =  00000019     D
DS$V_STRFLG                   =  00000002     D
DS$V_SUBT                     =  0000000E     D
DS$V_SYSFLG                   =  0000000A     D
DS$V_TIMED                    =  00000019     D
DS$V_TIMED_OUT                =  0000001B     D
DS$V_TIMRON                   =  00000011     D
DS$_AP_NORMAL_BREAK           =  00660150     D
DS$_ARITH                     =  006600D0     D
```

DS$_ASBE	= 00660118	D	DSA$GL_SID	0000FE14	D			
DS$_BADLINK	= 006600F0	D	DSA$GL_SUBTNO	0000FE4C	D			
DS$_BADTYPE	= 006600E8	D	DSA$GL_TESTNO	0000FE50	D			
DS$_BIIC	= 00660120	D	DSA$GL_UNITS	0000FE0C	D			
DS$_CHME	= 006600A8	D	DSA$GQ_MSGPTR	0000FE68	D			
DS$_CHMK	= 006600E0	D	DSA$GT_DEVNAM	0000FE5C	D			
DS$_DEVNAME	= 00660108	D	DSA$M_CRD_AUTOTEST_OFF	= 00000800	D			
DS$_ERROR	= 00660002	D	DSA$M_CRD_MENUTEST_OFF	= 00010000	D			
DS$_FHWE	= 00660068	D	DSA$M_CRD_MENUTEST_ON	= 00040000	D			
DS$_FRAGBUF	= 00660080	D	DSA$V_APT	= 0000001F	D			
DS$_ICBUSY	= 006600C8	D	DSA$V_ASK_PROMPT	= 00000013	D			
DS$_ICERR	= 006600C0	D	DSA$V_BELL	= 00000003	D			
DS$_IHWE	= 00660060	D	DSA$V_BINARY	= 00000001	D			
DS$_ILLCHAR	= 00660018	D	DSA$V_CRD_AUTOTEST_OFF	= 0000000B	D			
DS$_ILLPAGCNT	= 00660078	D	DSA$V_CRD_MENUTEST_OFF	= 00000010	D			
DS$_ILLUNIT	= 00660100	D	DSA$V_CRD_MENUTEST_ON	= 00000012	D			
DS$_INIT_FAIL	= 00660140	D	DSA$V_CRD_TRACE	= 00000011	D			
DS$_INSFMEM	= 00660050	D	DSA$V_HALT	= 00000000	D			
DS$_INVCPU	= 00660130	D	DSA$V_IE1	= 00000004	D			
DS$_IPL2HI	= 006600B8	D	DSA$V_IE2	= 00000005	D			
DS$_IVADDR	= 00660040	D	DSA$V_IE3	= 00000006	D			
DS$_IVVECT	= 00660038	D	DSA$V_IES	= 00000007	D			
DS$_KRNLSTK	= 00660090	D	DSA$V_LOAD_DEBUGGER	= 0000001E	D			
DS$_LOGIC	= 00660070	D	DSA$V_LOOP	= 00000002	D			
DS$_MCHK	= 00660088	D	DSA$V_OPER	= 0000000C	D			
DS$_MEM_ALLOC_ERR	= 00660138	D	DSA$V_PROMPT	= 0000000D	D			
DS$_MMOFF	= 00660058	D	DSA$V_QUICK	= 00000008	D			
DS$_NEEDUNIT	= 006600F8	D	DSA$V_SEARCH	= 0000000E	D			
DS$_NODE	= 00660128	D	DSA$V_TRACE	= 0000000A	D			
DS$_NOPCS	= 00660110	D	DSA$V_USER	= 0000001C	D			
DS$_NORMAL	= 00660001	D	DSA$V_VERIFY	= 00000009	D			
DS$_NOSUPPORT	= 006600B1	D	DSR$COMPLETION	********	X	04		
DS$_NOTALLOWMP	= 00660148	D	DSR$LOAD_CRD	********	X	04		
DS$_NOTDON	= 00660030	D	DSR$UNLOAD_CRD	********	X	04		
DS$_NOTIMP	= 006600B0	D	DSV$ATTACH	********	X	04		
DS$_NULLSTR	= 00660010	D	DSV$DEATTACH	********	X	04		
DS$_OVERFLOW	= 00660008	D	DSV$DEBUG	********	X	04		
DS$_POWER	= 00660098	D	DSV$DESELECT	********	X	04		
DS$_PROGERR	= 00660020	D	DSV$DIRECTORY	********	X	04		
DS$_SEVERE	= 00660004	D	DSV$EXIT	********	X	04		
DS$_TRANSL	= 006600A0	D	DSV$INITPCS	********	X	04		
DS$_TRUNCATE	= 00660028	D	DSV$LOAD	********	X	04		
DS$_UNEXPINT	= 006600D8	D	DSV$RUN	********	X	04		
DS$_UNSUPPDEV	= 00660158	D	DSV$SELECT	********	X	04		
DS$_VASFULL	= 00660048	D	DSV$SETLOAD	********	X	04		
DS$_WARNING	= 00660000	D	DSV$SETPAGE	********	X	04		
DSA$AL_APTMAIL	0000FE00	D	DSV$SHOWDEVICE	********	X	04		
DSA$AT_APTTXT	0000FA00	D	DSV$SHOWDEVICEB	********	X	04		
DSA$GL_APTCOM	0000FE04	D	DSV$SHOWLOAD	********	X	04		
DSA$GL_DEVLEN	0000FE58	D	DSV$SHOWMEMORY	********	X	04		
DSA$GL_ERRNO	0000FE44	D	DSV$SHOWPAGE	********	X	04		
DSA$GL_EVENT	0000FE48	D	DSV$SHOWSELECT	********	X	04		
DSA$GL_FLAGS	0000FE00	D	DSV$SHOWSELECTB	********	X	04		
DSA$GL_MSGTYP	0000FE40	D	DSV$SHOWTESTS	********	X	04		
DSA$GL_PASSES	0000FE08	D	DSX$HELP	********	X	04		
DSA$GL_PASSNO	0000FE54	D	DSX$MMOFF	********	X	04		
DSA$GL_SECTNO	0000FE10	D	DSX$MMON	********	X	04		

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DSX$PRINT                    ********   X   04
DSX$SUPERPARSE               ********   X   04
DS_CLEANUP                   ********   X   04
DS_ERRSUP                    ********   X   04
DS_SUPERLINE                 ********   X   04
DUMP                       = 00000011     D
DUMP_SELF                    ********W GX   00
EFN                        = 00000058     D
END_FLAGS_LOOP               00000607 R  D  03
ENUF                       = 00000017     D
EOL                          000004BA R  D  03
EVENT                      = 0000003A     D
EVENT_FLAGS                  0000062F R  D  03
EXAMINE                    = 00000012     D
EXA_DEP_QUALS                000008FC R  D  03
EXIT                       = 00000013     D
FAILURE                    = 00000005     D
FALSE                      = 00000000     D
FILEND                     = 00000029     D
FILESPEC                   = 00000028     D
FLAGS                      = 0000003B     D
FLAGS_LIST                   00000522 R  D  03
FLAGS_LOOP                   00000530 R  D  03
GET_ADDRESS                  0000077D R  D  03
GET_FILE_SPEC                00000659 R  D  03
GT_MENU_ERROR                000001F6 RG D  03
HALT                       = 00000046     D
HELP                       = 00000014     D
HELPINFO                     ********   X   04
HEX                        = 0000006B     D
HP$A_DEPENDENT               00000032     D
HP$A_DEVICE                  00000018     D
HP$A_DVA                     0000001C     D
HP$A_LINK                    00000020     D
HP$B_DRIVE                   0000000B     D
HP$B_FLAGS                   0000000A     D
HP$Q_DEVICE                  00000000     D
HP$T_DEVICE                  0000000C     D
HP$T_TYPE                    00000026     D
HP$W_SIZE                    00000008     D
HP$W_VECTOR                  00000024     D
IE1                        = 00000047     D
IE2                        = 00000048     D
IE3                        = 00000049     D
IES                        = 0000004A     D
IFNOTUSER                  = 00000073     D
IF_ADAPTER                 = 00000071     D
IF_FILE_SPEC               = 00000070     D
IF_REG_OR_ADR              = 00000072     D
IF_REQUIRED                = 0000006F     D
IF_RUN                     = 0000006E     D
IF_XDELTA                  = 00000074     D
ILLEGAL                      000004D2 R  D  03
ILL_CMD                    = 00000001     D
INCOMPLETE                   000004E6 R  D  03
INC_CMD                    = 00000002     D
INI$BRK                      ********   X   04
INITPCS                    = 0000008B     D
INIT_CONTEXT                 ********   X   04
KA820_CPU                    0000046E R  D  02
KA880_CPU                    00000468 R  D  02
KA884_CPU                    00000462 R  D  02
KA9CC_CPU                    0000045C R  D  02
KB_CHECK                     ********   X   04
KB_CHECK_APT                 ********   X   04
LAST                       = 0000002D     D
LINE_COUNT                   ********   X   04
LOAD                       = 00000015     D
LONG                       = 00000068     D
LOOP                       = 0000004B     D
MAPFREE                      ********   X   04
MMOFF                      = 00000030     D
MMON                       = 0000002F     D
MP$GB_SETCPU                 00000478 RG D  02
MP$GL_CONDITION_FLAGS        ********W GX   00
MP$GL_LUN                    00000479 RG D  02
MP$GR_BOOTED_PROCESSORS      ********   X   04
MP$GT_DEVICE_NAME            0000047D RG D  02
NEXT                       = 00000059     D
NEXT_INST                  = 00000016     D
NOBASE                     = 00000040     D
NOTNUF                     = 00000018     D
NO_ALLOC                   = 0000007C     D
NULL                       = 00000000     D
NULL_DATA                  = 00000067     D
OCT                        = 0000006D     D
OFF                        = 00000000     D
ON                         = 00000001     D
OPER                       = 0000004C     D
OPTIONAL                   = 0000002A     D
PAGE                       = 0000005A     D
PASS                       = 00000034     D
PR$_MAPEN                  = 00000038     D
PREGN                      = 00000032     D
PRIMARY_NAME                 00000455 R  D  02
PROMPT                     = 0000004D     D
PSL$V_IS                   = 0000001A     D
PTABLE                       00000474 R  D  02
QA                         = 00000035     D
QACL                       = 00000053     D
QADEF                      = 00000057     D
QAEP                       = 00000052     D
QAMP                       = 00000056     D
QASL                       = 00000055     D
QATL                       = 00000054     D
QA_COMMON                    00000AB6 R  D  04
QUICK                      = 0000004E     D
Q_ADAPTER                    ********   X   04
Q_GOOD_CMD                   0000044C R  D  02
RCLI                         00000002 R  D  04
REG12                      = 0000005E     D
REG13                      = 0000005F     D
REG14                      = 00000060     D
REG15                      = 00000061     D
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REG16                           = 00000062     D
REGN                            = 0000005D     D
REGP                            = 00000063     D
REQUIRED                        = 0000002B     D
RUN                             = 00000019     D
SCRIPT                          = 0000001A     D
SCRIPT$CONT                       ********   X   04
SCRIPT$FLUSH                      ********   X   04
SCRIPT$OPEN                       ********   X   04
SEARCH                          = 0000004F     D
SECTION                         = 00000033     D
SELECT                          = 0000007B     D
SELECT_PARAMS                     00000A14 R   D   03
SET                             = 0000001B     D
SETCPU                          = 00000039     D
SETENFORCE                      = 00000036     D
SETLOAD                         = 0000007F     D
SETMEM                          = 0000008A     D
SET_CRD_DEBUG                   = 00000020     D
SET_CRD_TRACE                   = 0000001F     D
SET_DEFAULT_PARAMS                00000F0B R   D   03
SET_PARAMS                        00000D1F R   D   03
SHOMEMALL                       = 00000089     D
SHOMEMBUF                       = 00000087     D
SHOMEMDAT                       = 00000088     D
SHOMEMMAP                       = 00000086     D
SHOW                            = 0000001D     D
SHOWCPU                         = 00000024     D
SHOWENFORCE                     = 00000038     D
SHOWLOAD                        = 00000080     D
SHOWMEM                         = 00000085     D
SHOWMEMORYFLAGS                   ********   X   04
SHOWMM                          = 00000031     D
SHOWSECTIONS                    = 00000083     D
SHOWSEL                         = 0000007D     D
SHOWSTATUS                      = 00000082     D
SHOWSUP                         = 00000081     D
SHOWTESTS                       = 00000084     D
SHOW_CALLS                      = 00000023     D
SHOW_CRD_TRACE                  = 00000022     D
SHOW_PARAMS                       00000A4B R   D   03
SIZ...                          = 00000001     D
SS$_ENDOFFILE                     ********   X   04
SS$_NORMAL                      = 00000001     D
START                           = 00000025     D
START_RUN_QUALS                   000007D8 R   D   03
SUBTEST                         = 0000002E     D
SUCCESS                         = 00000004     D
SUMMARY                         = 00000026     D
SYS$BINTIM                        ********  GX   04
SYS$EXIT                          ********  GX   04
TEST                            = 0000002C     D
TIME                            = 0000008E     D
TRACE                           = 00000050     D
TRUE                            = 00000001     D
T_CONT                            00000092 R   D   03
T_CRD_TRACE_OUTPUT                0000025B R   D   03
T_EMESSG1                         000000BD RG  D   03
T_EMESSG2                         000000E2 R   D   03
T_EMESSG3                         00000113 R   D   03
T_EMESSG4                         00000181 R   D   03
T_EMESSG5                         000001B2 R   D   03
T_ILLCMD                          0000001B R   D   03
T_ILLEFN                          00000061 R   D   03
T_INCOMPLETE                      0000003A R   D   03
T_MP_CONT                         000000AB R   D   03
T_OFF                             000001F2 R   D   03
T_ON                              000001EF R   D   03
T_PRGERR                          00000004 R   D   03
T_SHOWCPU                         00000293 R   D   03
T_SHOWENFORCE                     00000278 R   D   03
T_SHOWMM                          000001D3 R   D   03
T_USER_MODE_MENU_ERROR            00000221 R   D   03
ULTRIX_FLAGS                      ********     X   04
ULTRIX_ODS                      = 0000001C       D
ULTRIX_V_MODE                     ********     X   04
VERIFY                          = 00000051       D
VRABORT                           ********     X   04
VRCLRBRK                          ********     X   04
VRCLREF                           ********     X   04
VRCLRFLG                          ********     X   04
VRDEPOSIT                         ********     X   04
VREXAMINE                         ********     X   04
VRSETBASE                         ********     X   04
VRSETBRK                          ********     X   04
VRSETDFLT                         ********     X   04
VRSETEF                           ********     X   04
VRSETFLG                          ********     X   04
VRSETMEM                          ********     X   04
VRSETQA                           ********     X   04
VRSETWIDTH                        ********     X   04
VRSHOWBASE                        ********     X   04
VRSHOWBRK                         ********     X   04
VRSHOWDFLT                        ********     X   04
VRSHOWEF                          ********     X   04
VRSHOWFLG                         ********     X   04
VRSHOWQA                          ********     X   04
VRSHOWSECTIONS                    ********     X   04
VRSHOWSTATUS                      ********     X   04
VRSHOWWIDTH                       ********     X   04
VRSHOW_CALLS                      ********     X   04
VRSTART                           ********     X   04
VRSUMMARY                         ********     X   04
VRSUPPORT                         ********     X   04
WIDE_FLAG                         ********     X   04
WIDTH                           = 0000005B       D
WORD                            = 00000069       D
XDELBPT                           ********W GX     04
XDELTA                          = 00000075       D
```

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                                    +----------------+
                                    ! Psect synopsis !
                                    +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (     0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           0000FE70  (65136.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
WORK                            00000486  ( 1158.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR NOEXE   RD    WRT NOVEC LONG
DATA                            00000F78  ( 3960.)  03 (  3.)  NOPIC   USR   CON   REL   LCL   SHR NOEXE   RD  NOWRT NOVEC BYTE
CODE                            00000DD6  ( 3542.)  04 (  4.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD  NOWRT NOVEC BYTE
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$$	=0000008E	2358 (1)	#-2211 (1)
$$N	=00000001	4026 (1)	#-2088 (1) 2214 (1) 2215 (1) 2216 (1)
			2217 (1) 2218 (1) 2219 (1) 2220 (1)
			2221 (1) 2222 (1) 2223 (1) 2224 (1)
			2225 (1) 2226 (1) 2227 (1) 2228 (1)
			2229 (1) 2230 (1) 2231 (1) 2232 (1)
			2233 (1) 2234 (1) 2235 (1) 2236 (1)
			2237 (1) 2238 (1) 2239 (1) 2240 (1)
			2241 (1) 2242 (1) 2243 (1) 2244 (1)
			2245 (1) 2246 (1) 2247 (1) 2248 (1)
			2249 (1) 2250 (1) 2251 (1) 2252 (1)
			2253 (1) 2254 (1) 2255 (1) 2256 (1)
			2257 (1) 2258 (1) 2259 (1) 2260 (1)
			2261 (1) 2262 (1) 2263 (1) 2264 (1)
			2265 (1) 2266 (1) 2267 (1) 2268 (1)
			2269 (1) 2270 (1) 2271 (1) 2272 (1)
			2273 (1) 2274 (1) 2275 (1) 2276 (1)
			2277 (1) 2278 (1) 2279 (1) 2280 (1)
			2281 (1) 2282 (1) 2283 (1) 2284 (1)
			2285 (1) 2286 (1) 2287 (1) 2288 (1)
			2289 (1) 2290 (1) 2291 (1) 2292 (1)
			2293 (1) 2294 (1) 2295 (1) 2296 (1)
			2297 (1) 2298 (1) 2299 (1) 2300 (1)
			2301 (1) 2302 (1) 2303 (1) 2304 (1)
			2305 (1) 2306 (1) 2307 (1) 2308 (1)
			2309 (1) 2310 (1) 2311 (1) 2312 (1)
			2313 (1) 2314 (1) 2315 (1) 2316 (1)
			2317 (1) 2318 (1) 2319 (1) 2320 (1)
			2321 (1) 2322 (1) 2323 (1) 2324 (1)
			2325 (1) 2326 (1) 2327 (1) 2328 (1)
			2329 (1) 2330 (1) 2331 (1) 2332 (1)
			2333 (1) 2334 (1) 2335 (1) 2336 (1)
			2337 (1) 2338 (1) 2339 (1) 2340 (1)
			2341 (1) 2342 (1) 2343 (1) 2344 (1)
			2345 (1) 2346 (1) 2347 (1) 2348 (1)
			2349 (1) 2350 (1) 2351 (1) 2352 (1)
			2353 (1) 2354 (1) 2355 (1) 2356 (1)
			2358 (1) #-2492 (1) 2497 (1) #-2830 (1)
			#-2926 (1) #-2990 (1) 3172 (1) 3357 (1)
			#-4026 (1)
$ER	=00000002	2360 (1)	#-2360 (1)
$MODULE	00000000-R	637 (1)	2360 (1)
ABORT	=00000006	2220 (1)	715 (1)
ACT_ABORT	000002C3-R	2443 (1)	2220 (1)
ACT_ADAPTER	00000C45-R	3932 (1)	2335 (1)
ACT_ADDRESS	00000915-R	3229 (1)	2275 (1) #-3684 (1)
ACT_ADVANCE	00000B53-R	3700 (1)	2315 (1)
ACT_ALL	00000960-R	3282 (1)	2279 (1)
ACT_ASCII	00000B1B-R	3641 (1)	2306 (1)
ACT_ASK_PROMPT	00000A04-R	3378 (1)	2280 (1)

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ACT_ATTACH                      000002B2-R  2434  (1)      2221  (1)
ACT_BACKUP                      00000B4E-R  3691  (1)      2314  (1)
ACT_BASE                        000008FF-R  3216  (1)      2274  (1)
ACT_BASE_QUAL                   00000949-R  3260  (1)      2277  (1)
ACT_BEGINADAPTER                00000C37-R  3924  (1)      2334  (1)
ACT_BEGINTIME                   000007ED-R  3088  (1)      2355  (1)
ACT_BELL                        00000A0A-R  3386  (1)      2282  (1)
ACT_BINARY                      00000A10-R  3394  (1)      2283  (1)
ACT_BOOT                        000002CC-R  2451  (1)      2222  (1)
ACT_BREAK                       00000922-R  3238  (1)      2276  (1)
ACT_BRIEF                       00000C02-R  3904  (1)      2333  (1)
ACT_BYTE                        00000B70-R  3743  (1)      2320  (1)
ACT_CLEAR                       000002FF-R  2472  (1)      2223  (1)
ACT_CLEARENFORCE                00000882-R  3153  (1)      2269  (1)
ACT_CLEAR_CRD_DEBUG             000009FC-R  3368  (1)      2247  (1)
ACT_CLEAR_CRD_TRACE             000009B7-R  3341  (1)      2244  (1)    #-3371   (1)
ACT_CONT                        0000035B-R  2500  (1)      2653  (1)
ACT_CONTEXT                     00000281-R  2392  (1)      2217  (1)    #-2377   (1)    #-2378   (1)    #-2385   (1)
ACT_CONTINUE                    0000030C-R  2482  (1)      2224  (1)
ACT_CRD                         000006C6-R  2917  (1)      2253  (1)
ACT_DATA                        00000B58-R  3708  (1)      2316  (1)
ACT_DEATTACH                    0000035C-R  2507  (1)      2225  (1)
ACT_DEBUG                       00000365-R  2516  (1)      2226  (1)
ACT_DEBUG_SWITCH                000007BE-R  3034  (1)      2227  (1)
ACT_DEC                         00000B7A-R  3759  (1)      2322  (1)
ACT_DEFAULT                     00000981-R  3299  (1)      2281  (1)
ACT_DEFAULT_DBG                 0000036E-R  2520  (1)      2228  (1)
ACT_DEPOSIT                     00000388-R  2530  (1)      2229  (1)
ACT_DESELECT                    00000395-R  2540  (1)      2336  (1)
ACT_DEVICE                      00000BEC-R  3892  (1)      2332  (1)
ACT_DIRECTORY                   0000039E-R  2548  (1)      2230  (1)
ACT_DIR_WIDE                    000003AD-R  2554  (1)      2354  (1)
ACT_DO_CMD                      00000C72-R  3957  (1)      2340  (1)
ACT_DUMP                        000003B5-R  2562  (1)      2231  (1)
ACT_EFN                         00000AF6-R  3614  (1)      2302  (1)
ACT_ENUF                        000002AD-R  2425  (1)      2237  (1)
ACT_EVENT                       000008C1-R  3180  (1)      2272  (1)
ACT_EXAMINE                     000003E0-R  2580  (1)      2232  (1)
ACT_EXIT                        000003ED-R  2590  (1)      2233  (1)
ACT_FAILURE                     0000029F-R  2410  (1)      2219  (1)
ACT_FILEND                      000007AD-R  3008  (1)      2255  (1)
ACT_FILESPEC                    000007A5-R  3000  (1)      2254  (1)
ACT_FLAGS                       000008EA-R  3200  (1)      2273  (1)
ACT_HALT                        00000A16-R  3402  (1)      2284  (1)
ACT_HELP                        000003F6-R  2600  (1)      2234  (1)
ACT_HEX                         00000B75-R  3751  (1)      2321  (1)
ACT_IE1                         00000A1C-R  3410  (1)      2285  (1)
ACT_IE2                         00000A22-R  3418  (1)      2286  (1)
ACT_IE3                         00000A28-R  3426  (1)      2287  (1)
ACT_IES                         00000A2E-R  3434  (1)      2288  (1)
ACT_IFNOTUSER                   00000BC0-R  3858  (1)      2329  (1)
ACT_IF_ADAPTER                  00000BA5-R  3827  (1)      2327  (1)
ACT_IF_FILE_SPEC                00000B9B-R  3813  (1)      2326  (1)
ACT_IF_REG_OR_ADR               00000BB2-R  3841  (1)      2328  (1)
ACT_IF_REQUIRED                 00000B92-R  3799  (1)      2325  (1)
ACT_IF_RUN                      00000B84-R  3783  (1)      2324  (1)
ACT_IF_XDELTA                   00000BCD-R  3872  (1)      2330  (1)
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ACT_ILL_CMD                 00000277-R   2375   (1)      2215   (1)
ACT_INC_CMD                 0000027D-R   2383   (1)      2216   (1)
ACT_INITPCS                 00000437-R   2619   (1)      2353   (1)
ACT_LAST                    000007E8-R   3080   (1)      2259   (1)
ACT_LOAD                    0000045F-R   2636   (1)      2235   (1)
ACT_LONG                    00000B66-R   3727   (1)      2318   (1)
ACT_LOOP                    00000A34-R   3444   (1)      2289   (1)
ACT_MMOFF                   00000CBC-R   4001   (1)      2262   (1)
ACT_MMON                    00000C8D-R   3982   (1)      2261   (1)
ACT_NEXT                    00000B16-R   3634   (1)      2303   (1)
ACT_NEXT_INST               00000472-R   2647   (1)      2236   (1)
ACT_NOBASE                  00000955-R   3271   (1)      2278   (1)
ACT_NOTNUF                  000002A8-R   2417   (1)      2238   (1)
ACT_NO_ALLOC                000004D8-R   2687   (1)      2338   (1)
ACT_NULL                    00000276-R   2369   (1)      2214   (1)
ACT_NULL_DATA               00000B5D-R   3717   (1)      2317   (1)
ACT_OCT                     00000B7F-R   3767   (1)      2323   (1)
ACT_OPER                    00000A3A-R   3452   (1)      2290   (1)
ACT_OPTIONAL                000007B4-R   3016   (1)      2256   (1)
ACT_PAGE                    00000A5E-R   3504   (1)      2304   (1)
ACT_PASS                    000007CA-R   3042   (1)      2266   (1)
ACT_PREGN                   00000B47-R   3682   (1)      2264   (1)
ACT_PROMPT                  00000A40-R   3460   (1)      2291   (1)
ACT_QA                      000007CF-R   3049   (1)      2267   (1)
ACT_QACL                    00000AA0-R   3546   (1)      2297   (1)
ACT_QADEF                   00000AD4-R   3585   (1)      2301   (1)
ACT_QAEP                    00000A9A-R   3541   (1)      2296   (1)
ACT_QAMP                    00000AB2-R   3561   (1)      2300   (1)
ACT_QASL                    00000AAC-R   3556   (1)      2299   (1)
ACT_QATL                    00000AA6-R   3551   (1)      2298   (1)
ACT_QUICK                   00000A46-R   3468   (1)      2292   (1)
ACT_REG12                   00000B25-R   3656   (1)      2308   (1)
ACT_REG13                   00000B2A-R   3659   (1)      2309   (1)
ACT_REG14                   00000B2F-R   3662   (1)      2310   (1)
ACT_REG15                   00000B34-R   3665   (1)      2311   (1)
ACT_REG16                   00000B3A-R   3669   (1)      2312   (1)
ACT_REGN                    00000B20-R   3651   (1)      2307   (1)
ACT_REGNUF                  00000B42-R   3674   (1)    #-3673   (1)
ACT_REGP                    00000B3E-R   3671   (1)      2313   (1)    #-3667   (1)
ACT_REQUIRED                000007B9-R   3024   (1)      2257   (1)
ACT_RUN                     0000048F-R   2659   (1)      2239   (1)
ACT_SCRIPT                  000006B4-R   2898   (1)      2240   (1)
ACT_SEARCH                  00000A4C-R   3478   (1)      2293   (1)
ACT_SECTION                 000007D4-R   3057   (1)      2265   (1)
ACT_SELECT                  000004C7-R   2679   (1)      2337   (1)
ACT_SET                     000004E1-R   2695   (1)      2241   (1)
ACT_SETCPU                  000004EE-R   2707   (1)      2271   (1)
ACT_SETENFORCE              0000087E-R   3150   (1)      2268   (1)
ACT_SETLOAD                 00000C7B-R   3966   (1)      2341   (1)
ACT_SETMEM                  00000D92-R   4099   (1)      2352   (1)
ACT_SET_CRD_DEBUG           000009F3-R   3363   (1)      2246   (1)
ACT_SET_CRD_TRACE           000009AD-R   3335   (1)      2245   (1)    #-3366   (1)
ACT_SHOMEMALL               00000D86-R   4089   (1)      2351   (1)
ACT_SHOMEMBUF               00000D7C-R   4083   (1)      2349   (1)
ACT_SHOMEMDAT               00000D81-R   4086   (1)      2350   (1)
ACT_SHOMEMMAP               00000D78-R   4080   (1)      2348   (1)
ACT_SHOW                    00000677-R   2872   (1)      2243   (1)
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ACT_SHOWCPU                  00000608-R   2823   (1)      2250   (1)
ACT_SHOWENFORCE              00000890-R   3164   (1)      2270   (1)
ACT_SHOWLOAD                 00000C84-R   3973   (1)      2342   (1)
ACT_SHOWMEM                  00000D6F-R   4076   (1)      2347   (1)
ACT_SHOWMM                   00000CEA-R   4019   (1)      2263   (1)
ACT_SHOWSECTIONS             00000D5D-R   4064   (1)      2345   (1)
ACT_SHOWSEL                  00000C5C-R   3945   (1)      2339   (1)
ACT_SHOWSTATUS               00000D4B-R   4050   (1)      2344   (1)
ACT_SHOWSUP                  00000D54-R   4057   (1)      2343   (1)
ACT_SHOWTESTS                00000D66-R   4069   (1)      2346   (1)
ACT_SHOW_CALLS               000009A0-R   3323   (1)      2249   (1)
ACT_SHOW_CRD_TRACE           000009C1-R   3347   (1)      2248   (1)
ACT_START                    0000067C-R   2880   (1)      2251   (1)
ACT_SUBTEST                  000007DE-R   3066   (1)      2260   (1)
ACT_SUCCESS                  00000296-R   2403   (1)      2218   (1)
ACT_SUMMARY                  000006BD-R   2906   (1)      2252   (1)
ACT_TEST                     000007E3-R   3073   (1)      2258   (1)
ACT_TIME                     000007F7-R   3097   (1)      2356   (1)
ACT_TRACE                    00000A52-R   3486   (1)      2294   (1)
ACT_ULTRIX_ODS               00000642-R   2849   (1)      2242   (1)
ACT_VERIFY                   00000A58-R   3494   (1)      2295   (1)
ACT_WIDTH                    00000A7C-R   3521   (1)      2305   (1)
ACT_WORD                     00000B6B-R   3735   (1)      2319   (1)
ACT_XDELTA                   00000BE2-R   3880   (1)      2331   (1)
ADAPTER                     =00000079     2335   (1)      1388   (1)      1463   (1)      1484   (1)      1499   (1)
ADDRESS                     =0000003D     2275   (1)      1273   (1)      1284   (1)      1754   (1)      1817   (1)
                                                          1825   (1)
ADVANCE                     =00000065     2315   (1)      1008   (1)      1030   (1)      946    (1)      979    (1)
ALL                         =00000041     2279   (1)      1047   (1)      1125   (1)      1750   (1)
AP$GK_PROMPT_WAIT           =00FFFFFF     593    (1)
AP$GW_DATA                   00000000-XR                  4111   (1)
AP$M_AP_NODE_ID             =000000F0     593    (1)
AP$M_AP_RUNNING             =00000100     593    (1)
AP$M_BUFFER_FULL            =00000800     593    (1)
AP$M_DATA_READY             =00000200     593    (1)
AP$M_PP_NODE_ID             =0000000F     593    (1)
AP$M_REQUEST                =00000400     593    (1)
AP$S_AP_NODE_ID             =00000004     593    (1)
AP$S_PP_NODE_ID             =00000004     593    (1)
AP$V_AP_NODE_ID             =00000004     593    (1)
AP$V_AP_RUNNING             =00000008     593    (1)     #-4111   (1)
AP$V_BUFFER_FULL            =0000000B     593    (1)
AP$V_DATA_READY             =00000009     593    (1)
AP$V_PP_NODE_ID             =00000000     593    (1)
AP$V_REQUEST                =0000000A     593    (1)
AP$_REQ_CONSRX              =00000000     593    (1)
AP$_REQ_RXCDVEC             =00000001     593    (1)
APT_COM                      00000000-XR                  2082   (1)      2083   (1)
APT_MSG                      00000000-XR                  2078   (1)
ASCII                       =0000005C     2306   (1)      1414   (1)
ASK_PROMPT                  =00000042     2280   (1)      1050   (1)
ATTACH                      =00000007     2221   (1)      720    (1)
BACKUP                      =00000064     2314   (1)      1286   (1)      1753   (1)      1759   (1)      1829   (1)
                                                          1880   (1)      1881   (1)      1911   (1)      1945   (1)
BAD_LIST                     000004EA-R   991    (1)      1057   (1)      1064   (1)      1074   (1)      1097   (1)
                                                          1128   (1)      2002   (1)
BAD_QUAL                     00000506-R   1012   (1)      1325   (1)      1332   (1)      1375   (1)      1392   (1)
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				1447	(1)	1460	(1)	1482	(1)	1503	(1)		
				1633	(1)	1689	(1)	1768	(1)	1769	(1)		
				1770	(1)	1849	(1)	1850	(1)	1851	(1)		
				772	(1)								
BASE	=0000003C	2274	(1)	1547	(1)	1815	(1)						
BASE_QUAL	=0000003F	2277	(1)	1372	(1)	1420	(1)						
BEGIN	00000000-XR			2613	(1)								
BEGINADAPTER	=00000078	2334	(1)	1387	(1)	1462	(1)	1483	(1)	1498	(1)		
BEGINTIME	=0000008D	2355	(1)	1336	(1)								
BELL	=00000044	2282	(1)	1054	(1)								
BINARY	=00000045	2283	(1)	1057	(1)								
BIN_TIME	00000000-XR			#-2661	(1)	#-2882	(1)	3118	(1)	3132	(1)		
BIT...	=0000000C	593	(1)	581	(1)	584	(1)	586	(1)	590	(1)		
				591	(1)	592	(1)	593	(1)				
BOOT	=00000008	2222	(1)	726	(1)								
BREAK	=0000003E	2276	(1)	1552	(1)	1745	(1)	1822	(1)				
BREAK_QUALS	0000089E-R	1367	(1)	1373	(1)	1376	(1)	1746	(1)	1756	(1)		
				1823	(1)	1826	(1)						
BRIEF	=00000077	2333	(1)	1392	(1)	1689	(1)						
BYTE	=0000006A	2320	(1)	1424	(1)	1977	(1)						
B_SUCCESS	00000454-R	609	(1)	2404	(1)	2411	(1)						
CLEAR	=00000009	2223	(1)	742	(1)								
CLEARENFORCE	=00000037	2269	(1)	1776	(1)								
CLEAR_CRD_DEBUG	=00000021	2247	(1)	1771	(1)								
CLEAR_CRD_TRACE	=0000001E	2244	(1)	1766	(1)								
CLEAR_PARAMS	00000C83-R	1738	(1)	743	(1)								
CLI	00000072-R	2093	(1)	#-2076	(1)								
CLI$K_ALNUM	=00000087	581	(1)	1388	(1)	1463	(1)	1468	(1)	1484	(1)		
				1499	(1)	1837	(1)						
CLI$K_ALPHA	=00000086	581	(1)										
CLI$K_BIF	=00000083	581	(1)	1114	(1)	1144	(1)	1173	(1)	1174	(1)		
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				923	(1)								
CLI$K_BIFS	=00000094	581	(1)										
CLI$K_BR	=00000082	581	(1)	1008	(1)	1030	(1)	1048	(1)	1051	(1)		
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				1069	(1)	1072	(1)	1075	(1)	1078	(1)		
				1081	(1)	1084	(1)	1087	(1)	1092	(1)		
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				1185	(1)	1187	(1)	1189	(1)	1191	(1)		
				1193	(1)	1195	(1)	1197	(1)	1199	(1)		
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				1209	(1)	1211	(1)	1220	(1)	1223	(1)		
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				1328	(1)	1336	(1)	1349	(1)	1360	(1)		
				1373	(1)	1376	(1)	1390	(1)	1393	(1)		
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				1430	(1)	1433	(1)	1437	(1)	1442	(1)		
				1445	(1)	1448	(1)	1462	(1)	1470	(1)		
				1474	(1)	1476	(1)	1487	(1)	1501	(1)		
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				1559	(1)	1565	(1)	1571	(1)	1583	(1)		
				1589	(1)	1595	(1)	1602	(1)	1607	(1)		
				1612	(1)	1625	(1)	1628	(1)	1631	(1)		

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                                                  1721   (1)    1751   (1)    1753   (1)    1757   (1)
                                                  1759   (1)    1766   (1)    1771   (1)    1777   (1)
                                                  1783   (1)    1787   (1)    1818   (1)    1827   (1)
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                                                  1988   (1)    1993   (1)    1998   (1)    2003   (1)
                                                  2009   (1)    2013   (1)    716    (1)    729    (1)
                                                  743    (1)    748    (1)    753    (1)    775    (1)
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                                                  799    (1)    804    (1)    818    (1)    832    (1)
                                                  841    (1)    856    (1)    863    (1)    870    (1)
                                                  879    (1)    897    (1)    902    (1)    907    (1)
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CLI$K_BUFSIZ                =00000100     585   (1)  #-2105   (1)    585    (1)
CLI$K_CALL                  =00000092     581   (1)   1588   (1)    1714   (1)    1746   (1)    1756   (1)
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                                                  797    (1)    811    (1)    813    (1)    814    (1)
                                                  817    (1)    837    (1)    839    (1)    840    (1)
                                                  862    (1)    875    (1)    877    (1)    878    (1)
                                                  912    (1)    931    (1)
CLI$K_COMMA                 =0000008E     581   (1)   1001   (1)    1100   (1)    1111   (1)    1129   (1)
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CLI$K_DEC                   =0000008A     581   (1)   1128   (1)    1170   (1)    1182   (1)    1184   (1)
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                                                  1357   (1)    1359   (1)    1441   (1)    1888   (1)
                                                  1908   (1)    1942   (1)    1952   (1)    869    (1)
CLI$K_EOL                   =00000091     581   (1)   1004   (1)    1026   (1)    1219   (1)    1222   (1)
                                                  1227   (1)    1230   (1)    848    (1)    943    (1)
                                                  971    (1)
CLI$K_ERROR                 =00000080     581   (1)   1002   (1)    1005   (1)    1009   (1)    1024   (1)
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                                                  980    (1)    988    (1)
CLI$K_EXIT                  =00000081     581   (1)   721    (1)    849    (1)    851    (1)    944    (1)
CLI$K_FILE                  =00000095     581   (1)   1146   (1)    1150   (1)    1152   (1)    1159   (1)
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                                                  1224   (1)    1229   (1)
CLI$K_HEX                   =00000089     581   (1)
CLI$K_KEYWORD               =0000008C     581   (1)   1001   (1)    1002   (1)    1004   (1)    1005   (1)
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                                                  1057   (1)    1058   (1)    1060   (1)    1061   (1)
                                                  1063   (1)    1064   (1)    1065   (1)    1066   (1)
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2013 (1) 709 (1) 711 (1) 715 (1)

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                                                    1030   (1)    1031   (1)    1042   (1)    1043   (1)
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                                                  #-3983   (1)   #-4002   (1)   #-4020   (1)   #-4051   (1)
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                                                   3568   (1)      3570   (1)      3587   (1)      3593   (1)
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                                                   3786   (1)      3802   (1)      3844   (1)      3848   (1)
                                                   3893   (1)      3905   (1)      3937   (1)      3946   (1)
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CLI$L_NEXT                00000030      585      #-3635   (1)
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CLI$V_BREAK              =0000000A      585      #-3239   (1)
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CLI$V_EVENT                     =00000008     585    (1)    #-3181   (1)    #-3201   (1)
CLI$V_EXAM                      =00000005     585    (1)    #-2583   (1)
CLI$V_FLAGS                     =00000009     585    (1)    #-3203   (1)    #-3300   (1)
CLI$V_HEX                       =00000012     585    (1)    #-3752   (1)
CLI$V_KERNEL                    =00000017     585    (1)
CLI$V_LOAD                      =00000006     585    (1)    #-2639   (1)
CLI$V_LONG                      =0000000F     585    (1)    #-3728   (1)
CLI$V_NEXT                      =00000001     585    (1)    #-2650   (1)
CLI$V_NOALLOC                   =00000000     585    (1)    #-2681   (1)    #-2688   (1)
CLI$V_NOTNUF                    =00000001     585    (1)    #-2148   (1)    #-2376   (1)    #-2384   (1)    #-2418   (1)
                                                            #-2426   (1)
CLI$V_OCT                       =00000011     585    (1)    #-3768   (1)
CLI$V_PREG                      =0000001A     585    (1)    #-3683   (1)
CLI$V_QA                        =00000007     585    (1)    #-3050   (1)
CLI$V_QACKLOOPLOOPS             =0000001C     585    (1)    #-3547   (1)
CLI$V_QAERRORPRINTS             =0000001B     585    (1)    #-3542   (1)
CLI$V_QAMULTIPLEPASS            =0000001F     585    (1)    #-3562   (1)
CLI$V_QASUBTESTLOOPS            =0000001E     585    (1)    #-3557   (1)
CLI$V_QATESTLOOPS               =0000001D     585    (1)    #-3552   (1)
CLI$V_REG                       =00000014     585    (1)    #-3652   (1)    #-3672   (1)    #-3843   (1)
CLI$V_REQUIRED                  =00000000     585    (1)    #-3017   (1)    #-3025   (1)    #-3801   (1)
CLI$V_RUN                       =00000015     585    (1)    #-2665   (1)    #-2886   (1)    #-3785   (1)
CLI$V_SET                       =00000003     585    (1)    #-2698   (1)    #-3183   (1)    #-3241   (1)    #-3287   (1)
                                                            #-3507   (1)    #-3524   (1)    #-3569   (1)    #-3594   (1)
CLI$V_SHOW                      =00000004     585    (1)    #-2873   (1)    #-3205   (1)    #-3217   (1)    #-3303   (1)
                                                            #-3505   (1)    #-3522   (1)    #-3567   (1)    #-3592   (1)
CLI$V_START_OR_RUN              =00000003     585    (1)      585    (1)
CLI$V_VALSEC                    =00000016     585    (1)
CLI$V_WORD                      =0000000E     585    (1)    #-3736   (1)
CLI_ACTION                       0000013D-R   2210   (1)      2133   (1)
CMKSAPBOOT                       00000000-XR                  2466   (1)
CMK$SGIPR                        00000000-XR                  4033   (1)
CMK$_APBOOT                     =00000004     592    (1)    #-2466   (1)
CMK$_ASTEXIT                    =00000000     592    (1)
CMK$_CANTIM                     =0000000B     592    (1)
CMK$_HIBER                      =00000007     592    (1)
CMK$_INITSCB                    =00000008     592    (1)
CMK$_LAST                       =0000000E     592    (1)
CMK$_MMENABLE                   =00000003     592    (1)
CMK$_RCONSOLE                   =00000001     592    (1)
CMK$_REFRESH                    =00000005     592    (1)
CMK$_SCHDWK                     =00000006     592    (1)
CMK$_SETIMR                     =0000000C     592    (1)
CMK$_SETIPL                     =00000009     592    (1)
CMK$_SETPRT                     =0000000D     592    (1)
CMK$_SGIPR                      =0000000A     592    (1)    #-4033   (1)
CMK$_TCONSOLE                   =00000002     592    (1)
COMMAND_TREE                     000002A0-R   708    (1)      2134   (1)
COMMON_CRD_TRACE_DEBUG           000009EC-R   3359   (1)    #-3339   (1)    #-3345   (1)
COMMON_ENFORCE                   00000885-R   3155   (1)    #-3152   (1)
CONTEXT                         =00000003     2217   (1)
CONTINUE                        =0000000A     2224   (1)      747    (1)
CRD                             =00000027     2253   (1)      752    (1)
CRD$GL_CRD_COMMAND_DEBUG         00000000-XR                  #-2936   (1)    #-2941   (1)
CRD$K_CRD_INITIALIZATION        =00000000     591    (1)    #-2979   (1)
CRD$K_DS_CONTROL_C              =00000001     591    (1)
CRD$K_DS_FLAGS                  =00000000     591    (1)
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CRD$K_FAILURE                   =00000000     591    (1)
CRD$K_HOOK_POINT                =00000000     591    (1)    #-2980   (1)
CRD$K_LAST_ACCESS_CODE          =00000002     591    (1)
CRD$K_LAST_DS_VARIABLE          =00000002     591    (1)
CRD$K_LAST_FUNCTION             =00000002     591    (1)
CRD$K_LAST_HOOK_POINT           =00000001     591    (1)
CRD$K_READ                      =00000000     591    (1)
CRD$K_SUCCESS                   =00000001     591    (1)
CRD$K_TYPECODE                  =00000001     591    (1)
CRD$K_WRITE                     =00000001     591    (1)
DATA                            =00000066    2316    (1)     1888   (1)     1908   (1)     1942   (1)     1952   (1)
                                                              728   (1)      781   (1)      816   (1)      869   (1)
DBG_NAME                         0000037F-R  2525    (1)    #-2521   (1)     2522   (1)
DEATTACH                        =0000000B    2225    (1)     790     (1)
DEATTACH_PARAMS                  000009AC-R  1457    (1)     1474    (1)      791   (1)
DEBUG                           =0000000C    2226    (1)     795     (1)
DEBUG$GB_FLAGS                   00000000-XR         (1)    #-2483   (1)    #-2652   (1)
DEBUG_SWITCH                    =0000000D    2227    (1)     1299    (1)
DEC                             =0000006C    2322    (1)     1426    (1)     1982   (1)
DEFAULT                         =00000043    2281    (1)     1582    (1)     1856   (1)
DEFAULT_DBG                     =0000000E    2228    (1)     799     (1)
DEPOSIT                         =0000000F    2229    (1)     811     (1)
DESELECT                        =0000007A    2336    (1)     803     (1)
DESELECT_PARAMS                  000009F4-R  1480    (1)     804     (1)
DEVICE                          =00000076    2332    (1)     1587    (1)     1717   (1)
DEVICE_NAMES                     0000060F-R  1106    (1)     1437    (1)     1506   (1)     1589   (1)     1718   (1)
DEVICE_QUALS                     000008CA-R  1383    (1)     1390    (1)     1393   (1)     1588   (1)     1714   (1)
DIRECTORY                       =00000010    2230    (1)     770     (1)
DIR_WIDE                        =0000008C    2354    (1)     772     (1)
DO_CMD                          =0000007E    2340    (1)     1111    (1)
DS$A_PRGBGN                      00000000-XR         (1)    #-2641   (1)
DS$CLI                           00000000-R  2057    (1)
DS$GA_CRD_DS_INTERFACE           00000000-XR         (1)     2982    (1)
DS$GA_DS_CTRL_C_FIRST            00000000-XR         (1)    #-2958   (1)
DS$GA_DS_CTRL_C_SECOND           00000000-XR         (1)    #-2959   (1)
DS$GB_INHIBIT_NAMING             00000000-XR         (1)    #-3156   (1)    #-3166   (1)
DS$GB_MM_ENB                     00000000-XR         (1)    #-3993   (1)    #-4012   (1)
DS$GL_CLIBASE                    00000000-R  603     (1)     2061    (1)
DS$GL_CRD_DEBUG                  00000000-XR         (1)    #-3365   (1)    #-3370   (1)
DS$GL_FLAGS                      00000000-XR         (1)     2077    (1)      2085   (1)     2102   (1)     2566   (1)
                                                            #-2662   (1)    #-2883   (1)     2963   (1)     2966   (1)
DS$GPHARD                        00000000-XR         (1)     2736    (1)
DS$GT_PROMPT                     00000000-XR         (1)     2088    (1)     2104   (1)
DS$K_ERROR                      =00000002     584    (1)
DS$K_NORMAL                     =00000001     584    (1)
DS$K_PRINTB                     =00000002     590    (1)
DS$K_PRINTF                     =00000001     590    (1)    #-2457   (1)    #-2497   (1)    #-2568   (1)    #-2625   (1)
                                                            #-2713   (1)    #-2784   (1)    #-2804   (1)    #-2830   (1)
                                                            #-2835   (1)    #-3988   (1)    #-4007   (1)    #-4026   (1)
                                                            #-4040   (1)    #-4106   (1)    #-4113   (1)
DS$K_PRINTI                     =00000000     590    (1)    #-2088   (1)    #-2157   (1)    #-2168   (1)    #-2492   (1)
                                                            #-2926   (1)    #-2990   (1)    #-3172   (1)    #-3357   (1)
                                                            #-3622   (1)
DS$K_PRINTX                     =00000003     590    (1)
DS$K_SEVERE                     =00000004     584    (1)
DS$K_SUBSYS                     =00000066     584    (1)     584     (1)
DS$K_TYPE_ABORT_PROGRAM         =00000014     590    (1)
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DS$K_TYPE_ABORT_TEST            =00000013     590    (1)
DS$K_TYPE_COMMAND_ERR           =00000015     590    (1)   #-2158  (1)   #-2169  (1)   #-2458  (1)   #-2569  (1)
                                                           #-2626  (1)   #-2714  (1)   #-2785  (1)   #-2805  (1)
                                                           #-2830  (1)   #-2926  (1)   #-2990  (1)   #-3623  (1)
                                                           #-3989  (1)   #-4008  (1)   #-4026  (1)   #-4107  (1)
                                                           #-4114  (1)
DS$K_TYPE_COMMAND_OUT           =00000016     590    (1)   #-2492  (1)   #-2497  (1)   #-2836  (1)   #-3172  (1)
                                                           #-3357  (1)   #-4041  (1)
DS$K_TYPE_CRD_AUTOTEST          =0000001A     590    (1)
DS$K_TYPE_DS_PROMPT             =00000001     590    (1)   #-2088  (1)
DS$K_TYPE_DS_START              =0000001D     590    (1)
DS$K_TYPE_ERRDEV                =00000008     590    (1)
DS$K_TYPE_ERRHARD               =00000006     590    (1)
DS$K_TYPE_ERROR_BODY            =00000009     590    (1)
DS$K_TYPE_ERROR_END             =0000000A     590    (1)
DS$K_TYPE_ERRPREP               =0000001B     590    (1)
DS$K_TYPE_ERRSOFT               =00000007     590    (1)
DS$K_TYPE_ERRSUP                =00000004     590    (1)
DS$K_TYPE_ERRSYS                =00000005     590    (1)
DS$K_TYPE_ERR_HALT              =0000000D     590    (1)
DS$K_TYPE_EXCEPTION             =0000000C     590    (1)
DS$K_TYPE_EXCEPTION_HEAD        =0000000B     590    (1)
DS$K_TYPE_FIRST_PASS            =00000011     590    (1)
DS$K_TYPE_GENERAL               =00000000     590    (1)
DS$K_TYPE_GENERAL_ERROR         =00000003     590    (1)
DS$K_TYPE_NO_TESTS              =00000012     590    (1)
DS$K_TYPE_PARAM_ERROR           =0000001C     590    (1)
DS$K_TYPE_PROGRAM_END           =00000010     590    (1)
DS$K_TYPE_PROGRAM_INFO          =00000017     590    (1)
DS$K_TYPE_PROGRAM_START         =0000000F     590    (1)
DS$K_TYPE_QIO_INVADP            =00000024     590    (1)
DS$K_TYPE_QIO_NODRIVER          =00000022     590    (1)
DS$K_TYPE_QIO_WRONGVER          =00000023     590    (1)
DS$K_TYPE_SCRIPT_ECHO           =00000021     590    (1)
DS$K_TYPE_SCRIPT_PNF            =0000001E     590    (1)
DS$K_TYPE_SCRIPT_PROMPT         =00000020     590    (1)
DS$K_TYPE_SCRIPT_SKIP           =0000001F     590    (1)
DS$K_TYPE_SEQUENCE_ERROR        =00000019     590    (1)
DS$K_TYPE_START_ERR             =00000018     590    (1)
DS$K_TYPE_START_LIST            =00000025     590    (1)
DS$K_TYPE_SUMMARY               =0000000E     590    (1)
DS$K_TYPE_USER_PROMPT           =00000002     590    (1)
DS$K_WARNING                    =00000000     584    (1)
DS$L_USERCNTRLC                  00000000-XR                 #-2960   (1)
DS$M_ABRTFLG                    =00000040     586    (1)
DS$M_BADTIME                    =00100000     586    (1)
DS$M_BATCH                      =00400000     586    (1)
DS$M_BRKCLR                     =00001000     586    (1)
DS$M_BRKPT                      =00000800     586    (1)
DS$M_CHARFLG                    =00000100     586    (1)
DS$M_CMDFLG                     =00000080     586    (1)
DS$M_CTRLC                      =00000001     586    (1)
DS$M_CTRLO                      =00010000     586    (1)
DS$M_DEVFLG                     =00000200     586    (1)
DS$M_DISABLCC                   =01000000     586    (1)
DS$M_DONFLG                     =00002000     586    (1)
DS$M_ERRFLG                     =00000010     586    (1)
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DS$M_EXCEPT                     =00080000     586    (1)
DS$M_EXETST                     =00040000     586    (1)
DS$M_HLTFLG                     =00000008     586    (1)
DS$M_LODFLG                     =00000002     586    (1)
DS$M_MEMMGT                     =00008000     586    (1)
DS$M_NI                         =04000000     586    (1)
DS$M_OUTPUT                     =00800000     586    (1)
DS$M_RUBFLG                     =00000020     586    (1)
DS$M_SCRIPT                     =00200000     586    (1)
DS$M_SETIMR                     =02000000     586    (1)
DS$M_STRFLG                     =00000004     586    (1)
DS$M_SUBT                       =00004000     586    (1)
DS$M_SYSFLG                     =00000400     586    (1)
DS$M_TIMED                      =02000000     586    (1)    #-2662   (1)    #-2883   (1)
DS$M_TIMED_OUT                  =08000000     586    (1)
DS$M_TIMRON                     =00020000     586    (1)
DS$V_ABRTFLG                    =00000006     586    (1)
DS$V_BADTIME                    =00000014     586    (1)
DS$V_BATCH                      =00000016     586    (1)
DS$V_BRKCLR                     =0000000C     586    (1)
DS$V_BRKPT                      =0000000B     586    (1)
DS$V_CHARFLG                    =00000008     586    (1)
DS$V_CMDFLG                     =00000007     586    (1)
DS$V_CTRLC                      =00000000     586    (1)    #-2077   (1)    #-2102   (1)    #-2963   (1)
DS$V_CTRLO                      =00000010     586    (1)    #-2085   (1)
DS$V_DEVFLG                     =00000009     586    (1)
DS$V_DISABLCC                   =00000018     586    (1)    #-2966   (1)
DS$V_DONFLG                     =0000000D     586    (1)
DS$V_ERRFLG                     =00000004     586    (1)
DS$V_EXCEPT                     =00000013     586    (1)
DS$V_EXETST                     =00000012     586    (1)
DS$V_HLTFLG                     =00000003     586    (1)
DS$V_LODFLG                     =00000001     586    (1)
DS$V_MEMMGT                     =0000000F     586    (1)
DS$V_NI                         =0000001A     586    (1)    #-2566   (1)
DS$V_OUTPUT                     =00000017     586    (1)
DS$V_RUBFLG                     =00000005     586    (1)
DS$V_SCRIPT                     =00000015     586    (1)
DS$V_SETIMR                     =00000019     586    (1)
DS$V_STRFLG                     =00000002     586    (1)
DS$V_SUBT                       =0000000E     586    (1)
DS$V_SYSFLG                     =0000000A     586    (1)
DS$V_TIMED                      =00000019     586    (1)
DS$V_TIMED_OUT                  =0000001B     586    (1)
DS$V_TIMRON                     =00000011     586    (1)
DS$_AP_NORMAL_BREAK             =00660150     584    (1)
DS$_ARITH                       =006600D0     584    (1)
DS$_ASBE                        =00660118     584    (1)
DS$_BADLINK                     =006600F0     584    (1)
DS$_BADTYPE                     =006600E8     584    (1)
DS$_BIIC                        =00660120     584    (1)
DS$_CHME                        =006600A8     584    (1)
DS$_CHMK                        =006600E0     584    (1)
DS$_DEVNAME                     =00660108     584    (1)
DS$_ERROR                       =00660002     584    (1)
DS$_FHWE                        =00660068     584    (1)
DS$_FRAGBUF                     =00660080     584    (1)
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DS$_ICBUSY                      =006600C8     584    (1)
DS$_ICERR                       =006600C0     584    (1)
DS$_IHWE                        =00660060     584    (1)
DS$_ILLCHAR                     =00660018     584    (1)
DS$_ILLPAGCNT                   =00660078     584    (1)
DS$_ILLUNIT                     =00660100     584    (1)
DS$_INIT_FAIL                   =00660140     584    (1)
DS$_INSFMEM                     =00660050     584    (1)
DS$_INVCPU                      =00660130     584    (1)
DS$_IPL2HI                      =006600B8     584    (1)
DS$_IVADDR                      =00660040     584    (1)
DS$_IVVECT                      =00660038     584    (1)
DS$_KRNLSTK                     =00660090     584    (1)
DS$_LOGIC                       =00660070     584    (1)
DS$_MCHK                        =00660088     584    (1)
DS$_MEM_ALLOC_ERR               =00660138     584    (1)
DS$_MMOFF                       =00660058     584    (1)
DS$_NEEDUNIT                    =006600F8     584    (1)
DS$_NODE                        =00660128     584    (1)
DS$_NOPCS                       =00660110     584    (1)
DS$_NORMAL                      =00660001     584    (1)
DS$_NOSUPPORT                   =006600B1     584    (1)
DS$_NOTALLOWMP                  =00660148     584    (1)
DS$_NOTDON                      =00660030     584    (1)
DS$_NOTIMP                      =006600B0     584    (1)      584    (1)
DS$_NULLSTR                     =00660010     584    (1)
DS$_OVERFLOW                    =00660008     584    (1)
DS$_POWER                       =00660098     584    (1)
DS$_PROGERR                     =00660020     584    (1)
DS$_SEVERE                      =00660004     584    (1)
DS$_TRANSL                      =006600A0     584    (1)
DS$_TRUNCATE                    =00660028     584    (1)
DS$_UNEXPINT                    =006600D8     584    (1)
DS$_UNSUPPDEV                   =00660158     584    (1)
DS$_VASFULL                     =00660048     584    (1)
DS$_WARNING                     =00660000     584    (1)      584    (1)
DSA$GL_APTCOM                    0000FE04                    #-2080   (1)
DSA$GL_FLAGS                     0000FE00                      2076   (1)     2094   (1)     2095   (1)     2096   (1)
                                                               2455   (1)     2623   (1)     2670   (1)     2711   (1)
                                                               2827   (1)     2891   (1)     2918   (1)   #-2932   (1)
                                                             #-2938   (1)   #-2943   (1)     2946   (1)   #-2948   (1)
                                                               2954   (1)   #-3036   (1)     3337   (1)     3343   (1)
                                                               3350   (1)     3861   (1)     3876   (1)     3986   (1)
                                                               4005   (1)     4023   (1)     4103   (1)
DSA$M_CRD_AUTOTEST_OFF          =00000800                    #-2930   (1)   #-2943   (1)
DSA$M_CRD_MENUTEST_OFF          =00010000                    #-2931   (1)   #-2938   (1)
DSA$M_CRD_MENUTEST_ON           =00040000                    #-2932   (1)   #-2948   (1)
DSA$V_APT                       =0000001F                    #-2076   (1)
DSA$V_ASK_PROMPT                =00000013                    #-3379   (1)
DSA$V_BELL                      =00000003                    #-3387   (1)
DSA$V_BINARY                    =00000001                    #-3395   (1)
DSA$V_CRD_AUTOTEST_OFF          =0000000B                    #-2094   (1)
DSA$V_CRD_MENUTEST_OFF          =00000010                    #-2095   (1)
DSA$V_CRD_MENUTEST_ON           =00000012                    #-2096   (1)
DSA$V_CRD_TRACE                 =00000011                    #-3336   (1)   #-3342   (1)   #-3349   (1)
DSA$V_HALT                      =00000000                    #-3403   (1)
DSA$V_IE1                       =00000004                    #-3411   (1)
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DSA$V_IE2                       =00000005           #-3419   (1)
DSA$V_IE3                       =00000006           #-3427   (1)
DSA$V_IES                       =00000007           #-3435   (1)
DSA$V_LOAD_DEBUGGER             =0000001E           #-3035   (1)
DSA$V_LOOP                      =00000002           #-3445   (1)
DSA$V_OPER                      =0000000C           #-3453   (1)
DSA$V_PROMPT                    =0000000D           #-3461   (1)
DSA$V_QUICK                     =00000008           #-3469   (1)
DSA$V_SEARCH                    =0000000E           #-2670   (1)    #-2891   (1)    #-3479   (1)
DSA$V_TRACE                     =0000000A           #-3487   (1)
DSA$V_USER                      =0000001C           #-2455   (1)    #-2623   (1)    #-2711   (1)    #-2827   (1)
                                                    #-2918   (1)    #-2946   (1)    #-2954   (1)    #-3860   (1)
                                                    #-3875   (1)    #-3986   (1)    #-4005   (1)    #-4023   (1)
                                                    #-4103   (1)
DSA$V_VERIFY                    =00000009           #-3495   (1)
DSR$COMPLETION                   00000000-XR          2612   (1)
DSR$LOAD_CRD                     00000000-XR          2969   (1)
DSR$UNLOAD_CRD                   00000000-XR          2992   (1)
DSV$ATTACH                       00000000-XR          2437   (1)
DSV$DEATTACH                     00000000-XR          2508   (1)
DSV$DEBUG                        00000000-XR          2517   (1)
DSV$DESELECT                     00000000-XR          2541   (1)
DSV$DIRECTORY                    00000000-XR          2549   (1)
DSV$EXIT                         00000000-XR          2591   (1)
DSV$INITPCS                      00000000-XR          2630   (1)
DSV$LOAD                         00000000-XR          2637   (1)
DSV$RUN                          00000000-XR          2667   (1)
DSV$SELECT                       00000000-XR          2680   (1)
DSV$SETLOAD                      00000000-XR          2852   (1)    3967   (1)
DSV$SETPAGE                      00000000-XR          3509   (1)
DSV$SHOWDEVICE                   00000000-XR          3895   (1)    3907   (1)
DSV$SHOWDEVICEB                  00000000-XR          3898   (1)    3910   (1)
DSV$SHOWLOAD                     00000000-XR          3974   (1)
DSV$SHOWMEMORY                   00000000-XR          4077   (1)
DSV$SHOWPAGE                     00000000-XR          3512   (1)
DSV$SHOWSELECT                   00000000-XR          3912   (1)    3948   (1)
DSV$SHOWSELECTB                  00000000-XR          3915   (1)    3951   (1)
DSV$SHOWTESTS                    00000000-XR          4070   (1)
DSX$HELP                         00000000-XR          2609   (1)
DSX$MMOFF                        00000000-XR          4013   (1)
DSX$MMON                         00000000-XR          3994   (1)
DSX$PRINT                        00000000-XR          2088   (1)    2159   (1)    2170   (1)    2459   (1)
                                                      2492   (1)    2497   (1)    2570   (1)    2627   (1)
                                                      2715   (1)    2786   (1)    2806   (1)    2830   (1)
                                                      2837   (1)    2926   (1)    2990   (1)    3172   (1)
                                                      3357   (1)    3624   (1)    3990   (1)    4009   (1)
                                                      4026   (1)    4042   (1)    4108   (1)    4115   (1)
DSX$SUPERPARSE                   00000000-XR          2136   (1)
DS_CLEANUP                       00000000-XR          2602   (1)    2952   (1)
DS_ERRSUP                        00000000-XR          2360   (1)
DS_SUPERLINE                     00000000-XR          2108   (1)
DUMP                            =00000011     2231   (1)    779    (1)
DUMP_SELF                        00000000-XR          2574   (1)    563    (1)    564    (1)
EFN                             =00000058     2302   (1)    1128   (1)
END_FLAGS_LOOP                   00000607-R   1099   (1)    1048   (1)    1051   (1)    1055   (1)    1058   (1)
                                                      1061   (1)    1066   (1)    1069   (1)    1072   (1)
                                                      1075   (1)    1078   (1)    1081   (1)    1084   (1)
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                                                        1087   (1)     1092   (1)     1095   (1)
ENUF                    =00000017     2237   (1)       1115   (1)     1175   (1)     1362   (1)     1390   (1)
                                                        1393   (1)     1548   (1)     1553   (1)     1559   (1)
                                                        1565   (1)     1571   (1)     1583   (1)     1595   (1)
                                                        1600   (1)     1601   (1)     1602   (1)     1607   (1)
                                                        1612   (1)     1625   (1)     1628   (1)     1631   (1)
                                                        1634   (1)     1639   (1)     1644   (1)     1651   (1)
                                                        1656   (1)     1661   (1)     1666   (1)     1671   (1)
                                                        1676   (1)     1683   (1)     1695   (1)     1700   (1)
                                                        1705   (1)     1710   (1)     1721   (1)     1818   (1)
                                                        1878   (1)     1889   (1)     1898   (1)     1901   (1)
                                                        1909   (1)     1927   (1)     1953   (1)     2013   (1)
                                                        716    (1)     721    (1)     729    (1)     748    (1)
                                                        753    (1)     775    (1)     782    (1)     784    (1)
                                                        798    (1)     832    (1)     849    (1)     851    (1)
                                                        856    (1)     863    (1)     870    (1)     879    (1)
                                                        913    (1)     918    (1)     925    (1)     932    (1)
EOL                     000004BA-R    942    (1)       1100   (1)     1115   (1)     1126   (1)     1475   (1)
                                                        1548   (1)     1553   (1)     1559   (1)     1565   (1)
                                                        1571   (1)     1583   (1)     1595   (1)     1600   (1)
                                                        1601   (1)     1602   (1)     1607   (1)     1612   (1)
                                                        1622   (1)     1639   (1)     1644   (1)     1651   (1)
                                                        1656   (1)     1661   (1)     1666   (1)     1671   (1)
                                                        1676   (1)     1683   (1)     1690   (1)     1695   (1)
                                                        1700   (1)     1705   (1)     1710   (1)     1721   (1)
                                                        1757   (1)     1766   (1)     1771   (1)     1777   (1)
                                                        1818   (1)     1827   (1)     1839   (1)     1847   (1)
                                                        1852   (1)     1863   (1)     1878   (1)     1889   (1)
                                                        1898   (1)     1901   (1)     1909   (1)     1927   (1)
                                                        1943   (1)     1953   (1)     2013   (1)     716    (1)
                                                        729    (1)     748    (1)     753    (1)     773    (1)
                                                        775    (1)     782    (1)     783    (1)     784    (1)
                                                        798    (1)     799    (1)     818    (1)     832    (1)
                                                        841    (1)     856    (1)     863    (1)     868    (1)
                                                        870    (1)     879    (1)     913    (1)     918    (1)
                                                        925    (1)     929    (1)     932    (1)
EVENT                   =0000003A     2272   (1)       1599   (1)     1782   (1)     1868   (1)
EVENT_FLAGS              0000062F-R   1120   (1)       1783   (1)     1869   (1)
EXAMINE                 =00000012     2232   (1)       837    (1)
EXA_DEP_QUALS            000008FC-R   1411   (1)       1415   (1)     1421   (1)     1424   (1)     1427   (1)
                                                        1430   (1)     1433   (1)     1437   (1)     1442   (1)
                                                        1445   (1)     1448   (1)     811    (1)     814    (1)
                                                        817    (1)     837    (1)     840    (1)
EXIT                    =00000013     2233   (1)       831    (1)
FAILURE                 =00000005     2219   (1)
FALSE                   =00000000     591    (1)
FILEND                  =00000029     2255   (1)       1109   (1)     1172   (1)     1468   (1)     1469   (1)
                                                        1837   (1)
FILESPEC                =00000028     2254   (1)       1108   (1)     1143   (1)     1467   (1)     1836   (1)
FLAGS                   =0000003B     2273   (1)       1122   (1)     1606   (1)
FLAGS_LIST               00000522-R   1041   (1)       1787   (1)     1957   (1)
FLAGS_LOOP               00000530-R   1045   (1)       1042   (1)     1101   (1)
GET_ADDRESS              0000077D-R   1239   (1)       813    (1)     839    (1)
GET_FILE_SPEC            00000659-R   1142   (1)       1877   (1)     774    (1)     797    (1)     862    (1)
                                                        877    (1)     931    (1)
GT_MENU_ERROR            000001F6-R   684    (1)       2990   (1)
HALT                    =00000046     2284   (1)       1060   (1)
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HELP                    =00000014     2234  (1)      847  (1)      850  (1)
HELPINFO                 00000000-XR                2603  (1)    #-2607  (1)
HEX                     =0000006B     2321  (1)     1429  (1)     1987  (1)
HP$T_DEVICE              0000000C                   2743  (1)     2791  (1)
HP$T_TYPE                00000026                 #-2754  (1)     2756  (1)   #-2760  (1)     2762  (1)
                                                  #-2766  (1)     2768  (1)   #-2772  (1)     2774  (1)
IE1                     =00000047     2285  (1)     1065  (1)
IE2                     =00000048     2286  (1)     1068  (1)
IE3                     =00000049     2287  (1)     1071  (1)
IES                     =0000004A     2288  (1)     1074  (1)
IFNOTUSER               =00000073     2329  (1)
IF_ADAPTER              =00000071     2327  (1)     1473  (1)     1475  (1)
IF_FILE_SPEC            =00000070     2326  (1)     1173  (1)     1466  (1)
IF_REG_OR_ADR           =00000072     2328  (1)
IF_REQUIRED             =0000006F     2325  (1)     1114  (1)     1174  (1)
IF_RUN                  =0000006E     2324  (1)
IF_XDELTA               =00000074     2330  (1)      923  (1)
ILLEGAL                  000004D2-R    953  (1)     1043  (1)     1114  (1)     1121  (1)     1123  (1)
                                                     1152  (1)     1159  (1)     1162  (1)     1223  (1)
                                                     1224  (1)     1226  (1)     1229  (1)     1230  (1)
                                                     1267  (1)     1273  (1)     1279  (1)     1284  (1)
                                                     1305  (1)     1306  (1)     1319  (1)     1320  (1)
                                                     1326  (1)     1327  (1)     1335  (1)     1347  (1)
                                                     1356  (1)     1357  (1)     1359  (1)     1371  (1)
                                                     1372  (1)     1387  (1)     1388  (1)     1419  (1)
                                                     1420  (1)     1440  (1)     1441  (1)     1461  (1)
                                                     1463  (1)     1467  (1)     1483  (1)     1484  (1)
                                                     1498  (1)     1499  (1)     1552  (1)     1570  (1)
                                                     1578  (1)     1587  (1)     1638  (1)     1649  (1)
                                                     1675  (1)     1699  (1)     1715  (1)     1720  (1)
                                                     1739  (1)     1747  (1)     1754  (1)     1782  (1)
                                                     1810  (1)     1816  (1)     1817  (1)     1824  (1)
                                                     1825  (1)     1835  (1)     1868  (1)     1874  (1)
                                                     1876  (1)     1887  (1)     1888  (1)     1895  (1)
                                                     1896  (1)     1900  (1)     1907  (1)     1908  (1)
                                                     1938  (1)     1941  (1)     1942  (1)     1951  (1)
                                                     1952  (1)     1972  (1)      720  (1)      727  (1)
                                                      728  (1)      752  (1)      781  (1)      812  (1)
                                                      815  (1)      816  (1)      838  (1)      850  (1)
                                                      861  (1)      869  (1)      876  (1)      901  (1)
                                                      917  (1)
ILL_CMD                 =00000001     2215  (1)     1009  (1)     1031  (1)      947  (1)      980  (1)
INCOMPLETE               000004E6-R    983  (1)     1174  (1)     1182  (1)     1183  (1)     1212  (1)
                                                     1213  (1)     1468  (1)     1476  (1)
INC_CMD                 =00000002     2216  (1)     1002  (1)     1005  (1)     1024  (1)     1027  (1)
                                                      972  (1)      988  (1)
INI$BRK                  00000000-XR                3881  (1)
INITPCS                 =0000008B     2353  (1)      855  (1)
INIT_CONTEXT             00000000-XR                2606  (1)
KA820_CPU                0000046E-R    619  (1)     2774  (1)     2782  (1)
KA880_CPU                00000468-R    618  (1)     2768  (1)     2781  (1)
KA884_CPU                00000462-R    617  (1)     2762  (1)     2780  (1)
KA9CC_CPU                0000045C-R    616  (1)     2756  (1)     2779  (1)
KB_CHECK                 00000000-XR                2099  (1)
KB_CHECK_APT             00000000-XR                2079  (1)
LAST                    =0000002D     2259  (1)     1359  (1)
LINE_COUNT               00000000-XR              #-2110  (1)
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LOAD                            =00000015     2235   (1)      860   (1)
LONG                            =00000068     2318   (1)     1432   (1)     1992   (1)
LOOP                            =0000004B     2289   (1)     1077   (1)
MAPFREE                          00000000-XR            2955   (1)
MMOFF                           =00000030     2262   (1)     1900   (1)
MMON                            =0000002F     2261   (1)     1897   (1)
MP$GB_SETCPU                     00000478-R    623   (1)  #-2793   (1)  #-2809   (1)
MP$GL_CONDITION_FLAGS            00000000-XR           #-2484   (1)  #-2648   (1)  #-2660   (1)  #-2881   (1)
                                                         567   (1)
MP$GL_LUN                        00000479-R    625   (1)  #-2733   (1)  #-2736   (1)  #-2747   (1)
MP$GR_BOOTED_PROCESSORS          00000000-XR           #-2488   (1)
MP$GT_DEVICE_NAME                0000047D-R    627   (1)     2792   (1)     2811   (1)     2833   (1)
NEXT                            =00000059     2303   (1)     1441   (1)
NEXT_INST                       =00000016     2236   (1)      867   (1)
NOBASE                          =00000040     2278   (1)     1375   (1)     1436   (1)
NOTNUF                          =00000018     2238   (1)     1046   (1)     1053   (1)     1063   (1)     1064   (1)
                                                         1100   (1)     1129   (1)     1222   (1)     1295   (1)
                                                         1304   (1)     1305   (1)     1316   (1)     1318   (1)
                                                         1319   (1)     1325   (1)     1326   (1)     1332   (1)
                                                         1334   (1)     1335   (1)     1355   (1)     1356   (1)
                                                         1358   (1)     1384   (1)     1440   (1)     1458   (1)
                                                         1461   (1)     1474   (1)     1481   (1)     1495   (1)
                                                         1543   (1)     1557   (1)     1577   (1)     1578   (1)
                                                         1593   (1)     1622   (1)     1648   (1)     1649   (1)
                                                         1680   (1)     1681   (1)     1688   (1)     1715   (1)
                                                         1740   (1)     1768   (1)     1769   (1)     1811   (1)
                                                         1816   (1)     1833   (1)     1835   (1)     1849   (1)
                                                         1850   (1)     1857   (1)     1873   (1)     1874   (1)
                                                         1876   (1)     1885   (1)     1894   (1)     1896   (1)
                                                         1905   (1)     1907   (1)     1920   (1)     1921   (1)
                                                         1951   (1)     2008   (1)      711   (1)      727   (1)
                                                          738   (1)      743   (1)      766   (1)      771   (1)
                                                          791   (1)      804   (1)      825   (1)      826   (1)
                                                          861   (1)      891   (1)      895   (1)      897   (1)
                                                          902   (1)      907   (1)      930   (1)
NO_ALLOC                        =0000007C     2338   (1)     1503   (1)
NULL                            =00000000     2214   (1)
NULL_DATA                       =00000067     2317   (1)      783   (1)
OCT                             =0000006D     2323   (1)     1444   (1)     1997   (1)
OFF                             =00000000      591   (1)
ON                              =00000001      591   (1)
OPER                            =0000004C     2290   (1)     1080   (1)
OPTIONAL                        =0000002A     2256   (1)     1589   (1)     1718   (1)      774   (1)      797   (1)
PAGE                            =0000005A     2304   (1)     1643   (1)     1906   (1)
PASS                            =00000034     2266   (1)     1306   (1)
PR$_MAPEN                       =00000038           #-4032   (1)
PREGN                           =00000032     2264   (1)     1267   (1)
PRIMARY_NAME                     00000455-R    614   (1)     2723   (1)     2810   (1)
PROMPT                          =0000004D     2291   (1)     1083   (1)
PSL$V_IS                        =0000001A      592   (1)  #-2466   (1)  #-4033   (1)
PTABLE                           00000474-R    621   (1)     2736   (1)  #-2740   (1)
QA                              =00000035     2267   (1)     1311   (1)
QACL                            =00000053     2297   (1)     1650   (1)     1923   (1)
QADEF                           =00000057     2301   (1)     1655   (1)     1926   (1)
QAEP                            =00000052     2296   (1)     1660   (1)     1929   (1)
QAMP                            =00000056     2300   (1)     1665   (1)     1932   (1)
QASL                            =00000055     2299   (1)     1670   (1)     1935   (1)
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QATL                            =00000054     2298  (1)      1675  (1)      1938  (1)
QA_COMMON                        00000AB6-R   3566  (1)    #-3543  (1)    #-3544  (1)    #-3548  (1)    #-3549  (1)
                                                          #-3553  (1)    #-3554  (1)    #-3558  (1)    #-3559  (1)
                                                          #-3563  (1)    #-3587  (1)
QUICK                           =0000004E     2292  (1)      1086  (1)
Q_ADAPTER                        00000000-XR                #-2059  (1)    #-3829  (1)    #-3925  (1)    #-3926  (1)
                                                          #-3933  (1)    #-3934  (1)
Q_GOOD_CMD                       0000044C-R   606   (1)      2155  (1)      2166  (1)    #-2394  (1)    #-2395  (1)
                                                          #-2396  (1)
RCLI                             00000002-R   2058  (1)    #-2090  (1)    #-2117  (1)    #-2122  (1)    #-2160  (1)
                                                          #-2171  (1)    #-2180  (1)
REG12                           =0000005E     2308  (1)      1243  (1)
REG13                           =0000005F     2309  (1)      1250  (1)
REG14                           =00000060     2310  (1)      1278  (1)
REG15                           =00000061     2311  (1)      1257  (1)
REG16                           =00000062     2312  (1)      1262  (1)
REGN                            =0000005D     2307  (1)      1272  (1)
REGP                            =00000063     2313  (1)      1244  (1)      1251  (1)      1279  (1)
REQUIRED                        =0000002B     2257  (1)      1487  (1)      1506  (1)      1877  (1)       862  (1)
                                                           931  (1)
RUN                             =00000019     2239  (1)       874  (1)
SCRIPT                          =0000001A     2240  (1)       929  (1)
SCRIPT$CONT                      00000000-XR                 2498  (1)
SCRIPT$FLUSH                     00000000-XR                 2601  (1)
SCRIPT$OPEN                      00000000-XR                 2899  (1)
SEARCH                          =0000004F     2293  (1)      1091  (1)
SECTION                         =00000033     2265  (1)      1320  (1)
SELECT                          =0000007B     2337  (1)       901  (1)
SELECT_PARAMS                    00000A14-R   1494  (1)      1501  (1)      1504  (1)       902  (1)
SET                             =0000001B     2241  (1)       896  (1)
SETCPU                          =00000039     2271  (1)      1839  (1)
SETENFORCE                      =00000036     2268  (1)      1863  (1)
SETLOAD                         =0000007F     2341  (1)      1875  (1)
SETMEM                          =0000008A     2352  (1)      1886  (1)
SET_CRD_DEBUG                   =00000020     2246  (1)      1852  (1)
SET_CRD_TRACE                   =0000001F     2245  (1)      1847  (1)
SET_DEFAULT_PARAMS               00000F0B-R   1971  (1)      1857  (1)
SET_PARAMS                       00000D1F-R   1809  (1)       897  (1)
SHOMEMALL                       =00000089     2351  (1)      1624  (1)
SHOMEMBUF                       =00000087     2349  (1)      1627  (1)
SHOMEMDAT                       =00000088     2350  (1)      1630  (1)
SHOMEMMAP                       =00000086     2348  (1)      1633  (1)
SHOW                            =0000001D     2243  (1)       906  (1)
SHOWCPU                         =00000024     2250  (1)      1570  (1)
SHOWENFORCE                     =00000038     2270  (1)      1594  (1)
SHOWLOAD                        =00000080     2342  (1)      1611  (1)
SHOWMEM                         =00000085     2347  (1)      1621  (1)
SHOWMEMORYFLAGS                  00000000-XR                #-2060  (1)      4091  (1)
SHOWMM                          =00000031     2263  (1)      1638  (1)
SHOWSECTIONS                    =00000083     2345  (1)      1682  (1)
SHOWSEL                         =0000007D     2339  (1)      1690  (1)      1720  (1)
SHOWSTATUS                      =00000082     2344  (1)      1694  (1)
SHOWSUP                         =00000081     2343  (1)      1699  (1)
SHOWTESTS                       =00000084     2346  (1)      1704  (1)
SHOW_CALLS                      =00000023     2249  (1)      1564  (1)
SHOW_CRD_TRACE                  =00000022     2248  (1)      1558  (1)
SHOW_PARAMS                      00000A4B-R   1541  (1)       907  (1)
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SIZ...                          =00000001     593    (1)      586    (1)      593    (1)
SS$_ENDOFFILE                    00000000-XR                 #-2112  (1)
SS$_NORMAL                      =00000001     579    (1)    #-2737  (1)
START                           =00000025    2251    (1)      911    (1)
START_RUN_QUALS                  000007D8-R  1290    (1)     1300    (1)     1307    (1)     1312    (1)     1321    (1)
                                                             1328    (1)     1349    (1)     1358    (1)     1360    (1)
                                                              875    (1)      878    (1)      912    (1)
SUBTEST                         =0000002E    2260    (1)     1327    (1)
SUCCESS                         =00000004    2218    (1)
SUMMARY                         =00000026    2252    (1)      917    (1)
SYS$BINTIM                       00000000-XR                 3118    (1)     3132    (1)
SYS$EXIT                         00000000-XR                 2114    (1)
TEST                            =0000002C    2258    (1)     1357    (1)
TIME                            =0000008E    2356    (1)     1347    (1)
TRACE                           =00000050    2294    (1)     1094    (1)
TRUE                            =00000001     591    (1)
T_CONT                           00000092-R   653    (1)     2497    (1)
T_CRD_TRACE_OUTPUT               0000025B-R   690    (1)     3357    (1)
T_EMESSG1                        000000BD-R   659    (1)     2456    (1)     2624    (1)     2712    (1)     2830    (1)
                                                             3987    (1)     4006    (1)     4026    (1)     4105    (1)
T_EMESSG2                        000000E2-R   662    (1)     2567    (1)
T_EMESSG3                        00000113-R   665    (1)     2803    (1)
T_EMESSG4                        00000181-R   669    (1)     2783    (1)
T_EMESSG5                        000001B2-R   672    (1)     4112    (1)
T_ILLCMD                         0000001B-R   644    (1)     2156    (1)
T_ILLEFN                         00000061-R   650    (1)     3621    (1)
T_INCOMPLETE                     0000003A-R   647    (1)     2167    (1)
T_MP_CONT                        000000AB-R   656    (1)     2492    (1)
T_OFF                            000001F2-R   681    (1)     3167    (1)     3352    (1)     4029    (1)
T_ON                             000001EF-R   678    (1)     3165    (1)     3348    (1)     4037    (1)
T_PRGERR                         00000004-R   641    (1)     2360    (1)
T_SHOWCPU                        00000293-R   696    (1)     2834    (1)
T_SHOWENFORCE                    00000278-R   693    (1)     3172    (1)
T_SHOWMM                         000001D3-R   675    (1)     4039    (1)
T_USER_MODE_MENU_ERROR           00000221-R   687    (1)     2926    (1)
ULTRIX_FLAGS                     00000000-XR                 2863    (1)
ULTRIX_ODS                      =0000001C     2242    (1)     1144    (1)
ULTRIX_V_MODE                    00000000-XR                #-2862  (1)
VERIFY                          =00000051     2295    (1)     1097    (1)
VRABORT                          00000000-XR                 2444    (1)
VRCLRBRK                         00000000-XR                 3248    (1)
VRCLREF                          00000000-XR                 3190    (1)
VRCLRFLG                         00000000-XR                 2473    (1)     3292    (1)
VRDEPOSIT                        00000000-XR                 2531    (1)
VREXAMINE                        00000000-XR                 2581    (1)
VRSETBASE                        00000000-XR                 3222    (1)
VRSETBRK                         00000000-XR                 3243    (1)
VRSETDFLT                        00000000-XR                 3309    (1)
VRSETEF                          00000000-XR                 3185    (1)
VRSETFLG                         00000000-XR                 2696    (1)     3289    (1)
VRSETMEM                         00000000-XR                 4119    (1)
VRSETQA                          00000000-XR                 3572    (1)     3597    (1)
VRSETWIDTH                       00000000-XR                 3526    (1)
VRSHOWBASE                       00000000-XR                 3219    (1)
VRSHOWBRK                        00000000-XR                 3251    (1)
VRSHOWDFLT                       00000000-XR                 3305    (1)
VRSHOWEF                         00000000-XR                 3193    (1)
```

```
VRSHOWFLG                    00000000-XR                  3207   (1)
VRSHOWQA                     00000000-XR                  3576   (1)      3602   (1)
VRSHOWSECTIONS               00000000-XR                  4065   (1)
VRSHOWSTATUS                 00000000-XR                  4051   (1)
VRSHOWWIDTH                  00000000-XR                  3529   (1)
VRSHOW_CALLS                 00000000-XR                  3324   (1)
VRSTART                      00000000-XR                  2888   (1)
VRSUMMARY                    00000000-XR                  2907   (1)
VRSUPPORT                    00000000-XR                  4058   (1)
WIDE_FLAG                    00000000-XR                #-2551   (1)    #-2555   (1)
WIDTH                       =0000005B     2305   (1)      1709   (1)      1950   (1)
WORD                        =00000069     2319   (1)      1447   (1)      2002   (1)
XDELBPT                      00000000-XR                  3871   (1)    #-3873   (1)
XDELTA                      =00000075     2331   (1)      924    (1)
XDELTBIT                     00000000-XR                  3871   (1)
```

```
                                  +-------------------------+
                                  ! Performance indicators !
                                  +-------------------------+
```

Phase	Page faults	CPU Time	Elapsed Time
Initialization	40	00:00:00.02	00:00:00.25
Command processing	928	00:00:00.28	00:00:00.83
Pass 1	2094	00:00:11.40	00:00:15.47
Symbol table sort	0	00:00:00.41	00:00:00.46
Pass 2	461	00:00:02.98	00:00:06.71
Symbol table output	2	00:00:00.10	00:00:00.72
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	11	00:00:01.87	00:00:02.98
Assembler run totals	3541	00:00:17.07	00:00:27.43

The working set limit was 4000 pages.
592604 bytes (1158 pages) of virtual memory were used to buffer the intermediate code.
There were 80 pages of symbol table space allocated to hold 1075 non-local and 443 local symbols.
4122 source lines were read in Pass 1, producing 114 object records in Pass 2.
57 pages of virtual memory were used to define 42 macros.

```
                                  +-------------------------+
                                  ! Macro library statistics !
                                  +-------------------------+
```

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	9
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	18
DISK$DS:[DS.LOCAL.RELEASE.WORK]CRD.MLB;1	1
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	11
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	39

887 GETS were required to define 39 macros.

```
There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1)   180   Macros and Equated Symbols
(1)   330   Work Psect Declarations
(1)   369   Data Psect Declarations
(1)   374   DS$CanWait -   CANCEL DELAY ROUTINE
(1)   417 $WAKE - Wakeup from hibernate
(1)   451   DSX$WaitMS -   MILLISECOND DELAY ROUTINE
(1)   532   DSX$WaitUC -   MICROSECOND DELAY ROUTINE
(1)   624   EXE$HIBER -   HIBERNATE SYSTEM SERVICE ROUTINE.
(1)   681   EXE$CANTIM -   CANCEL TIMER SYSTEM SERVICE.
(1)   748   DSR$SETIMR_INI -   SET TIMER QUEUE INITIALIZATION
(1)   826   EXE$Setimr -   SET TIMER SYSTEM SERVICE.
(1)   916   DSI$TimSrv -   INTERVAL TIMER INTERRUPT SERVICE ROUTINE.
(1)   987   DSI$TIMER -   Level 7 timer interrupt service
(1)   1109   CLK$RE_INIT -   SYSTEM TIMER INITIALIZATION SUBROUTINE

```
0000    ; DEC/CMS REPLACEMENT HISTORY, Element CLOCK.MAR
0000    ; *5     1-MAR-1988 11:43:01 MCCARRON "Changed ident field"
0000    ; *4     1-MAR-1988 11:34:06 MCCARRON "Fixed truncation error (BSBW to JSB)"
0000    ; *3     1-FEB-1988 10:08:15 FORTUNA "fixed truncation erros..."
0000    ; *2    15-MAY-1986 16:29:09 BERGAZZI "MADE SOME SYMBOLS GLOBAL"
0000    ; *1     6-FEB-1986 15:15:03 DS ""
0000    ; DEC/CMS REPLACEMENT HISTORY, Element CLOCK.MAR
0000            .TITLE  CLOCK   INTERVAL TIMER ROUTINES.
0000            .IDENT  /10-11.5/                                                ;G:5
0000            .NoShow Conditionals
0000
0000    ;
0000    ; Copyright (c) 1977, 1982, 1983, 1984, 1985, 1986, 1988                 ;G:3
0000    ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    ;
0000    ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
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0000    ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000
0000    ;++
0000    ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR.
0000    ;
0000    ; ABSTRACT:
0000    ;
0000    ; ENVIRONMENT:
0000    ;
0000    ; AUTHOR:        KEN CHAPMAN     10-NOV-77       VERSION 01.
0000    ;
0000    ; MODIFIED BY:
0000    ;                KEN CHAPMAN     30-NOV-77       VERSION 02
0000    ;       01       FIXED $DS_WAITMS_L TO WAKE IN USER MODE.  (DSPR #65)
0000    ;                CHANGED $SETIMR TO RETURN A WARNING IF IPL IS TOO HIGH.
0000    ;                  (DSPR #53).
0000    ;
0000    ;                TOM SOUTTER     22-FEB-78       VERSION 03
0000    ;       02       INSTALLED EXE$GL_ABSTIM (NON-FUNCTIONAL)
0000    ;                TOM SOUTTER      2-MAR-78
0000    ;       03       CONVERTED SETIMR & TIMSRV ROUTINES TO USE VMS ASTDEL
0000    ;                TOM SOUTTER     23-MAR-78
0000    ;       04       TURN ON SYSTEM REAL TIME USING INTERVAL TIMER & TODC
0000    ;                ROGER RIGGS     03-APR-78
0000    ;       05       MODIFIED SETIMR TO QUE LONG REQUESTS SO THAT
0000    ;                THE CLOCK CAN BE USED FOR QIO WATCH DOG TIMERS
0000    ;       06       Fixed DSR$SETIMR_INI to release buffers in timer queue.
0000    ;                NICK HOWGATE    06-DEC-78       VERSION 4 (ESSAA-5.01)
0000    ;       07       EMULATE 'QUEUE' INSTRUCTIONS
```

```
                        0000     58 ;               COPY REQIDT TO ASTPRM IN SETIMR
                        0000     59 ;               AND FIX CANTIM TO BE ABLE TO CANCEL SPECIFIC TIMERS
                        0000     60 ;         08    Fix residual time in WAITMS to return correct value
                        0000     61 ;               Roger Riggs     11-Jun-1979
                        0000     62 ;         09    Revamped timer interrupt service to fix bug caused
                        0000     63 ;               by lowering IPL from 18 to 7 in calling SCH$QAST
                        0000     64 ;               when delivering timer requests. Also EXE$SETIMR
                        0000     65 ;               was affected, since the queue is now sorted by completion
                        0000     66 ;               time
                        0000     67 ;               Roger Riggs     20-NOV-1979
                        0000     68 ;         10    Remove W^ from several references
                        0000     69 ;               Roger Riggs, 24-Jan-1980, Version 5.2
                        0000     70 ;         12    Removed Errsup after clock overflow in WAITUS, since
                        0000     71 ;               it is unnecessary and means that we loaded the clock
                        0000     72 ;               with a value that will overflow before we can check it.
                        0000     73 ;               Also added DS$GK_USOVR, used by WAITUS and defined
                        0000     74 ;               in ONLY7xx for each processor, Expermentially determined
                        0000     75 ;               to produce an accuracy of about 1%.
                        0000     76 ;               Also added clear of overflow bit to clock interrupt service
                        0000     77 ;               Roger Riggs, 27-Feb-1980
                        0000     78 ;         13    Changed DSBINT to SETIPL(#18) before removing entries from
                        0000     79 ;               timer queue, Also restore IPL before continuing.
                        0000     80 ;         14    Assured that Both SETIMR and CANTIM are executed in KERNEL mode
                        0000     81 ;               Roger Riggs, 22-july-1980, Version 5.5
                        0000     82 ;         15    Moved EXE$GL_ABSTIM to ENTRY,
                        0000     83 ;
                        0000     84 ;               Dave Butenhof, 16-oct-1980, version 6.1
                        0000     85 ;         16    Move EXE$GQ_SYSTIME to entry, to make it accessible to drivers.
                        0000     86 ;               Dave Butenhof, 18-feb-1981, version 6.3
                        0000     87 ;         17    Delete SEP psect.
                        0000     88 ;               Dave Butenhof, 25-feb-1981, version 6.3
                        0000     89 ;         18    Fix problem found in queue handling.  REMQUE/INSQUE instructs
                        0000     90 ;               had been emulated.  Restore the queue instructions.
                        0000     91 ;         19    Fix WAITUS bug (Tom Kraus generated fix).
                        0000     92 ;
                        0000     93 ;         20    - Dave Butenhof, 26-Feb-1982, version 6.6
                        0000     94 ;               Add special code in WAITUS for Nebula...use interrupt
                        0000     95 ;               instead of polling.
                        0000     96 ;
                        0000     97 ;         21    - Jack Stansbury, 26-Feb-1982, Version 6.6
                        0000     98 ;               Added .LIBRARY statements for $DS, $DIAG, and $LIB.
                        0000     99 ;
                        0000    100 ;         22    Jack Stansbury, 15-September-1982, Version 6.9
                        0000    101 ;               Changed ICCS$M_ERR from 31 to 15. Also added code in DSI$TimSrv
                        0000    102 ;               routine that will not reset the interval timer if the SetVec routine
                        0000    103 ;               is currently trying to stop the interval timer.
                        0000    104 ;
                        0000    105 ;         23    Jack Stansbury, 16-September-1982, Version 6.9
                        0000    106 ;               Changed the ICCS$M_ERR bit back to #15. The VAX Hardware Handbook
                        0000    107 ;               is wrong in its picture of the ICCS in the back of the book.
                        0000    108 ;
                        0000    109 ;         24    Marion Baggett, 24-Sept-1982,   Version 6.9
                        0000    110 ;               Changed the entry mask in DSX$WAITUS to not save R2, R3. These regis
                        0000    111 ;               are not changed, and the extra time for CALLx to save them should be
                        0000    112 ;         25    Bob Bergazzi    21-Oct-1982     Version 6.9
                        0000    113 ;               Changed DSI$TIMSRV to clear the interrupt when the
                        0000    114 ;               DS$GB_Stopping_The_Timer flag is set. Otherwise we get stuck
```

```
0000  ;                 in a loop of continuous interrupts.
0000  ;
0000  ;        26       Bob Bergazzi    25-April-1983   Version 6.11
0000  ;                 Added global symbol DSX$WAITUS_USOVR to the instruction in the
0000  ;                 DSX$WAITUS routine which computes the interval clock count,
0000  ;                 so that we can reference it from KERNEL and change the value
0000  ;                 of the clock routine overhead factor (DS$GK_USOVR),
0000  ;                 if we are running on a SUPERSTAR processor. This is done from
0000  ;                 KERNEL during the BOOT procedure so that we don't add any more
0000  ;                 instructions to the DSX$WAITUS routine, which would change the
0000  ;                 value of the overhead factor for the existing processors.
0000  ;                 I.e. The code in KERNEL is modifying the instruction at
0000  ;                 DSX$WAITUS_USOVR.
0000  ;
0000  ;        27       Bob Bergazzi    May 16,1983     Version 6.11
0000  ;                 Changed the order of the .LIB statements.
0000  ;
0000  ;        28       Richard Brown   August 4, 1983  Version 6.13
0000  ;                 Corrected bug in DSX$CANWAIT.  If this service was called
0000  ;                 to cancel a $DS_WAITMS, it did not remove the entry from the
0000  ;                 timer queue, so the AST was still being delivered.  Therefore,
0000  ;                 the $SETIMR call in DSX$WAITMS was changed so that a request
0000  ;                 ID is specified (-1).  DSX$CANWAIT was changed so that it
0000  ;                 issues a $CANTIM to kill all timer requests with an ID of -1.
0000  ;
0000  ;        29       R.E.Muse        10 January 1984 version 6.14
0000  ;                 added PRDEF macro definition - Version 4 changes.
0000  ;
0000  ;        30       Bob Bergazzi    Jan. 26, 1984   Version 6.14
0000  ;                 Changed CLK$RE_INIT routine to call ONLY_CLOCK_INIT which
0000  ;                 does cpu-specific stuff to the TODR.
0000  ;
0000  ;        31       Bob Bergazzi    Aug. 24, 1984   Version 7.1
0000  ;                 Changed CLK$RE_INIT to not call ONLY_CLOCK_INIT, and also to
0000  ;                 write the bias value (10000000) into the TODR, if the TODR
0000  ;                 read less than 10000000. This fixes the bug where the EXE$GQ_SYSTIME
0000  ;                 was not being re-synchronized if the TODR read less than 10000000.
0000  ;
0000  ;        32       M. Baggett      23-May-1985     Version 8.2
0000  ;                 Fixed truncation errors caused by adding module ULTRIX
0000  ;
0000  ;        33       Domenic Andella 4-Nov-1985      Version 9.1
0000  ;                 Add code to DSI$TIMSRV to branch around if Ap.
0000  ;
0000  ;        34       Domenic Andella 23-Dec-1985     Version 9.1
0000  ;                 Use stack address as argument when getting processor
0000  ;                 id in routine DSI$TIMSRV, to protect from other processors
0000  ;                 overwritting location in memory.
0000  ;
0000  ;        35       Domenic Andella 6-Jan-1986      Version 9.1
0000  ;                 More mp mods required in routine DSI$TIMSRV to support
0000  ;                 Scorpio Ap. The Ap should only reset the timer, and exit
0000  ;
0000  ;        36       Bob Bergazzi    15-May-1986     Version 10.1                    ;G:2
0000  ;                 Made TODR_BIAS and TICK_NS global for use by KERNEL module.     ;G:2
0000  ;                                                                                 ;G:3
0000  ;                 Steven Fortuna  01-Jan-1988     Version 10.11                   ;G:3
```

```
                        0000   172 ;
                        0000   173 ;
                        0000   174 ;
                        0000   175 ;
                        0000   176 ;
                        0000   177 ;
                        0000   178 ;--
```

```
Fixed truncation errors by replacing BSBW with JSB'S.          ;G:3
                                                               ;G:4
Paul McCarron   1-March-1988    Version 10.11                  ;G:4
Fixed truncation error with EXE$DEANONPAGED by switching       ;G:4
BSBW to JSB.                                                   ;G:4
                                                               ;G:4
```

```
0000    180          .SBTTL  Macros and Equated Symbols
0000    181 ;
0000    182 ; INCLUDE FILES:
0000    183 ;
0000    184
0000    185          .LIBRARY        /SYS$LIBRARY:LIB/       ;                       [27]
0000    186          .LIBRARY        /$DS/                   ;                       [27]
0000    187          .LIBRARY        /$DIAG/                 ;                       [27]
0000    188
0000    189 ;
0000    190 ; EXTERNAL SYMBOLS
0000    191 ;
0000    192          .EXTRN  MP$_GET_PROCESSOR_ID            ;               [33]
0000    193
0000    194
0000    195
0000    196
0000    197 ;
0000    198 ; MACROS
0000    199 ;
0000    200          .MACRO  $PRDEF,$GBL
0000    201
0000    202          $DEFINI PR,$GBL
0000    203
0000    204
0000    205  $EQU    PR$_KSP 0
0000    206  $EQU    PR$_ESP 1
0000    207  $EQU    PR$_SSP 2
0000    208  $EQU    PR$_USP 3
0000    209  $EQU    PR$_ISP 4
0000    210  $EQU    PR$_P0BR        8
0000    211  $EQU    PR$_P0LR        9
0000    212  $EQU    PR$_P1BR        10
0000    213  $EQU    PR$_P1LR        11
0000    214  $EQU    PR$_SBR 12
0000    215  $EQU    PR$_SLR 13
0000    216  $EQU    PR$_PCBB        16
0000    217  $EQU    PR$_SCBB        17
0000    218  $EQU    PR$_IPL 18
0000    219  $EQU    PR$_ASTLVL      19
0000    220  $EQU    PR$_SIRR        20
0000    221  $EQU    PR$_SISR        21
0000    222  $EQU    PR$_ICCS        24
0000    223  $EQU    PR$_NICR        25
0000    224  $EQU    PR$_ICR 26
0000    225  $EQU    PR$_TODR        27
0000    226  $EQU    PR$_RXCS        32
0000    227  $EQU    PR$_RXDB        33
0000    228  $EQU    PR$_TXCS        34
0000    229  $EQU    PR$_TXDB        35
0000    230  $EQU    PR$_ACCS        40
0000    231  $EQU    PR$_ACCR        41
0000    232  $EQU    PR$_MAPEN       56
0000    233  $EQU    PR$_TBIA        57
0000    234  $EQU    PR$_TBIS        58
0000    235  $EQU    PR$_PME 61
0000    236  $EQU    PR$_SID 62
```

```
0000    237  $EQU    PR$_TBCHK       63
0000    238  $EQU    PR$V_SID_SN     0
0000    239  $EQU    PR$S_SID_SN     12
0000    240  $EQU    PR$V_SID_PL     12
0000    241  $EQU    PR$S_SID_PL     3
0000    242  $EQU    PR$V_SID_ECO    15
0000    243  $EQU    PR$S_SID_ECO    9
0000    244  $EQU    PR$V_SID_TYPE   24
0000    245  $EQU    PR$S_SID_TYPE   8
0000    246  $EQU    PR$_SID_TYP780  1
0000    247  $EQU    PR$_SID_TYP750  2
0000    248  $EQU    PR$_SID_TYP730  3
0000    249  $EQU    PR$_SID_TYP7VV  4
0000    250  $EQU    PR$_SID_TYPMAX  4
0000    251  $EQU    PR$_WCSA        44
0000    252  $EQU    PR$_WCSD        45
0000    253  $EQU    PR$_SBIFS       48
0000    254  $EQU    PR$_SBIS        49
0000    255  $EQU    PR$_SBISC       50
0000    256  $EQU    PR$_SBIMT       51
0000    257  $EQU    PR$_SBIER       52
0000    258  $EQU    PR$_SBITA       53
0000    259  $EQU    PR$_SBIQC       54
0000    260  $EQU    PR$_CMIERR      23
0000    261  $EQU    PR$_CSRS        28
0000    262  $EQU    PR$_CSRD        29
0000    263  $EQU    PR$_CSTS        30
0000    264  $EQU    PR$_CSTD        31
0000    265  $EQU    PR$_TBDR        36
0000    266  $EQU    PR$_CADR        37
0000    267  $EQU    PR$_MCESR       38
0000    268  $EQU    PR$_CAER        39
0000    269  $EQU    PR$_UBRESET     55
0000    270  $EQU    PR$_PAMACC      64
0000    271  $EQU    PR$_PAMLOC      65
0000    272  $EQU    PR$_CSWP        66
0000    273  $EQU    PR$_CRBT        67
0000    274  $EQU    PR$_MCTL1       68
0000    275  $EQU    PR$_MCTL2       69
0000    276  $EQU    PR$_MGEN        70
0000    277  $EQU    PR$_MTBER       71
0000    278  $EQU    PR$_MEAR        72
0000    279  $EQU    PR$_MDCR1       73
0000    280  $EQU    PR$_MEDR        74
0000    281  $EQU    PR$_MECCR       75
0000    282
0000    283          $DEFEND PR,$GBL,DEF
0000    284
0000    285          .ENDM   $PRDEF
0000    286
0000    287 $PR8SSDEF                                ;[35]
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000    288
0000    289 ;
0000    290 ; EQUATED SYMBOLS:
0000    291 ;
```

```
                        0000    292
                        0000    293         $CANTIMDEF
                        0000    294         $GETTIMDEF
                        0000    295         $DDBDEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .IIF    NB,DDB$L_LINK,  DDB$L_LINK:
                00000004 0000                       .BLKL   1
                        0004                .IIF    NB,DDB$L_UCB,   DDB$L_UCB:
                00000008 0004                       .BLKL   1
                        0008                .IIF    NB,DDB$W_SIZE,  DDB$W_SIZE:
                0000000A 0008                       .BLKW   1
                        000A                .IIF    NB,DDB$B_TYPE,  DDB$B_TYPE:
                0000000B 000A                       .BLKB   1
                0000000C 000B                       .BLKB   1
                        000C                .IIF    NB,DDB$L_DDT,   DDB$L_DDT:
                00000010 000C                       .BLKL   1
                        0010                .IIF    NB,DDB$L_ACPD,  DDB$L_ACPD:
                00000013 0010                       .BLKB   3
                        0013                .IIF    NB,DDB$B_ACPCLASS,      DDB$B_ACPCLASS:
                00000014 0013                       .BLKB   1
                        0014                .IIF    NB,DDB$T_NAME,  DDB$T_NAME:
                00000015 0014                       .BLKB   1
                00000024 0015                       .BLKB   15
                        0024                .IIF    NB,DDB$T_DRVNAME,       DDB$T_DRVNAME:
                00000025 0024                       .BLKB   1
                00000034 0025                       .BLKB   15
                        0034                .IIF    NB,DDB$C_LENGTH,        DDB$C_LENGTH:
                        0034                .IIF    NB,DDB$K_LENGTH,        DDB$K_LENGTH:
                        0000                .RESTORE
                        0000    296         $DS_DSADEF
                        0000    297         $DS_DSDEF
                        0000    298         $DYNDEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 FE70               .=0
                        0000                .RESTORE
                        0000    299         $IPLDEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 FE70               .=0
                        0000                .RESTORE
                        0000    300         $PRDEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 FE70               .=0
                        0000                .RESTORE
                        0000    301         $PR780DEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 FE70               .=0
                        0000                .RESTORE
                        0000    302         $DS_SCBDEF
                        0000    303         $SSDEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 FE70               .=0
                        0000                .RESTORE
```

```
                     0000   304          $PSLDEF
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
                00000000  FE70           .=0
                     0000                .RESTORE
                     0000   305          $SETIMRDEF
                     0000   306          $TQEDEF
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
                00000000  FE70           .=0
                     0000                .RESTORE
                     0000   307          $UCBDEF
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
                00000000  FE70           .=0
                     0000                .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                     0000                .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
                00000004  0000                        .BLKL   1
                     0004                .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                     0004                .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
                00000008  0004                        .BLKL   1
                     0008                .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
                0000000A  0008                        .BLKW   1
                     000A                .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
                0000000B  000A                        .BLKB   1
                     000B                .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
                0000000C  000B                        .BLKB   1
                     000C                .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                     000C                .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                     000C                .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
                0000000D  000C                        .BLKB   1
                00000010  000D                        .BLKB   3
                     0010                .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                     0010                .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
                00000014  0010                        .BLKL   1
                     0014                .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                     0014                .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                     0014                .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
                00000016  0014                        .BLKW   1
                     0016                .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
                00000018  0016                        .BLKW   1
                     0018                .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                     0018                .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
                0000001A  0018                        .BLKW   1
                     001A                .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                     001A                .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
                0000001C  001A                        .BLKW   1
                     001C                .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
                00000020  001C                        .BLKL   1
                     0020                .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
                00000024  0020                        .BLKL   1
                     0024                .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
                00000028  0024                        .BLKL   1
                     0028                .IIF    NB,UCB$L_PID,   UCB$L_PID:
                0000002C  0028                        .BLKL   1
                     002C                .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
                00000030  002C                        .BLKL   1
```

```
                     0030              .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
00000034             0030                      .BLKL   1
                     0034              .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
00000038             0034                      .BLKL   1
                     0038              .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
00000039             0038                      .BLKB   1
                     0039              .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
0000003A             0039                      .BLKB   1
                     003A              .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
0000003C             003A                      .BLKW   1
                     003C              .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
                     003C              .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
                     003C              .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
0000003D             003C                      .BLKB   1
                     003D              .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
                     003D              .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
0000003E             003D                      .BLKB   1
                     003E              .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
                     003E              .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
0000003F             003E                      .BLKB   1
                     003F              .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
00000040             003F                      .BLKB   1
                     0040              .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
00000044             0040                      .BLKL   1
                     0044              .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
00000048             0044                      .BLKL   1
                     0048              .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
0000004A             0048                      .BLKW   1
                     004A              .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
                     004A              .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
0000004B             004A                      .BLKB   1
                     004B              .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
0000004C             004B                      .BLKB   1
                     004C              .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
00000050             004C                      .BLKL   1
                     0050              .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
00000052             0050                      .BLKW   1
                     0052              .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
                     0052              .IIF    NB,UCB$B_STATE, UCB$B_STATE:
00000053             0052                      .BLKB   1
                     0053              .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
00000054             0053                      .BLKB   1
                     0054              .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
00000058             0054                      .BLKL   1
                     0058              .IIF    NB,UCB$W_STS,   UCB$W_STS:
0000005A             0058                      .BLKW   1
                     005A              .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
0000005C             005A                      .BLKW   1
                     005C              .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
                     005C              .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
00000060             005C                      .BLKL   1
                     0060              .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
00000064             0060                      .BLKL   1
                     0064              .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
                     0064              .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
00000068             0064                      .BLKL   1
                     0068              .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
```

```
0000006C  0068                                  .BLKL   1
          006C                  .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
0000006E  006C                                  .BLKW   1
          006E                  .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
00000070  006E                                  .BLKW   1
          0070                  .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
00000071  0070                                  .BLKB   1
          0071                  .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
00000072  0071                                  .BLKB   1
          0072                  .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074  0072                                  .BLKW   1
          0074                  .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
          0074                  .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000  0074                  . = 0
          0000                  .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002  0000                                  .BLKW   1
00000074  0002                  . = 116
          0074                  .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078  0074                                  .BLKL   1
          0078                  .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C  0078                                  .BLKL   1
          007C                  .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080  007C                                  .BLKL   1
          0080                  .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084  0080                                  .BLKL   1
          0084                  .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088  0084                                  .BLKL   1
          0088                  .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C  0088                                  .BLKL   1
          008C                  .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090  008C                                  .BLKL   1
          0090                  .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
          0090                  .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074  0090                  . = 116
          0074                  .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075  0074                                  .BLKB   1
          0075                  .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076  0075                                  .BLKB   1
          0076                  .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077  0076                                  .BLKB   1
          0077                  .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078  0077                                  .BLKB   1
          0078                  .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C  0078                                  .BLKL   1
0000007E  007C                                  .BLKW   1
          007E                  .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080  007E                                  .BLKW   1
          0080                  .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084  0080                                  .BLKL   1
00000080  0084                  . = 128
00000084  0080                                  .BLKL   1
          0084                  .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088  0084                                  .BLKL   1
          0088                  .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A  0088                                  .BLKW   1
          008A                  .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C  008A                                  .BLKW   1
```

```
                    008C                .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
                    008C                .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E            008C                        .BLKW   1
                    008E                .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090            008E                        .BLKW   1
                    0090                .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092            0090                        .BLKW   1
                    0092                .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
00000094            0092                        .BLKW   1
                    0094                .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095            0094                        .BLKB   1
                    0095                .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096            0095                        .BLKB   1
                    0096                .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098            0096                        .BLKW   1
00000096            0098                . = 150
00000098            0096                        .BLKW   1
                    0098                .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C            0098                        .BLKL   1
                    009C                .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0            009C                        .BLKL   1
                    00A0                .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
000000A4            00A0                        .BLKL   1
                    00A4                .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
000000A6            00A4                        .BLKW   1
                    00A6                .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
000000A7            00A6                        .BLKB   1
000000A8            00A7                        .BLKB   1
00000074            00A8                . = 116
00000078            0074                        .BLKL   1
0000007C            0078                        .BLKL   1
00000080            007C                        .BLKL   1
00000084            0080                        .BLKL   1
00000088            0084                        .BLKL   1
0000008C            0088                        .BLKL   1
                    008C                .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
00000090            008C                        .BLKL   1
00000094            0090                        .BLKL   1
00000098            0094                        .BLKL   1
0000009C            0098                        .BLKL   1
                    009C                .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
0000009D            009C                        .BLKB   1
                    009D                .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
0000009E            009D                        .BLKB   1
                    009E                .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
0000009F            009E                        .BLKB   1
000000A0            009F                        .BLKB   1
                    00A0                .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
000000A1            00A0                        .BLKB   1
                    00A1                .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
000000A2            00A1                        .BLKB   1
                    00A2                .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
000000A3            00A2                        .BLKB   1
000000A4            00A3                        .BLKB   1
                    00A4                .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
000000A5            00A4                        .BLKB   1
                    00A5                .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
```

```
                     000000A7  00A5                                .BLKW   1
                     000000A8  00A7                                .BLKB   1
                               00A8                  .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
                     000000AC  00A8                                .BLKL   1
                     000000B0  00AC                                .BLKL   1
                     000000B4  00B0                                .BLKL   1
                     000000B8  00B4                                .BLKL   1
                               00B8                  .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
                     000000BC  00B8                                .BLKL   1
                               00BC                  .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
                               00BC                  .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
                     00000074  00BC                  . = 116
                               0074                  .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
                     00000078  0074                                .BLKL   1
                               0078                  .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
                     0000007C  0078                                .BLKL   1
                               007C                  .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
                     0000007E  007C                                .BLKW   1
                     00000080  007E                                .BLKW   1
                               0000                  .RESTORE
                               0000    308           $DS_WAITMS_DEF
                               0000    309           $DS_WAITUS_DEF
                               0000    310           CMKDEF
                               0000    311           DSFDEF
                               0000    312
                     00000001  0000    313 ICCS$M_RUN      = 1 @ 0
                     00000010  0000    314 ICCS$M_XFER     = 1 @ 4
                     00000040  0000    315 ICCS$M_IE       = 1 @ 6
                     00000080  0000    316 ICCS$M_INT      = 1 @ 7
                     80000000  0000    317 ICCS$M_ERR      = 1 @ 31                ;                                       [23]  ;G:2
                               0000    318
                     800000C1  0000    319 ICCS$M_RESET    = <ICCS$M_ERR ! ICCS$M_INT ! ICCS$M_IE ! ICCS$M_RUN>
                               0000    320
                     10000000  0000    321 TODR_BIAS       == 1 @ 28               ; ^X10000000, approx. 1 month   [36]  ;G:2
                               0000    322
                     00002710  0000    323 TICK_US         = 10000                 ; MICROSECONDS PER TICK
                     000186A0  0000    324 TICK_NS         == TICK_US*10           ; 100NS UNITS PER TICK          [36]  ;G:2
                     00000064  0000    325 SEC_TICK        == 1000000/TICK_US      ; TICKS PER SECOND
                               0000    326
                     00000018  0000    327 CLOCK_IPL       = 24
```

```
                        00000000   329          .PSECT  Work, NoShr, NoExe, Wrt, Long   ;                    [17]  ;G:2
                            0000   330          .SBTTL  Work Psect Declarations
                            0000   331 ;
                            0000   332 ; OWN STORAGE:
                            0000   333 ;
                            0000   334
                            0000   335 DS$GL_TIMQFL:
                      00000000'     0000   336          .LONG   DS$GL_TIMQFL            ;QUEUE HEADER FOR LONG SETIMR REQUESTS
                      00000000'     0004   337          .LONG   DS$GL_TIMQFL
                            0008   338
                            0008   339 DS$GQ_CURYEAR::
                      00000010      0008   340          .BLKQ   1
                            0010   341
                            0010   342 DS$GT_NEWYEAR::
20 38 37 39 31 2D 4E 41 4A 2D 31 30   0010   343          .ASCII  \01-JAN-1978  0:0:0.0\
         30 2E 30 3A 30 3A 30 20      001C
                            0024   344
                      00000014      0024   345 DS$K_NYSIZ  ==  .-DS$GT_NEWYEAR
                            0024   346
                            0024   347 ONESECTIM:
                00000000 00000000   0024   348          .LONG   0,0                     ; Flink and Blink
                            0000    002C   349          .WORD   0                       ; Length =0
                              0F    002E   350          .BYTE   DYN$C_TQE               ; Type of data struncture
                              05    002F   351          .BYTE   TQE$C_SSREPT            ; Request type=repeat
                      000003BF'     0030   352          .LONG   ONE_SECOND              ; Address of once/sec routine
                00000000 00000000   0034   353          .LONG   0,0                     ; Unused longwords
                00000000 00000000   003C   354          .LONG   0,0                     ; Initial expiration time
                      00989680      0044   355          .LONG   100000*100              ; Delta time=1 second
                      00000000      0048   356          .LONG   0                       ; Final unused
                            004C   357
                            004C   358 WAITMS_ARGS:
                            004C   359          $SETIMR  DAYTIM=MSTIME, ASTADR=DS$CANWAIT, -
                            004C   360                   REQIDT=-1                                          ;[28]
                      00000004'     004C                 .ADDRESS        4
                      00000000'     0050                 .ADDRESS        0
                      00000060'     0054                 .ADDRESS        MSTIME
                      00000000'     0058                 .ADDRESS        DS$CANWAIT
                      FFFFFFFF'     005C                 .ADDRESS        -1
                            0060   361
                            0060   362 MSTIME:
                      00000068      0060   363          .BLKL   2
                            0068   364
                      00000000      0068   365 ID_TEMP:        .LONG 0                         ; Storage for cpu id [33]
                            006C   366
                            006C   367
```

```
                    006C   369          .SBTTL  Data Psect Declarations
                00000000   370          .PSECT  Data, Shr, NoExe, NoWrt, Byte
                    0000   371
                    0000   372          MODNAM  CLOCK
     4B 43 4F 4C 43 00' 0000      $MODULE:        .ASCIC  \CLOCK\
                05  0000
```

```
                                0006          .SBTTL  DS$CanWait -    CANCEL DELAY ROUTINE
                            00000000          .PSECT  Code, Shr, Exe, NoWrt, Long     ;                                [17]
                                0000  ;++
                                0000  ; FUNCTIONAL DESCRIPTION:
                                0000  ;
                                0000  ;       ROUTINE TO CANCEL PROGRAM DELAY
                                0000  ;
                                0000  ; CALLING SEQUENCE:
                                0000  ;
                                0000  ;       DS$CANWAIT()
                                0000  ;
                                0000  ; INPUT PARAMETERS:     NONE
                                0000  ;
                                0000  ; IMPLICIT INPUTS:      NONE
                                0000  ;
                                0000  ; OUTPUT PARAMETERS:    NONE
                                0000  ;
                                0000  ; IMPLICIT OUTPUTS:
                                0000  ;
                                0000  ;       DS$GL_FLAGS:
                                0000  ;               DS$V_ABRTFLG    = ABORT WAIT FLAG.
                                0000  ;
                                0000  ; COMPLETION CODES:
                                0000  ;
                                0000  ;       SS$_NORMAL      = SERVICE SUCCESSFULLY COMPLETED.
                                0000  ;
                                0000  ; SIDE EFFECTS:
                                0000  ;
                                0000  ;       WAKES UP HIBERNATING PROCESS.
                                0000  ;--
                                0000
                          0000  0000  .ENTRY  DSX$CANWAIT,^M<>
                                0002
                                0002          $CANTIM_S       REQIDT=#-1      ; Dequeue the timer queue entry [28]
                    00    DD    0002                  PUSHL   #0
          FFFFFFFF  8F    DD    0004                  PUSHL   #-1
     00000000'GF    02    FB    000A                  CALLS   #2,G^SYS$CANTIM
                                0011                                          ; that was enqueued by the      [28]
                                0011                                          ; $SETIMR call in DSX$WAITMS    [28]
                                0011                                          ; (If we're not cancelling a    [28]
                                0011                                          ; $DS_WAITMS, this doesn't do   [28]
                                0011                                          ; anything.)                    [28]
                    7E    7C    0011          CLRQ    -(SP)                   ; Two null args
     00000000'EF    02    FB    0013          CALLS   #2,SYS$WAKE             ; wake the program
                          04    001A          RET                             ; RETURN TO THE DIAGNOSTIC
```

```
                                001B   417          .SBTTL  $WAKE - Wakeup from hibernate
                                001B   418 ;++
                                001B   419 ; FUNCTIONAL DESCRIPTION:
                                001B   420 ;
                                001B   421 ;       This routine releases the process blocked by $HIBER
                                001B   422 ;
                                001B   423 ; CALLING SEQUENCE:
                                001B   424 ;
                                001B   425 ;       SYS$WAKE()
                                001B   426 ;
                                001B   427 ; INPUT PARAMETERS:     NONE
                                001B   428 ;
                                001B   429 ; IMPLICIT INPUTS:      NONE
                                001B   430 ;
                                001B   431 ; OUTPUT PARAMETERS:    NONE
                                001B   432 ;
                                001B   433 ; IMPLICIT OUTPUTS:
                                001B   434 ;
                                001B   435 ;       DS$V_ABRTFLG is SET in DS$GL_FLAGS
                                001B   436 ;
                                001B   437 ; COMPLETION CODES:     SS$_NORMAL
                                001B   438 ;
                                001B   439 ; SIDE EFFECTS:
                                001B   440 ;
                                001B   441 ;       The next time or current time $HIBER is called it will exit.
                                001B   442 ;--
                                001B   443
                          0000  001B   444 .ENTRY  EXE$WAKE,^M<>
                                001D   445
00000000'EF     40 8F     88    001D   446          BISB    #DS$M_ABRTFLG, -
                                0025   447                  L^DS$GL_FLAGS           ; Set the flag
                50  01     D0   0025   448          MOVL    S^#SS$_NORMAL,R0        ; It worked
                                 04   0028   449          RET                     ; Return
```

```
0029    451          .SBTTL  DSX$WaitMS -    MILLISECOND DELAY ROUTINE
0029    452 ;++
0029    453 ; FUNCTIONAL DESCRIPTION:
0029    454 ;
0029    455 ;       THIS ROUTINE ALLOWS THE PROGRAMMER TO DELAY HIS PROGRAM SOME
0029    456 ;       NUMBER OF 10 MILLISECOND UNITS.
0029    457 ;
0029    458 ; CALLING SEQUENCE:
0029    459 ;
0029    460 ;       DIAGNOSTIC SUPERVISOR PROCEDURE CALL.
0029    461 ;
0029    462 ; INPUT PARAMETERS:
0029    463 ;
0029    464 ;       WAITMS$_TIME(AP)= NUMBER OF 10 MILLISECOND UNITS TO DELAY.
0029    465 ;       WAITMS$_TAG(AP) = ADDRESS TO RECEIVE REMAINING TIME ON CANWAIT.
0029    466 ;
0029    467 ; IMPLICIT INPUTS:
0029    468 ;
0029    469 ;       NONE
0029    470 ;
0029    471 ; OUTPUT PARAMETERS:
0029    472 ;
0029    473 ;       R0 = SUCCESS/FAILURE
0029    474 ;       R1 = NUMBER OF UNITS LEFT
0029    475 ;
0029    476 ; IMPLICIT OUTPUTS:
0029    477 ;
0029    478 ;       NONE
0029    479 ;
0029    480 ; COMPLETION CODES:
0029    481 ;
0029    482 ;       SS$_NORMAL      = SERVICE SUCCESSFULLY COMPLETED.
0029    483 ;       DS$_ICERR       = INTERVAL CLOCK ERROR.
0029    484 ;       DS$_PROGERR     = NEGATIVE TIME INTERVAL SPECIFIED.
0029    485 ;                           (OR LESS THAN OVERHEAD)
0029    486 ;
0029    487 ; SIDE EFFECTS:
0029    488 ;
0029    489 ;       NONE
0029    490 ;--
```

```
                          0000  0029   492 .ENTRY  DSX$WAITMS,^M<>
                                002B   493
                                002B   494         $GETTIM_S  -(SP)                 ; GET START TIME
                          7E    7F     002B                    PUSHAQ  -(SP)
              00000000'GF 01    FB     002D                    CALLS   #1,G^SYS$GETTIM
                                0034   495
                          50    DC     0034   496         MOVPSL  R0                ; READ PROCESSOR STATUS.
                    05    10    ED     0036   497         CMPZV   #PSL$V_IPL, #PSL$S_IPL,-; CHECK IPL.
                    02    50           0039   498                 R0, #2
                          19    19     003B   499         BLSS    10$
     50   000003E8 8F    04 AC C5     003D   500         MULL3   WAITMS$_TIME(AP), -      ; CHANGE MILLSECONDS TO MICROSECONDS.
                                0046   501                 #1000, R0
                                0046   502         $DS_WAITUS_S  TIME=R0
                          00    DD     0046                    PUSHL   #0
                          50    DD     0048                    PUSHL   R0
              00000000'9F 02    FB     004A                    CALLS   #2, @#DS$WAITUS
                       5F 50    E9     0051   503         BLBC    R0,DSX$WAITMS_X          ; ERROR IN WAITUS, EXIT
                          30    11     0054   504         BRB     30$
                                0056   505
           50   00660020 8F    D0     0056   506 10$:    MOVL    #DS$_PROGERR, R0         ; ANTICIPATE NEG. TIME
         FFFE7960 8F    04 AC 7A     005D   507         EMUL    WAITMS$_TIME(AP), #-TICK_NS,- ; TRANSLATE TIME INTO 100NS INCS.
    00000060'EF   00001200 8F          0065   508                 #4608, MSTIME            ;  PLUS OVERHEAD
                          42    18     006F   509         BGEQ    DSX$WAITMS_X             ; IF GEQ, NEGATIVE OR TOO SMALL
                                0071   510
                                0071   511         $SETIMR_G  L^WAITMS_ARGS
    00000000'GF   0000004C'EF   FA     0071                    CALLG   L^WAITMS_ARGS,G^SYS$SETIMR
                       34 50    E9     007C   512         BLBC    R0, DSX$WAITMS_X         ; SKIP IF ERROR.
                                007F   513
                                007F   514         $HIBER_S
              00000000'GF 00    FB     007F                    CALLS   #0,G^SYS$HIBER
                                0086   515
                                0086   516 30$:    $GETTIM_S  -(SP)                 ; GET END TIME
                          7E    7F     0086                    PUSHAQ  -(SP)
              00000000'GF 01    FB     0088                    CALLS   #1,G^SYS$GETTIM
                       50   8E 7D     008F   517         MOVQ    (SP)+,R0                 ; GET END TIME OFF STACK
                       50   8E C2     0092   518         SUBL2   (SP)+,R0                 ; MAKE LOW ORDER DIFFERENCE
                       51   8E D9     0095   519         SBWC    (SP)+,R1                 ; AND HIGH ORDER DIFFERENCE
50   51   50   000186A0 8F    7B     0098   520         EDIV    #100000,R0,R1,R0         ; MAKE TRASH(R1) AND 10'S OF MILLSECONDS
              50    08 AC    D0     00A1   521         MOVL    WAITMS$_TAG(AP),R0       ; CHECK FOR REMAINING TIME ADR.
                          09    13     00A5   522         BEQL    40$
               60   04 AC    51     C3     00A7   523         SUBL3   R1,WAITMS$_TIME(AP),(R0); Store unused time
                          02    18     00AC   524         BGEQ    40$                      ; Branch if positive
                          60    D4     00AE   525         CLRL    (R0)                     ; Was negative reduce to zero
                                00B0   526
                       50   01 D0     00B0   527 40$:    MOVL    S^#SS$_NORMAL,R0         ; NORMAL RETURN
                                00B3   528
                                00B3   529 DSX$WAITMS_X:
                          04    00B3   530         RET                              ; RETURN TO PROGRAM
```

```
                        532          .SBTTL  DSX$WaitUC -    MICROSECOND DELAY ROUTINE
                        533 ;++
                        534 ; FUNCTIONAL DESCRIPTION:
                        535 ;
                        536 ;       THIS ROUTINE ALLOWS THE PROGRAMMER TO DELAY HIS PROGRAM SOME
                        537 ;       NUMBER OF 10 MICROSECOND UNITS.
                        538 ;
                        539 ; CALLING SEQUENCE:
                        540 ;
                        541 ;       DIAGNOSTIC SUPERVISOR PROCEDURE CALL.
                        542 ;
                        543 ; INPUT PARAMETERS:
                        544 ;
                        545 ;       WAITUS$_TIME(AP)= NUMBER OF 10 MICROSECOND UNITS TO DELAY.
                        546 ;       WAITUS$_TAG(AP) = ADDRESS TO RECEIVE REMAINING TIME ON CANWAIT.
                        547 ;
                        548 ; IMPLICIT INPUTS:
                        549 ;
                        550 ;       NONE
                        551 ;
                        552 ; OUTPUT PARAMETERS:
                        553 ;
                        554 ;       R0 = SUCCESS/FAILURE
                        555 ;       R1 = NUMBER OF UNITS LEFT
                        556 ;
                        557 ; IMPLICIT OUTPUTS:
                        558 ;
                        559 ;       NONE
                        560 ;
                        561 ; COMPLETION CODES:
                        562 ;
                        563 ;       SS$_NORMAL      = SERVICE SUCCESSFULLY COMPLETED.
                        564 ;       DS$_ICERR       = INTERVAL CLOCK ERROR.
                        565 ;       DS$_PROGERR     = NEGATIVE TIME INTERVAL SPECIFIED.
                        566 ;                           (OR LESS THAN OVERHEAD)
                        567 ;
                        568 ; SIDE EFFECTS:
                        569 ;
                        570 ;       NONE
                        571 ;--
```

```
                                00B4          .ENABLE LOCAL_BLOCK                ;                                    [26]
                          0000  00B4  .ENTRY  DSX$WAITUS,^M<>                    ;                                    [24]
                                00B6          DsbInt  #31                        ; Set to IPL 31                      [20]
                 7E   12   DB   00B6                  MFPR    S^#PR$_IPL,-(SP)
                 12   1F   DA   00B9                  MTPR    #31,S^#PR$_IPL
                 50   1C   D0   00BC          MOVL    S^#SS$_EXQUOTA, R0         ; ASSUME MULTIPLE TIME FUNCTION ERROR
      00000000'EF     11   E0   00BF          BBS     #DS$V_TIMRON, -            ; CHECK FOR TIMER ALREADY IN USE.
                      1F        00C6                  DS$GL_FLAGS,25$            ; LEAP FROG TO DSX$WAITUS_X
                                00C7
   00000000'EF   40 8F   8A   00C7          BICB2   #DS$M_ABRTFLG, -           ; CLEAR ABORT WAIT FLAG.
                                00CF                  DS$GL_FLAGS
                                00CF  DSX$WAITUS_USOVR::                         ;                                    [26]
   FFFFFFF6 8F   04 AC   7A   00CF          EMUL    WAITUS$_TIME(AP), -        ; COMPUTE INTERVAL CLOCK COUNT.
      50   00000000'8F        00D7
                                00DD                  #-10,#DS$GK_USOVR,R0       ; PLUS OVERHEAD
                      0C   19   00DD          BLSS    30$
      50   00660020 8F   D0   00DF          MOVL    #DS$_PROGERR, R0           ; IF GEQ, NEGATIVE OR TOO SMALL
                                00E6  25$:    EnbInt                             ; Restore IPL on error path          [20]
                 12   8E   DA   00E6                  MTPR    (SP)+,S^#PR$_IPL
                      49   11   00E9          BRB     DSX$WAITUS_X
                                00EB
      18   80000080 8F   DA   00EB  30$:    MTPR    #ICCS$M_INT + -            ; STOP THE CLOCK.
                                00F2                   ICCS$M_ERR, #PR$_ICCS
                      51   D4   00F2          CLRL    R1                         ; ANTICIPATE NO RESIDUAL TIME.
                 19   50   DA   00F4          MTPR    R0, #PR$_NICR              ; SET NEXT INTERVAL.
      18   80000091 8F   DA   00F7          MTPR    #ICCS$M_XFER ! ICCS$M_RUN ! -    ;                              [19]
                                00FE                   ICCS$M_INT ! ICCS$M_ERR, -     ;                              [19]
                                00FE                     #PR$_ICCS                ; LOAD AND START THE INTERVAL CLOCK.
                                00FE          EnbInt                             ; Enable interrupts again            [20]
                 12   8E   DA   00FE                  MTPR    (SP)+,S^#PR$_IPL
                                0101
      00000000'EF     06   E4   0101  40$:    BBSC    #DS$V_ABRTFLG, -           ; CHECK FOR CANWAIT.
                      0E        0108                  DS$GL_FLAGS, 50$
                 50   18   DB   0109          MFPR    #PR$_ICCS, R0              ; READ THE CLOCK STATUS.
      50   80000080 8F   D3   010C          BITL    #ICCS$M_INT ! -            ; CHECK FOR DONE
                                0113                   ICCS$M_ERR, R0            ;  OR ERROR.
                      EC   13   0113          BEQL    40$                        ; BR IF NEITHER.
                      0A   11   0115          BRB     55$                        ; Normal completion, no residual     [20]
                                0117
                 51   1A   DB   0117  50$:    MFPR    #PR$_ICR, R1               ; SAVE COUNT REMAINING.
      51   FFFFFFF6 8F   C6   011A          DIVL    #-10, R1                   ; COMPUTE 10US UNITS LEFT.
                                0121
                 08 AC   D5   0121  55$:    TSTL    WAITUS$_TAG(AP)            ; IF RETURN TAG NOT SPECIFIED        [20]
                      04   13   0124          BEQL    60$                        ; SKIP THE STORE
            08 BC   51   D0   0126          MOVL    R1,@WAITUS$_TAG(AP)        ; STORE THE REMAINING (10US)
                                012A
                 50   01   D0   012A  60$:    MOVL    S^#SS$_NORMAL, R0                  ; NORMAL RETURN.
                                012D
                      03   BB   012D  70$:    PUSHR   #^M<R0,R1>                 ; SAVE RETURN INFORMATION
                   02E5   30   012F          BSBW    CLK$RE_INIT                ; RESTART AND RESYNC THE TOD AND ICCS
                      03   BA   0132          POPR    #^M<R0,R1>                 ; RESTORE RETURN INFORMATION
                                0134          .DISABLE LOCAL_BLOCK               ;                                    [26]
                                0134
                                0134  DSX$WAITUS_X:
                          04   0134          RET                                ; RETURN TO PROGRAM
```

```
0135    624          .SBTTL  EXE$HIBER -     HIBERNATE SYSTEM SERVICE ROUTINE.
0135    625 ;++
0135    626 ; FUNCTIONAL DESCRIPTION:
0135    627 ;
0135    628 ;       EMULATION OF STARLET SYSTEM SERVICE "HIBER" (HIBERNATE).
0135    629 ;       THE HIBERNATE SYSTEM SERVICE ALLOWS A PROCESS TO MAKE ITSELF INACTIVE
0135    630 ;       BUT TO REMAIN KNOWN TO THE SYSTEM SO THAT IT CAN BE INTERRUPTED, FOR
0135    631 ;       EXAMPLE TO RECEIVE ASTS.  A HIBERNATE REQUEST IS A WAIT-FOR-WAKE-EVENT
0135    632 ;       REQUEST.  WHEN A WAKE IS ISSUED FOR A HIBERNATING PROCESS WITH THE
0135    633 ;       $WAKE SYSTEM SERVICE OR A RESULT OF A SCHEDULE WAKEUP ($SCHDWK)
0135    634 ;       SYSTEM SERVICE, THE PROCESS CONTINUES EXECUTION AT THE INSTRUCTION
0135    635 ;       FOLLOWING THE HIBERNATE CALL.
0135    636 ;
0135    637 ; CALLING SEQUENCE:
0135    638 ;
0135    639 ;       STARLET PROCEDURE CALL.
0135    640 ;
0135    641 ; INPUT PARAMETERS:     NONE
0135    642 ;
0135    643 ; IMPLICIT INPUTS:      NONE
0135    644 ;
0135    645 ; OUTPUT PARAMETERS:    NONE
0135    646 ;
0135    647 ; IMPLICIT OUTPUTS:     NONE
0135    648 ;
0135    649 ; COMPLETION CODES:
0135    650 ;
0135    651 ;       SS$_NORMAL      = SERVICE SUCCESSFULLY COMPLETED.
0135    652 ;
0135    653 ; SIDE EFFECTS:         NONE
0135    654 ;--
```

```
                        0000  0135   656 .ENTRY  EXE$HIBER,^M<>
                              0137   657
                   FEC6'  30  0137   658 10$:    BSBW    KB_CHECK                ; CHECK FOR ^C.
00000000'EF          06  E5  013A   659          BBCC    #DS$V_ABRTFLG, -        ; CHECK FOR ABORTWAIT FLAG.
                     F5      0141   660                  DS$GL_FLAGS, 10$
                             0142   661          CMK     HIBER                   ; CLEAR CLOCK.
                     7E  DC  0142           MOVPSL  -(SP)
                06 6E  1A  E0  0144           BBS     #PSL$V_IS, (SP), 30000$
                     8E  D4  0148           CLRL    (SP)+
                     07  BC  014A           CHMK    #CMK$_HIBER
                     06  11  014C           BRB     30001$
00000158'EF          16  014E       30000$: JSB     CMK$HIBER
                             0154       30001$:
                50   01  D0  0154   662          MOVL    S^#SS$_NORMAL, R0       ; NORMAL RETURN STATUS.
                         04  0157   663 EXE$HIBER_X:
                             0157   664          RET
                             0158   665
                             0158   666 ;
                             0158   667 ; KERNEL MODE HIBERNATE ROUTINE.
                             0158   668 ;
                             0158   669
                             0158   670 CMK$HIBER::
00000000'EF          11  E5  0158   671          BBCC    #DS$V_TIMRON, -         ; RELEASE THE TIMER.
                     0D      015F   672                  DS$GL_FLAGS, CMK$HIBER_X
18   80000080        8F  DA  0160   673          MTPR    #ICCS$M_ERR + -         ; IF TIMED, STOP & CLEAR CLOCK.
                             0167   674                   ICCS$M_INT, #PR$_ICCS
                51   1A  DB  0167   675          MFPR    #PR$_ICR, R1            ; SAVE COUNT.
                   02AA  30  016A   676          BSBW    CLK$RE_INIT
                             016D   677
                             016D   678 CMK$HIBER_X:
                         02  016D   679          REI                             ; RETURN.
```

```
                     016E    681          .SBTTL  EXE$CANTIM -    CANCEL TIMER SYSTEM SERVICE.
                     016E    682 ;++
                     016E    683 ; FUNCTIONAL DESCRIPTION:
                     016E    684 ;
                     016E    685 ;       THE CANCEL TIMER REQUEST SYSTEM SERVICE CANCELS ALL OR A SELECTED
                     016E    686 ;       SUBSET OF THE SET TIMER REQUESTS PREVIOUSLY ISSUED BY A PROCESS.
                     016E    687 ;
                     016E    688 ; CALLING SEQUENCE:
                     016E    689 ;
                     016E    690 ;       STARLET PROCEDURE CALL.
                     016E    691 ;
                     016E    692 ; INPUT PARAMETERS:
                     016E    693 ;
                     016E    694 ;       REQIDT  = If zero cancel all, else match with ASTPRM.
                     016E    695 ;       ACMODE  = NOT IMPLEMENTED.
                     016E    696 ;
                     016E    697 ; IMPLICIT INPUTS:      NONE
                     016E    698 ;
                     016E    699 ; OUTPUT PARAMETERS:    NONE
                     016E    700 ;
                     016E    701 ; IMPLICIT OUTPUTS:     NONE
                     016E    702 ;
                     016E    703 ; COMPLETION CODES:
                     016E    704 ;
                     016E    705 ;       SS$_NORMAL      = SERVICE SUCCESSFULLY COMPLETED.
                     016E    706 ;
                     016E    707 ; SIDE EFFECTS:         NONE
                     016E    708 ;--
```

```
                        003C  016E    710 .ENTRY  EXE$CANTIM,^M<R2,R3,R4,R5>
                              0170    711
                              0170    712         CMK     CANTIM                  ; Change to KERNEL mode
                    7E    DC  0170                MOVPSL  -(SP)
                 06 6E    1A  E0  0172            BBS     #PSL$V_IS, (SP), 30002$
                    8E    D4  0176                CLRL    (SP)+
                    0B    BC  0178                CHMK    #CMK$_CANTIM
                    06    11  017A                BRB     30003$
            00000186'EF       017C        30002$: JSB     CMK$CANTIM
                              0182        30003$:
                50  01    D0  0182    713         MOVL    S^#SS$_NORMAL,R0        ; Success
                        04    0185    714         RET
                              0186    715
                              0186    716 ;+
                              0186    717 ; KERNEL mode routine to cancel timer queues
                              0186    718 ;-
                              0186    719 CMK$CANTIM::
                              0186    720         DSBINT                          ; Prevent interruptions
                7E    12    DB  0186                MFPR    S^#PR$_IPL,-(SP)
                12    1F    DA  0189                MTPR    #31,S^#PR$_IPL
          55    00000000'EF   018C    721         MOVAL   DS$GL_TIMQFL,R5         ; Point to queue head
           54    04 AC    D0  0193    722         MOVL    CANTIM$_REQIDT(AP),R4   ; Get request identification
                              0197    723
                    65    DD  0197    724         PUSHL   (R5)                    ; Push address of first FLINK
                              0199    725
                50 8ED0       0199    726 10$:    POPL    R0                      ; Get address of entry
          55    50    D1  019C    727         CMPL    R0,R5                   ; FLINK to queue head?
                1C    13  019F    728         BEQL    30$                     ; All done
                60    DD  01A1    729         PUSHL   TQE$L_TQFL(R0)          ; Push link to next TQE
                              01A3    730
             0B A0    95  01A3    731         TSTB    TQE$B_RQTYPE(R0)        ; Is it ast request?
                F1    12  01A6    732         BNEQ    10$                     ; No, leave it in the queue
                54    D5  01A8    733         TSTL    R4                      ; Cancel all?
                06    13  01AA    734         BEQL    20$                     ; Branch if all
          14 A0 54    D1  01AC    735         CMPL    R4,TQE$L_ASTPRM(R0)     ; Match on REQIDT?
                E7    12  01B0    736         BNEQ    10$                     ; Branch if not
                              01B2    737 ;+
                              01B2    738 ; REMOVE ENTRY IN R0 FROM QUEUE AND DEALLOCATE
                              01B2    739 ;-
             50 60    0F  01B2    740 20$:    REMQUE  (R0), R0                ; Remove queue entry                    [18]
      00000000'EF     16  01B5    741         JSB     EXE$DEANONPAGED         ; DE-ALLOCATE THE SPACE                 ;G:3
                DC    11  01BB    742         BRB     10$                     ; Check next
                              01BD    743
                              01BD    744 30$:
                              01BD    745         ENBINT                          ; Restore IPL
             12 8E    DA  01BD                MTPR    (SP)+,S^#PR$_IPL
                        02    01C0    746         REI                             ; Return to previous mode
```

```
                        01C1    748          .SBTTL  DSR$SETIMR_INI -        SET TIMER QUEUE INITIALIZATION
                        01C1    749 ;++
                        01C1    750 ; FUNCTIONAL DESCRIPTION:
                        01C1    751 ;
                        01C1    752 ;       THIS ROUTINE INITIALIZES THE SETIMR QUEUES
                        01C1    753 ;       AND IS CALLED FROM KERNEL ON A START 10000
                        01C1    754 ;
                        01C1    755 ; CALLING SEQUENCE:
                        01C1    756 ;
                        01C1    757 ;       BSBW    DSR$SETIMR_INI
                        01C1    758 ;
                        01C1    759 ; INPUT PARAMETERS:     NONE
                        01C1    760 ;
                        01C1    761 ; IMPLICIT INPUTS:      NONE
                        01C1    762 ;
                        01C1    763 ; OUTPUT PARAMETERS:    NONE
                        01C1    764 ;
                        01C1    765 ; IMPLICIT OUTPUTS:
                        01C1    766 ;
                        01C1    767 ;       THE DS$GL_TIMQFL QUEUE IS EMPTY
                        01C1    768 ;
                        01C1    769 ; SIDE EFFECTS:         NONE
                        01C1    770 ;
                        01C1    771 ;--
                        01C1    772
                        01C1    773 DSR$SETIMR_INI::
50  00000000'EF   DE    01C1    774          MOVAL   L^DS$GL_TIMQFL,R0       ; GET QUEUE ADDRESS
    60    50      D0    01C8    775          MOVL    R0,(R0)                 ; Flink to self
  04 A0   50      D0    01CB    776          MOVL    R0,4(R0)                ; Blink to self
50  00000000'EF   7D    01CF    777          MOVQ    EXE$GQ_SYSTIME,R0       ; Expected completion time
55  00000024'EF   DE    01D6    778          MOVAL   ONESECTIM,R5            ; Point to one/sec timer
          01      10    01DD    779          BSBB    EXE$INSTIMQ             ; Insert in timer queue
                  05    01DF    780          RSB                             ; RETURN
```

```
                        01E0    782 ;++
                        01E0    783 ; FUNCTIONAL DESCRIPTION:
                        01E0    784 ;
                        01E0    785 ;       This routine is used to place entries in the time queue
                        01E0    786 ;       The queue is ordered by completion time. the soonest request
                        01E0    787 ;       being the first in the queue.
                        01E0    788 ;
                        01E0    789 ; CALLING SEQUCENE:
                        01E0    790 ;
                        01E0    791 ;       BSBW    EXE$INSTIMQ
                        01E0    792 ;
                        01E0    793 ;
                        01E0    794 ; INPUT PARAMETERS:
                        01E0    795 ;
                        01E0    796 ;       R0/R1           64 bit completion time
                        01E0    797 ;       R5              Address of TQE
                        01E0    798 ;
                        01E0    799 ;
                        01E0    800 ; IMPLICIT INPUTS:      NONE
                        01E0    801 ;
                        01E0    802 ; OUTPUT PARAMETERS:    NONE
                        01E0    803 ;
                        01E0    804 ; IMPLICIT OUTPUTS:     NONE
                        01E0    805 ;
                        01E0    806 ;--
                        01E0    807
                        01E0    808 EXE$INSTIMQ::
                        01E0    809
      18 A5   50   7D   01E0    810          MOVQ    R0,TQE$Q_TIME(R5)       ; Insert completion time in TQE
                        01E4    811          DSBINT  #IPL$_TIMER             ; Disable to timer level
         7E   12   DB   01E4                  MFPR    S^#PR$_IPL,-(SP)
         12   07   DA   01E7                  MTPR    #IPL$_TIMER,S^#PR$_IPL
54 00000000'EF   DE   01EA    812          MOVAL   DS$GL_TIMQFL,R4         ; Point to queue head
         53   54   D0   01F1    813          MOVL    R4,R3                   ; Copy start of queue
      53   04 A3   D0   01F4    814 50$:     MOVL    TQE$L_TQBL(R3),R3       ; Link to next entry
         54   53   D1   01F8    815          CMPL    R3,R4                   ; End of queue?
              0E   13   01FB    816          BEQL    60$                     ; Yes insert it here
      1C A3   51   D1   01FD    817          CMPL    R1,TQE$Q_TIME+4(R3)     ; Compare High order parts of time
              F1   1F   0201    818          BLSSU   50$                     ; If LSSU new entry more imminent
              06   1A   0203    819          BGTRU   60$                     ; If GTRU new entry less imminent
      18 A3   50   D1   0205    820          CMPL    R0,TQE$Q_TIME(R3)       ; Compare low order part of time
              E9   1F   0209    821          BLSSU   50$                     ; If LSSU new entry more imminent
         63   65   0E   020B    822 60$:     INSQUE  (R5), (R3)              ; Insert new entry                      [18]
                        020E    823          ENBINT
         12   8E   DA   020E                  MTPR    (SP)+,S^#PR$_IPL
                   05   0211    824          RSB
```

```
                     0212    826          .SBTTL  EXE$Setimr -    SET TIMER SYSTEM SERVICE.
                     0212    827 ;++
                     0212    828 ; FUNCTIONAL DESCRIPTION:
                     0212    829 ;
                     0212    830 ;       THE SET TIMER SYSTEM SERVICE ALLOWS A PROCESS TO CAUSE THE SETTING OF
                     0212    831 ;       AN EVENT FLAG AND THE ISSUANCE OF AN AST AT SOME FUTURE TIME.  THE
                     0212    832 ;       TIME FOR THE EVENT CAN BE SPECIFIED AS AN OFFSET FROM THE CURRENT
                     0212    833 ;       TIME, THAT IS, DELTA TIME.
                     0212    834 ;
                     0212    835 ; CALLING SEQUENCE:
                     0212    836 ;
                     0212    837 ;       STARLET PROCEDURE CALL.
                     0212    838 ;
                     0212    839 ; INPUT PARAMETERS:
                     0212    840 ;
                     0212    841 ;       EFN     = EVENT FLAG NUMBER OF THE EVENT FLAG TO SET WHEN THE
                     0212    842 ;                 TIME INTERVAL EXPIRES.  IF NOT SPECIFIED, IT DEFAULTS
                     0212    843 ;                 TO 0.
                     0212    844 ;       DAYTIM  = ADDRESS OF THE QUADWORD EXPIRATION TIME.  IF THE TIME
                     0212    845 ;                 VALUE IS NEGATIVE, IT INDICATES AN OFFSET (DELTA TIME)
                     0212    846 ;                 FROM THE CURRENT TIME.
                     0212    847 ;       ASTADR  = ADDRESS OF THE ENTRY MASK OF AN AST ROUTINE TO BE
                     0212    848 ;                 CALLED WHEN THE TIME INTERVAL EXPIRES.  IF 0, IT
                     0212    849 ;                 INDICATES NO AST IS TO BE QUEUED.
                     0212    850 ;       REQIDT  = COPIED TO ASTPRM ON AST DELIVERY.
                     0212    851 ;
                     0212    852 ; IMPLICIT INPUTS:      NONE
                     0212    853 ;
                     0212    854 ; OUTPUT PARAMETERS:    NONE
                     0212    855 ;
                     0212    856 ; IMPLICIT OUTPUTS:     NONE
                     0212    857 ;
                     0212    858 ; COMPLETION CODES:     NONE
                     0212    859 ;
                     0212    860 ;       SS$_EXQUOTA     = QUOTA FOR TIMER REQUESTS EXCEEDED.
                     0212    861 ;       DS$_NOTIMP      = FUNCTION NOT IMPLEMENTED IN STAND-ALONE.
                     0212    862 ;       SS$_NORMAL      = NORMAL RETURN.
                     0212    863 ;
                     0212    864 ; SIDE EFFECTS:         NONE
                     0212    865 ;--
```

```
                     003C  0212   867 .ENTRY  EXE$SETIMR,^M<R2,R3,R4,R5>
                           0214   868
                           0214   869         CMK     SETIMR                  ; Execute code in KERNEL mode
                        7E   DC   0214         MOVPSL  -(SP)
                  06 6E    1A   E0   0216         BBS     #PSL$V_IS, (SP), 30004$
                           8E   D4   021A         CLRL    (SP)+
                           0C   BC   021C         CHMK    #CMK$_SETIMR
                           06   11   021E         BRB     30005$
              00000227'EF   16   0220     30004$: JSB     CMK$SETIMR
                           0226       30005$:
                           04   0226   870         RET                     ; All done, return
                           0227   871
                           0227   872 ;+
                           0227   873 ; KERNEL mode routine to SETIMR
                           0227   874 ;-
                           0227   875 CMK$SETIMR::
                     50    1C   D0   0227   876         MOVL    S^#SS$_EXQUOTA,R0       ; PRESUME QUOTA EXCEEDED
                        FDD3'   30   022A   877         BSBW    W^KB_CHECK
           00000000'EF    11   E0   022D   878         BBS     #DS$V_TIMRON, DS$GL_FLAGS -
                           67        0234   879                 ,50$                    ; Can't SETIMR if TIMER owned
                                     0235   880
                                     0235   881         $CLREF_G  (AP)                  ; CLEAR THE EVENT FLAG.
           00000000'GF    6C   FA   0235                 CALLG   (AP),G^SYS$CLREF
                        5D 50   E9   023C   882         BLBC    R0,50$                  ; Exit if CLREF failed
                                     023F   883
        00000000'EF    40 8F   8A   023F   884         BICB2   #DS$M_ABRTFLG, -        ; CLEAR ABORTWAIT FLAG.
                                     0247   885                 DS$GL_FLAGS
                                     0247   886
     50    006600B8 8F   D0   0247   887         MOVL    #DS$_IPL2HI, R0         ; ANTICIPATE IPL TOO HIGH
                           51   DC   024E   888         MOVPSL  R1                      ; GET PROCESSOR STATUS.
                     05    10   ED   0250   889         CMPZV   #PSL$V_IPL,#PSL$S_IPL,- ; CHECK IPL.
                     02    51        0253   890                   R1, #2
                           45   18   0255   891         BGEQ    50$                     ; If GEQ, IPL is too high
     50    006600B0 8F   D0   0257   892         MOVL    #DS$_NOTIMP,R0          ; NOT IMPLEMENTED FOR ABSOLUTE TIME
      51    08 BC   7D   025E   893         MOVQ    aSETIMR$_DAYTIM(AP),R1  ; TEST SIGN BIT OF QUADWORD
                           38   14   0262   894         BGTR    50$                     ; Branch to exit if invalid delta time
                                     0264   895 ;
                                     0264   896 ; ALLOCATE SPACE AND BUILD A TIMER QUEUE ENTRY FOR THIS TIME REQUEST
                                     0264   897 ;
           00000000'EF    16   0264   898         JSB     EXE$ALLOCTQE            ; RETURNS R2=ADDR OF BLOCK IF SUCCEEDS ;G:3
                        2F 50   E9   026A   899         BLBC    R0,50$                  ; Exit if no space for TQE
                     55    52   D0   026D   900         MOVL    R2,R5                   ; Copy address of TQE
                        0B A5   94   0270   901         CLRB    TQE$B_RQTYPE(R5)        ; CLEAR AST CONTROL BLOCK FLAGS
  0C A5    00000000'8F   D0   0273   902         MOVL    #IOC$K_DIAGPID,TQE$L_PID(R5) ; SET PID
        10 A5    0C AC   7D   027B   903         MOVQ    SETIMR$_ASTADR(AP), -
                                     0280   904                   TQE$L_AST(R5)   ; COPY AST ADDRESS AND PARAMETER
        29 A5    04 AC   90   0280   905         MOVB    SETIMR$_EFN(AP), -      ; COPY EVENT FLAG NUMBER TO TQE
                                     0285   906                   TQE$B_EFN(R5)
           7E    08 BC   7D   0285   907         MOVQ    aSETIMR$_DAYTIM(AP),-(SP) ; GET DURATION TIME
     50    00000000'EF   7D   0289   908         MOVQ    EXE$GQ_SYSTIME,R0       ; GET CURRENT TIME
              50    8E   C2   0290   909         SUBL2   (SP)+,R0                ; Current -(-DELTA)=Current+DELTA
              51    8E   D9   0293   910         SBWC    (SP)+,R1                ; Same with high order
                 FF47   30   0296   911         BSBW    EXE$INSTIMQ             ; Insert it in the timer queue
              50    01   D0   0299   912         MOVL    S^#SS$_NORMAL,R0        ; RETURN SUCCESS
                                     029C   913                                 ; FALL IN TO EXIT
                           02   029C   914 50$:     REI                     ; Return to calling mode
```

```
                        029D   916          .SBTTL  DSI$TimSrv -    INTERVAL TIMER INTERRUPT SERVICE ROUTINE.
                        029D   917 ;++
                        029D   918 ; FUNCTIONAL DESCRIPTION:
                        029D   919 ;
                        029D   920 ;       INTERVAL TIMER INTERRUPT SERVICE ROUTINE
                        029D   921 ;
                        029D   922 ; CALLING SEQUENCE:
                        029D   923 ;
                        029D   924 ;       INTERRUPT
                        029D   925 ;
                        029D   926 ; IMPLICIT INPUTS:
                        029D   927 ;
                        029D   928 ;       NONE
                        029D   929 ;
                        029D   930 ; IMPLICIT OUTPUTS:
                        029D   931 ;
                        029D   932 ;       NONE
                        029D   933 ;
                        029D   934 ; SIDE EFFECTS:
                        029D   935 ;
                        029D   936 ;       NONE
                        029D   937 ;--
```

```
                                 029D   939          .ALIGN  LONG
                                 02A0   940 DSI$TIMSRV::
          09 00000000'EF    E8   02A0   941          Blbs    L^DS$GB_Stopping_The_Timer, -; Don't start the interval [35]
                                 02A7   942            4$                              ; timer up again if we are in the [35]
                                 02A7   943                                            ; . . . the process of stopping it - in [22]
                                 02A7   944                                            ; . . . the DSX$SETVEC routine, because of
                                 02A7   945                                            ; . . . the asynchronous nature of the  [22]
                                 02A7   946                                            ; . . . VAX 11/730 console instructions [22]
                                 02A7   947
          18    800000C1 8F    DA   02A7   948          MTPR    #ICCS$M_RESET,#PR$_ICCS ; Resetting the timer
                       07    11   02AE   949          BRB     5$                      ; Normal flow                           [25]
                                 02B0   950
          18    80000080 8F    DA   02B0   951 4$:      MTPR    #ICCS$M_ERR+ICCS$M_INT, -;                                      [35]
                                 02B7   952                    #PR$_ICCS               ; Clear the interrupt to avoid race     [25]
                                 02B7   953                                            ; with DSX$SETVEC                       [25]
               00000000'EF       D5   02B7   954 5$:      TSTL    MP$GR_BOOTED_PROCESSORS ; Are we an mp system? [33]
                          1B     13   02BD   955          BEQL    7$                      ; If not, then branch  [33]
                          52     DD   02BF   956          PUSHL   R2                      ; Get register          [35]
          52    0000005E 8F    DB   02C1   957          MFPR    #PR8SS$_BINID,R2        ; Read node id for current cpu [35]
          52    00000000'EF    91   02C8   958          CMPB    DS$GB_PRIMARY_CPU_IDENTIFIER,R2; Are we the primary?[35]
                          06     13   02CF   959          BEQL    6$                      ; Branch if Pp  [35]
                       52 8ED0   02D1   960          POPL    R2                      ; Release storage       [35]
                      004B    31   02D4   961          BRW     30$                     ; Not the primary, skip incr time [35]
                                 02D7   962
                       52 8ED0   02D7   963 6$:      POPL    R2                      ; Release storage       [35]
    00000000'EF       000186A0 8F    C0   02DA   964 7$:      ADDL2   #TICK_NS, EXE$GQ_SYSTIME ; INCREMENT SYSTIME    [35]
          00000004'EF       00    D8   02E5   965          ADWC    #0, EXE$GQ_SYSTIME+4    ; AND HIGH HALF
                                 02EC   966
                                 02EC   967 ;+
                                 02EC   968 ;       CHECK TIMER QUEUE FOR DUE REQUESTS
                                 02EC   969 ;-
                                 02EC   970
                          50     DD   02EC   971          PUSHL   R0                      ; Save a register               [35]
    50    00000000'EF           D0   02EE   972          MOVL    DS$GL_TIMQFL,R0         ; Get address of timer queue entry      [22]
    00000000'8F           50     D1   02F5   973          CMPL    R0,#DS$GL_TIMQFL        ; Anything in queue?
                          21     13   02FC   974          BEQL    20$                     ; Branch if not
00000004'EF       1C    A0     D1   02FE   975          CMPL    TQE$Q_TIME+4(R0),EXE$GQ_SYSTIME+4 ; Compare high order
                          0C     1F   0306   976          BLSSU   10$                     ; If LSSU entry due
                          15     1A   0308   977          BGTRU   20$                     ; If GTRU entry not due
00000000'EF       18    A0     D1   030A   978          CMPL    TQE$Q_TIME(R0),EXE$GQ_SYSTIME ; Compare low order
                          0B     1A   0312   979          BGTRU   20$                     ; IF GTRU entry not due
                                 0314   980
                                 0314   981 10$:      SOFTINT #IPL$_TIMER             ; Entry is due dispatch on timer level
                    14    07     DA   0314                  MTPR    #IPL$_TIMER,S^#PR$_SIRR
00 00000000'EF          07     E2   0317   982          BBSS    #IPL$_TIMER,DS$GA_SOFTINT,20$; Set level 7 interrupt expected
                                 031F   983
                       50 8ED0   031F   984 20$:      POPL    R0                      ; Restore R0
                          02     0322   985 30$:      REI
```

```
                        0323   987          .SBTTL  DSI$TIMER -     Level 7 timer interrupt service
                        0323   988 ;++
                        0323   989 ; FUNCTIONAL DESCRIPTION:
                        0323   990 ;
                        0323   991 ;       This interrupt service routine is called from a software level 7
                        0323   992 ;       timer interrupt.  It is used to process timer queue entries that
                        0323   993 ;       are due and to check for hung qio devices
                        0323   994 ;
                        0323   995 ; CALLING SEQUENCE:
                        0323   996 ;
                        0323   997 ;       Interrupt service entry
                        0323   998 ;
                        0323   999 ;--
```

```
                                0323  1001          .ALIGN  LONG
                                0324  1002 DSI$TIMER::
                          3F    BB  0324  1003          PUSHR   #^M<R0,R1,R2,R3,R4,R5>  ; Save a few
                                0326  1004
                                0326  1005 ;+
                                0326  1006 ;       CHECK TIMER QUEUE FOR DUE REQUESTS
                                0326  1007 ;-
                                0326  1008
                                0326  1009 10$:     SETIPL  #IPL$_HWCLK             ; Prevent interruptions by clock
                    12  18    DA  0326                      MTPR    #IPL$_HWCLK,S^#PR$_IPL
                55  00000000'EF    D0  0329  1010          MOVL    DS$GL_TIMQFL,R5         ; Get address of timer queue entry
                00000000'8F  55     D1  0330  1011          CMPL    R5,#DS$GL_TIMQFL        ; Anything in queue?
                          03  12    0337  1012          BNEQ    15$                     ; Branch if something in queue
                       007D  31    0339  1013          BRW     40$                     ; Exit if empty
                                033C  1014 15$:
              00000004'EF  1C A5    D1  033C  1015          CMPL    TQE$Q_TIME+4(R5),EXE$GQ_SYSTIME+4 ; Compare high order
                          0C  1F    0344  1016          BLSSU   20$                     ; If LSSU entry due
                          71  1A    0346  1017          BGTRU   40$                     ; If GTRU entry not due
              00000000'EF  18 A5    D1  0348  1018          CMPL    TQE$Q_TIME(R5),EXE$GQ_SYSTIME ; Compare low order
                          67  1A    0350  1019          BGTRU   40$                     ; IF GTRU entry not due
                                0352  1020 ;+
                                0352  1021 ; Remove entry from queue
                                0352  1022 ;-
                                0352  1023
                       50   65  0F  0352  1024 20$:     REMQUE  (R5), R0                ; Remove queue entry                    [18]
                                0355  1025          SETIPL  #IPL$_TIMER             ; Back to our level
                    12  07    DA  0355                      MTPR    #IPL$_TIMER,S^#PR$_IPL
           50   0B A5  02  00  EF  0358  1026          EXTZV   #0,#2,TQE$B_RQTYPE(R5),R0; Get request type
                                035E  1027          CASE    R0,<25$,35$>            ; Dispatch on type
                01'  00  50  AF  035E                CASEW   R0,#0,S^#<<30007$-30006$>/2>-1
                                0362        30006$:
                          0017' 0362                .SIGNED_WORD    25$-30006$
                          0039' 0364                .SIGNED_WORD    35$-30006$
                                0366        30007$:
                                0366  1028  ERRSUP_S
              00000000'EF  DF   0366                      PUSHAL  $MODULE
                          00  DD  036C                    PUSHL   #0
                          01  DD  036E                    PUSHL   #$ER
           00000000'EF    03  FB  0370                    CALLS   #3, DS_ERRSUP
                          AD  11  0377  1029          BRB     10$                             ; Check again
```

```
                     0379  1031 ;+
                     0379  1032 ; Process timer entry that queues an AST or sets an event flag
                     0379  1033 ;-
                     0379  1034
      7E   29 A5  9A 0379  1035 25$:    MOVZBL  TQE$B_EFN(R5),-(SP)     ; SPECIFY EVENT FLAG NUMBER
00000000'9F   01  FB 037D  1036          CALLS   #1,a#SYS$SETEF          ; AND GO SET IT
           10 A5  D5 0384  1037          TSTL    TQE$L_AST(R5)           ; AST ADDRESS SPECIFIED ?
              07  13 0387  1038          BEQL    30$                     ; IF EQL, NO AST SPECIFIED
                     0389  1039
              52  D4 0389  1040          CLRL    R2                      ; PRIORITY INCREMENT CLASS
            FC72' 30 038B  1041          BSBW    SCH$QAST                ; GO SCHEDULE AN AST FOR THIS TIMER
              96  11 038E  1042          BRB     10$                     ; GO BACK FOR NEXT ENTRY
                     0390  1043
      50   55  D0 0390  1044 30$:    MOVL    R5,R0                   ; POINT TO CURRENT ENTRY
00000000'EF   16 0393  1045          JSB     EXE$DEANONPAGED         ;  AND RETURN IT TO FREE MEMORY POOL  ;G:4
              8B  11 0399  1046          BRB     10$                     ; BACK TO LOOK AT NEXT ENTRY
                     039B  1047
                     039B  1048 ;+
                     039B  1049 ; call timer driven system routine
                     039B  1050 ;-
                     039B  1051
      53   10 A5  7D 039B  1052 35$:    MOVQ    TQE$L_FR3(R5),R3        ; Restore subroutine context
           0C B5  16 039F  1053          JSB     @TQE$L_FPC(R5)          ; Call routine
   0F 0B A5   02  E1 03A2  1054          BBC     #TQE$V_REPEAT,TQE$B_RQTYPE(R5),38$; if not repeatable
      50   20 A5  7D 03A7  1055          MOVQ    TQE$Q_DELTA(R5),R0      ; Get delta time
      50   18 A5  C0 03AB  1056          ADDL    TQE$Q_TIME(R5),R0       ; Add low order parts
      51   1C A5  D8 03AF  1057          ADWC    TQE$Q_TIME+4(R5),R1     ; Add high order parts w/ carry
            FE2A  30 03B3  1058          BSBW    EXE$INSTIMQ             ; re-insert in the timer queue
                     03B6  1059 38$:
            FF6D  31 03B6  1060          BRW     10$                     ; Look in queue again
                     03B9  1061
                     03B9  1062 40$:
                     03B9  1063          SETIPL  #IPL$_TIMER             ; Back to our level
   12   07  DA 03B9                      MTPR    #IPL$_TIMER,S^#PR$_IPL
                     03BC  1064 DSI$TIMER_X:
              3F  BA 03BC  1065          POPR    #^M<R0,R1,R2,R3,R4,R5>
                 02  03BE  1066          REI                             ; Exit from timer service
```

```
                                03BF  1068 ;+
                                03BF  1069 ; This routine is called each second to update the time
                                03BF  1070 ; and check for timed out UCB's
                                03BF  1071 ;-
                                03BF  1072
                                03BF  1073 ONE_SECOND:
          00000000'EF    D6     03BF  1074          INCL    EXE$GL_ABSTIM           ; Update time
                                03C5  1075
              7E    55    7D    03C5  1076          MOVQ    R5,-(SP)                ; Save registers
        56    00000000'EF   DE    03C8  1077          MOVAL   L^IOC$GL_DEVLIST-DDB$L_LINK, R6 ; Locate first DDB              [17]
              56    66    D0    03CF  1078 10$:     MOVL    DDB$L_LINK(R6),R6       ; LOCATE NEXT DDB
                    3F    13    03D2  1079          BEQL    60$                     ; IF EQL, NO MORE DDB'S
                                03D4  1080                                          ;
              55    DB A6 DE    03D4  1081 20$:     MOVAL   DDB$L_UCB-UCB$L_LINK(R6),R5     ; LOCATE FIRST UCB
                                03D8  1082                                          ;
              55    2C A5 D0    03D8  1083 30$:     MOVL    UCB$L_LINK(R5),R5       ; LOCATE NEXT UCB
                    F1    13    03DC  1084          BEQL    10$                     ; IF EQL, NO MORE UCB'S THIS DDB
                                03DE  1085 ;
                                03DE  1086 ; AT THIS POINT A UCB HAS BEEN LOCATED
                                03DE  1087 ;
                                03DE  1088
                                03DE  1089          SETIPL  #IPL$_POWER             ; Raise to Powerfail level
              12    1F    DA    03DE                MTPR    #IPL$_POWER,S^#PR$_IPL
        28 58 A5    00    E1    03E1  1090          BBC     #UCB$V_TIM,UCB$W_STS(R5),50$    ; IF NOT WAITING, GET NEXT UCB
    00000000'EF   5C A5 D1    03E6  1091          CMPL    UCB$L_DUETIM(R5),EXE$GL_ABSTIM  ; CHECK DUE TIME FOR TIMED OUT
                    1E    14    03EE  1092          BGTR    50$                     ; IF GTR, LET IT WAIT LONGER
                                03F0  1093
              58 A5 03    AA    03F0  1094          BICW    #UCB$M_INT!UCB$M_TIM, -
                                03F4  1095                  UCB$W_STS(R5)           ; Clear interrupt and timer
    58 A5   0040 8F     A8    03F4  1096          BISW    #UCB$M_TIMOUT,UCB$W_STS(R5)     ; SET TIMED OUT STATUS BIT
                                03FA  1097          SETIPL  UCB$B_DIPL(R5)          ; Set IPL to device level
          12    52 A5 DA    03FA                MTPR    UCB$B_DIPL(R5),S^#PR$_IPL
          53    10 A5 7D    03FE  1098          MOVQ    UCB$L_FR3(R5),R3        ; RETREIVE FORK CONTEXT
          52    0C A5 D0    0402  1099          MOVL    UCB$L_FPC(R5),R2        ; Get sved pc
             7E    72    32    0406  1100          CVTWL   -(R2),-(SP)             ; Get offset to exception routine
             52    8E    C0    0409  1101          ADDL    (SP)+,R2                ; Address of sxception routine
                   62    16    040C  1102          JSB     (R2)                    ; RE-ACTIVATE I/O REQUEST
                                040E  1103 50$:     SETIPL  #IPL$_TIMER             ; Restore to timer IPL
             12    07    DA    040E                MTPR    #IPL$_TIMER,S^#PR$_IPL
                   C5    11    0411  1104          BRB     30$                     ; GO LOCATE NEXT UCB
                                0413  1105
             55    8E    7D    0413  1106 60$:     MOVQ    (SP)+,R5                ; Restore
                         05    0416  1107          RSB                             ; Return from whence we came
```

```
0417  1109          .SBTTL  CLK$RE_INIT -   SYSTEM TIMER INITIALIZATION SUBROUTINE
0417  1110 ;++
0417  1111 ; FUNCTIONAL DESCRIPTION:
0417  1112 ;
0417  1113 ;       INITIALIZES THE INTERVAL TIMER FOR 10 MILLISECOND TICKS
0417  1114 ;       AND SYNCHRONIZES THE SYSTEM TIME TO THE TIME OF YEAR CLOCK
0417  1115 ;
0417  1116 ; CALLING SEQUENCE:
0417  1117 ;
0417  1118 ;       BSBW    CLK$RE_INIT
0417  1119 ;
0417  1120 ; IMPLICIT INPUTS:
0417  1121 ;
0417  1122 ;       NONE
0417  1123 ;
0417  1124 ; IMPLICIT OUTPUTS:
0417  1125 ;
0417  1126 ;       NONE
0417  1127 ;
0417  1128 ; COMPLETION CODES:
0417  1129 ;
0417  1130 ;       NONE
0417  1131 ;
0417  1132 ; SIDE EFFECTS:
0417  1133 ;
0417  1134 ;       INTERVAL TIMER IS LEFT RUNNING (INTERRUPT ENABLED)
0417  1135 ;       NEXT INTERVAL REGISTER IS SET TO 10 MILLISECONDS
0417  1136 ;
0417  1137 ;       IF PR$_TODR VALID,
0417  1138 ;           EXE$GQ_SYSTIME      =  CURRENT DATE/TIME (64-BIT FORMAT)
0417  1139 ;--
```

```
                                0417  1141 CLK$RE_INIT::
                                0417  1142
                                0417  1143 ;+
                                0417  1144 ; SETUP AND START INTERVAL TIMER
                                0417  1145 ;-
                                0417  1146
        18   80000080 8F    DA  0417  1147         MTPR    #ICCS$M_ERR + -          ; CLEAR ERROR,
                                041E  1148                  ICCS$M_INT, -           ; CLEAR DONE,
                                041E  1149                        #PR$_ICCS         ; AND STOP INTERVAL TIMER
        19   FFFFD8F0 8F    DA  041E  1150         MTPR    #-TICK_US, #PR$_NICR     ; SET NEXT INTERVAL.
        18   00000051 8F    DA  0425  1151         MTPR    #ICCS$M_IE + -           ; ENABLE INTERRUPT,
                                042C  1152                  ICCS$M_XFER + -         ; LOAD,
                                042C  1153                  ICCS$M_RUN, -           ; AND RESTART
                                042C  1154                        #PR$_ICCS         ; THE INTERVAL CLOCK.
                                042C  1155
                                042C  1156 ;+
                                042C  1157 ; SET SYSTIME FROM TOD IF TOD IS VALID
                                042C  1158 ;-
             50    1B    DB  042C  1159         MFPR    #PR780$_TODR, R0         ; GET TIME OF YEAR                          [31]
        50   10000000 8F    C2  042F  1160         SUBL2   #TODR_BIAS, R0           ; REMOVE VALIDATION BIAS
                     09    1E  0436  1161         BGEQU   10$                      ; BRANCH IF TODR OK                         [31]
        1B   10000000 8F    DA  0438  1162         MTPR    #TODR_BIAS, #PR780$_TODR; TODR BAD, RESET TO 0 (+ BIAS)             [31]
                     50    D4  043F  1163         CLRL    R0                       ; BIAS MINUS BIAS = 0                       [31]
                                0441  1164
             50    01    CA  0441  1165 10$:     BICL    #1,R0                    ; CLEAR LOW BIT
          50    50    FF  8F  9C  0444  1166         ROTL    #-1,R0,R0                ; DIVIDE BY 2 UNSIGNED
   50   00    50   00030D40 8F  7A  0449  1167         EMUL    #2*TICK_NS, R0, -        ; CONVERT TIME OF YEAR TO
                                0452  1168                   #0, R0                  ;   SYSTIME FORMAT (10MS TO 100NS)
        50   00000008'EF    C0  0452  1169         ADDL2   L^DS$GQ_CURYEAR, R0      ; ADJUST TO CURRENT TIME/DATE
        51   0000000C'EF    D8  0459  1170         ADWC    L^DS$GQ_CURYEAR+4, R1    ;   (ALL 64 BITS)
   00000000'EF    50    7D  0460  1171         MOVQ    R0, EXE$GQ_SYSTIME       ; Set system date/time
   0000003C'EF    50    7D  0467  1172         MOVQ    R0, ONESECTIM+TQE$Q_TIME ; Reset 1/second timer expiration time
                                046E  1173
                          05  046E  1174         RSB
                                046F  1175
                                046F  1176
                                046F  1177         .END
```

```
$$ARGS                          =  00000004     D
$$T1                            =  00000000     D
$ER                             =  00000002     D
$MODULE                            00000000 R   D  03
BIT...                          =  0000001A     D
CANTIM$_ACMODE                  =  00000008     D
CANTIM$_NARGS                   =  00000002     D
CANTIM$_REQIDT                  =  00000004     D
CLK$RE_INIT                        00000417 RG  D  04
CLOCK_IPL                       =  00000018     D
CMK$CANTIM                         00000186 RG  D  04
CMK$HIBER                          00000158 RG  D  04
CMK$HIBER_X                        0000016D R   D  04
CMK$SETIMR                         00000227 RG  D  04
CMK$_APBOOT                     =  00000004     D
CMK$_ASTEXIT                    =  00000000     D
CMK$_CANTIM                     =  0000000B     D
CMK$_HIBER                      =  00000007     D
CMK$_INITSCB                    =  00000008     D
CMK$_LAST                       =  0000000E     D
CMK$_MMENABLE                   =  00000003     D
CMK$_RCONSOLE                   =  00000001     D
CMK$_REFRESH                    =  00000005     D
CMK$_SCHDWK                     =  00000006     D
CMK$_SETIMR                     =  0000000C     D
CMK$_SETIPL                     =  00000009     D
CMK$_SETPRT                     =  0000000D     D
CMK$_SGIPR                      =  0000000A     D
CMK$_TCONSOLE                   =  00000002     D
DDB$B_ACPCLASS                     00000013     D
DDB$B_TYPE                         0000000A     D
DDB$C_LENGTH                       00000034     D
DDB$K_LENGTH                       00000034     D
DDB$L_ACPD                         00000010     D
DDB$L_DDT                          0000000C     D
DDB$L_LINK                         00000000     D
DDB$L_UCB                          00000004     D
DDB$T_DRVNAME                      00000024     D
DDB$T_NAME                         00000014     D
DDB$W_SIZE                         0000000B     D
DS$CANWAIT                         ********   X   02
DS$GA_SOFTINT                      ********   X   04
DS$GB_PRIMARY_CPU_IDENTIFIER       ********   X   04
DS$GB_STOPPING_THE_TIMER           ********   X   04
DS$GK_USOVR                        ********   X   04
DS$GL_FLAGS                        ********   X   04
DS$GL_TIMQFL                       00000000 R   D  02
DS$GQ_CURYEAR                      00000008 RG  D  02
DS$GT_NEWYEAR                      00000010 RG  D  02
DS$K_ERROR                      =  00000002     D
DS$K_NORMAL                     =  00000001     D
DS$K_NYSIZ                      =  00000014   G  D
DS$K_SEVERE                     =  00000004     D
DS$K_SUBSYS                     =  00000066     D
DS$K_WARNING                    =  00000000     D
DS$M_ABRTFLG                    =  00000040     D
DS$M_BADTIME                    =  00100000     D
DS$M_BATCH                      =  00400000     D
DS$M_BRKCLR                     =  00001000     D
DS$M_BRKPT                      =  00000800     D
DS$M_CHARFLG                    =  00000100     D
DS$M_CMDFLG                     =  00000080     D
DS$M_CTRLC                      =  00000001     D
DS$M_CTRLO                      =  00010000     D
DS$M_DEVFLG                     =  00000200     D
DS$M_DISABLCC                   =  01000000     D
DS$M_DONFLG                     =  00002000     D
DS$M_ERRFLG                     =  00000010     D
DS$M_EXCEPT                     =  00080000     D
DS$M_EXETST                     =  00040000     D
DS$M_HLTFLG                     =  00000008     D
DS$M_LODFLG                     =  00000002     D
DS$M_MEMMGT                     =  00008000     D
DS$M_NI                         =  04000000     D
DS$M_OUTPUT                     =  00800000     D
DS$M_RUBFLG                     =  00000020     D
DS$M_SCRIPT                     =  00200000     D
DS$M_SETIMR                     =  02000000     D
DS$M_STRFLG                     =  00000004     D
DS$M_SUBT                       =  00004000     D
DS$M_SYSFLG                     =  00000400     D
DS$M_TIMED                      =  02000000     D
DS$M_TIMED_OUT                  =  08000000     D
DS$M_TIMRON                     =  00020000     D
DS$V_ABRTFLG                    =  00000006     D
DS$V_BADTIME                    =  00000014     D
DS$V_BATCH                      =  00000016     D
DS$V_BRKCLR                     =  0000000C     D
DS$V_BRKPT                      =  0000000B     D
DS$V_CHARFLG                    =  00000008     D
DS$V_CMDFLG                     =  00000007     D
DS$V_CTRLC                      =  00000000     D
DS$V_CTRLO                      =  00000010     D
DS$V_DEVFLG                     =  00000009     D
DS$V_DISABLCC                   =  00000018     D
DS$V_DONFLG                     =  0000000D     D
DS$V_ERRFLG                     =  00000004     D
DS$V_EXCEPT                     =  00000013     D
DS$V_EXETST                     =  00000012     D
DS$V_HLTFLG                     =  00000003     D
DS$V_LODFLG                     =  00000001     D
DS$V_MEMMGT                     =  0000000F     D
DS$V_NI                         =  0000001A     D
DS$V_OUTPUT                     =  00000017     D
DS$V_RUBFLG                     =  00000005     D
DS$V_SCRIPT                     =  00000015     D
DS$V_SETIMR                     =  00000019     D
DS$V_STRFLG                     =  00000002     D
DS$V_SUBT                       =  0000000E     D
DS$V_SYSFLG                     =  0000000A     D
DS$V_TIMED                      =  00000019     D
DS$V_TIMED_OUT                  =  0000001B     D
DS$V_TIMRON                     =  00000011     D
DS$WAITUS                          ********   X   04
```

```
DS$_AP_NORMAL_BREAK             = 00660150    D     DSA$GL_PASSNO                   0000FE54    D
DS$_ARITH                       = 006600D0    D     DSA$GL_SECTNO                   0000FE10    D
DS$_ASBE                        = 00660118    D     DSA$GL_SID                      0000FE14    D
DS$_BADLINK                     = 006600F0    D     DSA$GL_SUBTNO                   0000FE4C    D
DS$_BADTYPE                     = 006600E8    D     DSA$GL_TESTNO                   0000FE50    D
DS$_BIIC                        = 00660120    D     DSA$GL_UNITS                    0000FE0C    D
DS$_CHME                        = 006600A8    D     DSA$GQ_MSGPTR                   0000FE68    D
DS$_CHMK                        = 006600E0    D     DSA$GT_DEVNAM                   0000FE5C    D
DS$_DEVNAME                     = 00660108    D     DSI$TIMER                       00000324 RG D   04
DS$_ERROR                       = 00660002    D     DSI$TIMER_X                     000003BC R  D   04
DS$_FHWE                        = 00660068    D     DSI$TIMSRV                      000002A0 RG D   04
DS$_FRAGBUF                     = 00660080    D     DSR$SETIMR_INI                  000001C1 RG D   04
DS$_ICBUSY                      = 006600C8    D     DSX$CANWAIT                     00000000 RG D   04
DS$_ICERR                       = 006600C0    D     DSX$WAITMS                      00000029 RG D   04
DS$_IHWE                        = 00660060    D     DSX$WAITMS_X                    000000B3 R  D   04
DS$_ILLCHAR                     = 00660018    D     DSX$WAITUS                      000000B4 RG D   04
DS$_ILLPAGCNT                   = 00660078    D     DSX$WAITUS_USOVR                000000CF RG D   04
DS$_ILLUNIT                     = 00660100    D     DSX$WAITUS_X                    00000134 R  D   04
DS$_INIT_FAIL                   = 00660140    D     DS_ERRSUP                       ********    X   04
DS$_INSFMEM                     = 00660050    D     DYN$C_TQE                     = 0000000F    D
DS$_INVCPU                      = 00660130    D     EXE$ALLOCTQE                    ********    X   04
DS$_IPL2HI                      = 006600B8    D     EXE$CANTIM                      0000016E RG D   04
DS$_IVADDR                      = 00660040    D     EXE$DEANONPAGED                 ********    X   04
DS$_IVVECT                      = 00660038    D     EXE$GL_ABSTIM                   ********    X   04
DS$_KRNLSTK                     = 00660090    D     EXE$GQ_SYSTIME                  ********    X   04
DS$_LOGIC                       = 00660070    D     EXE$HIBER                       00000135 RG D   04
DS$_MCHK                        = 00660088    D     EXE$HIBER_X                     00000157 R  D   04
DS$_MEM_ALLOC_ERR               = 00660138    D     EXE$INSTIMQ                     000001E0 RG D   04
DS$_MMOFF                       = 00660058    D     EXE$SETIMR                      00000212 RG D   04
DS$_NEEDUNIT                    = 006600F8    D     EXE$WAKE                        0000001B RG D   04
DS$_NODE                        = 00660128    D     GETTIM$_NARGS                 = 00000001    D
DS$_NOPCS                       = 00660110    D     GETTIM$_TIMADR                = 00000004    D
DS$_NORMAL                      = 00660001    D     ICCS$M_ERR                    = 80000000    D
DS$_NOSUPPORT                   = 006600B1    D     ICCS$M_IE                     = 00000040    D
DS$_NOTALLOWMP                  = 00660148    D     ICCS$M_INT                    = 00000080    D
DS$_NOTDON                      = 00660030    D     ICCS$M_RESET                  = 800000C1    D
DS$_NOTIMP                      = 006600B0    D     ICCS$M_RUN                    = 00000001    D
DS$_NULLSTR                     = 00660010    D     ICCS$M_XFER                   = 00000010    D
DS$_OVERFLOW                    = 00660008    D     ID_TEMP                         00000068 R  D   02
DS$_POWER                       = 00660098    D     IOC$GL_DEVLIST                  ********    X   04
DS$_PROGERR                     = 00660020    D     IOC$K_DIAGPID                   ********    X   04
DS$_SEVERE                      = 00660004    D     IPL$_HWCLK                    = 00000018    D
DS$_TRANSL                      = 006600A0    D     IPL$_POWER                    = 0000001F    D
DS$_TRUNCATE                    = 00660028    D     IPL$_TIMER                    = 00000007    D
DS$_UNEXPINT                    = 006600D8    D     KB_CHECK                        ********    X   04
DS$_UNSUPPDEV                   = 00660158    D     MP$GR_BOOTED_PROCESSORS         ********    X   04
DS$_VASFULL                     = 00660048    D     MP$_GET_PROCESSOR_ID            ********    X   00
DS$_WARNING                     = 00660000    D     MSTIME                          00000060 R  D   02
DSA$AL_APTMAIL                    0000FE00    D     ONESECTIM                       00000024 R  D   02
DSA$AT_APTTXT                     0000FA00    D     ONE_SECOND                      000003BF R  D   04
DSA$GL_APTCOM                     0000FE04    D     PR$_ICCS                      = 00000018    D
DSA$GL_DEVLEN                     0000FE58    D     PR$_ICR                       = 0000001A    D
DSA$GL_ERRNO                      0000FE44    D     PR$_IPL                       = 00000012    D
DSA$GL_EVENT                      0000FE48    D     PR$_NICR                      = 00000019    D
DSA$GL_FLAGS                      0000FE00    D     PR$_SIRR                      = 00000014    D
DSA$GL_MSGTYP                     0000FE40    D     PR780$_TODR                   = 0000001B    D
DSA$GL_PASSES                     0000FE08    D     PR8SS$_BINID                  = 0000005E    D
```

```
PSL$S_IPL                       =  00000005     D
PSL$V_IPL                       =  00000010     D
PSL$V_IS                        =  0000001A     D
SCB$L_ACCESS                       00000020     D
SCB$L_ARITH                        00000034     D
SCB$L_BREAK                        0000002C     D
SCB$L_CHME                         00000044     D
SCB$L_CHMK                         00000040     D
SCB$L_CHMS                         00000048     D
SCB$L_CHMU                         0000004C     D
SCB$L_COMPAT                       00000030     D
SCB$L_KNLSTK                       00000008     D
SCB$L_MACHCHK                      00000004     D
SCB$L_OPCCUS                       00000014     D
SCB$L_OPCDEC                       00000010     D
SCB$L_POWER                        0000000C     D
SCB$L_RADRMOD                      0000001C     D
SCB$L_ROPRAND                      00000018     D
SCB$L_RXDB                         000000F8     D
SCB$L_SFTLVL1                      00000084     D
SCB$L_SFTLVL10                     000000A8     D
SCB$L_SFTLVL11                     000000AC     D
SCB$L_SFTLVL12                     000000B0     D
SCB$L_SFTLVL13                     000000B4     D
SCB$L_SFTLVL14                     000000B8     D
SCB$L_SFTLVL15                     000000BC     D
SCB$L_SFTLVL2                      00000088     D
SCB$L_SFTLVL3                      0000008C     D
SCB$L_SFTLVL4                      00000090     D
SCB$L_SFTLVL5                      00000094     D
SCB$L_SFTLVL6                      00000098     D
SCB$L_SFTLVL7                      0000009C     D
SCB$L_SFTLVL8                      000000A0     D
SCB$L_SFTLVL9                      000000A4     D
SCB$L_TBIT                         00000028     D
SCB$L_TIMER                        000000C0     D
SCB$L_TRANSL                       00000024     D
SCB$L_TXDB                         000000FC     D
SCB$L_VM                           00000038     D
SCB$L_ZERO                         00000000     D
SCH$QAST                           ********   X    04
SEC_TICK                        =  00000064   G  D
SETIMR$_ASTADR                  =  0000000C     D
SETIMR$_DAYTIM                  =  00000008     D
SETIMR$_EFN                     =  00000004     D
SETIMR$_NARGS                   =  00000004     D
SETIMR$_REQIDT                  =  00000010     D
SIZ...                          =  00000001     D
SS$_EXQUOTA                     =  0000001C     D
SS$_NORMAL                      =  00000001     D
SYS$CANTIM                         ********   GX   04
SYS$CLREF                          ********   GX   04
SYS$GETTIM                         ********   GX   04
SYS$HIBER                          ********   GX   04
SYS$SETEF                          ********    X   04
SYS$SETIMR                         ********   GX   04
SYS$WAKE                           ********    X   04

TICK_NS                         =  000186A0   G  D
TICK_US                         =  00002710      D
TODR_BIAS                       =  10000000   G  D
TQE$B_EFN                       =  00000029      D
TQE$B_RQTYPE                    =  0000000B      D
TQE$C_SSREPT                    =  00000005      D
TQE$L_AST                       =  00000010      D
TQE$L_ASTPRM                    =  00000014      D
TQE$L_FPC                       =  0000000C      D
TQE$L_FR3                       =  00000010      D
TQE$L_PID                       =  0000000C      D
TQE$L_TQBL                      =  00000004      D
TQE$L_TQFL                      =  00000000      D
TQE$Q_DELTA                     =  00000020      D
TQE$Q_TIME                      =  00000018      D
TQE$V_REPEAT                    =  00000002      D
UCB$B_AMOD                         00000053      D
UCB$B_CEX                          00000077      D
UCB$B_CM1                          0000004A      D
UCB$B_CM2                          0000004B      D
UCB$B_DEVCLASS                     00000038      D
UCB$B_DEVTYPE                      00000039      D
UCB$B_DIPL                         00000052      D
UCB$B_DX_SCTCNT                    000000A6      D
UCB$B_ERTCNT                       00000070      D
UCB$B_ERTMAX                       00000071      D
UCB$B_FEX                          00000076      D
UCB$B_FIPL                         0000000B      D
UCB$B_LOCSRV                       0000003C      D
UCB$B_OFFNDX                       00000094      D
UCB$B_OFFRTC                       00000095      D
UCB$B_REMSRV                       0000003D      D
UCB$B_SECTORS                      0000003C      D
UCB$B_SLAVE                        00000074      D
UCB$B_SPR                          00000075      D
UCB$B_STATE                        00000052      D
UCB$B_TRACKS                       0000003D      D
UCB$B_TT_CRFILL                    0000009D      D
UCB$B_TT_DECRF                     000000A1      D
UCB$B_TT_DELFF                     000000A2      D
UCB$B_TT_DESPEE                    000000A0      D
UCB$B_TT_DETYPE                    000000A4      D
UCB$B_TT_LFFILL                    0000009E      D
UCB$B_TT_SPEED                     0000009C      D
UCB$B_TYPE                         0000000A      D
UCB$B_VERTSZ                       0000003F      D
UCB$C_LENGTH                       00000074      D
UCB$C_MB_LENGTH                    00000090      D
UCB$C_TT_LENGTH                    000000BC      D
UCB$K_LENGTH                       00000074      D
UCB$K_MB_LENGTH                    00000090      D
UCB$K_TT_LENGTH                    000000BC      D
UCB$L_AMB                          00000054      D
UCB$L_ASTQBL                       00000010      D
UCB$L_ASTQFL                       0000000C      D
UCB$L_CPID                         0000005C      D
UCB$L_CRB                          00000020      D
```

```
UCB$L_DDB                       00000024    D
UCB$L_DEVCHAR                   00000034    D
UCB$L_DEVDEPEND                 0000003C    D
UCB$L_DPC                       00000080    D
UCB$L_DUETIM                    0000005C    D
UCB$L_DX_BFPNT                  0000009C    D
UCB$L_DX_BUF                    00000098    D
UCB$L_DX_RXDB                   000000A0    D
UCB$L_EMB                       00000078    D
UCB$L_FIRST                     00000014    D
UCB$L_FPC                       0000000C    D
UCB$L_FQBL                      00000004    D
UCB$L_FQFL                      00000000    D
UCB$L_FR3                       00000010    D
UCB$L_FR4                       00000014    D
UCB$L_IOQBL                     00000044    D
UCB$L_IOQFL                     00000040    D
UCB$L_IRP                       0000004C    D
UCB$L_LINK                      0000002C    D
UCB$L_LOGADR                    00000064    D
UCB$L_MAXBLOCK                  00000084    D
UCB$L_MB_MBX                    0000007C    D
UCB$L_MB_PORT                   0000008C    D
UCB$L_MB_RAST                   00000078    D
UCB$L_MB_SHB                    00000080    D
UCB$L_MB_WAST                   00000074    D
UCB$L_MB_WIOQBL                 00000088    D
UCB$L_MB_WIOQFL                 00000084    D
UCB$L_MEDIA                     0000008C    D
UCB$L_NT_DATSSB                 00000074    D
UCB$L_NT_INTSSB                 00000078    D
UCB$L_OPCNT                     00000060    D
UCB$L_OWNUIC                    0000001C    D
UCB$L_PID                       00000028    D
UCB$L_RQBL                      00000004    D
UCB$L_RQFL                      00000000    D
UCB$L_SVAPTE                    00000068    D
UCB$L_SVPN                      00000064    D
UCB$L_TT_DECHAR                 000000A8    D
UCB$L_TT_RDUE                   0000008C    D
UCB$L_TT_RTIMOU                 000000B8    D
UCB$L_VCB                       00000030    D
UCB$M_INT                     = 00000002    D
UCB$M_TIM                     = 00000001    D
UCB$M_TIMOUT                  = 00000040    D
UCB$T_PARTNER                   0000000C    D
UCB$V_TIM                     = 00000000    D
UCB$W_BCNT                      0000006E    D
UCB$W_BCR                       00000096    D
UCB$W_BOFF                      0000006C    D
UCB$W_BUFQUO                    00000018    D
UCB$W_BYTESTOGO                 0000003E    D
UCB$W_CHARGE                    0000004A    D
UCB$W_CYLINDERS                 0000003E    D
UCB$W_DA                        0000008C    D
UCB$W_DC                        0000008E    D
UCB$W_DEVBUFSIZ                 0000003A    D
UCB$W_DEVSTS                    0000005A    D
UCB$W_DIRSEQ                    00000088    D
UCB$W_DSTADDR                   00000018    D
UCB$W_DX_BCR                    000000A4    D
UCB$W_EC1                       00000090    D
UCB$W_EC2                       00000092    D
UCB$W_ERRCNT                    00000072    D
UCB$W_FUNC                      0000007E    D
UCB$W_MB_SEED                   00000000    D
UCB$W_MSGCNT                    00000016    D
UCB$W_MSGMAX                    00000014    D
UCB$W_NT_CHAN                   0000007C    D
UCB$W_OFFSET                    0000008A    D
UCB$W_REFC                      00000050    D
UCB$W_SIZE                      00000008    D
UCB$W_SRCADDR                   0000001A    D
UCB$W_STS                       00000058    D
UCB$W_TT_DESIZE                 000000A5    D
UCB$W_UNIT                      00000048    D
UCB$W_VPROT                     0000001A    D
WAITMS$_NARGS                 = 00000002    D
WAITMS$_TAG                   = 00000008    D
WAITMS$_TIME                  = 00000004    D
WAITMS_ARGS                     0000004C R  D  02
WAITUS$_NARGS                 = 00000002    D
WAITUS$_TAG                   = 00000008    D
WAITUS$_TIME                  = 00000004    D
```

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                                  +----------------+
                                  ! Psect synopsis !
                                  +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           0000FE70  (65136.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
WORK                            0000006C  (  108.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR NOEXE   RD    WRT NOVEC LONG
DATA                            00000006  (    6.)  03 (  3.)  NOPIC   USR   CON   REL   LCL   SHR NOEXE   RD  NOWRT NOVEC BYTE
CODE                            0000046F  ( 1135.)  04 (  4.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD  NOWRT NOVEC LONG
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$ARGS	=00000004	360 (1)	293 (1) 294 (1) 305 (1) 308 (1) 309 (1) 360 (1)
$$T1	=00000000	407 (1)	293 (1) 294 (1) 305 (1) 308 (1) 309 (1) 360 (1) 407 (1)
$ER	=00000002	1028 (1)	#-1028 (1)
$MODULE	00000000-R	372 (1)	1028 (1)
BIT...	=0000001A	311 (1)	297 (1) 310 (1) 311 (1)
CANTIM$_ACMODE	=00000008	293 (1)	
CANTIM$_NARGS	=00000002	293 (1)	
CANTIM$_REQIDT	=00000004	293 (1)	#-722 (1)
CLK$RE_INIT	00000417-R	1141 (1)	#-617 (1) #-676 (1)
CLOCK_IPL	=00000018	327 (1)	
CMK$CANTIM	00000186-R	719 (1)	712 (1)
CMK$HIBER	00000158-R	670 (1)	661 (1)
CMK$HIBER_X	0000016D-R	678 (1)	#-672 (1)
CMK$SETIMR	00000227-R	875 (1)	869 (1)
CMK$_APBOOT	=00000004	310 (1)	
CMK$_ASTEXIT	=00000000	310 (1)	
CMK$_CANTIM	=0000000B	310 (1)	#-712 (1)
CMK$_HIBER	=00000007	310 (1)	#-661 (1)
CMK$_INITSCB	=00000008	310 (1)	
CMK$_LAST	=0000000E	310 (1)	
CMK$_MMENABLE	=00000003	310 (1)	
CMK$_RCONSOLE	=00000001	310 (1)	
CMK$_REFRESH	=00000005	310 (1)	
CMK$_SCHDWK	=00000006	310 (1)	
CMK$_SETIMR	=0000000C	310 (1)	#-869 (1)
CMK$_SETIPL	=00000009	310 (1)	
CMK$_SETPRT	=0000000D	310 (1)	
CMK$_SGIPR	=0000000A	310 (1)	
CMK$_TCONSOLE	=00000002	310 (1)	
DDB$L_LINK	00000000		1077 (1) #-1078 (1)
DDB$L_UCB	00000004		1081 (1)
DS$CANWAIT	00000000-XR		360 (1)
DS$GA_SOFTINT	00000000-XR		982 (1)
DS$GB_PRIMARY_CPU_IDENTIFIER	00000000-XR		#-958 (1)
DS$GB_STOPPING_THE_TIMER	00000000-XR		#-941 (1)
DS$GK_USOVR	00000000-XR		#-584 (1)
DS$GL_FLAGS	00000000-XR		#-447 (1) 578 (1) #-581 (1) 600 (1) 660 (1) 672 (1) 878 (1) #-885 (1)
DS$GL_TIMQFL	00000000-R	335 (1)	#-1010 (1) #-1011 (1) 336 (1) 337 (1) 721 (1) 774 (1) 812 (1) #-972 (1) #-973 (1)
DS$GQ_CURYEAR	00000008-R	339 (1)	#-1169 (1) #-1170 (1)
DS$GT_NEWYEAR	00000010-R	342 (1)	345 (1)
DS$K_ERROR	=00000002	297 (1)	
DS$K_NORMAL	=00000001	297 (1)	
DS$K_NYSIZ	=00000014	345 (1)	
DS$K_SEVERE	=00000004	297 (1)	
DS$K_SUBSYS	=00000066	297 (1)	297 (1)

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DS$K_WARNING                    =00000000     297    (1)
DS$M_ABRTFLG                    =00000040     311    (1)   #-446    (1)    #-580    (1)    #-884    (1)
DS$M_BADTIME                    =00100000     311    (1)
DS$M_BATCH                      =00400000     311    (1)
DS$M_BRKCLR                     =00001000     311    (1)
DS$M_BRKPT                      =00000800     311    (1)
DS$M_CHARFLG                    =00000100     311    (1)
DS$M_CMDFLG                     =00000080     311    (1)
DS$M_CTRLC                      =00000001     311    (1)
DS$M_CTRLO                      =00010000     311    (1)
DS$M_DEVFLG                     =00000200     311    (1)
DS$M_DISABLCC                   =01000000     311    (1)
DS$M_DONFLG                     =00002000     311    (1)
DS$M_ERRFLG                     =00000010     311    (1)
DS$M_EXCEPT                     =00080000     311    (1)
DS$M_EXETST                     =00040000     311    (1)
DS$M_HLTFLG                     =00000008     311    (1)
DS$M_LODFLG                     =00000002     311    (1)
DS$M_MEMMGT                     =00008000     311    (1)
DS$M_NI                         =04000000     311    (1)
DS$M_OUTPUT                     =00800000     311    (1)
DS$M_RUBFLG                     =00000020     311    (1)
DS$M_SCRIPT                     =00200000     311    (1)
DS$M_SETIMR                     =02000000     311    (1)
DS$M_STRFLG                     =00000004     311    (1)
DS$M_SUBT                       =00004000     311    (1)
DS$M_SYSFLG                     =00000400     311    (1)
DS$M_TIMED                      =02000000     311    (1)
DS$M_TIMED_OUT                  =08000000     311    (1)
DS$M_TIMRON                     =00020000     311    (1)
DS$V_ABRTFLG                    =00000006     311    (1)   #-599    (1)    #-659    (1)
DS$V_BADTIME                    =00000014     311    (1)
DS$V_BATCH                      =00000016     311    (1)
DS$V_BRKCLR                     =0000000C     311    (1)
DS$V_BRKPT                      =0000000B     311    (1)
DS$V_CHARFLG                    =00000008     311    (1)
DS$V_CMDFLG                     =00000007     311    (1)
DS$V_CTRLC                      =00000000     311    (1)
DS$V_CTRLO                      =00000010     311    (1)
DS$V_DEVFLG                     =00000009     311    (1)
DS$V_DISABLCC                   =00000018     311    (1)
DS$V_DONFLG                     =0000000D     311    (1)
DS$V_ERRFLG                     =00000004     311    (1)
DS$V_EXCEPT                     =00000013     311    (1)
DS$V_EXETST                     =00000012     311    (1)
DS$V_HLTFLG                     =00000003     311    (1)
DS$V_LODFLG                     =00000001     311    (1)
DS$V_MEMMGT                     =0000000F     311    (1)
DS$V_NI                         =0000001A     311    (1)
DS$V_OUTPUT                     =00000017     311    (1)
DS$V_RUBFLG                     =00000005     311    (1)
DS$V_SCRIPT                     =00000015     311    (1)
DS$V_SETIMR                     =00000019     311    (1)
DS$V_STRFLG                     =00000002     311    (1)
DS$V_SUBT                       =0000000E     311    (1)
DS$V_SYSFLG                     =0000000A     311    (1)
DS$V_TIMED                      =00000019     311    (1)
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DS$V_TIMED_OUT                  =0000001B      311    (1)
DS$V_TIMRON                     =00000011      311    (1)    #-577    (1)    #-671    (1)    #-878    (1)
DS$WAITUS                        00000000-XR                  502    (1)
DS$_AP_NORMAL_BREAK             =00660150      297    (1)
DS$_ARITH                       =006600D0      297    (1)
DS$_ASBE                        =00660118      297    (1)
DS$_BADLINK                     =006600F0      297    (1)
DS$_BADTYPE                     =006600E8      297    (1)
DS$_BIIC                        =00660120      297    (1)
DS$_CHME                        =006600A8      297    (1)
DS$_CHMK                        =006600E0      297    (1)
DS$_DEVNAME                     =00660108      297    (1)
DS$_ERROR                       =00660002      297    (1)
DS$_FHWE                        =00660068      297    (1)
DS$_FRAGBUF                     =00660080      297    (1)
DS$_ICBUSY                      =006600C8      297    (1)
DS$_ICERR                       =006600C0      297    (1)
DS$_IHWE                        =00660060      297    (1)
DS$_ILLCHAR                     =00660018      297    (1)
DS$_ILLPAGCNT                   =00660078      297    (1)
DS$_ILLUNIT                     =00660100      297    (1)
DS$_INIT_FAIL                   =00660140      297    (1)
DS$_INSFMEM                     =00660050      297    (1)
DS$_INVCPU                      =00660130      297    (1)
DS$_IPL2HI                      =006600B8      297    (1)    #-887    (1)
DS$_IVADDR                      =00660040      297    (1)
DS$_IVVECT                      =00660038      297    (1)
DS$_KRNLSTK                     =00660090      297    (1)
DS$_LOGIC                       =00660070      297    (1)
DS$_MCHK                        =00660088      297    (1)
DS$_MEM_ALLOC_ERR               =00660138      297    (1)
DS$_MMOFF                       =00660058      297    (1)
DS$_NEEDUNIT                    =006600F8      297    (1)
DS$_NODE                        =00660128      297    (1)
DS$_NOPCS                       =00660110      297    (1)
DS$_NORMAL                      =00660001      297    (1)
DS$_NOSUPPORT                   =006600B1      297    (1)
DS$_NOTALLOWMP                  =00660148      297    (1)
DS$_NOTDON                      =00660030      297    (1)
DS$_NOTIMP                      =006600B0      297    (1)      297    (1)    #-892    (1)
DS$_NULLSTR                     =00660010      297    (1)
DS$_OVERFLOW                    =00660008      297    (1)
DS$_POWER                       =00660098      297    (1)
DS$_PROGERR                     =00660020      297    (1)    #-506    (1)    #-586    (1)
DS$_SEVERE                      =00660004      297    (1)
DS$_TRANSL                      =006600A0      297    (1)
DS$_TRUNCATE                    =00660028      297    (1)
DS$_UNEXPINT                    =006600D8      297    (1)
DS$_UNSUPPDEV                   =00660158      297    (1)
DS$_VASFULL                     =00660048      297    (1)
DS$_WARNING                     =00660000      297    (1)      297    (1)
DSI$TIMER                        00000324-R    1002   (1)
DSI$TIMER_X                      000003BC-R    1064   (1)
DSI$TIMSRV                       000002A0-R    940    (1)
DSR$SETIMR_INI                   000001C1-R    773    (1)
DSX$CANWAIT                      00000000-R    405    (1)
DSX$WAITMS                       00000029-R    492    (1)
```

```
DSX$WAITMS_X                    000000B3-R   529    (1)    #-503    (1)    #-509    (1)    #-512    (1)
DSX$WAITUS                      000000B4-R   574    (1)
DSX$WAITUS_USOVR                000000CF-R   582    (1)
DSX$WAITUS_X                    00000134-R   621    (1)    #-588    (1)
DS_ERRSUP                       00000000-XR                    1028    (1)
DYN$C_TQE                      =0000000F                       350    (1)
EXE$ALLOCTQE                    00000000-XR                    898    (1)
EXE$CANTIM                      0000016E-R   710    (1)
EXE$DEANONPAGED                 00000000-XR                   1045    (1)     741    (1)
EXE$GL_ABSTIM                   00000000-XR                  #-1074    (1)   #-1091    (1)
EXE$GQ_SYSTIME                  00000000-XR                  #-1015    (1)   #-1018    (1)   #-1171    (1)   #-777    (1)
                                                             #-908    (1)    #-964    (1)    #-965    (1)    #-975    (1)
                                                             #-978    (1)
EXE$HIBER                       00000135-R   656    (1)
EXE$HIBER_X                     00000157-R   663    (1)
EXE$INSTIMQ                     000001E0-R   808    (1)    #-1058    (1)    #-779    (1)    #-911    (1)
EXE$SETIMR                      00000212-R   867    (1)
EXE$WAKE                        0000001B-R   444    (1)
GETTIM$_NARGS                  =00000001     294    (1)
GETTIM$_TIMADR                 =00000004     294    (1)
ICCS$M_ERR                     =80000000     317    (1)    #-1147    (1)     319    (1)    #-591    (1)    #-595    (1)
                                                             #-603    (1)    #-673    (1)    #-951    (1)
ICCS$M_IE                      =00000040     315    (1)    #-1151    (1)     319    (1)
ICCS$M_INT                     =00000080     316    (1)    #-1148    (1)     319    (1)    #-590    (1)    #-595    (1)
                                                             #-602    (1)    #-674    (1)    #-951    (1)
ICCS$M_RESET                   =800000C1     319    (1)    #-948    (1)
ICCS$M_RUN                     =00000001     313    (1)    #-1153    (1)     319    (1)    #-594    (1)
ICCS$M_XFER                    =00000010     314    (1)    #-1152    (1)    #-594    (1)
ID_TEMP                         00000068-R   365    (1)
IOC$GL_DEVLIST                  00000000-XR                   1077    (1)
IOC$K_DIAGPID                   00000000-XR                  #-902    (1)
IPL$_HWCLK                     =00000018                     #-1009    (1)
IPL$_POWER                     =0000001F                     #-1089    (1)
IPL$_TIMER                     =00000007                     #-1025    (1)   #-1063    (1)   #-1103    (1)   #-811    (1)
                                                             #-981    (1)    #-982    (1)
KB_CHECK                        00000000-XR                  #-658    (1)    #-877    (1)
MP$GR_BOOTED_PROCESSORS         00000000-XR                  #-954    (1)
MP$_GET_PROCESSOR_ID            00000000-XR                    192    (1)
MSTIME                          00000060-R   362    (1)     360    (1)    #-508    (1)
ONESECTIM                       00000024-R   347    (1)   #-1172    (1)     778    (1)
ONE_SECOND                      000003BF-R  1073    (1)     352    (1)
PR$_ICCS                       =00000018                    #-1149    (1)   #-1154    (1)   #-591    (1)   #-596    (1)
                                                             #-601    (1)    #-674    (1)    #-948    (1)    #-952    (1)
PR$_ICR                        =0000001A                    #-607    (1)    #-675    (1)
PR$_IPL                        =00000012                    #-1009    (1)   #-1025    (1)   #-1063    (1)   #-1089    (1)
                                                            #-1097    (1)   #-1103    (1)    #-575    (1)    #-587    (1)
                                                             #-597    (1)    #-720    (1)    #-745    (1)    #-811    (1)
                                                             #-823    (1)
PR$_NICR                       =00000019                    #-1150    (1)    #-593    (1)
PR$_SIRR                       =00000014                    #-981    (1)
PR780$_TODR                    =0000001B                    #-1159    (1)   #-1162    (1)
PR8SS$_BINID                   =0000005E                    #-957    (1)
PSL$S_IPL                      =00000005                    #-497    (1)    #-889    (1)
PSL$V_IPL                      =00000010                    #-497    (1)    #-889    (1)
PSL$V_IS                       =0000001A    310    (1)     #-661    (1)    #-712    (1)    #-869    (1)
SCH$QAST                        00000000-XR                 #-1041    (1)
SEC_TICK                       =00000064     325    (1)
```

```
SETIMR$_ASTADR                  =0000000C     360     (1)     #-903     (1)
SETIMR$_DAYTIM                  =00000008     360     (1)     #-893     (1)     #-907     (1)
SETIMR$_EFN                     =00000004     360     (1)     #-905     (1)
SETIMR$_NARGS                   =00000004     360     (1)
SETIMR$_REQIDT                  =00000010     360     (1)
SIZ...                          =00000001     311     (1)       311     (1)
SS$_EXQUOTA                     =0000001C                     #-576     (1)     #-876     (1)
SS$_NORMAL                      =00000001                     #-448     (1)     #-527     (1)     #-614     (1)     #-662     (1)
                                                              #-713     (1)     #-912     (1)
SYS$CANTIM                       00000000-XR                    407     (1)
SYS$CLREF                        00000000-XR                    881     (1)
SYS$GETTIM                       00000000-XR                    494     (1)       516     (1)
SYS$HIBER                        00000000-XR                    514     (1)
SYS$SETEF                        00000000-XR                   1036     (1)
SYS$SETIMR                       00000000-XR                    511     (1)
SYS$WAKE                         00000000-XR                    414     (1)
TICK_NS                         =000186A0     324     (1)     #-1167    (1)     #-507     (1)     #-964     (1)
TICK_US                         =00002710     323     (1)     #-1150    (1)       324     (1)       325     (1)
TODR_BIAS                       =10000000     321     (1)     #-1160    (1)     #-1162    (1)
TQE$B_EFN                       =00000029                     #-1035    (1)     #-906     (1)
TQE$B_RQTYPE                    =0000000B                      1026     (1)      1054     (1)     #-731     (1)     #-901     (1)
TQE$C_SSREPT                    =00000005                      351     (1)
TQE$L_AST                       =00000010                     #-1037    (1)     #-904     (1)
TQE$L_ASTPRM                    =00000014                     #-735     (1)
TQE$L_FPC                       =0000000C                      1053     (1)
TQE$L_FR3                       =00000010                     #-1052    (1)
TQE$L_PID                       =0000000C                     #-902     (1)
TQE$L_TQBL                      =00000004                     #-814     (1)
TQE$L_TQFL                      =00000000                     #-729     (1)
TQE$Q_DELTA                     =00000020                     #-1055    (1)
TQE$Q_TIME                      =00000018                     #-1015    (1)     #-1018    (1)     #-1056    (1)     #-1057    (1)
                                                              #-1172    (1)     #-810     (1)     #-817     (1)     #-820     (1)
                                                              #-975     (1)     #-978     (1)
TQE$V_REPEAT                    =00000002                     #-1054    (1)
UCB$B_DIPL                       00000052                     #-1097    (1)
UCB$L_DUETIM                     0000005C                     #-1091    (1)
UCB$L_FPC                        0000000C                     #-1099    (1)
UCB$L_FR3                        00000010                     #-1098    (1)
UCB$L_LINK                       0000002C                      1081     (1)     #-1083    (1)
UCB$M_INT                       =00000002                     #-1094    (1)
UCB$M_TIM                       =00000001                     #-1094    (1)
UCB$M_TIMOUT                    =00000040                     #-1096    (1)
UCB$V_TIM                       =00000000                     #-1090    (1)
UCB$W_STS                        00000058                      1090     (1)     #-1095    (1)     #-1096    (1)
WAITMS$_NARGS                   =00000002     308     (1)
WAITMS$_TAG                     =00000008     308     (1)     #-521     (1)
WAITMS$_TIME                    =00000004     308     (1)     #-500     (1)     #-507     (1)     #-523     (1)
WAITMS_ARGS                      0000004C-R   358     (1)       511     (1)
WAITUS$_NARGS                   =00000002     309     (1)
WAITUS$_TAG                     =00000008     309     (1)     #-610     (1)     #-612     (1)
WAITUS$_TIME                    =00000004     309     (1)     #-583     (1)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.01	00:00:00.27
Command processing	931	00:00:00.30	00:00:00.90
Pass 1	974	00:00:03.73	00:00:06.84
Symbol table sort	0	00:00:00.36	00:00:00.37
Pass 2	69	00:00:01.13	00:00:02.06
Symbol table output	2	00:00:00.06	00:00:00.24
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	5	00:00:00.17	00:00:00.29
Assembler run totals	2010	00:00:05.77	00:00:10.98

The working set limit was 2900 pages.
239228 bytes (468 pages) of virtual memory were used to buffer the intermediate code.
There were 70 pages of symbol table space allocated to hold 1241 non-local and 46 local symbols.
1177 source lines were read in Pass 1, producing 104 object records in Pass 2.
47 pages of virtual memory were used to define 44 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	11
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	5
SYS$COMMON:[SYSLIB]LIB.MLB;2	5
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	21
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	42

1464 GETS were required to define 42 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(2)   79   COM$DELATTNAST - DELIVER ATTENTION ASTS
(3)   117   COM$FLUSHATTNS - FLUSH ATTENTION AST LIST
(4)   159   COM$POST - POST I.O COMPLETION INDEPENDENT OF UNIT STATUS
(5)   190   COM$DRVDEALMEM - DEALLOCATE DRIVER MEMORY
(6)   235   COM$SETATTNAST - SET UP ATTENTION AST

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element COMDRVSUB.MAR
0000     2 ; *1     6-FEB-1986 15:15:12 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element COMDRVSUB.MAR
0000     4         .TITLE  COMDRVSUB       *** COMDRVSUB driver support routines
0000     5         .IDENT  /06.01/
0000     6 ;
0000     7 ;*****************************************************************************
0000     8 ;*                                                                           *
0000     9 ;*  COPYRIGHT (c) 1978, 1979, 1980                                           *
0000    10 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
0000    11 ;*                                                                           *
0000    12 ;*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND  COPIED   *
0000    13 ;*  ONLY  IN  ACCORDANCE  WITH  THE  TERMS  OF  SUCH  LICENSE AND WITH THE  *
0000    14 ;*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE OR  ANY  OTHER   *
0000    15 ;*  COPIES  THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY   *
0000    16 ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE  IS  HEREBY   *
0000    17 ;*  TRANSFERRED.                                                             *
0000    18 ;*                                                                           *
0000    19 ;*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE   *
0000    20 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT  *
0000    21 ;*  CORPORATION.                                                             *
0000    22 ;*                                                                           *
0000    23 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS   *
0000    24 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    25 ;*                                                                           *
0000    26 ;*****************************************************************************
0000    27 ;
0000    28 ;++
0000    29 ; FACILITY:
0000    30 ;
0000    31 ;       VAX/VMS I/O DRIVERS
0000    32 ;
0000    33 ; ABSTRACT:
0000    34 ;
0000    35 ;       THIS MODULE CONTAINS SUBROUTINES FOR THE TERMINAL,MAILBOX AND DMC11 DRIVERS.
0000    36 ;
0000    37 ; AUTHOR:
0000    38 ;
0000    39 ;       R.HEINEN 8-SEPT-1977
0000    40 ;
0000    41 ; REVISION HISTORY:
0000    42 ;
0000    43 ;       V07     TCM0001         Trudy C Matthews        2-Jan-1980
0000    44 ;               Changed COM$SETATTNAST so that it only extracts the
0000    45 ;               two bits of the access mode in the P3 parameter,
0000    46 ;               instead of taking the whole byte.
0000    47 ;
0000    48 ;
0000    49 ;               Dave Butenhof
0000    50 ;       01      Update VMS module for Supervisor; delete quota checks
0000    51 ;--
0000    52 ;
0000    53 ; EXTERNAL SYMBOLS
0000    54 ;
0000    55         $ACBDEF                         ; DEFINE AST CONTROL BLOCK
0000               .SAVE   LOCAL_BLOCK
0000               .IIF    NB,ACB$L_ASTQFL,        ACB$L_ASTQFL:
```

```
00000004  0000                                  .BLKL   1
          0004                  .IIF    NB,ACB$L_ASTQBL,        ACB$L_ASTQBL:
00000008  0004                                  .BLKL   1
          0008                  .IIF    NB,ACB$W_SIZE,  ACB$W_SIZE:
0000000A  0008                                  .BLKW   1
          000A                  .IIF    NB,ACB$B_TYPE,  ACB$B_TYPE:
0000000B  000A                                  .BLKB   1
          000B                  .IIF    NB,ACB$B_RMOD,  ACB$B_RMOD:
0000000C  000B                                  .BLKB   1
          000C                  .IIF    NB,ACB$L_PID,   ACB$L_PID:
00000010  000C                                  .BLKL   1
          0010                  .IIF    NB,ACB$L_AST,   ACB$L_AST:
00000014  0010                                  .BLKL   1
          0014                  .IIF    NB,ACB$L_ASTPRM,        ACB$L_ASTPRM:
00000018  0014                                  .BLKL   1
          0018                  .IIF    NB,ACB$C_LENGTH,        ACB$C_LENGTH:
          0018                  .IIF    NB,ACB$K_LENGTH,        ACB$K_LENGTH:
          0018                  .IIF    NB,ACB$L_KAST,  ACB$L_KAST:
0000001C  0018                                  .BLKL   1
          0000                  .RESTORE
          0000    56            $CCBDEF                         ; DEFINE CCB
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  001C                  .=0
          0000                  .IIF    NB,CCB$L_UCB,   CCB$L_UCB:
00000004  0000                                  .BLKL   1
          0004                  .IIF    NB,CCB$L_WIND,  CCB$L_WIND:
00000008  0004                                  .BLKL   1
          0008                  .IIF    NB,CCB$B_STS,   CCB$B_STS:
00000009  0008                                  .BLKB   1
          0009                  .IIF    NB,CCB$B_AMOD,  CCB$B_AMOD:
0000000A  0009                                  .BLKB   1
          000A                  .IIF    NB,CCB$W_IOC,   CCB$W_IOC:
0000000C  000A                                  .BLKW   1
          000C                  .IIF    NB,CCB$L_DIRP,  CCB$L_DIRP:
00000010  000C                                  .BLKL   1
          0010                  .IIF    NB,CCB$C_LENGTH,        CCB$C_LENGTH:
          0010                  .IIF    NB,CCB$K_LENGTH,        CCB$K_LENGTH:
          0000                  .RESTORE
          0000    57            $DYNDEF                         ; DEFINE DYNAMIC MEMORY BLOCKS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  001C                  .=0
          0000                  .RESTORE
          0000    58            $IPLDEF                         ; DEFINE IPL LEVELS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  001C                  .=0
          0000                  .RESTORE
          0000    59            $IRPDEF                         ; DEFINE I/O PACKET
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  001C                  .=0
          0000                  .IIF    NB,IRP$L_IOQFL, IRP$L_IOQFL:
00000004  0000                                  .BLKL   1
          0004                  .IIF    NB,IRP$L_IOQBL, IRP$L_IOQBL:
00000008  0004                                  .BLKL   1
```

```
                        0008            .IIF    NB,IRP$W_SIZE,  IRP$W_SIZE:
0000000A  0008                          .BLKW   1
                        000A            .IIF    NB,IRP$B_TYPE,  IRP$B_TYPE:
0000000B  000A                          .BLKB   1
                        000B            .IIF    NB,IRP$B_RMOD,  IRP$B_RMOD:
0000000C  000B                          .BLKB   1
                        000C            .IIF    NB,IRP$L_PID,   IRP$L_PID:
00000010  000C                          .BLKL   1
                        0010            .IIF    NB,IRP$L_AST,   IRP$L_AST:
00000014  0010                          .BLKL   1
                        0014            .IIF    NB,IRP$L_ASTPRM,        IRP$L_ASTPRM:
00000018  0014                          .BLKL   1
                        0018            .IIF    NB,IRP$L_WIND,  IRP$L_WIND:
0000001C  0018                          .BLKL   1
                        001C            .IIF    NB,IRP$L_UCB,   IRP$L_UCB:
00000020  001C                          .BLKL   1
                        0020            .IIF    NB,IRP$W_FUNC,  IRP$W_FUNC:
00000022  0020                          .BLKW   1
                        0022            .IIF    NB,IRP$B_EFN,   IRP$B_EFN:
00000023  0022                          .BLKB   1
                        0023            .IIF    NB,IRP$B_PRI,   IRP$B_PRI:
00000024  0023                          .BLKB   1
                        0024            .IIF    NB,IRP$L_IOSB,  IRP$L_IOSB:
00000028  0024                          .BLKL   1
                        0028            .IIF    NB,IRP$W_CHAN,  IRP$W_CHAN:
0000002A  0028                          .BLKW   1
                        002A            .IIF    NB,IRP$W_STS,   IRP$W_STS:
0000002C  002A                          .BLKW   1
                        002C            .IIF    NB,IRP$L_SVAPTE,        IRP$L_SVAPTE:
00000030  002C                          .BLKL   1
                        0030            .IIF    NB,IRP$W_BOFF,  IRP$W_BOFF:
00000032  0030                          .BLKW   1
                        0032            .IIF    NB,IRP$W_BCNT,  IRP$W_BCNT:
00000034  0032                          .BLKW   1
                        0034            .IIF    NB,IRP$L_IOST1, IRP$L_IOST1:
                        0034            .IIF    NB,IRP$L_MEDIA, IRP$L_MEDIA:
00000038  0034                          .BLKL   1
                        0038            .IIF    NB,IRP$L_IOST2, IRP$L_IOST2:
                        0038            .IIF    NB,IRP$L_TT_TERM,       IRP$L_TT_TERM:
                        0038            .IIF    NB,IRP$B_CARCON,        IRP$B_CARCON:
00000039  0038                          .BLKB   1
0000003C  0039                          .BLKB   3
                        003C            .IIF    NB,IRP$Q_NT_PRVMSK,     IRP$Q_NT_PRVMSK:
                        003C            .IIF    NB,IRP$W_ABCNT, IRP$W_ABCNT:
                        003C            .IIF    NB,IRP$W_TT_PRMPT,      IRP$W_TT_PRMPT:
0000003E  003C                          .BLKW   1
                        003E            .IIF    NB,IRP$W_OBCNT, IRP$W_OBCNT:
00000040  003E                          .BLKW   1
                        0040            .IIF    NB,IRP$L_SEGVBN,        IRP$L_SEGVBN:
00000044  0040                          .BLKL   1
                        0044            .IIF    NB,IRP$L_DIAGBUF,       IRP$L_DIAGBUF:
00000048  0044                          .BLKL   1
                        0048            .IIF    NB,IRP$L_SEQNUM,        IRP$L_SEQNUM:
0000004C  0048                          .BLKL   1
                        004C            .IIF    NB,IRP$L_EXTEND,        IRP$L_EXTEND:
00000050  004C                          .BLKL   1
                        0050            .IIF    NB,IRP$L_ARB,   IRP$L_ARB:
```

```
00000054  0050                                .BLKL   1
00000058  0054                                .BLKL   1
0000005C  0058                                .BLKL   1
          005C                .IIF    NB,IRP$C_LENGTH,        IRP$C_LENGTH:
          005C                .IIF    NB,IRP$K_LENGTH,        IRP$K_LENGTH:
          0000                .RESTORE
          0000      60        $PCBDEF                         ; DEFINE PCB
          0000                .SAVE   LOCAL_BLOCK
          0000                .PSECT  $ABS$,ABS
00000000  005C                .=0
          0000                .IIF    NB,PCB$L_SQFL,  PCB$L_SQFL:
00000004  0000                        .BLKL   1
          0004                .IIF    NB,PCB$L_SQBL,  PCB$L_SQBL:
00000008  0004                        .BLKL   1
          0008                .IIF    NB,PCB$W_SIZE,  PCB$W_SIZE:
0000000A  0008                        .BLKW   1
          000A                .IIF    NB,PCB$B_TYPE,  PCB$B_TYPE:
0000000B  000A                        .BLKB   1
          000B                .IIF    NB,PCB$B_PRI,   PCB$B_PRI:
0000000C  000B                        .BLKB   1
          000C                .IIF    NB,PCB$B_ASTACT,        PCB$B_ASTACT:
0000000D  000C                        .BLKB   1
          000D                .IIF    NB,PCB$B_ASTEN, PCB$B_ASTEN:
0000000E  000D                        .BLKB   1
          000E                .IIF    NB,PCB$W_MTXCNT,        PCB$W_MTXCNT:
00000010  000E                        .BLKW   1
          0010                .IIF    NB,PCB$L_ASTQFL,        PCB$L_ASTQFL:
00000014  0010                        .BLKL   1
          0014                .IIF    NB,PCB$L_ASTQBL,        PCB$L_ASTQBL:
00000018  0014                        .BLKL   1
          0018                .IIF    NB,PCB$L_PHYPCB,        PCB$L_PHYPCB:
0000001C  0018                        .BLKL   1
          001C                .IIF    NB,PCB$L_OWNER, PCB$L_OWNER:
00000020  001C                        .BLKL   1
          0020                .IIF    NB,PCB$L_WSSWP, PCB$L_WSSWP:
00000024  0020                        .BLKL   1
          0024                .IIF    NB,PCB$L_STS,   PCB$L_STS:
00000028  0024                        .BLKL   1
          0028                .IIF    NB,PCB$L_WTIME, PCB$L_WTIME:
0000002C  0028                        .BLKL   1
          002C                .IIF    NB,PCB$W_STATE, PCB$W_STATE:
0000002E  002C                        .BLKW   1
          002E                .IIF    NB,PCB$B_WEFC,  PCB$B_WEFC:
0000002F  002E                        .BLKB   1
          002F                .IIF    NB,PCB$B_PRIB,  PCB$B_PRIB:
00000030  002F                        .BLKB   1
          0030                .IIF    NB,PCB$W_APTCNT,        PCB$W_APTCNT:
00000032  0030                        .BLKW   1
          0032                .IIF    NB,PCB$W_TMBU,  PCB$W_TMBU:
00000034  0032                        .BLKW   1
          0034                .IIF    NB,PCB$W_GPGCNT,        PCB$W_GPGCNT:
00000036  0034                        .BLKW   1
          0036                .IIF    NB,PCB$W_PPGCNT,        PCB$W_PPGCNT:
00000038  0036                        .BLKW   1
          0038                .IIF    NB,PCB$W_ASTCNT,        PCB$W_ASTCNT:
0000003A  0038                        .BLKW   1
          003A                .IIF    NB,PCB$W_BIOCNT,        PCB$W_BIOCNT:
```

```
0000003C  003A                                  .BLKW   1
          003C                  .IIF    NB,PCB$W_BIOLM, PCB$W_BIOLM:
0000003E  003C                                  .BLKW   1
          003E                  .IIF    NB,PCB$W_DIOCNT,        PCB$W_DIOCNT:
00000040  003E                                  .BLKW   1
          0040                  .IIF    NB,PCB$W_DIOLM, PCB$W_DIOLM:
00000042  0040                                  .BLKW   1
          0042                  .IIF    NB,PCB$W_PRCCNT,        PCB$W_PRCCNT:
00000044  0042                                  .BLKW   1
          0044                  .IIF    NB,PCB$T_TERMINAL,      PCB$T_TERMINAL:
0000004C  0044                                  .BLKB   8
          004C                  .IIF    NB,PCB$L_PQB,   PCB$L_PQB:
          004C                  .IIF    NB,PCB$L_EFWM,  PCB$L_EFWM:
00000050  004C                                  .BLKL   1
          0050                  .IIF    NB,PCB$L_EFCS,  PCB$L_EFCS:
00000054  0050                                  .BLKL   1
          0054                  .IIF    NB,PCB$L_EFCU,  PCB$L_EFCU:
00000058  0054                                  .BLKL   1
          0058                  .IIF    NB,PCB$L_EFC2P, PCB$L_EFC2P:
0000005C  0058                                  .BLKL   1
          005C                  .IIF    NB,PCB$L_EFC3P, PCB$L_EFC3P:
00000060  005C                                  .BLKL   1
          0060                  .IIF    NB,PCB$L_PID,   PCB$L_PID:
00000064  0060                                  .BLKL   1
          0064                  .IIF    NB,PCB$L_PHD,   PCB$L_PHD:
00000068  0064                                  .BLKL   1
          0068                  .IIF    NB,PCB$T_LNAME, PCB$T_LNAME:
00000078  0068                                  .BLKB   16
          0078                  .IIF    NB,PCB$L_JIB,   PCB$L_JIB:
0000007C  0078                                  .BLKL   1
          007C                  .IIF    NB,PCB$Q_PRIV,  PCB$Q_PRIV:
00000084  007C                                  .BLKQ   1
          0084                  .IIF    NB,PCB$L_ARB,   PCB$L_ARB:
00000088  0084                                  .BLKL   1
          0088                  .IIF    NB,PCB$L_UIC,   PCB$L_UIC:
          0088                  .IIF    NB,PCB$W_MEM,   PCB$W_MEM:
0000008A  0088                                  .BLKW   1
          008A                  .IIF    NB,PCB$W_GRP,   PCB$W_GRP:
0000008C  008A                                  .BLKW   1
          008C                  .IIF    NB,PCB$C_LENGTH,        PCB$C_LENGTH:
          008C                  .IIF    NB,PCB$K_LENGTH,        PCB$K_LENGTH:
          0000                  .RESTORE
          0000      61          $PRDEF                          ; DEFINE PROCESSOR REGISTERS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000      62          $PRIDEF                         ; DEFINE NEW PRIORITIES
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000      63          $PRVDEF                         ; DEFINE PRIVELEGE BITS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
```

```
                        0000     64          $PSLDEF                                 ; DEFINE PSL
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 008C                .=0
                        0000                 .RESTORE
                        0000     65          $RSNDEF                                 ; DEFINE RESOURCES
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 008C                .=0
                        0000                 .RESTORE
                        0000     66          $UCBDEF                                 ; DEFINE UCB
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 008C                .=0
                        0000                 .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                        0000                 .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
                00000004 0000                        .BLKL   1
                        0004                 .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                        0004                 .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
                00000008 0004                        .BLKL   1
                        0008                 .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
                0000000A 0008                        .BLKW   1
                        000A                 .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
                0000000B 000A                        .BLKB   1
                        000B                 .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
                0000000C 000B                        .BLKB   1
                        000C                 .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                        000C                 .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                        000C                 .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
                0000000D 000C                        .BLKB   1
                00000010 000D                        .BLKB   3
                        0010                 .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                        0010                 .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
                00000014 0010                        .BLKL   1
                        0014                 .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                        0014                 .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                        0014                 .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
                00000016 0014                        .BLKW   1
                        0016                 .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
                00000018 0016                        .BLKW   1
                        0018                 .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                        0018                 .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
                0000001A 0018                        .BLKW   1
                        001A                 .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                        001A                 .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
                0000001C 001A                        .BLKW   1
                        001C                 .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
                00000020 001C                        .BLKL   1
                        0020                 .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
                00000024 0020                        .BLKL   1
                        0024                 .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
                00000028 0024                        .BLKL   1
                        0028                 .IIF    NB,UCB$L_PID,   UCB$L_PID:
                0000002C 0028                        .BLKL   1
                        002C                 .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
                00000030 002C                        .BLKL   1
                        0030                 .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
```

```
00000034  0030                                  .BLKL   1
          0034                  .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
00000038  0034                                  .BLKL   1
          0038                  .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
00000039  0038                                  .BLKB   1
          0039                  .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
0000003A  0039                                  .BLKB   1
          003A                  .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
0000003C  003A                                  .BLKW   1
          003C                  .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
          003C                  .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
          003C                  .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
0000003D  003C                                  .BLKB   1
          003D                  .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
          003D                  .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
0000003E  003D                                  .BLKB   1
          003E                  .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
          003E                  .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
0000003F  003E                                  .BLKB   1
          003F                  .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
00000040  003F                                  .BLKB   1
          0040                  .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
00000044  0040                                  .BLKL   1
          0044                  .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
00000048  0044                                  .BLKL   1
          0048                  .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
0000004A  0048                                  .BLKW   1
          004A                  .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
          004A                  .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
0000004B  004A                                  .BLKB   1
          004B                  .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
0000004C  004B                                  .BLKB   1
          004C                  .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
00000050  004C                                  .BLKL   1
          0050                  .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
00000052  0050                                  .BLKW   1
          0052                  .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
          0052                  .IIF    NB,UCB$B_STATE, UCB$B_STATE:
00000053  0052                                  .BLKB   1
          0053                  .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
00000054  0053                                  .BLKB   1
          0054                  .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
00000058  0054                                  .BLKL   1
          0058                  .IIF    NB,UCB$W_STS,   UCB$W_STS:
0000005A  0058                                  .BLKW   1
          005A                  .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
0000005C  005A                                  .BLKW   1
          005C                  .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
          005C                  .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
00000060  005C                                  .BLKL   1
          0060                  .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
00000064  0060                                  .BLKL   1
          0064                  .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
          0064                  .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
00000068  0064                                  .BLKL   1
          0068                  .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
0000006C  0068                                  .BLKL   1
```

```
                        006C            .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
0000006E  006C                                  .BLKW   1
                        006E            .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
00000070  006E                                  .BLKW   1
                        0070            .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
00000071  0070                                  .BLKB   1
                        0071            .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
00000072  0071                                  .BLKB   1
                        0072            .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074  0072                                  .BLKW   1
                        0074            .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
                        0074            .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000  0074          . = 0
                        0000            .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002  0000                                  .BLKW   1
00000074  0002          . = 116
                        0074            .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078  0074                                  .BLKL   1
                        0078            .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C  0078                                  .BLKL   1
                        007C            .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080  007C                                  .BLKL   1
                        0080            .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084  0080                                  .BLKL   1
                        0084            .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088  0084                                  .BLKL   1
                        0088            .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C  0088                                  .BLKL   1
                        008C            .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090  008C                                  .BLKL   1
                        0090            .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
                        0090            .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074  0090          . = 116
                        0074            .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075  0074                                  .BLKB   1
                        0075            .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076  0075                                  .BLKB   1
                        0076            .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077  0076                                  .BLKB   1
                        0077            .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078  0077                                  .BLKB   1
                        0078            .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C  0078                                  .BLKL   1
0000007E  007C                                  .BLKW   1
                        007E            .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080  007E                                  .BLKW   1
                        0080            .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084  0080                                  .BLKL   1
00000080  0084          . = 128
00000084  0080                                  .BLKL   1
                        0084            .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088  0084                                  .BLKL   1
                        0088            .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A  0088                                  .BLKW   1
                        008A            .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C  008A                                  .BLKW   1
                        008C            .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
```

```
                        008C            .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E  008C                                  .BLKW   1
                        008E            .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090  008E                                  .BLKW   1
                        0090            .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092  0090                                  .BLKW   1
                        0092            .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
00000094  0092                                  .BLKW   1
                        0094            .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095  0094                                  .BLKB   1
                        0095            .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096  0095                                  .BLKB   1
                        0096            .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098  0096                                  .BLKW   1
00000096  0098          . = 150
00000098  0096                                  .BLKW   1
                        0098            .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C  0098                                  .BLKL   1
                        009C            .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0  009C                                  .BLKL   1
                        00A0            .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
000000A4  00A0                                  .BLKL   1
                        00A4            .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
000000A6  00A4                                  .BLKW   1
                        00A6            .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
000000A7  00A6                                  .BLKB   1
000000A8  00A7                                  .BLKB   1
00000074  00A8          . = 116
00000078  0074                                  .BLKL   1
0000007C  0078                                  .BLKL   1
00000080  007C                                  .BLKL   1
00000084  0080                                  .BLKL   1
00000088  0084                                  .BLKL   1
0000008C  0088                                  .BLKL   1
                        008C            .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
00000090  008C                                  .BLKL   1
00000094  0090                                  .BLKL   1
00000098  0094                                  .BLKL   1
0000009C  0098                                  .BLKL   1
                        009C            .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
0000009D  009C                                  .BLKB   1
                        009D            .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
0000009E  009D                                  .BLKB   1
                        009E            .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
0000009F  009E                                  .BLKB   1
000000A0  009F                                  .BLKB   1
                        00A0            .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
000000A1  00A0                                  .BLKB   1
                        00A1            .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
000000A2  00A1                                  .BLKB   1
                        00A2            .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
000000A3  00A2                                  .BLKB   1
000000A4  00A3                                  .BLKB   1
                        00A4            .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
000000A5  00A4                                  .BLKB   1
                        00A5            .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
000000A7  00A5                                  .BLKW   1
```

```
000000A8  00A7                                  .BLKB   1
          00A8                  .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
000000AC  00A8                                  .BLKL   1
000000B0  00AC                                  .BLKL   1
000000B4  00B0                                  .BLKL   1
000000B8  00B4                                  .BLKL   1
          00B8                  .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
000000BC  00B8                                  .BLKL   1
          00BC                  .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
          00BC                  .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
00000074  00BC                  . = 116
          0074                  .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
00000078  0074                                  .BLKL   1
          0078                  .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
0000007C  0078                                  .BLKL   1
          007C                  .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
0000007E  007C                                  .BLKW   1
00000080  007E                                  .BLKW   1
          0000                  .RESTORE
          0000     67 ;
          0000     68 ; LOCAL DEFINITIONS
          0000     69 ;
00000000  0000     70 P1= 0
00000004  0000     71 P2= 4
00000008  0000     72 P3= 8
0000000C  0000     73 P4= 12
00000010  0000     74 P5= 16
00000014  0000     75 P6= 20
          0000     76
      00000000     77          .PSECT  SEP, SHR,EXE,RD,WRT,LONG
```

```
                                0000     79          .SBTTL  COM$DELATTNAST - DELIVER ATTENTION ASTS
                                0000     80 ;++
                                0000     81 ; COM$DELATTNAST - DELIVER ATTENION ASTS
                                0000     82 ;
                                0000     83 ; FUNCTIONAL DESCRIPTION:
                                0000     84 ;
                                0000     85 ; THIS ROUTINE IS USED BY THE TERMINAL AND MAILBOX DRIVERS TO DELIVER
                                0000     86 ; ALL OF THE ASTS AWAITING ATTENTION. THE CONTROL BLOCKS ARE USED AS FORK BLOCKS
                                0000     87 ; TO IPL$_QUEUEAST.
                                0000     88 ;
                                0000     89 ; INPUTS:
                                0000     90 ;
                                0000     91 ;       R4 = ADDRESS OF LIST HEAD OF AST CONTROL BLOCKS
                                0000     92 ;       R5 = UCB OF UNIT
                                0000     93 ;
                                0000     94 ; OUTPUTS:
                                0000     95 ;
                                0000     96 ;       R2,R3,R4,R5 ARE PRESERVED.
                                0000     97 ;--
                                0000     98 COM$DELATTNAST::                             ; DELIVER ATTENTION ASTS
                     38   BB    0000     99          PUSHR   #^M<R3,R4,R5>               ;
          55    04 BE   D0    0002    100 10$:     MOVL    @4(SP),R5                   ; GET NEXT ENTRY
                     28   13    0006    101          BEQL    50$                         ; IF EQL THEN NONE
          04 BE    65   D0    0008    102          MOVL    (R5),@4(SP)                 ; CLOSE LIST
                F3 AF   9F    000C    103          PUSHAB  B^10$                       ; SET UP RETURN ADDRESS
                        000F    104          FORK                                ; CREATE FORK PROCESS
     00000000'GF   16   000F                       JSB     G^EXE$FORK
                        0015    105 ;
                        0015    106 ; AST QUEUE FORK PROCESS
                        0015    107 ;
     10 A5    18 A5   7D    0015    108          MOVQ    ACB$L_KAST(R5),ACB$L_AST(R5); REARRANGE ENTRIES
     0B A5    20 A5   90    001A    109          MOVB    ACB$L_KAST+8(R5),ACB$B_RMOD(R5);
     0C A5    24 A5   D0    001F    110          MOVL    ACB$L_KAST+12(R5),ACB$L_PID(R5);
              18 A5   D4    0024    111          CLRL    ACB$L_KAST(R5)              ;
           52    01   9A    0027    112          MOVZBL  #PRI$_IOCOM,R2              ; SET UP PRIORITY INCREMENT
     00000000'GF   17   002A    113          JMP     G^SCH$QAST                  ; QUEUE THE AST
                     38   BA    0030    114 50$:     POPR    #^M<R3,R4,R5>               ;
                     05   0032    115          RSB
```

```
                                0033   117          .SBTTL  COM$FLUSHATTNS - FLUSH ATTENTION AST LIST
                                0033   118 ;++
                                0033   119 ; COM$FLUSHATTNS - FLUNS ATTENTION AST LIST
                                0033   120 ;
                                0033   121 ; THIS ROUTINE IS USED BY THE TERMINAL AND MAILBOX DRIVERS TO FLUSH
                                0033   122 ; AN ATTENTION AST LIST. THIS IS DONE AT CANCEL I/O TIME AND WHEN A
                                0033   123 ; QIO SPECIFIES A 0 AST ADDRESS ON A SET ATTENTION AST FUNCTION.
                                0033   124 ; IF THE AST CONTROL BLOCK OWNER IS NO LONGER IN THE SYSTEM THE AST IS ALSO
                                0033   125 ; FLUSHED.
                                0033   126 ;
                                0033   127 ;
                                0033   128 ; INPUTS:
                                0033   129 ;
                                0033   130 ;       R4 = PCB ADDRESS
                                0033   131 ;       R5 = UCB ADDRESS OF RELATED UNIT
                                0033   132 ;       R6 = CHANNEL NUMBER
                                0033   133 ;       R7 = LIST HEAD
                                0033   134 ;
                                0033   135 ; OUTPUTS:
                                0033   136 ;
                                0033   137 ;       R0 = SS$_NORMAL
                                0033   138 ;       R1,R2,R7 ARE DISTROYED.
                                0033   139 ;
                                0033   140 ;--
                                0033   141 COM$FLUSHATTNS::                           ; FLUSH ATTENTION AST LIST
                                0033   142          DSBINT  UCB$B_DIPL(R5)           ; DISABLE INTERRUPTS
      7E    12    DB            0033                 MFPR    S^#PR$_IPL,-(SP)
   12   52  A5    DA            0036                 MTPR    UCB$B_DIPL(R5),S^#PR$_IPL
      50    67    D0            003A   143 10$:      MOVL    (R7),R0                  ; GET LIST ENTRY
            1C    13            003D   144          BEQL    50$                      ; IF EQL THEN DONE
24 A0     60  A4    D1            003F   145          CMPL    PCB$L_PID(R4),ACB$L_KAST+12(R0); PID MATCH?
            10    12            0044   146          BNEQ    40$                      ; IF NEQ THEN NO
   22 A0    56    B1            0046   147          CMPW    R6,ACB$L_KAST+10(R0)     ; CHANNEL MATCH?
            0A    12            004A   148          BNEQ    40$                      ; IF NEQ THEN NO
      67    60    D0            004C   149          MOVL    (R0),(R7)                ; CLOSE UP LIST TO REMOVE ENTRY
                                004F   150          ENBINT                           ; REENABLE INTERRUPTS
      12    8E    DA            004F                 MTPR    (SP)+,S^#PR$_IPL
            1F    10            0052   151          BSBB    COM$DRVDEALMEM           ; DEALLOCATE THE BLOCK
            DD    11            0054   152          BRB     COM$FLUSHATTNS           ; CONTINUE
      57    50    D0            0056   153 40$:      MOVL    R0,R7                    ; LOOK TO NEXT ENTRY
            DF    11            0059   154          BRB     10$                      ; CONTINUE
                                005B   155 50$:      ENBINT                           ; REENABLE INTERRUPTS
      12    8E    DA            005B                 MTPR    (SP)+,S^#PR$_IPL
   50   00'8F    9A            005E   156          MOVZBL  #SS$_NORMAL,R0           ; SET NORMAL RETURN
                  05            0062   157          RSB
```

```
                        0063   159          .SBTTL  COM$POST - POST I.O COMPLETION INDEPENDENT OF UNIT STATUS
                        0063   160 ;++
                        0063   161 ; COM$POST - POST I/O COMPLETION INDEPENDENT OF UNIT STATUS
                        0063   162 ;
                        0063   163 ; FUNCTIONAL DESCRIPTION:
                        0063   164 ;
                        0063   165 ; THIS ROUTINE IS USED BY THE TERMINAL, MAILBOX AND DMC DRIVER TO COMPLETE
                        0063   166 ; I/O OPERATIONS INDEPENDENT OF THE STATUS OF THE UNIT. NO ATTEMPT IS MADE
                        0063   167 ; TO DE-QUEUE ANOTHER PACKET OR CHANGE THE BUSY STATUS OF THE UNIT.
                        0063   168 ;
                        0063   169 ; INPUTS:
                        0063   170 ;
                        0063   171 ;       R3 = I/O PACKET ADDRESS
                        0063   172 ;       R5 = UCB ADDRESS
                        0063   173 ;
                        0063   174 ; IMPLICIT INPUTS:
                        0063   175 ;
                        0063   176 ;       CALLER AT DRIVER FORK IPL OR GREATER.
                        0063   177 ;       IRP$L_MEDIA AND IRP$L_MEDIA+4 ARE THE IOSB QUAD WORD.
                        0063   178 ;
                        0063   179 ; OUTPUTS:
                        0063   180 ;
                        0063   181 ;       R0,R1 ARE DISTROYED.
                        0063   182 ;--
                        0063   183 COM$POST::                                   ; COMPLETE I/O
           60 A5   D6   0063   184          INCL    UCB$L_OPCNT(R5)            ; INCREMENT OPERATION COUNT
00000000'FF 63   0E   0066   185          INSQUE  (R3),@IOC$GL_PSBL          ; INSERT PACKET ON QUEUE
             03   12   006D   186          BNEQ    10$                        ; IF NEQ THEN NOT FIRST
                        006F   187          SOFTINT #IPL$_IOPOST               ; REQUEST FORK
           14   04   DA   006F                  MTPR    #IPL$_IOPOST,S^#PR$_SIRR
                   05   0072   188 10$:    RSB                                ; RETURN
```

```
                        0073   190          .SBTTL  COM$DRVDEALMEM - DEALLOCATE DRIVER MEMORY
                        0073   191 ;++
                        0073   192 ; COM$DRVDEALMEM - DEALLOCATE DRIVER MEMORY
                        0073   193 ;
                        0073   194 ; FUNCTIONAL DESCRIPTION:
                        0073   195 ;
                        0073   196 ; THIS ROUTINE IS USED BY DRIVERS TO DEALLOCATE SYSTEM DYNAMIC MEMORY.
                        0073   197 ;
                        0073   198 ; IT CAN BE CALLED AT ANY IPL.
                        0073   199 ;
                        0073   200 ; INPUTS:
                        0073   201 ;
                        0073   202 ;       R0 = ADDRESS OF THE BLOCK TO DEALLOCATE
                        0073   203 ;
                        0073   204 ;*****************************************************
                        0073   205 ;
                        0073   206 ; THE BUFFER MUST BE AT LEAST 24 BYTES LONG!
                        0073   207 ;
                        0073   208 ;*****************************************************
                        0073   209 ;
                        0073   210 ; OUTPUTS:
                        0073   211 ;
                        0073   212 ;       R0-R5 ARE PRESERVED.
                        0073   213 ;--
                        0073   214 COM$DRVDEALMEM::                             ; DEALLOCATE DRIVER MEMORY
              08 A0  18 B1  0073   215          CMPW    #24,8(R0)               ; BIG ENOUGH BUFFER TO DEALLOCATE?
                     1E 1A  0077   216          BGTRU   30$                     ; IF GTRU THEN NO - ERROR
                     38 BB  0079   217          PUSHR   #^M<R3,R4,R5>           ; SAVE FORKING REGS
               0B A0  06 90  007B   218          MOVB    #IPL$_QUEUEAST,11(R0)   ; INSERT PROPER IPL
                  55  50 D0  007F   219          MOVL    R0,R5                   ; COPY ADDRESS
                    94'AF 9F  0082   220          PUSHAB  B^20$                   ; SET UP RETURN ADDRESS
           00000000'GF 16  0085   221          JSB     G^EXE$FORK              ; CREATE FORK
                        008B   222 ;
                        008B   223 ; IPL$_QUEUEAST FORK ROUTINE
                        008B   224 ;
                  50  55 D0  008B   225          MOVL    R5,R0                   ; DEALLOCATE THE BLOCK
           00000000'GF 17  008E   226          JMP     G^EXE$DEANONPAGED       ;
                     38 BA  0094   227 20$:     POPR    #^M<R3,R4,R5>           ;
                        05  0096   228          RSB                             ;
                        0097   229 ;
                        0097   230 ; BUGCHECK ON TOO SMALL A BUFFER
                        0097   231 ;
                        0097   232 30$::    BUG_CHECK BADDALRQSZ                ; BUGCHECK
                        05  0097   233          RSB                             ; CONTINUE
```

```
                     0098   235          .SBTTL  COM$SETATTNAST - SET UP ATTENTION AST
                     0098   236 ;++
                     0098   237 ; COM$SETATTNAST - SET UP ATTENTION AST
                     0098   238 ;
                     0098   239 ; FUNCTIONAL DESCRIPTION:
                     0098   240 ;
                     0098   241 ; THIS ROUTINE IS A SUBROUTINE USED BY THE TERMINAL AND MAILBOX DRIVERS
                     0098   242 ; TO PROCESS REQUESTS FOR ENABLE OR DISABLE OF ATTENTION ASTS.
                     0098   243 ; P1 IS THE ADDRESS OF THE AST SERVICE FOR ENABLES. P1 = 0 FOR DISABLE.
                     0098   244 ; FOR DISABLES, THE SPECIFIED LIST IS SEARCHED AND THE ENTRY EXTRACTED AND
                     0098   245 ; DEALLOCATED.
                     0098   246 ; FOR ENABLES, A CONTROL BLOCK IS SET UP THAT WILL DOUBLE AS THE AST CONTROL
                     0098   247 ; BLOCK WHEN THE AST IS DELIVERED. THE BLOCK IS FORMATTED AS FOLLOWS:
                     0098   248 ;
                     0098   249 ;       ACB$B_RMOD = IPR$_QUEUEAST
                     0098   250 ;       ACB$L_KAST = AST PC
                     0098   251 ;       ACB$L_KAST+4 = AST PARAMETER (P2)
                     0098   252 ;       ACB$L_KAST+8 = ACCESS MODE OF REQUEST
                     0098   253 ;       ACB$L_KAST+10 = CHANNEL NUMBER
                     0098   254 ;       ACB$L_KAST+12 = PID OF REQUEST
                     0098   255 ;
                     0098   256 ; THE NEW BLOCK IS PLACED AT THE HEAD OF THE CURRENT LIST.
                     0098   257 ;
                     0098   258 ; IN BOTH CASES THE I/O IS COMPLETED.
                     0098   259 ;
                     0098   260 ; INPUTS:
                     0098   261 ;
                     0098   262 ;       R3 = I/O PACKET ADDRESS
                     0098   263 ;       R4 = CURRENT PCB
                     0098   264 ;       R5 = UCB ADDRESS
                     0098   265 ;       R6 = ASSIGNED CCB
                     0098   266 ;       R7 = ADDRESS OF THE CONTROL AST LIST HEAD TO CHANGE
                     0098   267 ;       AP = ADDRESS OF THE QIO ARGLIST
                     0098   268 ;
                     0098   269 ; OUTPUTS:
                     0098   270 ;
                     0098   271 ;       R0 = STATUS OF THE I/O
                     0098   272 ;       R3 = PACKET ADDRESS
                     0098   273 ;       R5 = UCB ADDRESS
                     0098   274 ;
                     0098   275 ;       NO OTHER REGISTERS ARE PRESERVED.
                     0098   276 ;
                     0098   277 ; COMPLETION CODES:
                     0098   278 ;
                     0098   279 ;       SS$_NORMAL
                     0098   280 ;       SS$_EXQUOTA  -- BUFFERED I/O OR AST QUOTA FAILURE
                     0098   281 ;       SS$_INSUFMEM -- DYNAMIC MEMORY FAILURE
                     0098   282 ;--
                     0098   283 COM$SETATTNAST::                          ; SET UP ATTENTION AST
56   28 A3   3C      0098   284          MOVZWL  IRP$W_CHAN(R3),R6        ; GET PACKET CHANNEL NUMBER
   58   6C   D0      009C   285          MOVL    P1(AP),R8                ; GET USER AST ADDRESS
        92   13      009F   286          BEQL    COM$FLUSHATTNS           ; IF EQL THEN DISABLE FUNCTION
                     00A1   287 ;
                     00A1   288 ; REQUEST TO ENABLE AST
                     00A1   289 ;
                     00A1   290 ; SET UP AST BLOCK
                     00A1   291 ;
```

```
                    51    28    9A   00A1    292          MOVZBL  #ACB$L_KAST+16,R1        ; SET SIZE OF NEEDED BLOCK
                          53    DD   00A4    293          PUSHL   R3                        ; SAVE PACKET ADDRESS
                00000000'GF    16   00A6    294          JSB     G^EXE$ALLOCBUF            ; ALLOCATE THE BUFFERED BLOCK
                          53  8ED0   00AC    295          POPL    R3                        ; RESTORE PACKET ADDRESS
                       40 50    E9   00AF    296          BLBC    R0,20$                    ; IF LOW SET THEN ALLOCATED
                   0B A2       06    90   00B2    297          MOVB    #IPL$_QUEUEAST,ACB$B_RMOD(R2); INSERT FORK IPL
                   18 A2       58    D0   00B6    298          MOVL    R8,ACB$L_KAST(R2)         ; INSERT AST ROUTINE ADDRESS
                1C A2    04 AC    D0   00BA    299          MOVL    P2(AP),ACB$L_KAST+4(R2)   ; INSERT PARAMETER FOR AST
          50    08 AC    02    00   00BF    300          EXTZV   #0,#2,P3(AP),R0           ; GET REQUEST ACCESS MODE
                00000000'GF    16   00C5    301          JSB     G^EXE$MAXACMODE           ; MAXIMIZE ACCESS MODE
                   20 A2    50    9A   00CB    302          MOVZBL  R0,ACB$L_KAST+8(R2)       ; INSERT IN CONTROL BLOCK
                20 A2       40 8F    88   00CF    303          BISB    #ACB$M_QUOTA,ACB$L_KAST+8(R2); INSERT TARGET ACCESS MODE
                   22 A2    56    B0   00D4    304          MOVW    R6,ACB$L_KAST+10(R2)      ; SAVE CHANNEL
                24 A2       60 A4    D0   00D8    305          MOVL    PCB$L_PID(R4),ACB$L_KAST+12(R2); INSERT PID ADDRESS OF REQUESTOR
                                     00DD    306 ;
                                     00DD    307 ; LOCK OUT INTERRUPTS TO ENTER BLOCK ON UCB
                                     00DD    308 ;
                                     00DD    309          DSBINT  UCB$B_DIPL(R5)            ; LOCK OUT INTERRUPTS
                   7E    12    DB   00DD                        MFPR    S^#PR$_IPL,-(SP)
                12    52 A5    DA   00E0                        MTPR    UCB$B_DIPL(R5),S^#PR$_IPL
                   62    67    D0   00E4    310          MOVL    (R7),(R2)                 ;  MERGE WITH CURRENT ENTRY
                   67    52    D0   00E7    311          MOVL    R2,(R7)                   ; INSERT NEW ENTRY VALUE
                                     00EA    312          ENBINT                            ; LOWER IPL
                   12    8E    DA   00EA                        MTPR    (SP)+,S^#PR$_IPL
                50    00'8F    9A   00ED    313          MOVZBL  #SS$_NORMAL,R0            ; SET NORMAL RETURN
                                05   00F1    314          RSB                               ; RETURN VIA CALLER
                      FF0B'     31   00F2    315 20$:     BRW     EXE$ABORTIO               ; ABORT THE I/O
                                     00F5    316 ;
                                     00F5    317          .END
```

ACB$B_RMOD	0000000B	D		IRP$L_WIND	00000018	D		PCB$W_MTXCNT	0000000E	D					
ACB$B_TYPE	0000000A	D		IRP$Q_NT_PRVMSK	0000003C	D		PCB$W_PPGCNT	00000036	D					
ACB$C_LENGTH	00000018	D		IRP$W_ABCNT	0000003C	D		PCB$W_PRCCNT	00000042	D					
ACB$K_LENGTH	00000018	D		IRP$W_BCNT	00000032	D		PCB$W_SIZE	00000008	D					
ACB$L_AST	00000010	D		IRP$W_BOFF	00000030	D		PCB$W_STATE	0000002C	D					
ACB$L_ASTPRM	00000014	D		IRP$W_CHAN	00000028	D		PCB$W_TMBU	00000032	D					
ACB$L_ASTQBL	00000004	D		IRP$W_FUNC	00000020	D		PR$_IPL	= 00000012	D					
ACB$L_ASTQFL	00000000	D		IRP$W_OBCNT	0000003E	D		PR$_SIRR	= 00000014	D					
ACB$L_KAST	00000018	D		IRP$W_SIZE	00000008	D		PRI$_IOCOM	= 00000001	D					
ACB$L_PID	0000000C	D		IRP$W_STS	0000002A	D		SCH$QAST	********	X	02				
ACB$M_QUOTA	= 00000040	D		IRP$W_TT_PRMPT	0000003C	D		SIZ...	= 00000002	D					
ACB$W_SIZE	00000008	D		P1	= 00000000	D		SS$_NORMAL	********	X	02				
CCB$B_AMOD	00000009	D		P2	= 00000004	D		UCB$B_AMOD	00000053	D					
CCB$B_STS	00000008	D		P3	= 00000008	D		UCB$B_CEX	00000077	D					
CCB$C_LENGTH	00000010	D		P4	= 0000000C	D		UCB$B_CM1	0000004A	D					
CCB$K_LENGTH	00000010	D		P5	= 00000010	D		UCB$B_CM2	0000004B	D					
CCB$L_DIRP	0000000C	D		P6	= 00000014	D		UCB$B_DEVCLASS	00000038	D					
CCB$L_UCB	00000000	D		PCB$B_ASTACT	0000000C	D		UCB$B_DEVTYPE	00000039	D					
CCB$L_WIND	00000004	D		PCB$B_ASTEN	0000000D	D		UCB$B_DIPL	00000052	D					
CCB$W_IOC	0000000A	D		PCB$B_PRI	0000000B	D		UCB$B_DX_SCTCNT	000000A6	D					
COM$DELATTNAST	00000000	RG	D	02	PCB$B_PRIB	0000002F	D		UCB$B_ERTCNT	00000070	D				
COM$DRVDEALMEM	00000073	RG	D	02	PCB$B_TYPE	0000000A	D		UCB$B_ERTMAX	00000071	D				
COM$FLUSHATTNS	00000033	RG	D	02	PCB$B_WEFC	0000002E	D		UCB$B_FEX	00000076	D				
COM$POST	00000063	RG	D	02	PCB$C_LENGTH	0000008C	D		UCB$B_FIPL	0000000B	D				
COM$SETATTNAST	00000098	RG	D	02	PCB$K_LENGTH	0000008C	D		UCB$B_LOCSRV	0000003C	D				
EXE$ABORTIO	********		X	02	PCB$L_ARB	00000084	D		UCB$B_OFFNDX	00000094	D				
EXE$ALLOCBUF	********		X	02	PCB$L_ASTQBL	00000014	D		UCB$B_OFFRTC	00000095	D				
EXE$DEANONPAGED	********		X	02	PCB$L_ASTQFL	00000010	D		UCB$B_REMSRV	0000003D	D				
EXE$FORK	********		X	02	PCB$L_EFC2P	00000058	D		UCB$B_SECTORS	0000003C	D				
EXE$MAXACMODE	********		X	02	PCB$L_EFC3P	0000005C	D		UCB$B_SLAVE	00000074	D				
IOC$GL_PSBL	********		X	02	PCB$L_EFCS	00000050	D		UCB$B_SPR	00000075	D				
IPL$_IOPOST	= 00000004		D		PCB$L_EFCU	00000054	D		UCB$B_STATE	00000052	D				
IPL$_QUEUEAST	= 00000006		D		PCB$L_EFWM	0000004C	D		UCB$B_TRACKS	0000003D	D				
IRP$B_CARCON	00000038	D			PCB$L_JIB	00000078	D		UCB$B_TT_CRFILL	0000009D	D				
IRP$B_EFN	00000022	D			PCB$L_OWNER	0000001C	D		UCB$B_TT_DECRF	000000A1	D				
IRP$B_PRI	00000023	D			PCB$L_PHD	00000064	D		UCB$B_TT_DELFF	000000A2	D				
IRP$B_RMOD	0000000B	D			PCB$L_PHYPCB	00000018	D		UCB$B_TT_DESPEE	000000A0	D				
IRP$B_TYPE	0000000A	D			PCB$L_PID	00000060	D		UCB$B_TT_DETYPE	000000A4	D				
IRP$C_LENGTH	0000005C	D			PCB$L_PQB	0000004C	D		UCB$B_TT_LFFILL	0000009E	D				
IRP$K_LENGTH	0000005C	D			PCB$L_SQBL	00000004	D		UCB$B_TT_SPEED	0000009C	D				
IRP$L_ARB	00000050	D			PCB$L_SQFL	00000000	D		UCB$B_TYPE	0000000A	D				
IRP$L_AST	00000010	D			PCB$L_STS	00000024	D		UCB$B_VERTSZ	0000003F	D				
IRP$L_ASTPRM	00000014	D			PCB$L_UIC	00000088	D		UCB$C_LENGTH	00000074	D				
IRP$L_DIAGBUF	00000044	D			PCB$L_WSSWP	00000020	D		UCB$C_MB_LENGTH	00000090	D				
IRP$L_EXTEND	0000004C	D			PCB$L_WTIME	00000028	D		UCB$C_TT_LENGTH	000000BC	D				
IRP$L_IOQBL	00000004	D			PCB$Q_PRIV	0000007C	D		UCB$K_LENGTH	00000074	D				
IRP$L_IOQFL	00000000	D			PCB$T_LNAME	00000068	D		UCB$K_MB_LENGTH	00000090	D				
IRP$L_IOSB	00000024	D			PCB$T_TERMINAL	00000044	D		UCB$K_TT_LENGTH	000000BC	D				
IRP$L_IOST1	00000034	D			PCB$W_APTCNT	00000030	D		UCB$L_AMB	00000054	D				
IRP$L_IOST2	00000038	D			PCB$W_ASTCNT	00000038	D		UCB$L_ASTQBL	00000010	D				
IRP$L_MEDIA	00000034	D			PCB$W_BIOCNT	0000003A	D		UCB$L_ASTQFL	0000000C	D				
IRP$L_PID	0000000C	D			PCB$W_BIOLM	0000003C	D		UCB$L_CPID	0000005C	D				
IRP$L_SEGVBN	00000040	D			PCB$W_DIOCNT	0000003E	D		UCB$L_CRB	00000020	D				
IRP$L_SEQNUM	00000048	D			PCB$W_DIOLM	00000040	D		UCB$L_DDB	00000024	D				
IRP$L_SVAPTE	0000002C	D			PCB$W_GPGCNT	00000034	D		UCB$L_DEVCHAR	00000034	D				
IRP$L_TT_TERM	00000038	D			PCB$W_GRP	0000008A	D		UCB$L_DEVDEPEND	0000003C	D				
IRP$L_UCB	0000001C	D			PCB$W_MEM	00000088	D		UCB$L_DPC	00000080	D				

UCB$L_DUETIM	0000005C	D	UCB$W_MB_SEED	00000000	D
UCB$L_DX_BFPNT	0000009C	D	UCB$W_MSGCNT	00000016	D
UCB$L_DX_BUF	00000098	D	UCB$W_MSGMAX	00000014	D
UCB$L_DX_RXDB	000000A0	D	UCB$W_NT_CHAN	0000007C	D
UCB$L_EMB	00000078	D	UCB$W_OFFSET	0000008A	D
UCB$L_FIRST	00000014	D	UCB$W_REFC	00000050	D
UCB$L_FPC	0000000C	D	UCB$W_SIZE	00000008	D
UCB$L_FQBL	00000004	D	UCB$W_SRCADDR	0000001A	D
UCB$L_FQFL	00000000	D	UCB$W_STS	00000058	D
UCB$L_FR3	00000010	D	UCB$W_TT_DESIZE	000000A5	D
UCB$L_FR4	00000014	D	UCB$W_UNIT	00000048	D
UCB$L_IOQBL	00000044	D	UCB$W_VPROT	0000001A	D
UCB$L_IOQFL	00000040	D			
UCB$L_IRP	0000004C	D			
UCB$L_LINK	0000002C	D			
UCB$L_LOGADR	00000064	D			
UCB$L_MAXBLOCK	00000084	D			
UCB$L_MB_MBX	0000007C	D			
UCB$L_MB_PORT	0000008C	D			
UCB$L_MB_RAST	00000078	D			
UCB$L_MB_SHB	00000080	D			
UCB$L_MB_WAST	00000074	D			
UCB$L_MB_WIOQBL	00000088	D			
UCB$L_MB_WIOQFL	00000084	D			
UCB$L_MEDIA	0000008C	D			
UCB$L_NT_DATSSB	00000074	D			
UCB$L_NT_INTSSB	00000078	D			
UCB$L_OPCNT	00000060	D			
UCB$L_OWNUIC	0000001C	D			
UCB$L_PID	00000028	D			
UCB$L_RQBL	00000004	D			
UCB$L_RQFL	00000000	D			
UCB$L_SVAPTE	00000068	D			
UCB$L_SVPN	00000064	D			
UCB$L_TT_DECHAR	000000A8	D			
UCB$L_TT_RDUE	0000008C	D			
UCB$L_TT_RTIMOU	000000B8	D			
UCB$L_VCB	00000030	D			
UCB$T_PARTNER	0000000C	D			
UCB$W_BCNT	0000006E	D			
UCB$W_BCR	00000096	D			
UCB$W_BOFF	0000006C	D			
UCB$W_BUFQUO	00000018	D			
UCB$W_BYTESTOGO	0000003E	D			
UCB$W_CHARGE	0000004A	D			
UCB$W_CYLINDERS	0000003E	D			
UCB$W_DA	0000008C	D			
UCB$W_DC	0000008E	D			
UCB$W_DEVBUFSIZ	0000003A	D			
UCB$W_DEVSTS	0000005A	D			
UCB$W_DIRSEQ	00000088	D			
UCB$W_DSTADDR	00000018	D			
UCB$W_DX_BCR	000000A4	D			
UCB$W_EC1	00000090	D			
UCB$W_EC2	00000092	D			
UCB$W_ERRCNT	00000072	D			
UCB$W_FUNC	0000007E	D			

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	000000BC (188.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
SEP	000000F5 (245.)	02 (2.)	NOPIC USR CON REL LCL SHR EXE RD WRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
ACB$B_RMOD	0000000B		#-109 (2) #-297 (6)
ACB$L_AST	00000010		#-108 (2)
ACB$L_KAST	00000018		#-108 (2) #-109 (2) #-110 (2) #-111 (2) #-145 (3)
			#-147 (3) #-292 (6) #-298 (6) #-299 (6) #-302 (6)
			#-303 (6) #-304 (6) #-305 (6)
ACB$L_PID	0000000C		#-110 (2)
ACB$M_QUOTA	=00000040		#-303 (6)
COM$DELATTNAST	00000000-R	98 (2)	
COM$DRVDEALMEM	00000073-R	214 (5)	#-151 (3)
COM$FLUSHATTNS	00000033-R	141 (3)	#-152 (3) #-286 (6)
COM$POST	00000063-R	183 (4)	
COM$SETATTNAST	00000098-R	283 (6)	
EXE$ABORTIO	00000000-XR		#-315 (6)
EXE$ALLOCBUF	00000000-XR		294 (6)
EXE$DEANONPAGED	00000000-XR		226 (5)
EXE$FORK	00000000-XR		104 (2) 221 (5)
EXE$MAXACMODE	00000000-XR		301 (6)
IOC$GL_PSBL	00000000-XR		185 (4)
IPL$_IOPOST	=00000004		#-187 (4)
IPL$_QUEUEAST	=00000006		#-218 (5) #-297 (6)
IRP$W_CHAN	00000028		#-284 (6)
P1	=00000000	70 (1)	#-285 (6)
P2	=00000004	71 (1)	#-299 (6)
P3	=00000008	72 (1)	300 (6)
P4	=0000000C	73 (1)	
P5	=00000010	74 (1)	
P6	=00000014	75 (1)	
PCB$L_PID	00000060		#-145 (3) #-305 (6)
PR$_IPL	=00000012		#-142 (3) #-150 (3) #-155 (3) #-309 (6) #-312 (6)
PR$_SIRR	=00000014		#-187 (4)
PRI$_IOCOM	=00000001		#-112 (2)
SCH$QAST	00000000-XR		113 (2)
SS$_NORMAL	00000000-XR		#-156 (3) #-313 (6)
UCB$B_DIPL	00000052		#-142 (3) #-309 (6)
UCB$L_OPCNT	00000060		#-184 (4)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.03	00:00:00.20
Command processing	928	00:00:00.28	00:00:00.94
Pass 1	616	00:00:02.29	00:00:03.66
Symbol table sort	0	00:00:00.16	00:00:00.16
Pass 2	42	00:00:00.54	00:00:01.30
Symbol table output	2	00:00:00.04	00:00:00.10
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	3	00:00:00.02	00:00:00.02

```
Assembler run totals          1620     00:00:03.36    00:00:06.38

The working set limit was 2400 pages.
130678 bytes (256 pages) of virtual memory were used to buffer the intermediate code.
There were 40 pages of symbol table space allocated to hold 666 non-local and 9 local symbols.
317 source lines were read in Pass 1, producing 46 object records in Pass 2.
26 pages of virtual memory were used to define 25 macros.
```

+----------------------------+
! Macro library statistics !
+----------------------------+

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	7
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	6
SYS$COMMON:[SYSLIB]STARLET.MLB;2	8
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	21

```
1010 GETS were required to define 21 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(3)   441   INI$LOAD_DEVICE   Make ptables for console and boot devices
(4)   495   DSP$CONFIG_LOAD Configure load device
(9)   990   Common routines
(10)   1119   configure RB730
(10)   1253   Attach UDA-50/LESI/KDB50/KFBTA/DEBNT load path   ;G:9

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element CONFIG.MAR
0000     2 ;  15   14-MAR-1988 09:41:49 MEIER "end device gets HP$A_DEVICE from parent's DVA fi
0000     3 ; *14   16-DEC-1987 16:20:39 GEARIN "fixed problem with exclusion of zeroes in devic
0000     4 ; *13    4-DEC-1987 16:38:37 GEARIN "ADDED SUPPORT FOR 5 DIGIT UNIT #"
0000     5 ; *12   11-NOV-1987 08:36:20 GEARIN "ADDED SUPPORT FOR EXTENDED P-TABLE"
0000     6 ; *11   17-JUN-1987 16:08:40 BAGGETT "CHANGES COMPLETED"
0000     7 ; *10    8-MAY-1987 14:43:54 BAGGETT "PLACE .OBJ IN GOOD LIBRARY"
0000     8 ; *9     8-MAY-1987 13:05:53 BAGGETT "TK50 CODE ADDED"
0000     9 ; *8     5-MAY-1987 11:15:42 MI "REPLACED WITHOUT CHANGE SINCE SELF TEST ISNSHOW DAY
0000    10 ; *7    23-FEB-1987 11:03:34 BAGGETT "ALL VDS WILL BOOT WITH VMB->DIAGBOOT->VDS FROM
0000    11 ; *6    13-FEB-1987 15:50:14 SALEM "DONE - MARION NEEDS MODULE"
0000    12 ; *5     4-DEC-1986 16:32:28 SILVER "FIX FOR VOLUME SHADOWING"
0000    13 ; *4    30-MAY-1986 16:24:22 BAGGETT "SYMBOLS REMOVED"
0000    14 ; *3    27-MAY-1986 15:12:13 SALEM "ALL DONE"
0000    15 ; *2     1-APR-1986 09:43:51 BAGGETT "<no reason given>"
0000    16 ; *1     6-FEB-1986 15:15:16 DS ""
0000    17 ; DEC/CMS REPLACEMENT HISTORY, Element CONFIG.MAR
0000    18         .TITLE  CONFIG  *** CONFIG Configure load device
0000    19         .IDENT /10.10-45/                                                    ;G:12
0000    20         .NoShow Conditionals
0000    21         .DSABL  GBL
0000    22
0000    23 ;
0000    24 ; Copyright (c) 1977, 1982, 1984, 1985, 1986, 1987                          ;G:7
0000    25 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    26 ;
0000    27 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0000    28 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
0000    29 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
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0000    39 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0000    40 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    41
0000    42 ;++
0000    43 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR.
0000    44 ;
0000    45 ; ABSTRACT:
0000    46 ;
0000    47 ; ENVIRONMENT:
0000    48 ;
0000    49 ; AUTHOR:       Roger Riggs     20-FEB-79       VERSION 01.
0000    50 ;
0000    51 ; MODIFICATIONS:
0000    52 ;
0000    53 ;                N. Howgate      26-Jun-79
0000    54 ;        01      References to I/O space are changed from
0000    55 ;                60000000 or 4000000 to IOC$K_IOSPACE
0000    56 ;                and are CPU dependant as defined in ONLYnnn.
0000    57 ;
```

```
0000     58 ;       02      John Ciukaj     1-25-80
0000     59 ;               Allow for RL01/RL02 to be configured: Add CON_UBA_RL
0000     60 ;
0000     61 ;       03      dave butenhof, 02-Sep-1981, version 6.5
0000     62 ;               Support RB730 (Nebula IDC) as load path.
0000     63 ;
0000     64 ;       04      - Jack Stansbury, 22-Oct-1981, Version 6.-
0000     65 ;               Changed SEP Psect to CODE, DATA, and WORK.
0000     66 ;               Also added .LIBRARY statements for $DS,
0000     67 ;               $DIAG and SYS$LIBRARY:LIB.
0000     68 ;
0000     69 ;       05      - Jack Stansbury, 22-Oct-1981, Version 6.-
0000     70 ;               Fixed truncation errors.
0000     71 ;
0000     72 ;       06      - Dave Butenhof, 24-Mar-1982, Version 6.6
0000     73 ;               Fix bug in CONFIG RB730 routine.  IDC can generate double
0000     74 ;               interrupt...make sure to disable device interrupts in handler
0000     75 ;               routine to avoid UNEXPECTED INTERRUPT error.
0000     76 ;       [07] Dave Butenhof, 15-Apr-1982, Version 6.7
0000     77 ;               Support UDA-50 load device.
0000     78 ;       [08] Dave Butenhof, 28-May-1982, version 6.8
0000     79 ;               Fix IDC code - use correct address for IDC, not the
0000     80 ;               one VMB gives us.
0000     81 ;
0000     82 ;       09      M. Baggett      24-Feb-1983     Version 6.11
0000     83 ;               Fixed document typo, support RC25.
0000     84 ;
0000     85 ;       10      M. Baggett      3-March-1983    Version 6.11
0000     86 ;               Added suport for HSC50.
0000     87 ;
0000     88 ;       11      M. Baggett      9-may-1983      Version 6.11
0000     89 ;               Booting from RP07 will have device name of DR and not DB.
0000     90 ;
0000     91 ;       12      M. Baggett      22-May-1983     Version 6.11
0000     92 ;               Allow any length name to be boot device (eg, CIAx, CIAxx, CIAxxx).
0000     93 ;
0000     94 ;       13      M. Baggett      21-Sep-1983     Version 6.13
0000     95 ;               Change HSC50 boot to a disk on the HSC50 to allow selections
0000     96 ;               among the different disks. Changed the name of LESI to RC11, and
0000     97 ;               temporarily changed the RC25 generic to DU.
0000     98 ;
0000     99 ;       14      M. Baggett      7-Sep-1983      Version 6.13
0000    100 ;               Change HSC50 controller naming to match standards.
0000    101 ;               Generic name is  HSC50$DUAnnn for DISK p-table.
0000    102 ;
0000    103 ;       15      Bob Bergazzi    2-14-84         Version 6.14
0000    104 ;               Moved code from KERNEL to here which builds ptables for the
0000    105 ;               console and boot devices. Subroutine is called INI$LOAD_DEVICE.
0000    106 ;               Done so that SET MEM can call this routine.
0000    107 ;
0000    108 ;       16      M. Baggett      15-Feb-1984     Version 6.14
0000    109 ;               Changed the default name for RC25/RCF25 device to DUA temporary ****
0000    110 ;
0000    111 ;       17      M. Baggett      16-May-1984     Version 7.0
0000    112 ;               Fixed HSC50 disk name to show proper unit number.
0000    113 ;
0000    114 ;       18      M. Baggett      6-Jun-1984      Version 7.0
```

```
0000   115 ;                Change device name for RC11/RC25/RCF25 back to DA.
0000   116 ;
0000   117 ;        19      Richard Brown   10-July-1984    Version 7.0
0000   118 ;                Change all references of "RC11" to "LESI".
0000   119 ;
0000   120 ;        20      Jim Shelhamer   1-Oct-1984      Version 7.1
0000   121 ;                Copied HSC50 code ([13] stuff) for multi-digit unit numbers to
0000   122 ;                RA disks section.
0000   123 ;
0000   124 ;        21      Jim Shelhamer   17-Oct-1984     Version 7.1
0000   125 ;                Added support (modelled after D Muse's changes in Attach) to handle
0000   126 ;                long device names for HSC devices.
0000   127 ;
0000   128 ;        22      Domenic Andella 25-Oct-1984     Version 7.1
0000   129 ;                Changed BLSS instruction in routine CON_CI_HSCCI
0000   130 ;                to unsigned BLSSU for comparison of drive # >= 10.
0000   131 ;
0000   132 ;        23      Jim Shelhamer   31-Oct-1984     Version 7.1
0000   133 ;                Changed BLSS instructio in routine CON_UBA_UDA
0000   134 ;                to unsigned BLSSU for comparison of drive # >= 10.
0000   135 ;
0000   136 ;        24      Bob Bergazzi    17-Dec-1984     Version 8.0
0000   137 ;                Fixed CI_NODE ptable to inherit controller letter from
0000   138 ;                CI780 ptable.
0000   139 ;
0000   140 ;        25      Bob Bergazzi    12-June-1985    Version 8.3
0000   141 ;                Add support for auto-config of BDA device ptables.
0000   142 ;
0000   143 ;        26      M. Baggett      12-Aug-1985     Version 8.3
0000   144 ;                Added support for Aurora booting on RDBX1.
0000   145 ;
0000   146 ;        27      Ted Salem       20-Aug-1985     Version 8.3
0000   147 ;                Added code in order to get the HSC port number being used
0000   148 ;
0000   149 ;        28      M. Baggett      3-Sep-1985      VDS     8.3
0000   150 ;                Made symbol AU$K_TYPE global.
0000   151 ;
0000   152 ;        29      Bob Bergazzi    4-Sep-1985      Version 8.3
0000   153 ;                Fix edit 26 (setup R0 with UD_INIT).
0000   154 ;
0000   155 ;        30      M. Baggett      4-Sep-1985      VDS 9.0
0000   156 ;                Set up registers for calling init routines.
0000   157 ;
0000   158 ;        31      Bob Bergazzi    24-Sep-1985     Version 9.0
0000   159 ;                Fixed auto config of UDA50 disk ptable, so that
0000   160 ;                the disk (e.g. DUA0) inherits the controller letter
0000   161 ;                from the DUA ptable. Symptom was reported for KDB50.
0000   162 ;
0000   163 ;        32      Jim Shelhamer   1-OCT-1985      Version 9.0
0000   164 ;                The values returned by the alloc for the CI ptable
0000   165 ;                were being clobbered by the routines to get the
0000   166 ;                pseudo-RPB. See edit 27.
0000   167 ;
0000   168 ;        33      M. Baggett      7-Oct-1985      Version 9.0
0000   169 ;                Changes for aurora booting AIO devices.
0000   170 ;
0000   171 ;        34      M. Baggett      14-Nov-1985     Version 9.2
```

```
0000   172 ;               Changes name RDBX1 to KFBTA.
0000   173 ;
0000   174 ;       35      Ted Salem       21-Nov-1985     Version 9.2
0000   175 ;               Moved code to configure the console device(s)
0000   176 ;               in the ONLYxxx modules.
0000   177 ;                                                                       ;G:2
0000   178 ;       36      M. Baggett      17-Dec-1985     Version 9.2             ;G:2
0000   179 ;               Correct value for KFBTA boot code and add               ;G:2
0000   180 ;               MAYA boot code.                                         ;G:2
0000   181 ;                                                                       ;G:2
0000   182 ;       37      M. Baggett      11-Feb-1986     Version 9.2             ;G:2
0000   183 ;               Change for booting AIO on SCORPIO.                      ;G:2
0000   184 ;                                                                       ;G:3
0000   185 ;       38      T. Salem        6-May-1986      Version 10.0            ;G:3
0000   186 ;               Took out symbol for Aurora sid.  No longer needed.      ;G:3
0000   187 ;                                                                       ;G:5
0000   188 ;       39      M. Baggett      30-May-1986     Version 10.0            ;G:4
0000   189 ;               Remove symbols defined in library                       ;G:4
0000   190 ;                                                                       ;G:5
0000   191 ;       40      Doug Silver     1-Dec-1986      Version 10.3            ;G:5
0000   192 ;               Create proper device name for a shadow set.             ;G:5
0000   193 ;               Also fixed bug which determines proper unit             ;G:5
0000   194 ;               number.                                                 ;G:5
0000   195 ;                                                                       ;G:13
0000   196 ;       41      Ted Salem       29-Jan-1987     Version 10.5            ;G:6
0000   197 ;               Add code to configure an NI boot path.                  ;G:6
0000   198 ;                                                                       ;G:7
0000   199 ;       42      M. Baggett      13-Feb-1987     Version 10.5            ;G:7
0000   200 ;               Allow VDS to boot from console media with VMB/DIAGBOOT. ;G:13
0000   201 ;                                                                       ;G:9
0000   202 ;       43      M. Baggett      24-Apr-1987     Version 10.8            ;G:9
0000   203 ;               Complete TK50 boot support.                             ;G:9
0000   204 ;                                                                       ;G:11
0000   205 ;       44      M. Baggett      17-Jun-1987     Version 10.8            ;G:11
0000   206 ;               Fixed bug to allow booting from UDA50 and KDB50.        ;G:11
0000   207 ;                                                                       ;G:12
0000   208 ;               David Gearin    20-Oct-1987     Version 10.10           ;G:12
0000   209 ;               Add support for new extended p-table format.            ;G:12
0000   210 ;                                                                       ;G:13
0000   211 ;               David Gearin    3-Dec-1987      Version 10.10           ;G:13
0000   212 ;               Allow for unit numbers of up to 5 digits.               ;G:13
0000   213 ;                                                                       ;G:14
0000   214 ;               David Gearin    16-Dec-1987     Version 10.10           ;G:14
0000   215 ;               Fixed bug that excluded zeroes that are encountered     ;G:14
0000   216 ;               in unit #.  These zeroes were left out of some          ;G:14
0000   217 ;               device names.                                           ;G:14
0000   218 ;--
```

```
                        0000    220 ;                                                                   [04]
                        0000    221 ; Include Files                                                     [04]
                        0000    222 ;                                                                   [04]
                        0000    223         .LIBRARY        /SYS$LIBRARY:LIB/       ;                   [04]
                        0000    224         .LIBRARY        /$DS/                   ;                   [04]
                        0000    225         .LIBRARY        /$DIAG/                 ;                   [04]
                        0000    226 ;                                                                   [04]
                        0000    227 ; Macros                                                            [04]
                        0000    228 ;                                                                   [04]
                        0000    229
                        0000    230 ;                                                                   [04]
                        0000    231 ; Equated Symbols                                                   [04]
                        0000    232 ;                                                                   [04]
                        0000    233
                        0000    234         CLIDEF
                        0000    235         $PRDEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 044C               .=0
                        0000                .RESTORE
                        0000    236         $BTDDEF                                 ; VMS boot device codes [07]
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 044C               .=0
                        0000                .RESTORE
                        0000    237         $MSCPDef                                ; Define disk protocol  [07]
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 044C               .=0
                        0000                .RESTORE
                        0000    238
                        0000    239 ;
                        0000    240 ; Define Ptable data structures
                        0000    241 ;
                        0000    242         $DS_HPEODEF                                                 ;G:12
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 044C               .=0
                        0000                .IIF    NB,HPE$T_DEVICE,        HPE$T_DEVICE:
                00000014 0000               .IIF    NB,.BLKL,       .BLKL   5
                        0014                .IIF    NB,HPE$W_EXT_DRIVE,     HPE$W_EXT_DRIVE:
                00000016 0014               .IIF    NB,.BLKW,       .BLKW   1
                        0016                .IIF    NB,HPE$A_EPB,   HPE$A_EPB:
                0000001A 0016               .IIF    NB,.BLKL,       .BLKL   1
                        0000                .RESTORE
                        0000    243         $DS_HPODEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 044C               .=0
                        0000                .IIF    NB,HP$Q_DEVICE, HP$Q_DEVICE:
                00000008 0000               .IIF    NB,.BLKQ,       .BLKQ   1
                        0008                .IIF    NB,HP$W_SIZE,   HP$W_SIZE:
                0000000A 0008               .IIF    NB,.BLKW,       .BLKW   1
                        000A                .IIF    NB,HP$B_FLAGS,  HP$B_FLAGS:
                0000000B 000A               .IIF    NB,.BLKB,       .BLKB   1
                        000B                .IIF    NB,HP$B_DRIVE,  HP$B_DRIVE:
                0000000C 000B               .IIF    NB,.BLKB,       .BLKB   1
```

```
                        000C                .IIF    NB,HP$T_DEVICE, HP$T_DEVICE:
                00000018 000C               .IIF    NB,.BLKB,       .BLKB   12
                        0018                .IIF    NB,HP$A_DEVICE, HP$A_DEVICE:
                0000001C 0018               .IIF    NB,.BLKL,       .BLKL   1
                        001C                .IIF    NB,HP$A_DVA,    HP$A_DVA:
                00000020 001C               .IIF    NB,.BLKL,       .BLKL   1
                        0020                .IIF    NB,HP$A_LINK,   HP$A_LINK:
                00000024 0020               .IIF    NB,.BLKL,       .BLKL   1
                        0024                .IIF    NB,HP$W_VECTOR, HP$W_VECTOR:
                00000026 0024               .IIF    NB,.BLKW,       .BLKW   1
                        0026                .IIF    NB,HP$T_TYPE,   HP$T_TYPE:
                00000032 0026               .IIF    NB,.BLKB,       .BLKB   12
                        0032                .IIF    NB,HP$A_DEPENDENT,      HP$A_DEPENDENT:
                        0000                .RESTORE
                        0000    244         $DS_RP04_DEF                                            ;G:13
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000032 044C               .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$K_RP04_LEN,       HP$K_RP04_LEN:
                        0032                .IIF    NB,RP04$K_LEN,  RP04$K_LEN:
                        0000                .RESTORE
                        0000    245         $DS_RK611_DEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000032 044C               .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$L_RK611_CSR,      HP$L_RK611_CSR:
                        0032                .IIF    NB,RK611$L_CSR, RK611$L_CSR:
                00000036 0032               .IIF    NB,.BLKL,       .BLKL   1
                        0036                .IIF    NB,HP$B_RK611_BR,       HP$B_RK611_BR:
                        0036                .IIF    NB,RK611$B_BR,  RK611$B_BR:
                00000037 0036               .IIF    NB,.BLKB,       .BLKB   1
                        0037                .IIF    NB,HP$K_RK611_LEN,      HP$K_RK611_LEN:
                        0037                .IIF    NB,RK611$K_LEN, RK611$K_LEN:
                        0000                .RESTORE
                        0000    246         $ds_rb730_def
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000032 044C               .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$L_RB730_CSR,      HP$L_RB730_CSR:
                        0032                .IIF    NB,RB730$L_CSR, RB730$L_CSR:
                00000036 0032               .IIF    NB,.BLKL,       .BLKL   1
                        0036                .IIF    NB,HP$B_RB730_BR,       HP$B_RB730_BR:
                        0036                .IIF    NB,RB730$B_BR,  RB730$B_BR:
                00000037 0036               .IIF    NB,.BLKB,       .BLKB   1
                        0037                .IIF    NB,HP$K_RB730_LEN,      HP$K_RB730_LEN:
                        0037                .IIF    NB,RB730$K_LEN, RB730$K_LEN:
                        0000                .RESTORE
                        0000    247         $ds_r80_def
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000032 044C               .=HP$A_DEPENDENT
                        0032                .IIF    NB,R80$K_LEN,   R80$K_LEN:
                        0000                .RESTORE
                        0000    248         $ds_r102_def
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000032 044C               .=HP$A_DEPENDENT
```

```
                        0032                .IIF    NB,HP$K_RL02_LEN,       HP$K_RL02_LEN:
                        0032                .IIF    NB,RL02$K_LEN,  RL02$K_LEN:
                        0000                .RESTORE
                        0000    249         $DS_RK06_DEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000032  044C              .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$K_RK06_LEN,       HP$K_RK06_LEN:
                        0032                .IIF    NB,RK06$K_LEN,  RK06$K_LEN:
                        0000                .RESTORE
                        0000    250         $DS_RL11_DEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000032  044C              .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$L_RL11_CSR,       HP$L_RL11_CSR:
                        0032                .IIF    NB,RL11$L_CSR,  RL11$L_CSR:
                00000036  0032              .IIF    NB,.BLKL,       .BLKL   1
                        0036                .IIF    NB,HP$B_RL11_BR,        HP$B_RL11_BR:
                        0036                .IIF    NB,RL11$B_BR,   RL11$B_BR:
                00000037  0036              .IIF    NB,.BLKB,       .BLKB   1
                        0037                .IIF    NB,HP$K_RL11_LEN,       HP$K_RL11_LEN:
                        0037                .IIF    NB,RL11$K_LEN,  RL11$K_LEN:
                        0000                .RESTORE
                        0000    251         $DS_RL01_DEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000032  044C              .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$K_RL01_LEN,       HP$K_RL01_LEN:
                        0032                .IIF    NB,RL01$K_LEN,  RL01$K_LEN:
                        0000                .RESTORE
                        0000    252         $Ds_UDA50_Def                           ;                                       [07]
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000032  044C              .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$L_UDA50_UDAIP,    HP$L_UDA50_UDAIP:
                        0032                .IIF    NB,UDA50$L_UDAIP,       UDA50$L_UDAIP:
                00000036  0032              .IIF    NB,.BLKL,       .BLKL   1
                        0036                .IIF    NB,HP$B_UDA50_BR,       HP$B_UDA50_BR:
                        0036                .IIF    NB,UDA50$B_BR,  UDA50$B_BR:
                00000037  0036              .IIF    NB,.BLKB,       .BLKB   1
                        0037                .IIF    NB,HP$B_UDA50_BURST,    HP$B_UDA50_BURST:
                        0037                .IIF    NB,UDA50$B_BURST,       UDA50$B_BURST:
                00000038  0037              .IIF    NB,.BLKB,       .BLKB   1
                        0038                .IIF    NB,HP$K_UDA50_LEN,      HP$K_UDA50_LEN:
                        0038                .IIF    NB,UDA50$K_LEN, UDA50$K_LEN:
                        0000                .RESTORE
                        0000    253         $Ds_RA80_Def                            ;                                       [07]
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000032  044C              .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$K_RA80_LEN,       HP$K_RA80_LEN:
                        0032                .IIF    NB,RA80$K_LEN,  RA80$K_LEN:
                        0000                .RESTORE
                        0000    254         $ds_ra90_def                                                            ;G:12
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000032  044C              .=HP$A_DEPENDENT
```

```
                        0032                .IIF    NB,HP$K_RA90_LEN,       HP$K_RA90_LEN:
                        0032                .IIF    NB,RA90$K_LEN,  RA90$K_LEN:
                        0000                .RESTORE
                        0000    255         $DS_CI_DEF                                      ;                       [10]
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000032 044C               .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$B_CI_TR,  HP$B_CI_TR:
                        0032                .IIF    NB,CI$B_BI_ID,  CI$B_BI_ID:
                        0032                .IIF    NB,CI$B_TR,     CI$B_TR:
                00000033 0032               .IIF    NB,..BLKB,      .BLKB   1
                        0033                .IIF    NB,HP$B_CI_BR,  HP$B_CI_BR:
                        0033                .IIF    NB,CI$B_BR,     CI$B_BR:
                00000034 0033               .IIF    NB,..BLKB,      .BLKB   1
                        0034                .IIF    NB,HP$B_CI_NODE,        HP$B_CI_NODE:
                        0034                .IIF    NB,CI$B_NODE,   CI$B_NODE:
                00000035 0034               .IIF    NB,..BLKB,      .BLKB   1
                        0035                .IIF    NB,HP$L_CI_FUNC,        HP$L_CI_FUNC:
                        0035                .IIF    NB,Ci$L_Func,   Ci$L_Func:
                00000039 0035               .IIF    NB,..BlkL,      .BlkL   1
                        0039                .IIF    NB,HP$L_CI_MAINT_ID,    HP$L_CI_MAINT_ID:
                        0039                .IIF    NB,Ci$L_Maint_Id,       Ci$L_Maint_Id:
                0000003D 0039               .IIF    NB,..BlkL,      .BlkL   1
                        003D                .IIF    NB,HP$L_CI_INDEX,       HP$L_CI_INDEX:
                        003D                .IIF    NB,Ci$L_Index,  Ci$L_Index:
                00000041 003D               .IIF    NB,..BlkL,      .BlkL   1
                        0041                .IIF    NB,HP$K_CI_LEN, HP$K_CI_LEN:
                        0041                .IIF    NB,CI$K_LEN,    CI$K_LEN:
                        0000                .RESTORE
                        0000    256         $DS_DISK_DEF                                    ;                       [13]
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000032 044C               .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$K_DISK_LEN,       HP$K_DISK_LEN:
                        0032                .IIF    NB,DISK$K_LEN,  DISK$K_LEN:
                        0000                .RESTORE
                        0000    257
                        0000    258 ;
                        0000    259 ; Define miscellaneous structures/constants
                        0000    260 ;
                        0000    261
                        0000    262         $DS_DSADEF
                        0000    263         $DS_DSDEF
                        0000    264         $SSDef                                          ; Define SS status codes        [07]
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 FE70               .=0
                        0000                .RESTORE
                        0000    265
                        0000    266         $DS_CHCDEF
                        0000    267         $DS_CHIDEF
                        0000    268
                00000000 0000   269 RK_CS1=0                    ; Offset to control/status reg 1
                00000040 0000   270 RK_CS1_M_IE=1a6             ; Interrupt bit
                00000080 0000   271 RK_CS1_M_RDY=1a7            ; Controller ready
                00008000 0000   272 RK_CS1_M_CERR=1a15          ; Clear controller errors
                00000008 0000   273 RK_CS2=8                    ; Offset to control/status reg 2
```

```
0000000A  0000    274 RK_DS=10                    ; Offset to Drive status register
00000008  0000    275 RK_DS_V_DDT=8               ; Zero if RK06 drive, 1 if RK07
00000004  0000    276 F_DRVCLR=4                  ; Function to clear indicated drive
          0000    277
          0000    278
00000000  0000    279 RL_CS=0                     ; offset to control/status register
00000080  0000    280 RL_CS_M_CRDY=1a7            ; controller ready
00000040  0000    281 RL_CS_M_IE=1a6              ; interrupt bit
00000004  0000    282 RL_DA=4                     ; offset to disk address register
00000001  0000    283 RL_DA_M_MRK=1a0             ; bit 0 in disk address register
00000002  0000    284 RL_DA_M_STS=1a1             ; get status bit
00000008  0000    285 RL_DA_M_RST=1a3             ; reset bit in disk adress register
00000006  0000    286 RL_MP=6                     ; offset to multipurpose register
00000007  0000    287 RL_MP_V_TYP=7               ; 0=RL01,1=RL02
00000004  0000    288 F_STAT=4                    ; get status function
          0000    289
00000000  0000    290 RP_CS1=0                    ; Offset to control/status reg 1
00000000  0000    291 F_NOP=0                     ; Function for drive NOP
00000018  0000    292 RP_DT=24                    ; Offset to drive type register
00000000  0000    293 RP_DT_V_DTN=0               ; Low bit of drive type
00000009  0000    294 RP_DT_S_DTN=9               ; Size of drive type
00000010  0000    295 DT_RP04=^X10                ; RP04 drive type
00000011  0000    296 DT_RP05=^X11                ; RP05
00000012  0000    297 DT_RP06=^X12                ; RP06
00000021  0000    298 DT_RP07_HPT=^X21            ; RP07(with head per track option)
00000022  0000    299 DT_RP07=^X22                ; RP07(w/o head per track option)
00000015  0000    300 DT_RM03=^X15                ; RM03
00000016  0000    301 DT_RM80=^X16                ; RM80
00000017  0000    302 DT_RM05=^X17                ; RM05
00000014  0000    303 HP$C_NAMELEN    == 20       ;                                                    [21]
00000040  0000    304 CONSOLE_CODE    = 64        ; Boot code for console boot                         [42]
          0000    305
          0000    306 ;
          0000    307 ; RB730:/RB02/RB80 REGISTER OFFSETS FROM CSR ADDRESS
          0000    308 ;
          0000    309         $DEFINI RB                          ; START OF REGISTER DEFINITIONS
          0000                .SAVE   LOCAL_BLOCK
          0000                .PSECT  $ABS$,ABS
00000000  FE70                .=0
          0000    310
          0000    311 $DEF    RB_CS           .BLKL   1           ;CONTROL STATUS REGISTER (CSR)
          0000                .IIF    NB,RB_CS,       RB_CS:
00000004  0000                .IIF    NB,.BLKL,       .BLKL   1
          0004    312         _VIELD  RB_CS,0,<-                  ;START OF CSR BIT DEFINITIONS
          0004    313                 <DRDY,,M>,-                 ; DRIVE READY
          0004    314                 <FCODE,3>,-                 ; FUNCTION CODE
          0004    315                 <,2>,-                      ; RESERVED BITS
          0004    316                 <IE,,M>,-                   ; INTERRUPT ENABLE
          0004    317                 <CRDY,,M>,-                 ; CONTROLLER READY
          0004    318                 <DS,2>,-                    ; DRIVE SELECT
          0004    319                 <OPI,,M>,-                  ; OPERATION INCOMPLETE
          0004    320                 <CRC,,M>,-                  ; DATA CRC OR HEADER CRC OR DATA ECC
          0004    321                 <DLT,,M>,-                  ; DATA LATE OR HEADER NOT FOUND
          0004    322                 <NXM,,M>,-                  ; NON-EXISTENT MEMORY
          0004    323                 <DE,,M>,-                   ; DRIVE ERROR
          0004    324                 <CE,,M>,-                   ; COMPOSITE ERROR
          0004    325                 <ATN,4>,-                   ; DRIVE ATTENTION BITS
```

```
                    0004                    <ECC,2>,-                   ; ECC STATUS
                    0004                    <SSEI,,M>,-                 ; SKIP SECTOR ERROR INHIBIT
                    0004                    <SSE,,M>,-                  ; SKIP SECTOR ERROR
                    0004                    <IR,,M>,-                   ; IDC INTERRUPT REQUEST
                    0004                    <MTN,,M>,-                  ; MAINTENANCE MODE
                    0004                    <TYP,,M>,-                  ; DRIVE TYPE 1=RB80, 0=RB02
                    0004                    <ASSI,,M>,-                 ; AUTOMATIC SKIP SECTOR INHIBIT
                    0004                    <TOI,,M>,-                  ; TIME OUT INHIBIT (U-DIAG'S)
                    0004                    <FMT,,M>,-                  ; R80 FORMAT CONTROL
                    0004                    <,2>-                       ; RESERVED BITS
                    0004            >                                   ;END CSR BIT DEFINITIONS
                    0004
                    0004
                    0004    $DEF    RB_BA           .BLKL   1           ;BUS ADDRESS REGISTER (BAR)
                    0004            .IIF    NB,RB_BA,       RB_BA:
          00000008  0004            .IIF    NB,.BLKL,       .BLKL   1
                    0008
                    0008    $DEF    RB_BC           .BLKL   1           ;BYTE COUNT REGISTER (BCR)
                    0008            .IIF    NB,RB_BC,       RB_BC:
          0000000C  0008            .IIF    NB,.BLKL,       .BLKL   1
                    000C
                    000C    $DEF    RB_DA           .BLKL   1           ;DISK ADDRESS REGISTER (DAR)
                    000C            .IIF    NB,RB_DA,       RB_DA:
          00000010  000C            .IIF    NB,.BLKL,       .BLKL   1
                    0010            _VIELD  RB_DA,0,<-                  ;START OF DAR BIT DEFINITIONS
                    0010                    <SEC,8>,-                   ; SECTOR
                    0010                    <TRK,8>,-                   ; TRACK
                    0010                    <CYL,16>-                   ; CYLINDER
                    0010            >                                   ;END OF DAR BIT DEFINITIONS
                    0010
                    0010    $DEF    RB_MP           .BLKL   1           ;MULTIPURPOSE REGISTER (MPR)
                    0010            .IIF    NB,RB_MP,       RB_MP:
          00000014  0010            .IIF    NB,.BLKL,       .BLKL   1
                    0014            _VIELD  RB_MP,0,<-                  ;RB02 STATUS WORD DEFINITIONS
                    0014                    <STA,3>,-                   ; DRIVE STATE
                    0014                    <BH,,M>,-                   ; BRUSH HOME
                    0014                    <HO,,M>,-                   ; HEADS OUT
                    0014                    <CO,,M>,-                   ; COVER OPEN
                    0014                    <HS,,M>,-                   ; HEAD SELECT
                    0014                    <,1>,-                      ; RESERVED
                    0014                    <DSE,,M>,-                  ; DRIVE SELECT ERROR
                    0014                    <VC,,M>,-                   ; VOLUME CHECK
                    0014                    <WGE,,M>,-                  ; WRITE GATE ERROR
                    0014                    <SPE,,M>,-                  ; SPIN ERROR
                    0014                    <SKTO,,M>,-                 ; SEEK TIME OUT
                    0014                    <WL,,M>,-                   ; WRITE LOCK
                    0014                    <CHE,,M>,-                  ; CURRENT HEAD ERROR
                    0014                    <WDE,,M>-                   ; WRITE DATA ERROR
                    0014            >                                   ;
                    0014            _VIELD  RB_MP,0,<-                  ;GET STATUS COMMAND DEFINITIONS
                    0014                    <MRK,,M>,-                  ; MARK (ALWAYS 1)
                    0014                    <STS,,M>,-                  ; GET STATUS
                    0014                    <,1>,-                      ; RESERVED
                    0014                    <RST,,M>,-                  ; RESET
                    0014            >
                    0014            _VIELD  RB_MP,0,<-                  ;RB80 STATUS WORD DEFINITIONS
                    0014                    <SEC,5>,-                   ; CURRENT RB80 SECTOR
```

```
                        0014   375                 <,3>,-                          ; RESERVED
                        0014   376                 <FLT,,M>,-                      ; DRIVE FAULT
                        0014   377                 <PLGV,,M>,-                     ; PLUG VALID
                        0014   378                 <SKE,,M>,-                      ; SEEK ERROR
                        0014   379                 <ONCY,,M>,-                     ; ON CYLINDER
                        0014   380                 <DRDY,,M>,-                     ; DRIVE READY
                        0014   381                 <WTP,,M>,-                      ; WRITE PROTECT
                        0014   382                 <,2>,-                          ; RESERVED
                        0014   383           >                                     ;END MPR BIT DEFINITIONS
                        0014   384
                        0014   385           $DEFEND RB                            ;END RB730:RB80/RB02 REGISTER DEFS
                        0000                 .RESTORE
                        0000   386
                        0000   387 ;
                        0000   388 ; HARDWARE FUNCTION CODES
                        0000   389 ;
                        0000   390
                00000004 0000   391 F_GETSTATUS=2*2                              ;GET STATUS
                        0000   392
                        0000   393 ;                                                                          [04]
                        0000   394 ; External Symbols                                                        [04]
                        0000   395 ;                                                                          [04]
                        0000   396           .EXTRN  SCB_BASE, SCB_IMAGE, IOC$K_IOSPACE
                        0000   397           .EXTRN  EXE$ALONONPAGED, EXE$DEANONPAGED, EXE$GB_CPUTYPE
                        0000   398           .EXTRN  DS$WAITUS, DS_ERRSUP, INS$PTABLE, DSP$CONFIG_ADP, DS$CHANNEL
                        0000   399           .EXTRN  DSV$SETLOAD
                        0000   400           .EXTRN  SYS$UNWIND
                        0000   401           .EXTRN  DS$GA_SELECTED, DS$GL_CLIBASE
                        0000   402           .EXTRN  DSR$ONLY_CONSOLE_CONFIG       ; Routine in only module   [35]
                        0000   403           .weak   Uda_Response, UD_Init         ; UDA-50 data block/init code   [07]
                        0000   404           .WEAK   NI$GN_RPB_BUFFER              ; RPB buffer for the NI    [41] ;G:6
                        0000   405           .WEAK   PA_INIT                       ; INIT SECTION FOR HSC50   [27]
                        0000   406           .Extrn  Dsr$Allocate_Pseudo_RPB       ;                                [07]
                        0000   407           .Extrn  Dsr$DeAllocate_Pseudo_RPB     ;                                [07]
                        0000   408           .EXTRN  BOOT$L_ADP,BOOT$L_R2,BOOT$L_R1,BOOT$L_DEVTYP,BOOT$L_UNIT,BOOT$L_CSR
                        0000   409           .EXTRN  HPE$C_EPB_SIZE                                        ;G:12
                        0000   410                                                                         ;G:12
                        0000   411                                                                         ;G:13
                        0000   412           .WEAK   KDB50_RESPONSE, BD_INIT       ; KDB50 data block/init code    [25]
                        0000   413           .WEAK   PB$INIT,ET$INIT               ; KFBTA and NIinit entry point  [26]
                        0000   414                                                                         ;G:12
                        0000   415                                                                         ;G:12
                00000000 0000   416           .PSECT  Data, NoExe, Shr, NoWrt, Long   ;                       [04]
                        0000   417          ModNam   CONFIG
            47 49 46 4E 4F 43 00' 0000       $MODULE:          .ASCIC  \CONFIG\
                           06   0000
                        0007   418 T_TYPES:
         41 42 44 5F 34 30 50 52 0007   419           .ASCII  "RP04_DBA"      ; ^X10  RP04
         41 42 44 5F 35 30 50 52 000F   420           .ASCII  "RP05_DBA"      ; ^X11  RP05
         41 42 44 5F 36 30 50 52 0017   421           .ASCII  "RP06_DBA"      ; ^X12  RP06
            00000000 00000000   001F   422           .QUAD   0               ; ^X13
         41 52 44 5F 33 30 4D 52 0027   423           .ASCII  "RM03_DRA"      ; ^X14  RM03 drive
            00000000 00000000   002F   424           .QUAD   0
         41 52 44 5F 30 38 4D 52 0037   425           .ASCII  "RM80_DRA"      ; ^X16 RM80
         41 52 44 5F 35 30 4D 52 003F   426           .ASCII  "RM05_DRA"      ; ^X17 RM05
00000000'00000000'00000000'00000000' 0047   427           .LONG   0[18]           ; 9 Unused Quadwords
00000000'00000000'00000000'00000000' 0057
```

```
00000000'00000000'00000000'00000000' 0067
00000000'00000000'00000000'00000000' 0077
                00000000'00000000' 0087
          41 52 44 5F 37 30 50 52  008F   428          .ASCII  "RP07_DRA"      ; ^X21 RP07(with head per track option)
          41 52 44 5F 37 30 50 52  0097   429          .ASCII  "RP07_DRA"      ; ^X22 RP07(w/o head  per track option)
                                   009F   430
                          00000013 009F   431 K_TYPES=<.-T_TYPES>/8           ; number of entries
                                   009F   432 HSC50_BOOT::                                                    ;G:9
                                00 009F   433          .BYTE   0              ; Flag for BOOTING/SET MEMORY        [43]
                                   00A0   434                                                                 ;G:14
                                   00A0   435                                                                 ;G:14
                                00000000   436 .PSECT  WORK,NOSHR,NOEXE,WRT,LONG                            ;G:14
                                   0000   437 DEVICE_UNIT_FLAG:                                              ;G:14
                                00 0000   438          .BYTE   0              ; Flag for constructing unit number  ;G:14
                                   0001   439                                                                 ;G:14
```

```
                     0001   441          .SBTTL  INI$LOAD_DEVICE          Make ptables for console and boot devices
                 00000000   442          .PSECT  Code, Exe, Shr, NoWrt, Long
                     0000   443 ;++                                                                          begin   [15]
                     0000   444 ; FUNCTIONAL DESCRIPTION:
                     0000   445 ;
                     0000   446 ;       This routine sets up the necessary P-tables
                     0000   447 ;       for the console load device and the boot device.
                     0000   448 ;
                     0000   449 ; CALLING SEQUENCE:
                     0000   450 ;
                     0000   451 ;       JSB     INI$LOAD_DEVICE
                     0000   452 ;
                     0000   453 ; INPUT PARAMETERS:
                     0000   454 ;
                     0000   455 ;       None
                     0000   456 ;
                     0000   457 ; IMPLICIT INPUTS:      NONE
                     0000   458 ;
                     0000   459 ; OUTPUT PARAMETERS:    NONE
                     0000   460 ;
                     0000   461 ; IMPLICIT OUTPUTS:
                     0000   462 ;
                     0000   463 ;       P-Tables for each device in the boot path and the
                     0000   464 ;       console load device.
                     0000   465 ;
                     0000   466 ; COMPLETION CODES:
                     0000   467 ;
                     0000   468 ;       None
                     0000   469 ;
                     0000   470 ; SIDE EFFECTS:
                     0000   471 ;
                     0000   472 ;       None
                     0000   473 ;
                     0000   474 ;--
                     0000   475
                     0000   476 INI$LOAD_DEVICE::
                     0000   477
      00000000'EF    16   0000   478          JSB     DSR$ONLY_CONSOLE_CONFIG         ; Config. Console device(s) [35]
                     0006   479
 50   00000000'EF    D0   0006   480          MOVL    L^BOOT$L_ADP,R0                 ; Get boot adapter address
                31   13   000D   481          BEQL    20$                             ; Branch if not there
00000000'EF   40 8F   91   000F   482          CMPB    #CONSOLE_CODE,BOOT$L_DEVTYP     ; Check if console boot via VMB/DIAG
                27   13   0017   483          BEQL    20$                             ; Skip.  Bus load not used.
      00000000'EF    DD   0019   484          pushl   l^boot$l_R1                     ; BI number                     [33]
      00000000'EF    DD   001F   485          PUSHL   L^BOOT$L_R2                     ; CI station number
      00000000'EF    DD   0025   486          PUSHL   L^BOOT$L_DEVTYP                 ; Push boot device type
      00000000'EF    DD   002B   487          PUSHL   L^BOOT$L_UNIT                   ; Push BOOT device unit number
      00000000'EF    DD   0031   488          PUSHL   L^BOOT$L_CSR                    ; Push BOOT device CSR address
                50   DD   0037   489          PUSHL   R0                              ; Push BOOT adapter address
 00000041'EF    06   FB   0039   490          CALLS   #6, L^DSP$CONFIG_LOAD           ; Auto-config load device
                     0040   491 20$:
                05   0040   492          RSB                                     ;                       end     [15]
```

```
                     0041    494          .List   MEB
                     0041    495          .SBTTL  DSP$CONFIG_LOAD Configure load device
                     0041    496 ;++
                     0041    497 ; FUNCTIONAL DESCRIPTION:
                     0041    498 ;
                     0041    499 ;       This routine determines sets up the necessary P-tables
                     0041    500 ;       for the load device given the adapter configuration register,
                     0041    501 ;       the device register and unit number.
                     0041    502 ;
                     0041    503 ; CALLING SEQUENCE:
                     0041    504 ;
                     0041    505 ;       DSP$CONFIG_LOAD(Adp adr, Dev adr, Unit, dev type, ci-port, bi num)
                     0041    506 ;
                     0041    507 ; INPUT PARAMETERS:
                     0041    508 ;
                     0041    509 ;       4(AP)   Address of configuration status register of adapter
                     0041    510 ;       8(AP)   Address of CSR for device.
                     0041    511 ;       12(AP)  Unit number of drive
                     0041    512 ;       16(AP)  device type: 0=massbus,1=RK06/07,2=RL01/02,32=HSC50          ;G:7
                     0041    513 ;       20(ap)  CI-HSC50 port station number
                     0041    514 ;       24(ap)  BI number
                     0041    515 ;
                     0041    516 ; IMPLICIT INPUTS:      NONE
                     0041    517 ;
                     0041    518 ; OUTPUT PARAMETERS:    NONE
                     0041    519 ;
                     0041    520 ; IMPLICIT OUTPUTS:
                     0041    521 ;
                     0041    522 ;       P-Tables for each device in the load control and data path
                     0041    523 ;
                     0041    524 ; COMPLETION CODES:
                     0041    525 ;
                     0041    526 ;       SS$_NORMAL
                     0041    527 ;
                     0041    528 ; SIDE EFFECTS:
                     0041    529 ;
                     0041    530 ;       The device and the adapter specified are pinged to determine
                     0041    531 ;       interrupt level and interrupt vectors.
                     0041    532 ;
                     0041    533 ; REGISTER USAGE:
                     0041    534 ;
                     0041    535 ;       R4      Address of P-table being created
                     0041    536 ;       R5      Address of channel or device
                     0041    537 ;--                                                                          ;G:13
                     0041    538          .NLIST  ME,MEB
                     0041    539          $OFFSET 0,NEGATIVE, < -
                     0041    540                  <L_STATUS,8>,-
                     0041    541                  <L_LINK,4>,-
                     0041    542                  <L_TYPE,4>,-
                     0041    543                  <L_LOCAL,0>>
                     0041             .SAVE   LOCAL_BLOCK
                     0041             .PSECT $ABS$ ABS
00000000  FE70               .=0
FFFFFFF8  0000               .BLKB   -8
          FFF8       L_STATUS:
FFFFFFF4  FFF8               .BLKB   -4
          FFF4       L_LINK:
```

```
                FFFFFFF0  FFF4                .BLKB   -4
                          FFF0        L_TYPE:
                          FFF0        L_LOCAL:
                      00000041                .RESTORE
                          0041   544          .LIST   MEB
```

```
                          0A3C  0041   546 .ENTRY  DSP$CONFIG_LOAD,^M<R2,R3,R4,R5,R9,R11>  ;                                [07]
                                0043   547
            5E   F0 AD    9E  0043   548         MOVAB   L_LOCAL(FP),SP          ; Allocate space for local storage
                 F0 AD    DF  0047   549         PUSHAL  L_TYPE(FP)              ; Address to store type
                 F4 AD    DF  004A   550         PUSHAL  L_LINK(FP)              ; Address of P-table created
                 04 AC    DD  004D   551         PUSHL   4(AP)                   ; Address of Adapter config reg
     00000000'EF    03    FB  0050   552         CALLS   #3,L^DSP$CONFIG_ADP     ; Configure the adaptor                [05]
                 53 50    E9  0057   553         BLBC    R0,100$                 ; Return on error
            22   10 AC    D1  005A   554         CMPL    16(AP),#BTD$K_BVPSSP    ; Is it KFBTA ?                        [36]
                    1C    13  005E   555         Beql    50$                     ; Treat as MSCP device                 [36]
            23   10 AC    D1  0060   556         CMPL    16(AP),#BTD$K_AIE_TK50  ; Is it MAYA                           [36]
                    16    13  0064   557         Beql    50$                     ; Treat as MSCP device                 [36]
   00000062 8F   10 AC    D1  0066   558         CMPL    16(AP),#BTD$K_AIE_NI    ; Is it NI                             [41]
                    0C    13  006E   559         Beql    50$                     ; Treat as MSCP device                 [41]
            11   10 AC    D1  0070   560         CmpL    16(Ap), #Btd$K_UDA      ; Is it a UDA (code 17)                [07]
                    06    13  0074   561         BeqL    50$                     ; If not, do CASE for contiguous codes [25]
            21   10 AC    D1  0076   562         CMPL    16(AP),#BTD$K_BDA       ; Is it a KDB50 ?                      [25]
                    03    12  007A   563         BNEQ    60$                     ; Branch if not                        [25]
                  03E4    31  007C   564 50$:    BrW     Con_Uba                 ; UDA50 sits on UNIBUS, BDA does not but[25]
                                007F   565                                         ; CON_UBA works for it.                [25]
            20   10 AC    D1  007F   566 60$:    CMPL    16(AP),#BTD$K_HSCCI     ; IS IT A HSC50 ?                      [10]
                    03    12  0083   567         BNEQ    70$                     ; BRANCH IF NOT.                       [10]
                  0026    31  0085   568         BRW     CON_CI_HSCCI            ; BRANCH FOR HSC50                     [10]
                                0088   569 70$:    CASE    16(AP),TYPE=L,LIMIT=#0, -       ;                              [07]
                                0088   570                 displist=<con_mba,con_uba,con_uba,con_uba>
      03'   00   10 AC    CF  0088               CASEL   16(AP),#0,S^#<<30001$-30000$>/2>-1
                                008D       30000$:
                          0337' 008D               .SIGNED_WORD    con_mba-30000$
                          03D6' 008F               .SIGNED_WORD    con_uba-30000$
                          03D6' 0091               .SIGNED_WORD    con_uba-30000$
                          03D6' 0093               .SIGNED_WORD    con_uba-30000$
                                0095       30001$:
                                0095   571         ERRSUP_S                        ; Should never happen!
         00000000'EF      DF  0095                         PUSHAL  $MODULE
                    00    DD  009B                         PUSHL   #0
                    01    DD  009D                         PUSHL   #$ER
     00000000'EF    03    FB  009F                         CALLS   #3, DS_ERRSUP
   50   00660002 8F      D0  00A6   572         MOVL    #DS$_ERROR,R0           ; Flag error
                                00AD   573 100$:
                          04  00AD   574         RET
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                                00AE   576 CON_CI_HSCCI:
                                00AE   577
                                00AE   578 ;
                                00AE   579 ; Now, build a pseudo-RPB to make the bootdriver init code                    [27]
                                00AE   580 ; happy, and then call said routine.  After it completes, the                [27]
                                00AE   581 ; global response buffer is accessible: it has the drive type, etc.          [27]
                                00AE   582 ;
                      0C AC   DD 00AE   583         PUSHL   12(AP)                  ; ci port number                    [27]
                         00   DD 00B1   584         PUSHL   #0                      ; No slave number                   [27]
                      0C AC   DD 00B3   585         PushL   12(Ap)                  ; Unit number                       [27]
                50    F4 BD   DE 00B6   586         MovAL   aL_Link(Fp), R0         ; Get address of link Ptable        [27]
                      18 A0   DD 00BA   587         PushL   Hp$A_Device(R0)         ; Address of link device            [27]
                         55   DD 00BD   588         PushL   R5                      ; Address of device CSR             [27]
                         7E   7C 00BF   589         ClrQ    -(Sp)                   ; Don't bother with adap./dev. codes [27]
          00000000'EF    07   FB 00C1   590         CallS   #7, Dsr$Allocate_Pseudo_RPB     ; Allocate the RPB          [27]
                         50   D5 00C8   591         TSTL    R0                      ; IF R0 is 0 there is an error      [27]
                         01   12 00CA   592         BNEQ    15$                     ; IF not 0 then continue            [27]
                         04   00CC   593         RET                             ; Else return                       [27]
                   59    50   D0 00CD   594 15$:    MovL    R0, R9                  ; Put RPB where PA_INIT wants it    [27]
               0000009F'EF    96 00D0   595         INCB    HSC50_BOOT              ; Set indicate driver called from here [43]
          00000000'EF    00   FB 00D6   596         CALLS   #0,PA_INIT              ; HSC50 inti routine                [27]
               0000009F'EF    94 00DD   597         CLRB    HSC50_BOOT              ; Clear byte                        [43]
                      0A 50   E8 00E3   598         BlbS    R0, 17$                 ; BRANCH if SUCCESS                 [27]
                         69   9F 00E6   599         PushAB  (R9)                    ; Address of RPB                    [27]
          00000000'EF    01   FB 00E8   600         CallS   #1, Dsr$DeAllocate_Pseudo_RPB   ; Deallocate the RPB        [27]
                         04   00EF   601         RET                             ; ...                               [27]
                14 AC    51   9A 00F0   602 17$:    MOVZBL  R1,20(AP)               ; REWRITE OVER OLD HSC PORT NUMBER  [27]
                         69   9F 00F4   603         PushAB  (R9)                    ; Address of RPB                    [27]
          00000000'EF    01   FB 00F6   604         CallS   #1, Dsr$DeAllocate_Pseudo_RPB   ; Deallocate the RPB        [27]
                                00FD   605 ;+                                                                  start [32]
                                00FD   606 ; BUILD PT FOR HSC50 DEVICE
                                00FD   607 ;-
                51   00000041 8F   D0 00FD   608         MOVL    #HP$K_CI_LEN, R1 ; LENGTH OF PT FOR CI_NODE.           [10]
                                0104   609                                                                        ;G:12
                                0104   610                                                                        ;G:12
                                0104   611                                                                        ;G:12
                           050B   30 0104   612         BSBW    ALLOCATE_PTABLE ; ALLOCATE THE SPACE FOR THIS DRIVE.   [10]
                         01 50    E8 0107   613         BLBS    R0,18$          ; BRANCH IF SUCCESS                    [10]
                                04 010A   614         RET                     ; RETURN ON ERROR                      [10]
                                010B   615                                                                  ;    end [32]
                      08 A2    51   B0 010B   616 18$:    MOVW    R1,HP$W_SIZE(R2) ; SET SIZE OF STRUCTURE.              [10]
                      26 A2    07   90 010F   617         MOVB    #7,HP$T_TYPE(R2) ; SET LENGTH OF TYPE NAME             [10]
27 A2    2045444F 4E5F4943 8F   7D 0113   618         MOVQ    #^A"CI_NODE ",HP$T_TYPE+1(R2) ; SET DEVICE TYPE        [10]
                         62   05   D0 011F   619         MOVL    #5,HP$Q_DEVICE(R2) ; SET LENGTH OF NAME                [10]
                      50    0C A2   9E 0122   620         MOVAB   HP$T_DEVICE(R2),R0 ; ADDRESS OF DEVICE NAME            [10]
                      04 A2    60   9E 0126   621         MOVAB   (R0),HP$Q_DEVICE+4(R2) ; SET ADDRESS OF DEVICE NAME    [10]
                80    4149435F 8F   D0 012A   622         MOVL    #^A"_CIA",(R0)+ ; INSERT "_CIA".                       [10]
                         53    F4 AD   D0 0131   623         MOVL    L_LINK(FP),R3   ; Fetch address of link ptable         [24]
                   FF A0    0F A3   90 0135   624         MOVB    HP$T_DEVICE+3(R3),-1(R0) ; Copy controller letter      [24]
                         53    14 AC   D0 013A   625         MOVL    20(AP),R3       ; GET PORT NUMBER                      [11]
                                013E   626                                                                        ;G:13
                00000000'EF    00   90 013E   627         MOVB    #0,DEVICE_UNIT_FLAG     ; Clear flag                   ;G:14
                                54   D4 0145   628         CLRL    R4                      ; CLEAR HIGH ORDER FIELD       ;G:13
  54    53    53    00002710 8F   7B 0147   629         EDIV    #10000,R3,R3,R4 ; GET FIRST DIGIT                      ;G:13
                                0D   13 0150   630         BEQL    181$                    ; BRANCH IF NOT THIS LARGE     ;G:13
                   80    53   30   81 0152   631         ADDB3   #^A"0",R3,(R0)+ ; SET THIS ASCII DIGIT                 ;G:13
                00000000'EF    01   88 0156   632         BISB2   #1,DEVICE_UNIT_FLAG     ; Non-zero digit has been found ;G:14
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                          62   D6   015D   633          INCL    HP$Q_DEVICE(R2) ; INCREASE LENGTH OF STRING                    ;G:13
                03E8 8F   54   B1   015F   634 181$:    CMPW    R4,#1000        ; DIGIT EQUAL TO ZERO?                         ;G:14
                          1C   1F   0164   635          BLSSU   182$            ; BRANCH IF YES                                ;G:14
                          55   D4   0166   636          CLRL    R5              ; CLEAR HIGH ORDER FIELD                       ;G:14
   54   53   54  000003E8 8F   7B   0168   637          EDIV    #1000,R4,R3,R4  ; GET NEXT DIGIT                               ;G:13
                          1B   13   0171   638          BEQL    19$             ; BRANCH IF NOT THIS LARGE                     ;G:13
                   80   53   30   81   0173   639          ADDB3   #^A"0",R3,(R0)+ ; SET THIS ASCII DIGIT                         ;G:13
                          62   D6   0177   640          INCL    HP$Q_DEVICE(R2) ; INCREASE LENGTH OF STRING                    ;G:13
             00000000'EF  01   88   0179   641          BISB2   #1,DEVICE_UNIT_FLAG     ; Non-zero digit has been found        ;G:14
                          0C   11   0180   642          BRB     19$             ; CONTINUE                                     ;G:14
               05 00000000'EF  E9   0182   643 182$:    BLBC    DEVICE_UNIT_FLAG,19$    ; Non zero digit hasn't been found     ;G:14
                      80   30   90   0189   644          MOVB    #^A"0",(R0)+    ; SET THIS ASCII DIGIT                         ;G:14
                          62   D6   018C   645          INCL    HP$Q_DEVICE(R2) ; INCREASE LENGTH OF STRING                    ;G:14
                    64 8F   54   91   018E   646 19$:     CMPB    R4,#100         ; DIGIT EQUAL TO ZERO?                         ;G:14
                          1C   1F   0192   647          BLSSU   195$            ; BRANCH IF YES                                ;G:14
                          55   D4   0194   648          CLRL    R5              ; CLEAR HIGH ORDER FIELD                         [11]
   54   53   54  00000064 8F   7B   0196   649          EDIV    #100,R4,R3,R4   ; GET NEXT DIGIT                               [10]
                          1B   13   019F   650          BEQL    20$             ; BRANCH IF NOT THIS LARGE                       [10]
                   80   53   30   81   01A1   651          ADDB3   #^A"0",R3,(R0)+ ; SET THIS ASCII DIGIT                           [10]
                          62   D6   01A5   652          INCL    HP$Q_DEVICE(R2) ; INCREASE LENGTH OF STRING                      [10]
             00000000'EF  01   88   01A7   653          BISB2   #1,DEVICE_UNIT_FLAG     ; Non-zero digit has been found        ;G:14
                          0C   11   01AE   654          BRB     20$             ; CONTINUE                                     ;G:14
               05 00000000'EF  E9   01B0   655 195$:    BLBC    DEVICE_UNIT_FLAG,20$    ; Non zero digit hasn't been found     ;G:14
                      80   30   90   01B7   656          MOVB    #^A"0",(R0)+    ; SET THIS ASCII DIGIT                         ;G:14
                          62   D6   01BA   657          INCL    HP$Q_DEVICE(R2) ; INCREASE LENGTH OF STRING                    ;G:14
                    0A    54   91   01BC   658 20$:     CMPB    R4,#10          ; DIGIT EQUAL TO ZERO?                         ;G:14
                          18   1F   01BF   659          BLSSU   25$             ; BRANCH IF YES                                ;G:14
                          55   D4   01C1   660          CLRL    R5              ; CLEAR HIGH ORDER FIELD                         [11]
          54   53   54   0A   7B   01C3   661          EDIV    #10,R4,R3,R4    ; GET NEXT DIGIT                                 [10]
                          1B   13   01C8   662          BEQL    30$             ; BRANCH IF NOT THIS LARGE                       [10]
                   80   53   30   81   01CA   663          ADDB3   #^A"0",R3,(R0)+ ; SET THIS ASCII DIGIT                           [10]
             00000000'EF  01   88   01CE   664          BISB2   #1,DEVICE_UNIT_FLAG     ; Non-zero digit has been found        ;G:14
                          62   D6   01D5   665          INCL    HP$Q_DEVICE(R2) ; INCREASE LENGTH OF STRING                      [10]
                          0C   11   01D7   666          BRB     30$             ; CONTINUE                                     ;G:14
               05 00000000'EF  E9   01D9   667 25$:     BLBC    DEVICE_UNIT_FLAG,30$    ; Non zero digit hasn't been found     ;G:14
                      80   30   90   01E0   668          MOVB    #^A"0",(R0)+    ; SET THIS ASCII DIGIT                         ;G:14
                          62   D6   01E3   669          INCL    HP$Q_DEVICE(R2) ; INCREASE LENGTH OF STRING                    ;G:14
                60   54   30   81   01E5   670 30$:     ADDB3   #^A"0",R4,(R0)  ; SET LAST DIGIT                                 [10]
              14 AB    14 AC   B0   01E9   671          MOVW    20(AP),HP$W_EXT_DRIVE(R11)      ;port # in EPB                 ;G:12
        000000FF'EF    14 AC   B1   01EE   672          CMPW    20(AP),^Xff                                                    ;G:12
                          05   14   01F6   673          BGTR    35$                                                            ;G:12
              0B A2    14 AC   90   01F8   674          MOVB    20(AP),HP$B_DRIVE(R2)           ; SET port NUMBER
 18 A2    04 AC    00000000'8F   C9   01FD   675 35$:     BISL3   #<IOC$K_IOSPACE>,4(AP),HP$A_DEVICE(R2) ; SET DEVICE ADDR          [10]
              1C A2    18 A2   D0   0207   676          MOVL    HP$A_DEVICE(R2),HP$A_DVA(R2)    ; Set direct address           [13]
              20 A2    F4 AD   D0   020C   677          MOVL    L_LINK(FP),HP$A_LINK(R2)        ; SET LINK ADDRESS.
                 3D A2    04   9A   0211   678          MOVZBL  #^X4,HP$L_CI_INDEX(R2)          ; SET INDEX USED BY $DS_CASE
        39 A2    80000004 8F   D0   0215   679          MOVL    #^X80000004,HP$L_CI_MAINT_ID(R2); SET HSC50 IDENTIFICATION       [10]
        35 A2    4F710200 8F   D0   021D   680          MOVL    #^X4F710200,HP$L_CI_FUNC(R2)    ; FUNCTIONALITY OF HSC50
              34 A2    14 AC   90   0225   681          MOVB    20(AP), HP$B_CI_NODE(R2)        ; SET NODE NUMBER.
                          52   DD   022A   682          PUSHL   R2                              ; Save address of CI_NODE p-table
                0000'CF   62   FA   022C   683          CALLG   (R2), W^INS$PTABLE              ; Insert it in list
                       03 50   E8   0231   684          BLBS    R0,100$                         ; Continue if no errors.
                        021E   31   0234   685          BRW     CON_RELEASE_X                   ; Go release buffer
           51    00000046 8F   D0   0237   686 100$:    MOVL    #<HP$K_DISK_LEN+HP$C_NAMELEN>,R1; Length of ptable for DISK     [13]
                                   023E   687                                                                                   ;G:12
                                   023E   688                                                                                   ;G:12
                                   023E   689                                                                                   ;G:12
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                    03D1   30   023E   690          BSBW    ALLOCATE_PTABLE          ; Allocate the space for this drive     [13]
                   01 50   E8   0241   691          BLBS    R0,110$                  ; Branch if success                     [13]
                           04   0244   692          RET                              ; Return on error.                      [13]
             08 A2   51    B0   0245   693 110$:     MOVW    R1,HP$W_SIZE(R2)         ; Set size of structure                 [13]
             26 A2   04    90   0249   694          MOVB    #4,HP$T_TYPE(R2)         ; Set length of type name               [13]
      27 A2   4B534944 8F   D0   024D   695          MOVL    #^A"DISK",HP$T_TYPE+1(R2) ; Set device type                      [13]
                 62   0B    D0   0255   696          MOVL    #11,HP$Q_DEVICE(R2)      ; Set  length of name                   [13]
             0A A2   04    88   0258   697          BISB2   #HP$M_NAME,HP$B_FLAGS(R2)       ; set long name flag              [21]
             50   08 A2    3C   025C   698          MOVZWL  HP$W_SIZE(R2),R0         ; Get size of ptable                    [21]
          50   50   14     C3   0260   699          SUBL3   #HP$C_NAMELEN,R0,R0      ; Determine offset                      [21]
          50   52   50     C1   0264   700          ADDL3   R0,R2,R0                 ; Address to store long device name     [21]
            04 A2   60     9E   0268   701          MOVAB   (R0),HP$Q_DEVICE+4(R2)   ; Set address of device name             [13]
       80   4353485F 8F    D0   026C   702          MOVL    #^A"_HSC",(R0)+          ; Insert "_HSC".                        [14]
          80   3035 8F    B0   0273   703          MOVW    #^A"50",(R0)+            ; Insert "50".                          [14]
            56   0C A2    DE   0278   704          MOVAL   HP$T_DEVICE(R2),R6       ; P-table entry for device name         [40]
                 0C AC    B5   027C   705          TSTW    12(AP)                   ; Shadow set?                           [40]
                         19    18   027F   706          BGEQ    115$             ; No                                    [40]
       80   53554424 8F    D0   0281   707          MOVL    #^A"$DUS",(R0)+          ; Insert "$DUS".                        [40]
       86   5355445F 8F    D0   0288   708          MOVL    #^A"_DUS",(R6)+          ; Put "_DUS" in usual dev. name area    [40]
                         53    D4   028F   709          CLRL    R3               ; Get rid of any junk                   [40]
   53   0C AC   8000 8F    AB   0291   710          BICW3   #^X8000,12(AP),R3        ; Clear shadow set bit.  R3 = drive #   [40]
                         19    11   0298   711          BRB     1155$            ; Don't do non-shadow set stuff         [40]
                               029A   712          ; Not a shadow set                                                   ;G:5
            53   0C AC    D0   029A   713 115$:     MOVL    12(AP),R3                ; Get drive #                           [17]
       80   41554424 8F    D0   029E   714          MOVL    #^A"$DUA",(R0)+          ; Insert "$DUA".                        [13]
       86   4155445F 8F    D0   02A5   715          MOVL    #^A"_DUA",(R6)+          ; Put "_DUA" in usual dev. name area    [21]
       00000000'EF   00    90   02AC   716          MOVB    #0,DEVICE_UNIT_FLAG                                          ;G:14
                               02B3   717                                                                               ;G:14
                               02B3   718          ; Get unit number for a shadowed or non-shadowed set.                ;G:14
                               02B3   719                                                                               ;G:14
                         54    D4   02B3   720 1155$:     CLRL    R4               ; Clear high order field                ;G:14
54   53   53   00002710 8F    7B   02B5   721          EDIV    #10000,R3,R3,R4          ; Set first Digit                       ;G:13
                         11    13   02BE   722          BEQL    116$             ; Branch if number less than 5 digits   ;G:13
            80   53    30    81   02C0   723          ADDB3   #^A"0",R3,(R0)+          ; Set Ascii digit                       ;G:13
            86   53    30    81   02C4   724          ADDB3   #^A"0",R3,(R6)+          ; Put digit in old area                 ;G:13
                         62    D6   02C8   725          INCL    HP$Q_DEVICE(R2)          ; Increase length of string             ;G:13
       00000000'EF   01    88   02CA   726          BISB2   #1,DEVICE_UNIT_FLAG      ; Non-zero digit has been found         ;G:14
            03E8 8F    54    B1   02D1   727 116$:     CMPW    R4,#1000                 ; Digit equal to zero?                  ;G:14
                         20    1F   02D6   728          BLSSU   1165$            ; Branch if yes                         ;G:14
                         55    D4   02D8   729          CLRL    R5               ; Clear high order field                ;G:14
54   53   54   000003E8 8F    7B   02DA   730          EDIV    #1000,R4,R3,R4           ; get next digit                        ;G:13
                         22    13   02E3   731          BEQL    117$             ; Branch if number less than 4 digits   ;G:13
            80   53    30    81   02E5   732          ADDB3   #^A"0",R3,(R0)+          ; Set Ascii digit                       ;G:13
            86   53    30    81   02E9   733          ADDB3   #^A"0",R3,(R6)+          ; Put digit in old area                 ;G:13
                         62    D6   02ED   734          INCL    HP$Q_DEVICE(R2)          ; Increase length of string             ;G:13
       00000000'EF   01    88   02EF   735          BISB2   #1,DEVICE_UNIT_FLAG      ; Non-zero digit has been found         ;G:14
                         0F    11   02F6   736          BRB     117$             ; Continue                              ;G:14
         08 00000000'EF    E9   02F8   737 1165$:     BLBC    DEVICE_UNIT_FLAG,117$    ; Non zero digit hasn't been found      ;G:14
                   80    30    90   02FF   738          MOVB    #^A"0",(R0)+             ; Set Ascii digit                       ;G:14
                   86    30    90   0302   739          MOVB    #^A"0",(R6)+             ; Put digit in old area                 ;G:14
                         62    D6   0305   740          INCL    HP$Q_DEVICE(R2)          ; Increase length of string             ;G:14
                64 8F    54    91   0307   741 117$:     CMPB    R4,#100                  ; Digit equal to zero?                  ;G:14
                         20    1F   030B   742          BLSSU   118$             ; Branch if yes                         ;G:14
                         55    D4   030D   743          CLRL    R5               ; Clear high order field                [13]
54   53   54   00000064 8F    7B   030F   744          EDIV    #100,R4,R3,R4            ; Set first digit                       [13]
                         22    13   0318   745          BEQL    120$             ; Branch if number is <100              [13]
            80   53    30    81   031A   746          ADDB3   #^A"0",R3,(R0)+          ; Set ascii digit                       [13]
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        86   53   30   81  031E          ADDB3   #^A"0",R3,(R6)+          ; Put digit in old area                [21]
  00000000'EF       01   88  0322          BISB2   #1,DEVICE_UNIT_FLAG      ; Non-zero digit has been found       ;G:14
                    62   D6  0329          INCL    HP$Q_DEVICE(R2)          ; Increase length of string            [13]
                    0F   11  032B          BRB     120$                     ; Make sure you get 2nd digit          [40]
     08 00000000'EF     E9  032D  118$:    BLBC    DEVICE_UNIT_FLAG,120$    ; Non zero digit hasn't been found    ;G:14
            80   30   90  0334          MOVB    #^A"0",(R0)+             ; Set ascii digit                     ;G:14
            86   30   90  0337          MOVB    #^A"0",(R6)+             ; Put digit in old area               ;G:14
                    62   D6  033A          INCL    HP$Q_DEVICE(R2)          ; Increase length of string           ;G:14
            0A   54   91  033C  120$:    CMPB    R4,#10                   ; Is it >=10    ?                      [17]
                    1A   1F  033F          BLSSU   130$                     ; Branch if not.                       [22]
                    55   D4  0341          CLRL    R5                       ; Clear high order field               [13]
   54   53   54   0A   7B  0343          EDIV    #10,R4,R3,R4             ; Get next digit                       [13]
        80   53   30   81  0348          ADDB3   #^A"0",R3,(R0)+          ; Set this ascii digit                 [13]
        86   53   30   81  034C          ADDB3   #^A"0",R3,(R6)+          ; Put 2nd digit in old area            [21]
                    62   D6  0350          INCL    HP$Q_DEVICE(R2)          ; Increase length of string            [13]
  00000000'EF       01   88  0352          BISB2   #1,DEVICE_UNIT_FLAG      ; Non-zero digit has been found       ;G:14
                    0F   11  0359          BRB     133$                     ; Continue                            ;G:14
     08 00000000'EF     E9  035B  130$:    BLBC    DEVICE_UNIT_FLAG,133$    ; Non zero digit hasn't been found    ;G:14
            80   30   90  0362          MOVB    #^A"0",(R0)+             ; Set last digit                       [13]
            86   30   90  0365          MOVB    #^A"0",(R6)+             ; Put 3rd digit in old area            [21]
                    62   D6  0368          INCL    HP$Q_DEVICE(R2)          ; Increase length of string           ;G:14
                             036A                                                                                ;G:14
        60   54   30   81  036A  133$:    ADDB3   #^A"0",R4,(R0)           ; Set this ascii digit                 [13]
        66   54   30   81  036E          ADDB3   #^A"0",R4,(R6)           ; Put 2nd digit in old area            [21]
                             0372                                                                                ;G:14
      14 AB   0C AC   B0  0372          MOVW    12(AP),HPE$W_EXT_DRIVE(R11)  ; Drive # in EPB                  ;G:14
 000000FF'EF   0C AC   B1  0377          CMPW    12(AP),^XFF                                                    ;G:12
                    05   14  037F          BGTR    135$                                                           ;G:12
      0B A2   0C AC   90  0381          MOVB    12(AP),HP$B_DRIVE(R2)    ; Set drive number                     [13]
              1C A2   D4  0386  135$:    CLRL    HP$A_DVA(R2)             ; Clear direct address                 [13]
        20 A2   8E   D0  0389          MOVL    (SP)+,HP$A_LINK(R2)      ; Set link address.                    [13]
      0000'CF   62   FA  038D          callg   (r2), w^ins$ptable       ; Insert it in list                    [21]
                             0392          blbcw   r0, CON_RELEASE_X        ; fail if error                        [21]
              03 50   E8  0392          BLBS    r0,.+4
               00BD   31  0395          BRW     CON_RELEASE_X
            50   52   D0  0398          MOVL    R2,R0                    ; Copy address of P-table of load dev  [21]
   52   00000000'EF   DE  039B          MOVAL   DS$GL_CLIBASE,R2         ; Set R2 to base of CLI data area      [21]
        08 A2   60   D0  03A2          MOVL    HP$Q_DEVICE(R0), -
                             03A6                  CLI$Q_FILE(R2)           ; Set length of load device name       [21]
            7E   3A   90  03A6          MOVB    #^A":",-(SP)             ; Tack a ":" to the end                [21]
            53   60   D0  03A9          MOVL    HP$Q_DEVICE(R0),R3       ; Length of name. Any size.            [12]
                    53   D7  03AC          DECL    R3                       ; "_" not included                     [12]
        50   04 A0   D0  03AE          MOVL    HP$Q_DEVICE+4(R0),R0     ; Get address of long device name      [21]
         7E   6043   90  03B2  140$:    MOVB    (R0)[R3],-(SP)           ; Place name on stack                  [12]
              F9 53   F5  03B6          SOBGTR  R3,140$                  ; Loop to move all of name             [12]
        0C A2   6E   9E  03B9          MOVAB   (SP),CLI$Q_FILE+4(R2)    ; Set address of load device name      [21]
               FC40'  30  03BD          BSBW    DSV$SETLOAD              ; Set default load device              [21]
            50   01   D0  03C0          MOVL    #SS$_NORMAL,R0           ; Success                              [21]
                    04  03C3          RET                              ;                                      [21]
                             03C4
```

```
                                03C4   796 CON_MBA:
                                03C4   797 ;+
                                03C4   798 ; BUILD PT FOR MASSBUS DRIVE
                                03C4   799 ;-
     55   04 AC   00000400'8F   C9  03C4   800          BISL3   #<IOC$K_IOSPACE>+<^X400>,4(AP),R5       ; Base adapter
          55   03   07   0C AC   F0  03CD   801          INSV    12(AP),#7,#3,R5                        ; Insert unit number to make drive csr
                         65   01   D0  03D3   802          MOVL    #F_NOP!1,RP_CS1(R5)                    ; Issue NOP to drive
                       50   18 A5   D0  03D6   803          MOVL    RP_DT(R5),R0                           ; Get drive type register
                    50   09   00   EF  03DA   804          EXTZV   #RP_DT_V_DTN,#RP_DT_S_DTN, -
                                7E       03DE   805                  R0,-(SP)                           ; Isolate drive type
                         51   32   D0  03DF   806          MOVL    #RP04$K_LEN,R1                         ; Length of PT for RP04,RP05,RP06,RM03
                                03E2   807                                                                                                  ;G:12
                                03E2   808                                                                                                  ;G:12
                                03E2   809                                                                                                  ;G:12
                                03E2   810                                                                                                  ;G:12
                           022D   30  03E2   811          BSBW    Allocate_Ptable                        ; Allocate the space for this device    [07]
                             53 8ED0  03E5   812          POPL    R3                                     ; Get drive type back
                        01 50   E8  03E8   813          BLBS    R0,10$                                 ; Branch if success
                                04  03EB   814          RET                                            ; Return on error
                                03EC   815 10$:
                    08 A2   51   B0  03EC   816          MOVW    R1,HP$W_SIZE(R2)                       ; Set size of structure
                                03F0   817
                       53   10   C2  03F0   818          SUBL    #DT_RP04,R3                            ; Make zero correspond to RP04 drivetype
                            0F   19  03F3   819          BLSS    30$                                    ; Branch if less than that
                       53   13   D1  03F5   820          CMPL    #K_TYPES,R3                            ; Range check drive type
                            0A   15  03F8   821          BLEQ    30$                                    ; Branch if unfamilar drive type
          50   00000007'EF43   7D  03FA   822          MOVQ    L^T_TYPES[R3],R0                       ; Get device type and name                [05]
                            13   12  0402   823          BNEQ    40$                                    ; Branch if valid
                                0404   824 30$:     ERRSUP_S                                           ; Unknown drive type
               00000000'EF   DF  0404                           PUSHAL  $MODULE
                            00   DD  040A                       PUSHL   #0
                            02   DD  040C                       PUSHL   #$ER
          00000000'EF       03   FB  040E                       CALLS   #3, DS_ERRSUP
                            3E   11  0415   825          BRB     CON_RELEASE_X                          ; Release buffer and exit
                                0417   826
               26 A2   04   90  0417   827 40$:     MOVB    #4,HP$T_TYPE(R2)                       ; Set length of type name
               27 A2   50   D0  041B   828          MOVL    R0,HP$T_TYPE+1(R2)                     ; Set drive type
                                041F   829
                    62   05   D0  041F   830          MOVL    #5,HP$Q_DEVICE(R2)                     ; Set length of name
               50   0C A2   9E  0422   831          MOVAB   HP$T_DEVICE(R2),R0                     ; Address of device name
               04 A2   60   9E  0426   832          MOVAB   (R0),HP$Q_DEVICE+4(R2)                 ; Set address of device name
                    80   51   D0  042A   833          MOVL    R1,(R0)+                               ; Insert "_xxx" xxx is DBA or DRA
          80   0C AC   30   81  042D   834          ADDB3   #^A"0",12(AP),(R0)+                    ; Set unit number
            14 AB   0C AC   B0  0432   835          MOVW    12(AP),HPE$W_EXT_DRIVE(R11) ; Put the drive # in EPB                        ;G:12
     000000FF'EF   0C AC   B1  0437   836          CMPW    12(AP),^XFF                                                                     ;G:12
                         05   14  043F   837          BGTR    50$                                                                             ;G:12
               0B A2   0C AC   90  0441   838          MOVB    12(AP),HP$B_DRIVE(R2)                  ; Set drive number
                  18 A2   55   D0  0446   839 50$:     MOVL    R5,HP$A_DEVICE(R2)                     ; Set device address                     ;G:12
                     1C A2   D4  044A   840          CLRL    HP$A_DVA(R2)                           ; Clear direct address
               20 A2   F4 AD   D0  044D   841          MOVL    L_LINK(FP),HP$A_LINK(R2); Set link address
                       018C   31  0452   842          BRW     CON_NORMAL_X                           ; Set Default load device
                                0455   843
                                0455   844 CON_RELEASE_X:
                    50   52   D0  0455   845          MOVL    R2,R0                                  ; Copy buffer address
                       FBA5'   30  0458   846          BSBW    EXE$DEANONPAGED                        ; Release the buffer
                                045B   847 CON_ERROR_X:
          50   00660002 8F   D0  045B   848          MOVL    #DS$_ERROR,R0                          ; Error
```

```
                0462   849 CON_X:
 04             0462   850         RET
```

```
                                0463    852 CON_UBA:
                                0463    853 ;+
                                0463    854 ; initialize adaptor and unibus
                                0463    855 ;-
            23    10 AC   D1    0463    856          CMPL    16(AP),#BTD$K_AIE_TK50  ; Is it MAYA                              [43]
                     7A   13    0467    857          BEQL    30$                     ; NO INIT FOR DEBNT                       [43]
            22    10 AC   D1    0469    858          CMPL    16(AP),#BTD$K_BVPSSP    ; IS IT KFBTA ?                           [37]
                     74   13    046D    859          BEQL    30$                     ; NO INIT FOR KFBTA                       [37]
  00000062  8F    10 AC   D1    046F    860          CMPL    16(AP),#BTD$K_AIE_NI    ; Is it NI                                [41]
                     6A   13    0477    861          Beql    30$                     ; Treat as MSCP device                    [41]
     0000FE0C'EF     01   D0    0479    862          MOVL    #1,DSA$GL_UNITS         ; Set 1 UUT                             ;G:6
  00000004'EF    F4 AD   D0    0480    863          MOVL    L_LINK(FP),DS$GA_SELECTED+4 ; Set address of P-table for channel
                         0488    864
     53   00000000'EF   9E    0488    865          MOVAB   DS$CHANNEL,R3           ; Point to channel services
               F8 AD   7F    048F    866          PUSHAQ  L_STATUS(FP)            ; Address of status quadword
          00000645'EF   9F    0492    867          PUSHAB  L^COMMON_INTERRUPT      ; interrupt address for RK0X & RL0X       [05]
            03    10 AC   D1    0498    868          CmpL    16(Ap), #3              ; Is the device an RB730?                 [06]
                     07   12    049C    869          BNeq    1$                      ; Branch if not                           [06]
     6E   00000767'EF   9E    049E    870          MovAB   L^RB730_INTERRUPT, (Sp) ; Replace interrupt address               [06]
                     00   DD    04A5    871 1$:      PUSHL   #CHC$_INITA             ; Use INITA                               [06]
               7E    04   7D    04A7    872          MOVQ    #4,-(SP)                ; Unit zero and arg count=4
               63    6E   FA    04AA    873          CALLG   (SP),(R3)               ; Init adapter
                  B2 50   E9    04AD    874          BLBC    R0,CON_X                ; Exit if error
            08 AE    01   D0    04B0    875          MOVL    #CHC$_INITB,8(SP)       ; Function INITB
               63    6E   FA    04B4    876          CALLG   (SP),(R3)               ; Init Unibus
                  A8 50   E9    04B7    877 2$:      BLBC    R0,CON_X                ; Exit if error
            08 AE    06   D0    04BA    878          MOVL    #CHC$_CLEAR,8(SP)       ; Function Clear adapter
               63    6E   FA    04BE    879          CALLG   (SP),(R3)               ; Clear status
                  9E 50   E9    04C1    880          BLBC    R0,CON_X                ; Exit if error
            08 AE    04   D0    04C4    881          MOVL    #CHC$_ENINT,8(SP)       ; Function enable interrupts
               63    6E   FA    04C8    882          CALLG   (SP),(R3)               ; Init unibus
                  94 50   E9    04CB    883          BLBC    R0,CON_X                ; Return on error
55  08 AC   00000000'8F    C9    04CE    884          BISL3   #IOC$K_IOSPACE,8(AP),R5 ; Get real address (VA)                  [07]
                         04D7    885
            11    10 AC   D1    04D7    886          CmpL    16(Ap), #Btd$K_UDA      ; Is it a UDA (code 17)                   [07]
                     06   13    04DB    887          BeqL    30$                     ; If not, do CASE for contiguous codes    [25]
            21    10 AC   D1    04DD    888          CMPL    16(AP),#BTD$K_BDA       ; Is it a KDB50?                          [25]
                     03   12    04E1    889          BNEQ    40$                     ; Branch if not                           [25]
                   039E   31    04E3    890 30$:     BrW     Con_Uba_Uda             ; UDA50                                   [07]
                         04E6    891 40$:     CASE    16(AP),TYPE=L,LIMIT=#1,-
                         04E6    892                  displist=<con_uba_rk,con_uba_rl,con_uba_rb>
        02'  01    10 AC   CF    04E6         CASEL   16(AP),#1,S^#<<30003$-30002$>/2>-1
                         04EB         30002$:
                    0006' 04EB                .SIGNED_WORD    con_uba_rk-30002$
                    016C' 04ED                .SIGNED_WORD    con_uba_rl-30002$
                    0295' 04EF                .SIGNED_WORD    con_uba_rb-30002$
                         04F1         30003$:
                         04F1    893
```

```
                                04F1    895 .enabl  lsb
                                04F1    896 CON_UBA_RK:
                                04F1    897 ;+
                                04F1    898 ; now build PT for RK611
                                04F1    899 ;-
          65    8000 8F    B0   04F1    900         MOVW    #RK_CS1_M_CERR,RK_CS1(R5); Clear controller errors
        08 A5     0C AC    B0   04F6    901         MOVW    12(AP),RK_CS2(R5)       ; Set unit number of drive in question
          65    0045 8F    B0   04FB    902         MOVW    #RK_CS1_M_IE!F_DRVCLR!1, -
                                0500    903                 RK_CS1(R5)              ; Enable interrupts and clear drive
                                0500    904         $DS_WAITUS_S    #1000           ; Wait for it to finish
                      00    DD  0500                PUSHL   #0
              000003E8 8F    DD  0502                PUSHL   #1000
        00000000'9F    02    FB  0508                CALLS   #2, a#DS$WAITUS
             54     0A A5    3C  050F    905         MOVZWL  RK_DS(R5),R4            ; Get drive status
          65    0040 8F    AA  0513    906         BICW    #RK_CS1_M_IE,RK_CS1(R5) ; Clear interrupt enable
            08 AE    05    D0  0518    907         MOVL    #CHC$_DSINT,8(SP)       ; Change function to disable
                63    6E    FA  051C    908         CALLG   (SP),(R3)               ; Disable interrupts
                  12 50    E9  051F    909         BLBC    R0,10$                  ; Return if error
                     54    B5  0522    910         TSTW    R4                      ; Status valid?
                     0F    18  0524    911         BGEQ    20$                     ; Error if not
    54  54    01    08    EF  0526    912         EXTZV   #RK_DS_V_DDT,#1,R4,R4   ; Isolate drive type, 0=RK06, 1=Rk07
                                052B    913
                     51    37  3C  052B    914         MOVZWL  #RK611$K_LEN,R1         ; Length of RK611 PT                    ;G:12
                                052E    915                                                                                     ;G:12
                                052E    916                                                                                     ;G:12
                                052E    917                                                                                     ;G:12
                   00E1    30   052E    918         BSBW    Allocate_Ptable         ; Allocate space for same                [07]
                04 50    E8   0531    919         BLBS    R0,25$                  ; Branch if succeeded
                                0534    920 10$:
                     04    0534    921         RET                             ; Return error
                   FF23    31   0535    922 20$:    BRW     CON_ERROR_X             ; Leap to error exit
                                0538    923 25$:
          08 A2     51    B0   0538    924         MOVW    R1,HP$W_SIZE(R2)        ; Set size of structure
                                053C    925
                62    04    D0  053C    926         MOVL    #4,HP$Q_DEVICE(R2)      ; Set length of "_DMA"
             50    0C A2    9E  053F    927         MOVAB   HP$T_DEVICE(R2),R0      ; Set address of "_DMA"
             04 A2    50    D0  0543    928         MOVL    R0,HP$Q_DEVICE+4(R2)    ; Set address of device name
        60   414D445F 8F    D0  0547    929         MOVL    #^A"_DMA",(R0)          ; Set "_DMA"
             18 A2    55    D0  054E    930         MOVL    R5,HP$A_DEVICE(R2)      ; Set device address
                1C A2    D4  0552    931         CLRL    HP$A_DVA(R2)            ; Clear virtural address
           20 A2    F4 AD    D0  0555    932         MOVL    L_LINK(FP),HP$A_LINK(R2); Set link to channel
         26 A2    5205 8F    B0  055A    933         MOVW    #^X5205,HP$T_TYPE(R2)   ; Set length and "R" of RK611
     28 A2    3131364B 8F    D0  0560    934         MOVL    #^A"K611",HP$T_TYPE+2(R2) ; Set "K611"
32 A2    18 A2    12    00    EF  0568    935         EXTZV   #0,#18, HP$A_DEVICE(R2), -
                                056F    936                 RK611$L_CSR(R2)         ; Set CSR address
                                056F    937
           24 A2    FE AD    B0  056F    938         MOVW    L_STATUS+6(FP), -
                                0574    939                 HP$W_VECTOR(R2)         ; Set current vector
                     14    13  0574    940         BEQL    30$                     ; Branch if invalid vector
    50   FC AD    04    02    EF  0576    941         EXTZV   #CHI$V_IPL,#4, -
                                057C    942                 L_STATUS+4(FP),R0       ; Extract BR level of device
             36 A2    50    90  057C    943         MOVB    R0,RK611$B_BR(R2)       ; Save BR level
                                0580    944
        00000000'EF    62    FA  0580    945         CALLG   (R2),L^INS$PTABLE       ; Add this PT                            [05]
                  03 50    E8  0587    946         BLBS    R0,40$                  ; Branch if success
                   FEC8    31   058A    947 30$:    BRW     CON_RELEASE_X           ; Release buffer and exit
                                058D    948 40$:
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```
                F4 AD   52   D0  058D   949          MOVL    R2,L_LINK(FP)           ; Save PT of RK611
                   51   32   3C  0591   950          MOVZWL  #RK06$K_LEN,R1          ; Length of RK06/RK07 PT
                                0594   951                                                                  ;G:12
                                0594   952                                                                  ;G:12
                     007B   30  0594   953          BSBW    Allocate_Ptable         ; Allocate space for PT      [07]
                   9A 50    E9  0597   954          BLBC    R0,10$                  ; Take error exit
                08 A2   51   B0  059A   955          MOVW    R1,HP$W_SIZE(R2)        ; Set size of structure
                                059E   956
                   62   05   D0  059E   957          MOVL    #5,HP$Q_DEVICE(R2)      ; Insert length of "_DMA0"
                50   0C A2   9E  05A1   958          MOVAB   HP$T_DEVICE(R2),R0      ; Insert address of "_DMA0"
                04 A2   50   D0  05A5   959          MOVL    R0,HP$Q_DEVICE+4(R2)    ; Set address of device name
          80   414D445F 8F   D0  05A9   960          MOVL    #^A"_DMA",(R0)+         ; Insert "_DMA"
           80   0C AC   30   81  05B0   961          ADDB3   #^A"0",12(AP),(R0)+     ; Insert unit number
             14 AB   0C AC   B0  05B5   962          MOVW    12(AP),HPE$W_EXT_DRIVE(R11) ; Put drive # in EPB     ;G:12
      000000FF'EF    0C AC   B1  05BA   963          CMPW    12(AP),^XFF                                          ;G:12
                        05   14  05C2   964          BGTR    45$                                                  ;G:12
             0B A2   0C AC   90  05C4   965          MOVB    12(AP),HP$B_DRIVE(R2)   ; Set drive number           ;G:12
                     18 A2   D4  05C9   966 45$:     CLRL    HP$A_DEVICE(R2)         ; Clear device address       ;G:12
                     1C A2   D4  05CC   967          CLRL    HP$A_DVA(R2)            ; Clear virtural address
                20 A2   F4 AD   D0  05CF   968          MOVL    L_LINK(FP),HP$A_LINK(R2); Link to RK611
           26 A2   304B5204 8F   D0  05D4   969          MOVL    #<^A"@RK0"-60>, -
                                05DC   970                  HP$T_TYPE(R2)           ; Set length=4 and "RK0"
              2A A2   54   36   81  05DC   971          ADDB3   #^A"6",R4,HP$T_TYPE+4(R2); Set "6" or "7" if R4=1
                                05E1   972 CON_NORMAL_X:
                0000'CF   62   FA  05E1   973          calls   (r2), w^ins$ptable      ; Insert it in list
                      A1 50    E9  05E6   974          blbc    r0, 30$                 ; fail if error
                   50   52   D0  05E9   975          MOVL    R2,R0                   ; Copy address of P-table of load dev
          52   00000000'EF   DE  05EC   976          MOVAL   DS$GL_CLIBASE,R2        ; Set R2 to base of CLI data area
                08 A2   60   D0  05F3   977          MOVL    HP$Q_DEVICE(R0), -
                                05F7   978                  CLI$Q_FILE(R2)          ; Set length of load device name
                   7E   3A   90  05F7   979          MOVB    #^A":",-(SP)            ; Tack a ":" to the end
                   53   60   D0  05FA   980          MOVL    HP$Q_DEVICE(R0),R3      ; Length of name. Any size.  [12]
                        53   D7  05FD   981          DECL    R3                      ; "-" not included           [12]
             7E   0C A043   90  05FF   982 50$:      MOVB    HP$T_DEVICE(R0)[R3],-(SP)       ; Place name on stack [12]
                   F8 53    F5  0604   983          SOBGTR  R3,50$                  ; Loop to move all of name   [12]
                0C A2   6E   9E  0607   984          MOVAB   (SP),CLI$Q_FILE+4(R2)   ; Set address of load device name
                      F9F2'  30  060B   985          BSBW    DSV$SETLOAD             ; Set default load device
                   50   01   D0  060E   986          MOVL    #SS$_NORMAL,R0          ; Success
                                04  0611   987          RET
                                    0612   988 .dsabl  lsb
```

```
                                  0612   990 .Subtitle       Common routines
                                  0612   991
                                  0612   992 ;
                                  0612   993 ; This little routine allocates a Ptable and pre-clears it.
                                  0612   994 ;
                                  0612   995 ; Inputs:
                                  0612   996 ;  R1 => Size of Ptable to allocate
                                  0612   997 ;
                                  0612   998 ; Outputs:
                                  0612   999 ;  R0 => Status code
                                  0612  1000 ;  R1 => Size of Ptable
                                  0612  1001 ;  R2 => Address of Ptable
                                  0612  1002 ;  R11 => Address of EPB                                                    ;G:12
                                  0612  1003 ;
                                  0612  1004
                                  0612  1005 Allocate_Ptable:                          ; Use to allocate/clear Ptable          [07]
                0400 8F     BB    0612  1006         PUSHR   #^M<R10>                                                    ;G:12
        51   00000000'8F    C0    0616  1007         ADDL2   #HPE$C_EPB_SIZE,R1                                          ;G:12
             00000000'EF    16    061D  1008         Jsb     L^Exe$AloNonPaged        ; Allocate the structure                [07]
                      3F    BB    0623  1009         PushR   #^M<R0,R1,R2,R3,R4,R5>   ; Save volatile registers               [07]
  62   51   00   6E   00    2C    0625  1010         MovC5   #0, (Sp), #0, R1, (R2)   ; Clear the Ptable                      [07]
                      3F    BA    062B  1011         PopR    #^M<R0,R1,R2,R3,R4,R5>   ; Restore the registers                 [07]
             5B   52   51    C1    062D  1012         ADDL3   R1,R2,R11                ; End of ptable in R11                 ;G:12
             5A   5B   04    C3    0631  1013         SUBL3   #4,R11,R10                ; Address to store address of EPB     ;G:12
  6A   5B   00000000'8F    C3    0635  1014         SUBL3   #HPE$C_EPB_SIZE,R11,(R10); Store EPB address in                ;G:13
                5B   6A    D0    063D  1015         MOVL    (R10),R11                ; EPB address in R11                   ;G:12
                0400 8F    BA    0640  1016         POPR    #^M<R10>                                                    ;G:12
                           05    0644  1017         Rsb                              ;                                        [07]
                                 0645  1018
                                 0645  1019 COMMON_INTERRUPT:
                      03    BB    0645  1020         PUSHR   #^M<R0,R1>               ; Save volatile regs
                      7E    7C    0647  1021         CLRQ    -(SP)                    ; no status or interrupt routine
                      05    DD    0649  1022         PUSHL   #CHC$_DSINT              ; Disable further interrupts
                      00    DD    064B  1023         PUSHL   #0                       ; unit 0
        00000000'EF   04    FB    064D  1024         CALLS   #4,DS$CHANNEL            ; disable
                      03    BA    0654  1025         POPR    #^M<R0,R1>               ; Restore
                           02    0656  1026         REI                              ; All status is in L_STATUS(FP)
                                 0657  1027
```

```
                                0657  1029 CON_UBA_RL:
                                0657  1030 ;+
                                0657  1031 ; now build PT for RL11
                                0657  1032 ;-
                                0657  1033
                          0B    B0  0657  1034          MOVW    #RL_DA_M_STS!RL_DA_M_RST!1,-
                       04 A5        0659  1035                  RL_DA(R5)                       ; Setup disk adress register to
                                    065B  1036                                                  ; clear errors and get status.
                                    065B  1037
                    52    04    D0  065B  1038          MOVL    #F_STAT,R2                      ; setup get status function
          52   02    08    0C AC   F0  065E  1039          INSV    12(AP),#8,#2,R2                 ; setup unit # of drive
                    65    52    B0  0664  1040          MOVW    R2,RL_CS(R5)                    ; initiate get status to clear errors
                                    0667  1041          $DS_WAITUS_S    #1000                   ; Wait for it to finish
                          00    DD  0667                        PUSHL   #0
                 000003E8 8F    DD  0669                        PUSHL   #1000
              00000000'9F   02    FB  066F                        CALLS   #2, a#DS$WAITUS
                                    0676  1042
                 65   0080 8F    B3  0676  1043          BITW    #RL_CS_M_CRDY,RL_CS(R5)         ; Check if controller ready
                         16    13  067B  1044          BEQL    5$                              ; Branch if not ready, Throw it away
                                    067D  1045
                    52   40 8F    88  067D  1046          BISB2   #RL_CS_M_IE,R2                  ; Setup interrupt enable
                       65   52    B0  0681  1047          MOVW    R2,RL_CS(R5)                    ; Now do get status to cause interrupt
                                    0684  1048
                                    0684  1049          $DS_WAITUS_S    #1000                   ; Wait for it to finish
                          00    DD  0684                        PUSHL   #0
                 000003E8 8F    DD  0686                        PUSHL   #1000
              00000000'9F   02    FB  068C                        CALLS   #2, a#DS$WAITUS
                       54   65    3C  0693  1050 5$:      MOVZWL  RL_CS(R5),R4                    ; Get status reg. contents
                 65   0040 8F    AA  0696  1051          BICW    #RL_CS_M_IE,RL_CS(R5)           ; Clear interrupt enable
                   08 AE   05    D0  069B  1052          MOVL    #CHC$_DSINT,8(SP)               ; Change function to disable
                       63   6E    FA  069F  1053          CALLG   (SP),(R3)                       ; Disable interrupts
                          12 50    E9  06A2  1054          BLBC    R0,10$                          ; Return if error
                             54    B5  06A5  1055          TSTW    R4                              ; Check composite error
                             0F    19  06A7  1056          BLSS    20$                             ; Error if set
             54   54    01    07    EF  06A9  1057          EXTZV   #RL_MP_V_TYP,#1,R4,R4           ; Isolate drive type, 0=RL01,1=RL02
                                    06AE  1058
                       51   37    3C  06AE  1059          MOVZWL  #RL11$K_LEN,R1                  ; Length of RL11 PT
                                    06B1  1060                                                                                  ;G:12
                                    06B1  1061                                                                                  ;G:12
                          FF5E    30  06B1  1062          BSBW    Allocate_Ptable                 ; Allocate space for same         [07]
                             04 50    E8  06B4  1063          BLBS    R0,25$                          ; Branch if succeeded
                                    06B7  1064 10$:
                                04  06B7  1065          RET                                     ; Return error
                          FDA0      31  06B8  1066 20$:     BRW     CON_ERROR_X                     ; Leap to error exit
                                    06BB  1067 25$:
                    08 A2   51    B0  06BB  1068          MOVW    R1,HP$W_SIZE(R2)                ; Set size of structure
                                    06BF  1069
                       62   04    D0  06BF  1070          MOVL    #4,HP$Q_DEVICE(R2)              ; Set length of "_DLA"
                    50    0C A2    9E  06C2  1071          MOVAB   HP$T_DEVICE(R2),R0              ; Set address of "_DLA"
                    04 A2   50    D0  06C6  1072          MOVL    R0,HP$Q_DEVICE+4(R2)            ; Set address of device name
              60   414C445F 8F    D0  06CA  1073          MOVL    #^A"_DLA",(R0)                  ; Set "_DLA"
                    18 A2   55    D0  06D1  1074          MOVL    R5,HP$A_DEVICE(R2)              ; Set device address
                       1C A2    D4  06D5  1075          CLRL    HP$A_DVA(R2)                    ; Clear virtural address
                 20 A2    F4 AD    D0  06D8  1076          MOVL    L_LINK(FP),HP$A_LINK(R2)        ; Set link to channel
              26 A2    5204 8F    B0  06DD  1077          MOVW    #^X5204,HP$T_TYPE(R2)           ; Set length and "R" of RL11
           28 A2    0031314C 8F    D0  06E3  1078          MOVL    #^A"L11",HP$T_TYPE+2(R2)        ; Set "11"
        32 A2   18 A2    12    00    EF  06EB  1079          EXTZV   #0,#18, HP$A_DEVICE(R2), -
```

```
                                06F2                RL11$L_CSR(R2)          ; Set CSR address
                                06F2
          24 A2   FE AD   B0    06F2        MOVW    L_STATUS+6(FP), -
                                06F7                HP$W_VECTOR(R2)         ; Set current vector
                     14   13    06F7        BEQL    30$                     ; Branch if invalid vector
   50   FC AD   04   02   EF    06F9        EXTZV   #CHI$V_IPL,#4, -
                                06FF                L_STATUS+4(FP),R0       ; Extract BR level of device
             36 A2   50   90    06FF        MOVB    R0,RL11$B_BR(R2)        ; Save BR level
                                0703
      00000000'EF   62   FA    0703        CALLG   (R2),L^INS$PTABLE       ; Add this PT                    [05]
                 03 50   E8    070A        BLBS    R0,40$                  ; Branch if success
                  FD45   31    070D  30$:  BRW     CON_RELEASE_X           ; Release buffer and exit
                                0710  40$:
             F4 AD   52   D0    0710        MOVL    R2,L_LINK(FP)           ; Save PT of RL11
                51   32   3C    0714        MOVZWL  #RL01$K_LEN,R1          ; Length of RL01/RL02 PT
                                0717                                                                    ;G:12
                                0717                                                                    ;G:12
                  FEF8   30    0717        BSBW    Allocate_ptable         ; Allocate space for PT          [07]
                 9A 50   E9    071A        BLBC    R0,10$                  ; Take error exit
             08 A2   51   B0    071D        MOVW    R1,HP$W_SIZE(R2)        ; Set size of structure
                                0721
                62   05   D0    0721        MOVL    #5,HP$Q_DEVICE(R2)      ; Insert length of "_DLA0"
             50   0C A2   9E    0724        MOVAB   HP$T_DEVICE(R2),R0      ; Insert address of "_DLA0"
             04 A2   50   D0    0728        MOVL    R0,HP$Q_DEVICE+4(R2)    ; Set address of device name
      80   414C445F 8F   D0    072C        MOVL    #^A"_DLA",(R0)+         ; Insert "_DLA"
       80   0C AC   30   81    0733        ADDB3   #^A"0",12(AP),(R0)+     ; Insert unit number
          14 AB   0C AC   B0    0738        MOVW    12(AP),HPE$W_EXT_DRIVE(R11) ; Put the drive # in R11    ;G:12
   000000FF'EF   0C AC   B1    073D        CMPW    12(AP),^XFF                                             ;G:12
                     05   14    0745        BGTR    45$                                                     ;G:12
          0B A2   0C AC   90    0747        MOVB    12(AP),HP$B_DRIVE(R2)   ; Set drive number
                 18 A2   D4    074C  45$:  CLRL    HP$A_DEVICE(R2)         ; Clear device address           ;G:12
                 1C A2   D4    074F        CLRL    HP$A_DVA(R2)            ; Clear virtural address
          20 A2   F4 AD   D0    0752        MOVL    L_LINK(FP),HP$A_LINK(R2); Link to RL11
   26 A2   304C5204 8F   D0    0757        MOVL    #<^A"@RL0"-60>, -
                                075F                HP$T_TYPE(R2)           ; Set length=4 and "RL0"
       2A A2   54   31   81    075F        ADDB3   #^A"1",R4,HP$T_TYPE+4(R2); Set "1" or "2" if R4=1
                  FE7A   31    0764        BRW     CON_NORMAL_X            ; now set default load device
                                0767
```

```
                                0767  .sbttl  configure RB730
                                0767  ;
                                0767  ; Device interrupt handler for RB730
                                0767  ;
                                0767  ; [warning:  this code really should not expect R5 to be valid.  It
                                0767  ;  works because DS$WAITUS doesn't trash R5; however, there is no
                                0767  ;  guarantee on this in the future.  THIS SHOULD BE CHANGED IN A FUTURE
                                0767  ;  RELEASE, but I am making these alterations 3 working days prior to
                                0767  ;  release cut-off, and I just am not up to fancies.  If it works, I'll
                                0767  ;  be ecstatic.]
                                0767  ;
                                0767  RB730_Interrupt:                          ;                                    [06]
                     03   BB    0767          PushR   #^M<R0,R1>                ; Save volatile regs                 [06]
                     7E   7C    0769          ClrQ    -(Sp)                     ; no status or interrupt routine     [06]
                     05   DD    076B          PushL   #CHC$_DSInt               ; Disable further interrupts         [06]
                     00   DD    076D          PushL   #0                        ; unit 0                             [06]
      00000000'EF    04   FB    076F          CallS   #4, DS$Channel            ; disable                            [06]
      65   00000040  8F   CA    0776          BicL2   #Rb_Cs_M_Ie, Rb_Cs(R5)    ; Disable device interrupts          [06]
                     03   BA    077D          PopR    #^M<R0,R1>                ; Restore                            [06]
                          02    077F          Rei                               ; All status is in L_STATUS(FP)      [06]
                                0780
                                0780  con_uba_rb:
                                0780
                                0780  ;
                                0780  ; Build Ptable for RB730 (Nebula IDC)
                                0780  ;
      55   40F26200'EF    9E    0780          MovAB   ^X40F26200, R5            ; Get proper address for IDC         [08]
                     52   D4    0787          clrl    r2                        ; r2 will be shifted unit number
  52   02   08   0C AC   F0    0789          insv    12(ap), #8, #2, r2        ; set unit number in right field
                                078F
                                078F  ;
                                078F  ; reset drive, with interrupt on completion
                                078F  ;
           10 A5    0B   D0    078F          movl    #rb_mp_m_sts-             ; put get status
                                0793                  !rb_mp_m_rst-             ;  and reset
                                0793                  !rb_mp_m_mrk, -           ;  and mark bit
                                0793                  rb_mp(r5)                 ;  into register
  65   00000044 8F   52   C9    0793          bisl3   r2, -                     ; put unit number
                                079B                  #f_getstatus -            ;  and command
                                079B                  !rb_cs_m_ie, -            ;  and interrupt enable bit
                                079B                  rb_cs(r5)                 ;  into cs register
                                079B          $ds_waitus_s    #1000             ; wait for it to finish
                     00   DD    079B                  PUSHL   #0
          000003E8  8F   DD    079D                  PUSHL   #1000
      00000000'9F    02   FB    07A3                  CALLS   #2, a#DS$WAITUS
              54    65   D0    07AA          movl    rb_cs(r5), r4             ; fetch status register
      65   00000040  8F   CA    07AD          bicl2   #rb_cs_m_ie, rb_cs(r5)    ; clear interrupt enable
           08 AE    05   D0    07B4          movl    #chc$_dsint, 8(sp)        ; change CHANNEL func to disable
              63    6E   FA    07B8          callg   (sp), (r3)                ; disable interrupts.
                 12 50   E9    07BB          blbc    r0, 10$                   ; return if error
                     54   B5    07BE          tstw    r4                        ; is good status?
                     0F   19    07C0          blss    20$                       ; composite error set
      54   54   01   1A   EF    07C2          extzv   #rb_cs_v_typ, #1, r4, r4; get type bit (0 = rl02, 1 = r80)
              51    37   3C    07C7          movzwl  #rb730$k_len, r1          ; length of RB730 Ptable
                                07CA                                                                                ;G:12
                                07CA                                                                                ;G:12
                                07CA                                                                                ;G:12
```

```
                FE45   30   07CA  1173          bsbw    Allocate_ptable         ; allocate space for it                [07]
              04 50    E8   07CD  1174          blbs    r0, 30$                 ; check status
                             07D0  1175 10$:
                       04    07D0  1176          ret                             ; return error
                             07D1  1177 20$:
                FC87   31    07D1  1178          brw     con_error_x             ; error exit (create status)
                             07D4  1179 30$:
                             07D4  1180 ;
                             07D4  1181 ; device responded: make Ptable
                             07D4  1182 ;
                             07D4  1183 ; Register usage:
                             07D4  1184 ;
                             07D4  1185 ;       R1 = size of Ptable
                             07D4  1186 ;       R2 = pointer to Ptable
                             07D4  1187 ;       R3 = address of DSX$CHANNEL routine
                             07D4  1188 ;       R4 = 0 if device is RL02, 1 if R80
                             07D4  1189 ;       R5 = address of device CS
                             07D4  1190 ;
                             07D4  1191
          08 A2    51   B0   07D4  1192          movw    r1, hp$w_size(r2)       ; Set size of Ptable
             62    04   D0   07D8  1193          movl    #4, hp$q_device(r2)     ; set length of "_DQA"
          50   0C A2   9E   07DB  1194          movab   hp$t_device(r2), r0     ; set address of "_DQA"
          04 A2    50   D0   07DF  1195          movl    r0, hp$q_device+4(r2)   ; set address of device name
    60  4151445F 8F   D0   07E3  1196          movl    #^a"_DQA", (r0)         ; set "_DQA" as name
          18 A2    55   D0   07EA  1197          movl    r5, hp$a_device(r2)     ; set device address
             1C A2   D4   07EE  1198          clrl    hp$a_dva(r2)            ; clear virtual address
       20 A2   F4 AD   D0   07F1  1199          movl    l_link(fp), -
                             07F6  1200           hp$a_link(r2)                 ; set link field
       26 A2   5205 8F   B0   07F6  1201          movw    #^x5205, hp$t_type(r2)  ; set length and 'R' of RB730
    28 A2   30333742 8F   D0   07FC  1202          movl    #^a"B730", -
                       0804  1203           hp$t_type+2(r2)               ; set rest of type field
       24 A2   FE AD   B0   0804  1204          movw    l_status+6(fp), -
                       0809  1205           hp$w_vector(r2)               ; set vector it interrupted thru
                12     13   0809  1206          beql    40$                     ; branch if invalid
50  FC AD   04   02   EF   080B  1207          extzv   #chi$v_ipl, #4, -
                       0811  1208           l_status+4(fp), r0            ; get BR level
          36 A2    50   90   0811  1209          movb    r0, rb730$b_br(r2)      ; save BR level
       0000'CF    62   FA   0815  1210          callg   (r2), w^ins$ptable      ; add this Ptable to list
             03 50    E8   081A  1211          blbs    r0, 50$                 ; branch if OK
                             081D  1212 40$:
                FC35   31    081D  1213          brw     con_release_x           ; release buffer and exit
                             0820  1214 50$:
          F4 AD    52   D0   0820  1215          movl    r2, l_link(fp)          ; save link of RB730
             51    32   3C   0824  1216          movzwl  #ri02$k_len, r1         ; length of RL02/R80 Ptable
                             0827  1217                                                                          ;G:12
                             0827  1218                                                                          ;G:12
                FDE8   30    0827  1219          bsbw    Allocate_Ptable         ; allocate Ptable                      [07]
             A3 50    E9   082A  1220          blbc    r0, 10$                 ; exit if error
          08 A2    51   B0   082D  1221          movw    r1, hp$w_size(r2)       ; set size
             62    05   D0   0831  1222          movl    #5, hp$q_device(r2)     ; set length of "_DQA0"
          50   0C A2   9E   0834  1223          movab   hp$t_device(r2), r0     ; address of "_DQA0"
          04 A2    50   D0   0838  1224          movl    r0, hp$q_device+4(r2)   ; set into descriptor
    80  4151445F 8F   D0   083C  1225          movl    #^a"_DQA", (r0)+        ; set first part of name
     60   0C AC   30   81   0843  1226          addb3   #^a"0", 12(ap), (r0)    ; insert correct unit number
       14 AB    0C AC   B0   0848  1227          MOVW    12(AP),HPE$W_EXT_DRIVE(R11)  ; Put the drive # in EPB          ;G:12
000000FF'EF    0C AC   B1   084D  1228          CMPW    12(AP),^XFF                                                    ;G:12
                       05   14   0855  1229          BGTR    55$                                                    ;G:12
```

```
      0B A2   0C AC   90  0857  1230          movb    12(ap), hp$b_drive(r2)  ; set binary unit number
              18 A2   D4  085C  1231 55$:     clrl    hp$a_device(r2)         ; no address                    ;G:12
              1C A2   D4  085F  1232          clrl    hp$a_dva(r2)            ; no pass-thru address
      20 A2   F4 AD   D0  0862  1233          movl    l_link(fp), -
                          0867  1234                   hp$a_link(r2)          ; set link address to RB730
         50   26 A2   9E  0867  1235          movab   hp$t_type(r2), r0       ; set address of type field
              09 54   E9  086B  1236          blbc    r4, 60$                 ; branch if RL02
                          086E  1237 ;
                          086E  1238 ; Set device type to R80
                          086E  1239 ;
   60   30385203 8F   D0  086E  1240          movl    #3+<^a"R80"@8>, (r0)    ; set type to counted "R80"
                 0A   11  0875  1241          brb     70$                     ; join common code
                          0877  1242 ;
                          0877  1243 ; Set device type to RL02
                          0877  1244 ;
   80   304C5204 8F   D0  0877  1245 60$:     movl    #4+<^a"RL0"@8>, (r0)+   ; set type to counted "RL02"
           60    32   90  087E  1246          movb    #^a"2", (r0)            ;
                          0881  1247 ;
                          0881  1248 ; Insert Ptable, return
                          0881  1249 ;
              FD5D   31  0881  1250 70$:     brw     con_normal_x            ; set load device, exit OK
                          0884  1251
```

```
                                0884  1253          .Subtitle       Attach UDA-50/LESI/KDB50/KFBTA/DEBNT load path          ;G:9
                                0884  1254
                                0884  1255 ;                                                                                 [07]
                                0884  1256 ; Since there seems to be no particular purpose to using interrupts
                                0884  1257 ; when initializing the device, this code uses the perfectly good
                                0884  1258 ; PUBTDRIVR/BDABTDRIVR/PBBTDRIVR code for the purpose, and merely checks the status
                                0884  1259 ;
                                0884  1260
                                0884  1261 con_uba_uda:
                                0884  1262
                                0884  1263 ;
                                0884  1264 ; First, turn off interrupts (which were set up in common
                                0884  1265 ; UBA code)
                                0884  1266 ;
                                0884  1267
                23   10 AC   D1 0884  1268          CMPL    16(AP),#BTD$K_AIE_TK50  ; Is it MAYA                            [43]
                       1D   13 0888  1269          BEQL    2$                      ; NO INIT FOR DEBNT                     [43]
                22   10 AC   D1 088A  1270          CMPL    16(AP),#BTD$K_BVPSSP    ; IS IT KFBTA ?                         [37]
                       17   13 088E  1271          BEQL    2$                      ; NO INIT FOR KFBTA                     [37]
          00000062 8F   10 AC   D1 0890  1272          CMPL    16(AP),#BTD$K_AIE_NI    ; Is it NI ?                            [41]
                       0D   13 0898  1273          BEQL    2$                      ; No init for NI                        [41]
                08 AE    05   D0 089A  1274          MovL    #Chc$_DsInt, 8(Sp)      ; change CHANNEL func to disable
                   63    6E   FA 089E  1275          CallG   (Sp), (R3)              ; disable interrupts.
                     03 50    E8 08A1  1276          Blbs    R0, 2$                  ; return if error                       ;G:6
                      00D8    31 08A4  1277          BRW     10$
                                08A7  1278 ;
                                08A7  1279 ; Now, build a pseudo-RPB to make the bootdriver init code                   ;G:13
                                08A7  1280 ; happy, and then call said routine.  After it completes, the
                                08A7  1281 ; global response buffer is accessible: it has the drive type, etc.
                                08A7  1282 ;
                   18 AC    DD 08A7  1283 2$:       pushL   24(AP)                  ; BI number if applicable               [33]
                      7E    7C 08AA  1284           CLRQ    -(SP)                   ; No slave number/No ci port            [07]
                   0C AC    DD 08AC  1285           PushL   12(Ap)                  ; Unit number                           [07]
              50   F4 BD    DE 08AF  1286           MovAL   aL_Link(Fp), R0         ; Get address of link Ptable            [07]
                   18 A0    DD 08B3  1287           PushL   Hp$A_Device(R0)         ; Address of link device                [07]
                      55    DD 08B6  1288           PushL   R5                      ; Address of device CSR                 [07]
                      7E    7C 08B8  1289           ClrQ    -(Sp)                   ; Don't bother with adap./dev. codes    [07]
       00000000'EF    08    FB 08BA  1290           CallS   #8, Dsr$Allocate_Pseudo_RPB     ; Allocate the RPB              [07]
                      50    D5 08C1  1291           TstL    R0                      ; If R0 is 0,                           [07]
                      03    12 08C3  1292           BNEQ    3$                      ;                                       ;G:2
                    00B8    31 08C5  1293           BRW     20$                     ; .. there was an error                 [36]
                59    50    D0 08C8  1294 3$:       MovL    R0, R9                  ; Put RPB where UD_INIT wants it        [07]
                                08CB  1295
              50    00000000'EF   DE 08CB  1296           MOVAL   UD_INIT,R0              ; UDA50 init routine                    [29]
              52    00000000'EF   9E 08D2  1297           MOVAB   UDA_RESPONSE,R2         ; UDA50 response buffer                 [29]
                11    10 AC   D1 08D9  1298           CMPL    16(AP),#BTD$K_UDA       ; Is it UDA50 ?                         [44]
                       48   13 08DD  1299           BEQL    5$                      ; BRANCH IF UDA50                       [44]
              50    00000000'EF   DE 08DF  1300           MOVAL   PA_INIT,R0              ; DEBN* initi routine                   [43]
                23    10 AC   D1 08E6  1301           CMPL    16(AP),#BTD$K_AIE_TK50  ; Is it MAYA ?                          [36]
                       3B   13 08EA  1302           Beql    5$                      ; Branch if MAYA                        [43]
              50    00000000'EF   DE 08EC  1303           moval   pb$init,r0              ; KFBTA init routine                    [44]
                22    10 AC   D1 08F3  1304           CMPL    16(AP),#BTD$K_BVPSSP    ; Is it KFBTA ?                         [44]
                       2E   13 08F7  1305           BEQL    5$                      ; BRANCH IF KFBTA                       [36]
          00000062 8F   10 AC   D1 08F9  1306           CMPL    16(AP),#BTD$K_AIE_NI    ; Is it NI ?                            [41]
                       10   12 0901  1307           Bneq    57$                     ; Branch if not NI                      [41]
              59    00000000'EF   DE 0903  1308           moval   NI$GN_RPB_BUFFER,r9     ; use the real rpb for now              [41]
              50    00000000'EF   DE 090A  1309           moval   et$init,r0              ; DEBNT init routine                    [41]
```

```
                    14   11   0911  1310          brb     5$                      ;                                       [41]
          21   10 AC   D1   0913  1311 57$:      CMPL    16(AP),#BTD$K_BDA       ; Is it a KDB50?                        [25]
                    0E   12   0917  1312          BNEQ    5$                      ; Branch if not                         [25]
     50   00000000'EF   DE   0919  1313          MOVAL   BD_INIT,R0              ; KDB50 init routine                    [25]
     52   00000000'EF   9E   0920  1314          MOVAB   KDB50_RESPONSE,R2       ; KDB50 response buffer                 [25]
                        0927  1315
                    50   D5   0927  1316 5$:      TSTL    R0                      ; Check if zero                         [37]
                    13   12   0929  1317          BNEQ    501$                    ; Branch if good                        [37]
                        092B  1318                                                                                        ;G:2
                        092B  1319          ERRSUP_S                            ; Should never happen!                  [37]
          00000000'EF   DF   092B                      PUSHAL  $MODULE
                    00   DD   0931                      PUSHL   #0
                    03   DD   0933                      PUSHL   #$ER
     00000000'EF    03   FB   0935                      CALLS   #3, DS_ERRSUP
                    41   11   093C  1320          brb     10$                     ; return on error                       [37]
                        093E  1321                                                                                        ;G:2
               60   00   FB   093E  1322 501$:     CallS   #0,(R0)                 ; Call init routine                     [25]
                 3B 50   E9   0941  1323          BlbC    R0, 10$                 ; Return if error                       [07]
                    69   9F   0944  1324          PushAB  (R9)                    ; Address of RPB                        [07]
     00000000'EF    01   FB   0946  1325          CallS   #1, Dsr$DeAllocate_Pseudo_RPB   ; Deallocate the RPB           [07]
               59   52   D0   094D  1326          Movl    R2,R9                   ; Get address of response buffer        [25]
          59   1C A9   D0   0950  1327          MovL    MSCP$L_Media_ID(R9), R9 ; Replace R9 with media ID codes        [07]
          22   10 AC   D1   0954  1328          CMPL    16(AP),#BTD$K_BVPSSP    ; Is it KFBTA ?                         [36]
                    10   13   0958  1329          beql    601$                    ; Branch if KFBTA                       [36]
          23   10 AC   D1   095A  1330          CMPL    16(AP),#BTD$K_AIE_TK50  ; Is it MAYA ?                          [36]
                    0A   13   095E  1331          Beql    601$                    ;                                       [36]
00000062  8F   10 AC   D1   0960  1332          CMPL    16(AP),#BTD$K_AIE_NI    ; Is it NI ?                            [41]
                    03   12   0968  1333          Bneq    67$                     ;                                       [41]
                  0093   31   096A  1334 601$:     BRW     51$                     ; KFBTA, skip UDA50/LESI PTABLE build   [36]
                        096D  1335
          21   10 AC   D1   096D  1336 67$:      CMPL    16(AP),#BTD$K_BDA       ; Is it a KDB50?                        [25]
                    03   12   0971  1337          BNEQ    7$                      ; Branch if not                         [25]
                  008A   31   0973  1338          BRW     51$                     ; KDB50, skip UDA50/LESI ptable build   [25]
                        0976  1339 ;
                        0976  1340 ; Build Ptable for UDA-50 (UNIBUS => SDI adapter)
                        0976  1341 ; Build Ptable for LESI                                                                [19]
                        0976  1342 ;
                        0976  1343
     51   38   3C   0976  1344 7$:      MovZWL  #Hp$K_UDA50_Len, r1     ; length of UDA-50 Ptable               [25]
                        0979  1345                                                                                        ;G:12
                        0979  1346                                                                                        ;G:12
          FC96   30   0979  1347          BsbW    Allocate_Ptable         ; allocate space for it                         [07]
          04 50   E8   097C  1348          BlbS    R0, 30$                 ; check status
                        097F  1349 10$:
                    04   097F  1350          Ret                             ; return error
                        0980  1351 20$:
          FAD8   31   0980  1352          BrW     Con_Error_X             ; error exit (create status)
                        0983  1353 30$:
                        0983  1354 ;
                        0983  1355 ; device responded: make Ptable
                        0983  1356 ;
                        0983  1357 ; Register usage:
                        0983  1358 ;
                        0983  1359 ;       R1 = size of Ptable
                        0983  1360 ;       R2 = pointer to Ptable
                        0983  1361 ;       R3 = scratch
                        0983  1362 ;       R4 = scratch
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                                  0983  1363 ;       R5 = address of device CS
                                  0983  1364 ;       R9 = UDA-50 drive media ID code
                                  0983  1365 ;
                                  0983  1366 ;               31   26   21   16   11  7 6    0
                                  0983  1367 ;               +----+----+----+----+----+------+
                                  0983  1368 ;               | D0 | D1 | A0 | A1 | A2 |   N  |
                                  0983  1369 ;               +----+----+----+----+----+------+                                  ;G:14
                                  0983  1370 ;                                                                                  ;G:13
                                  0983  1371 ;                       D0, D1 : 5-bit ASCII preferred device
                                  0983  1372 ;                                generic prefix for unit. 1='A', 2='B'.
                                  0983  1373 ;                                D0 is left letter, D1 is right.
                                  0983  1374 ;                       A0,A1,A2,N : Media name of unit.  Up to 3 alpha
                                  0983  1375 ;                                characters (left-justified in A0-2), and
                                  0983  1376 ;                                N (two decimal digits).  Ex: A0=17,
                                  0983  1377 ;                                A1=1, A2=0, N=80; name is 'RA80'.
                                  0983  1378 ;                                Name can also be RA81,RA60,RC25,RCF25,RX50,  ;G:12
                                  0983  1379 ;                                RD52,RD53,RA90                                ;G:12
                                  0983  1380 ;
                                  0983  1381
          08 A2    51    B0       0983  1382          MovW    R1, Hp$W_Size(R2)        ; Set size of Ptable
             62    04    D0       0987  1383          MovL    #4, Hp$Q_Device(R2)      ; set length of "_DUA"
          50    0C A2    9E       098A  1384          MovAB   Hp$T_Device(R2), R0      ; set address of "_DUA"
          04 A2    50    D0       098E  1385          MovL    R0, Hp$Q_Device+4(R2)    ; set address of device name
     60   4155445F 8F    D0       0992  1386          MovL    #^A"_DUA", (R0)          ; set "_DUA" as name/DEFAULT                [10]
          18 A2    55    D0       0999  1387          MovL    R5, Hp$A_Device(R2)      ; set device address
  32 A2   55   12   00    EF       099D  1388          ExtZV   #0, #18, R5, -           ; Set UNIBUS address into
                                  09A3  1389                   Hp$L_Uda50_UdaIp(R2)    ; .. correct field of Ptable
                1C A2    D4       09A3  1390          ClrL    Hp$A_Dva(R2)             ; clear sibling address
        20 A2   F4 AD    D0       09A6  1391          MovL    L_Link(Fp), -
                                  09AB  1392                   Hp$A_Link(R2)           ; set link field
     20643019 8F    59    D1       09AB  1393          CMPL    R9,#^X20643019           ; Check for RC25                            [10]
                    09    13       09B2  1394          BEQL    33$                      ; Branch if found.                          [10]
     20643319 8F    59    D1       09B4  1395          CMPL    R9,#^X20643319           ; Check for RCF25                           [10]
                    18    12       09BB  1396          BNEQ    35$                      ; Branch if found.                          [10]
                                  09BD  1397
      26 A2   4C04 8F    B0       09BD  1398 33$:     MOVW    #4!<^A"L"@8>, -          ; Set length and 'L'                        [13]
                                  09C3  1399                   HP$T_TYPE(R2)           ; of LESI                                   [10]
  28 A2   20495345 8F    D0       09C3  1400          MOVL    #^A"ESI ", -             ; and set                                   [13]
                                  09CB  1401                   HP$T_TYPE+2(R2)         ; rest of type field                        [10]
  0C A2   4141445F 8F    D0       09CB  1402          MOVL    #^A"_DAA",HP$T_DEVICE(R2); RESET "_DAA" AS NAME                     [18]
                    0E    11       09D3  1403          BRB     38$                      ; Branch to continue                        [10]
                                  09D5  1404
      26 A2   5505 8F    B0       09D5  1405 35$:     MovW    #5!<^A"U"@8>, -          ; Set length and 'U'
                                  09DB  1406                   Hp$T_Type(R2)           ; .. of UDA50
  28 A2   30354144 8F    D0       09DB  1407          MovL    #^A"DA50", -             ; And set
                                  09E3  1408                   Hp$T_Type+2(R2)         ; .. rest of type field
                                  09E3  1409
      24 A2   006C 8F    B0       09E3  1410 38$:     MovW    #^O154, Hp$W_Vector(R2) ; Set vector of fst UDA
          36 A2    05    90       09E9  1411          MovB    #5, Hp$B_UDA50_Br(R2)    ; save BR level
          37 A2    02    90       09ED  1412          MovB    #2, Hp$B_UDA50_Burst(R2); Assume default burst rate                 [07]
        0000'CF    62    FA       09F1  1413          CallG   (R2), W^Ins$Ptable       ; add this Ptable to list
                03 50    E8       09F6  1414          BlbS    R0, 50$                  ; branch if OK
                                  09F9  1415 40$:
                FA59    31       09F9  1416          BrW     Con_Release_X            ; release buffer and exit
                                  09FC  1417 50$:
          F4 AD    52    D0       09FC  1418          MovL    R2, L_Link(Fp)           ; save link of UDA50/LESI
             51    32    3C       0A00  1419 51$:     MovZWL  #RA80$K_Len, R1          ; length of RA80/81/60,RC25,RCF25,          [09]
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                                0A03  1420                                    ; RD53,RD52,RX50, TK50,NI Ptable        [26]
                                0A03  1421                                                                      ;G:12
                                0A03  1422                                                                      ;G:12
                    FC0C   30   0A03  1423          BsbW    Allocate_Ptable ; allocate Ptable                       [07]
                  03 50    E8   0A06  1424          BlbS    R0, 52$         ; continue if no error                  [10]
                   FF73    31   0A09  1425          BRW     10$             ; exit if error                         [10]
            08 A2    51    B0   0A0C  1426 52$:     MovW    R1, Hp$W_Size(R2)       ; set size
               62    05    D0   0A10  1427          MovL    #5, Hp$Q_Device(R2)     ; set length of "_DUA0"
            50   0C A2    9E   0A13  1428          MovAB   Hp$T_Device(R2), R0     ; address of "_DUA0"
            04 A2    50    D0   0A17  1429          MovL    R0, Hp$Q_Device+4(R2)   ; set into descriptor
      60   4155445F 8F    D0   0A1B  1430          MovL    #^A"_DUA", (R0)         ; set first part of name,DEFAULT        [10]
            23   10 AC    D1   0A22  1431          CMPL    16(AP),#BTD$K_AIE_TK50  ; Is it MAYA ?                  [43]
                    07    12   0A26  1432          bneq    53$                     ; Branch if not                 [43]
      60   41554D5F 8F    D0   0A28  1433          MovL    #^A"_MUA", (R0)         ; set first part of name,DEFAULT        [43]
   53   59   0A    16    EF   0A2F  1434 53$:     ExtZV   #22, #10, R9, R3        ; Get preferred name                    ;G:9
                    16    13   0A34  1435          BEql    55$                     ; Branch if null
   54   53   05    00    EF   0A36  1436          ExtZV   #0, #5, R3, R4          ; Get second character
   53   53   05    05    EF   0A3B  1437          ExtZV   #5, #5, R3, R3          ; Get first character
01 A0   53   40 8F    81   0A40  1438          AddB3   #<^A"A"-1>, R3, 1(R0)   ; Replace first character
02 A0   54   40 8F    81   0A46  1439          AddB3   #<^A"A"-1>, R4, 2(R0)   ; .. and second as well
            53   F4 AD    D0   0A4C  1440 55$:     MOVL    L_LINK(FP),R3           ; Fetch address of link ptable          [31]
         03 A0   0F A3    90   0A50  1441          MOVB    HP$T_DEVICE+3(R3),3(R0) ; Inherit controller letter            [31]
               50    04    C0   0A55  1442          AddL2   #4, R0                  ; Increment pointer
            53   0C AC    D0   0A58  1443          MOVL    12(AP),R3               ; Get drive #                           [20]
                          0A5C  1444                                                                    ;G:13
   00000000'EF    00    90   0A5C  1445          MOVB    #0,DEVICE_UNIT_FLAG     ; Clea unit number flag                 ;G:14
                  54    D4   0A63  1446          CLRL    R4                      ; Clear High order field                ;G:13
54   53   53   00002710 8F    7B   0A65  1447          EDIV    #10000,R3,R3,R4         ; Set first digit                       ;G:13
                  0D    13   0A6E  1448          BEQL    90$                     ; Branch if less than 5 digits          ;G:13
            80   53    30   0A70  1449          ADDB3   #^A"0",R3,(R0)+         ; Set first ascii digit                 ;G:13
                  62    D6   0A74  1450          INCL    HP$Q_DEVICE(R2)         ; Increase length of string             ;G:13
   00000000'EF    01    88   0A76  1451          BISB2   #1,DEVICE_UNIT_FLAG     ; Non-zero digit has been found         ;G:14
                          0A7D  1452                                                                    ;G:13
         03E8 8F    54    B1   0A7D  1453 90$:     CMPW    R4,#1000                ; Digit equal to zero?                  ;G:14
                  1C    1F   0A82  1454          BLSSU   95$                     ; Branch if yes                         ;G:14
                  55    D4   0A84  1455          CLRL    R5                      ; Clear high order field                ;G:14
54   53   54   000003E8 8F    7B   0A86  1456          EDIV    #1000,R4,R3,R4          ; Get next digit                        ;G:13
                  1B    13   0A8F  1457          BEQL    100$                    ; Branch if less than 4 digits          ;G:13
            80   53    30   0A91  1458          ADDB3   #^A"0",R3,(R0)+         ; Set next ascii digit                  ;G:13
                  62    D6   0A95  1459          INCL    HP$Q_DEVICE(R2)         ; Increase length of string             ;G:13
   00000000'EF    01    88   0A97  1460          BISB2   #1,DEVICE_UNIT_FLAG     ; Non-zero digit has been found         ;G:14
                  0C    11   0A9E  1461          BRB     100$                    ; Continue                              ;G:14
      05 00000000'EF    E9   0AA0  1462 95$:     BLBC    DEVICE_UNIT_FLAG,100$   ; Non zero digit hasn't been found      ;G:14
               80   30    90   0AA7  1463          MOVB    #^A"0",(R0)+            ; Set Ascii Digit                       ;G:14
                  62    D6   0AAA  1464          INCL    HP$Q_DEVICE(R2)         ; Increase length of string             ;G:14
            64 8F    54    91   0AAC  1465 100$:    CMPB    R4,#100                 ; Digit equal to zero?                  ;G:14
                  1C    1F   0AB0  1466          BLSSU   110$                    ; Branch if yes                         ;G:14
                  55    D4   0AB2  1467          CLRL    R5                      ; Clear high order field                [20]
54   53   54   00000064 8F    7B   0AB4  1468          EDIV    #100,R4,R3,R4           ; Set first digit                       [20]
                  1B    13   0ABD  1469          BEQL    120$                    ; Branch if number is <100              [20]
            80   53    30   0ABF  1470          ADDB3   #^A"0",R3,(R0)+         ; Set first ascii digit                 [20]
                  62    D6   0AC3  1471          INCL    HP$Q_DEVICE(R2)         ; Increase length of string             [20]
   00000000'EF    01    88   0AC5  1472          BISB2   #1,DEVICE_UNIT_FLAG     ; Non-zero digit has been found         ;G:14
                  0C    11   0ACC  1473          BRB     120$                    ; Continue                              ;G:14
      05 00000000'EF    E9   0ACE  1474 110$:    BLBC    DEVICE_UNIT_FLAG,120$   ; Non zero digit hasn't been found      ;G:14
               80   30    90   0AD5  1475          MOVB    #^A"0",(R0)+            ; Set Ascii Digit                       ;G:14
                  62    D6   0AD8  1476          INCL    HP$Q_DEVICE(R2)         ; Increase length of string             ;G:14
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                 0A    0C AC    91   0ADA  1477 120$:   CMPB    12(AP),#10                ; Is it >=10    ?                    [20]
                             16   1F   0ADE  1478         BLSSU   125$                      ; Branch if not.                     [20]
                             55   D4   0AE0  1479         CLRL    R5                        ; Clear high order field             [20]
              54    53    54    0A   7B   0AE2  1480         EDIV    #10,R4,R3,R4              ; Get next digit                     [20]
                    80    53    30   81   0AE7  1481         ADDB3   #^A"0",R3,(R0)+           ; Set this ascii digit               [20]
                             62   D6   0AEB  1482         INCL    HP$Q_DEVICE(R2)           ; Increase length of string          [20]
           00000000'EF     01   88   0AED  1483         BISB2   #1,DEVICE_UNIT_FLAG       ; Non-zero digit has been found      ;G:14
                             0C   11   0AF4  1484         BRB     130$                      ; Continue                           ;G:14
              05 00000000'EF     E9   0AF6  1485 125$:    BLBC    DEVICE_UNIT_FLAG,130$     ; Non zero digit hasn't been found   ;G:14
                          80    30   90   0AFD  1486         MOVB    #^A"0",(R0)+              ; Set digit                          ;G:14
                             62   D6   0B00  1487         INCL    HP$Q_DEVICE(R2)           ; Increase length of string          [20]
                    60    54    30   81   0B02  1488 130$:   ADDB3   #^A"0",R4,(R0)          ; Set last digit                     [20]
                 14 AB    0C AC    B0   0B06  1489         MOVW    12(AP),HPE$W_EXT_DRIVE(R11) ; Put the drive # in EPB          ;G:12
        000000FF'EF    0C AC    B1   0B0B  1490         CMPW    12(AP),^XFF                                                    ;G:12
                             05   14   0B13  1491         BGTR    131$                                                           ;G:12
                 0B A2    0C AC    90   0B15  1492         MOVB    12(AP),HP$B_DRIVE(R2)     ; Set drive number                   [20]
                          18 A2    D4   0B1A  1493 131$:    ClrL    Hp$A_Device(R2)           ; no address                         ;G:12
                          1C A2    D4   0B1D  1494         ClrL    Hp$A_Dva(R2)              ; no pass-thru address
                 20 A2    F4 AD    D0   0B20  1495         MovL    L_Link(Fp), -             ;                                    ;G:12
                                        0B25  1496                  Hp$A_Link(R2)          ; set link address to UDA50/LESI/KDB50 [25]
                    23    10 AC    D1   0B25  1497         CMPL    16(AP),#BTD$K_AIE_TK50    ; Is it MAYA ?                       [43]
                             14   12   0B29  1498         bneq    135$                      ; Branch if not                      [43]
                             59   D5   0B2B  1499         TSTL    R9                        ; Did a response come back ?         [43]
                             10   12   0B2D  1500         BNEQ    135$                      ; Branch if YES                      [43]
                  26 A2   5404 8F   B0   0B2F  1501         MOVW    #4!<^A"T"a8>, -           ; Set length and 'T'.  DEFAULT       [43]
                                        0B35  1502                  HP$T_TYPE(R2)          ; of TK50                            [43]
           28 A2   2030354B 8F   D0   0B35  1503         MOVL    #^A"K50 ", -              ; and set                            [43]
                                        0B3D  1504                  HP$T_TYPE+2(R2)        ; rest of type field                 [43]
                             3C   11   0B3D  1505         BRB     70$                       ; EXIT                               [43]
                    50    26 A2    9E   0B3F  1506 135$:   MovAB   Hp$T_Type(R2), R0        ; set address of type field          ;G:9
                             50   D6   0B43  1507         IncL    R0                        ; Skip count byte
                          51    50   D0   0B45  1508         MovL    R0, R1                    ; Copy start of length
                          53    11   D0   0B48  1509         MovL    #17, R3                   ; Bit of first character
              54    59    05    53   EF   0B4B  1510 60$:    ExtZV   R3, #5, R9, R4            ; Get next character
                             0F   13   0B50  1511         BEql    65$                       ; Exit if null
                 80    54    40 8F   81   0B52  1512         AddB3   #<^A"A"-1>, R4, (R0)+     ; Otherwise, store it
        FFEA 53   FFFFFFFB 8F   06   F1   0B57  1513         AcbL    #6, #-5, R3, 60$          ; Loop through characters
              53    59    07    00   EF   0B61  1514 65$:    ExtZV   #0, #7, R9, R3            ; Get number
                             54   D4   0B66  1515         ClrL    R4                        ; Clear high order
              54    53    53    0A   7B   0B68  1516         EDiv    #10, R3, R3, R4           ; Divide by 10
                    80    53    30   81   0B6D  1517         AddB3   #^A"0", R3, (R0)+         ; First digit
                    80    54    30   81   0B71  1518         AddB3   #^A"0", R4, (R0)+         ; Second digit
                          50    51   C2   0B75  1519         SubL2   R1, R0                    ; Get length
                          71    50   90   0B78  1520         MovB    R0, -(R1)                 ; Store byte length
                                        0B7B  1521
                                        0B7B  1522 ;
                                        0B7B  1523 ; Insert Ptable, return
                                        0B7B  1524 ;
                                        0B7B  1525
                       FA63   31   0B7B  1526 70$:    BrW     Con_Normal_X              ; set load device, exit OK
                                        0B7E  1527                                    ;                                    -  [07]
                                        0B7E  1528
                                        0B7E  1529         .END
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```
$ER                             = 00000004     D
$MODULE                           00000000 R   D   02
ALLOCATE_PTABLE                   00000612 R   D   04
BD_INIT                           ********W G      00
BOOT$L_ADP                        ********    X    00
BOOT$L_CSR                        ********    X    00
BOOT$L_DEVTYP                     ********    X    00
BOOT$L_R1                         ********    X    00
BOOT$L_R2                         ********    X    00
BOOT$L_UNIT                       ********    X    00
BTD$K_AIE_NI                    = 00000062     D
BTD$K_AIE_TK50                  = 00000023     D
BTD$K_BDA                       = 00000021     D
BTD$K_BVPSSP                    = 00000022     D
BTD$K_HSCCI                     = 00000020     D
BTD$K_UDA                       = 00000011     D
CHC$_ABORT                      = 00000002     D
CHC$_CLEAR                      = 00000006     D
CHC$_CLRDFT                     = 00000009     D
CHC$_DSINT                      = 00000005     D
CHC$_ENINT                      = 00000004     D
CHC$_INITA                      = 00000000     D
CHC$_INITB                      = 00000001     D
CHC$_PURGE                      = 00000003     D
CHC$_SELF_TEST                  = 0000000B     D
CHC$_SETDFT                     = 00000008     D
CHC$_STATUS                     = 00000007     D
CHC$_STOP                       = 0000000A     D
CHI$M_CHNINT                    = 00000001     D
CHI$M_DEVINT                    = 00000002     D
CHI$M_IPL                       = 0000007C     D
CHI$S_IPL                       = 00000005     D
CHI$V_CHNINT                    = 00000000     D
CHI$V_DEVINT                    = 00000001     D
CHI$V_IPL                       = 00000002     D
CI$B_BI_ID                        00000032     D
CI$B_BR                           00000033     D
CI$B_NODE                         00000034     D
CI$B_TR                           00000032     D
CI$K_LEN                          00000041     D
CI$L_FUNC                         00000035     D
CI$L_INDEX                        0000003D     D
CI$L_MAINT_ID                     00000039     D
CLI$K_BUFSIZ                    = 00000100     D
CLI$K_SIZE                        0000044C     D
CLI$L_ADDRESS                     00000018     D
CLI$L_COMMAND                     00000004     D
CLI$L_DATA                        0000001C     D
CLI$L_FLAGS                       00000000     D
CLI$L_FLAGS2                      00000444     D
CLI$L_LAST                        00000024     D
CLI$L_NEXT                        00000030     D
CLI$L_PASS                        0000002C     D
CLI$L_SUBT                        00000028     D
CLI$L_TEMP_BASE                   00000448     D
CLI$L_TEST                        00000020     D
CLI$M_START_OR_RUN              = 00000008     D
CLI$Q_BUFQWD                      00000034     D
CLI$Q_FILE                        00000008     D
CLI$Q_SECTION                     00000010     D
CLI$Q_TIME                        0000043C     D
CLI$T_BUFFER                      0000003C     D
CLI$V_ADAPTER                   = 00000018     D
CLI$V_ADR                       = 0000000B     D
CLI$V_ASCII                     = 00000013     D
CLI$V_BASE_QUAL                 = 00000002     D
CLI$V_BREAK                     = 0000000A     D
CLI$V_BRIEF                     = 0000001B     D
CLI$V_BYTE                      = 0000000D     D
CLI$V_CLEAR                     = 00000002     D
CLI$V_DEC                       = 00000010     D
CLI$V_DEFAULT                   = 0000000C     D
CLI$V_DEPOSIT                   = 00000019     D
CLI$V_EVENT                     = 00000008     D
CLI$V_EXAM                      = 00000005     D
CLI$V_FLAGS                     = 00000009     D
CLI$V_HEX                       = 00000012     D
CLI$V_KERNEL                    = 00000017     D
CLI$V_LOAD                      = 00000006     D
CLI$V_LONG                      = 0000000F     D
CLI$V_NEXT                      = 00000001     D
CLI$V_NOALLOC                   = 00000000     D
CLI$V_NOTNUF                    = 00000001     D
CLI$V_OCT                       = 00000011     D
CLI$V_PREG                      = 0000001A     D
CLI$V_QA                        = 00000007     D
CLI$V_QACKLOOPLOOPS             = 0000001C     D
CLI$V_QAERRORPRINTS             = 0000001B     D
CLI$V_QAMULTIPLEPASS            = 0000001F     D
CLI$V_QASUBTESTLOOPS            = 0000001E     D
CLI$V_QATESTLOOPS               = 0000001D     D
CLI$V_REG                       = 00000014     D
CLI$V_REQUIRED                  = 00000000     D
CLI$V_RUN                       = 00000015     D
CLI$V_SET                       = 00000003     D
CLI$V_SHOW                      = 00000004     D
CLI$V_START_OR_RUN              = 00000003     D
CLI$V_VALSEC                    = 00000016     D
CLI$V_WORD                      = 0000000E     D
COMMON_INTERRUPT                  00000645 R   D   04
CONSOLE_CODE                    = 00000040     D
CON_CI_HSCCI                      000000AE R   D   04
CON_ERROR_X                       0000045B R   D   04
CON_MBA                           000003C4 R   D   04
CON_NORMAL_X                      000005E1 R   D   04
CON_RELEASE_X                     00000455 R   D   04
CON_UBA                           00000463 R   D   04
CON_UBA_RB                        00000780 R   D   04
CON_UBA_RK                        000004F1 R   D   04
CON_UBA_RL                        00000657 R   D   04
CON_UBA_UDA                       00000884 R   D   04
CON_X                             00000462 R   D   04
DEVICE_UNIT_FLAG                  00000000 R   D   03
DIR...                          = FFFFFFFF     D
```

```
DISK$K_LEN                    00000032    D
DS$CHANNEL                    ********   X   00
DS$GA_SELECTED                ********   X   00
DS$GL_CLIBASE                 ********   X   00
DS$K_ERROR                  = 00000002    D
DS$K_NORMAL                 = 00000001    D
DS$K_SEVERE                 = 00000004    D
DS$K_SUBSYS                 = 00000066    D
DS$K_WARNING                = 00000000    D
DS$WAITUS                     ********   X   00
DS$_AP_NORMAL_BREAK         = 00660150    D
DS$_ARITH                   = 006600D0    D
DS$_ASBE                    = 00660118    D
DS$_BADLINK                 = 006600F0    D
DS$_BADTYPE                 = 006600E8    D
DS$_BIIC                    = 00660120    D
DS$_CHME                    = 006600A8    D
DS$_CHMK                    = 006600E0    D
DS$_DEVNAME                 = 00660108    D
DS$_ERROR                   = 00660002    D
DS$_FHWE                    = 00660068    D
DS$_FRAGBUF                 = 00660080    D
DS$_ICBUSY                  = 006600C8    D
DS$_ICERR                   = 006600C0    D
DS$_IHWE                    = 00660060    D
DS$_ILLCHAR                 = 00660018    D
DS$_ILLPAGCNT               = 00660078    D
DS$_ILLUNIT                 = 00660100    D
DS$_INIT_FAIL               = 00660140    D
DS$_INSFMEM                 = 00660050    D
DS$_INVCPU                  = 00660130    D
DS$_IPL2HI                  = 006600B8    D
DS$_IVADDR                  = 00660040    D
DS$_IVVECT                  = 00660038    D
DS$_KRNLSTK                 = 00660090    D
DS$_LOGIC                   = 00660070    D
DS$_MCHK                    = 00660088    D
DS$_MEM_ALLOC_ERR           = 00660138    D
DS$_MMOFF                   = 00660058    D
DS$_NEEDUNIT                = 006600F8    D
DS$_NODE                    = 00660128    D
DS$_NOPCS                   = 00660110    D
DS$_NORMAL                  = 00660001    D
DS$_NOSUPPORT               = 006600B1    D
DS$_NOTALLOWMP              = 00660148    D
DS$_NOTDON                  = 00660030    D
DS$_NOTIMP                  = 006600B0    D
DS$_NULLSTR                 = 00660010    D
DS$_OVERFLOW                = 00660008    D
DS$_POWER                   = 00660098    D
DS$_PROGERR                 = 00660020    D
DS$_SEVERE                  = 00660004    D
DS$_TRANSL                  = 006600A0    D
DS$_TRUNCATE                = 00660028    D
DS$_UNEXPINT                = 006600D8    D
DS$_UNSUPPDEV               = 00660158    D
DS$_VASFULL                 = 00660048    D
DS$_WARNING                 = 00660000    D
DSA$AL_APTMAIL                0000FE00    D
DSA$AT_APTTXT                 0000FA00    D
DSA$GL_APTCOM                 0000FE04    D
DSA$GL_DEVLEN                 0000FE58    D
DSA$GL_ERRNO                  0000FE44    D
DSA$GL_EVENT                  0000FE48    D
DSA$GL_FLAGS                  0000FE00    D
DSA$GL_MSGTYP                 0000FE40    D
DSA$GL_PASSES                 0000FE08    D
DSA$GL_PASSNO                 0000FE54    D
DSA$GL_SECTNO                 0000FE10    D
DSA$GL_SID                    0000FE14    D
DSA$GL_SUBTNO                 0000FE4C    D
DSA$GL_TESTNO                 0000FE50    D
DSA$GL_UNITS                  0000FE0C    D
DSA$GQ_MSGPTR                 0000FE68    D
DSA$GT_DEVNAM                 0000FE5C    D
DSP$CONFIG_ADP                ********   X   00
DSP$CONFIG_LOAD               00000041 RG D  04
DSR$ALLOCATE_PSEUDO_RPB       ********   X   00
DSR$DEALLOCATE_PSEUDO_RPB     ********   X   00
DSR$ONLY_CONSOLE_CONFIG       ********   X   00
DSV$SETLOAD                   ********   X   00
DS_ERRSUP                     ********   X   00
DT_RM03                     = 00000015    D
DT_RM05                     = 00000017    D
DT_RM80                     = 00000016    D
DT_RP04                     = 00000010    D
DT_RP05                     = 00000011    D
DT_RP06                     = 00000012    D
DT_RP07                     = 00000022    D
DT_RP07_HPT                 = 00000021    D
ET$INIT                       ********W G    00
EXE$ALONONPAGED               ********   X   00
EXE$DEANONPAGED               ********   X   00
EXE$GB_CPUTYPE                ********   X   00
F_DRVCLR                    = 00000004    D
F_GETSTATUS                 = 00000004    D
F_NOP                       = 00000000    D
F_STAT                      = 00000004    D
HP$A_DEPENDENT                00000032    D
HP$A_DEVICE                   00000018    D
HP$A_DVA                      0000001C    D
HP$A_LINK                     00000020    D
HP$B_CI_BR                    00000033    D
HP$B_CI_NODE                  00000034    D
HP$B_CI_TR                    00000032    D
HP$B_DRIVE                    0000000B    D
HP$B_FLAGS                    0000000A    D
HP$B_RB730_BR                 00000036    D
HP$B_RK611_BR                 00000036    D
HP$B_RL11_BR                  00000036    D
HP$B_UDA50_BR                 00000036    D
HP$B_UDA50_BURST              00000037    D
HP$C_NAMELEN                = 00000014  G D
HP$K_CI_LEN                   00000041    D
```

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HP$K_DISK_LEN                   00000032    D
HP$K_RA80_LEN                   00000032    D
HP$K_RA90_LEN                   00000032    D
HP$K_RB730_LEN                  00000037    D
HP$K_RK06_LEN                   00000032    D
HP$K_RK611_LEN                  00000037    D
HP$K_RL01_LEN                   00000032    D
HP$K_RL02_LEN                   00000032    D
HP$K_RL11_LEN                   00000037    D
HP$K_RP04_LEN                   00000032    D
HP$K_UDA50_LEN                  00000038    D
HP$L_CI_FUNC                    00000035    D
HP$L_CI_INDEX                   0000003D    D
HP$L_CI_MAINT_ID                00000039    D
HP$L_RB730_CSR                  00000032    D
HP$L_RK611_CSR                  00000032    D
HP$L_RL11_CSR                   00000032    D
HP$L_UDA50_UDAIP                00000032    D
HP$M_NAME                     = 00000004    D
HP$Q_DEVICE                     00000000    D
HP$T_DEVICE                     0000000C    D
HP$T_TYPE                       00000026    D
HP$W_SIZE                       00000008    D
HP$W_VECTOR                     00000024    D
HPE$A_EPB                       00000016    D
HPE$C_EPB_SIZE                  ********  X   00
HPE$T_DEVICE                    00000000    D
HPE$W_EXT_DRIVE                 00000014    D
HSC50_BOOT                      0000009F RG D  02
INI$LOAD_DEVICE                 00000000 RG D  04
INS$PTABLE                      ********  X   00
IOC$K_IOSPACE                   ********  X   00
KDB50_RESPONSE                  ********W G    00
K_TYPES                       = 00000013    D
L_LINK                          FFFFFFF4    D
L_LOCAL                         FFFFFFF0    D
L_STATUS                        FFFFFFF8    D
L_TYPE                          FFFFFFF0    D
MSCP$L_MEDIA_ID               = 0000001C    D
NI$GN_RPB_BUFFER                ********W G    00
PA_INIT                         ********W G    00
PB$INIT                         ********W G    00
R80$K_LEN                       00000032    D
RA80$K_LEN                      00000032    D
RA90$K_LEN                      00000032    D
RB730$B_BR                      00000036    D
RB730$K_LEN                     00000037    D
RB730$L_CSR                     00000032    D
RB730_INTERRUPT                 00000767 R  D  04
RB_BA                           00000004    D
RB_BC                           00000008    D
RB_CS                           00000000    D
RB_CS_M_IE                    = 00000040    D
RB_CS_V_TYP                   = 0000001A    D
RB_DA                           0000000C    D
RB_MP                           00000010    D
RB_MP_M_MRK                   = 00000001    D
RB_MP_M_RST                   = 00000008    D
RB_MP_M_STS                   = 00000002    D
RK06$K_LEN                      00000032    D
RK611$B_BR                      00000036    D
RK611$K_LEN                     00000037    D
RK611$L_CSR                     00000032    D
RK_CS1                        = 00000000    D
RK_CS1_M_CERR                 = 00008000    D
RK_CS1_M_IE                   = 00000040    D
RK_CS1_M_RDY                  = 00000080    D
RK_CS2                        = 00000008    D
RK_DS                         = 0000000A    D
RK_DS_V_DDT                   = 00000008    D
RL01$K_LEN                      00000032    D
RL02$K_LEN                      00000032    D
RL11$B_BR                       00000036    D
RL11$K_LEN                      00000037    D
RL11$L_CSR                      00000032    D
RL_CS                         = 00000000    D
RL_CS_M_CRDY                  = 00000080    D
RL_CS_M_IE                    = 00000040    D
RL_DA                         = 00000004    D
RL_DA_M_MRK                   = 00000001    D
RL_DA_M_RST                   = 00000008    D
RL_DA_M_STS                   = 00000002    D
RL_MP                         = 00000006    D
RL_MP_V_TYP                   = 00000007    D
RP04$K_LEN                      00000032    D
RP_CS1                        = 00000000    D
RP_DT                         = 00000018    D
RP_DT_S_DTN                   = 00000009    D
RP_DT_V_DTN                   = 00000000    D
SAVABS...                     = FFFFFFF0    D
SCB_BASE                        ********  X   00
SCB_IMAGE                       ********  X   00
SIZ...                        = 00000002    D
SS$_NORMAL                    = 00000001    D
SYS$UNWIND                      ********  X   00
T_TYPES                         00000007 R  D  02
UDA50$B_BR                      00000036    D
UDA50$B_BURST                   00000037    D
UDA50$K_LEN                     00000038    D
UDA50$L_UDAIP                   00000032    D
UDA_RESPONSE                    ********W G    00
UD_INIT                         ********W G    00
```

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                                  +-----------------+
                                  ! Psect synopsis !
                                  +-----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           FFFFFFF8  (    0.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
DATA                            000000A0  (  160.)  02 (  2.)  NOPIC   USR   CON   REL   LCL   SHR NOEXE   RD  NOWRT NOVEC LONG
WORK                            00000001  (    1.)  03 (  3.)  NOPIC   USR   CON   REL   LCL NOSHR NOEXE   RD    WRT NOVEC LONG
CODE                            00000B7E  ( 2942.)  04 (  4.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD  NOWRT NOVEC LONG
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$ER	=00000004	1319 (10)	#-1319 (10) #-571 (5) #-824 (7)
$MODULE	00000000-R	417 (2)	1319 (10) 571 (5) 824 (7)
ALLOCATE_PTABLE	00000612-R	1005 (9)	#-1062 (10) #-1097 (10) #-1173 (10) #-1219 (10)
			#-1347 (10) #-1423 (10) #-612 (6) #-690 (6)
			#-811 (7) #-918 (9) #-953 (9)
BD_INIT	00000000-XR		1313 (10) 412 (2)
BIT...	=00000010	267 (2)	263 (2) 266 (2) 267 (2)
BOOT$L_ADP	00000000-XR		408 (2) #-480 (3)
BOOT$L_CSR	00000000-XR		408 (2) #-488 (3)
BOOT$L_DEVTYP	00000000-XR		408 (2) #-482 (3) #-486 (3)
BOOT$L_R1	00000000-XR		408 (2) #-484 (3)
BOOT$L_R2	00000000-XR		408 (2) #-485 (3)
BOOT$L_UNIT	00000000-XR		408 (2) #-487 (3)
BTD$K_AIE_NI	=00000062		#-1272 (10) #-1306 (10) #-1332 (10) #-558 (5)
			#-860 (8)
BTD$K_AIE_TK50	=00000023		#-1268 (10) #-1301 (10) #-1330 (10) #-1431 (10)
			#-1497 (10) #-556 (5) #-856 (8)
BTD$K_BDA	=00000021		#-1311 (10) #-1336 (10) #-562 (5) #-888 (8)
BTD$K_BVPSSP	=00000022		#-1270 (10) #-1304 (10) #-1328 (10) #-554 (5)
			#-858 (8)
BTD$K_HSCCI	=00000020		#-566 (5)
BTD$K_UDA	=00000011		#-1298 (10) #-560 (5) #-886 (8)
CHC$_ABORT	=00000002	266 (2)	
CHC$_CLEAR	=00000006	266 (2)	#-878 (8)
CHC$_CLRDFT	=00000009	266 (2)	
CHC$_DSINT	=00000005	266 (2)	#-1022 (9) #-1052 (10) #-1133 (10) #-1163 (10)
			#-1274 (10) #-907 (9)
CHC$_ENINT	=00000004	266 (2)	#-881 (8)
CHC$_INITA	=00000000	266 (2)	#-871 (8)
CHC$_INITB	=00000001	266 (2)	#-875 (8)
CHC$_PURGE	=00000003	266 (2)	
CHC$_SELF_TEST	=0000000B	266 (2)	
CHC$_SETDFT	=00000008	266 (2)	
CHC$_STATUS	=00000007	266 (2)	
CHC$_STOP	=0000000A	266 (2)	
CHI$M_CHNINT	=00000001	267 (2)	
CHI$M_DEVINT	=00000002	267 (2)	
CHI$M_IPL	=0000007C	267 (2)	
CHI$S_IPL	=00000005	267 (2)	
CHI$V_CHNINT	=00000000	267 (2)	
CHI$V_DEVINT	=00000001	267 (2)	
CHI$V_IPL	=00000002	267 (2)	#-1085 (10) #-1207 (10) #-941 (9)
CLI$K_BUFSIZ	=00000100	234 (2)	234 (2)
CLI$K_SIZE	0000044C	234 (2)	
CLI$L_ADDRESS	00000018	234 (2)	
CLI$L_COMMAND	00000004	234 (2)	
CLI$L_DATA	0000001C	234 (2)	
CLI$L_FLAGS	00000000	234 (2)	
CLI$L_FLAGS2	00000444	234 (2)	
CLI$L_LAST	00000024	234 (2)	

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CLI$L_NEXT                      00000030     234     (2)
CLI$L_PASS                      0000002C     234     (2)
CLI$L_SUBT                      00000028     234     (2)
CLI$L_TEMP_BASE                 00000448     234     (2)
CLI$L_TEST                      00000020     234     (2)
CLI$M_START_OR_RUN             =00000008     234     (2)
CLI$Q_BUFQWD                    00000034     234     (2)
CLI$Q_FILE                      00000008     234     (2)    #-783    (6)    #-790    (6)    #-978    (9)    #-984    (9)
CLI$Q_SECTION                   00000010     234     (2)
CLI$Q_TIME                      0000043C     234     (2)
CLI$T_BUFFER                    0000003C     234     (2)
CLI$V_ADAPTER                  =00000018     234     (2)
CLI$V_ADR                      =0000000B     234     (2)
CLI$V_ASCII                    =00000013     234     (2)
CLI$V_BASE_QUAL                =00000002     234     (2)
CLI$V_BREAK                    =0000000A     234     (2)
CLI$V_BRIEF                    =0000001B     234     (2)
CLI$V_BYTE                     =0000000D     234     (2)
CLI$V_CLEAR                    =00000002     234     (2)
CLI$V_DEC                      =00000010     234     (2)
CLI$V_DEFAULT                  =0000000C     234     (2)
CLI$V_DEPOSIT                  =00000019     234     (2)
CLI$V_EVENT                    =00000008     234     (2)
CLI$V_EXAM                     =00000005     234     (2)
CLI$V_FLAGS                    =00000009     234     (2)
CLI$V_HEX                      =00000012     234     (2)
CLI$V_KERNEL                   =00000017     234     (2)
CLI$V_LOAD                     =00000006     234     (2)
CLI$V_LONG                     =0000000F     234     (2)
CLI$V_NEXT                     =00000001     234     (2)
CLI$V_NOALLOC                  =00000000     234     (2)
CLI$V_NOTNUF                   =00000001     234     (2)
CLI$V_OCT                      =00000011     234     (2)
CLI$V_PREG                     =0000001A     234     (2)
CLI$V_QA                       =00000007     234     (2)
CLI$V_QACKLOOPLOOPS            =0000001C     234     (2)
CLI$V_QAERRORPRINTS            =0000001B     234     (2)
CLI$V_QAMULTIPLEPASS           =0000001F     234     (2)
CLI$V_QASUBTESTLOOPS           =0000001E     234     (2)
CLI$V_QATESTLOOPS              =0000001D     234     (2)
CLI$V_REG                      =00000014     234     (2)
CLI$V_REQUIRED                 =00000000     234     (2)
CLI$V_RUN                      =00000015     234     (2)
CLI$V_SET                      =00000003     234     (2)
CLI$V_SHOW                     =00000004     234     (2)
CLI$V_START_OR_RUN             =00000003     234     (2)      234    (2)
CLI$V_VALSEC                   =00000016     234     (2)
CLI$V_WORD                     =0000000E     234     (2)
COMMON_INTERRUPT                00000645-R   1019    (9)      867    (8)
CONSOLE_CODE                   =00000040     304     (2)    #-482    (3)
CON_CI_HSCCI                    000000AE-R   576     (6)    #-568    (5)
CON_ERROR_X                     0000045B-R   847     (7)    #-1066   (10)   #-1178   (10)   #-1352   (10)   #-922    (9)
CON_MBA                         000003C4-R   796     (7)      570    (5)
CON_NORMAL_X                    000005E1-R   972     (9)    #-1116   (10)   #-1250   (10)   #-1526   (10)   #-842    (7)
CON_RELEASE_X                   00000455-R   844     (7)    #-1091   (10)   #-1213   (10)   #-1416   (10)   #-685    (6)
                                                            #-779    (6)    #-825    (7)    #-947    (9)
CON_UBA                         00000463-R   852     (8)    #-564    (5)      570    (5)
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CON_UBA_RB                      00000780-R   1140   (10)     892    (8)
CON_UBA_RK                      000004F1-R    896   (9)      892    (8)
CON_UBA_RL                      00000657-R   1029   (10)     892    (8)
CON_UBA_UDA                     00000884-R   1261   (10)   #-890    (8)
CON_X                           00000462-R    849   (7)    #-874    (8)     #-877    (8)     #-880    (8)     #-883    (8)
DEVICE_UNIT_FLAG                00000000-R    437   (2)    #-1445   (10)    #-1451   (10)    #-1460   (10)    #-1462   (10)
                                                           #-1472   (10)    #-1474   (10)    #-1483   (10)    #-1485   (10)
                                                           #-627    (6)     #-632    (6)     #-641    (6)     #-643    (6)
                                                           #-653    (6)     #-655    (6)     #-664    (6)     #-667    (6)
                                                           #-716    (6)     #-726    (6)     #-735    (6)     #-737    (6)
                                                           #-748    (6)     #-751    (6)     #-762    (6)     #-764    (6)
DIR...                          =FFFFFFFF     543   (4)      543    (4)
DS$CHANNEL                       00000000-XR                1024   (9)       1135   (10)      398   (2)       865   (8)
DS$GA_SELECTED                   00000000-XR                401    (2)     #-863    (8)
DS$GL_CLIBASE                    00000000-XR                401    (2)       781    (6)      976   (9)
DS$K_ERROR                      =00000002     263   (2)
DS$K_NORMAL                     =00000001     263   (2)
DS$K_SEVERE                     =00000004     263   (2)
DS$K_SUBSYS                     =00000066     263   (2)      263    (2)
DS$K_WARNING                    =00000000     263   (2)
DS$WAITUS                        00000000-XR                1041   (10)      1049   (10)     1160   (10)      398   (2)
                                                           904    (9)
DS$_AP_NORMAL_BREAK             =00660150     263   (2)
DS$_ARITH                       =006600D0     263   (2)
DS$_ASBE                        =00660118     263   (2)
DS$_BADLINK                     =006600F0     263   (2)
DS$_BADTYPE                     =006600E8     263   (2)
DS$_BIIC                        =00660120     263   (2)
DS$_CHME                        =006600A8     263   (2)
DS$_CHMK                        =006600E0     263   (2)
DS$_DEVNAME                     =00660108     263   (2)
DS$_ERROR                       =00660002     263   (2)    #-572    (5)     #-848    (7)
DS$_FHWE                        =00660068     263   (2)
DS$_FRAGBUF                     =00660080     263   (2)
DS$_ICBUSY                      =006600C8     263   (2)
DS$_ICERR                       =006600C0     263   (2)
DS$_IHWE                        =00660060     263   (2)
DS$_ILLCHAR                     =00660018     263   (2)
DS$_ILLPAGCNT                   =00660078     263   (2)
DS$_ILLUNIT                     =00660100     263   (2)
DS$_INIT_FAIL                   =00660140     263   (2)
DS$_INSFMEM                     =00660050     263   (2)
DS$_INVCPU                      =00660130     263   (2)
DS$_IPL2HI                      =006600B8     263   (2)
DS$_IVADDR                      =00660040     263   (2)
DS$_IVVECT                      =00660038     263   (2)
DS$_KRNLSTK                     =00660090     263   (2)
DS$_LOGIC                       =00660070     263   (2)
DS$_MCHK                        =00660088     263   (2)
DS$_MEM_ALLOC_ERR               =00660138     263   (2)
DS$_MMOFF                       =00660058     263   (2)
DS$_NEEDUNIT                    =006600F8     263   (2)
DS$_NODE                        =00660128     263   (2)
DS$_NOPCS                       =00660110     263   (2)
DS$_NORMAL                      =00660001     263   (2)
DS$_NOSUPPORT                   =006600B1     263   (2)
DS$_NOTALLOWMP                  =00660148     263   (2)
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DS$_NOTDON                      =00660030     263    (2)
DS$_NOTIMP                      =006600B0     263    (2)      263    (2)
DS$_NULLSTR                     =00660010     263    (2)
DS$_OVERFLOW                    =00660008     263    (2)
DS$_POWER                       =00660098     263    (2)
DS$_PROGERR                     =00660020     263    (2)
DS$_SEVERE                      =00660004     263    (2)
DS$_TRANSL                      =006600A0     263    (2)
DS$_TRUNCATE                    =00660028     263    (2)
DS$_UNEXPINT                    =006600D8     263    (2)
DS$_UNSUPPDEV                   =00660158     263    (2)
DS$_VASFULL                     =00660048     263    (2)
DS$_WARNING                     =00660000     263    (2)      263    (2)
DSA$GL_UNITS                     0000FE0C                     #-862    (8)
DSP$CONFIG_ADP                   00000000-XR                   398    (2)      552    (5)
DSP$CONFIG_LOAD                  00000041-R    546    (5)      490    (3)
DSR$ALLOCATE_PSEUDO_RPB          00000000-XR                  1290    (10)     406    (2)      590    (6)
DSR$DEALLOCATE_PSEUDO_RPB        00000000-XR                  1325    (10)     407    (2)      600    (6)      604    (6)
DSR$ONLY_CONSOLE_CONFIG          00000000-XR                   402    (2)      478    (3)
DSV$SETLOAD                      00000000-XR                   399    (2)    #-791    (6)    #-985    (9)
DS_ERRSUP                        00000000-XR                  1319    (10)     398    (2)      571    (5)      824    (7)
DT_RM03                         =00000015     300    (2)
DT_RM05                         =00000017     302    (2)
DT_RM80                         =00000016     301    (2)
DT_RP04                         =00000010     295    (2)    #-818    (7)
DT_RP05                         =00000011     296    (2)
DT_RP06                         =00000012     297    (2)
DT_RP07                         =00000022     299    (2)
DT_RP07_HPT                     =00000021     298    (2)
ET$INIT                          00000000-XR                  1309    (10)     413    (2)
EXE$ALONONPAGED                  00000000-XR                  1008    (9)      397    (2)
EXE$DEANONPAGED                  00000000-XR                   397    (2)    #-846    (7)
EXE$GB_CPUTYPE                   00000000-XR                   397    (2)
F_DRVCLR                        =00000004     276    (2)    #-902    (9)
F_GETSTATUS                     =00000004     391    (2)    #-1157   (10)
F_NOP                           =00000000     291    (2)    #-802    (7)
F_STAT                          =00000004     288    (2)    #-1038   (10)
HP$A_DEVICE                      00000018                    #-1074   (10)     1079   (10)    #-1110   (10)    #-1197   (10)
                                                             #-1231   (10)    #-1287   (10)    #-1387   (10)    #-1493   (10)
                                                             #-587    (6)     #-675    (6)     #-676    (6)     #-839    (7)
                                                             #-930    (9)      935     (9)     #-966    (9)
HP$A_DVA                         0000001C                    #-1075   (10)    #-1111   (10)    #-1198   (10)    #-1232   (10)
                                                             #-1390   (10)    #-1494   (10)    #-676    (6)     #-776    (6)
                                                             #-840    (7)     #-931    (9)     #-967    (9)
HP$A_LINK                        00000020                    #-1076   (10)    #-1112   (10)    #-1200   (10)    #-1234   (10)
                                                             #-1392   (10)    #-1496   (10)    #-677    (6)     #-777    (6)
                                                             #-841    (7)     #-932    (9)     #-968    (9)
HP$B_CI_NODE                     00000034                    #-681    (6)
HP$B_DRIVE                       0000000B                    #-1109   (10)    #-1230   (10)    #-1492   (10)    #-674    (6)
                                                             #-775    (6)     #-838    (7)     #-965    (9)
HP$B_FLAGS                       0000000A                    #-697    (6)
HP$B_UDA50_BR                    00000036                    #-1411   (10)
HP$B_UDA50_BURST                 00000037                    #-1412   (10)
HP$C_NAMELEN                    =00000014     303    (2)    #-686    (6)    #-699    (6)
HP$K_CI_LEN                      00000041                    #-608    (6)
HP$K_DISK_LEN                    00000032                    #-686    (6)
HP$K_UDA50_LEN                   00000038                    #-1344   (10)
```

HP$L_CI_FUNC	00000035			#-680	(6)					
HP$L_CI_INDEX	0000003D			#-678	(6)					
HP$L_CI_MAINT_ID	00000039			#-679	(6)					
HP$L_UDA50_UDAIP	00000032			#-1389	(10)					
HP$M_NAME	=00000004			#-697	(6)					
HP$Q_DEVICE	00000000			#-1070	(10)	#-1072	(10)	#-1101	(10)	#-1103 (10)
				#-1193	(10)	#-1195	(10)	#-1222	(10)	#-1224 (10)
				#-1383	(10)	#-1385	(10)	#-1427	(10)	#-1429 (10)
				#-1450	(10)	#-1459	(10)	#-1464	(10)	#-1471 (10)
				#-1476	(10)	#-1482	(10)	#-1487	(10)	#-619 (6)
				#-621	(6)	#-633	(6)	#-640	(6)	#-645 (6)
				#-652	(6)	#-657	(6)	#-665	(6)	#-669 (6)
				#-696	(6)	#-701	(6)	#-725	(6)	#-734 (6)
				#-740	(6)	#-749	(6)	#-754	(6)	#-761 (6)
				#-767	(6)	#-782	(6)	#-785	(6)	#-787 (6)
				#-830	(7)	#-832	(7)	#-926	(9)	#-928 (9)
				#-957	(9)	#-959	(9)	#-977	(9)	#-980 (9)
HP$T_DEVICE	0000000C			1071	(10)	1102	(10)	1194	(10)	1223 (10)
				1384	(10)	#-1402	(10)	1428	(10)	#-1441 (10)
				620	(6)	#-624	(6)	704	(6)	831 (7)
				927	(9)	958	(9)	#-982	(9)	
HP$T_TYPE	00000026			#-1077	(10)	#-1078	(10)	#-1114	(10)	#-1115 (10)
				#-1201	(10)	#-1203	(10)	1235	(10)	#-1399 (10)
				#-1401	(10)	#-1406	(10)	#-1408	(10)	#-1502 (10)
				#-1504	(10)	1506	(10)	#-617	(6)	#-618 (6)
				#-694	(6)	#-695	(6)	#-827	(7)	#-828 (7)
				#-933	(9)	#-934	(9)	#-970	(9)	#-971 (9)
HP$W_SIZE	00000008			#-1068	(10)	#-1099	(10)	#-1192	(10)	#-1221 (10)
				#-1382	(10)	#-1426	(10)	#-616	(6)	#-693 (6)
				#-698	(6)	#-816	(7)	#-924	(9)	#-955 (9)
HP$W_VECTOR	00000024			#-1083	(10)	#-1205	(10)	#-1410	(10)	#-939 (9)
HPE$C_EPB_SIZE	00000000-XR			#-1007	(9)	#-1014	(9)	409	(2)	
HPE$W_EXT_DRIVE	00000014			#-1106	(10)	#-1227	(10)	#-1489	(10)	#-671 (6)
				#-772	(6)	#-835	(7)	#-962	(9)	
HSC50_BOOT	0000009F-R	432	(2)	#-595	(6)	#-597	(6)			
INI$LOAD_DEVICE	00000000-R	476	(3)							
INS$PTABLE	00000000-XR			1089	(10)	1210	(10)	1413	(10)	398 (2)
				683	(6)	778	(6)	945	(9)	973 (9)
IOC$K_IOSPACE	00000000-XR			396	(2)	#-675	(6)	#-800	(7)	#-884 (8)
KDB50_RESPONSE	00000000-XR			1314	(10)	412	(2)			
K_TYPES	=00000013	431	(2)	#-820	(7)					
L_LINK	FFFFFFF4	543	(4)	#-1076	(10)	#-1093	(10)	#-1112	(10)	#-1199 (10)
				#-1215	(10)	#-1233	(10)	1286	(10)	#-1391 (10)
				#-1418	(10)	#-1440	(10)	#-1495	(10)	550 (5)
				586	(6)	#-623	(6)	#-677	(6)	#-841 (7)
				#-863	(8)	#-932	(9)	#-949	(9)	#-968 (9)
L_LOCAL	FFFFFFF0	543	(4)	548	(5)					
L_STATUS	FFFFFFF8	543	(4)	#-1082	(10)	1086	(10)	#-1204	(10)	1208 (10)
				866	(8)	#-938	(9)	942	(9)	
L_TYPE	FFFFFFF0	543	(4)	549	(5)					
MSCP$L_MEDIA_ID	=0000001C			#-1327	(10)					
NI$GN_RPB_BUFFER	00000000-XR			1308	(10)	404	(2)			
PA_INIT	00000000-XR			1300	(10)	405	(2)	596	(6)	
PB$INIT	00000000-XR			1303	(10)	413	(2)			
RA80$K_LEN	00000032			#-1419	(10)					
RB730$B_BR	00000036			#-1209	(10)					
RB730$K_LEN	00000037			#-1169	(10)					

```
RB730_INTERRUPT          00000767-R   1130   (10)     870    (8)
RB_CS                    00000000                  #-1136   (10)   #-1159   (10)   #-1161   (10)   #-1162   (10)
RB_CS_M_IE              =00000040                  #-1136   (10)   #-1158   (10)   #-1162   (10)
RB_CS_V_TYP             =0000001A                  #-1168   (10)
RB_MP                    00000010                  #-1155   (10)
RB_MP_M_MRK             =00000001                  #-1154   (10)
RB_MP_M_RST             =00000008                  #-1154   (10)
RB_MP_M_STS             =00000002                  #-1153   (10)
RK06$K_LEN               00000032                  #-950    (9)
RK611$B_BR               00000036                  #-943    (9)
RK611$K_LEN              00000037                  #-914    (9)
RK611$L_CSR              00000032                  #-936    (9)
RK_CS1                  =00000000     269    (2)   #-900    (9)    #-903    (9)    #-906    (9)
RK_CS1_M_CERR           =00008000     272    (2)   #-900    (9)
RK_CS1_M_IE             =00000040     270    (2)   #-902    (9)    #-906    (9)
RK_CS1_M_RDY            =00000080     271    (2)
RK_CS2                  =00000008     273    (2)   #-901    (9)
RK_DS                   =0000000A     274    (2)   #-905    (9)
RK_DS_V_DDT             =00000008     275    (2)   #-912    (9)
RL01$K_LEN               00000032                  #-1094   (10)
RL02$K_LEN               00000032                  #-1216   (10)
RL11$B_BR                00000036                  #-1087   (10)
RL11$K_LEN               00000037                  #-1059   (10)
RL11$L_CSR               00000032                  #-1080   (10)
RL_CS                   =00000000     279    (2)   #-1040   (10)   #-1043   (10)   #-1047   (10)   #-1050   (10)
                                                   #-1051   (10)
RL_CS_M_CRDY            =00000080     280    (2)   #-1043   (10)
RL_CS_M_IE              =00000040     281    (2)   #-1046   (10)   #-1051   (10)
RL_DA                   =00000004     282    (2)   #-1035   (10)
RL_DA_M_MRK             =00000001     283    (2)
RL_DA_M_RST             =00000008     285    (2)   #-1034   (10)
RL_DA_M_STS             =00000002     284    (2)   #-1034   (10)
RL_MP                   =00000006     286    (2)
RL_MP_V_TYP             =00000007     287    (2)   #-1057   (10)
RP04$K_LEN               00000032                  #-806    (7)
RP_CS1                  =00000000     290    (2)   #-802    (7)
RP_DT                   =00000018     292    (2)   #-803    (7)
RP_DT_S_DTN             =00000009     294    (2)   #-804    (7)
RP_DT_V_DTN             =00000000     293    (2)   #-804    (7)
SAVABS...               =FFFFFFF0     543    (4)
SCB_BASE                 00000000-XR                 396    (2)
SCB_IMAGE                00000000-XR                 396    (2)
SIZ...                  =00000002     267    (2)     267    (2)
SS$_NORMAL              =00000001                  #-792    (6)    #-986    (9)
SYS$UNWIND               00000000-XR                 400    (2)
T_TYPES                  00000007-R   418    (2)     431    (2)    #-822    (7)
UDA_RESPONSE             00000000-XR                 1297   (10)     403    (2)
UD_INIT                  00000000-XR                 1296   (10)     403    (2)

                                        +-------------------------+
                                        ! Performance indicators !
                                        +-------------------------+

Phase                  Page faults    CPU Time       Elapsed Time
-----                  -----------    --------       ------------
Initialization                  25    00:00:00.04    00:00:00.17
Command processing             925    00:00:00.28    00:00:01.02
```

```
Pass 1                          1059     00:00:04.31    00:00:06.98
Symbol table sort                  0     00:00:00.47    00:00:00.45
Pass 2                            84     00:00:01.46    00:00:02.90
Symbol table output                2     00:00:00.07    00:00:00.17
Psect synopsis output              2     00:00:00.01    00:00:00.00
Cross-reference output             7     00:00:00.24    00:00:00.35
Assembler run totals            2106     00:00:06.88    00:00:12.05

The working set limit was 3400 pages.
255393 bytes (499 pages) of virtual memory were used to buffer the intermediate code.
There were 90 pages of symbol table space allocated to hold 1498 non-local and 95 local symbols.
1529 source lines were read in Pass 1, producing 106 object records in Pass 2.
63 pages of virtual memory were used to define 56 macros.

                                  +----------------------------+
                                  ! Macro library statistics !
                                  +----------------------------+

Macro library name                 Macros defined
------------------                 --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1            21
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1               4
SYS$COMMON:[SYSLIB]LIB.MLB;2                          2
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1               0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1             0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1            0
SYS$COMMON:[SYSLIB]LIB.MLB;2                          0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                     11
SYS$COMMON:[SYSLIB]STARLET.MLB;2                      0
TOTALS (all libraries)                               38

1564 GETS were required to define 38 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 220 Libraries, Equated Symbols, Macros
(1) 267 Work Psect Declarations ; [13]
(1) 283 Data Psect Declarations ; [13]
(1) 468 VRSetWidth Routine - Set terminal width ; [12]
(1) 558 VRShowWidth Routine - Show terminal width ; [12]
(1) 607 KB_Poll Routine - Keyboard ready bit check
(1) 676 RInput Routine - Flag driven terminal input
(1) 791 RType Routine - Retype input line ('^R' function)
(1) 832 Out Routines - Flag driven terminal output
(1) 950 WriteVBlk Routine - Console write driver
(1) 998 ReadVBlk Routine - Console read driver
(1) 1226 SIZE_TERM Routine to size the console terminal

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element CONSOLE.MAR
0000     2 ;  7    15-MAR-1988 13:52:55 MI "Changed branch instructions to accommodate macro ex
0000     3 ; *6    12-SEP-1986 12:40:34 SILVER "<no reason given>"
0000     4 ; *5    11-SEP-1986 10:56:45 SILVER "<no reason given>"
0000     5 ; *4    30-MAY-1986 16:47:26 BAGGETT "NO CHANGES"
0000     6 ; *3    28-MAY-1986 10:51:53 SALEM "DONE"
0000     7 ; *2    27-MAY-1986 15:12:51 SALEM "ALL DONE"
0000     8 ; *1     6-FEB-1986 15:15:19 DS ""
0000     9 ; DEC/CMS REPLACEMENT HISTORY, Element CONSOLE.MAR
0000    10         .TITLE  CONSOLE *** CONSOLE Console I/O handler
0000    11         .IDENT  /09-35/                                                    ;G:2
0000    12         .NoShow Conditionals    ;                                           [16]
0000    13
0000    14 ;++
0000    15 ; COPYRIGHT (C) 1977, 1983, 1985
0000    16 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    17 ;
0000    18 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0000    19 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
0000    20 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
0000    21 ; MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
0000    22 ; EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
0000    23 ; TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
0000    24 ; REMAIN IN DEC.
0000    25 ;
0000    26 ; THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
0000    27 ; AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
0000    28 ; CORPORATION.
0000    29 ;
0000    30 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0000    31 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    32 ;--
```

```
0000     34 ;**
0000     35 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR.
0000     36 ;
0000     37 ; ABSTRACT:
0000     38 ;
0000     39 ;       This routine contains the interface with the LSI-11 console.
0000     40 ;       It provides the routines necessary to read and write characters
0000     41 ;       and strings on the operators console.  It contains the limited
0000     42 ;       functionality to interface with QIO.
0000     43 ;
0000     44 ; ENVIRONMENT:
0000     45 ;
0000     46 ;       Operates as part of the Supervisor only in stand-alone.
0000     47 ;       Portions hereof must operate in KERNEL mode.
0000     48 ;
0000     49 ; AUTHOR:
0000     50 ;
0000     51 ;       KEN CHAPMAN     10-NOV-77       VERSION 01.
0000     52 ;
0000     53 ; MODIFICATIONS:
0000     54 ;
0000     55 ;       01      NICK HOWGATE    30-DEC-77       VERSION 02.
0000     56 ;               CMK$TCONSOLE - TURN OFF ALL OUTPUT IF APT REQUESTS
0000     57 ;               NO REPORT (DSA$GL_FLAGS)=DSA$V_NORPT
0000     58 ;
0000     59 ;       02      Roger Riggs     25-JUL-78
0000     60 ;               CMK$TCONSOLE looks also at DS$V_CTRLO in DS$GL_FLAGS
0000     61 ;               MAKE ^O WORK.
0000     62 ;       03      Made unsolicited input is echoed as bells instead of the
0000     63 ;               characters typed.
0000     64 ;
0000     65 ;       04      NICK HOWGATE    5-FEB-79        (ESSAA-5.00)
0000     66 ;               CONVERT TABS TO SPACES
0000     67 ;
0000     68 ;       05      Implement P4 buffer in WRITEBLK
0000     69 ;
0000     70 ;       06      Fix IO$_READPROMPT to always prompt on new line
0000     71 ;
0000     72 ;       07      Defer echo of ^C until KB_CHECK but suppress rest of output
0000     73 ;               until ^C is serviced
0000     74 ;
0000     75 ;       08      MARION BAGGETT  NOV 12,1979
0000     76 ;               ADD THE CONTROL S AND CONTROL Q FUNCTION FOR STARTING AND
0000     77 ;               STOPPING THE PRINTOUT ON THE TERMINAL.
0000     78 ;
0000     79 ;       09      Roger Riggs, 14-Jan-1980, Version 5.2
0000     80 ;               Added checking of IO$M_CANCTRLO  on write to terminal.
0000     81 ;               Used by exception to make sure exceptions always print.
0000     82 ;               Also fixed RINPUT to ignore character if bit 15 (ERR) is
0000     83 ;               Set in the data register.
0000     84 ;
0000     85 ;       10      Dave Butenhof, 17-oct-1980, version 6.1
0000     86 ;               Cause re-type of input line ('^R') after asynchronous output
0000     87 ;               occurs, in the fashion of VMS.  Also, remove hyphen line
0000     88 ;               continuation code, since it doesn't belong here.
0000     89 ;
0000     90 ;       11      To fully support ^C 'disable' in tight time-critical code,
```

```
0000  ;                 cut down on instruction stream for control characters.
0000  ;                 Specifically, test for ^C first in RINPUT instead of last.
0000  ;                 Also, make new routine OUT_CNTRL to output ^C and ^O echo;
0000  ;                 without all the overhead of doing extra KB_POLL each
0000  ;                 character (small messages), or checking for tabs, etc.
0000  ;
0000  ;         12      Dave Butenhof, 17-mar-1981, version 6.3
0000  ;                 Add VRSETWIDTH routine, and hooks for SET WIDTH command.
0000  ;                 This allows users (FS in particular) to avoid destroying
0000  ;                 80 column printer paper with output from DS. Also add
0000  ;                 VRSHOWWIDTH routine.
0000  ;
0000  ;         13      - Jack Stansbury, 22-Oct-1981, Version 6.-
0000  ;                 Changed SEP Psect to CODE, DATA, and WORK.
0000  ;                 Also added .LIBRARY statements for $DS and $DIAG.
0000  ;
0000  ;         14      - Jack Stansbury, 26-Oct-1981, Version 6.-
0000  ;                 Fixed more truncation errors....
0000  ;
0000  ;         15      - Jack Stansbury, 25-Jan-1982, Version 6.6
0000  ;                 Changed the WIDTH variable to make it global, so that QA can
0000  ;                 access it.
0000  ;
0000  ;         16      - Jack Stansbury, 23-Mar-1982, Version 6.?
0000  ;                 Added typecoding to the output messages.
0000  ;
0000  ;         17      - Richard Brown, 8-June-82, Version 6.8
0000  ;                 Addition of support for specification of
0000  ;                 terminators other than carriage-return.  We will
0000  ;                 now be functionally equivalent to VMS QIO calls
0000  ;                 with respect to the optional terminator specification
0000  ;                 (argument P4) for the terminal driver.
0000  ;
0000  ;         18      Bob Bergazzi    6-Aug-82        Version 6.8
0000  ;                 Added code to change a ^Z into an EXIT command
0000  ;
0000  ;         19      Jack Stansbury, 26-Oct-1982, Version 6.9
0000  ;                 Added code to echo the ^C character only if the
0000  ;                 DS$V_Ctrl_C_No_Echo bit is clear. If it is set,
0000  ;                 then ^C's will not be echoed.
0000  ;
0000  ;         20      Bob Bergazzi    5-March-1983    Version 6.11
0000  ;                 Added code to make SET WIDTH work online.
0000  ;
0000  ;         21      Bob Bergazzi    8-Apr-1983      Version 6.11
0000  ;                 Removed incorrectly implemented edit 18.
0000  ;
0000  ;         22      Domenic Andella 25-Apr-83       Version 6.11
0000  ;                 Added code in CMK$TCONSOLE routine to activate
0000  ;                 11/XXX console terminal line.
0000  ;
0000  ;         23      Richard Brown   22-June-83      Version 6.12
0000  ;                 Added routine SIZE_TERM, which determines
0000  ;                 console terminal type.
0000  ;
0000  ;                 Also removed code in READVBLK that treated a
0000  ;                 question mark as a terminator, since many
```

```
0000  ;                 terminal IDs contain question marks, and we
0000  ;                 couldn't figure why it was a terminator anyway.
0000  ;
0000  ;        24       Bob Bergazzi    Nov. 29,1984    Version 8.0
0000  ;                 Removed edit 22.
0000  ;
0000  ;        25       Jim Shelhamer   30 Nov 1984     Version 8.0
0000  ;                 Added code for 11/ZZZ to handle console I/O over
0000  ;                 the BI via the RXCD register.
0000  ;
0000  ;        26       Bob Bergazzi    Dec. 14, 1984   Version 8.0
0000  ;                 Added support for DELETE character for video terminals.
0000  ;                 Does a backspace, space, backspace sequence.
0000  ;
0000  ;        27       M. Baggett      18-Dec-1984     Version 8.0
0000  ;                 Added terminals ID's for VT101, VT102, VT125 and VT200 family.
0000  ;                 Undefined types are set to VT100.
0000  ;
0000  ;        28       Jim Shelhamer   6-Aug-1985      Version 8.3
0000  ;                 Added check for sys$output being mailbox on
0000  ;                 SET WIDTH command processing.
0000  ;
0000  ;        29       M. Baggett      14-Aug-1985     Version 8.3
0000  ;                 Ignore console data bits for AURORA only.
0000  ;
0000  ;        30       Ted Salem       1-Oct-1985      Version 9.0
0000  ;                 Changed RSB to RET in order to do a proper return
0000  ;                 from an MP entry QIO call.
0000  ;
0000  ;        31       Jim Shelhamer   7-Oct-1985      Version 9.0
0000  ;                 Added setting of bit 7 in R0 when data is recv'd
0000  ;                 from RXCD to indicate data gotten.
0000  ;
0000  ;        32       M. Baggett      22-Oct-1985     Version 9.0
0000  ;                 Restore changes so Ctrl z, etc work on AURORA.
0000  ;                 Renumber some local labels.
0000  ;
0000  ;        33       Jim Shelhamer   29-Oct-1985     Version 9.1
0000  ;                 Skip checking if char is console data for AP's.
0000  ;
0000  ;        34       Jim Shelhamer   30-Jan-1986     Version 9.1
0000  ;                 Remove scorpio specific code.
0000  ;
0000  ;        35       Ted Salem       4- May-1986     Version 10.0                    ;G:2
0000  ;                 Made changes to check SYSTYPE instead of SID                    ;G:2
0000  ;                 for the Aurora system.                                          ;G:2
0000  ;                                                                                 ;G:2
0000  ;        36       Doug Silver     8- Sep-1986     Version 10.3                    ;G:6
0000  ;                 In READVBLK, decremented the buffer pointer                     ;G:5
0000  ;                 by a longword displacement instead of a byte                    ;G:5
0000  ;                 displacement when using a video terminal.  If                   ;G:6
0000  ;                 the adress happened to end in 00, decrementing                  ;G:6
0000  ;                 by 1 with a byte displacement actually                          ;G:6
0000  ;                 increments by FF.                                               ;G:6
0000  ;                                                                                 ;G:6
0000  ;        37       Doug Silver     12-Sep-1986     Version 10.3                    ;G:6
0000  ;                 To delete a character on a video terminal you                   ;G:6
```

```
0000    205 ;               type a backspace, space, backspace.  When a                 ;G:6
0000    206 ;               character is at the very end of a line on a                 ;G:6
0000    207 ;               video terminal, the cursor remains under it                 ;G:6
0000    208 ;               instead of to the right of it.  In this                     ;G:6
0000    209 ;               situation, only a space should be typed over                ;G:6
0000    210 ;               the character.                                              ;G:6
0000    211 ;                                                                           ;G:6
0000    212 ;                                                                           ;G:5
0000    213 ;*************************************************************************
0000    214 ; NOTE : If you make any changes to this module, you should check to make
0000    215 ;       sure if a similar change should be made for NAUTILUS, VENUS, or
0000    216 ;       SCORPIO which have their own console module.
0000    217 ;*************************************************************************
0000    218 ;--
```

```
                        0000    220          .SBTTL  Libraries, Equated Symbols, Macros
                        0000    221 ;
                        0000    222 ; INCLUDE FILES:
                        0000    223 ;
                        0000    224
                        0000    225          .Library        /Sys$Library:Lib/       ;                       [16]
                        0000    226          .LIBRARY        /$DS/                   ;                       [13]
                        0000    227          .LIBRARY        /$DIAG/                 ;                       [13]
                        0000    228
                        0000    229 ;
                        0000    230 ; MACROS:
                        0000    231 ;
                        0000    232
                        0000    233          $DS_DSADEF
                        0000    234          CLIDEF                          ; CLI data structure            [12]
                        0000    235          $PRDEF
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000  FE70               .=0
                        0000                 .RESTORE
                        0000    236          $QIODEF
                        0000    237          CMKDEF
                        0000    238          DSFDEF
                        0000    239          $DS_TypeDef                     ;                               [16]
                        0000    240          CRDDef                          ; CRD Bit definitions           [19]
                        0000    241          $TTDEF                          ; Terminal characteristics      [23]
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000  FE70               .=0
                        0000                 .RESTORE
                        0000    242
                        0000    243 ;
                        0000    244 ; EQUATED SYMBOLS:
                        0000    245 ;
                00000080  0000  246          PARITY  = 1a7
                00000020  0000  247          LOWCASE = 1a5
                00000003  0000  248          CNTRLC  = 3
                00000007  0000  249          BELL    = 7
                00000008  0000  250          BS      = 8                             ;                       [17]
                00000009  0000  251          TAB     = 9
                0000000A  0000  252          LF      = 10
                0000000B  0000  253          VT      = 11                            ;                       [17]
                0000000C  0000  254          FF      = 12                            ;                       [17]
                0000000D  0000  255          CR      = 13
                0000000F  0000  256          CNTRLO  = 15
                00000011  0000  257          CNTRLQ  = 17
                00000012  0000  258          CNTRLR  = 18
                00000013  0000  259          CNTRLS  = 19
                00000015  0000  260          CNTRLU  = 21
                00000020  0000  261          SPACE   = 32
                0000002D  0000  262          HYPHEN  = 45
                0000003F  0000  263          QUESTN  = 63
                0000005C  0000  264          BSLASH  = 92
                0000007F  0000  265          DELETE  = 127
```

```
                 0000          .SUBTITLE       Work Psect Declarations          ;                    [13]
             00000000          .PSECT  Work, NoExe, NoShr, Wrt, Long            ;                    [13]
                 0000  ;
                 0000  ; OWN STORAGE:
                 0000  ;
                 0000
             00  0000  COLUMN:          .BYTE   0                        ; COLUMN COUNTER
                 0001
             00  0001  LASTCHAR:        .BYTE   0                        ; Last character output to console
                 0002
             50  0002  DS$GB_WIDTH::    .BYTE   80                       ; Initial width is 80          [15]
                 0003
             00  0003  CONSFLG:         .BYTE   0                        ; CONTROL S AND CONTROL Q FLAG
                 0004
       00000000  0004  EVENT_FLAGS:     .LONG   0                        ; Receives event flags         [23]
```

```
                                    0008   283          .SUBTITLE       Data Psect Declarations          ;                    [13]
                                00000000   284          .PSECT  Data, NoExe, Shr, NoWrt, Long            ;                    [13]
                                    0000   285
                                    0000   286 T_CNTRLC:
            0A 0D 43 5E 0A 0D 00'   0000   287          .ASCIC  <CR><LF>'^C'<CR><LF>
                                06  0000
                                    0007   288
                                    0007   289 T_CNTRLU:
                 0A 0D 55 5E 00'    0007   290          .ASCIC  '^U'<CR><LF>
                                04  0007
                                    000C   291
                                    000C   292 T_CNTRLR:
                       52 5E 00'    000C   293          .ASCIC  '^R'
                                02  000C
                                    000F   294
                                    000F   295 T_CNTRLO:
                 0A 0D 4F 5E 00'    000F   296          .ASCIC  '^O'<CR><LF>
                                04  000F
                                    0014   297
                                    0014   298 T_CRLF:
                       0A 0D 00'    0014   299          .ASCIC  <CR><LF>
                                02  0014
                                    0017   300
                                    0017   301 T_WIDTH:                                                          ;       [12]
20 74 73 75 6D 20 68 74 64 69 57 00'  0017   302          .ASCIC  "Width must be greater than 0 and less than 133!/"      ;       [12]
74 20 72 65 74 61 65 72 67 20 65 62   0023
65 6C 20 64 6E 61 20 30 20 6E 61 68   002F
21 33 33 31 20 6E 61 68 74 20 73 73   003B
                                2F  0047
                                30  0017
                                    0048   303
                                    0048   304 T_SHOW_WIDTH:                                                      ;       [12]
69 77 20 6C 61 6E 69 6D 72 65 54 00'  0048   305          .ASCIC  "Terminal width is !ZB character!%S!/"                  ;       [12]
63 20 42 5A 21 20 73 69 20 68 74 64   0054
21 53 25 21 72 65 74 63 61 72 61 68   0060
                                2F  006C
                                24  0048
                                    006D   306
                                    006D   307 T_OUT_IS_MBX:                                                      ;[28]
64 20 74 6F 6E 6E 61 43 20 3F 3F 00'  006D   308          .ASCIC  "?? Cannot do SET WIDTH for mailbox output.!/"          ;[28]
20 48 54 44 49 57 20 54 45 53 20 6F   0079
20 78 6F 62 6C 69 61 6D 20 72 6F 66   0085
         2F 21 2E 74 75 70 74 75 6F   0091
                                2C  006D
                                    009A   309
                                    009A   310 ;                                                                  [23]
                                    009A   311 ;TABLE OF VIDEO TERMINAL TYPES                                     [23]
                                    009A   312 ;                                                                  [23]
                                    009A   313
                                    009A   314 VIDEO_TYPES:
                                    009A   315
                                    009A   316 T_VT50_A:
                    41 2F 1B 00'    009A   317          .ASCIC  <27>"/A"
                                03  009A
                                40  009E   318          .BYTE   TT$_VT5X
                                    009F   319 T_VT50_B:
                    42 2F 1B 00'    009F   320          .ASCIC  <27>"/B"
```

```
                        03  009F
                        40  00A3    321          .BYTE   TT$_VT5X
                            00A4    322 T_VT50_C:
                43 2F 1B 00' 00A4    323          .ASCIC  <27>"/C"
                        03  00A4
                        40  00A8    324          .BYTE   TT$_VT5X
                            00A9    325 T_VT55_E:
                45 2F 1B 00' 00A9    326          .ASCIC  <27>"/E"
                        03  00A9
                        41  00AD    327          .BYTE   TT$_VT55
                            00AE    328 T_VT50_H:
                48 2F 1B 00' 00AE    329          .ASCIC  <27>"/H"
                        03  00AE
                        40  00B2    330          .BYTE   TT$_VT5X
                            00B3    331 T_VT50_J:
                4A 2F 1B 00' 00B3    332          .ASCIC  <27>"/J"
                        03  00B3
                        40  00B7    333          .BYTE   TT$_VT5X
                            00B8    334 T_VT52_K:
                4B 2F 1B 00' 00B8    335          .ASCIC  <27>"/K"
                        03  00B8
                        40  00BC    336          .BYTE   TT$_VT52
                            00BD    337 T_VT52_L:
                4C 2F 1B 00' 00BD    338          .ASCIC  <27>"/L"
                        03  00BD
                        40  00C1    339          .BYTE   TT$_VT52
                            00C2    340 T_VT52_M:
                4D 2F 1B 00' 00C2    341          .ASCIC  <27>"/M"
                        03  00C2
                        40  00C6    342          .BYTE   TT$_VT52
                            00C7    343 T_VT100A:
                   5A 2F 1B 00' 00C7    344          .ASCIC  <27>"/Z"
                        03  00C7
                        60  00CB    345          .BYTE   TT$_VT100
                            00CC    346 T_VT101:
      63 30 3B 31 3F 5B 1B 00' 00CC    347          .ASCIC  <27>'[?1;0'<99>                          ;VT101 (STRIPPED VT100)
                        07  00CC
                        61  00D4    348          .BYTE   TT$_VT101
                            00D5    349 T_VT102:
            63 36 3F 5B 1B 00' 00D5    350          .ASCIC  <27>'[?6'<99>                            ;VT102 STP, AVO, GO, PRINTER
                        05  00D5
                        62  00DB    351          .BYTE   TT$_VT102
                            00DC    352 T_VT125:
01 3B 30 3B 35 3B 32 31 3F 5B 1B 00' 00DC    353          .ASCIC  <27>'[?12;5;0;'<1><1><1><99><0>          ;VT125 WITHOUT AVO
                   00 63 01 01  00E8
                        0F  00DC
                        64  00EC    354          .BYTE   TT$_VT125
                            00ED    355 T_VT125A:
01 3B 31 3B 35 3B 32 31 3F 5B 1B 00' 00ED    356          .ASCIC  <27>'[?12;5;1;'<1><1><1><99><0>          ;VT125 WITHOUT AVO
                   00 63 01 01  00F9
                        0F  00ED
                        64  00FD    357          .BYTE   TT$_VT125
                            00FE    358 T_VT125B:
01 3B 30 3B 37 3B 32 31 3F 5B 1B 00' 00FE    359          .ASCIC  <27>'[?12;7;0;'<1><1><1><99><0>          ;VT125 WITH AVO
                   00 63 01 01  010A
                        0F  00FE
                        64  010E    360          .BYTE   TT$_VT125
```

```
                                 010F   361 T_VT125C:
01 3B 31 3B 37 3B 32 31 3F 5B 1B 00' 010F   362          .ASCIC  <27>'[?12;7;1;'<1><1><1><99><0>          ;VT125 WITH AVO
                     00 63 01 01  011B
                                  0F  010F
                                 64   011F   363          .BYTE   TT$_VT125
                                 0120   364 T_VT61:
                        27 2F 1B 00' 0120   365          .ASCIC  <27>a/'a
                                 03   0120
                                 60   0124   366          .BYTE   TT$_VT100                                ; ASSIGNED UNTIL DEFINED
                                 0125   367 T_VT71:
                        7E 2F 1B 00' 0125   368          .ASCIC  <27><47><126>
                                 03   0125
                                 60   0129   369          .BYTE   TT$_VT100                                ; ASSIGNED UNTIL DEFINED
                                 012A   370 T_VT100:
           63 30 3B 31 3F 5B 1B 00' 012A   371          .ASCIC  <27>"[?1;0"<99>
                                 07   012A
                                 60   0132   372          .BYTE   TT$_VT100
                                 0133   373 T_VT100B:
           63 31 3B 31 3F 5B 1B 00' 0133   374          .ASCIC  <27>"[?1;1"<99>
                                 07   0133
                                 60   013B   375          .BYTE   TT$_VT100
                                 013C   376 T_VT100C:
           63 32 3B 31 3F 5B 1B 00' 013C   377          .ASCIC  <27>"[?1;2"<99>
                                 07   013C
                                 60   0144   378          .BYTE   TT$_VT100
                                 0145   379 T_VT100D:
           63 33 3B 31 3F 5B 1B 00' 0145   380          .ASCIC  <27>"[?1;3"<99>
                                 07   0145
                                 60   014D   381          .BYTE   TT$_VT100
                                 014E   382 T_VT100E:
           63 34 3B 31 3F 5B 1B 00' 014E   383          .ASCIC  <27>"[?1;4"<99>
                                 07   014E
                                 60   0156   384          .BYTE   TT$_VT100
                                 0157   385 T_VT100F:
           63 35 3B 31 3F 5B 1B 00' 0157   386          .ASCIC  <27>"[?1;5"<99>
                                 07   0157
                                 60   015F   387          .BYTE   TT$_VT100
                                 0160   388 T_VT100G:
           63 36 3B 31 3F 5B 1B 00' 0160   389          .ASCIC  <27>"[?1;6"<99>
                                 07   0160
                                 60   0168   390          .BYTE   TT$_VT100
                                 0169   391 T_VT100H:
           63 37 3B 31 3F 5B 1B 00' 0169   392          .ASCIC  <27>"[?1;7"<99>
                                 07   0169
                                 60   0171   393          .BYTE   TT$_VT100
                                 0172   394 T_VT220:
37 3B 32 3B 31 3B 32 36 3F 5B 1B 00' 0172   395          .ASCIC  <27>"[?62;1;2;7;8"<99>
                        63 38 3B 017E
                                  0E  0172
                                 6E   0181   396          .BYTE   TT$_VT200_SERIES
                                 0182   397 T_VT220A:
                  32 36 3F 5B 1B 00' 0182   398          .ASCIC  <27>'[?62'                               ;VT200 FAMILY
                                 05   0182
                                 6E   0188   399          .BYTE   TT$_VT200_SERIES
                                 0189   400 T_VT240:
33 3B 32 3B 31 3B 32 35 3F 5B 1B 00' 0189   401          .ASCIC  <27>"[?52;1;2;3;4;7;8"<99>
              63 38 3B 37 3B 34 3B   0195
```

```
                     12  0189
                     6E  019C   402          .BYTE   TT$_VT200_SERIES
                         019D   403 T_VT132:
63 30 3B 34 3F 5B 1B 00' 019D   404          .ASCIC  <27>"[?4;0"<99>
                     07  019D
                     66  01A5   405          .BYTE   TT$_VT132
                         01A6   406 T_VT132A:
63 31 3B 34 3F 5B 1B 00' 01A6   407          .ASCIC  <27>"[?4;1"<99>
                     07  01A6
                     66  01AE   408          .BYTE   TT$_VT132
                         01AF   409 T_VT132B:
63 32 3B 34 3F 5B 1B 00' 01AF   410          .ASCIC  <27>"[?4;2"<99>
                     07  01AF
                     66  01B7   411          .BYTE   TT$_VT132
                         01B8   412 T_VT132C:
63 33 3B 34 3F 5B 1B 00' 01B8   413          .ASCIC  <27>"[?4;3"<99>
                     07  01B8
                     66  01C0   414          .BYTE   TT$_VT132
                         01C1   415 T_VT132D:
63 34 3B 34 3F 5B 1B 00' 01C1   416          .ASCIC  <27>"[?4;4"<99>
                     07  01C1
                     66  01C9   417          .BYTE   TT$_VT132
                         01CA   418 T_VT132E:
63 35 3B 34 3F 5B 1B 00' 01CA   419          .ASCIC  <27>"[?4;5"<99>
                     07  01CA
                     66  01D2   420          .BYTE   TT$_VT132
                         01D3   421 T_VT132F:
63 36 3B 34 3F 5B 1B 00' 01D3   422          .ASCIC  <27>"[?4;6"<99>
                     07  01D3
                     66  01DB   423          .BYTE   TT$_VT132
                         01DC   424 T_VT132G:
63 37 3B 34 3F 5B 1B 00' 01DC   425          .ASCIC  <27>"[?4;7"<99>
                     07  01DC
                     66  01E4   426          .BYTE   TT$_VT132
                         01E5   427 T_VT61A:
           61 2F 1B 00' 01E5   428          .ASCIC  <27><47><97>
                     03  01E5
                     60  01E9   429          .BYTE   TT$_VT100                ; ASSIGNED UNTIL DEFINED
                         01EA   430 T_VT61B:
           62 2F 1B 00' 01EA   431          .ASCIC  <27><47><98>
                     03  01EA
                     60  01EE   432          .BYTE   TT$_VT100                ; ASSIGNED UNTIL DEFINED
                         01EF   433 T_VT61C:
           63 2F 1B 00' 01EF   434          .ASCIC  <27><47><99>
                     03  01EF
                     60  01F3   435          .BYTE   TT$_VT100                ; ASSIGNED UNTIL DEFINED
                         01F4   436 END_VIDEO_TYPES:
              FFFFFFFF   01F4   437          .LONG -1
                         01F8   438
                         01F8   439 ;                                                          [23]
                         01F8   440 ; TABLE OF HARDCOPY TERMINAL TYPES                         [23]
                         01F8   441 ;                                                          [23]
                         01F8   442
                         01F8   443 HARDCOPY_TYPES:
                         01F8   444
                         01F8   445 T_LA12:
   63 35 31 3F 5B 1B 00' 01F8   446          .ASCIC  <27>"[?15"<99>
```

```
                         06  01F8
                         24  01FF    447          .BYTE   TT$_LA12
                             0200    448 T_LA100:
      63 30 31 3F 5B 1B 00'  0200    449          .ASCIC  <27>"[?10"<99>
                         06  0200
                         25  0207    450          .BYTE   TT$_LA100
                             0208    451 T_LA120:
         63 32 3F 5B 1B 00'  0208    452          .ASCIC  <27>"[?2"<99>
                         05  0208
                         21  020E    453          .BYTE   TT$_LA120
                             020F    454 T_LA34:
   63 30 3B 33 3F 5B 1B 00'  020F    455          .ASCIC  <27>"[?3;0"<99>
                         07  020F
                         22  0217    456          .BYTE   TT$_LA34
                             0218    457 T_LA34A:
   63 31 3B 33 3F 5B 1B 00'  0218    458          .ASCIC  <27>"[?3;1"<99>
                         07  0218
                         22  0220    459          .BYTE   TT$_LA34
                             0221    460 END_HARDCOPY_TYPES:
                   FFFFFFFF  0221    461          .LONG -1
                             0225    462
                             0225    463 T_LA36:                          ; LA36 has no response sequence.        [23]
                         20  0225    464          .BYTE   TT$_LA36
                             0226    465 ;
                             0226    466
```

```
                     0226   468          .SBTTL  VRSetWidth Routine - Set terminal width                 ;       [12]
                 00000000   469          .PSECT  Code, Exe, Shr, NoWrt, Long                             ;       [13]
                     0000   470 ;++                                                                               [12]
                     0000   471 ; VRSETWIDTH                                                                      [12]
                     0000   472 ;                                                                                 [12]
                     0000   473 ; Functional description:                                                         [12]
                     0000   474 ;                                                                                 [12]
                     0000   475 ;       This is a CLI command routine.  It loads the global DS$GB_WIDTH with    [15]
                     0000   476 ;       a value specified to CLI.  If the width is out of range, an error       [12]
                     0000   477 ;       message is typed and it returns a failure status code (though CLI       [12]
                     0000   478 ;       does not currently recognize return status).                            [12]
                     0000   479 ;                                                                                 [12]
                     0000   480 ;       In online mode, a QIO SENSE mode operation is done in order to get      [20]
                     0000   481 ;       the terminal's characteristics, and then a SET is done with the width   [20]
                     0000   482 ;       parameter changed.                                                      [20]
                     0000   483 ;                                                                                 [12]
                     0000   484 ; Calling sequence:                                                               [12]
                     0000   485 ;                                                                                 [12]
                     0000   486 ;       JSB     VRSETWIDTH                                                      [12]
                     0000   487 ;                                                                                 [12]
                     0000   488 ; Input Parameters:                                                               [12]
                     0000   489 ;                                                                                 [12]
                     0000   490 ;       none                                                                    [12]
                     0000   491 ;                                                                                 [12]
                     0000   492 ; Implicit Inputs:                                                               [12]
                     0000   493 ;                                                                                 [12]
                     0000   494 ;       R2      points to CLI data table                                        [12]
                     0000   495 ;                                                                                 [12]
                     0000   496 ; Output parameters:                                                              [12]
                     0000   497 ;                                                                                 [12]
                     0000   498 ;       none                                                                    [12]
                     0000   499 ;                                                                                 [12]
                     0000   500 ; Implicit outputs:                                                              [12]
                     0000   501 ;                                                                                 [12]
                     0000   502 ;       none                                                                    [12]
                     0000   503 ;                                                                                 [12]
                     0000   504 ; Side effects:                                                                  [12]
                     0000   505 ;                                                                                 [12]
                     0000   506 ;       Changes value of DS$GB_WIDTH variable                                   [15]
                     0000   507 ;                                                                                 [12]
                     0000   508 ; Completion codes:                                                              [12]
                     0000   509 ;                                                                                 [12]
                     0000   510 ;       0       failure (value out of range)                                    [12]
                     0000   511 ;       1       success                                                         [12]
                     0000   512 ;--                                                                              [12]
```

```
                                0000   514 VRSETWIDTH::                                ;                                       [12]
                     50   1C A2   D0  0000   515          MOVL    CLI$L_DATA(R2), R0      ; Get width                             [12]
                          71   15  0004   516          BLEQ    10$                     ; Branch if value too small             [12]
              00000084 8F   50   D1  0006   517          CMPL    R0, #132                ; Also branch if                        [12]
                          68   14  000D   518          BGTR    10$                     ;  value too large                      [12]
                                0000F   519
                                000F   520          Br_If_Not_User  5$                 ; Thats all for standalone              [20]
              0000FE00'EF   1C   E1  000F              BBC     #DSA$V_User, -                  ; If bit not set, branch
                          54         0016                        L^DSA$GL_Flags, 5$            ;
                                0017   521
                          7E   7C  0017   522          ClrQ    -(SP)                   ; Space for characteristics buffer      [20]
                     50   6E   7E  0019   523          MovAQ   (SP), R0                ; on stack                              [20]
                                001C   524          $QIOW_S , -                     ; First, read the terminal characteristics
                                001C   525                  L^DS$GW_TTOUT, -        ; Channel number                        [20]
                                001C   526                  #IO$_SENSEMODE, -       ; Function                              [20]
                                001C   527                  P1 = (R0)               ; Address of characteristics buffer     [20]
                          7E   7C  001C                      CLRQ    -(SP)
                          7E   7C  001E                      CLRQ    -(SP)
                          00   DD  0020                      PUSHL   #0
                          60   DF  0022                      PUSHAL  (R0)
                          7E   7C  0024                      CLRQ    -(SP)
                          00   DD  0026                      PUSHL   #0
                 7E   0000'8F   3C  0028                     MOVZWL  #IO$_SENSEMODE,-(SP)
              7E   00000000'EF   3C  002D                    MOVZWL  L^DS$GW_TTOUT,-(SP)
                          00   DD  0034                      PUSHL   #0
              00000000'GF   0C   FB  0036                    CALLS   #12,G^SYS$QIOW
                     4D   50   E9  003D   528          BLBC    R0, 20$                 ; Error, output is not terminal, ie mbx [28]
                                0040   529
                02 AE   1C A2   9B  0040   530          MovZBW  CLI$L_DATA(R2), 2(SP)   ; Set the desired page width          [20]
                     50   6E   7E  0045   531          MovAQ   (SP), R0                ; Buffer on the stack                   [20]
                                0048   532          $QIOW_S , -                     ; no efn                                [20]
                                0048   533                  L^DS$GW_TTOUT, -        ; Channel number                        [20]
                                0048   534                  #IO$_SETMODE, -         ; Function                              [20]
                                0048   535                  P1 = (R0)               ; Address of characteristics buffer     [20]
                          7E   7C  0048                      CLRQ    -(SP)
                          7E   7C  004A                      CLRQ    -(SP)
                          00   DD  004C                      PUSHL   #0
                          60   DF  004E                      PUSHAL  (R0)
                          7E   7C  0050                      CLRQ    -(SP)
                          00   DD  0052                      PUSHL   #0
                 7E   0000'8F   3C  0054                     MOVZWL  #IO$_SETMODE,-(SP)
              7E   00000000'EF   3C  0059                    MOVZWL  L^DS$GW_TTOUT,-(SP)
                          00   DD  0060                      PUSHL   #0
              00000000'GF   0C   FB  0062                    CALLS   #12,G^SYS$QIOW
                          8E   7C  0069   536          ClrQ    (SP)+                   ; Release the buffer on the stack       [20]
                                006B   537
          00000002'EF   1C A2   90  006B   538 5$:     MOVB    CLI$L_DATA(R2), DS$GB_WIDTH     ; Store the value               [15]
                     50   01   D0  0073   539          MOVL    #1, R0                  ; Return success                        [12]
                          05   05  0076   540          RSB                             ;                                       [12]
                                0077   541
                                0077   542 10$:     $Print  -                       ; Print with a typecode                 [16]
                                0077   543                    #DS$K_Type_Command_Err, -     ; ... the typecode                [16]
                                0077   544                    #DS$K_PrintF, -       ; ... use PrintF to print it            [16]
                                0077   545                    T_Width               ; ... the message                       [16]
                   00000017'EF   9F  0077                    PUSHAB  T_Width
                       7E   01   9A  007D                    movzbl  #DS$K_PrintF, -(sp)
                       7E   15   98  0080                    cvtbl   #DS$K_Type_Command_Err, -(sp)
```

```
00000000'GF   03   FB  0083                          CALLS   #$$N+2, G^DSX$PRINT
              50   D4  008A   546          CLRL    R0                      ; Return failure                    [12]
                   05  008C   547          RSB                             ;                                   [12]
                       008D   548
              8E   7C  008D   549 20$:     ClrQ    (SP)+                   ; Release the buffer on the stack   [28]
                       008F   550          $Print  -                       ; Error, attempt to SET WIDTH       [28]
                       008F   551                    #DS$K_Type_Command_Err, -     ; ...for mbx output         [28]
                       008F   552                    #DS$K_PrintF, -       ; ... use PrintF to print it        [28]
                       008F   553                    T_OUT_IS_MBX          ; ... the message                   [28]
     0000006D'EF   9F  008F                          PUSHAB  T_OUT_IS_MBX
         7E   01   9A  0095                          movzbl  #DS$K_PrintF, -(sp)
         7E   15   98  0098                          cvtbl   #DS$K_Type_Command_Err, -(sp)
00000000'GF   03   FB  009B                          CALLS   #$$N+2, G^DSX$PRINT
              50   D4  00A2   554          CLRL    R0                      ; Return failure                    [28]
                   05  00A4   555          RSB                             ;                                   [28]
                       00A5   556
```

```
                     00A5   558          .SBTTL  VRShowWidth Routine - Show terminal width      ;                [12]
                     00A5   559
                     00A5   560 ;++                                                                             [12]
                     00A5   561 ; VRSHOWWIDTH                                                                   [12]
                     00A5   562 ;                                                                               [12]
                     00A5   563 ; Functional description:                                                       [12]
                     00A5   564 ;                                                                               [12]
                     00A5   565 ;       This is a CLI command routine.  It prints the current DS$GB_WIDTH.      [12]
                     00A5   566 ;                                                                               [12]
                     00A5   567 ; Calling sequence:                                                             [12]
                     00A5   568 ;                                                                               [12]
                     00A5   569 ;       JSB     VRSHOWWIDTH                                                     [12]
                     00A5   570 ;                                                                               [12]
                     00A5   571 ; Input Parameters:                                                             [12]
                     00A5   572 ;                                                                               [12]
                     00A5   573 ;       none                                                                    [12]
                     00A5   574 ;                                                                               [12]
                     00A5   575 ; Implicit Inputs:                                                              [12]
                     00A5   576 ;                                                                               [12]
                     00A5   577 ;       none                                                                    [12]
                     00A5   578 ;                                                                               [12]
                     00A5   579 ; Output parameters:                                                            [12]
                     00A5   580 ;                                                                               [12]
                     00A5   581 ;       none                                                                    [12]
                     00A5   582 ;                                                                               [12]
                     00A5   583 ; Implicit outputs:                                                             [12]
                     00A5   584 ;                                                                               [12]
                     00A5   585 ;       none                                                                    [12]
                     00A5   586 ;                                                                               [12]
                     00A5   587 ; Side effects:                                                                 [12]
                     00A5   588 ;                                                                               [12]
                     00A5   589 ;       none                                                                    [12]
                     00A5   590 ;                                                                               [12]
                     00A5   591 ; Completion codes:                                                             [12]
                     00A5   592 ;                                                                               [12]
                     00A5   593 ;       1       success                                                         [12]
                     00A5   594 ;--                                                                             [12]
```

```
                                00A5   596 VRSHOWWIDTH::                                  ;                                        [12]
      50   00000002'EF    9A    00A5   597         MovZBL  L^DS$GB_Width, R0              ; Put the current width in R0            [16]
                                00AC   598         $Print  -                              ; Print with a typecode                  [16]
                                00AC   599                   #DS$K_Type_Command_Out, -      ; ... the typecode number          [16]
                                00AC   600                   #DS$K_PrintF, -              ; ... the type of print routine          [16]
                                00AC   601                   T_Show_Width, -              ; ... the format message                 [16]
                                00AC   602                   R0                           ; ... and the width                      [16]
                     50    DD    00AC                     PUSHL   R0
           00000048'EF    9F    00AE                     PUSHAB  T_Show_Width
                 7E   01    9A    00B4                     movzbl  #DS$K_PrintF, -(sp)
                 7E   16    98    00B7                     cvtbl   #DS$K_Type_Command_Out, -(sp)
      00000000'GF    04    FB    00BA                     CALLS   #$$N+2, G^DSX$PRINT
                                00C1   603
                 50   01    D0    00C1   604         MOVL    #1, R0                         ; Set success                            [12]
                           05    00C4   605         RSB                                    ;                                        [12]
```

```
                     607          .SBTTL  KB_Poll Routine - Keyboard ready bit check
00C5                 608 ;++
00C5                 609 ; FUNCTIONAL DESCRIPTION:
00C5                 610 ;
00C5                 611 ;       THIS ROUTINE CHECKS THE 'READY' BIT IN THE CONSOLE'S STATUS
00C5                 612 ;       REGISTER AND, IF CLEAR, RETURNS TO THE CALLING ROUTINE.
00C5                 613 ;       If no character is ready this returns immediately.
00C5                 614 ;       Select one of the following based on the character typed:
00C5                 615 ;       ^C      clear local flags and set the global ^C flag
00C5                 616 ;               set ^O flag to suppress output until ^C is serviced by KB_CHECK
00C5                 617 ;       ^O      toggle the ^O bit (output may be flushed based on this bit)
00C5                 618 ;       ^S      SET CONSFLG FLAG TO SUSPEND TERMINAL OUTPUT
00C5                 619 ;       ^Q      CLEAR CONSFLG FLAG TO RESUME TERMINAL OUTPUT IF ANY
00C5                 620 ;       ^C      WILL ALSO CLEAR CONSFLG FLAG.
00C5                 621 ;       Else,   echo the character as a <BELL>
00C5                 622 ;
00C5                 623 ; CALLING SEQUENCE:
00C5                 624 ;
00C5                 625 ;       SUBROUTINE CALL.
00C5                 626 ;
00C5                 627 ; INPUT PARAMETERS:
00C5                 628 ;
00C5                 629 ;       NONE
00C5                 630 ;
00C5                 631 ; IMPLICIT INPUTS:
00C5                 632 ;
00C5                 633 ; OUTPUT PARAMETERS:
00C5                 634 ;
00C5                 635 ;       DS$GL_FLAGS<DS$V_CTRLC>         = ^C FLAG.
00C5                 636 ;
00C5                 637 ; IMPLICIT OUTPUTS:
00C5                 638 ;
00C5                 639 ;       NONE
00C5                 640 ;
00C5                 641 ; COMPLETION CODES:
00C5                 642 ;
00C5                 643 ;       NONE
00C5                 644 ;
00C5                 645 ; SIDE EFFECTS:
00C5                 646 ;
00C5                 647 ;       NONE
00C5                 648 ;--
```

```
                          00C5   650 KB_POLL::
                03   BB   00C5   651          PUSHR   #^M<R0,R1>                ; SAVE R0 & R1.
                          00C7   652          CMK     RCONSOLE
                7E   DC   00C7               MOVPSL  -(SP)
         06 6E  1A   E0   00C9               BBS     #PSL$V_IS, (SP), 30000$
                8E   D4   00CD               CLRL    (SP)+
                01   BC   00CF               CHMK    #CMK$_RCONSOLE
                06   11   00D1               BRB     30001$
       00000132'EF   16   00D3       30000$: JSB     CMK$RCONSOLE
                          00D9       30001$:
                          00D9   653
         1C 50  07   E1   00D9   654          BBC     #7,R0,KB_POLL_X           ; EXIT IF NO CHARACTER
                          00DD   655
            51  11   91   00DD   656          CMPB    #CNTRLQ,R1
                17   13   00E0   657          BEQL    KB_POLL_X                 ; SKIP ECHO IF CONTROL Q
                0F   19   00E2   658          BLSS    10$                       ; SKIP FOR SPEED OPTIMIZATION
                          00E4   659
            51  03   91   00E4   660          CMPB    #CNTRLC,R1
                10   13   00E7   661          BEQL    KB_POLL_X                 ; SKIP ECHO IF CONTROL-C
                          00E9   662
            51  0F   91   00E9   663          CMPB    #CNTRLO,R1
                0B   13   00EC   664          BEQL    KB_POLL_X                 ; SKIP ECHO IF CONTROL-O
                          00EE   665
            51  13   91   00EE   666          CMPB    #CNTRLS,R1
                06   13   00F1   667          BEQL    KB_POLL_X                 ; SKIP ECHO IF CONTROL S
                          00F3   668
            51  07   D0   00F3   669 10$:     MOVL    #BELL,R1                  ; ECHO A BELL.
               017A   30   00F6   670          BSBW    OUT_ECHO                  ; TYPE IT OUT
                          00F9   671
                          00F9   672 KB_POLL_X:
                03   BA   00F9   673          POPR    #^M<R0,R1>                ; RESTORE R0 & R1.
                     05   00FB   674          RSB                               ; RETURN.
```

```
                        00FC    676          .SBTTL  RInput Routine - Flag driven terminal input
                        00FC    677 ;++
                        00FC    678 ; FUNCTIONAL DESCRIPTION:
                        00FC    679 ;
                        00FC    680 ;       This routine returns a character from the console terminal.
                        00FC    681 ;       The associated interrupt routine CMK$RCONSOLE checks the
                        00FC    682 ;       the character and sets or cleas flags for ^S, ^Q, ^O.
                        00FC    683 ;
                        00FC    684 ; CALLING SEQUENCE:
                        00FC    685 ;
                        00FC    686 ;       BSBW    RINPUT
                        00FC    687 ;
                        00FC    688 ; INPUT PARAMETERS:
                        00FC    689 ;
                        00FC    690 ;       NONE
                        00FC    691 ;
                        00FC    692 ; IMPLICIT INPUTS:
                        00FC    693 ;
                        00FC    694 ;       NONE
                        00FC    695 ;
                        00FC    696 ; OUTPUT PARAMETERS:
                        00FC    697 ;
                        00FC    698 ;       NONE
                        00FC    699 ;
                        00FC    700 ; IMPLICIT OUTPUTS:
                        00FC    701 ;
                        00FC    702 ;       NONE
                        00FC    703 ;
                        00FC    704 ; COMPLETION CODES:
                        00FC    705 ;
                        00FC    706 ;       NONE
                        00FC    707 ;
                        00FC    708 ; SIDE EFFECTS:
                        00FC    709 ;
                        00FC    710 ;       NONE
                        00FC    711 ;--
```

```
                                00FC   713 RINPUT:                                  ; KEYBOARD INPUT ROUTINE.
      00000000'EF    17    E5   00FC   714          BBCC    S^#DS$V_OUTPUT, -
                     03         0103   715                   L^DS$GL_FLAGS, 10$     ; Branch if no asynch output, clear flag
                   00ED    30   0104   716          BSBW    RTYPE                   ; Re-type input line
                                0107   717
                                0107   718 10$:     CMK     RCONSOLE                ; READ KEYBOARD.
                     7E    DC   0107                MOVPSL  -(SP)
            06 6E    1A    E0   0109                BBS     #PSL$V_IS, (SP), 30002$
                     8E    D4   010D                CLRL    (SP)+
                     01    BC   010F                CHMK    #CMK$_RCONSOLE
                     06    11   0111                BRB     30003$
          00000132'EF      16   0113        30002$: JSB     CMK$RCONSOLE
                                0119        30003$:
            DF 50    07    E1   0119   719          BBC     #7,R0,RINPUT            ; TRY AGAIN IF NOTHING THERE
   00'8F   00000000'EF      91   011D   720          CMPB    DS$GB_SYSTYPE,#PR$_SYS_TYP800 ; Is it AURORA cpu ? [29][35]   ;G:3
                     07    13   0125   721          BEQL    20$                     ; Don't check if AURORA. Prevent hangs. [29]
     00   51   04    08    ED   0127   722          CMPZV   #8,#4,R1,#0             ; CONSOLE DATA?
                     CE    12   012C   723          BNEQ    RINPUT                  ; NO, IGNORE IT
               50    51    D0   012E   724 20$:     MOVL    R1,R0                   ; COPY CHARACTER
                                0131   725
                                0131   726 RINPUTX:                                ; ROUTINE EXIT POINT.
                           05   0131   727          RSB                             ; RETURN TO CALLING ROUTINE
                                0132   728
                                0132   729 CMK$RCONSOLE::
                     51    D4   0132   730 10$:     CLRL    R1                      ; INITIALIZE R1.                        [19]
                                0134   731
               50    20    DB   0134   732 20$:     MFPR    #PR$_RXCS, R0           ; GET KEYBOARD STATUS.
            03 50    07    E0   0137   733          BBS     #7, R0, 30$             ;
                   00B5    31   013B   734          BRW     140$                    ; No character, exit
                                013E   735
               51    21    DB   013E   736 30$:     MFPR    #PR$_RXDB, R1           ; INPUT CHARACTER.
            EF 51    0F    E0   0141   737          BBS     #15,R1,20$              ; Error on character, try again.
                                0145   738
   00'8F   00000000'EF      91   0145   739 60$:     CMPB    DS$GB_SYSTYPE,#PR$_SYS_TYP800 ; Is it AURORA cpu ? [29][35]   ;G:3
                     0A    13   014D   740          BEQL    70$                     ; DON'T check if aurora. Allow ^C etc   [32]
          51   0F00 8F    B3   014F   741          BITW    #^XF00,R1               ; Is this a console character?
                     03    13   0154   742          BEQL    70$                     ; Yes
                   009A    31   0156   743          BRW     140$                    ; No - just REI
                                0159   744
     51   51   07    00    EF   0159   745 70$:     EXTZV   #0,#7,R1,R1             ; Remove parity and garbage
               51    03    91   015E   746          CMPB    #CNTRLC,R1              ; CONTROL-C?
                     4B    12   0161   747          BNEQ    100$                    ; Check next
          00000003'EF      94   0163   748          CLRB    CONSFLG                 ; RESUME PRINTING ON ^C
                                0169   749
                                0169   750          Br_If_Ctrl_C_No_Echo    80$    ; If not echoing ^C's, skip around      [19]
      00000000'EF    01    E0   0169                BBS     #CRD$V_Ctrl_C_No_Echo, -        ; If bit set, branch
                     20         0170                          L^DS$GL_CRD_Flags, 80$        ;
                     03    BB   0171   751          PUSHR   #^M<R0,R1>              ; Save flag and character
     50   00000000'EF      9E   0173   752          MOVAB   T_CNTRLC,R0             ; ASCIC <NL>^C<NL>
                   00AF    30   017A   753          BSBW    OUT_CNTRL               ; Type it
                     03    BA   017D   754          POPR    #^M<R0,R1>              ; Restore
                                017F   755          Set_CtrlO                       ; Set ^O flag                           [16]
      00000000'EF    10    E2   017F                BBSS    #DS$V_CtrlO, -          ; Branch if CTRLO bit is set to
                     00         0186                          L^DS$GL_Flags, 30004$ ; ...
                                0187        30004$:                                 ; ... here. Set bit regardless.
                                0187   756          Set_CtrlC                       ; Set ^C flag                           [16]
      00000000'EF    00    E2   0187                BBSS    #DS$V_CtrlC, -          ; Branch if CTRLC bit is set to
```

```
                      00        018E                          L^DS$GL_Flags, 30005$ ; ...
                                018F              30005$:                           ; ... here. Set bit regardless.
                      62   11   018F    757               BRB     140$               ; Return Control C character
                                0191    758
                                0191    759 80$:          ; We are not echoing ^C's. Now check to see if we are allowing ^C as a  [19]
                                0191    760               ; valid character. If we are not, then go back up and see if there is   [19]
                                0191    761               ; another character there.                                              [19]
                                0191    762
                                0191    763               Br_If_Not_Flush_Ctrl_C  90$
00000000'EF           02   E1   0191                      BBC     #CRD$V_Flush_Ctrl_C, -          ; If bit not set, branch        [35]
                      03        0198                        L^DS$GL_CRD_Flags, 90$      ;                                       [35]
                    FF96   31   0199    764               BRW     10$                ; If flushing, return with no character [19]
                                019C    765 90$:          Set_Flush_Ctrl_C           ; Not currently flushing -> start now,  [19]
00000000'EF           02   E2   019C                      BBSS    #CRD$V_Flush_Ctrl_C, -  ; Branch if FLUSH_CTRL_C bit is set to
                      00        01A3                        L^DS$GL_CRD_Flags, 30006$     ; ...
                                01A4              30006$:                           ; ... here. Set bit regardless.
                                01A4    766               Set_CtrlC                  ; . . . set ^C flag, and                [19]
00000000'EF           00   E2   01A4                      BBSS    #DS$V_CtrlC, -          ; Branch if CTRLC bit is set to
                      00        01AB                        L^DS$GL_Flags, 30007$ ; ...
                                01AC              30007$:                           ; ... here. Set bit regardless.
                      45   11   01AC    767               BRB     140$               ; . . . return with the ^C character    [19]
                                01AE    768
                                01AE    769 100$:         Clear_Flush_Ctrl_C         ; This is not a ^C - stop flushing now  [19]
00000000'EF           02   E4   01AE                      BBSC    #CRD$V_Flush_Ctrl_C, -  ; Branch if FLUSH_CTRL_C bit is set to
                      00        01B5                        L^DS$GL_CRD_Flags, 30008$     ; ...
                                01B6              30008$:                           ; ... here. Clear bit regardless.
                   51   13   91   01B6    770               CMPB    #CNTRLS,R1         ; CONTROL-S ?
                      09   12   01B9    771               BNEQ    110$               ; NO, NEXT
            00000003'EF    01   88   01BB    772               BISB    #1,CONSFLG         ; STOP PRINTING
                      2D   11   01C2    773               BRB     130$               ; Flush and exit
                                01C4    774
                   51   11   91   01C4    775 110$:         CMPB    #CNTRLQ,R1         ; CONTROL-Q ?
                      08   12   01C7    776               BNEQ    120$               ; NO EXIT
                00000003'EF    94   01C9    777               CLRB    CONSFLG            ; RESUME PRINTING
                      20   11   01CF    778               BRB     130$               ; Flush and exit
                                01D1    779
                   51   0F   B1   01D1    780 120$:         CMPW    #CNTRLO,R1         ; CONTROL O?
                      1D   12   01D4    781               BNEQ    140$               ; NO
                00000003'EF    94   01D6    782               CLRB    CONSFLG            ; RESUME PRINTING ON CONTROL O
             50 0000000F'EF    9E   01DC    783               MOVAB   T_CNTRLO,R0        ; ECHO STRING FOR CNTRLO
                      0046   30   01E3    784               BSBW    OUT_CNTRL          ; TYPE IT
00000000'EF   00010000 8F    CC   01E6    785               XORL2   #DS$M_CTRLO,DS$GL_FLAGS ; TOGGLE ^O FLAG
                                01F1    786
                      50   7C   01F1    787 130$:         CLRQ    R0                 ; Set to no character found
                                01F3    788
                           02   01F3    789 140$:         REI                        ; Return from interrupt
```

```
                        01F4    791          .SBTTL  RType Routine - Retype input line ('^R' function)
                        01F4    792 ;++
                        01F4    793 ; Functional description:
                        01F4    794 ;
                        01F4    795 ;       Cause a linefeed-carriage return, echo prompt and whatever characters
                        01F4    796 ;       have been read so far from the terminal on the current line.
                        01F4    797 ;
                        01F4    798 ; Implicit inputs:
                        01F4    799 ;
                        01F4    800 ;       R2              count of characters input
                        01F4    801 ;       QIO$_P5(AP)     prompt length/pointer from $QIO argument list
                        01F4    802 ;       QIO$_P1(AP)     pointer to input buffer
                        01F4    803 ;
                        01F4    804 ; Side effects:
                        01F4    805 ;
                        01F4    806 ;       If this routine is interrupted, and output to terminal occurs, the
                        01F4    807 ;       routine will restart itself--repeatedly if necessary, until the line
                        01F4    808 ;       is output completely.
                        01F4    809 ;--
```

```
                    38   BB   01F4   811 RTYPE:  PUSHR   #^M<R3,R4,R5>            ; Save registers
          55  00000000'EF   9E   01F6   812        MOVAB   L^DS$GL_FLAGS, R5       ; Save pointer to flags longword
                          01FD   813
          50  00000014'EF   9E   01FD   814 10$:   MOVAB   T_CRLF, R0              ; Type <CR><LF>
                    4D   10   0204   815        BSBB    OUT_ASCIC
               53   2C   AC   7D   0206   816        MOVQ    QIO$_P5(AP), R3         ; Get prompt descriptor (ADDRESS/LENGTH)
                          020A   817
                  51   83   9A   020A   818 20$:   MOVZBL  (R3)+, R1               ; Get next character of prompt
               EC 65   17   E4   020D   819        BBSC    S^#DS$V_OUTPUT,(R5),10$ ; Re-start if asynch typeout
                    55   10   0211   820        BSBB    OUT_CHAR                ; Type it out
                     F4 54   F5   0213   821        SOBGTR  R4, 20$                 ; Loop to end of prompt
               54    1C   BC   9E   0216   822        MOVAB   @QIO$_P1(AP), R4        ; Point to buffer
                  53   52   D0   021A   823        MOVL    R2, R3                  ; Copy length
                          021D   824
                  51   84   9A   021D   825 30$:   MOVZBL  (R4)+, R1               ; Get next character
               D9 65   17   E4   0220   826        BBSC    S^#DS$V_OUTPUT,(R5),10$ ; Re-start if asynch typeout
                    42   10   0224   827        BSBB    OUT_CHAR                ; Type it
                     F4 53   F5   0226   828        SOBGTR  R3, 30$                 ; Loop to end of line
                    38   BA   0229   829        POPR    #^M<R3,R4,R5>           ; Restore registers
                         05   022B   830        RSB                             ; Return
```

```
                        832          .SBTTL  Out Routines - Flag driven terminal output
                        833 ;++
                        834 ; FUNCTIONAL DESCRIPTION:
                        835 ;
                        836 ;       OUT_CNTRL       Print out control character echo with low overhead
                        837 ;       OUT_ASCIC       OUTPUT ASCIC STRING R0=ADDRESS
                        838 ;       OUT_STRING      OUTPUT STRING R0=ADDRESS, R1=LENGTH
                        839 ;       CHAR_OUTPUT     OUTPUT CHARACTER R1=CHARACTER
                        840 ;       CHAR_ECHO       OUTPUT CHARACTER R1=CHARACTER, IGNORE ^O
                        841 ;
                        842 ; CALLING SEQUENCE:
                        843 ;
                        844 ;       NONE
                        845 ;
                        846 ; INPUT PARAMETERS:
                        847 ;
                        848 ;       NONE
                        849 ;
                        850 ; IMPLICIT INPUTS:
                        851 ;
                        852 ;       NONE
                        853 ;
                        854 ; OUTPUT PARAMETERS:
                        855 ;
                        856 ;       NONE
                        857 ;
                        858 ; IMPLICIT OUTPUTS:
                        859 ;
                        860 ;       NONE
                        861 ;
                        862 ; COMPLETION CODES:
                        863 ;
                        864 ;       NONE
                        865 ;
                        866 ; SIDE EFFECTS:         NONE
                        867 ;--
```

```
                                 022C   OUT_CNTRL:
                      52   DD    022C           PUSHL   R2                      ; Save register 2
                 52   80   9A    022E           MOVZBL  (R0)+,R2                ; Get length
                                 0231
                 51   80   9A    0231   10$:    MOVZBL  (R0)+,R1                ; Get character
                                 0234           CMK     TCONSOLE                ; Type character
                      7E   DC    0234           MOVPSL  -(SP)
              06 6E   1A   E0    0236           BBS     #PSL$V_IS, (SP), 30009$
                      8E   D4    023A           CLRL    (SP)+
                      02   BC    023C           CHMK    #CMK$_TCONSOLE
                      06   11    023E           BRB     30010$
           000002EE'EF     16    0240   30009$: JSB     CMK$TCONSOLE
                                 0246   30010$:
                 E8 52   F5      0246           SOBGTR  R2,10$                  ; Loop
           00000000'EF   94      0249           CLRB    COLUMN                  ; Control char. echo ends with <CR><LF>
                      52 8ED0    024F           POPL    R2                      ; Restore register
                         05      0252           RSB                             ; Return
                                 0253
                                 0253   OUT_ASCIC:
                 51   80   9A    0253           MOVZBL  (R0)+,R1                ; GET LENGTH
                                 0256
                                 0256   OUT_STRING:
                      04   BB    0256           PUSHR   #^MR2                   ; SAVE
                 52   51   D0    0258           MOVL    R1,R2                   ; COPY LENGTH
                      08   15    025B           BLEQ    20$                     ; START WITH COUNT
                                 025D
                 51   80   9A    025D   10$:    MOVZBL  (R0)+,R1                ; GET CHARACTER
                      06   10    0260           BSBB    OUT_CHAR                ; OUTPUT A CHARACTER
                 F8 52   F5      0262           SOBGTR  R2,10$                  ; NEXT
                                 0265
                      04   BA    0265   20$:    POPR    #^MR2                   ; RESTORE
                         05      0267           RSB
                                 0268
                                 0268   OUT_CHAR:                               ; TELETYPE OUTPUT ROUTINE.
                 FE5A   30       0268           BSBW    KB_POLL                 ; Check for ^C and ^O
                                 026B           Br_If_Ctrl0     Out_CharX       ; Exit if ^O in effect                [16]
       00000000'EF   10   E0     026B           BBS     #DS$V_Ctrl0, -                  ; If bit set, branch
                      7A         0272                     L^DS$GL_Flags, Out_CharX                ;
                                 0273
                                 0273   OUT_ECHO:
                                 0273           Br_If_Not_APT   5$              ; Branch around if not in APT mode    [16]
       0000FE00'EF   1F   E1     0273           BBC     #DSA$V_Apt, -                   ; If bit not set, branch
                      08         027A                     L^DSA$GL_Flags, 5$              ;
       0000FE00'EF   1B   E0     027B           BBS     #DSA$V_NORPT, -
                      6A         0282                     DSA$GL_FLAGS,OUT_CHARX; BRANCH IF REPORT DISABLED ?
                                 0283
         05 00000003'EF   E9     0283   5$:     BLBC    CONSFLG,10$             ; BRANCH IF CONTROL S NOT ON
                 FE38   30       028A           BSBW    KB_POLL                 ; WAIT FOR CONTROL Q OR CONTROL C
                      F4   11    028D           BRB     5$
                                 028F
                 51   0D   91    028F   10$:    CMPB    #CR,R1                  ; CARRIAGE RETURN ?
                      06   12    0292           BNEQ    20$                     ; NO -
           00000000'EF   94      0294           CLRB    COLUMN                  ; INIT COLUMN COUNT
                                 029A
00000002'EF  00000000'EF   91    029A   20$:    CMPB    COLUMN, DS$GB_WIDTH     ; Have we passed width limit?         [15]
                      0E   1F    02A5           BLSSU   25$                     ; (Must be unsigned) No, continue     [12]
                      07   BB    02A7           PUSHR   #^M<R0,R1,R2>           ; Save registers                      [12]
```

```
                50   00000014'EF   9E   02A9   915          MOVAB   T_CRLF, R0                ; Yes, Type CRLF, reset COLUMN          [12]
                          FFA0   30   02B0   916          BSBW    OUT_ASCIC                  ;                                       [12]
                            07   BA   02B3   917          POPR    #^M<R0,R1,R2>              ; Restore                               [12]
                                      02B5   918
                                      02B5   919 25$:                                        ;                                       [12]
                        51  09   91   02B5   920          CMPB    #TAB,R1                    ; CHARACTER = TAB
                            0F   12   02B8   921          BNEQ    50$                        ; NO -
                        51  20   9A   02BA   922          MOVZBL  #SPACE,R1                  ; SPACE
                                      02BD   923
                            0A   10   02BD   924 30$:     BSBB    50$                        ; OUTPUT A SPACE
                00000000'EF 07   93   02BF   925          BITB    #7,COLUMN                  ; ALIGNED ON MULT OF 8 BOUNDRY?
                            F5   12   02C6   926          BNEQ    30$                        ; NO, OUTPUT ANOTHER SPACE
                                 05   02C8   927          RSB                                ; YES, RETURN
                                      02C9   928
                        51  1F   91   02C9   929 50$:     CMPB    #31,R1                     ; Control character?
                            06   18   02CC   930          BGEQ    60$                        ; Not Horizontal motion if control char
                00000000'EF 96   02CE   931          INCB    COLUMN                     ; Inc position
                                      02D4   932
                00000001'EF 51   90   02D4   933 60$:     MOVB    R1,LASTCHAR                ; Save character to be saved
                                      02DB   934          CMK     TCONSOLE
                            7E   DC   02DB              MOVPSL  -(SP)
                     06 6E  1A   E0   02DD              BBS     #PSL$V_IS, (SP), 30011$
                            8E   D4   02E1              CLRL    (SP)+
                            02   BC   02E3              CHMK    #CMK$_TCONSOLE
                            06   11   02E5              BRB     30012$
                000002EE'EF 16   02E7          30011$: JSB     CMK$TCONSOLE
                                      02ED          30012$:
                                      02ED   935
                                      02ED   936 OUT_CHARX:
                05                    02ED   937          RSB                                ; RETURN TO CALLING ROUTINE.
                                      02EE   938
```

```
                        02EE   940 CMK$TCONSOLE::                          ; TELETYPE OUTPUT ROUTINE.
            01    BB    02EE   941          PUSHR   #^M<R0>                 ; Save registers                [25][34]
                        02F0   942
      50    22    DB    02F0   943 10$:     MFPR    #PR$_TXCS, R0           ; GET PRINTER STATUS.
   F9 50    07    E1    02F3   944          BBC     #7, R0, 10$             ; WAIT FOR PRINTER READY BIT.
      23    51    DA    02F7   945          MTPR    R1, #PR$_TXDB           ; OUTPUT CHARACTER.
            01    BA    02FA   946          POPR    #^M<R0>                 ; Restore                       [25][34]
                  02    02FC   947          REI                             ; RETURN TO CALLING ROUTINE.
                        02FD   948
```

```
                        02FD    950          .SBTTL  WriteVBlk Routine - Console write driver
                        02FD    951 ;++
                        02FD    952 ; FUNCTIONAL DESCRIPTION:
                        02FD    953 ;
                        02FD    954 ;       PERFORMS AN OUTPUT TO THE CONSOLE OF AN ASCII STRING.
                        02FD    955 ;
                        02FD    956 ; CALLING SEQUENCE:
                        02FD    957 ;
                        02FD    958 ;       CASE FROM QIO.
                        02FD    959 ;
                        02FD    960 ; INPUT PARAMETERS:
                        02FD    961 ;
                        02FD    962 ;       QIO$_EFN(AP)    = QIO EVENT FLAG NUMBER.
                        02FD    963 ;       QIO$_P1(AP)     = ADDRESS OF ASCII STRING.
                        02FD    964 ;       QIO$_P2(AP)     = LENGTH OF ASCII STRING.
                        02FD    965 ;
                        02FD    966 ; IMPLICIT INPUTS:
                        02FD    967 ;
                        02FD    968 ;       NONE
                        02FD    969 ;
                        02FD    970 ; OUTPUT PARAMETERS:
                        02FD    971 ;
                        02FD    972 ;       NONE
                        02FD    973 ;
                        02FD    974 ; IMPLICIT OUTPUTS:
                        02FD    975 ;
                        02FD    976 ;       NONE
                        02FD    977 ;
                        02FD    978 ; COMPLETION CODES:
                        02FD    979 ;
                        02FD    980 ;       NONE
                        02FD    981 ;
                        02FD    982 ; SIDE EFFECTS:
                        02FD    983 ;
                        02FD    984 ;       NONE
                        02FD    985 ;--
```

```
                                02FD   987 WRITEVBLK::
        08 0C AC    00'   E1    02FD   988          BBC     S^#IO$V_CANCTRLO, -
                                0302   989                  QIO$_FUNC(AP),10$        ; Branch if no Cancel Control O
                                0302   990          Clear_CtrlO                      ; Clear the ^O flag                    [16]
   00000000'EF      10    E4    0302                BBSC    #DS$V_CtrlO, -           ; Branch if CTRLO bit is set to
                    00          0309                          L^DS$GL_Flags, 30013$  ; ...
                                030A        30013$:                                  ; ... here. Clear bit regardless.
                                030A   991
           50    1C AC    7D    030A   992 10$:     MOVQ    QIO$_P1(AP), R0          ; GET ADDRESS/LENGTH OF ASCII STRING.
                  FF45    30    030E   993          BSBW    OUT_STRING               ; OUTPUT THE STRING
                                0311   994          $SETEF_G        (AP)
   00000000'GF      6C    FA    0311                        CALLG   (AP),G^SYS$SETEF
                          05    0318   995          RSB
                                0319   996 ;        RET                              ; RETURN TO ENTRY VECTOR.       [30]
```

```
0319   998          .SBTTL  ReadVBlk Routine - Console read driver
0319   999 ;++
0319  1000 ; FUNCTIONAL DESCRIPTION:
0319  1001 ;
0319  1002 ;       THE ROUTINE INPUTS CHARACTERS FROM THE TELETYPE AND STORES THEM
0319  1003 ;       IN THE BUFFER.  IT HANDLES "DELETE", "^U", "^C", "^R", AND
0319  1004 ;       "HYPHEN_CARRTN".
0319  1005 ;
0319  1006 ; CALLING SEQUENCE:
0319  1007 ;
0319  1008 ;       CASE FROM QIO.
0319  1009 ;
0319  1010 ; INPUT PARAMETERS:
0319  1011 ;
0319  1012 ;       QIO$_FUNC(AP)    = FUNCTION EITHER IO$_READVBLK OR IO$_READPROMPT
0319  1013 ;       QIO$_P1(AP)      = ADDRESS OF THE BEGINNING OF THE BUFFER.
0319  1014 ;       QIO$_IOSB(AP)    = ADDRESS TO HOLD LENGTH OF INPUT LINE
0319  1015 ;       QIO$_P2(AP)      = LENGTH IN BYTES ALLOWED FOR THE BUFFER.
0319  1016 ;       QIO$_P4(AP)      = OPTIONAL ADDR. OF TERMINATOR DESCRIPTOR.      [17]
0319  1017 ;
0319  1018 ; IMPLICIT INPUTS:
0319  1019 ;
0319  1020 ;       NONE
0319  1021 ;
0319  1022 ; OUTPUT PARAMETERS:
0319  1023 ;
0319  1024 ;       R1 = LENGTH OF LINE INPUT
0319  1025 ;       SUCCESS INDICATOR IN R0, R0 = 0 IF '?' TYPED ELSE R0 = 1
0319  1026 ;
0319  1027 ; IMPLICIT OUTPUTS:
0319  1028 ;
0319  1029 ;       NONE
0319  1030 ;
0319  1031 ; COMPLETION CODES:
0319  1032 ;
0319  1033 ;       NONE
0319  1034 ;
0319  1035 ; SIDE EFFECTS:
0319  1036 ;
0319  1037 ;       NONE
0319  1038 ;--
```

```
                                0319  1040 PREADVBLK::
                                0319  1041 READVBLK::
00000000'EF   00810000 8F   CA  0319  1042          BICL2   #DS$M_CTRLO ! DS$M_OUTPUT, -
                                0324  1043                   DS$GL_FLAGS             ; Clear ^O and output flag
            0C AC   00'8F   91  0324  1044          CMPB    #IO$_READPROMPT,QIO$_FUNC(AP) ; READ W/PROMPT?
                          22  12  0329  1045          BNEQ    10$                     ; Branch if not
                00000000'EF  95  032B  1046          TSTB    COLUMN                  ; At left margin?
                          13  12  0331  1047          BNEQ    6$                      ; Branch if not
                00000001'EF  0A  91  0333  1048          CMPB    #LF,LASTCHAR            ; Was last char a LF?
                          0A  13  033A  1049          BEQL    6$                      ; Branch if so
                              033C  1050
                50  00000014'EF  9E  033C  1051 3$:      MOVAB   T_CRLF,R0               ; Output CRLF
                        FF0D  30  0343  1052          BSBW    OUT_ASCIC               ; Type it
                              0346  1053
                     50 2C AC   7D  0346  1054 6$:      MOVQ    QIO$_P5(AP),R0          ; GET ADDRESS,LENGTH OF PROMPT
                        FF09  30  034A  1055          BSBW    OUT_STRING              ; AND TYPE IT
                              034D  1056
                     53 1C BC   9E  034D  1057 10$:     MOVAB   aQIO$_P1(AP), R3        ; SET BUFFER POINTER IN R3
                          52  D4  0351  1058          CLRL    R2                      ; INITIALIZE BYTE COUNTER IN R2
                              0353  1059
                        FDA6  30  0353  1060 20$:      BSBW    RINPUT                  ; GO GET A CHARACTER
                              0356  1061          Clear_CtrlO                     ; Clear the ^O flag                     [16]
                00000000'EF  10  E4  0356                  BBSC    #DS$V_CtrlO, -          ; Branch if CTRLO bit is set to
                          00  0359                            L^DS$GL_Flags, 30014$ ; ...
                              035E        30014$:                                 ; ... here. Clear bit regardless.
                     50 80 8F   8A  035E  1062          BICB2   #PARITY, R0             ; CLEAR PARITY BIT
                00000004'EF  0C  E1  0362  1063          BBC     #TT$V_SCOPE, -          ; Scope or hardcopy terminal?           [26]
                          4D  0369  1064                  DS$GL_TERMCHAR+4,25$
                              036A  1065                                              ; Scope                                 [26]
                     50 7F 8F   91  036A  1066          CMPB    #DELETE, R0             ; IS THIS "DELETE"                      [26]
                          7D  12  036E  1067          BNEQU   60$                     ; BRANCH IF NOT                         [26]
                          52  D5  0370  1068          TSTL    R2                      ; IS THIS BEGINNING OF BUFFER           [26]
                          03  12  0372  1069          BNEQ    23$                     ; BRANCH IF NOT BEGINNING               [26]
                        0132  31  0374  1070          BRW     140$                    ; GO TYPE BELL IF BEGINNING             [26]
                              0377  1071
00000002'EF   00000000'EF   91  0377  1072 23$:      CMPB    COLUMN,DS$GB_WIDTH      ; At the end of the line?               ;G:6
                          13  1F  0382  1073          BLSSU   24$                     ; Branch if not                         ;G:6
                00000000'EF  02  82  0384  1074          SUBB2   #2,COLUMN               ; SP char increments COLUMN, so subtract[26]
                              038B  1075                                              ; 1 for that, another 1 for the char    [26]
                              038B  1076                                              ; we are deleting                       [26]
                          53  D7  038B  1077          DECL    R3                      ; Backup buffer pointer                 [37]
                     51   20  9A  038D  1078          MOVZBL  #SPACE,R1               ; Load space char                       [37]
                        FED5  30  0390  1079          BSBW    OUT_CHAR                ; Type space                            [37]
                          52  D7  0393  1080          DECL    R2                      ; Adjust character counter              [37]
                          BC  11  0395  1081          BRB     20$                     ; Get another character                 [37]
                00000000'EF  02  82  0397  1082 24$:      SUBB2   #2,COLUMN               ; SP char increments COLUMN, so subtract[26]
                              039E  1083                                              ; 1 for that, another 1 for the char    [26]
                              039E  1084                                              ; we are deleting                       [26]
                          53  D7  039E  1085          DECL    R3                      ; Backup buffer pointer                 [36]
                     51   08  9A  03A0  1086          MOVZBL  #BS,R1                  ; Load backspace char                   [26]
                        FEC2  30  03A3  1087          BSBW    OUT_CHAR                ; Type backspace                        [26]
                     51   20  9A  03A6  1088          MOVZBL  #SPACE,R1               ; Load space char                       [26]
                        FEBC  30  03A9  1089          BSBW    OUT_CHAR                ; Type space                            [26]
                     51   08  9A  03AC  1090          MOVZBL  #BS,R1                  ; Load backspace char                   [26]
                        FEB6  30  03AF  1091          BSBW    OUT_CHAR                ; Type backspace                        [26]
                          52  D7  03B2  1092          DECL    R2                      ; Adjust character counter              [26]
                        FF9C  31  03B4  1093          BRW     20$                     ; Get another character                 [26]
```

```
                                03B7
          50    7F 8F    91    03B7  25$:    CMPB    #DELETE, R0              ; IS THIS "DELETE"                          [26]
                  21    12    03BB          BNEQU   50$                      ; BRANCH IF NOT                             [26]
                  52    D5    03BD          TSTL    R2                       ; IS THIS BEGINNING OF BUFFER               [26]
                  03    12    03BF          BNEQ    30$                      ; BRANCH IF NOT BEGINNING                   [26]
                00E5    31    03C1          BRW     140$                     ; GO TYPE BELL IF BEGINNING                 [26]
                                03C4
  00000000'EF     05    E2    03C4  30$:    BBSS    #DS$V_RUBFLG, -          ; BRANCH IF BSLASH ALREADY TYPED
                  07          03CB                    DS$GL_FLAGS, 40$
          51    5C 8F    9A    03CC          MOVZBL  #BSLASH, R1              ; LOAD BACK SLASH INTO R1
                FE95    30    03D0          BSBW    OUT_CHAR                 ; TYPE BACK SLASH
                                03D3
          51      73    9A    03D3  40$:    MOVZBL  -(R3), R1                ; LOAD DELETED CHARACTER INTO R1
                FE8F    30    03D6          BSBW    OUT_CHAR                 ; TYPE DELETED CHARACTER
                  52    D7    03D9          DECL    R2                       ; ADJUST CHARACTER COUNTER
                FF75    31    03DB          BRW     20$                      ; GO GET ANOTHER CHARACTER                  ;G:6
                                03DE
  00000000'EF     05    E5    03DE  50$:    BBCC    #DS$V_RUBFLG, -          ; Branch if last char not "DEL"
                  07          03E5                    DS$GL_FLAGS, 60$
          51    5C 8F    9A    03E6          MOVZBL  #BSLASH, R1              ; LOAD BACK SLASH INTO R1
                FE7B    30    03EA          BSBW    OUT_CHAR                 ; TYPE BACK SLASH
                                03ED
          50      15    91    03ED  60$:    CMPB    #CNTRLU, R0              ; IS THIS CONTROL U
                  0D    12    03F0          BNEQU   70$                      ; BRANCH IF NOT
  50    00000007'EF     9E    03F2          MOVAB   L^T_CNTRLU,R0            ; ADDRESS OF TEXT                           [14]
                FE57    30    03F9          BSBW    OUT_ASCIC                ; TYPE IT
                FF1A    31    03FC          BRW     PREADVBLK                ; GO INITIALIZE BUFFER
                                03FF
          50      03    91    03FF  70$:    CMPB    #CNTRLC, R0              ; IS THIS CONTROL C
                  0D    12    0402          BNEQU   90$                      ; BRANCH IF NOT
          53      50    9A    0404          MOVZBL  R0, R3                   ; Set terminator character
                  52    D4    0407          CLRL    R2                       ; FLUSH BUFFER.
      50    0000'8F     3C    0409          MOVZWL  #SS$_CONTROLC,R0         ; SET RETURN CODE
                00AF    31    040E          BRW     170$
                                0411
          50      12    91    0411  90$:    CMPB    #CNTRLR, R0              ; IS THIS CONTROL R
                  17    12    0414          BNEQU   110$                     ; BRANCH IF NOT
                  52    D5    0416          TSTL    R2                       ; IS THIS BEGINNING OF BUFFER
                  03    12    0418          BNEQU   100$                     ; NO                                  [17]
                008C    31    041A          BRW     140$                     ; GO TYPE BELL IF BEGINNING           [17]
                                041D  100$:                                   ;                                     [17]
  50    0000000C'EF     9E    041D          MOVAB   L^T_CNTRLR,R0            ; OUTPUT "^R<CR>"                           [14]
                FE2C    30    0424          BSBW    OUT_ASCIC
                FDCA    30    0427          BSBW    RTYPE                    ; Re-type input line
                FF26    31    042A          BRW     20$                      ; BRANCH TO GET NEXT CHAR
                                042D
                                042D  110$:
                                042D  ;[23]   CMPB    #QUESTN, R0              ; IS THIS A QUESTION MARK
                                042D  ;[23]   BNEQU   120$                     ; BRANCH IF NOT
                                042D  ;[23]   MOVZBL  R0, R1                   ; OUTPUT QUESTION MARK
                                042D  ;[23]   BSBW    OUT_CHAR                 ; TYPE QUESTION MARk
                                042D  ;[23]   MOVZBL  R0, R3                   ; Set terminator character
                                042D  ;[23]   MOVL    #CR,R1                   ; RETURN THE CARRIAGE
                                042D  ;[23]   BSBW    OUT_CHAR
                                042D  ;[23]   CLRL    R0                       ; SET ERROR RETURN
                                042D  ;[23]   BRW     170$                     ; BRANCH TO EXIT                      [17]
                                042D
```

```
                50   0D   91   042D  1151 120$:   CMPB    #CR, R0                 ; IS THIS CARRIAGE RETURN
                     17   12   0430  1152         BNEQU   130$                    ; BRANCH IF NOT
                63   50   90   0432  1153         MOVB    R0,(R3)                 ; STORE THE CHARACTER... MAY BE IGNORED
                51   50   D0   0435  1154         MOVL    R0,R1                   ; COPY FOR ECHO
                   FE2D   30   0438  1155         BSBW    OUT_CHAR                ; ECHO <CR>
                51   0A   D0   043B  1156         MOVL    #LF,R1
                   FE27   30   043E  1157         BSBW    OUT_CHAR                ; TYPE <LF>
                50   01   D0   0441  1158         MOVL    #1,R0                   ; ASSUME IT'S <CR> AND SET SUCCESS
                53   0D   9A   0444  1159         MOVZBL  #CR, R3                 ; Set terminator character
                     77   11   0447  1160         BRB     170$                    ; Exit
                               0449  1161
                               0449  1162 130$:                                  ;                                       [17]
            54   28 AC   D0   0449  1163         MOVL    QIO$_P4(AP),R4          ;IF TERMINATOR DESCRIPTOR PASSED        [17]
                     28   13   044D  1164         BEQL    4000$                   ;THEN                                   [17]
                     64   D5   044F  1165         TSTL    (R4)                    ;   IF SHORT FORM                       [17]
                     08   12   0451  1166         BNEQ    1000$                   ;   THEN (SEE VMS I/O USERS GDE)        [17]
                56   1F   D0   0453  1167         MOVL    #31,R6                  ;      INIT BIT POINTER TO MAX          [17]
                54   04   C0   0456  1168         ADDL2   #4,R4                   ;      GET ADDR. OF BIT PATTERN         [17]
                     0C   11   0459  1169         BRB     2000$                   ;   ELSE                                [17]
                56   64   D0   045B  1170 1000$:  MOVL    (R4),R6                 ;      GET BYTE COUNT OF BIT PAT        [17]
                56   08   C4   045E  1171         MULL2   #8,R6                   ;      CONVERT TO BIT POINTER           [17]
                54   04   C0   0461  1172         ADDL2   #4,R4                   ;      GET ADDR. OF BIT PAT. PTR        [17]
                54   64   D0   0464  1173         MOVL    (R4),R4                 ;      GET ADDR. OF BIT PATTERN         [17]
                               0467  1174 2000$:                                 ;   REPEAT
                64   56   E1   0467  1175         BBC     R6,(R4),-               ;      IF THIS BIT IS SET               [17]
                     05        046A  1176         3000$                           ;      THEN                             [17]
                56   50   91   046B  1177         CMPB    R0,R6                   ;         IF BIT NO. = INP. CHR ASCII   [17]
                     25   13   046E  1178         BEQL    5000$                   ;         THEN LEAVE LOOP               [17]
                               0470  1179 3000$:                                 ;      ELSE                             [17]
                     56   D7   0470  1180         DECL    R6                      ;         DECR. BIT POINTER             [17]
                     F3   18   0472  1181         BGEQ    2000$                   ;   UNTIL ENTIRE BIT PAT. DONE          [17]
                   002C   31   0474  1182         BRW     6000$                   ;   CHR NOT TERMINATOR, SO CONT.         [17]
                               0477  1183 4000$:                                 ;ELSE                                   [17]
                50   1F   91   0477  1184         CMPB    #31,R0                  ;   IF INP. CHR ASCII LSS 31            [17]
                     27   1B   047A  1185         BLEQU   6000$                   ;   THEN NOT TERMINATOR                 [17]
                50   0A   91   047C  1186         CMPB    #LF,R0                  ;   IF INP. CHR IS LINEFEED             [17]
                     22   13   047F  1187         BEQL    6000$                   ;   THEN NOT TERMINATOR                 [17]
                50   0B   91   0481  1188         CMPB    #VT,R0                  ;   IF INP. CHR IS VT                   [17]
                     1D   13   0484  1189         BEQL    6000$                   ;   THEN NOT TERMINATOR                 [17]
                50   0C   91   0486  1190         CMPB    #FF,R0                  ;   IF INP. CHR IS FORMFEED             [17]
                     18   13   0489  1191         BEQL    6000$                   ;   THEN NOT TERMINATOR                 [17]
                50   09   91   048B  1192         CMPB    #TAB,R0                 ;   IF INP. CHR IS TAB                  [17]
                     13   13   048E  1193         BEQL    6000$                   ;   THEN NOT TERMINATOR                 [17]
                50   08   91   0490  1194         CMPB    #BS,R0                  ;   IF INP. CHR IS BACKSPACE            [17]
                     0E   13   0493  1195         BEQL    6000$                   ;   THEN NOT TERMINATOR                 [17]
                               0495  1196 5000$:                                 ;TERMINATOR HAS BEEN FOUND              [17]
                51   50   D0   0495  1197         MOVL    R0,R1                   ;PUT CHAR INTO R1                       [17]
                   FDCD   30   0498  1198         BSBW    OUT_CHAR                ;PRINT IT                               [17]
                83   50   D0   049B  1199         MOVL    R0,(R3)+                ;STORE IT                               [17]
                     52   D6   049E  1200         INCL    R2                      ;COUNT IT                               [17]
                   001D   31   04A0  1201         BRW     170$                    ;EXIT                                   [17]
                               04A3  1202 6000$:                                 ;                                       [17]
            20 AC   52   D1   04A3  1203         CMPL    R2, QIO$_P2(AP)         ; IS THIS LAST BYTE IN BUFFER
                     09   19   04A7  1204         BLSS    150$                    ; BRANCH IF NOT LAST CHARACTER
                               04A9  1205
                51   07   9A   04A9  1206 140$:  MOVZBL  #BELL, R1               ; LOAD "BELL" CODE INTO R1
                   FDB9   30   04AC  1207         BSBW    OUT_CHAR                ; TYPE "BELL"
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                    FEA1   31  04AF  1208          BRW     20$                          ; TRY FOR SOMETHING ELSE
                                04B2  1209
                 51   50    9A  04B2  1210 150$:    MOVZBL  R0, R1                       ; LOAD CHARACTER INTO R1
                    FDB0   30  04B5  1211          BSBW    OUT_CHAR                     ; ECHO CHARACTER
                 83   50    90  04B8  1212          MOVB    R0, (R3)+                    ; STORE CHARACTER IN BUFFER
                      52    D6  04BB  1213          INCL    R2                           ; COUNT THIS CHARACTER
                    FE93   31  04BD  1214          BRW     20$                          ; GO GET ANOTHER CHARACTER
                                04C0  1215
              51    10 BC    DE  04C0  1216 170$:    MOVAL   aQIO$_IOSB(AP), R1           ; GET ADDRESS OF I/O STATUS BLOCK.
                 81   50    B0  04C4  1217          MOVW    R0, (R1)+                    ; STORE OPERATION STATUS
                 81   52    B0  04C7  1218          MOVW    R2, (R1)+                    ; Store character count.
                 81   53    B0  04CA  1219          MOVW    R3, (R1)+                    ; Store terminator char.
                 61   01    B0  04CD  1220          MOVW    S^#1, (R1)                   ; Store terminator size
                                04D0  1221          $SETEF_G (AP)                        ; SET EVENT FLAG.
00000000'GF      6C    FA  04D0                      CALLG   (AP),G^SYS$SETEF
                           05  04D7  1222          RSB
                                04D8  1223 ;        RET                                  ; RETURN TO QIO ENTRY VECTOR.   [30]
                                04D8  1224
```

```
                     1226 .sbttl SIZE_TERM Routine to size the console terminal
                     1227
                     1228 ;++
                     1229 ; FUNCTIONAL DESCRIPTION:                                                    [23]
                     1230 ;                                                                           [23]
                     1231 ;       This routine will size the console terminal to determine its        [23]
                     1232 ;       characteristics.  The routine is meant for standalone use,          [23]
                     1233 ;       and attempts to provide some of the same information that           [23]
                     1234 ;       can be obtained for timesharing terminals in user mode              [23]
                     1235 ;       using the $GETCHN service.  The routine sets the "type"             [23]
                     1236 ;       and "terminal characteristics" fields of DS$GL_TERMCHAR.            [23]
                     1237 ;       The fields are defined the the $TTDEF macro of VMS.                 [23]
                     1238 ;                                                                           [23]
                     1239 ;       The format of DS$GL_TERMCHAR is as follows:                         [23]
                     1240 ;                                                                           [23]
                     1241 ;       32                                0                                 [23]
                     1242 ;       ................................                                    [23]
                     1243 ;       : page          :       :       :                                   [23]
                     1244 ;       :   width       : type  : class :                                   [23]
                     1245 ;       :...............:.......:.......:                                   [23]
                     1246 ;       :page   :    terminal             :                                 [23]
                     1247 ;       : length:     characteristics     :                                 [23]
                     1248 ;       :.......:.........................:                                 [23]
                     1249 ;                                                                           [23]
                     1250 ;       NOTE: Currently, the routine only sets the TT$M_SCOPE               [23]
                     1251 ;       characteristic.  Other characteristics defined by $TTDEF,           [23]
                     1252 ;       or other fields in DS$GL_TERMCHAR, could be also be sized for.      [23]
                     1253 ;                                                                           [23]
                     1254 ;                                                                           [23]
                     1255 ; CALLING SEQUENCE:                                                         [23]
                     1256 ;                                                                           [23]
                     1257 ;       BSBW    SIZE_TERM                                                   [23]
                     1258 ;                                                                           [23]
                     1259 ; INPUT PARAMETERS:                                                         [23]
                     1260 ;                                                                           [23]
                     1261 ;       NONE                                                                [23]
                     1262 ;                                                                           [23]
                     1263 ; IMPLICIT INPUTS:                                                          [23]
                     1264 ;                                                                           [23]
                     1265 ;       DS$GL_TERMCHAR                                                      [23]
                     1266 ;                                                                           [23]
                     1267 ; OUTPUT PARAMETERS:                                                        [23]
                     1268 ;                                                                           [23]
                     1269 ;       NONE                                                                [23]
                     1270 ;                                                                           [23]
                     1271 ; IMPLICIT OUTPUTS:                                                         [23]
                     1272 ;                                                                           [23]
                     1273 ;       DS$GL_TERMCHAR                                                      [23]
                     1274 ;                                                                           [23]
                     1275 ; COMPLETION CODES:                                                         [23]
                     1276 ;                                                                           [23]
                     1277 ;                                                                           [23]
                     1278 ;                                                                           [23]
                     1279 ; SIDE EFFECTS:                                                             [23]
                     1280 ;                                                                           [23]
                     1281 ;                                                                           [23]
                     1282 ;                                                                           [23]
```

```
                                  04D8  1283 ;--                                                                  [23]
                                  04D8  1284
                      5A 1B 00'   04D8  1285 DEC_PROMPT:     .ASCIC  <27><90>        ;DEC prompt                  [23]
                            02    04D8
                   63 5B 1B 00'   04DB  1286 ANSI_PROMPT:    .ASCIC  <27>'[c'        ;ANSI prompt                 [23]
                            03    04DB
                         05 00'   04DF  1287 LA36_PROMPT:    .ASCIC  <5>             ;LA36 prompt                 [23]
                            01    04DF
                                  04E1  1288
                                  04E1  1289 PROMPTS:                                ; Pointers to prompt strings   [23]
                      000004D8'   04E1  1290          .ADDRESS DEC_PROMPT
                      000004DB'   04E5  1291          .ADDRESS ANSI_PROMPT
                      000004DF'   04E9  1292          .ADDRESS LA36_PROMPT
                      00000000    04ED  1293          .LONG   0
                                  04F1  1294
                      00000014    04F1  1295 RECVD_BUF_LENGTH = 20                   ; (Longest response string will [23]
                                  04F1  1296                                         ;  probably be from LA36, which [23]
                                  04F1  1297                                         ;  can be up to 20 chars. But we[23]
                                  04F1  1298                                         ;  don't know what LA36 string  [23]
                                  04F1  1299                                         ;  is anyway;it is user-defined)[23]
                      00000505    04F1  1300 RECVD_BUF:      .BLKB RECVD_BUF_LENGTH  ; Buffer to receive response   [23]
2E 31 3A 3A 20 30 0000050D'010E0000'  0505  1301 MAX_WAIT:       .ASCID  /0 ::1.5/       ; Max. time to wait for response[23]
                            35    0513
                      0000051C    0514  1302 QUAD_TIME:      .BLKQ   1               ; Converted binary time        [23]
                                  051C  1303
                         01FC     051C  1304 .ENTRY SIZE_TERM, ^M<R2,R3,R4,R5,R6,R7,R8>;                          [23]
                                  051E  1305
                                  051E  1306          $BINTIM_S MAX_WAIT, QUAD_TIME   ; Convert ASCII time to binary  [23]
                   F3 AF    7F    051E                      PUSHAQ  QUAD_TIME
                   E1 AF    7F    0521                      PUSHAQ  MAX_WAIT
          00000000'GF   02   FB    0524                      CALLS   #2,G^SYS$BINTIM
               00000000'EF   7C    052B  1307          CLRQ    DS$GL_TERMCHAR          ; Initialize DS$GL_TERMCHAR    [23]
                57   AD AF   9E    0531  1308          MOVAB   PROMPTS, R7             ; Get list of prompts          [23]
                   58   87   D0    0535  1309 10$:     MOVL    (R7)+,R8                ; Get address of next prompt   [23]
                        03   12    0538  1310          BNEQ    15$                     ; Any more remaining?          [23]
                      0085   31    053A  1311          BRW     40$                     ; Branch if no more prompts    [23]
                                  053D  1312 15$:     $SETIMR_S       #1,QUAD_TIME    ; Start timer.  (This MUST be  [23]
                        7E   7C    053D                      CLRQ    -(SP)
                   D2 AF    7F    053F                      PUSHAQ  QUAD_TIME
                        01   DD    0542                      PUSHL   #1
          00000000'GF   04   FB    0544                      CALLS   #4,G^SYS$SETIMR
                                  054B  1313                                         ;  done before the prompt is   [23]
                                  054B  1314                                         ;  sent, because the $SETIMR   [23]
                                  054B  1315                                         ;  service calls KB_CHECK, which[23]
                                  054B  1316                                         ;  will read KB input and throw [23]
                                  054B  1317                                         ;  it away.)                   [23]
                   50   58   D0    054B  1318          MOVL    R8,R0                   ; Put prompt addr. in R0       [23]
                      FCDB   30    054E  1319          BSBW    OUT_CNTRL               ; Send prompt to terminal      [23]
                   9D AF    94    0551  1320          CLRB    RECVD_BUF               ; Clear 1st byte of response buf[23]
                58   9A AF   9E    0554  1321          MOVAB   RECVD_BUF,R8            ; Init response buffer pointer [23]
                                  0558  1322 20$:                                    ; REPEAT
                                  0558  1323 30$:     $READEF_S       #1,EVENT_FLAGS  ; See if time was used up      [23]
               00000004'EF   DF    0558                      PUSHAL  EVENT_FLAGS
                        01   DD    055E                      PUSHL   #1
          00000000'GF   02   FB    0560                      CALLS   #2,G^SYS$READEF
          50   00000000'8F   D1    0567  1324          CMPL    #SS$_WASSET,R0          ; Has time run out?            [23]
                        19   13    056E  1325          BEQL    35$                     ; Yes.  No response.           [23]
```

```
                                0570  1326          CMK     RCONSOLE                ; Get a character of response   [23]
                        7E   DC 0570                MOVPSL  -(SP)
                     06 6E   1A E0 0572                BBS     #PSL$V_IS, (SP), 30015$
                        8E   D4 0576                CLRL    (SP)+
                        01   BC 0578                CHMK    #CMK$_RCONSOLE
                        04   11 057A                BRB     30016$
                    FBB2 CF  16 057C      30015$:   JSB     CMK$RCONSOLE
                                0580      30016$:
                     D4 50   07 E1 0580  1327          BBC     #7,R0,30$               ; If no character, try again    [23]
                        88   51 90 0584  1328          MOVB    R1,(R8)+                ; Store char. in response buffer[23]
                        CF   11 0587  1329          BRB     30$                     ; Get another character         [23]
                    FF64 CF  95 0589  1330 35$:     TSTB    RECVD_BUF               ; IF no characters were received[23]
                        A6   13 058D  1331          BEQL    10$                     ; THEN try another prompt       [23]
                                058F  1332
                                058F  1333 ;
                                058F  1334 ; A response was received.  Now match the response to a terminal type.  [23]
                                058F  1335 ;
                                058F  1336
                 58  00001000 8F   D0 058F  1337          MOVL    #TT$M_SCOPE, R8         ; Assume video terminal         [23]
                 54  0000009A'EF   9E 0596  1338          MOVAB   VIDEO_TYPES, R4         ; Point to video response list  [23]
                        0023   30 059D  1339          BSBW    100$                    ; Search list                   [23]
                     1F 50     E8 05A0  1340          BLBS    R0,40$                  ; Found a match                 [23]
                        58     D4 05A3  1341          CLRL    R8                      ; Not a video terminal          [23]
                 54  000001F8'EF   9E 05A5  1342          MOVAB   HARDCOPY_TYPES, R4      ; Point to hardcopy response list[23]
                        0014   30 05AC  1343          BSBW    100$                    ; Search list                   [23]
                     10 50     E8 05AF  1344          BLBS    R0,40$                  ; Found a match                 [23]
00000000'EF   08   08   20     F0 05B2  1345          INSV    #TT$_LA36,#8,#8, -      ; No match, so chances are that [23]
                                05BB  1346                  DS$GL_TERMCHAR          ;  the terminal is an LA36, since[23]
          00000004'EF   58     D0 05BB  1347          MOVL    R8,DS$GL_TERMCHAR+4     ;  they do not return a standard[23]
                                05C2  1348                                          ;  response.                    [23]
                        04     05C2  1349 40$:     RET                             ; BYE.                          [23]
                                05C3  1350
                                05C3  1351 100$:    ;This code searches a list of terminal responses and compares   [23]
                                05C3  1352          ;them to the received response, looking for a match.  If a   [23]
                                05C3  1353          ;match is found, DS$GL_TERMCHAR is set up appropriately.     [23]
                                05C3  1354
                        50     D4 05C3  1355          CLRL    R0                      ; Clear return status           [23]
                     FF 8F     64 91 05C5  1356          CMPB    (R4), #-1               ; End of list?                  [23]
                        28     13 05C9  1357          BEQL    300$                    ; Yes                           [23]
                     55        84 9A 05CB  1358          MOVZBL  (R4)+, R5               ; Get length                    [23]
                 FF1D CF       64 55 29 05CE  1359          CMPC3   R5,(R4),RECVD_BUF       ; Compare strings               [23]
                        07     13 05D4  1360          BEQL    200$                    ; Found a match                 [23]
                     54        55 C0 05D6  1361          ADDL    R5,R4                   ; Go to end of string           [23]
                        54     D6 05D9  1362          INCL    R4                      ; Skip over type code           [23]
                        E6     11 05DB  1363          BRB     100$                    ; Try next response in list     [23]
                     54        55 C0 05DD  1364 200$:    ADDL    R5,R4                   ; Point to type code            [23]
00000000'EF   08   08   64     F0 05E0  1365          INSV    (R4),#8,#8,DS$GL_TERMCHAR; Store type code              [23]
          00000004'EF   58     D0 05E9  1366          MOVL    R8,DS$GL_TERMCHAR+4     ; Store characteristics         [23]
                     50   01   D0 05F0  1367          MOVL    #1,R0                   ; Set good return status        [23]
                        05     05F3  1368 300$:    RSB                             ; Leave                         [23]
                                05F4  1369
                                05F4  1370          .END
```

```
$$ARGS                          = 0000000C    D
$$N                             = 00000002    D
$$T1                            = 00000000    D
ANSI_PROMPT                       000004DB R  D  04
BELL                            = 00000007    D
BIT...                          = 00000004    D
BS                              = 00000008    D
BSLASH                          = 0000005C    D
CLI$K_BUFSIZ                    = 00000100    D
CLI$K_SIZE                        0000044C    D
CLI$L_ADDRESS                     00000018    D
CLI$L_COMMAND                     00000004    D
CLI$L_DATA                        0000001C    D
CLI$L_FLAGS                       00000000    D
CLI$L_FLAGS2                      00000444    D
CLI$L_LAST                        00000024    D
CLI$L_NEXT                        00000030    D
CLI$L_PASS                        0000002C    D
CLI$L_SUBT                        00000028    D
CLI$L_TEMP_BASE                   00000448    D
CLI$L_TEST                        00000020    D
CLI$M_START_OR_RUN              = 00000008    D
CLI$Q_BUFQWD                      00000034    D
CLI$Q_FILE                        00000008    D
CLI$Q_SECTION                     00000010    D
CLI$Q_TIME                        0000043C    D
CLI$T_BUFFER                      0000003C    D
CLI$V_ADAPTER                   = 00000018    D
CLI$V_ADR                       = 0000000B    D
CLI$V_ASCII                     = 00000013    D
CLI$V_BASE_QUAL                 = 00000002    D
CLI$V_BREAK                     = 0000000A    D
CLI$V_BRIEF                     = 0000001B    D
CLI$V_BYTE                      = 0000000D    D
CLI$V_CLEAR                     = 00000002    D
CLI$V_DEC                       = 00000010    D
CLI$V_DEFAULT                   = 0000000C    D
CLI$V_DEPOSIT                   = 00000019    D
CLI$V_EVENT                     = 00000008    D
CLI$V_EXAM                      = 00000005    D
CLI$V_FLAGS                     = 00000009    D
CLI$V_HEX                       = 00000012    D
CLI$V_KERNEL                    = 00000017    D
CLI$V_LOAD                      = 00000006    D
CLI$V_LONG                      = 0000000F    D
CLI$V_NEXT                      = 00000001    D
CLI$V_NOALLOC                   = 00000000    D
CLI$V_NOTNUF                    = 00000001    D
CLI$V_OCT                       = 00000011    D
CLI$V_PREG                      = 0000001A    D
CLI$V_QA                        = 00000007    D
CLI$V_QACKLOOPLOOPS             = 0000001C    D
CLI$V_QAERRORPRINTS             = 0000001B    D
CLI$V_QAMULTIPLEPASS            = 0000001F    D
CLI$V_QASUBTESTLOOPS            = 0000001E    D
CLI$V_QATESTLOOPS               = 0000001D    D
CLI$V_REG                       = 00000014    D
CLI$V_REQUIRED                  = 00000000    D
CLI$V_RUN                       = 00000015    D
CLI$V_SET                       = 00000003    D
CLI$V_SHOW                      = 00000004    D
CLI$V_START_OR_RUN              = 00000003    D
CLI$V_VALSEC                    = 00000016    D
CLI$V_WORD                      = 0000000E    D
CMK$RCONSOLE                      00000132 RG D  04
CMK$TCONSOLE                      000002EE RG D  04
CMK$_APBOOT                     = 00000004    D
CMK$_ASTEXIT                    = 00000000    D
CMK$_CANTIM                     = 0000000B    D
CMK$_HIBER                      = 00000007    D
CMK$_INITSCB                    = 00000008    D
CMK$_LAST                       = 0000000E    D
CMK$_MMENABLE                   = 00000003    D
CMK$_RCONSOLE                   = 00000001    D
CMK$_REFRESH                    = 00000005    D
CMK$_SCHDWK                     = 00000006    D
CMK$_SETIMR                     = 0000000C    D
CMK$_SETIPL                     = 00000009    D
CMK$_SETPRT                     = 0000000D    D
CMK$_SGIPR                      = 0000000A    D
CMK$_TCONSOLE                   = 00000002    D
CNTRLC                          = 00000003    D
CNTRLO                          = 0000000F    D
CNTRLQ                          = 00000011    D
CNTRLR                          = 00000012    D
CNTRLS                          = 00000013    D
CNTRLU                          = 00000015    D
COLUMN                            00000000 R  D  02
CONSFLG                           00000003 R  D  02
CR                              = 0000000D    D
CRD$M_CRD_DEBUG                 = 00000001    D
CRD$M_CTRL_C_NO_ECHO            = 00000002    D
CRD$M_FLUSH_CTRL_C              = 00000004    D
CRD$M_INHIBIT_ALLOCATE          = 00000008    D
CRD$V_CRD_DEBUG                 = 00000000    D
CRD$V_CTRL_C_NO_ECHO            = 00000001    D
CRD$V_FLUSH_CTRL_C              = 00000002    D
CRD$V_INHIBIT_ALLOCATE          = 00000003    D
DEC_PROMPT                        000004D8 R  D  04
DELETE                          = 0000007F    D
DS$GB_SYSTYPE                     ********    X  04
DS$GB_WIDTH                       00000002 RG D  02
DS$GL_CRD_FLAGS                   ********    X  04
DS$GL_FLAGS                       ********    X  04
DS$GL_TERMCHAR                    ********    X  04
DS$GW_TTOUT                       ********    X  04
DS$K_PRINTB                     = 00000002    D
DS$K_PRINTF                     = 00000001    D
DS$K_PRINTI                     = 00000000    D
DS$K_PRINTX                     = 00000003    D
DS$K_TYPE_ABORT_PROGRAM         = 00000014    D
DS$K_TYPE_ABORT_TEST            = 00000013    D
DS$K_TYPE_COMMAND_ERR           = 00000015    D
DS$K_TYPE_COMMAND_OUT           = 00000016    D
```

```
DS$K_TYPE_CRD_AUTOTEST          = 0000001A    D     DS$M_STRFLG                     = 00000004    D
DS$K_TYPE_DS_PROMPT             = 00000001    D     DS$M_SUBT                       = 00004000    D
DS$K_TYPE_DS_START              = 0000001D    D     DS$M_SYSFLG                     = 00000400    D
DS$K_TYPE_ERRDEV                = 00000008    D     DS$M_TIMED                      = 02000000    D
DS$K_TYPE_ERRHARD               = 00000006    D     DS$M_TIMED_OUT                  = 08000000    D
DS$K_TYPE_ERROR_BODY            = 00000009    D     DS$M_TIMRON                     = 00020000    D
DS$K_TYPE_ERROR_END             = 0000000A    D     DS$V_ABRTFLG                    = 00000006    D
DS$K_TYPE_ERRPREP               = 0000001B    D     DS$V_BADTIME                    = 00000014    D
DS$K_TYPE_ERRSOFT               = 00000007    D     DS$V_BATCH                      = 00000016    D
DS$K_TYPE_ERRSUP                = 00000004    D     DS$V_BRKCLR                     = 0000000C    D
DS$K_TYPE_ERRSYS                = 00000005    D     DS$V_BRKPT                      = 0000000B    D
DS$K_TYPE_ERR_HALT              = 0000000D    D     DS$V_CHARFLG                    = 00000008    D
DS$K_TYPE_EXCEPTION             = 0000000C    D     DS$V_CMDFLG                     = 00000007    D
DS$K_TYPE_EXCEPTION_HEAD        = 0000000B    D     DS$V_CTRLC                      = 00000000    D
DS$K_TYPE_FIRST_PASS            = 00000011    D     DS$V_CTRLO                      = 00000010    D
DS$K_TYPE_GENERAL               = 00000000    D     DS$V_DEVFLG                     = 00000009    D
DS$K_TYPE_GENERAL_ERROR         = 00000003    D     DS$V_DISABLCC                   = 00000018    D
DS$K_TYPE_NO_TESTS              = 00000012    D     DS$V_DONFLG                     = 0000000D    D
DS$K_TYPE_PARAM_ERROR           = 0000001C    D     DS$V_ERRFLG                     = 00000004    D
DS$K_TYPE_PROGRAM_END           = 00000010    D     DS$V_EXCEPT                     = 00000013    D
DS$K_TYPE_PROGRAM_INFO          = 00000017    D     DS$V_EXETST                     = 00000012    D
DS$K_TYPE_PROGRAM_START         = 0000000F    D     DS$V_HLTFLG                     = 00000003    D
DS$K_TYPE_QIO_INVADP            = 00000024    D     DS$V_LODFLG                     = 00000001    D
DS$K_TYPE_QIO_NODRIVER          = 00000022    D     DS$V_MEMMGT                     = 0000000F    D
DS$K_TYPE_QIO_WRONGVER          = 00000023    D     DS$V_NI                         = 0000001A    D
DS$K_TYPE_SCRIPT_ECHO           = 00000021    D     DS$V_OUTPUT                     = 00000017    D
DS$K_TYPE_SCRIPT_PNF            = 0000001E    D     DS$V_RUBFLG                     = 00000005    D
DS$K_TYPE_SCRIPT_PROMPT         = 00000020    D     DS$V_SCRIPT                     = 00000015    D
DS$K_TYPE_SCRIPT_SKIP           = 0000001F    D     DS$V_SETIMR                     = 00000019    D
DS$K_TYPE_SEQUENCE_ERROR        = 00000019    D     DS$V_STRFLG                     = 00000002    D
DS$K_TYPE_START_ERR             = 00000018    D     DS$V_SUBT                       = 0000000E    D
DS$K_TYPE_START_LIST            = 00000025    D     DS$V_SYSFLG                     = 0000000A    D
DS$K_TYPE_SUMMARY               = 0000000E    D     DS$V_TIMED                      = 00000019    D
DS$K_TYPE_USER_PROMPT           = 00000002    D     DS$V_TIMED_OUT                  = 0000001B    D
DS$M_ABRTFLG                    = 00000040    D     DS$V_TIMRON                     = 00000011    D
DS$M_BADTIME                    = 00100000    D     DSA$AL_APTMAIL                    0000FE00    D
DS$M_BATCH                      = 00400000    D     DSA$AT_APTTXT                     0000FA00    D
DS$M_BRKCLR                     = 00001000    D     DSA$GL_APTCOM                     0000FE04    D
DS$M_BRKPT                      = 00000800    D     DSA$GL_DEVLEN                     0000FE58    D
DS$M_CHARFLG                    = 00000100    D     DSA$GL_ERRNO                      0000FE44    D
DS$M_CMDFLG                     = 00000080    D     DSA$GL_EVENT                      0000FE48    D
DS$M_CTRLC                      = 00000001    D     DSA$GL_FLAGS                      0000FE00    D
DS$M_CTRLO                      = 00010000    D     DSA$GL_MSGTYP                     0000FE40    D
DS$M_DEVFLG                     = 00000200    D     DSA$GL_PASSES                     0000FE08    D
DS$M_DISABLCC                   = 01000000    D     DSA$GL_PASSNO                     0000FE54    D
DS$M_DONFLG                     = 00002000    D     DSA$GL_SECTNO                     0000FE10    D
DS$M_ERRFLG                     = 00000010    D     DSA$GL_SID                        0000FE14    D
DS$M_EXCEPT                     = 00080000    D     DSA$GL_SUBTNO                     0000FE4C    D
DS$M_EXETST                     = 00040000    D     DSA$GL_TESTNO                     0000FE50    D
DS$M_HLTFLG                     = 00000008    D     DSA$GL_UNITS                      0000FE0C    D
DS$M_LODFLG                     = 00000002    D     DSA$GQ_MSGPTR                     0000FE68    D
DS$M_MEMMGT                     = 00008000    D     DSA$GT_DEVNAM                     0000FE5C    D
DS$M_NI                         = 04000000    D     DSA$V_APT                       = 0000001F    D
DS$M_OUTPUT                     = 00800000    D     DSA$V_NORPT                     = 0000001B    D
DS$M_RUBFLG                     = 00000020    D     DSA$V_USER                      = 0000001C    D
DS$M_SCRIPT                     = 00200000    D     DSX$PRINT                         ********    X   04
DS$M_SETIMR                     = 02000000    D     END_HARDCOPY_TYPES                00000221  R   D   03
```

```
END_VIDEO_TYPES                 000001F4 R   D  03
EVENT_FLAGS                     00000004 R   D  02
FF                            = 0000000C     D
HARDCOPY_TYPES                  000001F8 R   D  03
HYPHEN                        = 0000002D     D
IO$V_CANCTRLO                   ********     X  04
IO$_READPROMPT                  ********     X  04
IO$_SENSEMODE                   ********     X  04
IO$_SETMODE                     ********     X  04
KB_POLL                         000000C5 RG  D  04
KB_POLL_X                       000000F9 R   D  04
LA36_PROMPT                     000004DF R   D  04
LASTCHAR                        00000001 R   D  02
LF                            = 0000000A     D
LOWCASE                       = 00000020     D
MAX_WAIT                        00000505 R   D  04
OUT_ASCIC                       00000253 R   D  04
OUT_CHAR                        00000268 R   D  04
OUT_CHARX                       000002ED R   D  04
OUT_CNTRL                       0000022C R   D  04
OUT_ECHO                        00000273 R   D  04
OUT_STRING                      00000256 R   D  04
PARITY                        = 00000080     D
PR$_RXCS                      = 00000020     D
PR$_RXDB                      = 00000021     D
PR$_SYS_TYP800                  ********     X  04
PR$_TXCS                      = 00000022     D
PR$_TXDB                      = 00000023     D
PREADVBLK                       00000319 RG  D  04
PROMPTS                         000004E1 R   D  04
PSL$V_IS                      = 0000001A     D
QIO$_ASTADR                   = 00000014     D
QIO$_ASTPRM                   = 00000018     D
QIO$_CHAN                     = 00000008     D
QIO$_EFN                      = 00000004     D
QIO$_FUNC                     = 0000000C     D
QIO$_IOSB                     = 00000010     D
QIO$_NARGS                    = 0000000C     D
QIO$_P1                       = 0000001C     D
QIO$_P2                       = 00000020     D
QIO$_P3                       = 00000024     D
QIO$_P4                       = 00000028     D
QIO$_P5                       = 0000002C     D
QIO$_P6                       = 00000030     D
QUAD_TIME                       00000514 R   D  04
QUESTN                        = 0000003F     D
READVBLK                        00000319 RG  D  04
RECVD_BUF                       000004F1 R   D  04
RECVD_BUF_LENGTH              = 00000014     D
RINPUT                          000000FC R   D  04
RINPUTX                         00000131 R   D  04
RTYPE                           000001F4 R   D  04
SIZ...                        = 00000001     D
SIZE_TERM                       0000051C RG  D  04
SPACE                         = 00000020     D
SS$_CONTROLC                    ********     X  04
SS$_WASSET                      ********     X  04
SYS$BINTIM                      ********  GX   04
SYS$QIOW                        ********  GX   04
SYS$READEF                      ********  GX   04
SYS$SETEF                       ********  GX   04
SYS$SETIMR                      ********  GX   04
TAB                           = 00000009     D
TT$M_SCOPE                    = 00001000     D
TT$V_SCOPE                    = 0000000C     D
TT$_LA100                     = 00000025     D
TT$_LA12                      = 00000024     D
TT$_LA120                     = 00000021     D
TT$_LA34                      = 00000022     D
TT$_LA36                      = 00000020     D
TT$_VT100                     = 00000060     D
TT$_VT101                     = 00000061     D
TT$_VT102                     = 00000062     D
TT$_VT125                     = 00000064     D
TT$_VT132                     = 00000066     D
TT$_VT200_SERIES              = 0000006E     D
TT$_VT52                      = 00000040     D
TT$_VT55                      = 00000041     D
TT$_VT5X                      = 00000040     D
T_CNTRLC                        00000000 R   D  03
T_CNTRLO                        0000000F R   D  03
T_CNTRLR                        0000000C R   D  03
T_CNTRLU                        00000007 R   D  03
T_CRLF                          00000014 R   D  03
T_LA100                         00000200 R   D  03
T_LA12                          000001F8 R   D  03
T_LA120                         00000208 R   D  03
T_LA34                          0000020F R   D  03
T_LA34A                         00000218 R   D  03
T_LA36                          00000225 R   D  03
T_OUT_IS_MBX                    0000006D R   D  03
T_SHOW_WIDTH                    00000048 R   D  03
T_VT100                         0000012A R   D  03
T_VT100A                        000000C7 R   D  03
T_VT100B                        00000133 R   D  03
T_VT100C                        0000013C R   D  03
T_VT100D                        00000145 R   D  03
T_VT100E                        0000014E R   D  03
T_VT100F                        00000157 R   D  03
T_VT100G                        00000160 R   D  03
T_VT100H                        00000169 R   D  03
T_VT101                         000000CC R   D  03
T_VT102                         000000D5 R   D  03
T_VT125                         000000DC R   D  03
T_VT125A                        000000ED R   D  03
T_VT125B                        000000FE R   D  03
T_VT125C                        0000010F R   D  03
T_VT132                         0000019D R   D  03
T_VT132A                        000001A6 R   D  03
T_VT132B                        000001AF R   D  03
T_VT132C                        000001B8 R   D  03
T_VT132D                        000001C1 R   D  03
T_VT132E                        000001CA R   D  03
T_VT132F                        000001D3 R   D  03
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T_VT132G                        000001DC R   D  03
T_VT220                         00000172 R   D  03
T_VT220A                        00000182 R   D  03
T_VT240                         00000189 R   D  03
T_VT50_A                        0000009A R   D  03
T_VT50_B                        0000009F R   D  03
T_VT50_C                        000000A4 R   D  03
T_VT50_H                        000000AE R   D  03
T_VT50_J                        000000B3 R   D  03
T_VT52_K                        000000B8 R   D  03
T_VT52_L                        000000BD R   D  03
T_VT52_M                        000000C2 R   D  03
T_VT55_E                        000000A9 R   D  03
T_VT61                          00000120 R   D  03
T_VT61A                         000001E5 R   D  03
T_VT61B                         000001EA R   D  03
T_VT61C                         000001EF R   D  03
T_VT71                          00000125 R   D  03
T_WIDTH                         00000017 R   D  03
VIDEO_TYPES                     0000009A R   D  03
VRSETWIDTH                      00000000 RG  D  04
VRSHOWWIDTH                     000000A5 RG  D  04
VT                            = 0000000B     D
WRITEVBLK                       000002FD RG  D  04
```

! Psect synopsis !

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000FE70 (65136.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
WORK	00000008 (8.)	02 (2.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC LONG
DATA	00000226 (550.)	03 (3.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC LONG
CODE	000005F4 (1524.)	04 (4.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$ARGS	=0000000C	236 (1)	236 (1)
$$N	=00000002	602 (1)	#-545 (1) #-553 (1) 602 (1)
$$T1	=00000000	1312 (1)	1312 (1) 236 (1) 527 (1) 535 (1)
ANSI_PROMPT	000004DB-R	1286 (1)	1291 (1)
BELL	=00000007	249 (1)	#-1206 (1) #-669 (1)
BIT...	=00000004	240 (1)	237 (1) 238 (1) 239 (1) 240 (1)
BS	=00000008	250 (1)	#-1086 (1) #-1090 (1) #-1194 (1)
BSLASH	=0000005C	264 (1)	#-1103 (1) #-1113 (1)
CLI$K_BUFSIZ	=00000100	234 (1)	234 (1)
CLI$K_SIZE	0000044C	234 (1)	
CLI$L_ADDRESS	00000018	234 (1)	
CLI$L_COMMAND	00000004	234 (1)	
CLI$L_DATA	0000001C	234 (1)	#-515 (1) #-530 (1) #-538 (1)
CLI$L_FLAGS	00000000	234 (1)	
CLI$L_FLAGS2	00000444	234 (1)	
CLI$L_LAST	00000024	234 (1)	
CLI$L_NEXT	00000030	234 (1)	
CLI$L_PASS	0000002C	234 (1)	
CLI$L_SUBT	00000028	234 (1)	
CLI$L_TEMP_BASE	00000448	234 (1)	
CLI$L_TEST	00000020	234 (1)	
CLI$M_START_OR_RUN	=00000008	234 (1)	
CLI$Q_BUFQWD	00000034	234 (1)	
CLI$Q_FILE	00000008	234 (1)	
CLI$Q_SECTION	00000010	234 (1)	
CLI$Q_TIME	0000043C	234 (1)	
CLI$T_BUFFER	0000003C	234 (1)	
CLI$V_ADAPTER	=00000018	234 (1)	
CLI$V_ADR	=0000000B	234 (1)	
CLI$V_ASCII	=00000013	234 (1)	
CLI$V_BASE_QUAL	=00000002	234 (1)	
CLI$V_BREAK	=0000000A	234 (1)	
CLI$V_BRIEF	=0000001B	234 (1)	
CLI$V_BYTE	=0000000D	234 (1)	
CLI$V_CLEAR	=00000002	234 (1)	
CLI$V_DEC	=00000010	234 (1)	
CLI$V_DEFAULT	=0000000C	234 (1)	
CLI$V_DEPOSIT	=00000019	234 (1)	
CLI$V_EVENT	=00000008	234 (1)	
CLI$V_EXAM	=00000005	234 (1)	
CLI$V_FLAGS	=00000009	234 (1)	
CLI$V_HEX	=00000012	234 (1)	
CLI$V_KERNEL	=00000017	234 (1)	
CLI$V_LOAD	=00000006	234 (1)	
CLI$V_LONG	=0000000F	234 (1)	
CLI$V_NEXT	=00000001	234 (1)	
CLI$V_NOALLOC	=00000000	234 (1)	
CLI$V_NOTNUF	=00000001	234 (1)	
CLI$V_OCT	=00000011	234 (1)	
CLI$V_PREG	=0000001A	234 (1)	

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CLI$V_QA                        =00000007     234    (1)
CLI$V_QACKLOOPLOOPS             =0000001C     234    (1)
CLI$V_QAERRORPRINTS             =0000001B     234    (1)
CLI$V_QAMULTIPLEPASS            =0000001F     234    (1)
CLI$V_QASUBTESTLOOPS            =0000001E     234    (1)
CLI$V_QATESTLOOPS               =0000001D     234    (1)
CLI$V_REG                       =00000014     234    (1)
CLI$V_REQUIRED                  =00000000     234    (1)
CLI$V_RUN                       =00000015     234    (1)
CLI$V_SET                       =00000003     234    (1)
CLI$V_SHOW                      =00000004     234    (1)
CLI$V_START_OR_RUN              =00000003     234    (1)      234    (1)
CLI$V_VALSEC                    =00000016     234    (1)
CLI$V_WORD                      =0000000E     234    (1)
CMK$RCONSOLE                     00000132-R   729    (1)     1326    (1)      652    (1)      718    (1)
CMK$TCONSOLE                     000002EE-R   940    (1)      874    (1)      934    (1)
CMK$_APBOOT                     =00000004     237    (1)
CMK$_ASTEXIT                    =00000000     237    (1)
CMK$_CANTIM                     =0000000B     237    (1)
CMK$_HIBER                      =00000007     237    (1)
CMK$_INITSCB                    =00000008     237    (1)
CMK$_LAST                       =0000000E     237    (1)
CMK$_MMENABLE                   =00000003     237    (1)
CMK$_RCONSOLE                   =00000001     237    (1)    #-1326    (1)    #-652    (1)    #-718    (1)
CMK$_REFRESH                    =00000005     237    (1)
CMK$_SCHDWK                     =00000006     237    (1)
CMK$_SETIMR                     =0000000C     237    (1)
CMK$_SETIPL                     =00000009     237    (1)
CMK$_SETPRT                     =0000000D     237    (1)
CMK$_SGIPR                      =0000000A     237    (1)
CMK$_TCONSOLE                   =00000002     237    (1)    #-874    (1)    #-934    (1)
CNTRLC                          =00000003     248    (1)    #-1122   (1)    #-660    (1)    #-746    (1)
CNTRLO                          =0000000F     256    (1)    #-663    (1)    #-780    (1)
CNTRLQ                          =00000011     257    (1)    #-656    (1)    #-775    (1)
CNTRLR                          =00000012     258    (1)    #-1129   (1)
CNTRLS                          =00000013     259    (1)    #-666    (1)    #-770    (1)
CNTRLU                          =00000015     260    (1)    #-1116   (1)
COLUMN                           00000000-R   273    (1)    #-1046   (1)    #-1072   (1)    #-1074   (1)    #-1082   (1)
                                                           #-876    (1)    #-910    (1)    #-912    (1)    #-925    (1)
                                                           #-931    (1)
CONSFLG                          00000003-R   279    (1)    #-748    (1)    #-772    (1)    #-777    (1)    #-782    (1)
                                                           #-904    (1)
CR                              =0000000D     255    (1)    #-1151   (1)    #-1159   (1)      287    (1)      290    (1)
                                                             296    (1)      299    (1)    #-908    (1)
CRD$M_CRD_DEBUG                 =00000001     240    (1)
CRD$M_CTRL_C_NO_ECHO            =00000002     240    (1)
CRD$M_FLUSH_CTRL_C              =00000004     240    (1)
CRD$M_INHIBIT_ALLOCATE          =00000008     240    (1)
CRD$V_CRD_DEBUG                 =00000000     240    (1)
CRD$V_CTRL_C_NO_ECHO            =00000001     240    (1)    #-750    (1)
CRD$V_FLUSH_CTRL_C              =00000002     240    (1)    #-763    (1)    #-765    (1)    #-769    (1)
CRD$V_INHIBIT_ALLOCATE          =00000003     240    (1)
DEC_PROMPT                       000004D8-R   1285   (1)     1290    (1)
DELETE                          =0000007F     265    (1)    #-1066   (1)    #-1095   (1)
DS$GB_SYSTYPE                    00000000-XR         (1)    #-720    (1)    #-739    (1)
DS$GB_WIDTH                      00000002-R   277    (1)    #-1072   (1)    #-538    (1)    #-597    (1)    #-912    (1)
DS$GL_CRD_FLAGS                  00000000-XR         (1)      750    (1)      763    (1)      765    (1)      769    (1)
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DS$GL_FLAGS                     00000000-XR                  #-1043  (1)    1061  (1)    1102  (1)    1112  (1)
                                                               715  (1)     755  (1)     756  (1)     766  (1)
                                                             #-785  (1)     812  (1)     897  (1)     990  (1)
DS$GL_TERMCHAR                  00000000-XR                    1064  (1)  #-1307  (1)    1346  (1)  #-1347  (1)
                                                              1365  (1)  #-1366  (1)
DS$GW_TTOUT                     00000000-XR                  #-527  (1)  #-535  (1)
DS$K_PRINTB                     =00000002     239    (1)
DS$K_PRINTF                     =00000001     239    (1)   #-545  (1)  #-553  (1)  #-602  (1)
DS$K_PRINTI                     =00000000     239    (1)
DS$K_PRINTX                     =00000003     239    (1)
DS$K_TYPE_ABORT_PROGRAM         =00000014     239    (1)
DS$K_TYPE_ABORT_TEST            =00000013     239    (1)
DS$K_TYPE_COMMAND_ERR           =00000015     239    (1)   #-545  (1)  #-553  (1)
DS$K_TYPE_COMMAND_OUT           =00000016     239    (1)   #-602  (1)
DS$K_TYPE_CRD_AUTOTEST          =0000001A     239    (1)
DS$K_TYPE_DS_PROMPT             =00000001     239    (1)
DS$K_TYPE_DS_START              =0000001D     239    (1)
DS$K_TYPE_ERRDEV                =00000008     239    (1)
DS$K_TYPE_ERRHARD               =00000006     239    (1)
DS$K_TYPE_ERROR_BODY            =00000009     239    (1)
DS$K_TYPE_ERROR_END             =0000000A     239    (1)
DS$K_TYPE_ERRPREP               =0000001B     239    (1)
DS$K_TYPE_ERRSOFT               =00000007     239    (1)
DS$K_TYPE_ERRSUP                =00000004     239    (1)
DS$K_TYPE_ERRSYS                =00000005     239    (1)
DS$K_TYPE_ERR_HALT              =0000000D     239    (1)
DS$K_TYPE_EXCEPTION             =0000000C     239    (1)
DS$K_TYPE_EXCEPTION_HEAD        =0000000B     239    (1)
DS$K_TYPE_FIRST_PASS            =00000011     239    (1)
DS$K_TYPE_GENERAL               =00000000     239    (1)
DS$K_TYPE_GENERAL_ERROR         =00000003     239    (1)
DS$K_TYPE_NO_TESTS              =00000012     239    (1)
DS$K_TYPE_PARAM_ERROR           =0000001C     239    (1)
DS$K_TYPE_PROGRAM_END           =00000010     239    (1)
DS$K_TYPE_PROGRAM_INFO          =00000017     239    (1)
DS$K_TYPE_PROGRAM_START         =0000000F     239    (1)
DS$K_TYPE_QIO_INVADP            =00000024     239    (1)
DS$K_TYPE_QIO_NODRIVER          =00000022     239    (1)
DS$K_TYPE_QIO_WRONGVER          =00000023     239    (1)
DS$K_TYPE_SCRIPT_ECHO           =00000021     239    (1)
DS$K_TYPE_SCRIPT_PNF            =0000001E     239    (1)
DS$K_TYPE_SCRIPT_PROMPT         =00000020     239    (1)
DS$K_TYPE_SCRIPT_SKIP           =0000001F     239    (1)
DS$K_TYPE_SEQUENCE_ERROR        =00000019     239    (1)
DS$K_TYPE_START_ERR             =00000018     239    (1)
DS$K_TYPE_START_LIST            =00000025     239    (1)
DS$K_TYPE_SUMMARY               =0000000E     239    (1)
DS$K_TYPE_USER_PROMPT           =00000002     239    (1)
DS$M_ABRTFLG                    =00000040     238    (1)
DS$M_BADTIME                    =00100000     238    (1)
DS$M_BATCH                      =00400000     238    (1)
DS$M_BRKCLR                     =00001000     238    (1)
DS$M_BRKPT                      =00000800     238    (1)
DS$M_CHARFLG                    =00000100     238    (1)
DS$M_CMDFLG                     =00000080     238    (1)
DS$M_CTRLC                      =00000001     238    (1)
DS$M_CTRLO                      =00010000     238    (1)   #-1042  (1)  #-785  (1)
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DS$M_DEVFLG                     =00000200     238     (1)
DS$M_DISABLCC                   =01000000     238     (1)
DS$M_DONFLG                     =00002000     238     (1)
DS$M_ERRFLG                     =00000010     238     (1)
DS$M_EXCEPT                     =00080000     238     (1)
DS$M_EXETST                     =00040000     238     (1)
DS$M_HLTFLG                     =00000008     238     (1)
DS$M_LODFLG                     =00000002     238     (1)
DS$M_MEMMGT                     =00008000     238     (1)
DS$M_NI                         =04000000     238     (1)
DS$M_OUTPUT                     =00800000     238     (1)     #-1042   (1)
DS$M_RUBFLG                     =00000020     238     (1)
DS$M_SCRIPT                     =00200000     238     (1)
DS$M_SETIMR                     =02000000     238     (1)
DS$M_STRFLG                     =00000004     238     (1)
DS$M_SUBT                       =00004000     238     (1)
DS$M_SYSFLG                     =00000400     238     (1)
DS$M_TIMED                      =02000000     238     (1)
DS$M_TIMED_OUT                  =08000000     238     (1)
DS$M_TIMRON                     =00020000     238     (1)
DS$V_ABRTFLG                    =00000006     238     (1)
DS$V_BADTIME                    =00000014     238     (1)
DS$V_BATCH                      =00000016     238     (1)
DS$V_BRKCLR                     =0000000C     238     (1)
DS$V_BRKPT                      =0000000B     238     (1)
DS$V_CHARFLG                    =00000008     238     (1)
DS$V_CMDFLG                     =00000007     238     (1)
DS$V_CTRLC                      =00000000     238     (1)     #-756    (1)     #-766    (1)
DS$V_CTRLO                      =00000010     238     (1)     #-1061   (1)     #-755    (1)     #-897    (1)     #-990    (1)
DS$V_DEVFLG                     =00000009     238     (1)
DS$V_DISABLCC                   =00000018     238     (1)
DS$V_DONFLG                     =0000000D     238     (1)
DS$V_ERRFLG                     =00000004     238     (1)
DS$V_EXCEPT                     =00000013     238     (1)
DS$V_EXETST                     =00000012     238     (1)
DS$V_HLTFLG                     =00000003     238     (1)
DS$V_LODFLG                     =00000001     238     (1)
DS$V_MEMMGT                     =0000000F     238     (1)
DS$V_NI                         =0000001A     238     (1)
DS$V_OUTPUT                     =00000017     238     (1)     #-714    (1)     #-819    (1)     #-826    (1)
DS$V_RUBFLG                     =00000005     238     (1)     #-1101   (1)     #-1111   (1)
DS$V_SCRIPT                     =00000015     238     (1)
DS$V_SETIMR                     =00000019     238     (1)
DS$V_STRFLG                     =00000002     238     (1)
DS$V_SUBT                       =0000000E     238     (1)
DS$V_SYSFLG                     =0000000A     238     (1)
DS$V_TIMED                      =00000019     238     (1)
DS$V_TIMED_OUT                  =0000001B     238     (1)
DS$V_TIMRON                     =00000011     238     (1)
DSA$GL_FLAGS                     0000FE00                     520     (1)      900     (1)      902     (1)
DSA$V_APT                       =0000001F                  #-900     (1)
DSA$V_NORPT                     =0000001B                  #-901     (1)
DSA$V_USER                      =0000001C                  #-520     (1)
DSX$PRINT                        00000000-XR                 545     (1)      553     (1)      602     (1)
END_HARDCOPY_TYPES               00000221-R  460     (1)
END_VIDEO_TYPES                  000001F4-R  436     (1)
EVENT_FLAGS                      00000004-R  281     (1)      1323    (1)
```

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FF                          =0000000C     254    (1)    #-1190   (1)
HARDCOPY_TYPES               000001F8-R   443    (1)      1342   (1)
HYPHEN                      =0000002D     262    (1)
IO$V_CANCTRLO                00000000-XR                #-988    (1)
IO$_READPROMPT               00000000-XR                #-1044   (1)
IO$_SENSEMODE                00000000-XR                #-527    (1)
IO$_SETMODE                  00000000-XR                #-535    (1)
KB_POLL                      000000C5-R   650    (1)    #-896    (1)    #-905    (1)
KB_POLL_X                    000000F9-R   672    (1)    #-654    (1)    #-657    (1)    #-661    (1)    #-664    (1)
                                                        #-667    (1)
LA36_PROMPT                  000004DF-R   1287   (1)      1292   (1)
LASTCHAR                     00000001-R   275    (1)    #-1048   (1)    #-933    (1)
LF                          =0000000A     252    (1)    #-1048   (1)    #-1156   (1)    #-1186   (1)      287    (1)
                                                          290    (1)      296    (1)      299    (1)
LOWCASE                     =00000020     247    (1)
MAX_WAIT                     00000505-R   1301   (1)      1306   (1)
OUT_ASCIC                    00000253-R   880    (1)    #-1052   (1)    #-1119   (1)    #-1136   (1)    #-815    (1)
                                                        #-916    (1)
OUT_CHAR                     00000268-R   895    (1)    #-1079   (1)    #-1087   (1)    #-1089   (1)    #-1091   (1)
                                                        #-1104   (1)    #-1107   (1)    #-1114   (1)    #-1155   (1)
                                                        #-1157   (1)    #-1198   (1)    #-1207   (1)    #-1211   (1)
                                                        #-820    (1)    #-827    (1)    #-889    (1)
OUT_CHARX                    000002ED-R   936    (1)    #-897    (1)    #-902    (1)
OUT_CNTRL                    0000022C-R   869    (1)    #-1319   (1)    #-753    (1)    #-784    (1)
OUT_ECHO                     00000273-R   899    (1)    #-670    (1)
OUT_STRING                   00000256-R   883    (1)    #-1055   (1)    #-993    (1)
PARITY                      =00000080     246    (1)    #-1062   (1)
PR$_RXCS                    =00000020                   #-732    (1)
PR$_RXDB                    =00000021                   #-736    (1)
PR$_SYS_TYP800               00000000-XR                #-720    (1)    #-739    (1)
PR$_TXCS                    =00000022                   #-943    (1)
PR$_TXDB                    =00000023                   #-945    (1)
PREADVBLK                    00000319-R   1040   (1)    #-1120   (1)
PROMPTS                      000004E1-R   1289   (1)      1308   (1)
PSL$V_IS                    =0000001A     237    (1)    #-1326   (1)    #-652    (1)    #-718    (1)    #-874    (1)
                                                        #-934    (1)
QIO$_ASTADR                 =00000014     236    (1)
QIO$_ASTPRM                 =00000018     236    (1)
QIO$_CHAN                   =00000008     236    (1)
QIO$_EFN                    =00000004     236    (1)
QIO$_FUNC                   =0000000C     236    (1)    #-1044   (1)      989    (1)
QIO$_IOSB                   =00000010     236    (1)      1216   (1)
QIO$_NARGS                  =0000000C     236    (1)
QIO$_P1                     =0000001C     236    (1)      1057   (1)      822    (1)    #-992    (1)
QIO$_P2                     =00000020     236    (1)    #-1203   (1)
QIO$_P3                     =00000024     236    (1)
QIO$_P4                     =00000028     236    (1)    #-1163   (1)
QIO$_P5                     =0000002C     236    (1)    #-1054   (1)    #-816    (1)
QIO$_P6                     =00000030     236    (1)
QUAD_TIME                    00000514-R   1302   (1)      1306   (1)      1312   (1)
QUESTN                      =0000003F     263    (1)
READVBLK                     00000319-R   1041   (1)
RECVD_BUF                    000004F1-R   1300   (1)    #-1320   (1)      1321   (1)    #-1330   (1)      1359   (1)
RECVD_BUF_LENGTH            =00000014     1295   (1)      1300   (1)
RINPUT                       000000FC-R   713    (1)    #-1060   (1)    #-719    (1)    #-723    (1)
RINPUTX                      00000131-R   726    (1)
RTYPE                        000001F4-R   811    (1)    #-1137   (1)    #-716    (1)
```

```
SIZ...                          =00000001     240    (1)      238    (1)      240    (1)
SIZE_TERM                        0000051C-R   1304   (1)
SPACE                           =00000020     261    (1)    #-1078   (1)    #-1088   (1)    #-922    (1)
SS$_CONTROLC                     00000000-XR                  #-1126   (1)
SS$_WASSET                       00000000-XR                  #-1324   (1)
SYS$BINTIM                       00000000-XR                    1306   (1)
SYS$QIOW                         00000000-XR                    527    (1)      535    (1)
SYS$READEF                       00000000-XR                    1323   (1)
SYS$SETEF                        00000000-XR                    1221   (1)      994    (1)
SYS$SETIMR                       00000000-XR                    1312   (1)
TAB                             =00000009     251    (1)    #-1192   (1)    #-920    (1)
TT$M_SCOPE                      =00001000                    #-1337   (1)
TT$V_SCOPE                      =0000000C                    #-1063   (1)
TT$_LA100                       =00000025                      450    (1)
TT$_LA12                        =00000024                      447    (1)
TT$_LA120                       =00000021                      453    (1)
TT$_LA34                        =00000022                      456    (1)      459    (1)
TT$_LA36                        =00000020                    #-1345   (1)      464    (1)
TT$_VT100                       =00000060                      345    (1)      366    (1)      369    (1)      372    (1)
                                                               375    (1)      378    (1)      381    (1)      384    (1)
                                                               387    (1)      390    (1)      393    (1)      429    (1)
                                                               432    (1)      435    (1)
TT$_VT101                       =00000061                      348    (1)
TT$_VT102                       =00000062                      351    (1)
TT$_VT125                       =00000064                      354    (1)      357    (1)      360    (1)      363    (1)
TT$_VT132                       =00000066                      405    (1)      408    (1)      411    (1)      414    (1)
                                                               417    (1)      420    (1)      423    (1)      426    (1)
TT$_VT200_SERIES                =0000006E                      396    (1)      399    (1)      402    (1)
TT$_VT52                        =00000040                      336    (1)      339    (1)      342    (1)
TT$_VT55                        =00000041                      327    (1)
TT$_VT5X                        =00000040                      318    (1)      321    (1)      324    (1)      330    (1)
                                                               333    (1)
T_CNTRLC                         00000000-R   286    (1)      752    (1)
T_CNTRLO                         0000000F-R   295    (1)      783    (1)
T_CNTRLR                         0000000C-R   292    (1)      1135   (1)
T_CNTRLU                         00000007-R   289    (1)      1118   (1)
T_CRLF                           00000014-R   298    (1)      1051   (1)      814    (1)      915    (1)
T_LA100                          00000200-R   448    (1)
T_LA12                           000001F8-R   445    (1)
T_LA120                          00000208-R   451    (1)
T_LA34                           0000020F-R   454    (1)
T_LA34A                          00000218-R   457    (1)
T_LA36                           00000225-R   463    (1)
T_OUT_IS_MBX                     0000006D-R   307    (1)      553    (1)
T_SHOW_WIDTH                     00000048-R   304    (1)      602    (1)
T_VT100                          0000012A-R   370    (1)
T_VT100A                         000000C7-R   343    (1)
T_VT100B                         00000133-R   373    (1)
T_VT100C                         0000013C-R   376    (1)
T_VT100D                         00000145-R   379    (1)
T_VT100E                         0000014E-R   382    (1)
T_VT100F                         00000157-R   385    (1)
T_VT100G                         00000160-R   388    (1)
T_VT100H                         00000169-R   391    (1)
T_VT101                          000000CC-R   346    (1)
T_VT102                          000000D5-R   349    (1)
T_VT125                          000000DC-R   352    (1)
```

```
T_VT125A                    000000ED-R   355    (1)
T_VT125B                    000000FE-R   358    (1)
T_VT125C                    0000010F-R   361    (1)
T_VT132                     0000019D-R   403    (1)
T_VT132A                    000001A6-R   406    (1)
T_VT132B                    000001AF-R   409    (1)
T_VT132C                    000001B8-R   412    (1)
T_VT132D                    000001C1-R   415    (1)
T_VT132E                    000001CA-R   418    (1)
T_VT132F                    000001D3-R   421    (1)
T_VT132G                    000001DC-R   424    (1)
T_VT220                     00000172-R   394    (1)
T_VT220A                    00000182-R   397    (1)
T_VT240                     00000189-R   400    (1)
T_VT50_A                    0000009A-R   316    (1)
T_VT50_B                    0000009F-R   319    (1)
T_VT50_C                    000000A4-R   322    (1)
T_VT50_H                    000000AE-R   328    (1)
T_VT50_J                    000000B3-R   331    (1)
T_VT52_K                    000000B8-R   334    (1)
T_VT52_L                    000000BD-R   337    (1)
T_VT52_M                    000000C2-R   340    (1)
T_VT55_E                    000000A9-R   325    (1)
T_VT61                      00000120-R   364    (1)
T_VT61A                     000001E5-R   427    (1)
T_VT61B                     000001EA-R   430    (1)
T_VT61C                     000001EF-R   433    (1)
T_VT71                      00000125-R   367    (1)
T_WIDTH                     00000017-R   301    (1)      545    (1)
VIDEO_TYPES                 0000009A-R   314    (1)      1338   (1)
VRSETWIDTH                  00000000-R   514    (1)
VRSHOWWIDTH                 000000A5-R   596    (1)
VT                         =0000000B     253    (1)    #-1188   (1)
WRITEVBLK                   000002FD-R   987    (1)

                                        +-------------------------+
                                        ! Performance indicators !
                                        +-------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    37    00:00:00.02    00:00:00.20
Command processing               937    00:00:00.28    00:00:00.91
Pass 1                           711    00:00:02.37    00:00:05.64
Symbol table sort                  0    00:00:00.20    00:00:00.20
Pass 2                            54    00:00:00.83    00:00:01.82
Symbol table output                2    00:00:00.04    00:00:00.14
Psect synopsis output              2    00:00:00.01    00:00:00.01
Cross-reference output             7    00:00:00.24    00:00:00.46
Assembler run totals            1752    00:00:03.99    00:00:09.38

The working set limit was 2400 pages.
134492 bytes (263 pages) of virtual memory were used to buffer the intermediate code.
There were 40 pages of symbol table space allocated to hold 646 non-local and 85 local symbols.
1370 source lines were read in Pass 1, producing 59 object records in Pass 2.
51 pages of virtual memory were used to define 41 macros.
```

```
ZZ-ECSAA-10.11  VAX-11 Macro Run Statistics                    3-MAY-1988       Fiche 5 Frame K14          Sequence 1003
CONSOLE                          *** CONSOLE Console I/O handler      21-MAR-1988 18:03:02  VAX/VMS Macro V04-00        Page  50
VAX-11 Macro Run Statistics                                           12-SEP-1986 10:04:25  CONSOLE.MAR;1                (1)


                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                       Macros defined
------------------                       --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              3
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1               16
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                      18
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                37

755 GETS were required to define 37 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

```
0     ! DEC/CMS REPLACEMENT HISTORY, Element CRDDUMMY.B32
0     ! *9    13-MAR-1986 12:49:05 SHELHAMER "<no reason given>"
0     ! *8    13-MAR-1986 11:27:14 SHELHAMER "<no reason given>"
0     ! *7    13-MAR-1986 11:24:39 SHELHAMER "GET OBJ INTO DS.OLB"
0     ! *6    14-FEB-1986 13:54:19 BERGAZZI "TRIMMING"
0     ! *5    13-FEB-1986 10:45:17 BERGAZZI "<no reason given>"
0     ! *4    13-FEB-1986 10:16:32 BERGAZZI "<no reason given>"
0     ! *3    13-FEB-1986 10:03:57 BERGAZZI "<no reason given>"
0     ! *2    13-FEB-1986 10:02:29 BERGAZZI "<no reason given>"
0     ! *1    12-FEB-1986 15:08:02 BERGAZZI "CRDDUMMY"
0     ! DEC/CMS REPLACEMENT HISTORY, Element CRDDUMMY.B32
0     %Title '*** Loading and Unloading the CRD Image'                                    !G:6
0     MODULE CRDDUMMY (                          ! Routines to handle loading and         !G:4
0                                                ! unloading the Loadable-CRD image       !G:2
0                     IDENT = '10-0'                                                       !G:2
0                     ) =
0     !++
0     ! COPYRIGHT (c) 1986                                                                 !G:2
0     ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0     !
0     ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0     ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
0     ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
0     ! MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
0     ! EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
0     ! TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
0     ! REMAIN IN DEC.
0     !
0     ! THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
0     ! AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
0     ! CORPORATION.
0     !
0     ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0     ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0     !--                                                                                  !G:2
0     !++
0     ! Facility:
0     !
0     !       Diagnostic Supervisor (part of the Resident-DS image).                       !G:2
0     !
0     ! Abstract:
0     !
0     !       This module contains the DSR$CRD_LOAD routine, which merely prints           !G:2
0     !       an error message, because it is only linked with 11/780/782/785,             !G:2
0     !       11/750, and 8600/8650 supervisors, which do not support CRD.                 !G:2
0     !
0     ! Author:
0     !
0     !       Bob Bergazzi                                                                 !G:2
0     !
0     ! Creation Date:
0     !
0     !       12-Feb-1986                                                                  !G:2
0     !
0     ! Version                                                                            !G:2
0     !
0     !       Version 10.0                                                                 !G:2
```

```
;    0058  0     !
;    0059  0     ! Modified By:
;    0060  0     !
;    0061  0     !--                                                                    !G:2
;    0062  0     %SBTTL  'Libraries'
;    0063  1     BEGIN                                   ! Begin the CRDDUMMY module    !G:6
;    0064  1                                                                            !G:2
;    0065  1     LIBRARY                                                                !G:2
;    0066  1             '$DS';                                                         !G:2
;    0067  1
;    0068  1     LIBRARY                                                                !G:2
;    0069  1             '$Diag';                                                       !G:2
;    0070  1
;    0071  1     LIBRARY                                                                !G:2
;    0072  1             '$CRD';                                                        !G:2
;    0073  1
;    0074  1     LIBRARY                                                                !G:2
;    0075  1             'Sys$Library:Lib';                                             !G:2
;    0076  1     %SBTTL  'Table of Contents'
;    0077  1
;    0078  1     FORWARD ROUTINE                                                        !G:2
;    0079  1             DSR$Load_CRD            : NOVALUE ADDRESSING_MODE (LONG_RELATIVE),  !G:2
;    0080  1                                     ! Load the CRD Loadable image file     !G:2
;    0081  1                                                                            !G:2
;    0082  1             DSR$Unload_CRD          : NOVALUE ADDRESSING_MODE (LONG_RELATIVE),  !G:2
;    0083  1                                     ! Unload the CRD Loadable image file   !G:2
;    0084  1                                                                            !G:2
;    0085  1             DSR$Restore_CRD_Vectors : NOVALUE ADDRESSING_MODE (LONG_RELATIVE),  !G:2
;    0086  1                                     ! Restore the CRD dispatch vectors - this is  !G:2
;    0087  1                                     ! called by the BEGIN0 label in the KERNEL  !G:2
;    0088  1                                     ! module. The Unload_CRD routine cannot be  !G:2
;    0089  1                                     ! called because memory has already been  !G:2
;    0090  1                                     ! re-mapped by the time BEGIN0 executes.  !G:2
;    0091  1                                                                            !G:2
;    0092  1             CRD_Exit                : NOVALUE ADDRESSING_MODE (LONG_RELATIVE);  !G:2
;    0093  1                                     ! Either exit from the VDS image (back to the  !G:2
;    0094  1                                     ! console), or to the CLI.             !G:2
;    0095  1                                                                            !G:2
;    0096  1     %SBTTL  'Included Macros and Literals'
;    0097  1
;    0098  1             $DS_TYPEDEF;            ! Define the typecode literals.        !G:2
;    0099  1             $DS_DSADEF;             ! Define the DSA flags.                !G:2
;    0100  1                                                                            !G:2
;    0101  1     %SBTTL  'External Routines'                                            !G:2
;    0102  1                                                                            !G:2
;    0103  1     EXTERNAL ROUTINE                                                       !G:2
;    0104  1             DS_Cleanup              : JSB_None ADDRESSING_MODE (LONG_RELATIVE),  !G:2
;    0105  1                                     ! Cleanup the diagnostic before going back to  !G:2
;    0106  1                                     ! CLI command mode                     !G:2
;    0107  1                                                                            !G:2
;    0108  1             DSR$Check_MenuTest_Off_Set: JSB_None ADDRESSING_MODE (LONG_RELATIVE),  !G:2
;    0109  1                                     ! Return 1 if the MenuTest bits are set in the  !G:2
;    0110  1                                     ! R5 passed to the VDS                 !G:2
;    0111  1                                                                            !G:2
;    0112  1             DSR$Check_AutoTest_Off_Set: JSB_None ADDRESSING_MODE (LONG_RELATIVE);  !G:2
;    0113  1                                     ! Return 1 if the AutoTest bits are set in the  !G:2
;    0114  1                                     ! R5 passed to the VDS                 !G:2
```

```
;    0115  1      %SBTTL  'External Own Storage'                                                                    !G:2
;    0116  1                                                                                                       !G:2
;    0117  1      EXTERNAL                                                                                         !G:2
;    0118  1              Begin_Bliss                    : ADDRESSING_MODE (LONG_RELATIVE),                       !G:2
;    0119  1                                             ! The location of the Begin_Bliss label (in the KERNEL module). !G:2
;    0120  1                                                                                                       !G:2
;    0121  1              DS$GA_DS_Ctrl_C_First          : ADDRESSING_MODE (LONG_RELATIVE),                       !G:2
;    0122  1                                             ! The first ^C handler for the VDS                       !G:2
;    0123  1                                                                                                       !G:2
;    0124  1              DS$GA_DS_Ctrl_C_Second         : ADDRESSING_MODE (LONG_RELATIVE),                       !G:2
;    0125  1                                             ! The second ^C handler for the VDS                      !G:2
;    0126  1                                                                                                       !G:2
;    0127  1              DS$L_UserCntrlC                : ADDRESSING_MODE (LONG_RELATIVE),                       !G:2
;    0128  1                                             ! The user's ^C handler                                  !G:2
;    0129  1                                                                                                       !G:2
;    0130  1              DS$GL_Flags                    : ADDRESSING_MODE (LONG_RELATIVE),                       !G:6
;    0131  1                                             ! The DS flags longword                                  !G:6
;    0132  1                                                                                                       !G:6
;    0133  1              DS$GL_CRD_Flags                : ADDRESSING_MODE (LONG_RELATIVE);                       !G:6
;    0134  1                                             ! The DS/CRD flags longword in the DSVECS module         !G:2
;    0135  1                                                                                                       !G:2
;    0136  1      %SBTTL  'Psect Definitions'
;    0137  1
;    0138  1      PSECT
;    0139  1          PLIT    = Data (NOEXECUTE,   SHARE, NOWRITE, ADDRESSING_MODE (LONG_RELATIVE));
;    0140  1
;    0141  1      PSECT
;    0142  1          CODE    = Code (  EXECUTE,   SHARE, NOWRITE, ADDRESSING_MODE (LONG_RELATIVE));               !G:2
;    0143  1
;    0144  1      PSECT
;    0145  1          OWN     = Work (NOEXECUTE, NOSHARE,   WRITE, ADDRESSING_MODE (LONG_RELATIVE));
;    0146  1
;    0147  1      PSECT
;    0148  1          GLOBAL  = Work (NOEXECUTE, NOSHARE,   WRITE, ADDRESSING_MODE (LONG_RELATIVE));
;    0149  1                                                                                                       !G:6
;    0150  1      %SBTTL  'Module-Global Static Storage'
;    0151  1
;    0152  1              ModNam ('CRDDUMMY');           ! Module name for ErrSup macro                           !G:6
;    0153  1                                                                                                       !G:6
;    0154  1      %SBTTL  'Local ASCIC Bindings'                                                                   !G:2
;    0155  1                                                                                                       !G:2
;    0156  1      BIND                                                                                             !G:2
;    0157  1              T_Invalid_CPU                  = $ASCIC ('!/CRD ONLY SUPPORTED ON A VAX-11/730,725!/');  !G:5
;    0158  1                                                                                                       !G:6
;    0159  1      %SBTTL  'Own Storage'                                                                            !G:2
;    0160  1                                                                                                       !G:2
;    0161  1      OWN                                                                                              !G:2
;    0162  1              !+                                                                                       !G:2
;    0163  1              ! Save the contents of the DSA$GL_Flags longword before starting CRD - for restoring it to it's !G:2
;    0164  1              ! original value. Do this for the DS flags also.                                         !G:2
;    0165  1              !-                                                                                       !G:2
;    0166  1                                                                                                       !G:2
;    0167  1              DS$L_Saved_DSA_Flags           : INITIAL (0),                                            !G:2
;    0168  1              DS$L_Saved_DS_Flags            : INITIAL (0);                                            !G:5
;    0169  1                                                                                                       !G:6
;    0170  1      %SBTTL 'DSR$Load_CRD Routine'                                                                    !G:2
;    0171  1                                                                                                       !G:2
```

```
;    0172  1     GLOBAL ROUTINE DSR$Load_CRD : NOVALUE =                                                    !G:2
;    0173  1
;    0174  1     !++                                                                                        !G:2
;    0175  1     ! Functional Description:                                                                  !G:2
;    0176  1     !                                                                                          !G:2
;    0177  1     !       Print the message that CRD doesn't run on this system.                             !G:6
;    0178  1     !                                                                                          !G:2
;    0179  1     ! Formal Parameters:                                                                       !G:2
;    0180  1     !                                                                                          !G:2
;    0181  1     !       None                                                                               !G:2
;    0182  1     !                                                                                          !G:2
;    0183  1     ! Side Effects:                                                                            !G:2
;    0184  1     !                                                                                          !G:2
;    0185  1     !       None                                                                               !G:6
;    0186  1     !                                                                                          !G:2
;    0187  1     ! Completion Codes:                                                                        !G:2
;    0188  1     !                                                                                          !G:2
;    0189  1     !       None                                                                               !G:2
;    0190  1     !--                                                                                        !G:2
;    0191  2     BEGIN                                   ! Routine DSR$Load_CRD                             !G:2
;    0192  2             REGISTER                                                                           !G:2
;    0193  2                     Save_DSA_Flags;                                                            !G:6
;    0194  2                                                                                                !G:2
;    0195  2             DS$L_Saved_DSA_Flags = .DSA$GL_Flags;                                              !G:2
;    0196  2             DS$L_Saved_DS_Flags  = .DS$GL_Flags;                                               !G:2
;    0197  2                                                                                                !G:2
;    0198  2             !+                                                                                 !G:2
;    0199  2             ! First, make sure that the Binary flag is set so that any subsequent $Print's with the  !G:2
;    0200  2             ! CRD_AutoTest typecode won't get the first byte of the output string cut off (with Binary  !G:2
;    0201  2             ! set, the TypeCode is stuck onto the front of the output string, and then if the TypeCode  !G:2
;    0202  2             ! is CRD_AutoTest, then this first byte gets chopped off - by DSX$TypeOut in the PRINT module).  !G:2
;    0203  2             !-                                                                                 !G:2
;    0204  2                                                                                                !G:2
;    0205  2             DSA$V_Binary = On;                                                                 !G:2
;    0206  2                                                                                                !G:2
;    0207  2             !+                                                                                 !G:2
;    0208  2             ! Print the message indicating that CRD does not run on this system.               !G:2
;    0209  2             !-                                                                                 !G:2
;    0210  2                                                                                                !G:2
;    0211  2             Save_DSA_Flags = .DSA$GL_Flags; ! Save them locally                                !G:2
;    0212  2                                                                                                !G:2
;    0213  2             DSA$V_CRD_MenuTest_Off = Off;                                                      !G:2
;    0214  2             DSA$V_CRD_MenuTest_On = Off;                                                       !G:2
;    0215  2             DSA$V_CRD_AutoTest_Off = Off;                                                      !G:6
;    0216  2             DSA$V_Binary       = Off;                                                          !G:2
;    0217  2                                                                                                !G:2
;    0218  2             $Print (DS$K_Type_General_Error, DS$K_PrintF, T_Invalid_CPU);                      !G:6
;    0219  2                                                                                                !G:2
;    0220  2             DSA$GL_Flags = .Save_DSA_Flags; ! Restore the (locally saved) DSA flag settings    !G:2
;    0221  2                                                                                                !G:2
;    0222  2             CRD_Exit ();                    ! Exit CRD                                         !G:2
;    0223  2             RETURN;                                                                            !G:2
;    0224  1     END;                                    ! Routine DSR$Load_CRD                             !G:2


                                                                .TITLE  CRDDUMMY *** Loading and Unloading the CRD Imag
                                                                                                            e
;
```

```
                                                        .IDENT  \10-0\

                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                        59  4D  4D  55  44  44  52  43  08  00000 P.AAA:  .ASCII  <8>\CRDDUMMY\                                  ;
50  55  53  20  59  4C  4E  4F  20  44  52  43  2F  21  2A  00009 P.AAB:  .ASCII  \*!/CRD ONLY SUPPORTED ON A VAX-11/730,72\  ;
58  41  56  20  41  20  4E  4F  20  44  45  54  52  4F  50  00018                                                             ;
                    32  37  2C  30  33  37  2F  31  31  2D  00027                                                             ;
                                                    2F  21  35  00031          .ASCII  \5!/\                                  ;

                                                        .PSECT  WORK,NOEXE,2

                                                00000000  00000 DS$L_SAVED_DSA_FLAGS:
                                                                   .LONG   0                                                  ;
                                                00000000  00004 DS$L_SAVED_DS_FLAGS:
                                                                   .LONG   0                                                  ;

                                                                DSA$AL_APTMAIL=     65024
                                                                DSA$GL_FLAGS=       65024
                                                                DSA$GL_APTCOM=      65028
                                                                DSA$GL_PASSES=      65032
                                                                DSA$GL_UNITS=       65036
                                                                DSA$GL_SECTNO=      65040
                                                                DSA$GL_SID=         65044
                                                                DSA$GL_MSGTYP=      65088
                                                                DSA$GL_ERRNO=       65092
                                                                DSA$GL_EVENT=       65096
                                                                DSA$GL_SUBTNO=      65100
                                                                DSA$GL_TESTNO=      65104
                                                                DSA$GL_PASSNO=      65108
                                                                DSA$GL_DEVLEN=      65112
                                                                DSA$GL_DEVNAM=      65116
                                                                DSA$GL_MSGPTR=      65128
                                                                $MODULE=            P.AAA
                                                                T_INVALID_CPU=      P.AAB
                                                                   .EXTRN  DS_CLEANUP, DSR$CHECK_MENUTEST_OFF_SET
                                                                   .EXTRN  DSR$CHECK_AUTOTEST_OFF_SET
                                                                   .EXTRN  BEGIN_BLISS, DS$GA_DS_CTRL_C_FIRST
                                                                   .EXTRN  DS$GA_DS_CTRL_C_SECOND
                                                                   .EXTRN  DS$L_USERCNTRLC
                                                                   .EXTRN  DS$GL_FLAGS, DS$GL_CRD_FLAGS
                                                                   .EXTRN  DSX$PRINT

                                                        .PSECT  CODE,NOWRT,  SHR,2

                                                  0004 00000          .ENTRY  DSR$LOAD_CRD, Save R2                          ; 0172
00000000'  EF  0000FE00   9F   D0 00002           MOVL    a#^X0000FE00, DS$L_SAVED_DSA_FLAGS             ; 0195
00000000'  EF  00000000G  EF   D0 0000D           MOVL    DS$GL_FLAGS, DS$L_SAVED_DS_FLAGS               ; 0196
0000FE00   9F             02   88 00018           BISB2   #2, a#^X0000FE00                               ; 0205
           52  0000FE00   9F   D0 0001F           MOVL    a#^X0000FE00, SAVE_DSA_FLAGS                   ; 0211
0000FE01   9F       0508  8F   AA 00026           BICW2   #1288, a#^X0000FE01                            ; 0214
0000FE00   9F             02   8A 0002F           BICB2   #2, a#^X0000FE00                               ; 0216
               00000000'  EF   9F 00036           PUSHAB  T_INVALID_CPU                                  ; 0218
                          01   DD 0003C           PUSHL   #1                                             ;
                          03   DD 0003E           PUSHL   #3                                             ;
00000000G  9F             03   FB 00040           CALLS   #3, a#DSX$PRINT                                ;
0000FE00   9F             52   D0 00047           MOVL    SAVE_DSA_FLAGS, a#^X0000FE00                   ; 0220
```

```
                    00000000V  EF          00  FB 0004E        CALLS   #0, CRD_EXIT                          ; 0222
                                               04 00055        RET                                            ; 0223

; Routine Size:  86 bytes,    Routine Base:  CODE + 0000


;   0225  1                                                                                                  !G:6
;   0226  1     %SBTTL 'DSR$Unload_CRD Routine'                                                              !G:2
;   0227  1                                                                                                  !G:2
;   0228  1     GLOBAL ROUTINE DSR$Unload_CRD (Return_To_Caller) : NOVALUE =                                 !G:2
;   0229  1                                                                                                  !G:2
;   0230  1     !++                                                                                          !G:2
;   0231  1     ! Functional Description:                                                                    !G:2
;   0232  1     !                                                                                            !G:2
;   0233  1     !       This routine does nothing because CRD should never be loaded on this system, and this routine should !G:6
;   0234  1     !       never get called. If it does get called it merely returns.                           !G:6
;   0235  1     !                                                                                            !G:2
;   0236  1     ! Formal Parameters:                                                                         !G:2
;   0237  1     !                                                                                            !G:2
;   0238  1     !       Return_To_Caller: If the image is loaded, then return to the caller of this routine when the !G:2
;   0239  1     !                         unloading is done. If it is not loaded, return regardless.         !G:2
;   0240  1     !                                                                                            !G:2
;   0241  1     ! Side Effects:                                                                              !G:2
;   0242  1     !                                                                                            !G:2
;   0243  1     !       None                                                                                 !G:6
;   0244  1     !                                                                                            !G:2
;   0245  1     ! Completion Codes:                                                                          !G:2
;   0246  1     !                                                                                            !G:2
;   0247  1     !       None                                                                                 !G:2
;   0248  1     !--                                                                                          !G:2
;   0249  2     BEGIN                                  ! Routine DSR$Unload_CRD                              !G:2
;   0250  2                 RETURN;                                                                          !G:2
;   0251  1     END;                                   ! Routine DSR$Load_CRD                                !G:2



                                                 0000 00000        .ENTRY  DSR$UNLOAD_CRD, Save nothing          ; 0228
                                                   04 00002        RET                                            ; 0250

; Routine Size:  3 bytes,    Routine Base:  CODE + 0056


;   0252  1                                                                                                  !G:2
;   0253  1     %SBTTL 'DSR$Restore_CRD_Vectors Routine'                                                     !G:2
;   0254  1                                                                                                  !G:2
;   0255  1     GLOBAL ROUTINE DSR$Restore_CRD_Vectors : NOVALUE =                                           !G:2
;   0256  1                                                                                                  !G:2
;   0257  1     !++                                                                                          !G:2
;   0258  1     ! Functional Description:                                                                    !G:2
;   0259  1     !                                                                                            !G:2
;   0260  1     !       This routine does nothing for this type of system.                                   !G:6
;   0261  1     !                                                                                            !G:2
;   0262  1     ! Formal Parameters:                                                                         !G:2
;   0263  1     !                                                                                            !G:2
;   0264  1     !       None                                                                                 !G:2
```

```
;    0265  1      !                                                                                          !G:2
;    0266  1      ! Side Effects:                                                                            !G:2
;    0267  1      !                                                                                          !G:2
;    0268  1      !       None                                                                               !G:6
;    0269  1      !                                                                                          !G:2
;    0270  1      ! Completion Codes:                                                                        !G:2
;    0271  1      !                                                                                          !G:2
;    0272  1      !       None                                                                               !G:2
;    0273  1      !--                                                                                        !G:2
;    0274  2      BEGIN                                  ! Routine DSR$Restore_CRD_Vectors                   !G:2
;    0275  2              RETURN;                                                                            !G:2
;    0276  1      END;                                   ! Routine DSR$Restore_CRD_Vectors                   !G:2



                                                0000 00000          .ENTRY  DSR$RESTORE_CRD_VECTORS, Save nothing       ; 0255
                                                  04 00002          RET                                                 ; 0275

; Routine Size:  3 bytes,    Routine Base:  CODE + 0059

;    0277  1
;    0278  1      %SBTTL 'CRD_Exit Routine'                                                                  !G:6
;    0279  1                                                                                                 !G:2
;    0280  1      ROUTINE CRD_Exit : NOVALUE =                                                               !G:2
;    0281  1
;    0282  1      !++
;    0283  1      ! Functional Description:
;    0284  1      !
;    0285  1      !       Exit from the CRD-world to either the VDS CLI command mode, or to the 11/730,725 console mode.  !G:2
;    0286  1      !
;    0287  1      ! Formal Parameters:                                                                        !G:2
;    0288  1      !
;    0289  1      !       None
;    0290  1      !
;    0291  1      ! Implicit Inputs:                                                                         !G:2
;    0292  1      !
;    0293  1      !       None
;    0294  1      !
;    0295  1      ! Side Effects:
;    0296  1      !
;    0297  1      !       Either exits the VDS or goes to CLI mode via the Begin_Bliss label.                !G:2
;    0298  1      !
;    0299  1      ! Completion Codes:
;    0300  1      !
;    0301  1      !       None - does not return from here                                                   !G:2
;    0302  1      !--
;    0303  2      BEGIN                                  ! Routine CRD_Exit                                  !G:2
;    0304  2              BUILTIN                                                                            !G:2
;    0305  2                      HALT;                                                                      !G:2
;    0306  2                                                                                                 !G:2
;    0307  2              !+                                                                                 !G:2
;    0308  2              ! Cancel any ^C's that happened before this routine was called, and re-enable catching  !G:2
;    0309  2              ! of ^C's.                                                                         !G:2
;    0310  2              !-                                                                                 !G:2
```

```
;    0311  2                                                                                                    !G:2
;    0312  2              DS$GL_Flags <DS$V_CtrlC> = Off;                                                       !G:2
;    0313  2              $DS_CntrlC (Disabl = 0);                                                              !G:2
;    0314  2                                                                                                    !G:2
;    0315  2              !+                                                                                    !G:2
;    0316  2              ! Now resume echoing ^C's.                                                            !G:6
;    0317  2              !-                                                                                    !G:2
;    0318  2                                                                                                    !G:2
;    0319  2              CRD$V_Ctrl_C_No_Echo = False;                                                         !G:6
;    0320  2              CRD$V_Flush_Ctrl_C = False;                                                           !G:6
;    0321  2                                                                                                    !G:2
;    0322  2              !+                                                                                    !G:2
;    0323  2              ! Restore the DSA and DS flag settings that were saved in DSR$Load_CRD.               !G:2
;    0324  2              !-                                                                                    !G:2
;    0325  2                                                                                                    !G:2
;    0326  2              DSA$GL_Flags = .DS$L_Saved_DSA_Flags;                                                 !G:2
;    0327  2              DS$GL_Flags  = .DS$L_Saved_DS_Flags;                                                  !G:2
;    0328  2                                                                                                    !G:2
;    0329  2              !+                                                                                    !G:2
;    0330  2              ! Make sure all the CRD bits are cleared. Don't touch BINARY though. Perhaps the operator turned !G:2
;    0331  2              ! it on on purpose.                                                                   !G:2
;    0332  2              !-                                                                                    !G:2
;    0333  2                                                                                                    !G:2
;    0334  2              DSA$V_CRD_Trace     = Off;                                                            !G:2
;    0335  2              DSA$V_CRD_MenuTest_Off = Off;                                                         !G:2
;    0336  2              DSA$V_CRD_MenuTest_On = Off;                                                          !G:2
;    0337  2              DSA$V_CRD_AutoTest_Off = Off;                                                         !G:2
;    0338  2                                                                                                    !G:2
;    0339  2              DS_Cleanup ();                    ! Cleanup any residual diagnostics                  !G:2
;    0340  2                                                                                                    !G:2
;    0341  2              !+                                                                                    !G:2
;    0342  2              ! Make the VDS think that no diagnogstic is loaded.                                   !G:2
;    0343  2              !-                                                                                    !G:2
;    0344  2                                                                                                    !G:2
;    0345  2              DS$GL_Flags <DS$V_LodFlg> = Off;                                                      !G:2
;    0346  2              L$L_Environ = 0;                                                                      !G:2
;    0347  2                                                                                                    !G:2
;    0348  3              IF (DSR$Check_MenuTest_Off_Set () OR                                                  !G:2
;    0349  3                  DSR$Check_AutoTest_Off_Set ()                                                     !G:2
;    0350  2              ) THEN                                                                                !G:2
;    0351  3                      BEGIN                                                                         !G:2
;    0352  3                      WHILE (True) DO                                                               !G:2
;    0353  3                              HALT ();                                                              !G:2
;    0354  3                      END                                                                           !G:2
;    0355  2              ELSE                                                                                  !G:2
;    0356  3                      BEGIN                                                                         !G:2
;    0357  3                      !+                                                                            !G:2
;    0358  3                      ! Since this goes back to the DS$Cli routine, the ^C recognition will be re-enabled there. !G:2
;    0359  3                      !-                                                                            !G:2
;    0360  3                                                                                                    !G:2
;    0361  3                      JSB_None (Begin_Bliss);                                                       !G:2
;    0362  2                      END;                                                                          !G:2
;    0363  1      END;                                  ! Routine CRD_Exit                                      !G:2


                                                                .EXTRN  DS$CNTRLC
```

```
                                                  0FFC 00000 CRD_EXIT:
                                                                  .WORD   Save R2,R3,R4,R5,R6,R7,R8,R9,R10,R11          ; 0280
                                  52 00000000G  EF  9E 00002      MOVAB   DS$GL_FLAGS, R2                               ;
                                  62            01  8A 00009      BICB2   #1, DS$GL_FLAGS                               ; 0312
                                                7E  7C 0000C      CLRQ    -(SP)                                         ; 0313
                        00000000G  9F           02  FB 0000E      CALLS   #2, @#DS$CNTRLC                               ;
                        00000000G  EF           06  8A 00015      BICB2   #6, DS$GL_CRD_FLAGS                           ; 0319
                        0000FE00   9F 00000000' EF  D0 0001C      MOVL    DS$L_SAVED_DSA_FLAGS, @#^X0000FE00            ; 0326
                                  62 00000000' EF  D0 00027      MOVL    DS$L_SAVED_DS_FLAGS, DS$GL_FLAGS              ; 0327
                        0000FE01   9F     0708  8F  AA 0002E      BICW2   #1800, @#^X0000FE01                           ; 0336
                                     00000000G  EF  16 00037      JSB     DS_CLEANUP                                    ; 0339
                                  62            02  8A 0003D      BICB2   #2, DS$GL_FLAGS                               ; 0345
                                     00000204   9F  D4 00040      CLRL    @#^X00000204                                  ; 0346
                                     00000000G  EF  16 00046      JSB     DSR$CHECK_MENUTEST_OFF_SET                    ; 0348
                                  09            50  E8 0004C      BLBS    R0, 1$                                        ;
                                     00000000G  EF  16 0004F      JSB     DSR$CHECK_AUTOTEST_OFF_SET                    ; 0349
                                  03            50  E9 00055      BLBC    R0, 2$                                        ;
                                                    00 00058 1$:  HALT                                                  ; 0353
                                                FD  11 00059      BRB     1$                                            ;
                                     00000000G  EF  16 0005B 2$:  JSB     BEGIN_BLISS                                   ; 0361
                                                    04 00061      RET                                                   ; 0363

; Routine Size:  98 bytes,    Routine Base:  CODE + 005C


;   0364  1     END                                  ! End of CRDDUMMY module                                    !G:6
;   0365  0     ELUDOM




;                                  PSECT SUMMARY
;
;       Name                    Bytes                          Attributes
;
;  DATA                            52  NOVEC,NOWRT,  RD ,NOEXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  WORK                             8  NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  CODE                           190  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
```

Symbol	Type	Defined	Referenced ...
$ASCIC	Macro	Lib02	157
$DS_CNTRLC	KeyWMacr	Lib02	313
$DS_DSADEF	Macro	Lib02	99
$DS_TYPEDEF	Macro	Lib02	98
$EQULST	Macro	Lib04	98
$ER	Comptime	152	
$MODULE	Bind	152	
$PRINT	Macro	Lib01	218
BEGIN_BLISS	External	118	361c
CRD$V_CTRL_C_NO_ECHO	Macro	Lib01	319
CRD$V_FLUSH_CTRL_C	Macro	Lib01	320
CRD_EXIT	Routine	280	92f 222c
DS$CNTRLC	ExtRout	313	313c
DS$GA_DS_CTRL_C_FIRST	External	121	
DS$GA_DS_CTRL_C_SECOND	External	124	
DS$GL_CRD_FLAGS	External	133	319= 320=
DS$GL_FLAGS	External	130	196. 312= 327= 345=
DS$K_PRINTB	Literal	98	
DS$K_PRINTF	Literal	98	218
DS$K_PRINTI	Literal	98	
DS$K_PRINTX	Literal	98	
DS$K_TYPE_ABORT_PROGRAM	Literal	98	
DS$K_TYPE_ABORT_TEST	Literal	98	
DS$K_TYPE_COMMAND_ERR	Literal	98	
DS$K_TYPE_COMMAND_OUT	Literal	98	
DS$K_TYPE_CRD_AUTOTEST	Literal	98	
DS$K_TYPE_DS_PROMPT	Literal	98	
DS$K_TYPE_DS_START	Literal	98	
DS$K_TYPE_ERRDEV	Literal	98	
DS$K_TYPE_ERRHARD	Literal	98	
DS$K_TYPE_ERROR_BODY	Literal	98	
DS$K_TYPE_ERROR_END	Literal	98	
DS$K_TYPE_ERRPREP	Literal	98	
DS$K_TYPE_ERRSOFT	Literal	98	
DS$K_TYPE_ERRSUP	Literal	98	
DS$K_TYPE_ERRSYS	Literal	98	
DS$K_TYPE_ERR_HALT	Literal	98	
DS$K_TYPE_EXCEPTION	Literal	98	
DS$K_TYPE_EXCEPTION_HEAD	Literal	98	
DS$K_TYPE_FIRST_PASS	Literal	98	
DS$K_TYPE_GENERAL	Literal	98	
DS$K_TYPE_GENERAL_ERROR	Literal	98	218
DS$K_TYPE_NO_TESTS	Literal	98	
DS$K_TYPE_PARAM_ERROR	Literal	98	
DS$K_TYPE_PROGRAM_END	Literal	98	
DS$K_TYPE_PROGRAM_INFO	Literal	98	
DS$K_TYPE_PROGRAM_START	Literal	98	
DS$K_TYPE_QIO_INVADP	Literal	98	
DS$K_TYPE_QIO_NODRIVER	Literal	98	
DS$K_TYPE_QIO_WRONGVER	Literal	98	
DS$K_TYPE_SCRIPT_ECHO	Literal	98	
DS$K_TYPE_SCRIPT_PNF	Literal	98	
DS$K_TYPE_SCRIPT_PROMPT	Literal	98	
DS$K_TYPE_SCRIPT_SKIP	Literal	98	
DS$K_TYPE_SEQUENCE_ERROR	Literal	98	

Symbol	Type	Defined	Referenced ...
DS$K_TYPE_START_ERR	Literal	98	
DS$K_TYPE_START_LIST	Literal	98	
DS$K_TYPE_SUMMARY	Literal	98	
DS$K_TYPE_USER_PROMPT	Literal	98	
DS$L_SAVED_DSA_FLAGS	Own	167	167= 195= 326.
DS$L_SAVED_DS_FLAGS	Own	168	168= 196= 327.
DS$L_USERCNTRLC	External	127	
DS$V_CTRLC	Macro	Lib01	312
DS$V_LODFLG	Macro	Lib01	345
DSA$AL_APTMAIL	Bind	99	99
DSA$GL_APTCOM	Bind	99	
DSA$GL_DEVLEN	Bind	99	
DSA$GL_DEVNAM	Bind	99	
DSA$GL_ERRNO	Bind	99	
DSA$GL_EVENT	Bind	99	
DSA$GL_FLAGS	Bind	99	195 205 211 213 214 215 216 220 326 334 335 336 337
DSA$GL_MSGPTR	Bind	99	
DSA$GL_MSGTYP	Bind	99	
DSA$GL_PASSES	Bind	99	
DSA$GL_PASSNO	Bind	99	
DSA$GL_SECTNO	Bind	99	
DSA$GL_SID	Bind	99	
DSA$GL_SUBTNO	Bind	99	
DSA$GL_TESTNO	Bind	99	
DSA$GL_UNITS	Bind	99	
DSA$V_BINARY	Macro	Lib02	205 216
DSA$V_CRD_AUTOTEST_OFF	Macro	Lib02	215 337
DSA$V_CRD_MENUTEST_OFF	Macro	Lib02	213 335
DSA$V_CRD_MENUTEST_ON	Macro	Lib02	214 336
DSA$V_CRD_TRACE	Macro	Lib02	334
DSR$CHECK_AUTOTEST_OFF_SET	ExtRout	112	349c
DSR$CHECK_MENUTEST_OFF_SET	ExtRout	108	348c
DSR$LOAD_CRD	GlobRout	172	79f
DSR$RESTORE_CRD_VECTORS	GlobRout	255	85f
DSR$UNLOAD_CRD	GlobRout	228	82f
DSX$PRINT	ExtRout	218	218c
DS_CLEANUP	ExtRout	104	339c
FALSE	Literal	Lib03	319 320
GET1ST_	Macro	Lib04	98
GET2ND_	Unbound		98
HALT	Builtin	305	353
JSB_NONE	Linkage	Lib01	104 108 112 361
L$L_ENVIRON	Literal	Lib02	346
MODNAM	Macro	Lib01	152
NUL2ND_	Macro	Lib04	98
OFF	Literal	Lib03	213 214 215 216 312 334 335 336 337 345
ON	Literal	Lib03	205
RETURN_TO_CALLER	RoutForm	228	
SAVE_DSA_FLAGS	Register	193	211= 220.
TRUE	Literal	Lib03	352
T_INVALID_CPU	Bind	157	218a

CROSS REFERENCE MAP

Line #	Event	File ...
1	Source (start)	DISK$DS:[DS.LOCAL.RELEASE.WORK]CRDDUMMY.B32;1
13	Module CRDDUMMY	
66	Library #1	DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
69	Library #2	DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
72	Library #3	DISK$DS:[DS.LOCAL.RELEASE.WORK]CRD.L32;1
75	Library #4	SYS$COMMON:[SYSLIB]LIB.L32;3
365	Eludom CRDDUMMY	

KEY TO REFERENCE TYPE FLAGS

```
.   Fetch
=   Store
c   Routine call
a   Address use
a   Indirect use
e   External, external routine, or external literal declaration
f   Forward or forward routine declaration
h   Condition handler enabling
m   Map declaration
u   Undeclare declaration
```

Library Statistics

File	Symbols Total	Symbols Loaded	Symbols Percent	Pages Mapped	Processing Time
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1	675	7	1	47	00:00.0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1	942	10	1	96	00:00.0
DISK$DS:[DS.LOCAL.RELEASE.WORK]CRD.L32;1	486	4	0	62	00:00.0
SYS$COMMON:[SYSLIB]LIB.L32;3	21522	3	0	1156	00:01.0

COMMAND QUALIFIERS

```
;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:CRDDUMMY.B32

; Size:         190 code + 60 data bytes
; Run Time:        00:02.6
; Elapsed Time:    00:04.9
; Lines/CPU Min:    8588
; Lexemes/CPU-Min: 81058
; Memory Used:  101 pages
; Compilation Complete
```

Table of contents

(2) 90 DECLARATIONS
(3) 182 DD_SELECT - Select correct CPUs for this driver
(4) 232 Console TU58 Driver
(4) 487 Character transmission

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element CSDDBTDRV.MAR
0000     2 ; *1     6-FEB-1986 15:16:29 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element CSDDBTDRV.MAR
0000     4         .TITLE  CSDDBTDRV - CONSOLE TU58 BOOT DRIVER
0000     5         .IDENT  '06-12'
0000     6
0000     7 ;
0000     8 ;*****************************************************************************
0000     9 ;*                                                                           *
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0000    26 ;*                                                                           *
0000    27 ;*****************************************************************************
0000    28 ;
0000    29
0000    30 ;++
0000    31 ; FACILITY:     BOOTS
0000    32 ;
0000    33 ; ABSTRACT:
0000    34 ;       This module contains the bootstrap device driver for the
0000    35 ;       console TU58.
0000    36 ;
0000    37 ; ENVIRONMENT:  IPL 31, kernel mode, code must be PIC
0000    38 ;
0000    39 ; AUTHOR:  Steve Beckhardt,     Creation Date:  1-Nov-1979
0000    40 ;
0000    41 ; MODIFIED BY:
0000    42 ;
0000    43 ;       12      Amy Iorio       June 6, 1985    Version 8.3
0000    44 ;               Branched around halt in do_mapping.
0000    45 ;
0000    46 ;       11      Bob Bergazzi    May 16, 1983    Version 6.11
0000    47 ;               Changed the order of the .LIB statements.
0000    48 ;
0000    49 ;       10      Marion Baggett, 15-Jul-1982, Version 6.9
0000    50 ;               Increased the timeout value so loading of QALOAD for QA-ing
0000    51 ;               can be done on ZAPPA comet.
0000    52 ;
0000    53 ;       09      - Dave Butenhof, 23-Mar-1982, version 6.7
0000    54 ;               Now that TU58 hardware is fixed (Nebula), remove some
0000    55 ;               hack code
0000    56 ;
0000    57 ;       08      - Dave Butenhof, 10-Feb-1982, version 6.6
```

```
0000     58 ;                  Fix driver to work correctly on Nebula.  This is mainly
0000     59 ;                  a matter of allowing some leeway in READY/DONE bit polling
0000     60 ;                  loops to allow console to do something.  Also allow ^C
0000     61 ;                  termination of long TU-58 reads.
0000     62 ;
0000     63 ;          V02-007 KTA0037         Kerbey T. Altmann       26-Oct-1981
0000     64 ;                  Fix start and size to encompass the entire driver.
0000     65 ;
0000     66 ;          02-006  STJ0125         Steven T. Jeffreys      30-Jul-1981
0000     67 ;                  Added support of MRSP protocol.  For an explantion of the
0000     68 ;                  TU58's operation, including RSP and MRSP protocol, please
0000     69 ;                  see the "TU58 Engineering Specification", document number
0000     70 ;                  TU58-0-0.
0000     71 ;
0000     72 ;          02-005  TCM0002         Trudy C. Matthews       29-Jul-1981
0000     73 ;                  Changed all "7ZZ"s to "730"s.
0000     74 ;
0000     75 ;          02-004  TCM0001         Trudy C. Matthews       12-Jun-1981
0000     76 ;                  Altered XMIT_TWO_CHARS routine to work on 11/730 processor,
0000     77 ;                  which requires that the high 3 bytes of the value moved to
0000     78 ;                  PR$_CSTD be zero.  Corrected bug in DO_MAPPING routine.
0000     79 ;                  Added CONSDD_START label to mark start of driver.
0000     80 ;
0000     81 ;          02-003  SRB0001         Steve Beckhardt         10-Jul-1980
0000     82 ;                  Fixed bugs in change CAS0001
0000     83 ;
0000     84 ;          02-02   CAS0001         C.A. Samuelson          30-Apr-1980
0000     85 ;                  Change interface to BOOTDRIVR for UBA pruge of buffered
0000     86 ;                  datapath
0000     87 ;
0000     88 ;--
```

```
0000     90          .SBTTL  DECLARATIONS
0000     91 ;
0000     92 ; INCLUDE FILES:
0000     93 ;
0000     94          .library        /sys$library:lib/       ;                       [11]
0000     95          .library        /$ds/           ;                               [11]
0000     96          .library        /$diag/         ;                               [11]
0000     97
0000     98          DsFDef                          ; Define DS$V_ flags            [08]
0000     99          $BTDDEF                         ; Boot device types
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000    100          $IODEF                          ; I/O function codes
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000    101          $PRDEF                          ; Processor registers
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000    102          $PTEDEF                         ; PTE definitions
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000    103          $RPBDEF                         ; RPB offsets
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000    104          $SSDEF                          ; Status codes
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000    105          $VADEF                          ; Virtual address fields
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000    106
0000    107 ;
0000    108 ; MACROS:
0000    109 ;
0000    110
0000    111 ;
0000    112 ; EQUATED SYMBOLS:
0000    113 ;
0000    114
0000    115 ;
0000    116 ; CONSOLE TU58 REGISTER DEFINITIONS
0000    117 ;
0000    118
0000    119          $DEFINI DD                      ;START OF REGISTER DEFINITIONS
0000                 .SAVE   LOCAL_BLOCK
0000    120
0000    121          _VIELD  CSRS,0,<-               ;START OF PROC. REG. CSRS DEFS.
0000    122                  <,6>,-                  ; UNUSED
0000    123                  <IE,,M>,-               ; INTERRUPT ENABLE
0000    124                  <DONE,,M>,-             ; DONE
0000    125          >
0000    126
0000    127          _VIELD  CSRD,0,<-               ;START OF PROC. REG. CSRD DEFS.
0000    128                  <DATA,8>,-              ; DATA
0000    129                  <,7>,-                  ; UNUSED
0000    130                  <ERROR,,M>,-            ; ERROR
0000    131          >
```

```
                     0000   132
                     0000   133          _VIELD  CSTS,0,<-                ;START OF PROC. REG. CSTS DEFS.
                     0000   134                  <BREAK,,M>,-              ; BREAK
                     0000   135                  <,5>,-                    ; UNUSED
                     0000   136                  <IE,,M>,-                 ; INTERRUPT ENABLE
                     0000   137                  <READY,,M>,-              ; READY
                     0000   138          >
                     0000   139
                     0000   140          _VIELD  CSTD,0,<-                 ;START OF PROC. REG. CSTD DEFS.
                     0000   141                  <DATA,8>,-                ; DATA
                     0000   142          >
                     0000   143
                     0000   144          ;
                     0000   145          ; PROTOCOL FLAGS
                     0000   146          ;
                     0000   147
00000001             0000   148 DD_DATA = 1
00000002             0000   149 DD_CNTRL = 2
00000004             0000   150 DD_INIT = 4
00000010             0000   151 DD_CONTINUE = 16
                     0000   152
                     0000   153          ;
                     0000   154          ; FUNCTION CODES
                     0000   155          ;
                     0000   156
00000001             0000   157 DD_Init_Cmd = 1
00000002             0000   158 DD_READ = 2
00000003             0000   159 DD_WRITE = 3
00000040             0000   160 DD_ENDPKT = 64
                     0000   161
                     0000   162          ;
                     0000   163          ; SWITCH BITS
                     0000   164          ;
                     0000   165
00000003             0000   166 MRSP_SWITCH = 3
                     0000   167
                     0000   168          $DEFEND DD
                     0000                .RESTORE
                     0000   169
                     0000   170 ;
                     0000   171 ; Boot driver table entry
                     0000   172 ;
                     0000   173
                     0000   174          $BOOT_DRIVER    DEVTYPE = BTD$K_CONSOLE,-   ; Device type (console)
                     0000   175                          ACTION = DD_SELECT,-        ; Action routine
                     0000   176                          SIZE = CONSDD_DRVSIZ,-      ; Driver size
                     0000   177                          ADDR = CONSDD_START,-      ; Driver start
                     0000   178                          ENTRY = CONSDD_DRIVER,-     ; Driver entry
                     0000   179                          DRIVRNAME = DDNAME          ; Driver file name
                 00000000           .PSECT  BOOTDRIVR_4
                 FFFF  0000         .WORD   -1
                 0040  0002         .WORD   BTD$K_CONSOLE
00000000'        0004               .LONG   DD_SELECT-$TABLE
00000271'        0008               .LONG   CONSDD_DRVSIZ
00000000'        000C               .LONG   CONSDD_START-$TABLE
00000033'        0010               .LONG   CONSDD_DRIVER-CONSDD_START
00000026'        0014               .LONG   DDNAME-CONSDD_START
```

```
00000000                .PSECT  BOOTDRIVR_2
    0000   180
```

```
                        0000   182          .SBTTL  DD_SELECT - Select correct CPUs for this driver
                        0000   183
                        0000   184 ;++
                        0000   185 ; FUNCTIONAL DESCRIPTION:
                        0000   186 ;
                        0000   187 ;       This routine is an action routine called by the boot driver
                        0000   188 ;       select code to determine if this is a cpu that has a TU58
                        0000   189 ;       for a console.
                        0000   190 ;
                        0000   191 ; CALLING SEQUENCE:
                        0000   192 ;
                        0000   193 ;       JSB     DD_SELECT
                        0000   194 ;
                        0000   195 ; INPUT PARAMETERS:
                        0000   196 ;
                        0000   197 ;       EXE$GB_CPUTYPE          Global variable containing cpu type
                        0000   198 ;
                        0000   199 ; OUTPUT PARAMETERS:
                        0000   200 ;
                        0000   201 ;       R0      0 = Do not use this driver
                        0000   202 ;               1 = Use this driver
                        0000   203 ;
                        0000   204 ;       MRSP    1 if this CPU has a TU58 that speaks MRSP, 0 if not.
                        0000   205 ;
                        0000   206 ;               It is assumed that certain CPUs must have MRSP TU58s.
                        0000   207 ;               Currently, only the 11/730 must have an MRSP TU58.
                        0000   208 ;               The 11/780 and 11/730 may have MRSP TU58s, but it is
                        0000   209 ;               not essential that MRSP be used.
                        0000   210 ;
                        0000   211 ;--
                        0000   212
                        0000   213 CONSDD_START:                            ; Label to mark start of driver
                        0000   214
                        0000   215 DD_SELECT:
            00000025'GF   94    0000   216         CLRB    G^MRSP                  ; Assume TU58 does not speak MRSP
                  50   D4    0006   217         CLRL    R0                      ; Initialize R0
                        0008   218         CPUDISP <CPU_780,-                      ; 11/780
                        0008   219                  CPU_750,-                      ; 11/750
                        0008   220                  CPU_730,-                      ; 11/730
                        0008   221                  >
02'  01   00000000'EF   8F    0008         CASEB   EXE$GB_CPUTYPE,#PR$_SID_TYP780,S^#<<30001$-30000$>/2>-1
                        0010     30000$:
                  0006'  0010         .SIGNED_WORD    CPU_780-30000$
                  000D'  0012         .SIGNED_WORD    CPU_750-30000$
                  0007'  0014         .SIGNED_WORD    CPU_730-30000$
                        0016     30001$:
                        0016   222 CPU_780:
                     05 0016   223         RSB                             ; Do not use this driver
                        0017   224
                        0017   225 CPU_730:
            00000025'GF   D6    0017   226         INCL    G^MRSP                  ; Use MRSP (and fall through to common code)
                        001D   227
                        001D   228 CPU_750:
                  50   D6    001D   229         INCL    R0                      ; Use this driver
                     05 001F   230         RSB
```

```
                                0020   232          .SBTTL  Console TU58 Driver
                                0020   233
                                0020   234 ;++
                                0020   235 ;
                                0020   236 ; Inputs:
                                0020   237 ;
                                0020   238 ;       R1      Address of page table for virtual -> physical mapping
                                0020   239 ;       R2      Base VPN of transfer (Bits 29:9 of R10)
                                0020   240 ;       R5      LBN for current piece of transfer
                                0020   241 ;       R8      Size of transfer in bytes
                                0020   242 ;       R9      Address of the RPB
                                0020   243 ;       R10     Starting address of transfer
                                0020   244 ;
                                0020   245 ;       FUNC(AP)  I/O operation (IO$_READLBLK or IO$_WRITELBLK only)
                                0020   246 ;       MODE(AP)  Address interpretation mode:
                                0020   247 ;                    0 -> Physical,  1 -> Virtual
                                0020   248 ;
                                0020   249 ; Outputs:
                                0020   250 ;
                                0020   251 ;       R0      Status code:
                                0020   252 ;
                                0020   253 ;               SS$_NORMAL      Successful transfer
                                0020   254 ;               SS$_BUFBYTALI   Odd byte count
                                0020   255 ;               SS$_CTRLERR     Fatal controller error
                                0020   256 ;--
                    00000010    0020   257 FUNC = 16
                    00000014    0020   258 MODE = 20
                                0020   259
                                0020   260
                                0020   261 ;
                                0020   262 ; OWN STORAGE:
                                0020   263 ;
                                0020   264
                    00000000    0020   265 STKPTR: .LONG   0                       ; Saved stack pointer
                          00    0024   266 INIT:   .BYTE   0                       ; TU58 initialized flag
                          00    0025   267 MRSP:   .BYTE   0                       ; MRSP protocol flag
58 45 2E 52 45 56 49 52 44 44 44 00'  0026   268 DDNAME: .ASCIC  /DDDRIVER.EXE/          ; Driver file name
                          45    0032
                          0C    0026
                                0033   269
                                0033   270 CONSDD_DRIVER:
                    0D06 8F     BB  0033   271          PUSHR   #^M<R1,R2,R8,R10,R11>   ; Save input registers
                      0A 58     E9  0037   272          BLBC    R8,1$                   ; Branch if even byte count
                50    030C 8F   3C  003A   273          MOVZWL  #SS$_BUFBYTALI,R0       ; Error - odd byte count
                    0D06 8F     BA  003F   274          POPR    #^M<R1,R2,R8,R10,R11>   ; Restore registers
                          05    0043   275          RSB
                  D8 AF   5E    D0  0044   276 1$:      MOVL    SP,STKPTR               ; Save stack pointer
                                0048   277
                                0048   278 ;
                                0048   279 ; There are 4 possibilities concerning mapping:  the I/O can be
                                0048   280 ; done virtual or physical (MODE(AP)) and we can be executing virtual
                                0048   281 ; or physical (contents of processor register PR$_MAPEN).  If both
                                0048   282 ; modes match, then we can just copy data to/from the user buffer.
                                0048   283 ; If the I/O is to be done virtual and we are executing physical
                                0048   284 ; then the buffer address has to be translated using the page table
                                0048   285 ; pointed to by R1.  If the I/O is to be done physical and we are
                                0048   286 ; executing virtual then we have to double map the buffer using a spare
```

```
                        0048   287 ; PTE.  At this point, we just compute a mapping switch in R11 as follows:
                        0048   288 ;
                        0048   289 ;       0       Both modes match, just copy the data
                        0048   290 ;       1       Do virtual -> physical translation using page table
                        0048   291 ;       -1      Do physical -> virtual mapping using a spare PTE
                        0048   292 ;
            5B   38 DB  0048   293         MFPR    #PR$_MAPEN,R11          ; Get mapping enabled switch
            5B   5B CE  004B   294         MNEGL   R11,R11                 ; Negate it
         5B   14 AC C0  004E   295         ADDL    MODE(AP),R11            ; Add I/O mode switch
                        0052   296
            56   51 7D  0052   297         MOVQ    R1,R6                   ; R6 = Addr. pf page tbl, R7 = Base VPN
               0201 30  0055   298         BSBW    DO_MAPPING              ; Initialize mapping if required
                        0058   299
              CA AF 95  0058   300         TstB    Mrsp                    ; If Nebula, turn off clock
                 07 13  005B   301         BEql    3$                      ; Branch if not Nebula
      18 80000080 8F DA  005D   302         Mtpr    #<1a31>!<1a7>, #Pr$_Iccs; Turn off clock
              BD AF 95  0064   303 3$:      TSTB    INIT                    ; Is it necessary to initialize TU58?
                 03 13  0067   304         BEql    5$                      ; Yes
               0021 31  0069   305         BrW     10$                     ; No
                        006C   306 5$:
                        006C   307         ;
                        006C   308         ; Initialize TU58.  This code is executed the first time the
                        006C   309         ; driver is called and the next time the driver is called
                        006C   310         ; after exiting with an error.
                        006C   311         ;
                        006C   312
            1E   01 DA  006C   313         MTPR    #CSTS_M_BREAK,#PR$_CSTS ; Set BREAK bit in trans. csr
                 52 D4  006F   314         CLRL    R2                      ; R2 contains null characters
               015D 30  0071   315         BSBW    XMIT_TWO_CHARS          ; Send two nulls
            1E   00 DA  0074   316         MTPR    #0,#PR$_CSTS            ; Clear BREAK bit
            50   1D DB  0077   317         MFPR    #PR$_CSRD,R0            ; Clear receive buffer
      52    0404 8F 3C  007A   318         MOVZWL  #DD_INIT@8+DD_INIT,R2   ; R2 contains two INIT characters
               014F 30  007F   319         BSBW    XMIT_TWO_CHARS          ; Send two INIT characters
               0198 30  0082   320         BSBW    RECV_ONE_CHAR           ; Receive a character
            10   52 91  0085   321         CMPB    R2,#DD_CONTINUE         ; Is it continue?
                 4D 12  0088   322         BNeq    32$                     ; No, error
              97 AF 96  008A   323         INCB    INIT                    ; So that we don't execute this code again
                        008D   324
                        008D   325 ;
                        008D   326 ; Perform the I/O transfer.  Register usage is:
                        008D   327 ;
                        008D   328 ;       R0              Scratch
                        008D   329 ;       R1              Loop counter
                        008D   330 ;       R2              Character to/from TU58
                        008D   331 ;       R3              Character received from TU58
                        008D   332 ;       R4              Checksum
                        008D   333 ;       R5              Logical block number
                        008D   334 ;       R6              Address of page table
                        008D   335 ;       R7              Virtual page number of buffer
                        008D   336 ;       R8              Size of remaining buffer (in bytes)
                        008D   337 ;       R9              Address of RPB
                        008D   338 ;       R10             Address of current spot in buffer
                        008D   339 ;       R11             Mapping switch
                        008D   340 ;
                        008D   341 ;
                        008D   342         ASSUME  DD_WRITE  EQ  DD_READ+1
                        008D   343         ASSUME  DD_DATA  EQ  1
```

```
                          008D
                 54   D4   008D   10$:   CLRL    R4                          ; Clear checksum
        52   0A02 8F   3C   008F         MOVZWL  #10a8+DD_CNTRL,R2           ; Command packet and byte count
               0134   30   0094         BSBW    XMIT_TWO_UPDSUM             ; Send them
            52   02   9A   0097         MOVZBL  #DD_READ,R2                 ; Assume read command
         21   10 AC   D1   009A         CMPL    FUNC(AP),#IO$_READLBLK      ; Is it a read?
                 02   13   009E         BEQL    20$                         ; Yes
                 52   D6   00A0         INCL    R2                          ; No, convert to write command
               0126   30   00A2   20$:   BSBW    XMIT_TWO_UPDSUM             ; Send command and modifier (0)
                          00A5   ;
                          00A5   ;      The unit number of the console boot device is always zero.
                          00A5   ;      This is a result of the 11/750 console implementation, where
                          00A5   ;      logical device CSA1: is actually physical device DDA0:.
                          00A5   ;
                 52   D4   00A5         CLRL    R2                          ; Set Unit # and Switch fields
            FF7A CF   95   00A7         TSTB    MRSP                        ; Does this TU58 speak MRSP?
                 04   13   00AB         BEQL    25$                         ; Branch if not
         00 52   0B   E2   00AD         BBSS    #<MRSP_SWITCH+8>,R2,25$     ; Set MRSP switch
               0117   30   00B1   25$:   BSBW    XMIT_TWO_UPDSUM             ; Send unit # and switches (0)
                 52   D4   00B4         CLRL    R2                          ; Set sequence number (unused field)
               0112   30   00B6         BSBW    XMIT_TWO_UPDSUM             ; Send sequence number (0)
            52   58   3C   00B9         MOVZWL  R8,R2                       ; Byte count
               010C   30   00BC         BSBW    XMIT_TWO_UPDSUM             ; Send it
            52   55   3C   00BF         MOVZWL  R5,R2                       ; Block number
               0106   30   00C2         BSBW    XMIT_TWO_UPDSUM             ; Send it
            52   54   3C   00C5         MOVZWL  R4,R2                       ; Checksum
               0106   30   00C8         BSBW    XMIT_TWO_CHARS              ; Send it
         21   10 AC   D1   00CB         CMPL    FUNC(AP),#IO$_READLBLK      ; Is it a read command?
                 42   13   00CF         BEQL    50$
                          00D1
                          00D1   ;
                          00D1   ; Do a write to the TU58
                          00D1   ;
               0149   30   00D1   30$:   BSBW    RECV_ONE_CHAR               ; Receive one character
            10   52   91   00D4         CMPB    R2,#DD_CONTINUE             ; Is it CONTINUE?
                 42   12   00D7   32$:   BNEQ    52$                         ; No, error
                 54   D4   00D9         CLRL    R4                          ; Clear checksum
         51   80 8F   9A   00DB         MOVZBL  #128,R1                     ; Number of bytes to send
            58   51   D1   00DF         CMPL    R1,R8                       ; Is it less than remaining byte count?
                 03   1F   00E2         BLSSU   35$                         ; Yes
            51   58   D0   00E4         MOVL    R8,R1                       ; No, use remaining byte count instead
        52   51   08   78   00E7   35$:   ASHL    #8,R1,R2                    ; Put byte count in second byte
                 52   D6   00EB         INCL    R2                          ; Flag byte = DD_DATA
               00DB   30   00ED         BSBW    XMIT_TWO_UPDSUM             ; Send flag byte and byte count
            51   02   C6   00F0         DIVL    #2,R1                       ; Convert byte count to word count
               0144   30   00F3   40$:   BSBW    GETBYTE                     ; Get a byte from memory in R3
            52   53   D0   00F6         MOVL    R3,R2                       ; Save byte in R2
               013E   30   00F9         BSBW    GETBYTE                     ; Get another byte from memory in R3
    52   08   08   53   F0   00FC         INSV    R3,#8,#8,R2                 ; Put it in second byte of R2
               00C7   30   0101         BSBW    XMIT_TWO_UPDSUM             ; Send two bytes
              EC 51   F5   0104         SOBGTR  R1,40$                      ; Repeat until byte count is 0
            52   54   3C   0107         MOVZWL  R4,R2                       ; Get checksum
               00C4   30   010A         BSBW    XMIT_TWO_CHARS              ; Send it
                 58   D5   010D         TSTL    R8                          ; Any more data to send?
                 C0   12   010F         BNEQ    30$                         ; Yes, send another packet
                 30   11   0111         BRB     END_OF_DATA                 ; No, get End packet
                          0113
```

```
                        0113   401 ;
                        0113   402 ; Do a read from TU58
                        0113   403 ;
                  54    D4  0113   404 50$:    CLRL    R4                          ; Clear checksum
                00F2    30  0115   405         BSBW    RECV_TWO_UPDSUM             ; Get flag byte in R3, byte count in R2
             01   53    91  0118   406         CMPB    R3,#DD_DATA                 ; Is this a data packet?
                  2E    12  011B   407 52$:    BNEQ    DD_ERROR2                   ; No, error
          51 52   02    C7  011D   408         DIVL3   #2,R2,R1                    ; Convert byte count to word count in R1
                00E6    30  0121   409 55$:    BSBW    RECV_TWO_UPDSUM             ; Receive next two data bytes in R3, R2
                011E    30  0124   410         BSBW    PUTBYTE                     ; Store first byte in memory
             53   52    9A  0127   411         MOVZBL  R2,R3                       ; Move second byte to R3
                0118    30  012A   412         BSBW    PUTBYTE                     ; Store second byte in memory
              F1 51     F5  012D   413         SOBGTR  R1,55$                      ; Repeat until byte count is 0
                00E5    30  0130   414         BSBW    RECV_TWO_CHARS              ; Get checksum in R3, R2
       53   08 08   52    F0  0133   415         INSV    R2,#8,#8,R3                 ; Assemble checksum into one word
             54   53    B1  0138   416         CMPW    R3,R4                       ; Is checksum correct?
                  79    12  013B   417         BNEQ    DD_ERROR                    ; No, error
                  3B    10  013D   418         BsbB    DD_CheckControlC            ; Check for control C                   [08]
                  58    D5  013F   419         TSTL    R8                          ; Anymore data to receive?
                  D0    12  0141   420         BNEQ    50$                         ; Yes, receive next data packet
                        0143   421
                        0143   422 ;
                        0143   423 ; We've sent or received all the data.  Make sure we receive an end
                        0143   424 ; packet with a success code.
                        0143   425 ;
                        0143   426 END_OF_DATA:
                  54    D4  0143   427         CLRL    R4                          ; Clear checksum
                00C2    30  0145   428         BSBW    RECV_TWO_UPDSUM             ; Get flag byte and byte count
             02   53    91  0148   429         CMPB    R3,#DD_CNTRL                ; Is it a command packet?
                        014B   430 DD_ERROR2:                                      ; (extension for branch to error)
                  69    12  014B   431         BNEQ    DD_ERROR                    ; No, error
                00BA    30  014D   432         BSBW    RECV_TWO_UPDSUM             ; Get opcode and success/failure byte
          40 8F   53    91  0150   433         CMPB    R3,#DD_ENDPKT               ; Is it an end packet?
                  60    12  0154   434         BNEQ    DD_ERROR                    ; No, error
                  52    D5  0156   435         TSTL    R2                          ; Is it success?
                  5C    19  0158   436         BLSS    DD_ERROR                    ; No, error
             51   04    D0  015A   437         MOVL    #4,R1                       ; Read remainder of packet
                00AA    30  015D   438 10$:    BSBW    RECV_TWO_UPDSUM             ;
              FA 51     F5  0160   439         SOBGTR  R1,10$                      ;
                00B2    30  0163   440         BSBW    RECV_TWO_CHARS              ; Read checksum in R3, R2
       53   08 08   52    F0  0166   441         INSV    R2,#8,#8,R3                 ; Form checksum in R3
             54   53    B1  016B   442         CMPW    R3,R4                       ; Is checksum correct?
                  46    12  016E   443         BNEQ    DD_ERROR                    ; No, error
                  2C    10  0170   444         BsbB    Reset_Clock                 ;
             50   01    3C  0172   445         MOVZWL  #SS$_NORMAL,R0              ; Return success                        [08]
             0D06 8F    BA  0175   446         POPR    #^M<R1,R2,R8,R10,R11>       ; Restore registers
                        05  0179   447         RSB
                        017A   448
                        017A   449 DD_CheckControlC:                               ; Check for control C                   [08]
       00000000'EF      16  017A   450         Jsb     L^Kb_Poll                   ; Poll keyboard                         [08]
 00000000'EF    00      E1  0180   451         BbC     S^#Ds$V_CtrlC, -            ; If ^C bit                             [08]
                15          0187   452                  L^Ds$GL_Flags, 20$         ; .. isn't set, continue                [08]
             FE98 CF    94  0188   453         ClrB    Init                        ; Make sure to re-init Tu58 later       [08]
                10      10  018C   454         BsbB    Reset_Clock                 ;
          5E FE8E CF    D0  018E   455         MOVL    STKPTR,SP                   ; Restore stack pointer                 [08]
             0D06 8F    BA  0193   456         POPR    #^M<R1,R2,R8,R10,R11>       ; Restore registers                     [08]
          50 0651 8F    3C  0197   457         MovZWL  #SS$_ControlC, R0           ; Set status                            [08]
```

```
                    04  019C          Ret                                  ; Return from BOO$QIO, to prevent        [08]
                        019D                                               ;  retry of the operation.               [08]
                    05  019D  20$:    Rsb                                  ; No ^C, just return                     [08]
                        019E
                        019E  Reset_Clock:
         FE83 CF    95  019E          TstB    Mrsp
              0A    13  01A2          BEql    10$
              3F    BB  01A4          PushR   #^M<R0,R1,R2,R3,R4,R5>
   00000000'EF      16  01A6          Jsb     L^Clk$Re_Init
              3F    BA  01AC          PopR    #^M<R0,R1,R2,R3,R4,R5>
                    05  01AE  10$:    Rsb
                        01AF
                        01AF  .Enable LSB                                  ;                                        [08]
                        01AF
                        01AF  DD_TimeOut:                                  ; Operation timed out                    [08]
   50   022C 8F    3C  01AF          MovZWL  #SS$_TimeOut, R0             ; Set timeout code                       [08]
              05    11  01B4          BrB     10$                          ; Join common                            [08]
                        01B6
                        01B6  DD_ERROR:
   50   0054 8F    3C  01B6          MOVZWL  #SS$_CTRLERR,R0              ; Set failure status                     [08]
                        01BB
         FE65 CF    94  01BB  10$:    CLRB    INIT                         ; Initialize TU58 on next entry          [08]
              DD    10  01BF          BsbB    Reset_Clock                  ;
   5E   FE5B CF    D0  01C1          MOVL    STKPTR,SP                    ; Restore stack pointer
         0D06 8F    BA  01C6          POPR    #^M<R1,R2,R8,R10,R11>        ; Restore registers
                    05  01CA          RSB                                  ; Return and retry
                        01CB
                        01CB  .DisAble LSB                                 ;                                        [08]
```

```
                                01CB    487 .Subtitle       Character transmission
                                01CB    488
                                01CB    489 ;++
                                01CB    490 ; XMIT_TWO_UPDSUM - Transmit two characters and update checksum
                                01CB    491 ; XMIT_TWO_CHARS - Transmit two characters
                                01CB    492 ; XMIT_ONE_CHAR - Transmit one character
                                01CB    493 ;
                                01CB    494 ; Inputs:
                                01CB    495 ;       R2      Contains one or two characters in low bytes
                                01CB    496 ;       R4      Checksum so far
                                01CB    497 ;
                                01CB    498 ; Outputs:
                                01CB    499 ;       R4      Updated checksum
                                01CB    500 ;--
                                01CB    501
                                01CB    502 XMIT_TWO_UPDSUM:
                    54    52    A0    01CB    503         ADDW    R2,R4                   ; Add two characters to checksum
                    54    00    D8    01CE    504         ADWC    #0,R4                   ; Add carry
                                01D1    505
                                01D1    506 XMIT_TWO_CHARS:
                          52    DD    01D1    507         PUSHL   R2                      ; Save input on stack.
                    52    52    9A    01D3    508         MOVZBL  R2,R2                   ; Zero high bytes of data.
                          05    10    01D6    509         BSBB    XMIT_ONE_CHAR           ; Transmit one character
                52    8E    F8 8F    78    01D8    510         ASHL    #-8,(SP)+,R2            ; Retrieve second character
                                01DD    511                                             ; and fall through to transmit it
                                01DD    512
                                01DD    513 XMIT_ONE_CHAR:
                    50    1E    9A    01DD    514         MovZBL  #Pr$_CsTs, R0           ; Number of register to poll            [08]
                          06    10    01E0    515         BsbB    Wait_Ready              ; Wait for bit 7 to set                 [08]
                    1F    52    DA    01E2    516         MTPR    R2,#PR$_CSTD            ; Transmit character
                          05    01E5    517         RSB
                                01E6    518
                                01E6    519 DD_Error1:                                  ; Extension to DD_Error                 [08]
                          CE    11    01E6    520         BrB     DD_Error                ; Just chain on to it                   [08]
                                01E8    521
                                01E8    522 ;++
                                01E8    523 ; Wait_Ready - wait for done/ready bit in specified IPR to set
                                01E8    524 ;
                                01E8    525 ; Inputs:
                                01E8    526 ;       R0      Number of processor register to poll
                                01E8    527 ;
                                01E8    528 ; Outputs:
                                01E8    529 ;       None
                                01E8    530 ;
                                01E8    531 ; If desired bit does not set within the timeout period, a direct
                                01E8    532 ; exit is made from the driver through DD_TIMEOUT.
                                01E8    533 ;
                                01E8    534 ;--
                                01E8    535
                                01E8    536 Wait_Ready:                                 ; Wait for bit                          [08]
                          06    BB    01E8    537         PushR   #^M<R1, R2>             ; Save R1 for loop counter              [08]
                51    001F0000 8F    D0    01EA    538         MovL    #^X1F0000, R1           ; Fetch value                           [10]
01'01'01'01'01'01'01'01'01'01'  01F1    539 10$:    .Byte   1[10]                   ; Nops to free console                  [08]
                          52    50    DB    01FB    540         Mfpr    R0, R2                  ; Read console CSR                      [08]
                    05    52    07    E0    01FE    541         BbS     #CsRs_V_Done, R2, 20$   ; Exit loop if ready                    [08]
                       EC    51    F5    0202    542         SobGtr  R1, 10$                 ; Otherwise, loop                       [08]
                          A8    11    0205    543         BrB     DD_TimeOut              ; Timeout if drop here                  [08]
```

```
                    06   BA  0207   20$:    PopR    #^M<R1, R2>                    ; Restore register          [08]
                         05  0209           Rsb                                    ; Return to caller          [08]
                             020A   ;++
                             020A   ; RECV_TWO_UPDSUM - Receive two characters and update checksum
                             020A   ; RECV_TWO_CHARS - Receive two characters
                             020A   ; RECV_ONE_CHAR - Receive one character
                             020A   ;
                             020A   ; Inputs:
                             020A   ;       R4      Checksum so far
                             020A   ;
                             020A   ; Outputs:
                             020A   ;       R2      Most recently received character
                             020A   ;       R3      Previous character in low byte
                             020A   ;--
                             020A
                             020A   RECV_TWO_UPDSUM:
                    0C   10  020A           BSBB    RECV_TWO_CHARS          ; Receive two characters in R3,  R2
     53   08   08   52   F0  020C           INSV    R2,#8,#8,R3             ; Put second character into R3
                54   53   A0  0211           ADDW    R3,R4                   ; Add two characters to checksum
                54   00   D8  0214           ADWC    #0,R4                   ; Add carry to checksum
                         05  0217           RSB
                             0218
                             0218   RECV_TWO_CHARS:
                    03   10  0218           BSBB    RECV_ONE_CHAR           ; Get one character in R2
                53   52   9A  021A           MOVZBL  R2,R3                   ; Save first character in R3 and
                             021D                                           ; fall through to get second character
                             021D
                             021D   RECV_ONE_CHAR:
                50   1C   9A  021D           MovZBL  #Pr$_CsRs, R0                  ; Get number of register    [08]
                     C6   10  0220           BsbB    Wait_Ready                     ; Wait for ready to set     [08]
                52   1D   DB  0222           MFPR    #PR$_CSRD,R2                   ; Get next character
                FDFC CF   95  0225           TSTB    MRSP                           ; Does this TU58 speak MRSP?
                     0A   13  0229           BEQL    20$                            ; Branch if not
                50   1E   DB  022B   10$:    MFPR    #PR$_CSTS,R0                   ; Get transmit status
             F9 50   07   E1  022E           BBC     #CSTS_V_READY,R0,10$           ; Loop until ready
                1F   10   DA  0232           MTPR    #DD_CONTINUE,#PR$_CSTD         ; Send CONTINUE character
             AD 52   0F   E0  0235   20$:    BBS     #CSRD_V_ERROR,R2,DD_ERROR1     ; Branch if data overrun
                         05  0239           RSB
                             023A
                             023A
                             023A   ;++
                             023A   ; GETBYTE - Subroutine to get a byte from memory
                             023A   ; PUTBYTE - Subroutine to store a byte in memory
                             023A   ;
                             023A   ;       These two subroutines do two things special:
                             023A   ;
                             023A   ;               1)  Since the floppy always reads or writes 128 bytes
                             023A   ;                   these routines simply return if the byte count is zero.
                             023A   ;               2)  These routines take care of page boundaries if
                             023A   ;                   mapping is required.
                             023A   ;
                             023A   ; Inputs:
                             023A   ;       R3      Byte to store (PUTBYTE)
                             023A   ;       R6      Address of page table
                             023A   ;       R7      Virtual page number of buffer
                             023A   ;       R8      Size of remaining buffer (in bytes)
                             023A   ;       R10     Address of current spot in buffer
```

```
                        023A   601 ;       R11     Mapping switch:
                        023A   602 ;                       -1   Do physical -> virtual map
                        023A   603 ;                       0    No mapping required
                        023A   604 ;                       1    Do virtual -> physical translation
                        023A   605 ;
                        023A   606 ; Outputs:
                        023A   607 ;       R3      Byte fetched from memory (GETBYTE)
                        023A   608 ;--
                        023A   609
                        023A   610          .ENABL  LSB
                        023A   611
                        023A   612 GETBYTE:
                53      D4   023A   613          CLRL    R3                      ; Return 0 if byte count = 0
                58      D5   023C   614          TSTL    R8                      ; Is byte count 0?
                2F      13   023E   615          BEQL    90$                     ; Yes
            53  8A      9A   0240   616          MOVZBL  (R10)+,R3               ; Get byte
                07      11   0243   617          BRB     10$                     ; Branch to common code
                        0245   618
                        0245   619
                        0245   620 PUTBYTE:
                58      D5   0245   621          TSTL    R8                      ; Is byte count 0?
                26      13   0247   622          BEQL    90$                     ; Yes
            8A  53      90   0249   623          MOVB    R3,(R10)+               ; Store byte
                        024C   624
                        024C   625
                58      D7   024C   626 10$:     DECL    R8                      ; Decr. byte count
                1F      13   024E   627          BEQL    90$                     ; Reached zero
        5A  01FF    8F      B3   0250   628          BITW    #VA$M_BYTE,R10          ; Did address overflow onto new page?
                18      12   0255   629          BNEQ    90$                     ; No
                57      D6   0257   630          INCL    R7                      ; Yes, increment page number
                        0259   631
                        0259   632 ;
                        0259   633 ; Fall through to ...
                        0259   634 ;
                        0259   635
                        0259   636
                        0259   637 ;**
                        0259   638 ; DO_MAPPING - Subroutine to perform necessary mapping
                        0259   639 ;
                        0259   640 ; Inputs:
                        0259   641 ;       R6      Address of page table
                        0259   642 ;       R7      Page number of buffer
                        0259   643 ;       R10     Address to map
                        0259   644 ;       R11     Mapping switch:
                        0259   645 ;                       -1      Do physical -> virtual map
                        0259   646 ;                       0       No mapping required
                        0259   647 ;                       1       Do virtual -> physical translation
                        0259   648 ;
                        0259   649 ; Outputs:
                        0259   650 ;       R10     Address to use
                        0259   651 ;--
                        0259   652
                        0259   653 DO_MAPPING:
                5B      D5   0259   654          TSTL    R11                     ; Any mapping required?
                12      11   025B   655          BRB     90$                     ; No    [changed from BEQL-- 12]
                11      19   025D   656          BLSS    100$                    ; Yes, map physical to virtual
    5A  FFFFFE00    8F      CA   025F   657          BICL    #^C<VA$M_BYTE>,R10      ; Yes, translate virtual to physical
```

```
                                0266   658                                          ; Clear everything but byte offset
          50    6647    D0      0266   659          MOVL    (R6)[R7],R0             ; Get PFN in R0
   5A   15   09   50    F0      026A   660          INSV    R0,#VA$V_VPN,#PTE$S_PFN,R10   ; Insert PFN after byte offset
                        05      026F   661 90$:     RSB
                                0270   662
                                0270   663
                                0270   664 ;
                                0270   665 ; Map physical to virtual
                                0270   666 ;
                        00      0270   667 100$:    HALT                            ; Not implemented yet
                                0271   668
                                0271   669          .DSABL  LSB
                                0271   670
                  00000271      0271   671 CONSDD_DRVSIZ=.-CONSDD_START
                                0271   672
                                0271   673          .END
```

```
$TABLE                          = 00000000 R   D   02
BTD$K_CONSOLE                   = 00000040     D
CLK$RE_INIT                       ********     X   03
CONSDD_DRIVER                     00000033 R   D   03
CONSDD_DRVSIZ                   = 00000271     D
CONSDD_START                      00000000 R   D   03
CPU_730                           00000017 R   D   03
CPU_750                           0000001D R   D   03
CPU_780                           00000016 R   D   03
CSRD_V_ERROR                    = 0000000F     D
CSRS_V_DONE                     = 00000007     D
CSTS_M_BREAK                    = 00000001     D
CSTS_V_READY                    = 00000007     D
DDNAME                            00000026 R   D   03
DD_CHECKCONTROLC                  0000017A R   D   03
DD_CNTRL                        = 00000002     D
DD_CONTINUE                     = 00000010     D
DD_DATA                         = 00000001     D
DD_ENDPKT                       = 00000040     D
DD_ERROR                          000001B6 R   D   03
DD_ERROR1                         000001E6 R   D   03
DD_ERROR2                         0000014B R   D   03
DD_INIT                         = 00000004     D
DD_READ                         = 00000002     D
DD_SELECT                         00000000 R   D   03
DD_TIMEOUT                        000001AF R   D   03
DD_WRITE                        = 00000003     D
DO_MAPPING                        00000259 R   D   03
DS$GL_FLAGS                       ********     X   03
DS$M_ABRTFLG                    = 00000040     D
DS$M_BADTIME                    = 00100000     D
DS$M_BATCH                      = 00400000     D
DS$M_BRKCLR                     = 00001000     D
DS$M_BRKPT                      = 00000800     D
DS$M_CHARFLG                    = 00000100     D
DS$M_CMDFLG                     = 00000080     D
DS$M_CTRLC                      = 00000001     D
DS$M_CTRLO                      = 00010000     D
DS$M_DEVFLG                     = 00000200     D
DS$M_DISABLCC                   = 01000000     D
DS$M_DONFLG                     = 00002000     D
DS$M_ERRFLG                     = 00000010     D
DS$M_EXCEPT                     = 00080000     D
DS$M_EXETST                     = 00040000     D
DS$M_HLTFLG                     = 00000008     D
DS$M_LODFLG                     = 00000002     D
DS$M_MEMMGT                     = 00008000     D
DS$M_NI                         = 04000000     D
DS$M_OUTPUT                     = 00800000     D
DS$M_RUBFLG                     = 00000020     D
DS$M_SCRIPT                     = 00200000     D
DS$M_SETIMR                     = 02000000     D
DS$M_STRFLG                     = 00000004     D
DS$M_SUBT                       = 00004000     D
DS$M_SYSFLG                     = 00000400     D
DS$M_TIMED                      = 02000000     D
DS$M_TIMED_OUT                  = 08000000     D
DS$M_TIMRON                     = 00020000     D
DS$V_ABRTFLG                    = 00000006     D
DS$V_BADTIME                    = 00000014     D
DS$V_BATCH                      = 00000016     D
DS$V_BRKCLR                     = 0000000C     D
DS$V_BRKPT                      = 0000000B     D
DS$V_CHARFLG                    = 00000008     D
DS$V_CMDFLG                     = 00000007     D
DS$V_CTRLC                      = 00000000     D
DS$V_CTRLO                      = 00000010     D
DS$V_DEVFLG                     = 00000009     D
DS$V_DISABLCC                   = 00000018     D
DS$V_DONFLG                     = 0000000D     D
DS$V_ERRFLG                     = 00000004     D
DS$V_EXCEPT                     = 00000013     D
DS$V_EXETST                     = 00000012     D
DS$V_HLTFLG                     = 00000003     D
DS$V_LODFLG                     = 00000001     D
DS$V_MEMMGT                     = 0000000F     D
DS$V_NI                         = 0000001A     D
DS$V_OUTPUT                     = 00000017     D
DS$V_RUBFLG                     = 00000005     D
DS$V_SCRIPT                     = 00000015     D
DS$V_SETIMR                     = 00000019     D
DS$V_STRFLG                     = 00000002     D
DS$V_SUBT                       = 0000000E     D
DS$V_SYSFLG                     = 0000000A     D
DS$V_TIMED                      = 00000019     D
DS$V_TIMED_OUT                  = 0000001B     D
DS$V_TIMRON                     = 00000011     D
END_OF_DATA                       00000143 R   D   03
EXE$GB_CPUTYPE                    ********     X   03
FUNC                            = 00000010     D
GETBYTE                           0000023A R   D   03
INIT                              00000024 R   D   03
IO$_READLBLK                    = 00000021     D
KB_POLL                           ********     X   03
MODE                            = 00000014     D
MRSP                              00000025 R   D   03
MRSP_SWITCH                     = 00000003     D
PR$_CSRD                        = 0000001D     D
PR$_CSRS                        = 0000001C     D
PR$_CSTD                        = 0000001F     D
PR$_CSTS                        = 0000001E     D
PR$_ICCS                        = 00000018     D
PR$_MAPEN                       = 00000038     D
PR$_SID_TYP780                  = 00000001     D
PTE$S_PFN                       = 00000015     D
PUTBYTE                           00000245 R   D   03
RECV_ONE_CHAR                     0000021D R   D   03
RECV_TWO_CHARS                    00000218 R   D   03
RECV_TWO_UPDSUM                   0000020A R   D   03
RESET_CLOCK                       0000019E R   D   03
SIZ...                          = 00000008     D
SS$_BUFBYTALI                   = 0000030C     D
SS$_CONTROLC                    = 00000651     D
SS$_CTRLERR                     = 00000054     D
```

```
SS$_NORMAL                  = 00000001    D
SS$_TIMEOUT                 = 0000022C    D
STKPTR                        00000020 R  D  03
VA$M_BYTE                   = 000001FF    D
VA$V_VPN                    = 00000009    D
WAIT_READY                    000001E8 R  D  03
XMIT_ONE_CHAR                 000001DD R  D  03
XMIT_TWO_CHARS                000001D1 R  D  03
XMIT_TWO_UPDSUM               000001CB R  D  03

                                        +----------------+
                                        ! Psect synopsis !
                                        +----------------+

PSECT name                  Allocation          PSECT No.  Attributes
----------                  ----------          ---------  ----------
.  ABS  .                   00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                       00000000  (    0.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
BOOTDRIVR_4                 00000018  (   24.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
BOOTDRIVR_2                 00000271  (  625.)  03 (  3.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$TABLE	=00000000-R	179 (2)	179 (2)
BIT...	=00000008	98 (2)	98 (2)
BTD$K_CONSOLE	=00000040		179 (2)
CLK$RE_INIT	00000000-XR		466 (4)
CONSDD_DRIVER	00000033-R	270 (4)	179 (2)
CONSDD_DRVSIZ	=00000271	671 (4)	179 (2)
CONSDD_START	00000000-R	213 (3)	179 (2) 671 (4)
CPU_730	00000017-R	225 (3)	221 (3)
CPU_750	0000001D-R	228 (3)	221 (3)
CPU_780	00000016-R	222 (3)	221 (3)
CSRD_V_ERROR	=0000000F		#-580 (4)
CSRS_V_DONE	=00000007		#-541 (4)
CSTS_M_BREAK	=00000001		#-313 (4)
CSTS_V_READY	=00000007		#-578 (4)
DDNAME	00000026-R	268 (4)	179 (2)
DD_CHECKCONTROLC	0000017A-R	449 (4)	#-418 (4)
DD_CNTRL	=00000002		#-346 (4) #-429 (4)
DD_CONTINUE	=00000010		#-321 (4) #-378 (4) #-579 (4)
DD_DATA	=00000001		343 (4) #-406 (4)
DD_ENDPKT	=00000040		#-433 (4)
DD_ERROR	000001B6-R	476 (4)	#-417 (4) #-431 (4) #-434 (4) #-436 (4)
			#-443 (4) #-520 (4)
DD_ERROR1	000001E6-R	519 (4)	#-580 (4)
DD_ERROR2	0000014B-R	430 (4)	#-407 (4)
DD_INIT	=00000004		#-318 (4)
DD_READ	=00000002		342 (4) #-348 (4)
DD_SELECT	00000000-R	215 (3)	179 (2)
DD_TIMEOUT	000001AF-R	472 (4)	#-543 (4)
DD_WRITE	=00000003		342 (4)
DO_MAPPING	00000259-R	653 (4)	#-298 (4)
DS$GL_FLAGS	00000000-XR		452 (4)
DS$M_ABRTFLG	=00000040	98 (2)	
DS$M_BADTIME	=00100000	98 (2)	
DS$M_BATCH	=00400000	98 (2)	
DS$M_BRKCLR	=00001000	98 (2)	
DS$M_BRKPT	=00000800	98 (2)	
DS$M_CHARFLG	=00000100	98 (2)	
DS$M_CMDFLG	=00000080	98 (2)	
DS$M_CTRLC	=00000001	98 (2)	
DS$M_CTRLO	=00010000	98 (2)	
DS$M_DEVFLG	=00000200	98 (2)	
DS$M_DISABLCC	=01000000	98 (2)	
DS$M_DONFLG	=00002000	98 (2)	
DS$M_ERRFLG	=00000010	98 (2)	
DS$M_EXCEPT	=00080000	98 (2)	
DS$M_EXETST	=00040000	98 (2)	
DS$M_HLTFLG	=00000008	98 (2)	
DS$M_LODFLG	=00000002	98 (2)	
DS$M_MEMMGT	=00008000	98 (2)	
DS$M_NI	=04000000	98 (2)	

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DS$M_OUTPUT                     =00800000     98     (2)
DS$M_RUBFLG                     =00000020     98     (2)
DS$M_SCRIPT                     =00200000     98     (2)
DS$M_SETIMR                     =02000000     98     (2)
DS$M_STRFLG                     =00000004     98     (2)
DS$M_SUBT                       =00004000     98     (2)
DS$M_SYSFLG                     =00000400     98     (2)
DS$M_TIMED                      =02000000     98     (2)
DS$M_TIMED_OUT                  =08000000     98     (2)
DS$M_TIMRON                     =00020000     98     (2)
DS$V_ABRTFLG                    =00000006     98     (2)
DS$V_BADTIME                    =00000014     98     (2)
DS$V_BATCH                      =00000016     98     (2)
DS$V_BRKCLR                     =0000000C     98     (2)
DS$V_BRKPT                      =0000000B     98     (2)
DS$V_CHARFLG                    =00000008     98     (2)
DS$V_CMDFLG                     =00000007     98     (2)
DS$V_CTRLC                      =00000000     98     (2)    #-451    (4)
DS$V_CTRLO                      =00000010     98     (2)
DS$V_DEVFLG                     =00000009     98     (2)
DS$V_DISABLCC                   =00000018     98     (2)
DS$V_DONFLG                     =0000000D     98     (2)
DS$V_ERRFLG                     =00000004     98     (2)
DS$V_EXCEPT                     =00000013     98     (2)
DS$V_EXETST                     =00000012     98     (2)
DS$V_HLTFLG                     =00000003     98     (2)
DS$V_LODFLG                     =00000001     98     (2)
DS$V_MEMMGT                     =0000000F     98     (2)
DS$V_NI                         =0000001A     98     (2)
DS$V_OUTPUT                     =00000017     98     (2)
DS$V_RUBFLG                     =00000005     98     (2)
DS$V_SCRIPT                     =00000015     98     (2)
DS$V_SETIMR                     =00000019     98     (2)
DS$V_STRFLG                     =00000002     98     (2)
DS$V_SUBT                       =0000000E     98     (2)
DS$V_SYSFLG                     =0000000A     98     (2)
DS$V_TIMED                      =00000019     98     (2)
DS$V_TIMED_OUT                  =0000001B     98     (2)
DS$V_TIMRON                     =00000011     98     (2)
END_OF_DATA                      00000143-R   426    (4)    #-399    (4)
EXE$GB_CPUTYPE                   00000000-XR           #-221    (3)
FUNC                            =00000010     257    (4)    #-349    (4)    #-371    (4)
GETBYTE                          0000023A-R   612    (4)    #-389    (4)    #-391    (4)
INIT                             00000024-R   266    (4)    #-303    (4)    #-323    (4)    #-453    (4)    #-479    (4)
IO$_READLBLK                    =00000021                   #-349    (4)    #-371    (4)
KB_POLL                          00000000-XR                  450    (4)
MODE                            =00000014     258    (4)    #-295    (4)
MRSP                             00000025-R   267    (4)    #-216    (3)    #-226    (3)    #-300    (4)    #-359    (4)
                                                            #-463    (4)    #-575    (4)
MRSP_SWITCH                     =00000003                   #-361    (4)
PR$_CSRD                        =0000001D                   #-317    (4)    #-574    (4)
PR$_CSRS                        =0000001C                   #-572    (4)
PR$_CSTD                        =0000001F                   #-516    (4)    #-579    (4)
PR$_CSTS                        =0000001E                   #-313    (4)    #-316    (4)    #-514    (4)    #-577    (4)
PR$_ICCS                        =00000018                   #-302    (4)
PR$_MAPEN                       =00000038                   #-293    (4)
PR$_SID_TYP780                  =00000001                   #-221    (3)
```

```
PTE$S_PFN                  =00000015                  #-660    (4)
PUTBYTE                     00000245-R   620    (4)   #-410    (4)   #-412    (4)
RECV_ONE_CHAR               0000021D-R   571    (4)   #-320    (4)   #-377    (4)   #-567    (4)
RECV_TWO_CHARS              00000218-R   566    (4)   #-414    (4)   #-440    (4)   #-560    (4)
RECV_TWO_UPDSUM             0000020A-R   559    (4)   #-405    (4)   #-409    (4)   #-428    (4)   #-432    (4)
                                                      #-438    (4)
RESET_CLOCK                 0000019E-R   462    (4)   #-444    (4)   #-454    (4)   #-480    (4)
SIZ...                     =00000008     98    (2)     98     (2)
SS$_BUFBYTALI              =0000030C                  #-273    (4)
SS$_CONTROLC               =00000651                  #-457    (4)
SS$_CTRLERR                =00000054                  #-477    (4)
SS$_NORMAL                 =00000001                  #-445    (4)
SS$_TIMEOUT                =0000022C                  #-473    (4)
STKPTR                      00000020-R   265    (4)   #-276    (4)   #-455    (4)   #-481    (4)
VA$M_BYTE                  =000001FF                  #-628    (4)   #-657    (4)
VA$V_VPN                   =00000009                  #-660    (4)
WAIT_READY                  000001E8-R   536    (4)   #-515    (4)   #-573    (4)
XMIT_ONE_CHAR               000001DD-R   513    (4)   #-509    (4)
XMIT_TWO_CHARS              000001D1-R   506    (4)   #-315    (4)   #-319    (4)   #-370    (4)   #-396    (4)
XMIT_TWO_UPDSUM             000001CB-R   502    (4)   #-347    (4)   #-352    (4)   #-362    (4)   #-364    (4)
                                                      #-366    (4)   #-368    (4)   #-387    (4)   #-393    (4)

                                        +-------------------------+
                                        ! Performance indicators !
                                        +-------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    24    00:00:00.02    00:00:00.19
Command processing               903    00:00:00.35    00:00:00.93
Pass 1                           735    00:00:02.28    00:00:04.47
Symbol table sort                  0    00:00:00.33    00:00:00.33
Pass 2                            62    00:00:00.69    00:00:01.30
Symbol table output                2    00:00:00.01    00:00:00.07
Psect synopsis output              2    00:00:00.01    00:00:00.01
Cross-reference output             4    00:00:00.09    00:00:00.11
Assembler run totals            1734    00:00:03.78    00:00:07.41

The working set limit was 2400 pages.
132768 bytes (260 pages) of virtual memory were used to buffer the intermediate code.
There were 60 pages of symbol table space allocated to hold 1150 non-local and 26 local symbols.
673 source lines were read in Pass 1, producing 76 object records in Pass 2.
24 pages of virtual memory were used to define 21 macros.
```

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                3
SYS$COMMON:[SYSLIB]LIB.MLB;2                           4
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       9
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                17

1203 GETS were required to define 17 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 219 CONVERT BINARY TIME TO ASCII STRING
(1) 314 CONVERT ASCII STRING TO BINARY TIME
(1) 567 CONVERT BINARY TIME TO NUMERIC TIME

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element CVRTIM.MAR
0000     2 ; *1     6-FEB-1986 15:16:43 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element CVRTIM.MAR
0000     4         .TITLE  CVRTIM  *** CVRTIM time conversion routines
0000     5         .IDENT  /V02-04/
0000     6
0000     7 ;
0000     8 ;*****************************************************************************
0000     9 ;*                                                                           *
0000    10 ;*  COPYRIGHT (c) 1976, 1977, 1978, 1979, 1980                               *
0000    11 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
0000    12 ;*                                                                           *
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0000    20 ;*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE   *
0000    21 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT  *
0000    22 ;*  CORPORATION.                                                             *
0000    23 ;*                                                                           *
0000    24 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS   *
0000    25 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    26 ;*                                                                           *
0000    27 ;*****************************************************************************
0000    28 ;
0000    29 ; D. N. CUTLER 6-JAN-76
0000    30 ;
0000    31 ; SYSTEM SERVICES TO CONVERT TIME
0000    32 ;
0000    33 ;       CONVERT BINARY TIME TO ASCII STRING
0000    34 ;       CONVERT ASCII STRING TO BINARY TIME
0000    35 ;       CONVERT BINARY TIME TO NUMERIC FORMAT
0000    36 ;
0000    37 ;       THE CONVERSION ALGORITHMS USED HEREIN WERE DEVELOPED BY P. CONKLIN,
0000    38 ;       M. SPIER, AND D. ROSENBERY ON THE PDP-10.
0000    39 ;
0000    40 ; MODIFIED BY:
0000    41 ;
0000    42 ;                  Roger Riggs, 8-May-1980, Version 5.04
0000    43 ;       02         Emulate character string instructions
0000    44 ;
0000    45 ;       03         Bob Bergazzi     Aug 22, 1984    Version 7.1
0000    46 ;                  Made DATETABLE a global symbol.
0000    47 ;--
0000    48 ;       V02   LMK0001          LEN KAWELL      14-MAR-1979
0000    49 ;                  FIX LOSS OF PRECISION IN HUNDRETHS OF SECONDS IN $NUMTIM
0000    50 ;
0000    51 ;       04         Ted Salem        March 22, 1985  Version 8.2
0000    52 ;                  Interlock routine exe$numtim.
0000    53 ;
0000    54 ; MACRO LIBRARY CALLS
0000    55 ;
0000    56         .LIBRARY        /$DS/           ;                                [04]
0000    57
```

```
                                0000     58          .library        /$diag/
                                0000     59          $SSDEF                          ;DEFINE SYSTEM STATUS VALUES
                                0000                 .SAVE   LOCAL_BLOCK
                                0000                 .RESTORE
                                0000     60          $MP_ILDEFS                      ;DEFINE MP$R_ACTIVE_ROUTINE offsets [04]
                                0000     61 ;
                                0000     62 ; EXTERNALS:
                                0000     63 ;
                                0000     64
                                0000     65 ;        .EXTRN          MP$R_ACTIVE_ROUTINES    ;BITVECTOR FOR INTERLOCKING [04]
                                0000     66 ;        .EXTRN          MP$R_GET_PROCESSOR_ID   ;                           [04]
                                0000     67 ;        .EXTRN          MP$R_ROUTINE_COUNT_TABLE ;                          [04]
                                0000     68 ;        .EXTRN          MP$R_ROUTINE_ID_TABLE   ;                           [04]
                                0000     69 ;
                                0000     70
                                0000     71 ; LOCAL SYMBOLS
                                0000     72 ;
                                0000     73 ; ARGUMENT LIST OFFSET DEFINTIONS FOR CONVERT BINARY TIME TO ASCII STRING
                                0000     74 ;
                                0000     75
                    00000004    0000     76 ATIMLEN=4                               ;ADDRESS OF WORD TO STORE LENGTH
                    00000008    0000     77 ATIMBUF=8                               ;ADDRESS OF OUTPUT BUFFER DESCRIPTOR
                    0000000C    0000     78 ATIMADR=12                              ;ADDRESS OF 64-BIT ABSOLUTE OR DELTA TIME
                    00000010    0000     79 ACVTFLG=16                              ;CONVERSION INDICATOR
                                0000     80
                                0000     81 ;
                                0000     82 ; ARGUMENT LIST OFFSET DEFINITIONS FOR CONVERT ASCII STRING TO BINARY TIME
                                0000     83 ;
                                0000     84
                    00000004    0000     85 BTIMBUF=4                               ;ADDRESS OF ASCII STRING DESCRIPTOR
                    00000008    0000     86 BTIMADR=8                               ;ADDRESS TO STORE 64-BIT ABSOLUTE OR DELTA T
                                0000     87
                                0000     88 ;
                                0000     89 ; ARGUMENT LIST OFFSET DEFINITIONS FOR CONVERT BINARY TIME TO NUMERIC TIME
                                0000     90 ;
                                0000     91
                    00000004    0000     92 NTIMBUF=4                               ;ADDRESS OF 7-WORD BUFFER TO RECEIVE TIME
                    00000008    0000     93 NTIMADR=8                               ;ADDRESS OF 64-BIT ABSOLUTE OR DELTA TIME
                                0000     94
                                0000     95 ;
                                0000     96 ; CONVERSION CONSTANTS
                                0000     97 ;
                                0000     98 ; TOTAL DAYS IN A CENTURY
                                0000     99 ;
                                0000    100
                    00008EAC    0000    101 CENTURYDAYS=<100*365>+<100/4>-<100/100> ;
                                0000    102
                                0000    103 ;
                                0000    104 ; AVERAGE QUARTER DAYS PER CENTURY
                                0000    105 ;
                                0000    106
                    00023AB1    0000    107 QDAYSPCENT=<<<100*365>+<100/4>-<100/100>>*4>+<400/400> ;
                                0000    108
                                0000    109 ;
                                0000    110 ; AVERAGE QUARTER DAYS PER YEAR
                                0000    111 ;
                                0000    112
```

```
                    000005B5  0000   113 QDAYSPYEAR=<365*4>+1                     ;
                              0000   114
                              0000   115 ;
                              0000   116 ; TOTAL DAYS IN A QUADRICENTURY
                              0000   117 ;
                              0000   118
                    00023AB1  0000   119 QUADRIDAYS=<400*365>+<400/4>-<400/100>+<400/400> ;
                              0000   120
                              0000   121 ;
                              0000   122 ; TOTAL DAYS IN A QUADYEAR
                              0000   123 ;
                              0000   124
                    000005B5  0000   125 QUADYEARDAYS=<365*4>+1                   ;
                              0000   126
                              0000   127 ;
                              0000   128 ; OFFSET IN DAYS FROM 1-JAN-1501 TO 17-NOV-1858
                              0000   129 ;
                              0000   130
                    0001FE98  0000   131 TIMOFF1=<<1858-1501>*365>+<<1858-1501>/4>-<<1858-1501>/100>+<<1858-1501>/400>+ -;
                              0000   132       31+28+31+30+31+30+31+31+30+31+17 ;
                              0000   133
                              0000   134 ;
                              0000   135 ; OFFSET IN DAYS FROM 1-JAN-1601 TO 17-NOV-1858
                              0000   136 ;
                              0000   137
                              0000   138 TIMOFF2=<<1858-1601>*365>+<<1858-1601>/4>-<<1858-1601>/100>+<<1858-1601>/400>+ -;
                    00016FEC  0000   139       31+28+31+30+31+30+31+31+30+31+17 ;
                              0000   140
                              0000   141 ;
                              0000   142 ; CHARACTER CODE DEFINITIONS
                              0000   143 ;
                              0000   144
                    00000020  0000   145 BLANK=32                                 ;
                    0000003A  0000   146 COLON=58                                 ;
                    0000002D  0000   147 HYPHEN=45                                ;
                    00000039  0000   148 NINE=57                                  ;
                    00000030  0000   149 ONE=48                                   ;
                    0000002E  0000   150 PERIOD=46                                ;
                              0000   151
                              0000   152 ;
                              0000   153 ; NUMERIC TIME BUFFER OFFSET DEFINITIONS
                              0000   154 ;
                              0000   155
                    00000000  0000   156 YEAR=0                                   ;
                    00000002  0000   157 MONTH=2                                  ;
                    00000004  0000   158 DAY=4                                    ;
                    00000006  0000   159 HOUR=6                                   ;
                    00000008  0000   160 MINUTE=8                                 ;
                    0000000A  0000   161 SECOND=10                                ;
                    0000000C  0000   162 HUNDREDTH=12                             ;
                              0000   163
                              0000   164 ;
                              0000   165 ; LOCAL DATA
                              0000   166 ;
                              0000   167 ; MONTH, DAY CONVERSION TABLE
                              0000   168 ;
                         00000000    169         .PSECT  SEP, SHR, EXE, WRT, LONG
```

```
                        0000   170 DATETABLE::                          ;DATE CONVERSION TABLE          [03]
                  1F    0000   171         .BYTE   31                   ;JANUARY
                  1D    0001   172         .BYTE   29                   ;FEBRUARY
                  1F    0002   173         .BYTE   31                   ;MARCH
                  1E    0003   174         .BYTE   30                   ;APRIL
                  1F    0004   175         .BYTE   31                   ;MAY
                  1E    0005   176         .BYTE   30                   ;JUNE
                  1F    0006   177         .BYTE   31                   ;JULY
                  1F    0007   178         .BYTE   31                   ;AUGUST
                  1E    0008   179         .BYTE   30                   ;SEPTEMBER
                  1F    0009   180         .BYTE   31                   ;OCTOBER
                  1E    000A   181         .BYTE   30                   ;NOVEMBER
                  1F    000B   182         .BYTE   31                   ;DECEMBER
                        000C   183
                        000C   184 ;
                        000C   185 ; MONTH CONVERSION TABLE
                        000C   186 ;
                        000C   187
                        000C   188 MONTHTAB:                            ;
              4E 41 4A  03  000C   189         .ASCII  <3>/JAN/            ;
              42 45 46  03  0010   190         .ASCII  <3>/FEB/            ;
              52 41 4D  03  0014   191         .ASCII  <3>/MAR/            ;
              52 50 41  03  0018   192         .ASCII  <3>/APR/            ;
              59 41 4D  03  001C   193         .ASCII  <3>/MAY/            ;
              4E 55 4A  03  0020   194         .ASCII  <3>/JUN/            ;
              4C 55 4A  03  0024   195         .ASCII  <3>/JUL/            ;
              47 55 41  03  0028   196         .ASCII  <3>/AUG/            ;
              50 45 53  03  002C   197         .ASCII  <3>/SEP/            ;
              54 43 4F  03  0030   198         .ASCII  <3>/OCT/            ;
              56 4F 4E  03  0034   199         .ASCII  <3>/NOV/            ;
              43 45 44  03  0038   200         .ASCII  <3>/DEC/            ;
                        003C   201
                        003C   202 ;
                        003C   203 ; HOURS, MINUTES, SECONDS, HUNDREDTHS CONVERSION TABLE
                        003C   204 ;
                        003C   205
                        003C   206 TIMETABLE:                            ;TIME CONVERSION TABLE
                  64    003C   207         .BYTE   100                  ;HUNDREDTHS
                  3C    003D   208         .BYTE   60                   ;SECONDS
                  3C    003E   209         .BYTE   60                   ;MINUTES AND HOURS
                        003F   210
                        003F   211 ;
                        003F   212 ; CONVERSION CONTROL STRINGS
                        003F   213 ;
                        003F   214
5A 34 21 2D 43 41 21 2D 57 53 32 21  003F   215 DATE:   .ASCII  /!2SW-!AC-!4ZW /      ;
                              20 57  004B
                     20 57 53 34 21  004D   216 DELTA:  .ASCII  /!4SW /             ;
32 21 3A 57 5A 32 21 3A 57 5A 32 21  0052   217 TIME:   .ASCII  /!2ZW:!2ZW:!2ZW.!2ZW/ ;
                  57 5A 32 21 2E 57 5A  005E
```

```
                                0065          .SBTTL  CONVERT BINARY TIME TO ASCII STRING
                                0065  ;+
                                0065  ; EXE$ASCTIM - CONVERT BINARY TIME TO ASCII STRING
                                0065  ;
                                0065  ; THIS SERVICE PROVIDES THE CAPABILITY TO CONVERT AN ABSOLUTE OR DELTA
                                0065  ; TIME FROM 64-BIT FORMAT TO AN ASCII STRING.
                                0065  ;
                                0065  ; INPUTS:
                                0065  ;
                                0065  ;       ATIMLEN(AP) = ADDRESS OF WORD TO RECEIVE OUTPUT LENGTH.
                                0065  ;       ATIMBUF(AP) = ADDRESS OF OUTPUT BUFFER DESCRIPTOR.
                                0065  ;       ATIMADR(AP) = ADDRESS OF 64-BIT TIME VALUE. IF ZERO, THEN THE CURRENT
                                0065  ;               SYSTEM TIME IS USED. POSITIVE VALUES ARE INTERPRETED AS
                                0065  ;               ABSOLUTE TIMES AND NEGATIVE VALUES AS DELTA TIMES.
                                0065  ;       ACVTFLG(AP) = CONVERSION INDICATOR.
                                0065  ;               LOW BIT CLEAR INDICATES BOTH DATE AND TIME ARE TO BE CON-
                                0065  ;                       VERTED.
                                0065  ;               LOW BIT SET INDICATES ONLY TIME IS TO BE CONVERTED.
                                0065  ;
                                0065  ; OUTPUTS:
                                0065  ;
                                0065  ;       R0 LOW BIT CLEAR INDICATES FAILURE TO CONVERT TIME TO ASCII.
                                0065  ;
                                0065  ;               R0 = SS$_ACCVIO - 64-BIT TIME VALUE OR OUTPUT BUFFER DESCRIPTOR
                                0065  ;                       CANNOT BE READ BY CALLING ACCESS MODE, OR OUTPUT BUFFER
                                0065  ;                       CANNOT BE WRITTEN BY CALLING ACCESS MODE.
                                0065  ;
                                0065  ;               R0 = SS$_IVTIME - SPECIFIED DELTA TIME IS GREATER THAN 9999
                                0065  ;                       DAYS.
                                0065  ;
                                0065  ;       R0 LOW BIT SET INDICATES SUCCESSFUL COMPLETION.
                                0065  ;
                                0065  ;               R0 = SS$_NORMAL - NORMAL COMPLETION.
                                0065  ;-
                                0065
                                0065  EXE$ASCTIM::                                    ;CONVERT TIME TO ASCII
                        007C    0065          .WORD   ^M<R2,R3,R4,R5,R6>              ;ENTRY MASK
        7E    08 BC     7D      0067          MOVQ    @ATIMBUF(AP),-(SP)              ;SAVE OUTPUT BUFFER DESCRIPTOR
           56    5E     D0      006B          MOVL    SP,R6                           ;SAVE ADDRESS OF OUTPUT BUFFER DESCRIPTOR
                 7E     D4      006E          CLRL    -(SP)                           ;CLEAR SPACE FOR LENGTH FROM FAO
           55    5E     D0      0070          MOVL    SP,R5                           ;SAVE ADDRESS OF LENGTH
                 52     D4      0073          CLRL    R2                              ;ASSUME ABSOLUTE TIME SPECIFIED
        53    0C AC     D0      0075          MOVL    ATIMADR(AP),R3                  ;GET ADDRESS OF 64-BIT TIME VALUE
                 07     13      0079          BEQL    10$                             ;IF EQL NONE SPECIFIED
           50    63     7D      007B          MOVQ    (R3),R0                         ;GET 64-BIT TIME VALUE
                 02     18      007E          BGEQ    10$                             ;IF GEQ ABSOLUTE TIME
                 52     D6      0080          INCL    R2                              ;INDICATE DELTA TIME
           5E    10     C2      0082  10$:    SUBL    #<<<7*2>+3>/4>*4,SP             ;ALLOCATE NUMERIC TIME BUFFER
           54    5E     D0      0085          MOVL    SP,R4                           ;SAVE ADDRESS OF NUMERIC TIME BUFFER
                                0088          $NUMTIM_S (R4),(R3)                     ;CONVERT TIME TO NUMERIC FORMAT
                 63     7F      0088                  PUSHAQ  (R3)
                 64     DF      008A                  PUSHAL  (R4)
  00000000'GF    02     FB      008C                  CALLS   #2,G^SYS$NUMTIM
              6F 50     E9      0093          BLBC    R0,60$                          ;IF LBC CONVERSION FAILURE
                                0096
                                0096  ;
                                0096  ; CONVERT TIME TO ASCII FORMAT
```

```
                                0096   ;
                                0096
          3E 10 AC     E8       0096           BLBS    ACVTFLG(AP),40$          ;IF LBS ONLY TIME IS TO BE CONVERTED
             12 52     E8       009A           BLBS    R2,20$                   ;IF LBS DELTA TIME SPECIFIED
                                009D
                                009D   ;
                                009D   ; CONVERT DATE
                                009D   ;
                                009D
       52    02 A4     3C       009D           MOVZWL  MONTH(R4),R2             ;GET NUMERIC MONTH VALUE
   52   FF62 CF42     DE       00A1           MOVAL   W^MONTHTAB-4[R2],R2      ;GET ADDRESS OF MONTH COUNTED STRING
          FF94 CF     DF       00A7           PUSHAL  W^DATE                   ;BUILD DESCRIPTOR FOR CONTROL STRING
               0E     DD       00AB           PUSHL   #DELTA-DATE              ;
               06     11       00AD           BRB     30$                      ;
                                00AF
                                00AF   ;
                                00AF   ; CONVERT DELTA TIME
                                00AF   ;
                                00AF
          FF9A CF     DF       00AF   20$:    PUSHAL  W^DELTA                  ;BUILD CONTROL STRING DESCRIPTOR
               05     DD       00B3           PUSHL   #TIME-DELTA              ;
          51   5E     D0       00B5   30$:    MOVL    SP,R1                    ;COPY ADDRESS OF CONTROL STRING DESCRIPTOR
                                00B8           $FAO_S  (R1),(R5),(R6),DAY(R4),R2,YEAR(R4) ;CONVERT DELTA TIME OR DATE
               64     DD       00B8                   PUSHL   YEAR(R4)
               52     DD       00BA                   PUSHL   R2
             04 A4    DD       00BC                   PUSHL   DAY(R4)
               66     7F       00BF                   PUSHAQ  (R6)
               65     3F       00C1                   PUSHAW  (R5)
               61     7F       00C3                   PUSHAQ  (R1)
00000000'GF    06     FB       00C5                   CALLS   #$$T2,G^SYS$FAO
             36 50    E9       00CC           BLBC    R0,60$                   ;IF LBC CONVERT FAILURE
          66   65     A2       00CF           SUBW    (R5),(R6)                ;ANY SPACE LEFT IN TIME BUFFER?
               27     15       00D2           BLEQ    50$                      ;IF LEQ NO
       04 A6   65     C0       00D4           ADDL    (R5),4(R6)               ;UPDATE TIME BUFFER ADDRESS
                                00D8
                                00D8   ;
                                00D8   ; CONVERT TIME
                                00D8   ;
                                00D8
          FF76 CF     DF       00D8   40$:    PUSHAL  W^TIME                   ;BUILD CONTROL STRING DESCRIPTOR
               13     DD       00DC           PUSHL   #EXE$ASCTIM-TIME         ;
          51   5E     D0       00DE           MOVL    SP,R1                    ;COPY ADDRESS OF CONTROL STRING DESCRIPTOR
                                00E1           $FAO_S  (R1),2(R5),(R6),HOUR(R4),MINUTE(R4),SECOND(R4),HUNDREDTH(R4) ;
             0C A4    DD       00E1                   PUSHL   HUNDREDTH(R4)
             0A A4    DD       00E4                   PUSHL   SECOND(R4)
             08 A4    DD       00E7                   PUSHL   MINUTE(R4)
             06 A4    DD       00EA                   PUSHL   HOUR(R4)
               66     7F       00ED                   PUSHAQ  (R6)
             02 A5    3F       00EF                   PUSHAW  2(R5)
               61     7F       00F2                   PUSHAQ  (R1)
00000000'GF    07     FB       00F4                   CALLS   #$$T2,G^SYS$FAO
       51    04 AC    D0       00FB   50$:    MOVL    ATIMLEN(AP),R1           ;LENGTH ADDRESS SPECIFIED?
               04     13       00FF           BEQL    60$                      ;IF EQL NO
    61   65   85     A1       0101           ADDW3   (R5)+,(R5),(R1)          ;COMPUTE AND RETURN OUTPUT LENGTH
                    04       0105   60$:    RET                              ;
```

```
                        0106   314          .SBTTL  CONVERT ASCII STRING TO BINARY TIME
                        0106   315 ;+
                        0106   316 ; EXE$BINTIM - CONVERT ASCII STRING TO BINARY TIME
                        0106   317 ;
                        0106   318 ; THIS SERVICE PROVIDES THE CAPABILITY TO CONVERT AN ASCII STRING TO A
                        0106   319 ; 64-BIT ABSOLUTE OR DELTA TIME.
                        0106   320 ;
                        0106   321 ; INPUTS:
                        0106   322 ;
                        0106   323 ;       BTIMBUF(AP) = ADDRESS OF ASCII STRING DESCRIPTOR.
                        0106   324 ;       BTIMADR(AP) = ADDRESS TO STORE 64-BIT TIME VALUE.
                        0106   325 ;
                        0106   326 ; OUTPUTS:
                        0106   327 ;
                        0106   328 ;       R0 LOW BIT CLEAR INDICATES FAILURE TO CONVERT TIME TO ASCII.
                        0106   329 ;
                        0106   330 ;               R0 = SS$_IVTIME - ASCII STRING HAS INVALID SYNTAX OR TIME
                        0106   331 ;                    COMPONENT IS OUT OF RANGE.
                        0106   332 ;
                        0106   333 ;       R0 LOW BIT SET INDICATES SUCCESSFUL COMPLETION.
                        0106   334 ;
                        0106   335 ;               R0 = SS$_NORMAL - NORMAL COMPLETION.
                        0106   336 ;-
                        0106   337
                        0106   338 EXE$BINTIM::                                ;CONVERT ASCII STRING TO BINARY TIME
                  01FC  0106   339          .WORD   ^M<R2,R3,R4,R5,R6,R7,R8> ;ENTRY MASK
     5E    10     C2   0108   340          SUBL    #<<<7*2>+3>/4>*4,SP      ;ALLOCATE NUMERIC TIME BUFFER
     57    5E     D0   010B   341          MOVL    SP,R7                    ;SAVE ADDRESS OF NUMERIC TIME BUFFER
55   04 BC     7D   010E   342          MOVQ    @BTIMBUF(AP),R5          ;GET ADDRESS AND LENGTH OF ASCII STRING
           58     D4   0112   343          CLRL    R8                       ;ASSUME DELTA TIME
           55     B7   0114   344 10$:     DECW    R5                       ;ANY MORE CHARACTERS?
           6F     19   0116   345          BLSS    30$                      ;IF LSS NO
     86    20     91   0118   346          CMPB    #BLANK,(R6)+             ;SKIP LEADING BLANK?
           F7     13   011B   347          BEQL    10$                      ;IF EQL YES
           55     B6   011D   348          INCW    R5                       ;CORRECT NUMBER OF CHARACTERS
                       011F   349 ;+
                       011F   350 ;       REPLACED        LOCC    #HYPHEN,R5,-(R6)        ;ABSOLUTE TIME FORMAT?
                       011F   351 ;-
     51    76     9E   011F   352          MOVAB   -(R6),R1
     50    55     3C   0122   353          MOVZWL  R5,R0
           0C     13   0125   354          BEQL    10002$
                       0127   355 10000$:
     2D    81     91   0127   356          CMPB    (R1)+,#HYPHEN
           05     13   012A   357          BEQL    10001$
        F8 50     F5   012C   358          SOBGTR  R0,10000$
           02     11   012F   359          BRB     10002$
                       0131   360 10001$:
           51     D7   0131   361          DECL    R1
                       0133   362 10002$:
           52     13   0133   363          BEQL    30$                      ;IF EQL NO
           58     D6   0135   364          INCL    R8                       ;INDICATE ABSOLUTE TIME
                       0137   365          $NUMTIM_S (R7)                   ;CONVERT CURRENT TIME TO NUMERIC FORMAT
           00     DD   0137                PUSHL   #0
           67     DF   0139                PUSHAL  (R7)
00000000'GF    02     FB   013B                CALLS   #2,G^SYS$NUMTIM
                       0142   366
                       0142   367 ;
```

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                        0142   368 ; CONVERT ABSOLUTE TIME
                        0142   369 ;
                        0142   370
          54   04 A7   DE  0142   371         MOVAL   DAY(R7),R4              ;SET ADDRESS TO STORE DAY
               6B   10  0146   372         BSBB    CONVERT                 ;CONVERT DAY FIELD
                    2D  0148   373         .BYTE   HYPHEN                  ;EXPECTED TERMINATOR
                    55  B5 0149   374         TSTW    R5                      ;ANY MORE CHARACTERS?
                    64  13 014B   375         BEQL    60$                     ;IF EQL NO
                86  2D  91 014D   376         CMPB    #HYPHEN,(R6)+           ;MONTH FIELD VOID?
                    2E  13 0150   377         BEQL    20$                     ;IF EQL YES
                        0152   378 ;+
                        0152   379 ;       REPLACED        MATCHC  #3,-(R6),#4*12,W^MONTHTAB ;SEARCH FOR MONTH SUBSTRIN
                        0152   380 ;-
                51  76  9E  0152   381         MOVAB   -(R6),R1
           50   61  08  78  0155   382         ASHL    #8,(R1),R0
                50  03  90  0159   383         MOVB    #3,R0
                    52  D4 015C   384         CLRL    R2                      ; Clear month index
                        015E   385
      FEA8 CF42     50  D1 015E   386 15$:    CMPL    R0,MONTHTAB[R2]         ; Correct month?
                    06  13 0164   387         BEQL    19$                     ; Branch if so
           F4 52    0C  F2 0166   388         AOBLSS  #12,R2,15$              ; Increment month and branch if more
                    74  11 016A   389         BRB     IVTIME                  ; Month not found, flag invalid
                        016C   390
   02 A7    52  01  A1  016C   391 19$:    ADDW3   #1,R2,MONTH(R7)         ;CONVERT TO MONTH AND STORE
                56  03  C0  0171   392         ADDL    #3,R6                   ;UPDATE ADDRESS OF ASCII STRING
                55  03  A2  0174   393         SUBW    #3,R5                   ;UPDATE COUNT OF REMAINING CHARACTERS
                    67  19 0177   394         BLSS    IVTIME                  ;IF LSS INVALID SYNTAX
                    36  13 0179   395         BEQL    60$                     ;IF EQL END OF STRING
                86  2D  91 017B   396         CMPB    #HYPHEN,(R6)+           ;FIELD TERMINATED PROPERLY?
                    60  12 017E   397         BNEQ    IVTIME                  ;IF NEQ NO
                    55  B7 0180   398 20$:    DECW    R5                      ;DECREMENT COUNT OF REMAINING CHARACTERS
                54  67  DE 0182   399         MOVAL   YEAR(R7),R4             ;SET ADDRESS TO STORE YEAR
                    0A  11 0185   400         BRB     40$                     ;
                        0187   401
                        0187   402 ;
                        0187   403 ; CONVERT DELTA TIME
                        0187   404 ;
                        0187   405
                54  67  DE 0187   406 30$:    MOVAL   YEAR(R7),R4             ;GET ADDRESS TO STORE YEAR
                    84  D4 018A   407         CLRL    (R4)+                   ;CLEAR YEAR AND MONTH
                    64  7C 018C   408         CLRQ    (R4)                    ;CLEAR DAY, HOUR, MINUTE, AND SECOND
                  0C A7  B4 018E   409         CLRW    HUNDREDTH(R7)           ;CLEAR HUNDREDTH
                    20  10 0191   410 40$:    BSBB    CONVERT                 ;CONVERT RELATIVE DAY OR YEAR FIELD
                    20  13 0193   411         .BYTE   BLANK                   ;EXPECTED TERMINATOR
                    55  B7 0194   412 50$:    DECW    R5                      ;ANY REMAINING CHARACTERS?
                    19  19 0196   413         BLSS    60$                     ;IF LSS NO
                86  20  91 0198   414         CMPB    #BLANK,(R6)+            ;NEXT CHARACTER BLANK?
                    F7  13 019B   415         BEQL    50$                     ;IF EQL YES
                    56  D7 019D   416         DECL    R6                      ;BACK UP TO NONBLANK CHARACTER
                    55  D6 019F   417         INCL    R5                      ;ADJUST REMAINING CHARACTER COUNT
                        01A1   418
                        01A1   419 ;
                        01A1   420 ; CONVERT TIME
                        01A1   421 ;
                        01A1   422
      54   06 A7    DE  01A1   423         MOVAL   HOUR(R7),R4             ;SET ADDRESS TO STORE HOUR
                    0C  10 01A5   424         BSBB    CONVERT                 ;CONVERT HOUR FIELD
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                        3A  01A7   425          .BYTE   COLON                   ;EXPECTED TERMINATOR
                  09    10  01A8   426          BSBB    CONVERT                 ;CONVERT MINUTE FIELD
                        3A  01AA   427          .BYTE   COLON                   ;EXPECTED TERMINATOR
                  06    10  01AB   428          BSBB    CONVERT                 ;CONVERT SECOND FIELD
                        2E  01AD   429          .BYTE   PERIOD                  ;EXPECTED TERMINATOR
                  03    10  01AE   430          BSBB    CONVERT                 ;CONVERT HUNDREDTH FIELD
                        20  01B0   431          .BYTE   BLANK                   ;EXPECTED TERMINATOR
                  33    11  01B1   432 60$:     BRB     CVRTIME                 ;
                            01B3   433
                            01B3   434 ;
                            01B3   435 ; SUBROUTINE TO CONVERT NUMERIC FIELD TO BINARY
                            01B3   436 ;
                            01B3   437
                            01B3   438 CONVERT:                                 ;CONVERT FIELD
                  50    D4  01B3   439          CLRL    R0                      ;CLEAR ACCUMULATED VALUE
                  84    B5  01B5   440 10$:     TSTW    (R4)+                   ;POINT PAST NEXT FIELD
                  55    B7  01B7   441          DECW    R5                      ;ANY MORE CHARACTERS?
                  2B    19  01B9   442          BLSS    CVRTIME                 ;IF LSS NO
              51  86    9A  01BB   443          MOVZBL  (R6)+,R1                ;GET NEXT CHARACTER
           00 BE  51    91  01BE   444          CMPB    R1,a(SP)                ;EXPECTED TERMINATOR?
                  19    13  01C2   445          BEQL    20$                     ;IF EQL YES
              51  30    C2  01C4   446          SUBL    #ONE,R1                 ;SUBTRACT OUT CHARACTER BIAS
                  17    19  01C7   447          BLSS    IVTIME                  ;IF LSS INVALID CHARACTER
              51  09    D1  01C9   448          CMPL    #NINE-ONE,R1            ;RESULT VALUE WITHIN RANGE?
                  12    19  01CC   449          BLSS    IVTIME                  ;IF LSS INVALID CHARACTER
              50  0A    A4  01CE   450          MULW    #10,R0                  ;MULTIPLY PARTIAL RESULT BY 10
                  0D    1D  01D1   451          BVS     IVTIME                  ;IF VS INVALID TIME
              50  51    A0  01D3   452          ADDW    R1,R0                   ;ACCUMULATE VALUE
                  08    1D  01D6   453          BVS     IVTIME                  ;IF VS INVALID TIME VALUE
              74  50    B0  01D8   454          MOVW    R0,-(R4)                ;STORE VALUE
                  D8    11  01DB   455          BRB     10$                     ;
                  6E    D6  01DD   456 20$:     INCL    (SP)                    ;INCREMENT PAST TERMINATOR
                        05  01DF   457          RSB                             ;
                            01E0   458
                            01E0   459 ;
                            01E0   460 ; INVALID SYNTAX OR TIME COMPONENT
                            01E0   461 ;
                            01E0   462
           50   0184 8F    3C  01E0   463 IVTIME: MOVZWL  #SS$_IVTIME,R0          ;SET INVALID TIME
                        04  01E5   464          RET                             ;
                            01E6   465
                            01E6   466 ;
                            01E6   467 ; CHECK CONVERTED DATE AND TIME VALUES
                            01E6   468 ;
                            01E6   469
                            01E6   470 CVRTIME:                                 ;
04 A7      270F 8F    B1  01E6   471          CMPW    #9999,DAY(R7)           ;DAY WITHIN UPPER LIMIT?
                  F2    1F  01EC   472          BLSSU   IVTIME                  ;IF LSSU NO
     06 A7        18    B1  01EE   473          CMPW    #24,HOUR(R7)            ;HOUR WITHIN LIMITS?
                  EC    1B  01F2   474          BLEQU   IVTIME                  ;IF LEQU NO
     08 A7        3C    B1  01F4   475          CMPW    #60,MINUTE(R7)          ;MINUTE WITHIN LIMITS?
                  E6    1B  01F8   476          BLEQU   IVTIME                  ;IF LEQU NO
     0A A7        3C    B1  01FA   477          CMPW    #60,SECOND(R7)          ;SECOND WITHIN LIMITS?
                  E0    1B  01FE   478          BLEQU   IVTIME                  ;IF LEQU NO
0C A7      0064 8F    B1  0200   479          CMPW    #100,HUNDREDTH(R7)      ;HUNDREDTH WITHIN LIMITS?
                  D8    1B  0206   480          BLEQU   IVTIME                  ;IF LEQU NO
     55   04 A7    3C  0208   481          MOVZWL  DAY(R7),R5              ;GET DAY VALUE
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                    03 58    E8  020C   482          BLBS    R8,5$                   ;IF LBS ABSOLUTE TIME
                     0097    31  020F   483          BRW     40$                     ;
                             0212   484
                             0212   485 ;
                             0212   486 ; CONVERT YEARS TO QUADRICENTURIES, CENTURIES, QUADYEARS, YEARS
                             0212   487 ;
                             0212   488
                         CC  13  0212   489 5$:      BEQL    IVTIME                  ;IF EQL INVALID TIME
                      50 67  3C  0214   490          MOVZWL  YEAR(R7),R0             ;GET YEAR VALUE
                   50 F9BF CO  3E  0217   491          MOVAW   -1601(R0),R0            ;CALCULATE YEARS PAST 1601
                         C2  19  021C   492          BLSS    IVTIME                  ;IF LSS INVALID TIME
                         51  D4  021E   493          CLRL    R1                      ;CLEAR HIGH PART OF DIVIDEND
   51   50   50  00000190 8F  7B  0220   494          EDIV    #400,R0,R0,R1           ;CALCULATE QUADRICENTURIES
                         52  D4  0229   495          CLRL    R2                      ;CLEAR HIGH PART OF DIVIDEND
   52   51   51  00000064 8F  7B  022B   496          EDIV    #100,R1,R1,R2           ;CALCULATE CENTURIES
                         53  D4  0234   497          CLRL    R3                      ;CLEAR HIGH PART OF DIVIDEND
        53   52  52   04  7B  0236   498          EDIV    #4,R2,R2,R3             ;CALCULATE QUADYEARS AND YEARS
                             023B   499
                             023B   500 ;
                             023B   501 ; CONVERT QUADRICENTURIES, CENTURIES, QUADYEARS, YEARS TO DAYS
                             023B   502 ;
                             023B   503
                   53  016D 8F  A4  023B   504          MULW    #365,R3                 ;CALCULATE NUMBER OF DAYS PAST LEAP YEAR
   52   53   52  000005B5 8F  7A  0240   505          EMUL    #QUADYEARDAYS,R2,R3,R2  ;CALCULATE NUMBER OF QUADYEAR DAYS AND SUM
        51   50  00008EAC 8F  C4  0249   506          MULL    #CENTURYDAYS,R1         ;CALCULATE NUMBER OF CENTURY DAYS
   55   51   50  00023AB1 8F  7A  0250   507          EMUL    #QUADRIDAYS,R0,R1,R5    ;CALCULATE NUMBER OF QUADRIDAYS AND SUM
                         50  D4  0259   508          CLRL    R0                      ;CLEAR INITIAL LOOP INDEX
                    56   02 A7  3C  025B   509          MOVZWL  MONTH(R7),R6            ;GET SPECIFIED MONTH VALUE
                       55   52  C0  025F   510 10$:     ADDL    R2,R5                   ;ACCUMULATE TOTAL DAYS
                  52  FD99 CF40  9A  0262   511          MOVZBL  W^DATETABLE[R0],R2      ;GET NUMBER OF DAYS IN MONTH
                       50   01  D1  0268   512          CMPL    #1,R0                   ;SECOND MONTH OF YEAR?
                            1E  12  026B   513          BNEQ    30$                     ;IF NEQ NO
                       53   67  3C  026D   514          MOVZWL  YEAR(R7),R3             ;GET SPECIFIED YEAR VALUE
                       53   03  D3  0270   515          BITL    #3,R3                   ;YEAR MULTIPLE OF 4?
                            14  12  0273   516          BNEQ    20$                     ;IF NEQ NO
                            54  D4  0275   517          CLRL    R4                      ;CLEAR HIGH PART OF DIVIDEND
54   53   53  00000064 8F  7B  0277   518          EDIV    #100,R3,R3,R4           ;CALCULATE CENTURY AND YEAR IN CENTURY
                            54  D5  0280   519          TSTL    R4                      ;YEAR MULTIPLE OF 100?
                            07  12  0282   520          BNEQ    30$                     ;IF NEQ NO
                       53   03  D3  0284   521          BITL    #3,R3                   ;YEAR MULTIPLE OF 400?
                            02  13  0287   522          BEQL    30$                     ;IF EQL YES
                            52  D7  0289   523 20$:     DECL    R2                      ;REDUCE NUMBER OF DAYS IN MONTH
                 D0 50      56  F2  028B   524 30$:     AOBLSS  R6,R0,10$               ;ANY MORE DAYS TO ACCUMULATE?
                50   0184 8F  3C  028F   525          MOVZWL  #SS$_IVTIME,R0          ;ASSUME INVALID DAY OF MONTH
                  51   04 A7  3C  0294   526          MOVZWL  DAY(R7),R1              ;GET SPECIFIED DAY
             55   00016FEC 8F  C2  0298   527          SUBL    #TIMOFF2,R5             ;SUBTRACT OUT NUMBER OF DAYS TO 17-NOV-1858
                       55   51  C0  029F   528          ADDL    R1,R5                   ;CALCULATE TOTAL NUMBER OF DAYS
                            57  19  02A2   529          BLSS    60$                     ;IF LSS INVALID TIME
                       52   51  D1  02A4   530          CMPL    R1,R2                   ;DAY WITHIN LIMITS?
                            52  1A  02A7   531          BGTRU   60$                     ;IF GTRU NO
                             02A9   532
                             02A9   533 ;
                             02A9   534 ; CONVERT TIME TO TENTHS OF MICROSECONDS
                             02A9   535 ;
                             02A9   536
                 50   06 A7  3C  02A9   537 40$:     MOVZWL  HOUR(R7),R0             ;GET HOUR VALUE
                 51   08 A7  3C  02AD   538          MOVZWL  MINUTE(R7),R1           ;GET MINUTE VALUE
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                50    51    50    3C    7A  02B1    539          EMUL    #60,R0,R1,R0              ;CONVERT HOURS TO MINUTES AND SUM
                        51    0A A7    3C  02B6    540          MOVZWL  SECOND(R7),R1             ;GET SECOND VALUE
                50    51    50    3C    7A  02BA    541          EMUL    #60,R0,R1,R0              ;CONVERT MINUTES TO SECONDS AND SUM
                        51    0C A7    3C  02BF    542          MOVZWL  HUNDREDTH(R7),R1          ;GET HUNDREDTH VALUE
    50    51    50     00000064 8F    7A  02C3    543          EMUL    #100,R0,R1,R0             ;CONVERT SECONDS TO HUNDREDTHS AND SUM
    50    00    50     000186A0 8F    7A  02CC    544          EMUL    #100000,R0,#0,R0          ;CONVERT TO TENTHS OF MICROSECONDS
                                          02D5    545
                                          02D5    546 ;
                                          02D5    547 ; CONVERT DAYS TO TENTHS OF MICROSECONDS
                                          02D5    548 ;
                                          02D5    549
    52    00    55     324A9A70 8F    7A  02D5    550          EMUL    #843750000,R5,#0,R2       ;MULTIPLY BY 864000000000/1024
                      52    52    0A    79  02DE    551          ASHQ    #10,R2,R2                 ;MULTIPLY BY 1024
                                          02E2    552
                                          02E2    553 ;
                                          02E2    554 ; COMBINE RESULTS AND STORE 64-BIT TIME
                                          02E2    555 ;
                                          02E2    556
                            52    50    C0  02E2    557          ADDL    R0,R2                     ;ADD LOW ORDER PARTS
                            53    51    D8  02E5    558          ADWC    R1,R3                     ;ADD HIGH ORDER PARTS
                            50    01    3C  02E8    559          MOVZWL  #SS$_NORMAL,R0            ;SET NORMAL COMPLETION
                              09  58    E8  02EB    560          BLBS    R8,50$                    ;IF LBS ABSOLUTE TIME
                            53    53    CE  02EE    561          MNEGL   R3,R3                     ;CONVERT TO DELTA TIME
                            52    52    CE  02F1    562          MNEGL   R2,R2                     ;
                            53    00    D9  02F4    563          SBWC    #0,R3                     ;
                        08  BC    52    7D  02F7    564 50$:     MOVQ    R2,@BTIMADR(AP)           ;STORE 64-BIT TIME VALUE
                                    04    02FB    565 60$:     RET                               ;
```

```
                                02FC   567          .SBTTL  CONVERT BINARY TIME TO NUMERIC TIME
                                02FC   568 ;+
                                02FC   569 ; EXE$NUMTIM - CONVERT BINARY TIME TO NUMERIC TIME
                                02FC   570 ;
                                02FC   571 ; THIS SERVICE PROVIDES THE CAPABILITY TO CONVERT AN ABSOLUTE OR DELTA TIME
                                02FC   572 ; FROM 64-BIT FORMAT TO INTEGER DATE AND TIME VALUES.
                                02FC   573 ;
                                02FC   574 ; INPUTS:
                                02FC   575 ;
                                02FC   576 ;       NTIMBUF(AP) = ADDRESS OF 7-WORD BUFFER TO RECEIVE CONVERTED DATE AND
                                02FC   577 ;                     TIME VALUES.
                                02FC   578 ;       NTIMADR(AP) = ADDRESS OF 64-BIT TIME VALUE. IF ZERO, THEN THE CURRENT
                                02FC   579 ;                     SYSTEM TIME IS USED. POSITIVE VALUES ARE INTERPRETED AS
                                02FC   580 ;                     ABSOLUTE TIMES AND NEGATIVE VALUES AS DELTA TIMES.
                                02FC   581 ;
                                02FC   582 ; OUTPUTS:
                                02FC   583 ;
                                02FC   584 ;       R0 LOW BIT CLEAR INDICATES FAILURE TO CONVERT TO NUMERIC TIME.
                                02FC   585 ;
                                02FC   586 ;                R0 = SS$_ACCVIO - 64-BIT TIME VALUE CANNOT BE READ BY CALLING
                                02FC   587 ;                     ACCESS MODE OR TIME BUFFER CANNOT BE WRITTEN BY
                                02FC   588 ;                     CALLING ACCESS MODE.
                                02FC   589 ;
                                02FC   590 ;                R0 = SS$_IVTIME - SPECIFIED DELTA TIME IS GREATER THAN 9999
                                02FC   591 ;                     DAYS.
                                02FC   592 ;
                                02FC   593 ;       R0 LOW BIT SET INDICATES SUCCESSFUL COMPLETION.
                                02FC   594 ;
                                02FC   595 ;                R0 = SS$_NORMAL - NORMAL COMPLETION.
                                02FC   596 ;-
                                02FC   597
                                02FC   598 EXE$NUMTIM::                                 ;CONVERT TO NUMERIC TIME
                         00FC   02FC   599          .WORD   ^M<R2,R3,R4,R5,R6,R7>       ;ENTRY MASK
                                02FE   600
                                02FE   601          $MP_SET_INTERLOCK  #MP$V_IL_NUMT ; Interlock this routine  [04]
                   00    DD   02FE                 PUSHL   #MP$V_IL_NUMT
                   08    DD   0300                 PUSHL   #$SRVCODE_SET_INTERLOCK
00000000'9F        02    FB   0302                 CALLS   #2, @#DS$SERVICE_DISPATCHER
                              0309   602
      57    04 AC    D0   0309   603          MOVL    NTIMBUF(AP),R7                     ;GET ADDRESS OF 7-WORD TIME BUFFER
                              030D   604          IFNOWRT #7*2,(R7),10$                      ;CAN TIME BUFFER BE WRITTEN?
   67    0E    00    0D   030D                 PROBEW  #0,#7*2,(R7)
                   28    13   0311                 BEQL    10$
         50    01    3C   0313   605          MOVZWL  #SS$_NORMAL,R0                     ;ASSUME NORMAL COMPLETION
51    00000000'EF    7D   0316   606          MOVQ    EXE$GQ_SYSTIME,R1                  ;ASSUME TIME NOT SPECIFIED
      53    08 AC    D0   031D   607          MOVL    NTIMADR(AP),R3                     ;GET ADDRESS OF 64-TIME VALUE
                   1E    13   0321   608          BEQL    20$                                ;IF EQL NONE SPECIFIED
                              0323   609          IFNORD  #8,(R3),10$                        ;CAN 64-BIT TIME VALUE BE READ?
   63    08    00    0C   0323                 PROBER  #0,#8,(R3)
                   12    13   0327                 BEQL    10$
         51    63    7D   0329   610          MOVQ    (R3),R1                            ;GET 64-BIT TIME VALUE
                   13    18   032C   611          BGEQ    20$                                ;IF GEQ ABSOLUTE TIME
         52    52    CE   032E   612          MNEGL   R2,R2                              ;NEGATE DELTA TIME VALUE
         51    51    CE   0331   613          MNEGL   R1,R1                              ;
         52    00    D9   0334   614          SBWC    #0,R2                              ;
      06 50    00    E4   0337   615          BBSC    #0,R0,20$                          ;INDICATE DELTA TIME VALUE
         50    0C    3C   033B   616 10$:     MOVZWL  #SS$_ACCVIO,R0                     ;SET ACCESS VIOLATION
```

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                                  033E
                     00D9    31   033E          BRW     91$                     ; JUMP TO CLEAR INTERLOCK AND RET [04]
                                  0341
                                  0341
                                  0341  ;
                                  0341  ; R1 AND R2 CONTAIN 64-BIT ABSOLUTE TIME VALUE IN UNITS OF TENTHS OF MICRO-
                                  0341  ; SECONDS. CALCULATE DAYS PAST BASE TIME AND FRACTION OF DAY BY DIVIDING
                                  0341  ; BY 864000000000 WHICH IS THE NUMBER OF TENTHS OF MICROSECONDS IN A DAY.
                                  0341  ; THE DIVISION IS PERFORMED IN THREE STEPS TO INSURE BOTH QUOTIENT AND
                                  0341  ; REMAINDER STAY WITHIN 32 BITS.
                                  0341  ;
                                  0341  ; CALCULATE DAYS BY DIVIDING BY 1024 AND THEN 843750000. QUOTIENT IS DAYS
                                  0341  ; AND REMAINDER IS FRACTION OF DAY.
                                  0341  ;
                                  0341
          54   51   0A   00   EF  0341  20$:    EXTZV   #0,#10,R1,R4            ;SAVE REMAINDER FROM NEXT DIVIDE
            51   51   F6 8F   79  0346          ASHQ    #-10,R1,R1              ;DIVIDE BY 1024
   52   51   51   324A9A70 8F   7B  034B          EDIV    #843750000,R1,R1,R2     ;CALCULATE DAYS AND FRACTION OF DAY
                                  0354
                                  0354  ;
                                  0354  ; R1 CONTAINS DAYS PAST BASE TIME, R2 PLUS R4 CONTAIN FRACTION OF DAY.
                                  0354  ; R2 CONTAINS PART OF FRACTION IN UNITS OF 864000000000/1024 AND
                                  0354  ; R4 CONTAINS REMAINDER IN UNITS OF TENTHS OF MICROSECONDS.
                                  0354  ;
                                  0354  ; CALCULATE FRACTION OF DAY IN HUNDREDTHS OF SECONDS BY DIVIDING BY
                                  0354  ; 100000 WHICH IS THE NUMBER OF TENTHS OF MICROSECONDS IN A HUNDRETH
                                  0354  ; OF A SECOND.
                                  0354  ;
                                  0354
                        53   D4   0354          CLRL    R3                      ;CLEAR HIGH PART OF DIVIDEND
                52   52   0A   79  0356          ASHQ    #10,R2,R2               ;CONVERT BACK TO TENTHS OF MICROSECONDS
                     52   54   C8  035A          BISL    R4,R2                   ;ADD REMAINDER BACK
   52   55   52   000186A0 8F   7B  035D          EDIV    #100000,R2,R5,R2        ;CALCULATE FRACTION OF DAY IN HUNDREDTHS
                                  0366
                                  0366  ;
                                  0366  ; R1 CONTAINS DAYS PAST THE BASE TIME AND R5 CONTAINS THE FRACTION OF DAY
                                  0366  ; IN HUNDREDTHS OF A SECOND.
                                  0366  ;
                                  0366
                7E 50   00   E3   0366          BBCS    #0,R0,70$               ;IF CLR, DELTA TIME SPECIFIED
                                  036A
                                  036A  ;
                                  036A  ; ADD TIME OFFSET SO THAT DAY IS RELATIVE TO 1-JAN-1501.
                                  036A  ;
                                  036A
          51   0001FE98 8F   C0   036A          ADDL    #TIMOFF1,R1             ;ADD TIME OFFSET
                                  0371
                                  0371  ;
                                  0371  ; CALCULATE NUMBER OF QUADRICENTURIES THAT HAVE PAST SINCE 1501.
                                  0371  ;
                                  0371
                        52   D4   0371          CLRL    R2                      ;CLEAR HIGH PART OF DIVIDEND
   52   51   51   00023AB1 8F   7B  0373          EDIV    #QUADRIDAYS,R1,R1,R2    ;CALCULATE NUMBER OF QUADRICENTURIES
                                  037C
                                  037C  ;
                                  037C  ; R1 CONTAINS THE NUMBER OF QUADRICENTURIES AND R2 CONTAINS THE NUMBER OF
                                  037C  ; DAYS INTO THE NEXT QUADRICENTURY. CALCULATE THE NUMBER OF CENTURIES BY
```

```
                                037C   674 ; CONVERTING TO QUARTER DAYS INTO NEXT QUADRICENTURY AND THEN DIVIDING BY
                                037C   675 ; THE AVERAGE NUMBER OF QUARTER DAYS IN A CENTURY.
                                037C   676 ;
                                037C   677
                          52    04   C4  037C   678          MULL    #4,R2                       ;CALCULATE NUMBER OF QUARTER DAYS
                                53   D4   037F   679          CLRL    R3                          ;CLEAR HIGH PART OF DIVIDEND
   53   52   52   00023AB1    8F   7B   0381   680          EDIV    #QDAYSPCENT,R2,R2,R3        ;CALCULATE NUMBER OF CENTURIES
                                038A   681
                                038A   682 ;
                                038A   683 ; R2 CONTAINS THE NUMBER OF CENTURIES AND R3 CONTAINS THE NUMBER OF QUARTER
                                038A   684 ; DAYS INTO THE NEXT CENTURY.
                                038A   685 ;
                                038A   686 ; CALCULATE YEARS BY DISCARDING ANY FRACTION OF A DAY, ADDING 3/4'THS OF A
                                038A   687 ; DAY, AND DIVIDING BY THE AVERAGE NUMBER OF DAYS IN A YEAR. THE LEAP DAY
                                038A   688 ; OF EACH FOUR YEAR CYCLE IS FORCED INTO THE FOURTH YEAR.
                                038A   689 ;
                                038A   690
                                54   D4   038A   691          CLRL    R4                          ;CLEAR HIGH PART OF DIVIDEND
                          53    03   C8   038C   692          BISL    #3,R3                       ;TRUNCATE FRACTION AND ADD 3/4'THS OF DAY
   54   53   53   000005B5    8F   7B   038F   693          EDIV    #QDAYSPYEAR,R3,R3,R4        ;CALCULATE NUMBER OF YEARS
                          54    04   C6  0398   694          DIVL    #4,R4                       ;CALCULATE NUMBER OF DAYS MINUS ONE
                                54   D6   039B   695          INCL    R4                          ;CONVERT TO ACTUAL JULIAN DAY OF YEAR
                                039D   696
                                039D   697 ;
                                039D   698 ; R1 CONTAINS NUMBER OF QUADRICENTURIES.
                                039D   699 ; R2 CONTAINS NUMBER OF CENTURIES.
                                039D   700 ; R3 CONTAINS NUMBER OF YEARS.
                                039D   701 ; R4 CONTAINS JULIAN DAY OF YEAR.
                                039D   702 ;
                                039D   703 ; CALCULATE ACTUAL YEAR.
                                039D   704 ;
                                039D   705
                    51    6241    DE   039D   706          MOVAL   (R2)[R1],R1                 ;COMBINE CENTURIES AND QUADRICENTURIES
                      51    32    C4   03A1   707          MULL    #50,R1                      ;CALCULATE NUMBER OF DOUBLE CENTURIES
                51    05DD C341    3E   03A4   708          MOVAW   1501(R3)[R1],R1             ;CALCULATE ACTUAL YEAR
                      87    51    B0   03AA   709          MOVW    R1,(R7)+                    ;STORE YEAR
                                03AD   710
                                03AD   711 ;
                                03AD   712 ; TEST FOR NONLEAP YEAR AND BIAS DAY IF AFTER 28-FEB.
                                03AD   713 ;
                                03AD   714
                          51    03   D3  03AD   715          BITL    #3,R1                       ;YEAR MULTIPLE OF 4?
                                14   12   03B0   716          BNEQ    30$                         ;IF NEQ NO
                                52   D4   03B2   717          CLRL    R2                          ;CLEAR HIGH PART OF DIVIDEND
   52   51   51   00000064    8F   7B   03B4   718          EDIV    #100,R1,R1,R2               ;CALCULATE CENTURY AND YEAR IN CENTURY
                                52   D5   03BD   719          TSTL    R2                          ;YEAR MULTIPLE OF 100?
                                0C   12   03BF   720          BNEQ    40$                         ;IF NEQ NO
                          51    03   D3  03C1   721          BITL    #3,R1                       ;YEAR MULTIPLE OF 400?
                                07   13   03C4   722          BEQL    40$                         ;IF EQL YES
                          54    3B   D1  03C6   723 30$:     CMPL    #31+28,R4                   ;AFTER 28-FEB?
                                02   18   03C9   724          BGEQ    40$                         ;IF GEQ NO
                                54   D6   03CB   725          INCL    R4                          ;ADJUST FOR TABLE BIAS
                          51    01   D0  03CD   726 40$:     MOVL    #1,R1                       ;INITIALIZE MONTH
                52    FC2A CF41    9A   03D0   727 50$:     MOVZBL  W^DATETABLE-1[R1],R2        ;GET NUMBER OF DAYS IN MONTH
                      54    52   C2   03D6   728          SUBL    R2,R4                       ;SUBTRACT FROM JULIAN DAY
                                04   15   03D9   729          BLEQ    60$                         ;IF LEQ CORRECT MONTH FOUND
                    F1 51    0C   F3   03DB   730          AOBLEQ  #12,R1,50$                  ;LOOP THROUGH ALL MONTHS
```

```
                87    51    B0   03DF   731 60$:    MOVW    R1,(R7)+                ;STORE MONTH
              87    54    52    A1   03E2   732         ADDW3   R2,R4,(R7)+             ;STORE DAY
                    16    11   03E6   733         BRB     80$                     ;
                                 03E8   734
                                 03E8   735 ;
                                 03E8   736 ; DELTA TIME SPECIFIED - STORE RELATIVE DAY
                                 03E8   737 ;
                                 03E8   738
                    87    D4   03E8   739 70$:    CLRL    (R7)+                   ;CLEAR YEAR AND MONTH
                87    51    B0   03EA   740         MOVW    R1,(R7)+                ;STORE DAY
            51    00002710 8F    D1   03ED   741         CMPL    #10000,R1               ;RELATIVE DAY WITHIN LIMITS?
                    08    1A   03F4   742         BGTRU   80$                     ;IF GTRU YES
              50    0184 8F    3C   03F6   743         MOVZWL  #SS$_IVTIME,R0          ;SET INVALID TIME
                                 03FB   744
                      001C    31   03FB   745         BRW     91$                     ; JUMP TO CLEAR INTERLOCK AND RET [04]
                                 03FE   746
                                 03FE   747 ;
                                 03FE   748 ; R5 CONTAINS FRACTION OF DAY IN HUNDREDTHS OF SECONDS.
                                 03FE   749 ;
                                 03FE   750 ; CALCULATE HOUR, MINUTE, SECOND, AND HUNDREDTH OF SECOND.
                                 03FE   751 ;
                                 03FE   752
                57    08    C0   03FE   753 80$:    ADDL    #8,R7                   ;POINT TWO BYTES PAST END OF BUFFER
                    51    D4   0401   754         CLRL    R1                      ;CLEAR LOOP INDEX
          52    FC34 CF41    9A   0403   755 90$:    MOVZBL  W^TIMETABLE[R1],R2      ;GET NEXT UNIT DIVISOR
                    56    D4   0409   756         CLRL    R6                      ;CLEAR HIGH PART OF DIVIDEND
      56    55    55    52    7B   040B   757         EDIV    R2,R5,R5,R6             ;CALCULATE NEXT PART
                77    56    B0   0410   758         MOVW    R6,-(R7)                ;STORE NEXT PART
              EC 51    02    F3   0413   759         AOBLEQ  #2,R1,90$               ;LOOP FOR HUNDREDTHS, SECONDS, AND MINUTES
                77    55    B0   0417   760         MOVW    R5,-(R7)                ;STORE HOUR
                                 041A   761 91$:
                                 041A   762
                                 041A   763         $MP_CLEAR_INTERLOCK  #MP$V_IL_NUMT ; Clear Interlock       [04]
                    00    DD   041A                       PUSHL   #MP$V_IL_NUMT
                    09    DD   041C                       PUSHL   #$SRVCODE_CLEAR_INTERLOCK
      00000000'9F   02    FB   041E                       CALLS   #2, @#DS$SERVICE_DISPATCHER
                                 0425   764
                    04   0425   765         RET                                     ;
                                 0426   766
                                 0426   767         .END
```

```
$$T2                            = 00000007    D
$SRVCODE_BOOTATTACHED           = 00000000    D
$SRVCODE_CLEAR_INTERLOCK        = 00000009    D
$SRVCODE_GETSYSBUF              = 00000004    D
$SRVCODE_HALTATTACHED           = 00000002    D
$SRVCODE_INTERLOCK_TEST         = 00000007    D
$SRVCODE_PPSCB                  = 0000000A    D
$SRVCODE_PRINTREV               = 00000006    D
$SRVCODE_RELSYSBUF              = 00000005    D
$SRVCODE_SET_INTERLOCK          = 00000008    D
$SRVCODE_SHOWIDLE               = 00000003    D
$SRVCODE_STARTATTACHED          = 00000001    D
ACVTFLG                         = 00000010    D
ATIMADR                         = 0000000C    D
ATIMBUF                         = 00000008    D
ATIMLEN                         = 00000004    D
BLANK                           = 00000020    D
BTIMADR                         = 00000008    D
BTIMBUF                         = 00000004    D
CENTURYDAYS                     = 00008EAC    D
COLON                           = 0000003A    D
CONVERT                           000001B3 R  D  02
CVRTIME                           000001E6 R  D  02
DATE                              0000003F R  D  02
DATETABLE                         00000000 RG D  02
DAY                             = 00000004    D
DELTA                             0000004D R  D  02
DS$SERVICE_DISPATCHER             ********   X   02
EXE$ASCTIM                        00000065 RG D  02
EXE$BINTIM                        00000106 RG D  02
EXE$GQ_SYSTIME                    ********   X   02
EXE$NUMTIM                        000002FC RG D  02
HOUR                            = 00000006    D
HUNDREDTH                       = 0000000C    D
HYPHEN                          = 0000002D    D
IVTIME                            000001E0 R  D  02
MINUTE                          = 00000008    D
MONTH                           = 00000002    D
MONTHTAB                          0000000C R  D  02
MP$V_IL_ALLN                    = 00000004    D
MP$V_IL_CNDB                    = 00000007    D
MP$V_IL_CNHN                    = 00000006    D
MP$V_IL_DELN                    = 00000005    D
MP$V_IL_DSBK                    = 00000008    D
MP$V_IL_ERSP                    = 00000003    D
MP$V_IL_GTLN                    = 00000009    D
MP$V_IL_NUMT                    = 00000000    D
MP$V_IL_PRNT                    = 00000001    D
MP$V_IL_RRPT                    = 00000002    D
NINE                            = 00000039    D
NTIMADR                         = 00000008    D
NTIMBUF                         = 00000004    D
ONE                             = 00000030    D
PERIOD                          = 0000002E    D
QDAYSPCENT                      = 00023AB1    D
QDAYSPYEAR                      = 000005B5    D
QUADRIDAYS                      = 00023AB1    D
QUADYEARDAYS                    = 000005B5    D
SECOND                          = 0000000A    D
SS$_ACCVIO                      = 0000000C    D
SS$_IVTIME                      = 00000184    D
SS$_NORMAL                      = 00000001    D
SYS$FAO                           ********   X   02
SYS$NUMTIM                        ********  GX   02
TIME                              00000052 R  D  02
TIMETABLE                         0000003C R  D  02
TIMOFF1                         = 0001FE98    D
TIMOFF2                         = 00016FEC    D
YEAR                            = 00000000    D
```

```
                                    +----------------+
                                    ! Psect synopsis !
                                    +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           00000000  (    0.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
SEP                             00000426  ( 1062.)  02 (  2.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD    WRT NOVEC LONG
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$T2	=00000007	308 (1)	295 (1) 308 (1)
$SRVCODE_BOOTATTACHED	=00000000	763 (1)	
$SRVCODE_CLEAR_INTERLOCK	=00000009	763 (1)	#-763 (1)
$SRVCODE_GETSYSBUF	=00000004	763 (1)	
$SRVCODE_HALTATTACHED	=00000002	763 (1)	
$SRVCODE_INTERLOCK_TEST	=00000007	763 (1)	
$SRVCODE_PPSCB	=0000000A	763 (1)	
$SRVCODE_PRINTREV	=00000006	763 (1)	
$SRVCODE_RELSYSBUF	=00000005	763 (1)	
$SRVCODE_SET_INTERLOCK	=00000008	763 (1)	#-601 (1)
$SRVCODE_SHOWIDLE	=00000003	763 (1)	
$SRVCODE_STARTATTACHED	=00000001	763 (1)	
ACVTFLG	=00000010	79 (1)	#-275 (1)
ATIMADR	=0000000C	78 (1)	#-261 (1)
ATIMBUF	=00000008	77 (1)	#-256 (1)
ATIMLEN	=00000004	76 (1)	#-309 (1)
BLANK	=00000020	145 (1)	#-346 (1) 411 (1) #-414 (1) 431 (1)
BTIMADR	=00000008	86 (1)	#-564 (1)
BTIMBUF	=00000004	85 (1)	#-342 (1)
CENTURYDAYS	=00008EAC	101 (1)	#-506 (1)
COLON	=0000003A	146 (1)	425 (1) 427 (1)
CONVERT	000001B3-R	438 (1)	#-372 (1) #-410 (1) #-424 (1) #-426 (1)
			#-428 (1) #-430 (1)
CVRTIME	000001E6-R	470 (1)	#-432 (1) #-442 (1)
DATE	0000003F-R	215 (1)	284 (1) #-285 (1)
DATETABLE	00000000-R	170 (1)	#-511 (1) #-727 (1)
DAY	=00000004	158 (1)	#-295 (1) 371 (1) #-471 (1) #-481 (1)
			#-526 (1)
DELTA	0000004D-R	216 (1)	#-285 (1) 292 (1) #-293 (1)
DS$SERVICE_DISPATCHER	00000000-XR		601 (1) 763 (1)
EXE$ASCTIM	00000065-R	254 (1)	#-306 (1)
EXE$BINTIM	00000106-R	338 (1)	
EXE$GQ_SYSTIME	00000000-XR		#-606 (1)
EXE$NUMTIM	000002FC-R	598 (1)	
HOUR	=00000006	159 (1)	#-308 (1) 423 (1) #-473 (1) #-537 (1)
HUNDREDTH	=0000000C	162 (1)	#-308 (1) #-409 (1) #-479 (1) #-542 (1)
HYPHEN	=0000002D	147 (1)	#-356 (1) 373 (1) #-376 (1) #-396 (1)
IVTIME	000001E0-R	463 (1)	#-389 (1) #-394 (1) #-397 (1) #-447 (1)
			#-449 (1) #-451 (1) #-453 (1) #-472 (1)
			#-474 (1) #-476 (1) #-478 (1) #-480 (1)
			#-489 (1) #-492 (1)
MINUTE	=00000008	160 (1)	#-308 (1) #-475 (1) #-538 (1)
MONTH	=00000002	157 (1)	#-282 (1) #-391 (1) #-509 (1)
MONTHTAB	0000000C-R	188 (1)	283 (1) #-386 (1)
MP$V_IL_ALLN	=00000004	60 (1)	
MP$V_IL_CNDB	=00000007	60 (1)	
MP$V_IL_CNHN	=00000006	60 (1)	
MP$V_IL_DELN	=00000005	60 (1)	
MP$V_IL_DSBK	=00000008	60 (1)	
MP$V_IL_ERSP	=00000003	60 (1)	

```
MP$V_IL_GTLN                =00000009     60     (1)
MP$V_IL_NUMT                =00000000     60     (1)    #-601    (1)    #-763    (1)
MP$V_IL_PRNT                =00000001     60     (1)
MP$V_IL_RRPT                =00000002     60     (1)
NINE                        =00000039     148    (1)    #-448    (1)
NTIMADR                     =00000008     93     (1)    #-607    (1)
NTIMBUF                     =00000004     92     (1)    #-603    (1)
ONE                         =00000030     149    (1)    #-446    (1)    #-448    (1)
PERIOD                      =0000002E     150    (1)      429    (1)
QDAYSPCENT                  =00023AB1     107    (1)    #-680    (1)
QDAYSPYEAR                  =000005B5     113    (1)    #-693    (1)
QUADRIDAYS                  =00023AB1     119    (1)    #-507    (1)    #-669    (1)
QUADYEARDAYS                =000005B5     125    (1)    #-505    (1)
SECOND                      =0000000A     161    (1)    #-308    (1)    #-477    (1)    #-540    (1)
SS$_ACCVIO                  =0000000C                   #-616    (1)
SS$_IVTIME                  =00000184                   #-463    (1)    #-525    (1)    #-743    (1)
SS$_NORMAL                  =00000001                   #-559    (1)    #-605    (1)
SYS$FAO                      00000000-XR                  295    (1)      308    (1)
SYS$NUMTIM                   00000000-XR                  268    (1)      365    (1)
TIME                         00000052-R    217    (1)    #-293    (1)      305    (1)    #-306    (1)
TIMETABLE                    0000003C-R    206    (1)    #-755    (1)
TIMOFF1                     =0001FE98      132    (1)    #-662    (1)
TIMOFF2                     =00016FEC      139    (1)    #-527    (1)
YEAR                        =00000000      156    (1)    #-295    (1)      399    (1)      406    (1)    #-490    (1)
                                                          #-514    (1)
```

```
                    +-------------------------+
                    ! Performance indicators !
                    +-------------------------+
```

Phase	Page faults	CPU Time	Elapsed Time
Initialization	38	00:00:00.03	00:00:00.25
Command processing	926	00:00:00.27	00:00:01.33
Pass 1	419	00:00:01.30	00:00:02.91
Symbol table sort	0	00:00:00.13	00:00:00.14
Pass 2	19	00:00:00.43	00:00:00.95
Symbol table output	2	00:00:00.01	00:00:00.01
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	5	00:00:00.05	00:00:00.07
Assembler run totals	1413	00:00:02.23	00:00:05.67

```
The working set limit was 2900 pages.
61946 bytes (121 pages) of virtual memory were used to buffer the intermediate code.
There were 30 pages of symbol table space allocated to hold 476 non-local and 36 local symbols.
767 source lines were read in Pass 1, producing 40 object records in Pass 2.
17 pages of virtual memory were used to define 15 macros.
```

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              2
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                3
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           2
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       7
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                14

584 GETS were required to define 14 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(2) 62 DECLARATIONS
(3) 89 CVTFILNAM - CONVERT FILE NAME FROM ASCII TO RAD50
(4) 215 STORER50BYTE - CONVERT AND STORE ASCII BYTE TO RAD50
(5) 252 PACKRAD50 - PACK 3 BYTES OF RAD50 CHARACTERS INTO A WORD
(6) 284 ASCIITORAD50 - CONVERT ASCII CHARACTER TO RAD50

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element CVTFILNAM.MAR
0000     2 ; *1     6-FEB-1986 15:16:46 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element CVTFILNAM.MAR
0000     4         .TITLE  CVTFILNAM - Converts ASCII to RAD50
0000     5         .IDENT  '06-02'
0000     6
0000     7 ;
0000     8 ;*****************************************************************************
0000     9 ;*                                                                           *
0000    10 ;*  COPYRIGHT (c) 1978, 1980, 1982, 1983 BY                                 *
0000    11 ;*  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.                   *
0000    12 ;*  ALL RIGHTS RESERVED.                                                     *
0000    13 ;*                                                                           *
0000    14 ;*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND COPIED    *
0000    15 ;*  ONLY IN  ACCORDANCE WITH  THE  TERMS  OF  SUCH  LICENSE  AND WITH THE   *
0000    16 ;*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE. THIS SOFTWARE OR  ANY  OTHER    *
0000    17 ;*  COPIES THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY   *
0000    18 ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE IS  HEREBY   *
0000    19 ;*  TRANSFERRED.                                                             *
0000    20 ;*                                                                           *
0000    21 ;*  THE INFORMATION IN THIS SOFTWARE IS  SUBJECT TO CHANGE WITHOUT NOTICE    *
0000    22 ;*  AND  SHOULD  NOT  BE  CONSTRUED AS  A COMMITMENT BY DIGITAL EQUIPMENT   *
0000    23 ;*  CORPORATION.                                                             *
0000    24 ;*                                                                           *
0000    25 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE  OR  RELIABILITY OF ITS    *
0000    26 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    27 ;*                                                                           *
0000    28 ;*                                                                           *
0000    29 ;*****************************************************************************
0000    30 ;
0000    31 ;++
0000    32 ; FACILITY:
0000    33 ;
0000    34 ;       Used by BOOT58 and FILEREAD
0000    35 ;
0000    36 ; ABSTRACT:
0000    37 ;
0000    38 ;       Converts an ASCII string file name, type, and version number
0000    39 ;       to a 6-word RAD50 file name and type, and a 16-bit binary
0000    40 ;       version number.
0000    41 ;
0000    42 ; ENVIRONMENT:
0000    43 ;
0000    44 ;       any
0000    45 ;
0000    46 ; AUTHOR:
0000    47 ;
0000    48 ;       Carol Peters    22 March 1979
0000    49 ;               Extracted from the Release 1 module FILEREAD.MAR; all
0000    50 ;               code and definitions are unchanged from Release 1 form.
0000    51 ;
0000    52 ; MODIFIED BY:
0000    53 ;
0000    54 ;       02      Bob Bergazzi    30-Jun-1983     Version 6.12
0000    55 ;               Adapted for VDS
0000    56 ;
0000    57 ;       V03-001 TCM0001         Trudy C. Matthews       15-Nov-1982
```

```
                                0000     58 ;
                                0000     59 ;
                                0000     60 ;--
```

Added G^ to call to LIB$CVT_DTB.

```
                     0000     62          .SBTTL  DECLARATIONS
                     0000     63
                     0000     64 ;
                     0000     65 ; Include files
                     0000     66 ;
                     0000     67
                     0000     68          $SSDEF                          ; Status code definitions
                     0000              .SAVE   LOCAL_BLOCK
                     0000              .RESTORE
                     0000     69
                     0000     70 ;
                     0000     71 ; Equated symbols
                     0000     72 ;
                     0000     73
00000061             0000     74          LCA     =       ^O141           ;LOWER CASE A
0000007A             0000     75          LCZ     =       ^O172           ;LOWER CASE Z
00000041             0000     76          UCA     =       ^O101           ;UPPER CASE A
0000005A             0000     77          UCZ     =       ^O132           ;UPPER CASE Z
00000030             0000     78          ZERO    =       ^O60            ;ASCII ZERO
00000039             0000     79          NINE    =       ^O71            ;ASCII NINE
0000002E             0000     80          DOT     =       ^O56            ;ASCII PERIOD
0000003B             0000     81          SEMI    =       ^O73            ;ASCII SEMICOLON
                     0000     82
                     0000     83 ;
                     0000     84 ; PSECT declaration
                     0000     85 ;
                     0000     86
                  00000000    87          .PSECT  code, exe, nowrt, shr, long     ;                       [02]
```

```
                     0000     89          .SBTTL  CVTFILNAM - CONVERT FILE NAME FROM ASCII TO RAD50
                     0000     90
                     0000     91 ;++
                     0000     92 ; FUNCTIONAL DESCRIPTION:
                     0000     93 ;
                     0000     94 ;       THIS ROUTINE CONVERTS THE ASCII FILE NAME (NAME, TYPE, VERSION)
                     0000     95 ; TO THE FILE NAME BLOCK FORM OF 3 WORDS RAD50 NAME, 1 WORD OF TYPE
                     0000     96 ; AND 1 WORD OF VERSION.
                     0000     97 ;
                     0000     98 ; CALLING SEQUENCE:
                     0000     99 ;
                     0000    100 ;       CALLG   ARGLIST,FIL$CVTFILNAM
                     0000    101 ;
                     0000    102 ; INPUT PARAMETERS:
                     0000    103 ;
                     0000    104 ;       FILNAM(AP)      =               ;STRING DESCRIPTOR OF FILE NAME STRING
                     0000    105 ;       FILNAMBLK(AP)   =               ;ADDRESS OF 5 WORD BLOCK
                     0000    106 ;                                               3 WORD RAD50 FILE NAME
                     0000    107 ;                                               1 WORD RAD50 FILE TYPE
                     0000    108 ;                                               1 WORD BINARY VERSION
                     0000    109 ;
                     0000    110 ; IMPLICIT INPUTS:
                     0000    111 ;
                     0000    112 ;       NONE
                     0000    113 ;
                     0000    114 ; OUTPUT PARAMETERS:
                     0000    115 ;
                     0000    116 ;       R0 = SYSTEM STATUS CODE
                     0000    117 ;       FILNAME BLOCK FILLED IN
                     0000    118 ;
                     0000    119 ; IMPLICIT OUTPUTS:
                     0000    120 ;
                     0000    121 ;       NONE
                     0000    122 ;
                     0000    123 ; COMPLETION CODES:
                     0000    124 ;
                     0000    125 ;       SS$_NORMAL                      SUCCESSFUL COMPLETION
                     0000    126 ;       SS$_BADFILENAME                 SYNTAX ERROR IN FILE NAME
                     0000    127 ;
                     0000    128 ; SIDE EFFECTS:
                     0000    129 ;
                     0000    130 ;       NONE
                     0000    131 ;
                     0000    132 ; EQUATED SYMBOLS:
                     0000    133 ;
                     0000    134 ;    OFFSETS FROM AP
                     0000    135 ;
00000004             0000    136         FILNAM          =       4       ;DESCRIPTOR OF ASCII FILE NAME STRING
00000008             0000    137         FILNAMBLK       =       8       ;ADDRESS OF 5 WORD FILE NAME BLOCK
                     0000    138 ;
                     0000    139 ;    OFFSETS FROM FP
                     0000    140 ;
FFFFFFFD             0000    141         TYPE            =       -3      ;BEGINNING OF TYPE FIELD
FFFFFFF4             0000    142         NAME            =       -12     ;BEGINNING OF NAME FIELD
                     0000    143 ;
                     0000    144 ;--
                     0000    145
```

```
                                0000   146 FIL$CVTFILNAM::
                           007C 0000   147         .WORD   ^M<R2,R3,R4,R5,R6>
                        7E   7C 0002   148         CLRQ    -(SP)                   ;RESERVE AND ZERO A
                        7E   D4 0004   149         CLRL    -(SP)                   ;12 BYTE NAME STRING
                  55    04 BC   7D 0006   150         MOVQ    @FILNAM(AP),R5          ;R5 = SIZE, R6 = ADR OF STRING
                     55   55   3C 000A   151         MOVZWL  R5,R5                   ; only low word used                    [02]
                  54    F4 AD   9E 000D   152         MOVAB   NAME(FP),R4             ;ADDRESS TO STORE NAME
                     53   09   D0 0011   153         MOVL    #9,R3                   ;UP TO 9 CHARACTERS
                          0F   11 0014   154         BRB     40$
                               0016   155 ;
                               0016   156 ; STORE UP TO 9 CHARACTERS OF RAD50 IN THE BYTE ARRAY ADDRESSED BY R4
                               0016   157 ; IN PREPARATION FOR CONVERTING INTO THE PACKED RAD50 FORMAT
                               0016   158 ;
                               0016   159 20$:
                     50   86   90 0016   160         MOVB    (R6)+,R0                ;GET THE NEXT CHARACTER
                     50   2E   91 0019   161         CMPB    #DOT,R0                 ;IS IT A DOT?
                          0C   13 001C   162         BEQL    FILETYPE                ;BRANCH IF YES
                     50   3B   91 001E   163         CMPB    #SEMI,R0                ;IS IT A SEMICOLON
                          24   13 0021   164         BEQL    VERSION                 ;BRANCH IF YES
                          59   10 0023   165         BSBB    STORER50BYTE            ;CONVERT AND STORE THE CHARACTER
                               0025   166 40$:
                        EE 55   F4 0025   167         SOBGEQ  R5,20$                  ;COUNT THE CHARACTERS IN THE STRING
                          2F   11 0028   168         BRB     BUILDFNB                ;END OF STRING, NO TYPE, NO VERSION
                               002A   169 ;
                               002A   170 ; NOW SET UP THE 3 BYTE ARRAY OF FILE TYPE
                               002A   171 ;
                               002A   172 FILETYPE:
                  54    FD AD   9E 002A   173         MOVAB   TYPE(FP),R4             ;ADDRESS OF BYTE ARRAY
                     53   03   D0 002E   174         MOVL    #3,R3                   ;MAX SIZE OF FILE TYPE
                          0F   11 0031   175         BRB     40$
                               0033   176 20$:
                     50   86   90 0033   177         MOVB    (R6)+,R0                ;GET NEXT CHARACTER
                     50   3B   91 0036   178         CMPB    #SEMI,R0                ;IS IT A SEMICOLON?
                          0C   13 0039   179         BEQL    VERSION                 ;BRANCH IF YES
                     50   2E   91 003B   180         CMPB    #DOT,R0                 ;DOT FOR VERSION TOO
                          07   13 003E   181         BEQL    VERSION                 ;BRANCH IF VERSION DELIMITER
                          3C   10 0040   182         BSBB    STORER50BYTE            ;CONVERT AND STORE THE BYTE
                               0042   183 40$:
                        EE 55   F4 0042   184         SOBGEQ  R5,20$                  ;LOOP THROUGH THE CHARACTERS
                          12   11 0045   185         BRB     BUILDFNB                ;END OF STRING, NO VERSION
                               0047   186 ;
                               0047   187 ; VERSION DELIMITER FOUND, CONVERT THE VERSION
                               0047   188 ;
                               0047   189 VERSION:
                7E    08 AC   08 C1 0047   190         ADDL3   #4*2,FILNAMBLK(AP),-(SP) ;ADDRESS TO STORE VERSION
                     7E   55   7D 004C   191         MOVQ    R5,-(SP)                ;PUSH ADDRESS, PUSH SIZE OF VERSION STRING
00000000'GF          03   FB 004F   192         CALLS   #3,G^LIB$CVT_DTB        ;CONVERT DECIMAL VERSION STRING TO BINARY
                  2A 50   E9 0056   193         BLBC    R0,BADFILNAM            ;BRANCH IF BAD FILE NAME
                               0059   194 ;
                               0059   195 ; NOW PACK THE TEMPORARY BYTE STRING INTO THE RAD50 WORDS
                               0059   196 ;
                               0059   197 BUILDFNB:
                  54    08 AC   D0 0059   198         MOVL    FILNAMBLK(AP),R4        ;ADDRESS TO STORE PACKED RAD50
                  53    F4 AD   9E 005D   199         MOVAB   NAME(FP),R3             ;ADDRESS OF NAME STRING
                          63   95 0061   200         TSTB    (R3)                    ;ANY NAME GIVEN?
                          06   13 0063   201         BEQL    20$                     ;BRANCH IF NO
                          26   10 0065   202         BSBB    PACKRAD50               ;1ST 3 CHARACTERS
```

```
                     24   10  0067   203          BSBB    PACKRAD50                ;2ND 3 CHARACTERS
                     22   10  0069   204          BSBB    PACKRAD50                ;3RD 3 CHARACTERS
                                 006B   205 20$:
          54   08 AC    06   C1  006B   206          ADDL3   #3*2,FILNAMBLK(AP),R4   ;ADDRESS TO STORE FILE TYPE
               53   FD AD    9E  0070   207          MOVAB   TYPE(FP),R3              ;ADDRESS OF TYPE STRING
                     63   95  0074   208          TSTB    (R3)                     ;ANY FILE TYPE PRESENT?
                     02   13  0076   209          BEQL    40$                      ;BRANCH IF NOT
                     13   10  0078   210          BSBB    PACKRAD50                ;CONVERT 3 CHARACTERS
                                 007A   211 40$:
                50   01   3C  007A   212          MOVZWL  #SS$_NORMAL,R0           ;INDICATE SUCCESS
                     04   007D   213          RET
```

```
                                007E    215          .SBTTL  STORER50BYTE - CONVERT AND STORE ASCII BYTE TO RAD50
                                007E    216 ;++
                                007E    217 ; FUNCTIONAL DESCRIPTION:
                                007E    218 ;
                                007E    219 ;       CONVERT ASCII BYTE TO RAD50 AND STORE IN THE SPECIFIED BYTE ARRAY
                                007E    220 ;
                                007E    221 ; CALLING SEQUENCE:
                                007E    222 ;
                                007E    223 ;       BSBB    STORER50BYTE
                                007E    224 ;
                                007E    225 ; INPUT:
                                007E    226 ;
                                007E    227 ;       R0 = ASCII BYTE
                                007E    228 ;       R3 = SIZE OF BYTE ARRAY TO STORE IN
                                007E    229 ;       R4 = ADDRESS OF BYTE ARRAY TO STORE IN
                                007E    230 ;
                                007E    231 ; OUTPUT:
                                007E    232 ;
                                007E    233 ;       RSB IF SUCCESSFUL, RET WITH ERROR CODE IN R0 IF ERROR
                                007E    234 ;       R3, R4 UPDATED TO REFLECT THE ADDITIONAL BYTE STORED
                                007E    235 ;
                                007E    236 ;--
                                007E    237
                                007E    238          .ENABL  LSB
                                007E    239
                                007E    240 STORER50BYTE:
                          26    10    007E    241          BSBB    ASCIITORAD50            ;CONVERT TO RAD50
                        06 53   F4    0080    242          SOBGEQ  R3,20$                  ;BRANCH IF ROOM TO STORE THIS CHARACTER
                                      0083    243 BADFILNAM:
                50   0818 8F   3C    0083    244          MOVZWL  #SS$_BADFILENAME,R0     ;RETURN ERROR CODE
                                04    0088    245          RET
                                      0089    246 20$:
                     84   50   90    0089    247          MOVB    R0,(R4)+                ;STORE IT
                                05    008C    248          RSB                             ;AND RSB SUCCESSFULLY
                                      008D    249
                                      008D    250          .DSABL  LSB
```

```
                        008D   252          .SBTTL  PACKRAD50 - PACK 3 BYTES OF RAD50 CHARACTERS INTO A WORD
                        008D   253 ;++
                        008D   254 ; FUNCTIONAL DESCRIPTION:
                        008D   255 ;
                        008D   256 ;       PACK 3 BYTES OF RAD50 CHARACTERS INTO A WORD
                        008D   257 ;
                        008D   258 ; CALLING SEQUENCE:
                        008D   259 ;
                        008D   260 ;       BSBB    PACKRAD50
                        008D   261 ;
                        008D   262 ; INPUTS:
                        008D   263 ;
                        008D   264 ;       R3 = RAD50 BYTE STRING ADDRESS
                        008D   265 ;       R4 = ADDRESS OF WORD ARRAY TO STORE IN
                        008D   266 ;
                        008D   267 ; OUTPUTS:
                        008D   268 ;
                        008D   269 ;       R3 UPDATED TO POINT TO NEXT GROUP OF 3 CHARACTERS
                        008D   270 ;       R4 UPDATED TO POINT AT NEXT WORD TO STORE IN
                        008D   271 ;
                        008D   272 ;--
                        008D   273
                        008D   274 PACKRAD50:
        50    83    9A  008D   275          MOVZBL  (R3)+,R0                ;BUILD PACKED WORD IN R0
   50   0640  8F    A4  0090   276          MULW    #40*40,R0               ;START ACCUMULUATING IN R0
        51    83    9A  0095   277          MOVZBL  (R3)+,R1                ;SECOND CHARACTER TO TEMP
        51    28    A4  0098   278          MULW    #40,R1                  ;MULTIPLY BY THE RADIX
        50    51    A0  009B   279          ADDW    R1,R0                   ;AND ACCUMULATE
        51    83    9A  009E   280          MOVZBL  (R3)+,R1                ;LAST CHARACTER
  84    50    51    A1  00A1   281          ADDW3   R1,R0,(R4)+             ;ACCUMULATE AND STORE RESULT
                      05  00A5   282          RSB
```

```
                        00A6   284          .SBTTL  ASCIITORAD50 - CONVERT ASCII CHARACTER TO RAD50
                        00A6   285 ;++
                        00A6   286 ; FUNCTIONAL DESCRIPTION:
                        00A6   287 ;
                        00A6   288 ;       CONVERT ASCII CHARACTER TO ITS RAD50 EQUIVALENT
                        00A6   289 ;
                        00A6   290 ; CALLING SEQUENCE:
                        00A6   291 ;
                        00A6   292 ;       BSBB    ASCIITORAD50
                        00A6   293 ;
                        00A6   294 ; INPUTS:
                        00A6   295 ;
                        00A6   296 ;       R0 = CHARACTER TO CONVERT
                        00A6   297 ;
                        00A6   298 ; OUTPUTS:
                        00A6   299 ;
                        00A6   300 ;       RSB IF SUCCESSFUL, RET WITH ERROR CODE IN R0 IF ERROR
                        00A6   301 ;       R0 = RAD50 EQUIVALENT
                        00A6   302 ;       R1,R2,R3 PRESERVED
                        00A6   303 ;
                        00A6   304 ;--
                        00A6   305
                        00A6   306 ASCIITORAD50:
7A 8F    50     91      00A6   307          CMPB    R0,#LCZ                 ;LOWER CASE ALPHA?
         D7     1A      00AA   308          BGTRU   BADFILNAM               ;BRANCH IF BAD RAD50
61 8F    50     91      00AC   309          CMPB    R0,#LCA
         05     19      00B0   310          BLSS    10$                     ;BRANCH IF NOT
50   60 8F     82      00B2   311          SUBB    #LCA-1,R0               ;CONVERT TO ALPHA
         05     00B6   312          RSB                             ;AND RETURN SUCCESSFULLY
                        00B7   313 10$:
5A 8F    50     91      00B7   314          CMPB    R0,#UCZ                 ;UPPER CASE ALPHA?
         C6     14      00BB   315          BGTR    BADFILNAM               ;BRANCH IF BAD RAD50
41 8F    50     91      00BD   316          CMPB    R0,#UCA
         05     19      00C1   317          BLSS    20$                     ;BRANCH IF NOT ALPHA
50   40 8F     82      00C3   318          SUBB    #UCA-1,R0               ;CONVERT TO RAD50 ALPHA
         05     00C7   319          RSB                             ;AND RETURN SUCCESSFULLY
                        00C8   320 20$:
   39    50     91      00C8   321          CMPB    R0,#NINE                ;NUMERIC?
         B6     14      00CB   322          BGTR    BADFILNAM               ;BRANCH IF BAD RAD50
   30    50     91      00CD   323          CMPB    R0,#ZERO
         B1     19      00D0   324          BLSS    BADFILNAM               ;BRANCH IF BAD RAD50
   50    12     82      00D2   325          SUBB    #ZERO-30,R0             ;CONVERT TO RAD50 NUMERIC
         05     00D5   326          RSB                             ;AND RETURN SUCCESSFULLY
                        00D6   327
                        00D6   328          .END
```

```
ASCIITORAD50                    000000A6 R  D  02
BADFILNAM                       00000083 R  D  02
BUILDFNB                        00000059 R  D  02
DOT                           = 0000002E    D
FIL$CVTFILNAM                   00000000 RG D  02
FILETYPE                        0000002A R  D  02
FILNAM                        = 00000004    D
FILNAMBLK                     = 00000008    D
LCA                           = 00000061    D
LCZ                           = 0000007A    D
LIB$CVT_DTB                     ********  X   02
NAME                          = FFFFFFF4    D
NINE                          = 00000039    D
PACKRAD50                       0000008D R  D  02
SEMI                          = 0000003B    D
SS$_BADFILENAME               = 00000818    D
SS$_NORMAL                    = 00000001    D
STORER50BYTE                    0000007E R  D  02
TYPE                          = FFFFFFFD    D
UCA                           = 00000041    D
UCZ                           = 0000005A    D
VERSION                         00000047 R  D  02
ZERO                          = 00000030    D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	00000000 (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
CODE	000000D6 (214.)	02 (2.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
ASCIITORAD50	000000A6-R	306 (6)	#-241 (4)
BADFILNAM	00000083-R	243 (4)	#-193 (3) #-308 (6) #-315 (6) #-322 (6) #-324 (6)
BUILDFNB	00000059-R	197 (3)	#-168 (3) #-185 (3)
DOT	=0000002E	80 (2)	#-161 (3) #-180 (3)
FIL$CVTFILNAM	00000000-R	146 (3)	
FILETYPE	0000002A-R	172 (3)	#-162 (3)
FILNAM	=00000004	136 (3)	#-150 (3)
FILNAMBLK	=00000008	137 (3)	#-190 (3) #-198 (3) #-206 (3)
LCA	=00000061	74 (2)	#-309 (6) #-311 (6)
LCZ	=0000007A	75 (2)	#-307 (6)
LIB$CVT_DTB	00000000-XR		192 (3)
NAME	=FFFFFFF4	142 (3)	152 (3) 199 (3)
NINE	=00000039	79 (2)	#-321 (6)
PACKRAD50	0000008D-R	274 (5)	#-202 (3) #-203 (3) #-204 (3) #-210 (3)
SEMI	=0000003B	81 (2)	#-163 (3) #-178 (3)
SS$_BADFILENAME	=00000818		#-244 (4)
SS$_NORMAL	=00000001		#-212 (3)
STORER50BYTE	0000007E-R	240 (4)	#-165 (3) #-182 (3)
TYPE	=FFFFFFFD	141 (3)	173 (3) 207 (3)
UCA	=00000041	76 (2)	#-316 (6) #-318 (6)
UCZ	=0000005A	77 (2)	#-314 (6)
VERSION	00000047-R	189 (3)	#-164 (3) #-179 (3) #-181 (3)
ZERO	=00000030	78 (2)	#-323 (6) #-325 (6)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.01	00:00:00.27
Command processing	893	00:00:00.29	00:00:01.00
Pass 1	426	00:00:00.86	00:00:01.69
Symbol table sort	0	00:00:00.12	00:00:00.12
Pass 2	28	00:00:00.27	00:00:00.61
Symbol table output	2	00:00:00.00	00:00:00.00
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	4	00:00:00.01	00:00:00.04
Assembler run totals	1382	00:00:01.57	00:00:03.74

The working set limit was 1900 pages.
43684 bytes (86 pages) of virtual memory were used to buffer the intermediate code.
There were 30 pages of symbol table space allocated to hold 431 non-local and 9 local symbols.
328 source lines were read in Pass 1, producing 36 object records in Pass 2.
8 pages of virtual memory were used to define 7 macros.

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       4
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                 4

469 GETS were required to define 4 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(2) 77 DEASSIGN I/O CHANNEL

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element DASSGN.MAR
0000     2 ; *1     6-FEB-1986 15:16:48 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element DASSGN.MAR
0000     4         .TITLE  DASSGN  *** DASSGN deassign QIO channel
0000     5         .IDENT  /05-02/
0000     6
0000     7 ;
0000     8 ;*****************************************************************************
0000     9 ;*                                                                           *
0000    10 ;*  COPYRIGHT (c) 1977, 1978, 1979, 1980                                    *
0000    11 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
0000    12 ;*                                                                           *
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0000    16 ;*  COPIES  THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY   *
0000    17 ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE  IS  HEREBY   *
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0000    20 ;*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE   *
0000    21 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT  *
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0000    23 ;*                                                                           *
0000    24 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS   *
0000    25 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    26 ;*                                                                           *
0000    27 ;*****************************************************************************
0000    28 ;
0000    29 ; D. N. CUTLER 26-AUG-76
0000    30 ;
0000    31 ;
0000    32 ;               N. HOWGATE      20-FEB-78       VERSION 02 (ESSAA-4.00).
0000    33 ;       01      DIAGNOSTIC SUPERVISOR INTEGRATION
0000    34 ;               Dave Butenhof   13-may-1980, Version 5.4
0000    35 ;       02      Create .UPD file to convert VMS V2.0 source to Supervisor
0000    36 ;               environment
0000    37 ;               Roger Riggs, 19-Jun-1980, Version 5.5
0000    38 ;       03      Put normal in R0 instead of R1
0000    39 ;       V03     LMK0002         LEN KAWELL      27-SEP-1979,03-OCT-1979
0000    40 ;       Disassociate mailbox if CCB$M_AMB is set in channel status.
0000    41 ;
0000    42 ;       V02     LMK0001         LEN KAWELL      27-DEC-1978
0000    43 ;       Clear DEV$M_RCK, DEV$M_WCK, and DEV$M_SWL when dismounting
0000    44 ;       a foreign mounted volume.
0000    45 ;
0000    46 ;
0000    47 ;       DS01    M. Baggett      MARCH-8-1983    VDS 6.11
0000    48 ;               Fix truncation error.
0000    49 ;
0000    50 ; SYSTEM SERVICE DEASSIGN I/O CHANNEL
0000    51 ;
0000    52 ; MACRO LIBRARY CALLS
0000    53 ;
0000    54
0000    55         $CCBDEF                             ;DEFINE CCB OFFSETS
0000               .SAVE   LOCAL_BLOCK
0000               .IIF    NB,CCB$L_UCB,   CCB$L_UCB:
```

```
00000004  0000                                  .BLKL   1
          0004                  .IIF    NB,CCB$L_WIND,  CCB$L_WIND:
00000008  0004                                  .BLKL   1
          0008                  .IIF    NB,CCB$B_STS,   CCB$B_STS:
00000009  0008                                  .BLKB   1
          0009                  .IIF    NB,CCB$B_AMOD,  CCB$B_AMOD:
0000000A  0009                                  .BLKB   1
          000A                  .IIF    NB,CCB$W_IOC,   CCB$W_IOC:
0000000C  000A                                  .BLKW   1
          000C                  .IIF    NB,CCB$L_DIRP,  CCB$L_DIRP:
00000010  000C                                  .BLKL   1
          0010                  .IIF    NB,CCB$C_LENGTH,        CCB$C_LENGTH:
          0010                  .IIF    NB,CCB$K_LENGTH,        CCB$K_LENGTH:
          0000                  .RESTORE
          0000    56            $DDBDEF                         ;DEFINE DDB OFFSETS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  0010                  .=0
          0000                  .IIF    NB,DDB$L_LINK,  DDB$L_LINK:
00000004  0000                                  .BLKL   1
          0004                  .IIF    NB,DDB$L_UCB,   DDB$L_UCB:
00000008  0004                                  .BLKL   1
          0008                  .IIF    NB,DDB$W_SIZE,  DDB$W_SIZE:
0000000A  0008                                  .BLKW   1
          000A                  .IIF    NB,DDB$B_TYPE,  DDB$B_TYPE:
0000000B  000A                                  .BLKB   1
0000000C  000B                                  .BLKB   1
          000C                  .IIF    NB,DDB$L_DDT,   DDB$L_DDT:
00000010  000C                                  .BLKL   1
          0010                  .IIF    NB,DDB$L_ACPD,  DDB$L_ACPD:
00000013  0010                                  .BLKB   3
          0013                  .IIF    NB,DDB$B_ACPCLASS,      DDB$B_ACPCLASS:
00000014  0013                                  .BLKB   1
          0014                  .IIF    NB,DDB$T_NAME,  DDB$T_NAME:
00000015  0014                                  .BLKB   1
00000024  0015                                  .BLKB   15
          0024                  .IIF    NB,DDB$T_DRVNAME,       DDB$T_DRVNAME:
00000025  0024                                  .BLKB   1
00000034  0025                                  .BLKB   15
          0034                  .IIF    NB,DDB$C_LENGTH,        DDB$C_LENGTH:
          0034                  .IIF    NB,DDB$K_LENGTH,        DDB$K_LENGTH:
          0000                  .RESTORE
          0000    57            $DDTDEF                         ;DEFINE DDT OFFSETS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  0034                  .=0
          0000                  .IIF    NB,DDT$L_START, DDT$L_START:
00000004  0000                                  .BLKL   1
          0004                  .IIF    NB,DDT$L_UNSOLINT,      DDT$L_UNSOLINT:
00000008  0004                                  .BLKL   1
          0008                  .IIF    NB,DDT$L_FDT,   DDT$L_FDT:
0000000C  0008                                  .BLKL   1
          000C                  .IIF    NB,DDT$L_CANCEL,        DDT$L_CANCEL:
00000010  000C                                  .BLKL   1
          0010                  .IIF    NB,DDT$L_REGDUMP,       DDT$L_REGDUMP:
00000014  0010                                  .BLKL   1
          0014                  .IIF    NB,DDT$W_DIAGBUF,       DDT$W_DIAGBUF:
```

```
00000016  0014                                  .BLKW   1
          0016                  .IIF    NB,DDT$W_ERRORBUF,      DDT$W_ERRORBUF:
00000018  0016                                  .BLKW   1
          0018                  .IIF    NB,DDT$L_UNITINIT,      DDT$L_UNITINIT:
0000001C  0018                                  .BLKL   1
          001C                  .IIF    NB,DDT$L_ALTSTART,      DDT$L_ALTSTART:
00000020  001C                                  .BLKL   1
          0000                  .RESTORE
          0000     58           $IODEF                          ;DEFINE I/O FUNCTION CODES
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  0034                  .=0
          0000                  .RESTORE
          0000     59           $IPLDEF                         ;DEFINE INTERRUPT PRIORITY LEVELS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  0034                  .=0
          0000                  .RESTORE
          0000     60           $PCBDEF                         ;DEFINE PCB OFFSETS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  0034                  .=0
          0000                  .IIF    NB,PCB$L_SQFL,  PCB$L_SQFL:
00000004  0000                                  .BLKL   1
          0004                  .IIF    NB,PCB$L_SQBL,  PCB$L_SQBL:
00000008  0004                                  .BLKL   1
          0008                  .IIF    NB,PCB$W_SIZE,  PCB$W_SIZE:
0000000A  0008                                  .BLKW   1
          000A                  .IIF    NB,PCB$B_TYPE,  PCB$B_TYPE:
0000000B  000A                                  .BLKB   1
          000B                  .IIF    NB,PCB$B_PRI,   PCB$B_PRI:
0000000C  000B                                  .BLKB   1
          000C                  .IIF    NB,PCB$B_ASTACT,        PCB$B_ASTACT:
0000000D  000C                                  .BLKB   1
          000D                  .IIF    NB,PCB$B_ASTEN, PCB$B_ASTEN:
0000000E  000D                                  .BLKB   1
          000E                  .IIF    NB,PCB$W_MTXCNT,        PCB$W_MTXCNT:
00000010  000E                                  .BLKW   1
          0010                  .IIF    NB,PCB$L_ASTQFL,        PCB$L_ASTQFL:
00000014  0010                                  .BLKL   1
          0014                  .IIF    NB,PCB$L_ASTQBL,        PCB$L_ASTQBL:
00000018  0014                                  .BLKL   1
          0018                  .IIF    NB,PCB$L_PHYPCB,        PCB$L_PHYPCB:
0000001C  0018                                  .BLKL   1
          001C                  .IIF    NB,PCB$L_OWNER, PCB$L_OWNER:
00000020  001C                                  .BLKL   1
          0020                  .IIF    NB,PCB$L_WSSWP, PCB$L_WSSWP:
00000024  0020                                  .BLKL   1
          0024                  .IIF    NB,PCB$L_STS,   PCB$L_STS:
00000028  0024                                  .BLKL   1
          0028                  .IIF    NB,PCB$L_WTIME, PCB$L_WTIME:
0000002C  0028                                  .BLKL   1
          002C                  .IIF    NB,PCB$W_STATE, PCB$W_STATE:
0000002E  002C                                  .BLKW   1
          002E                  .IIF    NB,PCB$B_WEFC,  PCB$B_WEFC:
0000002F  002E                                  .BLKB   1
          002F                  .IIF    NB,PCB$B_PRIB,  PCB$B_PRIB:
```

```
                00000030  002F                        .BLKB   1
                          0030          .IIF    NB,PCB$W_APTCNT,        PCB$W_APTCNT:
                00000032  0030                        .BLKW   1
                          0032          .IIF    NB,PCB$W_TMBU,  PCB$W_TMBU:
                00000034  0032                        .BLKW   1
                          0034          .IIF    NB,PCB$W_GPGCNT,        PCB$W_GPGCNT:
                00000036  0034                        .BLKW   1
                          0036          .IIF    NB,PCB$W_PPGCNT,        PCB$W_PPGCNT:
                00000038  0036                        .BLKW   1
                          0038          .IIF    NB,PCB$W_ASTCNT,        PCB$W_ASTCNT:
                0000003A  0038                        .BLKW   1
                          003A          .IIF    NB,PCB$W_BIOCNT,        PCB$W_BIOCNT:
                0000003C  003A                        .BLKW   1
                          003C          .IIF    NB,PCB$W_BIOLM, PCB$W_BIOLM:
                0000003E  003C                        .BLKW   1
                          003E          .IIF    NB,PCB$W_DIOCNT,        PCB$W_DIOCNT:
                00000040  003E                        .BLKW   1
                          0040          .IIF    NB,PCB$W_DIOLM, PCB$W_DIOLM:
                00000042  0040                        .BLKW   1
                          0042          .IIF    NB,PCB$W_PRCCNT,        PCB$W_PRCCNT:
                00000044  0042                        .BLKW   1
                          0044          .IIF    NB,PCB$T_TERMINAL,      PCB$T_TERMINAL:
                0000004C  0044                        .BLKB   8
                          004C          .IIF    NB,PCB$L_PQB,   PCB$L_PQB:
                          004C          .IIF    NB,PCB$L_EFWM,  PCB$L_EFWM:
                00000050  004C                        .BLKL   1
                          0050          .IIF    NB,PCB$L_EFCS,  PCB$L_EFCS:
                00000054  0050                        .BLKL   1
                          0054          .IIF    NB,PCB$L_EFCU,  PCB$L_EFCU:
                00000058  0054                        .BLKL   1
                          0058          .IIF    NB,PCB$L_EFC2P, PCB$L_EFC2P:
                0000005C  0058                        .BLKL   1
                          005C          .IIF    NB,PCB$L_EFC3P, PCB$L_EFC3P:
                00000060  005C                        .BLKL   1
                          0060          .IIF    NB,PCB$L_PID,   PCB$L_PID:
                00000064  0060                        .BLKL   1
                          0064          .IIF    NB,PCB$L_PHD,   PCB$L_PHD:
                00000068  0064                        .BLKL   1
                          0068          .IIF    NB,PCB$T_LNAME, PCB$T_LNAME:
                0000007B  0068                        .BLKB   16
                          0078          .IIF    NB,PCB$L_JIB,   PCB$L_JIB:
                0000007C  0078                        .BLKL   1
                          007C          .IIF    NB,PCB$Q_PRIV,  PCB$Q_PRIV:
                00000084  007C                        .BLKQ   1
                          0084          .IIF    NB,PCB$L_ARB,   PCB$L_ARB:
                00000088  0084                        .BLKL   1
                          0088          .IIF    NB,PCB$L_UIC,   PCB$L_UIC:
                          0088          .IIF    NB,PCB$W_MEM,   PCB$W_MEM:
                0000008A  0088                        .BLKW   1
                          008A          .IIF    NB,PCB$W_GRP,   PCB$W_GRP:
                0000008C  008A                        .BLKW   1
                          008C          .IIF    NB,PCB$C_LENGTH,        PCB$C_LENGTH:
                          008C          .IIF    NB,PCB$K_LENGTH,        PCB$K_LENGTH:
                          0000          .RESTORE
                          0000    61    $PRDEF                          ;DEFINE PROCESSOR REGISTERS
                          0000          .SAVE   LOCAL_BLOCK
                          0000          .PSECT  $ABS$,ABS
```

```
                    00000000  008C                .=0
                              0000                .RESTORE
                              0000     62         $RSNDEF                          ;DEFINE RESOURCE WAIT NUMBERS
                              0000                .SAVE   LOCAL_BLOCK
                              0000                .PSECT  $ABS$,ABS
                    00000000  008C                .=0
                              0000                .RESTORE
                              0000     63         $SSDEF                           ;DEFINE SYSTEM STATUS VALUES
                              0000                .SAVE   LOCAL_BLOCK
                              0000                .PSECT  $ABS$,ABS
                    00000000  008C                .=0
                              0000                .RESTORE
                              0000     64         $UCBDEF                          ;DEFINE UCB OFFSETS
                              0000                .SAVE   LOCAL_BLOCK
                              0000                .PSECT  $ABS$,ABS
                    00000000  008C                .=0
                              0000                .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                              0000                .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
                    00000004  0000                        .BLKL   1
                              0004                .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                              0004                .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
                    00000008  0004                        .BLKL   1
                              0008                .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
                    0000000A  0008                        .BLKW   1
                              000A                .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
                    0000000B  000A                        .BLKB   1
                              000B                .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
                    0000000C  000B                        .BLKB   1
                              000C                .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                              000C                .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                              000C                .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
                    0000000D  000C                        .BLKB   1
                    00000010  000D                        .BLKB   3
                              0010                .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                              0010                .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
                    00000014  0010                        .BLKL   1
                              0014                .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                              0014                .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                              0014                .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
                    00000016  0014                        .BLKW   1
                              0016                .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
                    00000018  0016                        .BLKW   1
                              0018                .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                              0018                .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
                    0000001A  0018                        .BLKW   1
                              001A                .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                              001A                .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
                    0000001C  001A                        .BLKW   1
                              001C                .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
                    00000020  001C                        .BLKL   1
                              0020                .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
                    00000024  0020                        .BLKL   1
                              0024                .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
                    00000028  0024                        .BLKL   1
                              0028                .IIF    NB,UCB$L_PID,   UCB$L_PID:
                    0000002C  0028                        .BLKL   1
                              002C                .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
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                    00000030  002C                        .BLKL   1
                              0030              .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
                    00000034  0030                        .BLKL   1
                              0034              .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
                    00000038  0034                        .BLKL   1
                              0038              .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
                    00000039  0038                        .BLKB   1
                              0039              .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
                    0000003A  0039                        .BLKB   1
                              003A              .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
                    0000003C  003A                        .BLKW   1
                              003C              .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
                              003C              .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
                              003C              .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
                    0000003D  003C                        .BLKB   1
                              003D              .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
                              003D              .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
                    0000003E  003D                        .BLKB   1
                              003E              .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
                              003E              .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
                    0000003F  003E                        .BLKB   1
                              003F              .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
                    00000040  003F                        .BLKB   1
                              0040              .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
                    00000044  0040                        .BLKL   1
                              0044              .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
                    00000048  0044                        .BLKL   1
                              0048              .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
                    0000004A  0048                        .BLKW   1
                              004A              .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
                              004A              .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
                    0000004B  004A                        .BLKB   1
                              004B              .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
                    0000004C  004B                        .BLKB   1
                              004C              .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
                    00000050  004C                        .BLKL   1
                              0050              .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
                    00000052  0050                        .BLKW   1
                              0052              .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
                              0052              .IIF    NB,UCB$B_STATE, UCB$B_STATE:
                    00000053  0052                        .BLKB   1
                              0053              .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
                    00000054  0053                        .BLKB   1
                              0054              .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
                    00000058  0054                        .BLKL   1
                              0058              .IIF    NB,UCB$W_STS,   UCB$W_STS:
                    0000005A  0058                        .BLKW   1
                              005A              .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
                    0000005C  005A                        .BLKW   1
                              005C              .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
                              005C              .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
                    00000060  005C                        .BLKL   1
                              0060              .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
                    00000064  0060                        .BLKL   1
                              0064              .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
                              0064              .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
                    00000068  0064                        .BLKL   1
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                     0068              .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
0000006C             0068                      .BLKL   1
                     006C              .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
0000006E             006C                      .BLKW   1
                     006E              .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
00000070             006E                      .BLKW   1
                     0070              .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
00000071             0070                      .BLKB   1
                     0071              .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
00000072             0071                      .BLKB   1
                     0072              .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074             0072                      .BLKW   1
                     0074              .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
                     0074              .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000             0074              . = 0
                     0000              .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002             0000                      .BLKW   1
00000074             0002              . = 116
                     0074              .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078             0074                      .BLKL   1
                     0078              .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C             0078                      .BLKL   1
                     007C              .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080             007C                      .BLKL   1
                     0080              .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084             0080                      .BLKL   1
                     0084              .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088             0084                      .BLKL   1
                     0088              .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C             0088                      .BLKL   1
                     008C              .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090             008C                      .BLKL   1
                     0090              .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
                     0090              .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074             0090              . = 116
                     0074              .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075             0074                      .BLKB   1
                     0075              .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076             0075                      .BLKB   1
                     0076              .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077             0076                      .BLKB   1
                     0077              .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078             0077                      .BLKB   1
                     0078              .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C             0078                      .BLKL   1
0000007E             007C                      .BLKW   1
                     007E              .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080             007E                      .BLKW   1
                     0080              .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084             0080                      .BLKL   1
00000080             0084              . = 128
00000084             0080                      .BLKL   1
                     0084              .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088             0084                      .BLKL   1
                     0088              .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A             0088                      .BLKW   1
                     008A              .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
```

```
0000008C  008A                                  .BLKW   1
          008C                  .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
          008C                  .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E  008C                                  .BLKW   1
          008E                  .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090  008E                                  .BLKW   1
          0090                  .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092  0090                                  .BLKW   1
          0092                  .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
00000094  0092                                  .BLKW   1
          0094                  .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095  0094                                  .BLKB   1
          0095                  .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096  0095                                  .BLKB   1
          0096                  .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098  0096                                  .BLKW   1
00000096  0098                  . = 150
00000098  0096                                  .BLKW   1
          0098                  .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C  0098                                  .BLKL   1
          009C                  .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0  009C                                  .BLKL   1
          00A0                  .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
000000A4  00A0                                  .BLKL   1
          00A4                  .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
000000A6  00A4                                  .BLKW   1
          00A6                  .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
000000A7  00A6                                  .BLKB   1
000000A8  00A7                                  .BLKB   1
00000074  00A8                  . = 116
00000078  0074                                  .BLKL   1
0000007C  0078                                  .BLKL   1
00000080  007C                                  .BLKL   1
00000084  0080                                  .BLKL   1
00000088  0084                                  .BLKL   1
0000008C  0088                                  .BLKL   1
          008C                  .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
00000090  008C                                  .BLKL   1
00000094  0090                                  .BLKL   1
00000098  0094                                  .BLKL   1
0000009C  0098                                  .BLKL   1
          009C                  .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
0000009D  009C                                  .BLKB   1
          009D                  .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
0000009E  009D                                  .BLKB   1
          009E                  .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
0000009F  009E                                  .BLKB   1
000000A0  009F                                  .BLKB   1
          00A0                  .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
000000A1  00A0                                  .BLKB   1
          00A1                  .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
000000A2  00A1                                  .BLKB   1
          00A2                  .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
000000A3  00A2                                  .BLKB   1
000000A4  00A3                                  .BLKB   1
          00A4                  .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
000000A5  00A4                                  .BLKB   1
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                          00A5                  .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
                 000000A7 00A5                                  .BLKW   1
                 000000A8 00A7                                  .BLKB   1
                          00A8                  .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
                 000000AC 00A8                                  .BLKL   1
                 000000B0 00AC                                  .BLKL   1
                 000000B4 00B0                                  .BLKL   1
                 000000B8 00B4                                  .BLKL   1
                          00B8                  .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
                 000000BC 00B8                                  .BLKL   1
                          00BC                  .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
                          00BC                  .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
                 00000074 00BC                  . = 116
                          0074                  .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
                 00000078 0074                                  .BLKL   1
                          0078                  .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
                 0000007C 0078                                  .BLKL   1
                          007C                  .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
                 0000007E 007C                                  .BLKW   1
                 00000080 007E                                  .BLKW   1
                          0000                  .RESTORE
                          0000      65
                          0000      66 ;
                          0000      67 ; LOCAL SYMBOLS
                          0000      68 ;
                          0000      69 ; ARGUMENT LIST OFFSET DEFINITIONS
                          0000      70 ;
                          0000      71
                 00000004 0000      72 CHAN=4                                      ;I/O CHANNEL NUMBER
                          0000      73
                 00000000 0000      74          .PSECT  SEP,    SHR,    EXE,    WRT,    LONG
                          0000      75          MODNAM  SYSDASSGN
4E 47 53 53 41 44 53 59 53 00' 0000    $MODULE:        .ASCIC  \SYSDASSGN\
                       09 0000
```

```
                                000A    77          .SBTTL  DEASSIGN I/O CHANNEL
                                000A    78 ;+
                                000A    79 ; EXE$DASSGN - DEASSIGN I/O CHANNEL
                                000A    80 ;
                                000A    81 ; THIS SERVICE DEASSIGNS A PREVIOUSLY ASSIGNED I/O CHANNEL AND CLEARS THE
                                000A    82 ; LINKAGE AND CONTROL INFORMATION IN THE CORRESPONDING CHANNEL CONTROL BLOCK.
                                000A    83 ; IF ANY I/O IS OUTSTANDING ON THE CHANNEL IT IS CANCELLED. IF A FILE IS
                                000A    84 ; OPEN ON THE CHANNEL IT IS CLOSED. IF A MAILBOX WAS ASSOCIATED WITH THE
                                000A    85 ; DEVICE WHEN IT WAS ASSIGNED, THE LINKAGE TO THE MAILBOX IS CLEARED. IF THE
                                000A    86 ; THE CHANNEL IS LAST ONE ASSIGNED TO THE DEVICE AND IT IS MARKED FOR DIS-
                                000A    87 ; MOUNT, THEN THE DISMOUNT IS COMPLETED.
                                000A    88 ;
                                000A    89 ; INPUTS:
                                000A    90 ;
                                000A    91 ;       CHAN(AP) = NUMBER OF THE I/O CHANNEL TO DEASSIGN.
                                000A    92 ;
                                000A    93 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                                000A    94 ;
                                000A    95 ; OUTPUTS:
                                000A    96 ;
                                000A    97 ;       R0 LOW BIT CLEAR INDICATES FAILURE TO DEASSIGN CHANNEL.
                                000A    98 ;
                                000A    99 ;              R0 = SS$_IVCHAN - INVALID CHANNEL NUMBER SPECIFIED.
                                000A   100 ;
                                000A   101 ;              R0 = SS$_NOPRIV - SPECIFIED CHANNEL IS NOT ASSIGNED TO A
                                000A   102 ;                   DEVICE OR THE CALLER DOES NOT HAVE SUFFICIENT
                                000A   103 ;                   PRIVILEGE TO ACCESS THE CHANNEL.
                                000A   104 ;
                                000A   105 ;       R0 LOW BIT SET INDICATES SUCCESSFUL COMPLETION.
                                000A   106 ;
                                000A   107 ;              R0 = SS$_NORMAL - NORMAL COMPLETION.
                                000A   108 ;-
                                000A   109
                          00FC  000A   110          .ENTRY  EXE$DASSGN,^M<R2,R3,R4,R5,R6,R7>
54  00000000'EF    9E         000C   111          MOVAB   DS$AX_SOFTPCB, R4       ; Software PCB to R4
    55    04 AC    3C         0013   112          MOVZWL  CHAN(AP),R5             ;GET CHANNEL NUMBER
          50  55   D0         0017   113          MOVL    R5,R0                   ;COPY I/O CHANNEL NUMBER
    00000000'EF    16         001A   114          JSB     IOC$VERIFYCHAN          ;VERIFY CHANNEL NUMBER                  [DS0
          21  50   E9         0020   115          BLBC    R0,50$                  ;IF LBC INVALID CHANNEL
          56  51   D0         0023   116          MOVL    R1,R6                   ;COPY ADDRESS OF CCB
          57  52   D0         0026   117          MOVL    R2,R7                   ;SAVE CHANNEL INDEX
                               0029   118          $CANCEL_S R5                    ;CANCEL I/O ON CHANNEL
          7E  55   3C         0029                        MOVZWL  R5,-(SP)
00000000'GF   01   FB         002C                        CALLS   #1,G^SYS$CANCEL
                               0033   119 20$:
              7E   DC         0033   120 30$:     MOVPSL  -(SP)                   ;SAVE CURRENT PROCESSOR STATUS
                               0035   121          SETIPL  #IPL$_ASTDEL            ;RAISE TO AST DELIVERY LEVEL
          12  02   DA         0035                MTPR    #IPL$_ASTDEL,S^#PR$_IPL
            0A A6   B5         0038   122          TSTW    CCB$W_IOC(R6)           ;ANY I/O STILL OUTSTANDING?
              08   13         003B   123          BEQL    60$                     ;IF EQL NO
              8E   D5         003D   124          TSTL    (SP)+                   ; Remove PSL before repeat
                               003F   125 40$:     SETIPL  #0                      ;ALLOW INTERRUPTS
          12  00   DA         003F                MTPR    #0,S^#PR$_IPL
              EF   11         0042   126          BRB     20$                     ;
                   04         0044   127 50$:     RET                             ;
                               0045   128 ;
                               0045   129 ; DEASSIGN CHANNEL AND CHECK IF THIS WAS THE LAST CHANNEL ASSIGNED TO DEVICE
```

```
                                0045   ;
                                0045   60$:
          55    66    D0        0045           MOVL    CCB$L_UCB(R6),R5          ;GET ASSIGNED DEVICE UCB ADDRESS
            09 A6    94        0048           CLRB    CCB$B_AMOD(R6)            ;DEASSIGN CHANNEL
            50 A5    B7        004B           DECW    UCB$W_REFC(R5)            ;DECREMENT DEVICE REFERENCE COUNT
               14    13        004E           BEQL    70$                       ;IF EQL LAST REFERENCE
       50 A5   01    B1        0050           CMPW    #1,UCB$W_REFC(R5)         ;UCB REFERENCE COUNT ONE?
               5E    12        0054           BNEQ    120$                      ;IF NEQ NO
    59 34 A5   00'   E1        0056           BBC     S^#DEV$V_ALL,UCB$L_DEVCHAR(R5),120$ ;IF CLR, DEVICE NOT ALLOCATED
    28 A5   60 A4    D1        005B           CMPL    PCB$L_PID(R4),UCB$L_PID(R5) ;ALLOCATED TO CURRENT PROCESS?
               52    12        0060           BNEQ    120$                      ;IF NEQ NO
               03    11        0062           BRB     80$                       ;
                                0064   ;
                                0064   ; DEALLOCATE DEVICE AND IF DISMOUNTING, CLEAR MOUNT OPTIONS AND DEALLOCATE VCB
                                0064   ;
            28 A5    D4        0064   70$:    CLRL    UCB$L_PID(R5)             ;CLEAR OWNER PROCESS ID
    25 34 A5   00'   E1        0067   80$:    BBC     S^#DEV$V_DMT,UCB$L_DEVCHAR(R5),90$ ;IF CLR, NOT MARKED FOR DISMOUNT
    20 34 A5   00'   E1        006C           BBC     S^#DEV$V_FOR,UCB$L_DEVCHAR(R5),90$ ;IF CLR, STRUCTURED VOLUME
                     CA        0071           BICL    #DEV$M_DMT!DEV$M_FOR!-    ;CLEAR MARKED FOR DISMOUNT, FOREIGN, AND
                                0072                   DEV$M_RCK!DEV$M_WCK!-     ;READ/WRITE CHECK, AND
                                0072                   DEV$M_SWL!-               ;SOFTWARE WRITE LOCKED, AND
34 A5   00000000'8F             0072                   DEV$M_MNT,UCB$L_DEVCHAR(R5) ;MOUNTED
       50   30 A5    D0        0079           MOVL    UCB$L_VCB(R5),R0          ;GET ADDRESS OF VCB
               12    13        007D           BEQL    90$                       ;IF EQL NONE
            30 A5    D4        007F           CLRL    UCB$L_VCB(R5)             ;CLEAR ADDRESS OF VCB
     00000000'EF     16        0082           JSB     EXE$DEANONPAGED           ;DEALLOCATE VCB
            1A A5    B4        0088           CLRW    UCB$W_VPROT(R5)           ;CLEAR VOLUME PROTECTION MASK
58 A5   0800 8F      AA        008B           BICW    #UCB$M_VALID,UCB$W_STS(R5) ;CLEAR SOFTWARE VOLUME VALID
                                0091   ;
                                0091   ; CALL DRIVER'S CANCEL ROUTINE FOR ANY SPECIAL CLEANUP
                                0091   ;
       50   24 A5    D0        0091   90$:    MOVL    UCB$L_DDB(R5),R0          ;GET ADDRESS OF DDB
       50   0C A0    D0        0095           MOVL    DDB$L_DDT(R0),R0          ;GET ADDRESS OF DDT
                                0099           SETIPL  UCB$B_FIPL(R5)            ;RAISE TO DEVICE FORK IPL
       12   0B A5    DA        0099                   MTPR    UCB$B_FIPL(R5),S^#PR$_IPL
       53   4C A5    D0        009D           MOVL    UCB$L_IRP(R5),R3          ;GET CURRENT I/O PACKET ADDRESS
          52   57    D0        00A1           MOVL    R7,R2                     ;SET CHANNEL INDEX
       51   0C A0    D0        00A4           MOVL    DDT$L_CANCEL(R0),R1       ;GET ADDRESS OF CANCEL I/O ENTRY POINT
       03 51   10    E0        00A8           BBS     #16,R1,100$               ;++++ BRANCH IF SUPERVISOR ABSOLUTE
          51   50    C0        00AC           ADDL    R0,R1                     ;++++ MAKE ABSOLUTE ADDRESS
               61    16        00AF   100$:   JSB     (R1)                      ;CALL CANCEL I/O ROUTINE
                                00B1           SETIPL  #IPL$_ASTDEL              ;LOWER TO AST DELIVERY LEVEL
          12   02    DA        00B1                   MTPR    #IPL$_ASTDEL,S^#PR$_IPL
          50   01    D0        00B4   120$:   MOVL    #SS$_NORMAL, R0           ; Set success code
     00000000'EF     17        00B7           JMP     IOC$UNLOCK                ;UNLOCK I/O DATA BASE AND RETURN
                                00BD
                                00BD           .END
```

```
$ER                             = 00000001    D
$MODULE                           00000000 R  D  02
CCB$B_AMOD                        00000009    D
CCB$B_STS                         00000008    D
CCB$C_LENGTH                      00000010    D
CCB$K_LENGTH                      00000010    D
CCB$L_DIRP                        0000000C    D
CCB$L_UCB                         00000000    D
CCB$L_WIND                        00000004    D
CCB$W_IOC                         0000000A    D
CHAN                            = 00000004    D
DDB$B_ACPCLASS                    00000013    D
DDB$B_TYPE                        0000000A    D
DDB$C_LENGTH                      00000034    D
DDB$K_LENGTH                      00000034    D
DDB$L_ACPD                        00000010    D
DDB$L_DDT                         0000000C    D
DDB$L_LINK                        00000000    D
DDB$L_UCB                         00000004    D
DDB$T_DRVNAME                     00000024    D
DDB$T_NAME                        00000014    D
DDB$W_SIZE                        00000008    D
DDT$L_ALTSTART                    0000001C    D
DDT$L_CANCEL                      0000000C    D
DDT$L_FDT                         00000008    D
DDT$L_REGDUMP                     00000010    D
DDT$L_START                       00000000    D
DDT$L_UNITINIT                    00000018    D
DDT$L_UNSOLINT                    00000004    D
DDT$W_DIAGBUF                     00000014    D
DDT$W_ERRORBUF                    00000016    D
DEV$M_DMT                         ********      X    02
DEV$M_FOR                         ********      X    02
DEV$M_MNT                         ********      X    02
DEV$M_RCK                         ********      X    02
DEV$M_SWL                         ********      X    02
DEV$M_WCK                         ********      X    02
DEV$V_ALL                         ********      X    02
DEV$V_DMT                         ********      X    02
DEV$V_FOR                         ********      X    02
DS$AX_SOFTPCB                     ********      X    02
EXE$DASSGN                        0000000A RG   D    02
EXE$DEANONPAGED                   ********      X    02
IOC$UNLOCK                        ********      X    02
IOC$VERIFYCHAN                    ********      X    02
IPL$_ASTDEL                     = 00000002      D
PCB$B_ASTACT                      0000000C      D
PCB$B_ASTEN                       0000000D      D
PCB$B_PRI                         0000000B      D
PCB$B_PRIB                        0000002F      D
PCB$B_TYPE                        0000000A      D
PCB$B_WEFC                        0000002E      D
PCB$C_LENGTH                      0000008C      D
PCB$K_LENGTH                      0000008C      D
PCB$L_ARB                         00000084      D
PCB$L_ASTQBL                      00000014      D
PCB$L_ASTQFL                      00000010      D
PCB$L_EFC2P                       00000058      D
PCB$L_EFC3P                       0000005C      D
PCB$L_EFCS                        00000050      D
PCB$L_EFCU                        00000054      D
PCB$L_EFWM                        0000004C      D
PCB$L_JIB                         00000078      D
PCB$L_OWNER                       0000001C      D
PCB$L_PHD                         00000064      D
PCB$L_PHYPCB                      00000018      D
PCB$L_PID                         00000060      D
PCB$L_PQB                         0000004C      D
PCB$L_SQBL                        00000004      D
PCB$L_SQFL                        00000000      D
PCB$L_STS                         00000024      D
PCB$L_UIC                         00000088      D
PCB$L_WSSWP                       00000020      D
PCB$L_WTIME                       00000028      D
PCB$Q_PRIV                        0000007C      D
PCB$T_LNAME                       00000068      D
PCB$T_TERMINAL                    00000044      D
PCB$W_APTCNT                      00000030      D
PCB$W_ASTCNT                      00000038      D
PCB$W_BIOCNT                      0000003A      D
PCB$W_BIOLM                       0000003C      D
PCB$W_DIOCNT                      0000003E      D
PCB$W_DIOLM                       00000040      D
PCB$W_GPGCNT                      00000034      D
PCB$W_GRP                         0000008A      D
PCB$W_MEM                         00000088      D
PCB$W_MTXCNT                      0000000E      D
PCB$W_PPGCNT                      00000036      D
PCB$W_PRCCNT                      00000042      D
PCB$W_SIZE                        00000008      D
PCB$W_STATE                       0000002C      D
PCB$W_TMBU                        00000032      D
PR$_IPL                         = 00000012      D
SIZ...                          = 00000002      D
SS$_NORMAL                      = 00000001      D
SYS$CANCEL                        ********    GX    02
UCB$B_AMOD                        00000053      D
UCB$B_CEX                         00000077      D
UCB$B_CM1                         0000004A      D
UCB$B_CM2                         0000004B      D
UCB$B_DEVCLASS                    00000038      D
UCB$B_DEVTYPE                     00000039      D
UCB$B_DIPL                        00000052      D
UCB$B_DX_SCTCNT                   000000A6      D
UCB$B_ERTCNT                      00000070      D
UCB$B_ERTMAX                      00000071      D
UCB$B_FEX                         00000076      D
UCB$B_FIPL                        0000000B      D
UCB$B_LOCSRV                      0000003C      D
UCB$B_OFFNDX                      00000094      D
UCB$B_OFFRTC                      00000095      D
UCB$B_REMSRV                      0000003D      D
UCB$B_SECTORS                     0000003C      D
UCB$B_SLAVE                       00000074      D
```

UCB$B_SPR	00000075	D	UCB$L_RQBL		00000004	D
UCB$B_STATE	00000052	D	UCB$L_RQFL		00000000	D
UCB$B_TRACKS	0000003D	D	UCB$L_SVAPTE		00000068	D
UCB$B_TT_CRFILL	0000009D	D	UCB$L_SVPN		00000064	D
UCB$B_TT_DECRF	000000A1	D	UCB$L_TT_DECHAR		000000A8	D
UCB$B_TT_DELFF	000000A2	D	UCB$L_TT_RDUE		0000008C	D
UCB$B_TT_DESPEE	000000A0	D	UCB$L_TT_RTIMOU		000000B8	D
UCB$B_TT_DETYPE	000000A4	D	UCB$L_VCB		00000030	D
UCB$B_TT_LFFILL	0000009E	D	UCB$M_VALID	=	00000800	D
UCB$B_TT_SPEED	0000009C	D	UCB$T_PARTNER		0000000C	D
UCB$B_TYPE	0000000A	D	UCB$W_BCNT		0000006E	D
UCB$B_VERTSZ	0000003F	D	UCB$W_BCR		00000096	D
UCB$C_LENGTH	00000074	D	UCB$W_BOFF		0000006C	D
UCB$C_MB_LENGTH	00000090	D	UCB$W_BUFQUO		00000018	D
UCB$C_TT_LENGTH	000000BC	D	UCB$W_BYTESTOGO		0000003E	D
UCB$K_LENGTH	00000074	D	UCB$W_CHARGE		0000004A	D
UCB$K_MB_LENGTH	00000090	D	UCB$W_CYLINDERS		0000003E	D
UCB$K_TT_LENGTH	000000BC	D	UCB$W_DA		0000008C	D
UCB$L_AMB	00000054	D	UCB$W_DC		0000008E	D
UCB$L_ASTQBL	00000010	D	UCB$W_DEVBUFSIZ		0000003A	D
UCB$L_ASTQFL	0000000C	D	UCB$W_DEVSTS		0000005A	D
UCB$L_CPID	0000005C	D	UCB$W_DIRSEQ		00000088	D
UCB$L_CRB	00000020	D	UCB$W_DSTADDR		00000018	D
UCB$L_DDB	00000024	D	UCB$W_DX_BCR		000000A4	D
UCB$L_DEVCHAR	00000034	D	UCB$W_EC1		00000090	D
UCB$L_DEVDEPEND	0000003C	D	UCB$W_EC2		00000092	D
UCB$L_DPC	00000080	D	UCB$W_ERRCNT		00000072	D
UCB$L_DUETIM	0000005C	D	UCB$W_FUNC		0000007E	D
UCB$L_DX_BFPNT	0000009C	D	UCB$W_MB_SEED		00000000	D
UCB$L_DX_BUF	00000098	D	UCB$W_MSGCNT		00000016	D
UCB$L_DX_RXDB	000000A0	D	UCB$W_MSGMAX		00000014	D
UCB$L_EMB	00000078	D	UCB$W_NT_CHAN		0000007C	D
UCB$L_FIRST	00000014	D	UCB$W_OFFSET		0000008A	D
UCB$L_FPC	0000000C	D	UCB$W_REFC		00000050	D
UCB$L_FQBL	00000004	D	UCB$W_SIZE		00000008	D
UCB$L_FQFL	00000000	D	UCB$W_SRCADDR		0000001A	D
UCB$L_FR3	00000010	D	UCB$W_STS		00000058	D
UCB$L_FR4	00000014	D	UCB$W_TT_DESIZE		000000A5	D
UCB$L_IOQBL	00000044	D	UCB$W_UNIT		00000048	D
UCB$L_IOQFL	00000040	D	UCB$W_VPROT		0000001A	D
UCB$L_IRP	0000004C	D				
UCB$L_LINK	0000002C	D				
UCB$L_LOGADR	00000064	D				
UCB$L_MAXBLOCK	00000084	D				
UCB$L_MB_MBX	0000007C	D				
UCB$L_MB_PORT	0000008C	D				
UCB$L_MB_RAST	00000078	D				
UCB$L_MB_SHB	00000080	D				
UCB$L_MB_WAST	00000074	D				
UCB$L_MB_WIOQBL	00000088	D				
UCB$L_MB_WIOQFL	00000084	D				
UCB$L_MEDIA	0000008C	D				
UCB$L_NT_DATSSB	00000074	D				
UCB$L_NT_INTSSB	00000078	D				
UCB$L_OPCNT	00000060	D				
UCB$L_OWNUIC	0000001C	D				
UCB$L_PID	00000028	D				

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	000000BC (188.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
SEP	000000BD (189.)	02 (2.)	NOPIC USR CON REL LCL SHR EXE RD WRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$ER	=00000001	75 (1)	
$MODULE	00000000-R	75 (1)	
CCB$B_AMOD	00000009		#-133 (2)
CCB$L_UCB	00000000		#-132 (2)
CCB$W_IOC	0000000A		#-122 (2)
CHAN	=00000004	72 (1)	#-112 (2)
DDB$L_DDT	0000000C		#-162 (2)
DDT$L_CANCEL	0000000C		#-166 (2)
DEV$M_DMT	00000000-XR		#-148 (2)
DEV$M_FOR	00000000-XR		#-148 (2)
DEV$M_MNT	00000000-XR		#-151 (2)
DEV$M_RCK	00000000-XR		#-149 (2)
DEV$M_SWL	00000000-XR		#-150 (2)
DEV$M_WCK	00000000-XR		#-149 (2)
DEV$V_ALL	00000000-XR		#-138 (2)
DEV$V_DMT	00000000-XR		#-146 (2)
DEV$V_FOR	00000000-XR		#-147 (2)
DS$AX_SOFTPCB	00000000-XR		111 (2)
EXE$DASSGN	0000000A-R	110 (2)	
EXE$DEANONPAGED	00000000-XR		155 (2)
IOC$UNLOCK	00000000-XR		172 (2)
IOC$VERIFYCHAN	00000000-XR		114 (2)
IPL$_ASTDEL	=00000002		#-121 (2) #-170 (2)
PCB$L_PID	00000060		#-139 (2)
PR$_IPL	=00000012		#-121 (2) #-125 (2) #-163 (2) #-170 (2)
SS$_NORMAL	=00000001		#-171 (2)
SYS$CANCEL	00000000-XR		118 (2)
UCB$B_FIPL	0000000B		#-163 (2)
UCB$L_DDB	00000024		#-161 (2)
UCB$L_DEVCHAR	00000034		138 (2) 146 (2) 147 (2) #-151 (2)
UCB$L_IRP	0000004C		#-164 (2)
UCB$L_PID	00000028		#-139 (2) #-145 (2)
UCB$L_VCB	00000030		#-152 (2) #-154 (2)
UCB$M_VALID	=00000800		#-157 (2)
UCB$W_REFC	00000050		#-134 (2) #-136 (2)
UCB$W_STS	00000058		#-157 (2)
UCB$W_VPROT	0000001A		#-156 (2)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	37	00:00:00.04	00:00:00.24
Command processing	941	00:00:00.30	00:00:01.18
Pass 1	705	00:00:02.69	00:00:04.21
Symbol table sort	0	00:00:00.33	00:00:00.33
Pass 2	158	00:00:00.68	00:00:01.30
Symbol table output	27	00:00:00.05	00:00:00.07

```
Psect synopsis output                4     00:00:00.01    00:00:00.01
Cross-reference output              11     00:00:00.02    00:00:00.06
Assembler run totals              1885     00:00:04.12    00:00:07.40

The working set limit was 2400 pages.
148416 bytes (290 pages) of virtual memory were used to buffer the intermediate code.
There were 60 pages of symbol table space allocated to hold 1158 non-local and 10 local symbols.
174 source lines were read in Pass 1, producing 76 object records in Pass 2.
23 pages of virtual memory were used to define 22 macros.

                                    +----------------------------+
                                    ! Macro library statistics !
                                    +----------------------------+

Macro library name                   Macros defined
------------------                   --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              6
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           2
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       9
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                18

1459 GETS were required to define 18 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents


```
(2)      208        DECLARATIONS
(7)      460        SET BASE ADDRESS SUBROUTINE
(8)      503        SHOW BASE ADDRESS SUBROUTINE                          ;       [13]
(9)      545        SET DEFAULTS SUBROUTINE
(11)     618        SHOW DEFAULTS SUBROUTINE
(13)     694        EXAMINE MEMORY AND REGISTERS SUBROUTINE
(14)     905        VRTYPEXAMINE    Type out location EXAMINE'd
(23)    1367        DEPOSIT MEMORY AND REGISTERS SUBROUTINE
(26)    1558        SET BREAKPOINT SUBROUTINE
(28)    1633        CLEAR BREAKPOINT SUBROUTINE
(30)    1700        DSP$REMOVEBREAK Remove breakpoints
(31)    1756        SHOW BREAKPOINTS SUBROUTINE
(32)    1807        FIND_BPT        FIND BPT IN BPT TABLE
(33)    1847        DEBUGGER CONDITION HANDLER
(34)    1920        BREAKPOINT CONDITION SUBROUTINE
(36)    2091        TBIT CONDITION SUBROUTINE
(38)    2150        RESTORE SCB VECTORS SUBROUTINE                                ;G:5
(39)    2197        TEMPORARY SCB VECTOR STORAGE SUBROUTINE                       ;G:5
(40)    2256        TEMPORARY BREAKPOINT REMOVAL SUBROUTINE
(41)    2298        BREAKPOINT REPLACEMEMT SUBROUTINE
(42)    2351        FETCH_STORE     COPY BYTE ROUTINE
(45)    2573        Handle EXAMINE/DEPOSIT of IPRs in KERNEL mode
(45)    2597        FETCH_STOR_PREG Move data to/from IPR
(45)    2642        DSV$DEBUG - Process DEBUG Command                             [14]
```

```
                        0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element DEBUG.MAR
                        0000     2 ; *11   18-MAR-1988 10:32:20 FORTUNA "Fixed Examine command error."
                        0000     3 ; *10    5-FEB-1988 11:31:25 FORTUNA "Add support for a third NBIA examine command e
                        0000     4 ; *9    22-JAN-1988 11:01:29 FORTUNA "fixed non-existent address bug for 8800 and JJ
                        0000     5 ; *8    16-SEP-1987 15:36:09 GEARIN "ADDED GLOBAL TO STORE VALUE OF IPRS"
                        0000     6 ; *7    14-MAY-1987 10:11:46 FORTUNA "MODIFY CODE TO PASS PARAMETERS OF BASE ADDR AN
                        0000     7 ; *6    12-MAY-1987 11:25:03 FORTUNA "REFORM THE OUTPUT LINE OF A SHOW BREAK AND BRE
                        0000     8 ;OFFSET"
                        0000     9 ; *5    25-MAR-1987 11:03:02 GEARIN "ADDED CODE TO SAVE/RESTORE CERTAIN SCB VECTORS"
                        0000    10 ; *4    29-JAN-1987 15:05:44 GEARIN "INSTRUCTION NOW SHOWS ACTUAL OPCODE NOT FOR BPT
                        0000    11 ; *3    23-JUL-1986 14:27:34 SALEM "DONE"
                        0000    12 ; *2    30-APR-1986 10:02:00 ANDELLA "<no reason given>"
                        0000    13 ; *1     6-FEB-1986 15:16:49 DS ""
                        0000    14 ; DEC/CMS REPLACEMENT HISTORY, Element DEBUG.MAR
                        0000    15         .TITLE  DEBUG   EXAMINE, DEPOSIT, AND BREAKPOINT SUBROUTINES          ;G:5
                        0000    16         .IDENT  /10.11-11/                                                    ;G:11
                        0000    17         .NLIST  CND
                        0000    18         .LIST   MEB
                        0000    19                                                                               ;G:11
                        0000    20 ;
                        0000    21 ; COPYRIGHT (C) 1977, 1980, 1984, 1985, 1986, 1987, 1988                      ;G:9
                        0000    22 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
                        0000    23 ;
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                        0000    37 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
                        0000    38
                        0000    39 ;++
                        0000    40 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR
                        0000    41 ;
                        0000    42 ; ABSTRACT:
                        0000    43 ;
                        0000    44 ; ENVIRONMENT:
                        0000    45 ;
                        0000    46 ; AUTHOR:       TOM SOUTTER     10-NOV-77       VERSION 01
                        0000    47 ;
                        0000    48 ; MODIFIED BY:
                        0000    49 ;
                        0000    50 ;               TOM SOUTTER     18-NOV-77       VERSION 02
                        0000    51 ;       01      DSPR #10 - LOCATE BREAKPOINTS VIA OPERATOR SPECIFIED BASE
                        0000    52 ;
                        0000    53 ;               KEN CHAPMAN     16-FEB-78       VERSION 03 (ESSAA-3.07).
                        0000    54 ;       02      REMOVED EXCEPTION HANDLER TO SCB.
                        0000    55 ;               Roger Riggs     18-JUL-78               (4.03)
                        0000    56 ;       03      Changed SS$_ARITH TO DS$_ARITH
                        0000    57 ;       04      Various enhancements and cleanup done.
```

```
0000     58 ;                'NEXT [n]' command.
0000     59 ;        05      Added code to restore opcode on hidden breakpoint
0000     60 ;        06      Modified FETCH_STORE to correctly report address on
0000     61 ;                COMET machine checks
0000     62 ;                Roger Riggs     29-NOV-1979
0000     63 ;        07      Added BSBW SCRIPT$STOP before call to CLI to halt script
0000     64 ;                mechanism on breakpoints and single step.
0000     65 ;                Dave Butenhof  16-JAN-80
0000     66 ;        08      Add code to examine/deposit internal processor registers.
0000     67 ;                Roger Riggs, 27-May-1980, Version 5.4
0000     68 ;        09      Changed radix on processor register output to hex.
0000     69 ;
0000     70 ;                Dave Butenhof, 30-sep-1980, Version 6.1
0000     71 ;        10      Make PSL typeout unaffected by /WORD or /BYTE.
0000     72 ;                Also change /ASCII to use !AF FAO directive, and also type
0000     73 ;                the longword in hex to aid in decoding non-printing strings.
0000     74 ;                Dave Butenhof, 23-feb-1981, version 6.3
0000     75 ;        11      fix truncation errors
0000     76 ;
0000     77 ;        12      - Jack Stansbury, 22-Oct-1981, Version 6.-
0000     78 ;                Fixed truncation errors. Also added .LIBRARY statements
0000     79 ;                for $DS and $DIAG.
0000     80 ;
0000     81 ;        13      - Jack Stansbury, 10-Nov-1981, Version 6.-
0000     82 ;                Added routines for VRSHOWBASE (to show the base address)
0000     83 ;                and VRSHOWDFLT (to show the default size and radix). Also
0000     84 ;                changed the error messages to mixed case.
0000     85 ;
0000     86 ;        14      - Richard Brown, 19-May-82, Version 6.8
0000     87 ;                Addition of routine to process the DEBUG user command.
0000     88 ;
0000     89 ;        15      - Domenic Andella, 17-Jul-84, Version 7.0
0000     90 ;                The 'DEP' command does a write followed by
0000     91 ;                read to display the data written. This causes
0000     92 ;                a mchk on VENUS when depositing a one into
0000     93 ;                the Unibus Adapter Control Register (UACR),
0000     94 ;                and could cause similar problems in other
0000     95 ;                new CPU's. Problem solved by removing the
0000     96 ;                final examine from the 'DEPOSIT' command.
0000     97 ;                This makes VDS consistent with the DEPOSIT
0000     98 ;                command in XDELTA and DEBUG.
0000     99 ;
0000    100 ;        16      Domenic Andella, 4-Apr-1985     Version 8.2
0000    101 ;                Add mod to COND_DEBUG to call MP$_STOP_EVERYTHING
0000    102 ;                if mp system.
0000    103 ;
0000    104 ;
0000    105 ;        17      Ted Salem       23 April-1985   Version 8.2
0000    106 ;                Interlocked COND_DEBUG.
0000    107 ;
0000    108 ;        18      Ted Salem       6-May-1985      Version 8.2
0000    109 ;                Added code in order to Examine and Deposit from and
0000    110 ;                to an AP.
0000    111 ;
0000    112 ;        19      Domenic Andella 22-May-1985     Version 8.2
0000    113 ;                Add code in COND_DEBUG to support breakpoints in a
0000    114 ;                multi-processing system. This edit changes #16.
```

```
0000    115 ;
0000    116 ;       20      Jim Baranski    24-June-1985    Version 8.3
0000    117 ;               Add code in VREXAMINE, VRDEPOSIT, VRSETBRK, VRCLRBRK,
0000    118 ;               for /BASE:temp_base & /NOBASE.
0000    119 ;
0000    120 ;       21      Domenic Andella 2-July-1985     Version 8.3
0000    121 ;               Repositioned mp interlock commands in routine
0000    122 ;               COND_DEBUG to solve interlock problem with
0000    123 ;               BCI750 diagnostic (EVCKA T18-s3) that holds
0000    124 ;               interlock time for long duration.
0000    125 ;
0000    126 ;       22      Ted Salem       25-July-1985    Version 8.3
0000    127 ;               Fixed a bug in DSV$DEBUG.  DS$LOAD was not being
0000    128 ;               called with the proper number of arguments.
0000    129 ;
0000    130 ;       23      Domenic Andella 21-August-1985  Version 9.0
0000    131 ;               Reinstated edit 21, fixed bug in DBG_BREAK
0000    132 ;               fetching cpu identifier.
0000    133 ;
0000    134 ;       24      Domenic Andella 9-Jan-1986      Version 9.1
0000    135 ;               PRINTF for Set Cpu command requires address
0000    136 ;               argument for MP$GT_DEVICE_NAME, in routine
0000    137 ;               VRTYPEXAMINE.
0000    138 ;                                                               ;G:2
0000    139 ;       25      Domenic Andella 29-Apr-1986     Version 10.0    ;G:2
0000    140 ;               Make fix in routine VREXAMINE to load address   ;G:2
0000    141 ;               of an Ap's ipr data. Re-instate instruction     ;G:2
0000    142 ;               to load IPR data in routine VRDEPOSIT. This     ;G:2
0000    143 ;               instruction disappeared from V8.3.              ;G:6
0000    144 ;                                                               ;G:2
0000    145 ;       26      Ted Salem       8-Jul_1986      Version 10.1    ;G:3
0000    146 ;               Made dbg_addr_rtn a global symbol               ;G:3
0000    147 ;                                                               ;G:3
0000    148 ;       27      David Gearin    29-Jan-1987     VERSION 10.5    ;G:5
0000    149 ;               Modified DBG_TBIT subroutine so the call to     ;G:6
0000    150 ;               RBREAK_IN is performed after the call to FETCH_ ;G:4
0000    151 ;               STORE.  This permits the actual opcode to be shown ;G:4
0000    152 ;               while stepping through a program instead of '03' ;G:6
0000    153 ;               (the opcode for Breakpoint). Also added another call ;G:4
0000    154 ;               to RBREAK_IN in case the BBCC command does branch. ;G:4
0000    155 ;               This way the breakpoints will be reinserted.    ;G:4
0000    156 ;                                                               ;G:4
0000    157 ;       28      David Gearin    12-Feb-1987     Version 10.8    ;G:5
0000    158 ;               Added sub-routines SAVE_SCB_VECTORS and RESTORE_SCB_VECTORS ;G:5
0000    159 ;               to override a diagnostic program's exception handler during ;G:5
0000    160 ;               an examine or deposit command.                  ;G:5
0000    161 ;                                                               ;G:5
0000    162 ;               Steven Fortuna  11-May-1987     Version 10.8    ;G:6
0000    163 ;               Add output lines to print the Base and Offset when a show ;G:6
0000    164 ;               break is entered or a break point is hit.  Also add the ;G:6
0000    165 ;               capability to modify the break points Base addres and offset ;G:6
0000    166 ;               by entering the SET BREAK/BASE=.... command.  No symptom ;G:6
0000    167 ;               ovserved.                                       ;G:6
0000    168 ;                                                               ;G:7
0000    169 ;               Steven Fortuna  12-May-1987     Version 10.8    ;G:8
0000    170 ;               Add Parameters to pass the base address and offset of ;G:8
0000    171 ;               breakpoints to MPCOMMON so Ap breakpoint message would ;G:7
```

```
0000  ;          be consent with Primary breakpoint message.                  ;G:7
0000  ;          No symptom ovserved.                                         ;G:7
0000  ;                                                                       ;G:8
0000  ;          David Gearin    Sept-15-1987    Version 10.10                ;G:8
0000  ;          Added an external variable, ds$gl_ipr_value                  ;G:8
0000  ;          This variable will be used to store ipr values to            ;G:8
0000  ;          be used by bliss routines.                                   ;G:8
0000  ;                                                                       ;G:9
0000  ;          Steven Fortuna  12-Jan-1988     Version 10.11                ;G:11
0000  ;          Add an error output message to be displayed, and             ;G:11
0000  ;          the clearing of the NEX bit in the Bus Error Register        ;G:11
0000  ;          when non-existent I/O addresses are access by an             ;G:9
0000  ;          Examine command under VDS.                                   ;G:9
0000  ;          Symptom:  As reported-When examing non-existent I/O addresses ;G:9
0000  ;          VDS expects a machine check but only gets "0" return and     ;G:9
0000  ;          the setting of the NEX bit in the Bus Error Register.        ;G:9
0000  ;                                                                       ;G:9
0000  ;          Steven Fortuna  05-Feb-1988     Version 10.11                ;G:11
0000  ;          Add support for three NBIA'S for the examine command problem, ;G:10
0000  ;          mention above.                                               ;G:10
0000  ;                                                                       ;G:9
0000  ;          Steven Fortuna  18-Mar-1988     Version 10.11                ;G:11
0000  ;          Fixed a bug with the examine command that occured because    ;G:11
0000  ;          of edit 9.                                                   ;G:11
0000  ;          SYMPTOM:  Errors to I/O space were occuring before the actual ;G:11
0000  ;          datum of the EXAMINE command was executed. Thus the datum of ;G:11
0000  ;          the EXAMINE command did not match the error's output address ;G:11
0000  ;          when a machine check occured.                                ;G:11
0000  ;          SOLUTION:  Do a Fetch with the datum of the EXAMINE command  ;G:11
0000  ;          first, that way if an error occurs it will be with the actual ;G:11
0000  ;          address to be examined.  If successful do the routine        ;G:11
0000  ;          CHCK_TO_SEE_IF_IO_SPACE.                                     ;G:11
0000  ;                                                                       ;G:11
0000  ;--                                                                     ;G:6
0000                                                                          ;G:6
```

```
                 0000          .SBTTL  DECLARATIONS
                 0000    ;
                 0000    ; INCLUDE FILES:
                 0000    ;
                 0000          .LIBRARY        /$DS/                   ;                       [12]
                 0000          .LIBRARY        /$DIAG/                 ;                       [12]
                 0000
                 0000    ;
                 0000    ; MACROS:
                 0000    ;
                 0000          $MP_ILdefs                      ; mp$R_active_routines  offsets  [17]
                 0000          $BIICDEF                                                        ;G:9
                 0000          .SAVE   LOCAL_BLOCK
                 0000          .RESTORE
                 0000          $NBIADEF                                                        ;G:9
                 0000          .SAVE   LOCAL_BLOCK
                 0000          .RESTORE
                 0000    ;
                 0000    ; EXTERNALS:
                 0000    ;
                 0000          .EXTRN  DS$GL_IPR_VALUE                                         ;G:8
                 0000          .EXTRN  MP$GB_SETCPU,MP$GT_DEVICE_NAME                  ;       [18]
                 0000          .EXTRN  MP$_GET_IPR,MP$_GET_GPR                         ;       [18]
                 0000          .EXTRN  MP$GR_BOOTED_PROCESSORS                         ;       [19]
                 0000
                 0000          .WEAK   MP$_GET_IPR,MP$_GET_GPR                         ;       [18]
                 0000          .WEAK   MP$GL_AP_BKPT_STORE                             ;       [19]
                 0000          .WEAK   MP$GL_AP_BASE_ADDR_BKPT                                 ;G:8
                 0000          .WEAK   MP$GL_AP_OFFSET_BKPT                                    ;G:8
                 0000          .WEAK   MP$_COND_DEBUG                                  ;       [19]
                 0000          .WEAK   MP$_GET_PROCESSOR_ID                            ;       [19]
                 0000          .WEAK   MP$_RESUME_ATTACHED_PROCESSORS                  ;       [19]
                 0000          .WEAK   MP$GR_SAVED_GPRS                                ;       [19]
                 0000
                 0000    ;
                 0000    ; EQUATED SYMBOLS:
                 0000    ;
                 0000
                 0000
        00000009 0000          HTAB     =   9                  ; ASCII HORIZONTAL TAB
        00000003 0000          BPTCODE  == 03                  ; BREAKPOINT OPCODE
        00000010 0000          PSLREG   =  16                  ; ERSATZ ADDRESS FOR 'PSL'
        0000000F 0000          BPTMAX   == 15                  ; MAXIMUM NUMBER OF BREAKPOINTS
        00000020 0000          EXAMSIZE =  32                  ; SIZE OF DISPLAY BUFFER FOR EXAMINE
        00000050 0000          PSLBUFSZ =  80                  ; SIZE OF PSL MNEMONICS BUFFER
        00000000 0000          INITBASE =   0                  ; INITIAL BASE ADDRESS FOR EXAM/DEP
        00000004 0000          INITSIZE =   4                  ; INITIAL BYTE COUNT FOR EXAM/DEP
                 0000
        00000001 0000          SS$_NORMAL      = 1             ; SUCCESSFUL COMPLETION
                 0000
        00010E00 0000          DEBUGGER_SIZE = 135 * 512       ;NO. OF PAGES TIMES BYTES PER PAGE[14] ;G:5
                 0000
                 0000          CLIDEF                          ; CLI COMMAND BLOCK OFFSETS
                 0000          DSFDEF                          ; CONTROL FLAG DEFINITIONS
                 0000          $DS_DSDEF                       ; SUPERVISOR STATUS CODES
                 0000          $PSLDEF                         ; PROCESSOR STATUS BITS
                 0000          .SAVE   LOCAL_BLOCK
```

```
                    0000                .PSECT  $ABS$,ABS
          00000000  044C                .=0
                    0000                .RESTORE
                    0000    263         $PRDEF                          ; PROCESSOR REGISTERS
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
          00000000  044C                .=0
                    0000                .RESTORE
                    0000    264         $SETPRTDEF                      ; SETPRT arglist offsets
                    0000    265         $DS_DSADEF                      ; Define DSA$x codes
                    0000    266         CMKDEF                          ; Define CHMK codes
```

```
                                  0000  ; GLOBAL REFERENCES                                                    [14]
                                  0000
                                  0000          .GLOBAL DIAG_FILE_NAME          ;FILENAME OF LAST DIAG. LOADED  [14]
                                  0000
                                  0000  ;
                                  0000  ; OWN STORAGE:
                                  0000  ;
                                  0000
                              00000000          .PSECT  WORK, NOSHR, NOEXE, WRT, LONG
                                  0000
                                  0000  DEBUG$GB_FLAGS::
                                  00  0000          .BYTE   0
                          00000000  0001                  V_TBIT=0                ; T-BIT TRAP EXPECTED
                          00000001  0001                          M_TBIT=1 @ V_TBIT
                          00000001  0001                  V_STEP=1                ; STEP EXECUTION, SET T-BIT AFTER T-BIT TRAP
                          00000002  0001                          M_STEP=1 @ V_STEP
                                  0001  DS$AB_BPTINST::
00'00'00'00'00'00'00'00'00'00'00'00' 0001          .BYTE   0[BPTMAX+1]             ; SAVED INSTRUCTION TABLE
                        00'00'00'00' 000D
                                  0011          .ALIGN  LONG                                                    ;G:7
                                  0014  DS$AA_BPTADDR::
00000000'00000000'00000000'00000000' 0014          .LONG   0[BPTMAX+1]             ; BREAKPOINT LOCATION TABLE
00000000'00000000'00000000'00000000' 0024
00000000'00000000'00000000'00000000' 0034
00000000'00000000'00000000'00000000' 0044
                                  0054  DS$AA_BPTBASE::                                                         ;G:6
00000000'00000000'00000000'00000000' 0054          .LONG   0[BPTMAX+1]             ; BREAKPOINT BASE LOCATION TABLE      ;G:6
00000000'00000000'00000000'00000000' 0064
00000000'00000000'00000000'00000000' 0074
00000000'00000000'00000000'00000000' 0084
                                  0094  DS$AA_OFFSET:                                                           ;G:6
                          00000000  0094          .LONG   0                       ; BREAKPOINT OFFSET LOCAION           ;G:6
                                  0098  DFLTSIZE:
                          00000004  0098          .LONG   INITSIZE                ; EXAMINE/DEPOSIT SIZE QUALIFIER
                                  009C
                                  009C  BASEADDRESS:
                          00000000  009C          .LONG   INITBASE                ; ADDRESS BIAS FOR EXAMINE/DEPOSIT
                          000000B0  00A0  SAVE_SCB_VEC:   .BLKL   4               ; SPACE FOR SAVED SCB VECTOR ADRESSES
                          000000B8  00B0  NEW_AP_FP:      .BLKQ   1               ; SPACE FOR AP/FP
                          000000BC  00B8  NEW_SP:         .BLKL   1               ; OPERATOR MODIFIED 'SP'
                          000000C4  00BC  NEW_PC_PSL:     .BLKQ   1               ; OPERATOR MODIFIED 'PC/PSL'
                                  00C4
                          00000000  00C4  ID_TEMP:        .LONG   0               ; Storage for cpu id [23]
                                  00C8                                                                          ;G:6
                 000000D0'00000003' 00C8  FMTDIRECTIVE:   .LONG   20$-10$,10$     ; QUADWORD STRING DESCRIPTOR
                          3F 3F 21  00D0  10$:    .ASCII  .!??.                   ; FORMAT DIRECTIVE STRING
                                  00D3  20$:
                                  00D3
                                  00D3  EXAMQWDBUF:
                 000000DB'00000020  00D3          .LONG   EXAMSIZE,EXAMBUFFER     ; QUADWORD BUFFER DESCRIPTOR
                                  00DB  EXAMBUFFER:
                          000000FB  00DB          .BLKB   EXAMSIZE                ; DISPLAY BUFFER FOR EXAMINE
                                  00FB  PSLBUFFER:
                          0000014B  00FB          .BLKB   PSLBUFSZ                ; BUFFER FOR PSL MNEMONICS
                                  014B
                                  014B  FAOLST:
                                  014B          $FAOL   FMTDIRECTIVE,         - ; CONTROL STRING POINTER
```

```
                                014B   321                 EXAMQWDBUF+2,          - ; RETURNED STRING LENGTH (WORD)
                                014B   322                 EXAMQWDBUF,            - ; RETURN STRING BUFFER DESCRIPTOR
                                014B   323                 FAOARG                   ; ARGLIST POINTER (UNCOUNTED)
                    00000004'   014B                       .ADDRESS       4
                    000000C8'   014F                       .ADDRESS       FMTDIRECTIVE
                    000000D5'   0153                       .ADDRESS       EXAMQWDBUF+2
                    000000D3'   0157                       .ADDRESS       EXAMQWDBUF
                    0000015F'   015B                       .ADDRESS       FAOARG
                                015F   324                                                                        ;G:6
                                015F   325 FAOARG:
                    00000163    015F   326          .BLKL   1                       ; FAO OPTIONAL ARGS LIST
                                0163   327
                                0163   328
                                0163   329 ; The following storage allocation is for use by the routine which      [14]
                                0163   330 ; loads the debugger.                                                  [14]
                                0163   331
62 65 64 20 67 6E 69 64 61 6F 4C 00'  0163   332 FMT_DBG_MSG:    .ASCIC "Loading debugger...!/"          ;          [14]
      2F 21 2E 2E 2E 72 65 67 67 75   016F
                                 15   0163
6F 6C 20 72 65 67 67 75 62 65 44 00'  0179   333 FMT_DBG_LOAD:   .ASCIC "Debugger loaded at !XL!/"         ;          [14]
21 4C 58 21 20 74 61 20 64 65 64 61   0185
                                 2F   0191
                                 18   0179
4F 4C 20 54 27 4E 41 43 20 3F 3F 00'  0192   334 FMT_NO_ROOM:    .ASCIC "?? CAN'T LOAD DEBUGGER - NOT ENOUGH FREE MEMORY.!/";[14]
20 52 45 47 47 55 42 45 44 20 44 41   019E
48 47 55 4F 4E 45 20 54 4F 4E 20 2D   01AA
59 52 4F 4D 45 4D 20 45 45 52 46 20   01B6
                     2F 21 2E         01C2
                              32      0192
                    00000000 00000000  01C5   335 DBG_ADDR_REQ:   .QUAD 0                 ;ARRAY TO REQUEST ADDR.          [14]
                                01CD   336                                                 ; RANGE                          [14]
                    00000000 00000000  01CD   337 DBG_ADDR_RTN:: .QUAD 0                 ;ARRAY TO RECEIVED ACTUAL ARRAY [14][26] ;G:
                                01D5   338                                                 ; ALLOCATED                      [14]
                             00000000  01D5   339 DEBUG_LO::      .LONG 0                ;LOWEST ADDR. ALLOCATED TO DEBUGGER[14]
                             00000000  01D9   340 DEBUG_HI::      .LONG 0                ;HIGHEST ADDR. ALLOCATED TO DEBUGGER[14]
                             00000000  01DD   341 SYMTAB_HI::     .LONG 0                ;TOP OF SYMBOL TABLE AREA        [14]
                                01E1   342
                                   00  01E1   343 MP$GB_FUNCTION   ::     .BYTE   0       ; DEPOSIT OR EXAMINE             [18]
                             00000000  01E2   344 MP$GL_IPR_STATUS ::     .LONG   0       ; PP'S IPR ROUTINE STATUS        [18]
                             00000000  01E6   345 MP$GL_IPR_VALUE  ::     .LONG   0       ; IPR VALUE                      [18]
                             00000000  01EA   346 MP$GL_REG_ADDRESS::     .LONG   0       ; GPRS REG ADDRESS               [18]
                             00000000  01EE   347 MP$GL_REG_VALUE  ::     .LONG   0       ; IPRS REG VALUE                 [18]
                             00000000  01F2   348 MP$GL_RET_STATUS ::     .LONG   0       ; AP'S RETURN STATUS             [18]
                             00000000  01F6   349 MP$GL_SAVED_R1   ::     .LONG   0       ; PP'S VALUE OF R1               [18]
                                01FA   350
                             00000000  01FA   351 RET_REC :       .LONG   0               ; RECORD ATTRIBUTES FROM DS$LOAD [22]
                             00000000  01FE   352 RET_LEN :       .LONG   0               ; RECORD LENGTH FROM DS$LOAD     [22]
                                0202   353
                                0202   354
```

```
                                00000000   356          .PSECT  DATA, SHR, NOEXE, NOWRT, BYTE
                                    0000   357
                                    0000   358          MODNAM  DEBUG                   ; SUPERVISOR MODULE IDENTIFIER
                     47 55 42 45 44 00'     0000      $MODULE:        .ASCIC  \DEBUG\
                                    05      0000
                                    03      0006   359 BPT_LITERAL:    .BYTE   BPTCODE         ; A BPT INSTRUCTION
                                            0007   360
                                            0007   361 FMT_BASE_OUT:                                                ;       [13]
74 6E 65 72 72 75 63 20 65 68 54 00'        0007   362          .ASCIC  "The current base address is !XL(X).!/"      ;       [13]
73 65 72 64 64 61 20 65 73 61 62 20         0013
2E 29 58 28 4C 58 21 20 73 69 20 73         001F
                              2F 21         002B
                                    25      0007
                                            002D   363 FMT_DFLT_OUT:                                               ;       [13]
64 61 72 20 74 6E 65 72 72 75 43 00'        002D   364          .ASCIC  "Current radix: !AC.!/Current size:  !AC.!/" ;       [13]
75 43 2F 21 2E 43 41 21 20 3A 78 69         0039
20 3A 65 7A 69 73 20 74 6E 65 72 72         0045
                  2F 21 2E 43 41 21 20      0051
                                    2A      002D
                                            0058   365 FMT_HEX:                                                   ;       [13]
6C 61 6D 69 63 65 64 61 78 65 48 00'        0058   366          .ASCIC  "Hexadecimal"                           ;       [13]
                                    0B      0058
                                            0064   367 FMT_DEC:                                                   ;       [13]
                  6C 61 6D 69 63 65 44 00'  0064   368          .ASCIC  "Decimal"                               ;       [13]
                                    07      0064
                                            006C   369 FMT_OCT:                                                   ;       [13]
                        6C 61 74 63 4F 00'  006C   370          .ASCIC  "Octal"                                 ;       [13]
                                    05      006C
                                            0072   371 FMT_LONG:                                                  ;       [13]
               64 72 6F 77 67 6E 6F 4C 00'  0072   372          .ASCIC  "Longword"                              ;       [13]
                                    08      0072
                                            007B   373 FMT_WORD:                                                  ;       [13]
                           64 72 6F 57 00'  007B   374          .ASCIC  "Word"                                  ;       [13]
                                    04      007B
                                            0080   375 FMT_BYTE:                                                  ;       [13]
                           65 74 79 42 00'  0080   376          .ASCIC  "Byte"                                  ;       [13]
                                    04      0080
                                            0085   377 FMTBPT::                                                  ;       [19]
20 74 6E 69 6F 70 6B 61 65 72 42 00'        0085   378          .ASCIC  .Breakpoint at:!_!XL(X)!_(Base=!XL(X) Offset=!XL(X))!/.      ;G:6
21 29 58 28 4C 58 21 5F 21 3A 74 61         0091
58 28 4C 58 21 3D 65 73 61 42 28 5F         009D
4C 58 21 3D 74 65 73 66 66 4F 20 29         00A9
                  2F 21 29 29 58 28         00B5
                                    35      0085
                                            00BB   379 FMTSTEP:                                                                 ;G:7
   2F 21 4C 58 21 20 3A 4C 58 21 00'        00BB   380          .ASCIC  "!XL: !XL!/"
                                    0A      00BB
                                            00C6   381 FMTBPTADR:
21 29 58 28 4C 58 21 5F 21 5F 21 00'        00C6   382          .ASCIC  .!_!_!XL(X)!_(Base=!XL(X) Offset=!XL(X))!/.                 ;G:6
58 28 4C 58 21 3D 65 73 61 42 28 5F         00D2
4C 58 21 3D 74 65 73 66 66 4F 20 29         00DE
                  2F 21 29 29 58 28         00EA
                                    29      00C6
                                            00F0   383 FMTBPTLST:
73 74 6E 69 6F 70 6B 61 65 72 42 00'        00F0   384          .ASCIC  .Breakpoints located at:!/.                             ;G:7
3A 74 61 20 64 65 74 61 63 6F 6C 20         00FC
                              2F 21         0108
```

```
                                        19  00F0
                                            010A   385 FMTBPTNONE:
6E 65 72 72 75 63 20 65 6E 6F 4E 00'        010A   386         .ASCIC  .None currently set!/.                          ;       [13]
         2F 21 74 65 73 20 79 6C 74         0116
                                        14  010A
                                            011F   387 FMTBPTNOTSET:
20 74 6E 69 6F 70 6B 61 65 72 42 00'        011F   388         .ASCIC  .Breakpoint was not set!!!/.                    ;       [13]
21 74 65 73 20 74 6F 6E 20 73 61 77         012B
                                  2F 21 21  0137
                                        1A  011F
                                            013A   389 FMTINVLDREG:
20 64 69 6C 61 76 6E 49 20 3F 3F 00'        013A   390         .ASCIC  .?? Invalid register mnemonic!/.                ;       [13]
65 6E 6D 20 72 65 74 73 69 67 65 72         0146
                  2F 21 63 69 6E 6F 6D      0152
                                        1E  013A
                                            0159   391 PRNT_AP_NAME::
            20 2F 20 43 41 21 20 00'        0159   392         .ASCIC  " !AC / "                                       ;       [18]
                                        07  0159
                                            0161   393 FMTEXAM_ASCII:
21 22 46 41 21 22 00000169'010E0000'        0161   394         .ASCID  ."!AF"!_!#XL.
                        4C 58 23 21 5F      016F
                                            0174   395 FMTEXAM:
43 41 21 5F 21 53 41 21 20 20 20 00'        0174   396         .ASCIC  "   !AS!_!AC!/"
                                     2F 21  0180
                                        0D  0174
                                            0182   397 FMTNOBPTSLEFT:
65 72 62 20 4C 55 21 20 6C 6C 41 00'        0182   398         .ASCIC  .All !UL breakpoints currently in use!!!/.      ;       [13]
72 75 63 20 73 74 6E 69 6F 70 6B 61         018E
73 75 20 6E 69 20 79 6C 74 6E 65 72         019A
                        2F 21 21 21 65      01A6
                                        28  0182
```

```
                                                  01AB   400                                                                  ;G:9
6F 70 73 65 72 20 6F 4E 20 3F 3F 00'  01AB   401 T_MACHCK:       .ASCIC  '?? No response/invalid operation'          ;       [13]
20 64 69 6C 61 76 6E 69 2F 65 73 6E   01B7
         6E 6F 69 74 61 72 65 70 6F   01C3
                                 20   01AB
76 20 73 73 65 63 63 41 20 3F 3F 00'  01CC   402 T_ACCVIO:       .ASCIC  '?? Access violation'                       ;       [13]
            6E 6F 69 74 61 6C 6F 69   01D8
                                 13   01CC
74 61 6C 73 6E 61 72 54 20 3F 3F 00'  01E0   403 T_TRANSL:       .ASCIC  '?? Translation not valid'                  ;       [13]
69 6C 61 76 20 74 6F 6E 20 6E 6F 69   01EC
                                 64   01F8
                                 18   01E0
20 67 6E 69 72 75 64 20 43 41 21 00'  01F9   404 FMT_EXCEPTION:  .ASCIC  "!AC during reference to X'!XL'!/"          ;       [13]
6F 74 20 65 63 6E 65 72 65 66 65 72   0205
         2F 21 27 4C 58 21 27 58 20   0211
                                 20   01F9
      6D 6F 72 66 20 64 61 65 72 00'  021A   405 T_PREGREAD:     .ASCIC  "read from"                                 ;       [13]
                                 09   021A
         6F 74 20 65 74 69 72 77 00'  0224   406 T_PREGWRITE:    .ASCIC  "write to"                                  ;       [13]
                                 08   0224
41 21 20 74 27 6E 61 43 20 3F 3F 00'  022D   407 FMT_BADPREG:    .ASCIC  "?? Can't !AC P!XB  !/"                     ;       [13]
      2F 21 20 20 42 58 21 50 20 43   0239
                                 15   022D
                                      0243   408 APSLMNE::
44 50 46 2C 2C 2C 50 54 2C 4D 43 00'  0243   409          .ASCIC  \CM,TP,,,FPD,IS,CUR=2a,PRV=2a,,IPL=5^X,\ -
50 2C 40 32 3D 52 55 43 2C 53 49 2C   024F
35 3D 4C 50 49 2C 2C 40 32 3D 56 52   025B
                           2C 58 5E   0267
46 2C 56 44 2C 2C 2C 2C 2C 2C 2C 2C   026A   410                 \,,,,,,,,DV,FU,IV,T,N,Z,V,C\
56 2C 5A 2C 4E 2C 54 2C 56 49 2C 55   0276
                              43 2C   0282
                                 40   0243
                                      0284   411
                           00000004   0284   412 MODELST::  .LONG        4
                           00000298'  0288   413          .ADDRESS        AKM
                           0000029F'  028C   414          .ADDRESS        AEM
                           000002A9'  0290   415          .ADDRESS        ASM
                           000002B4'  0294   416          .ADDRESS        AUM
                                      0298   417
               4C 45 4E 52 45 4B 00'  0298   418 AKM:     .ASCIC  .KERNEL.
                                 06   0298
      45 56 49 54 55 43 45 58 45 00'  029F   419 AEM:     .ASCIC  .EXECUTIVE.
                                 09   029F
   52 4F 53 49 56 52 45 50 55 53 00'  02A9   420 ASM:     .ASCIC  .SUPERVISOR.
                                 0A   02A9
                     52 45 53 55 00'  02B4   421 AUM:     .ASCIC  .USER.
                                 04   02B4
```

```
                        02B9    423 REGNAMLST:
000002FD'               02B9    424             .ADDRESS  AR0
00000300'               02BD    425             .ADDRESS  AR1
00000303'               02C1    426             .ADDRESS  AR2
00000306'               02C5    427             .ADDRESS  AR3                                   ;G:6
00000309'               02C9    428             .ADDRESS  AR4
0000030C'               02CD    429             .ADDRESS  AR5
0000030F'               02D1    430             .ADDRESS  AR6
00000312'               02D5    431             .ADDRESS  AR7
00000315'               02D9    432             .ADDRESS  AR8
00000318'               02DD    433             .ADDRESS  AR9
0000031B'               02E1    434             .ADDRESS  AR10
0000031F'               02E5    435             .ADDRESS  AR11
00000323'               02E9    436             .ADDRESS  AAP
00000326'               02ED    437             .ADDRESS  AFP
00000329'               02F1    438             .ADDRESS  ASP
0000032C'               02F5    439             .ADDRESS  APC
0000032F'               02F9    440             .ADDRESS  APSL
                        02FD    441
30 52 00'               02FD    442 AR0:        .ASCIC  .R0.
       02               02FD
31 52 00'               0300    443 AR1:        .ASCIC  .R1.
       02               0300
32 52 00'               0303    444 AR2:        .ASCIC  .R2.
       02               0303
33 52 00'               0306    445 AR3:        .ASCIC  .R3.
       02               0306
34 52 00'               0309    446 AR4:        .ASCIC  .R4.
       02               0309
35 52 00'               030C    447 AR5:        .ASCIC  .R5.
       02               030C
36 52 00'               030F    448 AR6:        .ASCIC  .R6.
       02               030F
37 52 00'               0312    449 AR7:        .ASCIC  .R7.
       02               0312
38 52 00'               0315    450 AR8:        .ASCIC  .R8.
       02               0315
39 52 00'               0318    451 AR9:        .ASCIC  .R9.
       02               0318
30 31 52 00'            031B    452 AR10:       .ASCIC  .R10.
          03            031B
31 31 52 00'            031F    453 AR11:       .ASCIC  .R11.
          03            031F
50 41 00'               0323    454 AAP:        .ASCIC  .AP.
       02               0323
50 46 00'               0326    455 AFP:        .ASCIC  .FP.
       02               0326
50 53 00'               0329    456 ASP:        .ASCIC  .SP.
       02               0329
43 50 00'               032C    457 APC:        .ASCIC  .PC.
       02               032C
4C 53 50 00'            032F    458 APSL:       .ASCIC  .PSL.
          03            032F
```

```
                     0333   460          .SBTTL  SET BASE ADDRESS SUBROUTINE
                  00000000  461          .PSECT  CODE, SHR, EXE, NOWRT, BYTE
                     0000   462 ;++
                     0000   463 ; FUNCTIONAL DESCRIPTION:
                     0000   464 ;
                     0000   465 ;       SETS UP AN ADDRESS BIAS VALUE TO BE USED BY SUBSEQUENT
                     0000   466 ;       EXAMINE AND DEPOSIT OPERATOR COMMANDS
                     0000   467 ;
                     0000   468 ; CALLING SEQUENCE:
                     0000   469 ;
                     0000   470 ;       BSBW    VRSETBASE
                     0000   471 ;
                     0000   472 ; INPUT PARAMETERS:
                     0000   473 ;
                     0000   474 ;       R2      = BASE OF CLI DATA FRAME.
                     0000   475 ;       CLI$L_ADDRESS(R2)       ; OPERATOR SPECIFIED BIAS
                     0000   476 ;
                     0000   477 ; IMPLICIT INPUTS:
                     0000   478 ;
                     0000   479 ;       NONE
                     0000   480 ;
                     0000   481 ; OUTPUT PARAMETERS:
                     0000   482 ;
                     0000   483 ;       BASEADDRESS                     ; RECEIVES BIAS VALUE
                     0000   484 ;
                     0000   485 ; IMPLICIT OUTPUTS:
                     0000   486 ;
                     0000   487 ;       NONE
                     0000   488 ;
                     0000   489 ; COMPLETION CODES:
                     0000   490 ;
                     0000   491 ;       NONE
                     0000   492 ;
                     0000   493 ; SIDE EFFECTS:
                     0000   494 ;
                     0000   495 ;       NONE
                     0000   496 ;
                     0000   497 ;--
                     0000   498
                     0000   499 VRSETBASE::                             ;
0000009C'EF   18 A2  D0     0000   500          MOVL    CLI$L_ADDRESS(R2),L^BASEADDRESS ; STORE THE SPECIFIED BIAS      [12]
                     05     0008   501          RSB                     ; RETURN                                        ;G:6
```

```
                        0009   503          .SBTTL  SHOW BASE ADDRESS SUBROUTINE                                ;       [13]
                        0009   504 ;++
                        0009   505 ; FUNCTIONAL DESCRIPTION:
                        0009   506 ;
                        0009   507 ;       Shows the current base address.
                        0009   508 ;
                        0009   509 ; CALLING SEQUENCE:
                        0009   510 ;
                        0009   511 ;       BSBW    VRSHOWBASE
                        0009   512 ;       JSB     VRSHOWBASE
                        0009   513 ;
                        0009   514 ; INPUT PARAMETERS:
                        0009   515 ;
                        0009   516 ;       NONE
                        0009   517 ;
                        0009   518 ; IMPLICIT INPUTS:
                        0009   519 ;
                        0009   520 ;       BASEADDRESS : The current base address
                        0009   521 ;
                        0009   522 ; OUTPUT PARAMETERS:
                        0009   523 ;
                        0009   524 ;       NONE
                        0009   525 ;
                        0009   526 ; IMPLICIT OUTPUTS:
                        0009   527 ;
                        0009   528 ;       NONE
                        0009   529 ;
                        0009   530 ; COMPLETION CODES:
                        0009   531 ;
                        0009   532 ;       NONE
                        0009   533 ;
                        0009   534 ; SIDE EFFECTS:
                        0009   535 ;
                        0009   536 ;       NONE
                        0009   537 ;
                        0009   538 ;--
                        0009   539
                        0009   540 VRSHOWBASE::                                                 ;               [13]
                        0009   541          $DS_PRINTF_S    L^FMT_BASE_OUT, -                   ; Print the base address [13]
                        0009   542                            L^BASEADDRESS                     ;               [13]
    0000009C'EF   DD    0009                       PUSHL   L^BASEADDRESS
    00000007'EF   9F    000F                       PUSHAB  L^FMT_BASE_OUT
00000000'9F     02      FB  0015                   CALLS   #$$N, @#DS$PRINTF
                        05  001C   543          RSB                                             ; Return to caller      [13]
```

```
001D    545          .SBTTL  SET DEFAULTS SUBROUTINE
001D    546 ;++
001D    547 ; FUNCTIONAL DESCRIPTION:
001D    548 ;
001D    549 ;       SETS UP DEFAULT PARAMETERS TO BE USED BY SUBSEQUENT
001D    550 ;       EXAMINE AND DEPOSIT OPERATOR COMMANDS
001D    551 ;
001D    552 ; CALLING SEQUENCE:
001D    553 ;
001D    554 ;       BSBW    VRSETDFLT
001D    555 ;
001D    556 ; INPUT PARAMETERS:
001D    557 ;
001D    558 ;       R2      = BASE OF CLI DATA FRAME.
001D    559 ;       CLI$L_FLAGS(R2) ; OPERATOR SPECIFIED DEFAULT(S)
001D    560 ;
001D    561 ; IMPLICIT INPUTS:
001D    562 ;
001D    563 ;       NONE
001D    564 ;
001D    565 ; OUTPUT PARAMETERS:
001D    566 ;
001D    567 ;       DS$GL_RADIX                     ; RECEIVES RADIX VALUE
001D    568 ;       DFLTSIZE                        ; RECEIVES SIZE VALUE IN BYTES
001D    569 ;
001D    570 ; IMPLICIT OUTPUTS:
001D    571 ;
001D    572 ;       NONE
001D    573 ;
001D    574 ; COMPLETION CODES:
001D    575 ;
001D    576 ;       NONE
001D    577 ;
001D    578 ; SIDE EFFECTS:
001D    579 ;
001D    580 ;       NONE
001D    581 ;
001D    582 ;--
```

```
                         001D    584 VRSETDFLT::                                 ;
                         001D    585
                         001D    586 ;+
                         001D    587 ; FIRST, CHECK RADIX FLAGS AND SET DEFAULT TO SPECIFIED VALUE
                         001D    588 ; (IF MORE THAN ONE SPECIFIED, USE MAXIMIZED VALUE)
                         001D    589 ;-
                         001D    590
      07 62    11   E1   001D    591          BBC     #CLI$V_OCT,CLI$L_FLAGS(R2),10$ ; OCTAL ?
00000000'EF    08   D0   0021    592          MOVL    #8,L^DS$GL_RADIX               ; YES, SET DEFAULT                [12]
      07 62    10   E1   0028    593 10$:     BBC     #CLI$V_DEC,CLI$L_FLAGS(R2),20$ ; DECIMAL ?                       [12]
00000000'EF    0A   D0   002C    594          MOVL    #10,L^DS$GL_RADIX              ; YES, SET DEFAULT                [12]
      07 62    12   E1   0033    595 20$:     BBC     #CLI$V_HEX,CLI$L_FLAGS(R2),30$ ; HEX ?                           [12]
00000000'EF    10   D0   0037    596          MOVL    #16,L^DS$GL_RADIX              ; YES, SET DEFAULT                [12]
                         003E    597 30$:
                         003E    598
                         003E    599 ;+
                         003E    600 ; HERE, CHECK SIZE FLAGS AND SET DEFAULT TO SPECIFIED NUMBER OF
                         003E    601 ; BITS  (IF MORE THAN ONE SPECIFIED, USE MAXIMIZED VALUE)
                         003E    602 ;-
                         003E    603
      07 62    0D   E1   003E    604          BBC     #CLI$V_BYTE,CLI$L_FLAGS(R2),40$ ; BYTE ?
00000098'EF    01   D0   0042    605          MOVL    #1,L^DFLTSIZE                  ; YES, SET SIZE IN BYTES          [12]
      07 62    0E   E1   0049    606 40$:     BBC     #CLI$V_WORD,CLI$L_FLAGS(R2),50$ ; WORD ?                         [12]
00000098'EF    02   D0   004D    607          MOVL    #2,L^DFLTSIZE                  ; YES, SET SIZE IN BYTES          [12]
      07 62    0F   E1   0054    608 50$:     BBC     #CLI$V_LONG,CLI$L_FLAGS(R2),60$ ; LONGWORD ?                     [12]
00000098'EF    04   D0   0058    609          MOVL    #4,L^DFLTSIZE                  ; YES, SET SIZE IN BYTES          [12]
                         005F    610 60$:
                         005F    611
                         005F    612 ;+
                         005F    613 ; RETURN
                         005F    614 ;-
                         005F    615
                05       005F    616          RSB                                    ; RETURN
```

```
0060    618          .SBTTL  SHOW DEFAULTS SUBROUTINE
0060    619 ;++
0060    620 ; FUNCTIONAL DESCRIPTION:
0060    621 ;
0060    622 ;       Show the current default size and radix.
0060    623 ;
0060    624 ; CALLING SEQUENCE:
0060    625 ;
0060    626 ;       BSBW    VRSHOWDFLT
0060    627 ;       JSB     VRSHOWDFLT
0060    628 ;
0060    629 ; INPUT PARAMETERS:
0060    630 ;
0060    631 ;       NONE
0060    632 ;
0060    633 ; IMPLICIT INPUTS:
0060    634 ;
0060    635 ;       NONE
0060    636 ;
0060    637 ; OUTPUT PARAMETERS:
0060    638 ;
0060    639 ;       NONE
0060    640 ;
0060    641 ; IMPLICIT OUTPUTS:
0060    642 ;
0060    643 ;       NONE
0060    644 ;
0060    645 ; COMPLETION CODES:
0060    646 ;
0060    647 ;       NONE
0060    648 ;
0060    649 ; SIDE EFFECTS:
0060    650 ;
0060    651 ;       NONE
0060    652 ;
0060    653 ;--
```

```
                                0060   655 VRSHOWDFLT::                                  ;                                        [13]
                                0060   656          ;                                                                          [13]
                                0060   657          ; First, save R0, R1, and R2.       ;                                        [13]
                                0060   658          ;                                                                          [13]
                     07    BB   0060   659          PUSHR   #^M<R0,R1,R2>               ;                                        [13]
                                0062   660          ;                                                                          [13]
                                0062   661          ; Put the FMT for the radix in R0,                                         [13]
                                0062   662          ; the FMT for the size in R1.                                              [13]
                                0062   663          ;                                                                          [13]
      52   00000000'EF    D0   0062   664          MOVL    L^DS$GL_RADIX, R2           ; Store the radix in R2                  [13]
                52   10    D1   0069   665          CMPL    #16, R2                     ; Hexadecimal?                           [13]
                     09    12   006C   666          BNEQ    10$                         ; If not, branch                         [13]
      50   00000058'EF    9E   006E   667          MOVAB   L^FMT_HEX, R0               ; Store format for hex                   [13]
                     15    11   0075   668          BRB     30$                         ;                                        [13]
                52   0A    D1   0077   669 10$:     CMPL    #10, R2                     ; Decimal ?                              [13]
                     09    12   007A   670          BNEQ    20$                         ; If not, branch                         [13]
      50   00000064'EF    9E   007C   671          MOVAB   L^FMT_DEC, R0               ; Store format for decimal               [13]
                     07    11   0083   672          BRB     30$                         ;                                        [13]
      50   0000006C'EF    9E   0085   673 20$:     MOVAB   L^FMT_OCT, R0               ; Must be octal                          [13]
                                008C   674 30$:                                         ;                                        [13]
      52   00000098'EF    D0   008C   675          MOVL    L^DFLTSIZE, R2              ; Store the size in R2                   [13]
                52   04    D1   0093   676          CMPL    #4, R2                      ; Longword?                              [13]
                     09    12   0096   677          BNEQ    40$                         ; If not, branch                         [13]
      51   00000072'EF    9E   0098   678          MOVAB   L^FMT_LONG, R1              ; Store format for long                  [13]
                     15    11   009F   679          BRB     60$                         ;                                        [13]
                52   02    D1   00A1   680 40$:     CMPL    #2, R2                      ; Word?                                  [13]
                     09    12   00A4   681          BNEQ    50$                         ; If not, branch                         [13]
      51   0000007B'EF    9E   00A6   682          MOVAB   L^FMT_WORD, R1              ; Store format for word                  [13]
                     07    11   00AD   683          BRB     60$                         ;                                        [13]
      51   00000080'EF    9E   00AF   684 50$:     MOVAB   L^FMT_BYTE, R1              ; Store format for byte                  [13]
                                00B6   685 60$:                                         ;                                        [13]
                                00B6   686          ;                                                                          [13]
                                00B6   687          ; Print the size and radix.                                                [13]
                                00B6   688          ;                                                                          [13]
                                00B6   689          $DS_PRINTF_S    L^FMT_DFLT_OUT, -       ; Print in this format                [13]
                                00B6   690                          R0, R1              ; Size and radix                         [13]
                     51    DD   00B6                      PUSHL   R1
                     50    DD   00B8                      PUSHL   R0
          0000002D'EF    9F   00BA                      PUSHAB  L^FMT_DFLT_OUT
      00000000'9F    03    FB   00C0                      CALLS   #$$N, @#DS$PRINTF
                     07    BA   00C7   691          POPR    #^M<R0,R1,R2>               ; Restore registers                      [13]
                           05   00C9   692          RSB                                 ; Return to caller                       [13]
```

```
                        00CA   694          .SBTTL  EXAMINE MEMORY AND REGISTERS SUBROUTINE
                        00CA   695 ;++
                        00CA   696 ; FUNCTIONAL DESCRIPTION:
                        00CA   697 ;
                        00CA   698 ;       LOCATES AND DISPLAYS SPECIFIED MEMORY OR GENERAL REGISTERS
                        00CA   699 ;       TO THE OPERATOR IN THE SPECIFIED RADIX OR ASCII.
                        00CA   700 ;       ALL SUPERVISOR OVERHEAD (I.E., STACK & REGISTER USAGE)
                        00CA   701 ;       IS TRANSPARENT TO THE OPERATOR.
                        00CA   702 ;
                        00CA   703 ; CALLING SEQUENCE:
                        00CA   704 ;
                        00CA   705 ;       BSBW    VREXAMINE
                        00CA   706 ;
                        00CA   707 ; INPUT PARAMETERS:
                        00CA   708 ;
                        00CA   709 ;       R2      = BASE OF CLI DATA FRAME.
                        00CA   710 ;       CLI$L_FLAGS(R2)          ; RADIX/SIZE SPECIFIERS
                        00CA   711 ;       CLI$L_ADDRESS(R2)        ; ADDRESS SPECIFIER
                        00CA   712 ;
                        00CA   713 ; IMPLICIT INPUTS:
                        00CA   714 ;
                        00CA   715 ;       (AP) = BASE ADDRESS OF PROGRAM REGISTER CONTEXT
                        00CA   716 ;       DS$GL_RADIX                      ; DEFAULT RADIX
                        00CA   717 ;       DFLTSIZE                         ; DEFAULT SIZE IN BYTES
                        00CA   718 ;
                        00CA   719 ; OUTPUT PARAMETERS:
                        00CA   720 ;
                        00CA   721 ;       NONE
                        00CA   722 ;
                        00CA   723 ; IMPLICIT OUTPUTS:
                        00CA   724 ;
                        00CA   725 ;       NONE                                                    ;G:11
                        00CA   726 ;
                        00CA   727 ; COMPLETION CODES:
                        00CA   728 ;
                        00CA   729 ;       NONE
                        00CA   730 ;
                        00CA   731 ; SIDE EFFECTS:
                        00CA   732 ;
                        00CA   733 ;       NONE
                        00CA   734 ;                                                               ;G:11
                        00CA   735 ;--                                                             ;G:11
                        00CA   736                                                                 ;G:11
                        00CA   737 VREXAMINE::                          ;
    01F8 8F     BB      00CA   738          PUSHR   #^M<R3,R4,R5,R6,R7,R8>  ; SAVE SOME REGISTERS  ;G:11
      0C7F      30      00CE   739          BSBW    RBREAK_OUT              ; REMOVE ALL BREAKPOINTS
                        00D1   740
                        00D1   741 10$:
53    18 A2     D0      00D1   742          MOVL    CLI$L_ADDRESS(R2),R3    ; Get address for examine
                        00D5   743 ;+
                        00D5   744 ; First, determine where specified item is: if it is an internal CPU
                        00D5   745 ; register, special handling is required; but external registers are
                        00D5   746 ; available in memory.
                        00D5   747 ;-
                        00D5   748
3F 62     14    E1      00D5   749          BBC     #CLI$V_REG,CLI$L_FLAGS(R2),20$ ; Branch if not register
   10     53    D1      00D9   750          CMPL    R3,#16                  ; REG ADR EXCEED 'PSL' ?  ;G:5
```

```
                10   1B  00DC          BLEQU   15$                     ; Out of range
                         00DE                                          ;
                         00DE          $DS_PRINTF_S  L^FMTINVLDREG     ; COMPLAIN ABOUT REGISTER NAME          [12]
      0000013A'EF   9F  00DE                  PUSHAB  L^FMTINVLDREG
 00000000'9F   01   FB  00E4                  CALLS   #$$N, @#DS$PRINTF
             0189   31  00EB          BRW     VREXAMINEX              ; AND EXIT
                         00EE                                          ;
      00000000'EF   95  00EE  15$:    TSTB    MP$GB_SETCPU            ; See if we set cpu to an AP            [18]
                1C   13  00F4          BEQL    17$                     ; Branch if not AP                      [18]
 000001E1'EF   01   90  00F6          MOVB    #1,MP$GB_FUNCTION       ; Set function to examine i.e. not deposit[1
      00000000'EF   16  00FD          JSB     MP$_GET_GPR             ; Get the value  of the register        [18]
            03 50   E8  0103          BLBS    R0,16$                  ; Success?                              [18]
                         0106                                          ; Yes, then branch                      [18]
                         0106                                          ; Else, AP did not respond in time
             016E   31  0106          BRW     VREXAMINEX              ; EXIT                                  [18]
 53   000001EE'EF   DE  0109  16$:    MOVAL   MP$GL_REG_VALUE ,R3     ; and put it in R3                      [18]
                1E   11  0110          BRB     30$                     ; Continue
                         0112
        53   6C43   DE  0112  17$:    MOVAL   (AP)[R3],R3             ; Locate saved register
                18   11  0116          BRB     30$                     ; Continue
                         0118                                          ;
       14 62   1A   E0  0118  20$:    BBS     #CLI$V_PREG, -
                         011C                  CLI$L_FLAGS(R2),30$     ; Branch if not memory
  07 0444 C2   02   E1  011C          BBC     #CLI$V_BASE_QUAL, -                                          ;G:6
                         0122                  CLI$L_FLAGS2(R2), 25$   ;                                [20]
     53   0448 C2   C0  0122          ADDL2   CLI$L_TEMP_BASE(R2), R3 ;Add Temp Base Adr, or           [20]
                07   11  0127          BRB     30$                     ;                                [20]  ;G:5
 53   0000009C'EF   C0  0129  25$:    ADDL2   L^BASEADDRESS, R3       ; Compute memory address         [12]
                         0130  30$:
                         0130
                         0130  ;+
                         0130  ; DETERMINE SIZE OF ITEM, USE DEFAULT IF NOT SPECIFIED.
                         0130  ;-
          54   04   D0  0130          MOVL    #4,R4                           ; ASSUME LONGWORD                ;G:11
       1F 62   0F   E0  0133          BBS     #CLI$V_LONG,CLI$L_FLAGS(R2),80$ ; LONGWORD SPECIFIED ?           ;G:11
       06 62   14   E1  0137          BBC     #CLI$V_REG,CLI$L_FLAGS(R2),40$  ; Skip if not register examine ;G:9
       10   18 A2   D1  013B          CMPL    CLI$L_ADDRESS(R2),#PSLREG       ; Is the register the PSL?
                15   13  013F          BEQL    80$                             ; If so, ignore data type switches ;
                         0141  40$:
          54   02   D0  0141          MOVL    #2,R4                   ; ASSUME WORD
       0E 62   0E   E0  0144          BBS     #CLI$V_WORD,CLI$L_FLAGS(R2),80$ ; WORD SPECIFIED ?               ;G:11
          54   01   D0  0148          MOVL    #1,R4                   ; ASSUME BYTE
       07 62   0D   E0  014B          BBS     #CLI$V_BYTE,CLI$L_FLAGS(R2),80$ ; BYTE SPECIFIED ?               ;G:11
 54   00000098'EF   D0  014F          MOVL    L^DFLTSIZE,R4           ; ELSE USE DEFAULT SIZE                  [12]
                         0156  80$:                                                                          ;G:11
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                          0156   795 ;+                                                                          ;G:11
                          0156   796 ; EXTRACT THE TARGET ITEM FROM MEMORY
                          0156   797 ;-
                          0156   798
             03 62   1A   E1   0156   799         BBC     #CLI$V_PREG,CLI$L_FLAGS(R2),90$ ; IF not IPR treat as memory  ;G:11
                   0041   31   015A   800         BRW     130$                            ; ELSE go and treat the IPR    [28]
                          015D   801                                                                                 ;G:11
       03 0000FE00'EF   1C   E0   015D   802 90$:    BBS     #DSA$V_USER, L^DSA$GL_FLAGS, 100$ ; IF user mode THEN branch  [28]
                          0165   803                                                                                 ;G:9
                   0B86   30   0165   804         BSBW    SAVE_SCB_VECTORS                ; SAVE PROGRAM'S SCB VECTORS   ;G:5
                          0168   805                                                     ; AND RE-INSERT SUPERVISORS.   [28]
                          0168   806 100$:                                                                           ;G:11
                          0168   807                                                                               ;G:11
                     7E   D4   0168   808         CLRL    -(SP)                           ; SPACE FOR DATA               ;G:11
                     6E   9F   016A   809         PUSHAB  (SP)                            ; WHERE TO STORE CURRENT CONTENTS
                     63   9F   016C   810         PUSHAB  (R3)                            ; AND WHERE TO FETCH IT FROM
                     54   DD   016E   811         PUSHL   R4                              ; NUMBER OF BYTES TO SHOW      ;G:5
          00000DC9'EF   03   FB   0170   812         CALLS   #3,FETCH_STORE                  ; READ THE NECESSARY BYTES
                    58   50   D0   0177   813         MOVL    R0,R8                           ; Save status from fetch_store.  ;G:11
                  55 8ED0   017A   814         POPL    R5                              ; Get data into R5             ;G:11
                          017D   815                                                                               ;G:11
       16 0000FE00'EF   1C   E0   017D   816         BBS     #DSA$V_USER, L^DSA$GL_FLAGS, 120$ ; IF user mode THEN branch  [28]
                 0A 58   E9   0185   817         BLBC    R8,110$                         ; Error Status returned from   ;G:11
                          0188   818                                                     ; FETCH_STORE.                 ;G:11
                     01   BB   0188   819         PUSHR   #^M<R0>                         ; Save the status from FETCH_STORE.  ;G:11
                   02F9   30   018A   820         BSBW    CHCK_TO_SEE_IF_IO_SPACE         ; Check to see if we are on a machine ;G:11
                          018D   821                                                     ; with an NBIA and if so, check to  ;G:11
                          018D   822                                                     ; see if the address to examine is  ;G:11
                          018D   823                                                     ; for I/O space.               ;G:11
                    58   50   D0   018D   824         MOVL    R0,R8                           ; Save status from             ;G:11
                          0190   825                                                     ; CHCK_TO_SEE_IF_IO_SPACE.     ;G:11
                     01   BA   0190   826         POPR    #^M<R0>                         ; Restore the status from FETCH_STORE.  ;G:11
                   0B23   30   0192   827 110$:   BSBW    RESTORE_SCB_VECTORS             ; RESTORE PROGRAM'S VECTORS.   [28]
                 03 58   E8   0195   828         BLBS    R8,120$                         ; Normal return from           ;G:11
                          0198   829                                                     ; CHCK_TO_SEE_IF_IO_SPACE.     ;G:11
                   00DC   31   0198   830         BRW     VREXAMINEX                      ; Error. Non-existent I/O SPACE.  ;G:11
                          019B   831                                                     ; EXIT.                        ;G:11
                          019B   832                                                                               ;G:11
                   0086   31   019B   833 120$:   BRW     200$                            ; Continue                     ;G:11
                     54   01   D0   019E   834 130$:   MOVL    #1,R4                           ; In case NEXT used, increment by 1  ;G:11
                     55   01   D0   01A1   835         MOVL    #1,R5                           ; CMK$SGIPR code for EXAMINE function
       10 0000FE00'EF   1C   E1   01A4   836         BBC     #DSA$V_USER, L^DSA$GL_FLAGS, 140$       ; User mode?           ;G:11
          00000000'EF   9F   01AC   837         PUSHAB  L^T_EMESSG1                     ; User mode error message      [12]
       00000000'EF   01   FB   01B2   838         CALLS   #1,DS$PRINTF                    ; Type it
                   00BB   31   01B9   839         BRW     VREXAMINEX                      ; Leave this place
                          01BC   840 140$:                                                                          ;G:11
          00000000'EF   95   01BC   841         TSTB    MP$GB_SETCPU                    ; See if we set cpu to an AP   [18]
                     35   13   01C2   842         BEQL    170$                            ; Branch if not AP             [18]
                     54   01   D0   01C4   843         MOVL    #1,R4                           ; In case NEXT used, increment by 1  [18]
       000001E1'EF   01   90   01C7   844         MOVB    #1,MP$GB_FUNCTION               ; CMK$SGIPR code for EXAMINE function  [18]
       000001F6'EF   51   D0   01CE   845         MOVL    R1,MP$GL_SAVED_R1               ; STORE r1 for store/get value  [18]
          00000000'EF   16   01D5   846         JSB     MP$_GET_IPR                     ; Get the value of the IP register  [18]
       51 000001E6'EF   D0   01DB   847         MOVL    MP$GL_IPR_VALUE,R1              ; and put it in R1             [25]
                     55   51   D0   01E2   848         MOVL    R1,R5                           ; and also R5                  [25]
       50 000001F2'EF   D0   01E5   849         MOVL    MP$GL_RET_STATUS,R0             ; Also, store the returned status in r0  [18]
         03 000001E2'EF   E9   01EC   850         BLBC    MP$GL_IPR_STATUS,150$           ; Check status of GET_IPR routine  [18]
                   002E   31   01F3   851         BRW     200$                                                       ;G:11
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                     007E   31  01F6   852 150$:   BRW     VREXAMINEX                ; Exit if ERROR routine                ;G:11
                                01F9   853                                                                              ;G:5
                                01F9   854                                                                              ;G:9
          03 0000FE00'EF    1C   E0  01F9   855 170$:   BBS     #DSA$V_USER,L^DSA$GL_FLAGS,190$ ; IF user mode THEN branch  [28]
                     0AEA   30   0201   856             BSBW    SAVE_SCB_VECTORS          ; SAVE PROGRAM'S SCB VECTORS         [28]
                                0204   857                                                                              ;G:5
                                0204   858 190$:   CMK     SGIPR                     ; Store/Get IPR value via CHMK trap    ;G:11
                       7E   DC  0204             MOVPSL  -(SP)
                  06 6E    1A   E0  0206             BBS     #PSL$V_IS,(SP),30000$
                       8E   D4  020A             CLRL    (SP)+
                       0A   BC  020C             CHMK    #CMK$_SGIPR
                       06   11  020E             BRB     30001$
                00000FC0'EF   16  0210       30000$: JSB     CMK$SGIPR
                                0216       30001$:
                     55   51   D0  0216   859             MOVL    R1,R5                     ; Get the value into R5
                                0219   860                                                                              ;G:6
          03 0000FE00'EF    1C   E0  0219   861             BBS     #DSA$V_USER,L^DSA$GL_FLAGS,200$ ; IF user mode THEN branch  [28]
                                0221   862                                                                              ;G:9
                     0A94   30   0221   863             BSBW    RESTORE_SCB_VECTORS       ; RESTORE PROGRA'S VECTORS           [28]
                                0224   864                                                                              ;G:5
                   1F 50    E8  0224   865 200$:   BLBS    R0,460$                   ; Type it, if no error                 ;G:11
                                0227   866                                                                              ;G:6
                18 62    1A   E1  0227   867             BBC     #CLI$V_PREG,CLI$L_FLAGS(r2),450$                        ;G:11
                                022B   868                                               ; Exit if not IPR function     ;G:11
             50   0000021A'EF   9E  022B   869             MOVAB   L^T_PREGREAD,R0           ; Set up for IPR read access error  [12]
                                0232   870             $PRINTI_S       L^FMT_BADPREG,R0,R3 ; Type error                    [12]
                       53   DD  0232                     PUSHL   R3
                       50   DD  0234                     PUSHL   R0
                0000022D'EF   9F  0236                     PUSHAB  L^FMT_BADPREG
             00000000'EF    03   FB  023C                     CALLS   #$$N, DSX$PRINTI
                     0031   31   0243   871 450$:   BRW     VREXAMINEX                ; Exit routine                         ;G:11
                     0036   30   0246   872 460$:   BSBW    VRTYPEXAMINE              ; Type out value                       ;G:11
                                0249   873                                                                              ;G:11
                                0249   874 ;+                                                                           ;G:11
                                0249   875 ; If NEXT is not zero, decrement it and loop back for next item, unless
                                0249   876 ; examining registers and PSL has just been displayed, or examining IPRs
                                0249   877 ; and P255 has just been displayed.                                          ;G:11
                                0249   878 ;-
                                0249   879
                   30 A2    D5  0249   880             TSTL    CLI$L_NEXT(R2)            ; All specified items displayed?
                       29   13  024C   881             BEQL    VREXAMINEX                ; Yes, exit
                08 62    14   E1  024E   882             BBC     #CLI$V_REG,CLI$L_FLAGS(R2),470$ ; Skip if not registers    ;G:11
                10   18 A2    D1  0252   883             CMPL    CLI$L_ADDRESS(R2),#PSLREG ; Pointing at PSL?
                       1F   13  0256   884             BEQL    VREXAMINEX                ; Yes, time to exit
                       0E   11  0258   885             BRB     480$                      ; Increment register-style     ;G:11
                0F 62    1A   E1  025A   886 470$:   BBC     #CLI$V_PREG,CLI$L_FLAGS(R2),490$ ; Skip if not IPRs        ;G:11
          000000FF 8F    18 A2    D1  025E   887             CMPL    CLI$L_ADDRESS(R2),#255  ; Pointing at top IPR?
                       0F   13  0266   888             BEQL    VREXAMINEX                ; Yes, time to exit
                   18 A2    D6  0268   889 480$:   INCL    CLI$L_ADDRESS(R2)         ; Bump to next register                ;G:11
                       04   11  026B   890             BRB     500$                      ; Skip to loop back                    ;G:11
                18 A2    54   C0  026D   891 490$:   ADDL2   R4,CLI$L_ADDRESS(R2)     ; Bump to next data item               ;G:11
                   30 A2    D7  0271   892 500$:   DECL    CLI$L_NEXT(R2)            ; Count this item                      ;G:11
                     FE5A   31  0274   893             BRW     10$                       ; Do it all again
                                0277   894                                                                              ;G:11
                                0277   895 ;+
                                0277   896 ; Return
                                0277   897 ;-
```

```
                    0277   898
                    0277   899 VREXAMINEX:
        0B01   30   0277   900         BSBW    RBREAK_IN                  ; Re-insert breakpoints
    01F8 8F    BA   027A   901         POPR    #^M<R3,R4,R5,R6,R7,R8>     ; Restore registers                ;G:11
               05   027E   902         RSB                                ; Return                           ;G:11
                    027F   903                                                                                ;G:11
```

```
                                027F   905 .SBTTL  VRTYPEXAMINE    Type out location EXAMINE'd
                                027F   906
                                027F   907 ;+
                                027F   908 ; DETERMINE DISPLAY RADIX TO BE USED, DEFAULT IF NOT SPECIFIED.
                                027F   909 ;  (CONSTRUCT A CONTROL STRING FOR "FAO")
                                027F   910 ;-
                                027F   911 VRTYPEXAMINE:
                     00C0 8F    BB  027F   912          PUSHR   #^M<R6,R7>
                                0283   913
        000000D2'EF    4C 8F    90  0283   914          MOVB    #^A"L",L^FMTDIRECTIVE+10        ; SET UP FOR ADDRESS CONVERSION [12]
                  2A 62    12    E0  028B   915          BBS     #CLI$V_HEX,CLI$L_FLAGS(R2),140$ ; BRANCH IF HEX SPECIFIED
                  56   5A 8F    90  028F   916          MOVB    #^A'Z',R6                       ; SETUP FOR DECIMAL             ;G:5
                  26 62    10    E0  0293   917          BBS     #CLI$V_DEC,CLI$L_FLAGS(R2),150$ ; BRANCH IF DECIMAL SPECIFIED
                  56   4F 8F    90  0297   918          MOVB    #^A'O',R6                       ; SETUP OCTAL
                  1E 62    11    E0  029B   919          BBS     #CLI$V_OCT,CLI$L_FLAGS(R2),150$ ; BRANCH IF OCTAL SPECIFIED
                                029F   920
                  56   4F 8F    90  029F   921          MOVB    #^A'O',R6                   ; SETUP OCTAL
              08  00000000'EF    D1  02A3   922          CMPL    L^DS$GL_RADIX,#8            ; OCTAL DEFAULT ?                   [12]
                           11    13  02AA   923          BEQL    150$                        ; YES, USE IT
                  56   5A 8F    90  02AC   924          MOVB    #^A'Z',R6                   ; SETUP DECIMAL
              0A  00000000'EF    D1  02B0   925          CMPL    L^DS$GL_RADIX,#10           ; DECIMAL DEFAULT ?                 [12]
                           04    13  02B7   926          BEQL    150$                        ; YES, USE IT
                  56   58 8F    90  02B9   927 140$:     MOVB    #^A"X",R6                   ; OTHERWIZE USE HEXIDECIMAL
                                02BD   928
        000000D1'EF    56    90  02BD   929 150$:     MOVB    R6,L^FMTDIRECTIVE+9         ; INSERT DIRECTIVE BYTE             [12]
```

```
                                02C4    931 ;+
                                02C4    932 ; CONVERT ADDRESS (REGISTER OR MEMORY) OF ITEM TO ASCII
                                02C4    933 ; AND INSERT INTO OUTPUT BUFFER, FOLLOWED BY SYNTACTICAL SEPARATORS.
                                02C4    934 ;-
                                02C4    935
        000000D3'EF   20   D0   02C4    936          MOVL    #EXAMSIZE,L^EXAMQWDBUF          ; SET UP BUFFER CHAR. COUNT     [12]
000000D7'EF   000000DB'EF   DE   02CB    937          MOVAL   L^EXAMBUFFER,L^EXAMQWDBUF+4     ; SET UP BUFFER POINTER         [12]
                                02D6    938
        0000015F'EF   63   DE   02D6    939          MOVAL   (R3),L^FAOARG                   ; SET ADDRESS TO CONVERT        [12]
              57   18 A2   D0   02DD    940          MOVL    CLI$L_ADDRESS(R2),R7            ; Get address for conversion    [12]
              17 62   14   E1   02E1    941          BBC     #CLI$V_REG,CLI$L_FLAGS(R2),170$ ; Branch if not external reg.  [12]
    000000D1'EF   4341 8F   B0   02E5    942          MOVW    #^A"AC",L^FMTDIRECTIVE+9        ; YES, SET TO COPY A STRING     [12]
0000015F'EF   000002B9'EF47   D0   02EE    943          MOVL    L^REGNAMLST[R7],L^FAOARG        ; STRING ADDRESS FOR FAO        [12]
                     27   11   02FA    944          BRB     200$                            ;                               [12]
              23 62   1A   E1   02FC    945 170$:    BBC     #CLI$V_PREG,CLI$L_FLAGS(R2),200$ ; Branch if not internal reg. [12]
        000000D7'FF   50 8F   90   0300    946          MOVB    #^A"P",@L^EXAMQWDBUF+4          ; Move a "P" into output        [12]
              000000D7'EF   D6   0308    947          INCL    L^EXAMQWDBUF+4                  ; Update buffer avail. address  [12]
              000000D3'EF   D7   030E    948          DECL    L^EXAMQWDBUF                    ; Update buffer avail. byte count.[1
        000000D2'EF   42 8F   90   0314    949          MOVB    #^A"B",L^FMTDIRECTIVE+10        ; Set for byte edit in radix    [12]
           0000015F'EF   57   D0   031C    950          MOVL    R7,L^FAOARG                     ; Point FAO to the register name.[12
                                0323    951
                                0323    952 200$:    $FAOL_G  L^FAOLST                       ; CONVERT ADDRESS TO ASCII      [12]
00000000'GF   0000014B'EF   FA   0323                     CALLG   L^FAOLST,G^SYS$FAOL
000000D3'EF   000000D5'EF   A2   032E    953          SUBW2   L^EXAMQWDBUF+2,L^EXAMQWDBUF     ; ADJUST BUFFER DESCRIPTOR      [12]
        57   000000D5'EF   3C   0339    954          MOVZWL  L^EXAMQWDBUF+2,R7               ;  (BY NUMBER INSERTED)         [12]
        000000D7'EF   57   C0   0340    955          ADDL2   R7,L^EXAMQWDBUF+4               ;  TO REMAINING BYTES           [12]
                                0347    956
000000D7'FF   093A 8F   B0   0347    957          MOVW    #^A':   ',@L^EXAMQWDBUF+4       ; STORE <:<TAB>> AFTER NUMBER   [12]
     000000D7'EF   02   C0   0350    958          ADDL2   #2,EXAMQWDBUF+4                 ; UPDATE AVAILABLE ADDRESS
     000000D3'EF   02   A2   0357    959          SUBW2   #2,EXAMQWDBUF                   ; SHORTEN AVAILABLE LENGTH
```

```
                          035E   961 ;+
                          035E   962 ; IF ITEM IS NUMERIC, CONVERT IT TO ASCII INTO OUTPUT BUFFER.
                          035E   963 ;-
                          035E   964
          000000FB'EF   94 035E   965          CLRB    L^PSLBUFFER                ; ERASE ANY PREVIOUS MNEMONICS          [12]
          00000000'EF   95 0364   966          TSTB    MP$GB_SETCPU               ; See if we set cpu to an AP            [18]
                     13 13 036A   967          BEQL    198$                       ; Branch if not AP                      [18]
          00000000'EF   9F 036C   968          PUSHAB  MP$GT_DEVICE_NAME          ; Device name of the Ap          [24]
          00000159'EF   9F 0372   969          PUSHAB  L^PRNT_AP_NAME             ; Control String                 [24]
     00000000'9F   02   FB 0378   970          CALLS   #2, a#DS$PRINTF            ; Print the name of the device   [24]
           03 62   13   E1 037F   971 198$:    BBC     #CLI$V_ASCII,CLI$L_FLAGS(R2),199$ ; Skip branch, if ASCII       [12]
                 008C   31 0383   972          BRW     400$                       ; Branch if not ASCII                   [12]
                        0386   973 199$:                                         ;                                       [12]
           12 62   1A   E0 0386   974          BBS     #CLI$V_PREG,CLI$L_FLAGS(R2),300$ ; Always longword, if IPR
           57   42 8F   90 038A   975          MOVB    #^A"B",R7                  ; SELECT BYTE OUTPUT
              01   54   D1 038E   976          CMPL    R4,#1                      ; SIZE = BYTE ?
                   0D   13 0391   977          BEQL    330$                       ; YES, USE IT
           57   57 8F   90 0393   978          MOVB    #^A"W",R7                  ; YES, SELECT DIRECTIVE
              02   54   D1 0397   979          CMPL    R4,#2                      ; SIZE = WORD ?
                   04   13 039A   980          BEQL    330$                       ; YES, USE IT
           57   4C 8F   90 039C   981 300$:    MOVB    #^A"L",R7                  ; Use longword form
     000000D1'EF   56   90 03A0   982 330$:    MOVB    R6,L^FMTDIRECTIVE+9        ; RADIX TO DIRECTIVE STRING             [12]
     000000D2'EF   57   90 03A7   983          MOVB    R7,L^FMTDIRECTIVE+10       ; SIZE TO DIRECTIVE STRING              [12]
     0000015F'EF   55   D0 03AE   984          MOVL    R5,L^FAOARG                ; DATA ITEM FOR FAO                     [12]
                        03B5   985          $FAOL_G  L^FAOLST                  ; CONVERT ITEM TO ASCII                 [12]
00000000'GF   0000014B'EF   FA 03B5                   CALLG   L^FAOLST,G^SYS$FAOL
     57   000000D5'EF   3C 03C0   986          MOVZWL  L^EXAMQWDBUF+2,R7          ; GET COUNT OF BYTES INSERTED           [12]
     000000D3'EF   57   A2 03C7   987          SUBW2   R7,L^EXAMQWDBUF            ; ADJUST BUFFER DESCRIPTOR              [12]
     000000D7'EF   57   C0 03CE   988          ADDL2   R7,L^EXAMQWDBUF+4          ; UPDATE ADDRESS                        [12]
                        03D5   989
                        03D5   990 ;+
                        03D5   991 ; AND IF ITEM IS 'PSL', CONVERT ITS CONTENTS TO A MNEMONIC STRING.
                        03D5   992 ;-
                        03D5   993
        37 62   14   E1 03D5   994          BBC     #CLI$V_REG,CLI$L_FLAGS(R2),350$ ; BRANCH IF NOT REGISTER
        10   18 A2   D1 03D9   995          CMPL    CLI$L_ADDRESS(R2),#PSLREG  ; REGISTER = "PSL" ?
                 31   12 03DD   996          BNEQ    350$                       ; NO, SO SKIP OUT
                        03DF   997          $DS_CVTREG_S  #31,R5,L^APSLMNE,L^PSLBUFFER,#PSLBUFSZ, - ; CNVRT TO MNCS [12]
                        03DF   998                  MODELST,MODELST            ; INCLUDING ACCESS MODE MNEMONICS
                   00   DD 03DF                   PUSHL   #0
                   00   DD 03E1                   PUSHL   #0
                   00   DD 03E3                   PUSHL   #0
                   00   DD 03E5                   PUSHL   #0
        00000284'EF   DF 03E7                   PUSHAL  MODELST
        00000284'EF   DF 03ED                   PUSHAL  MODELST
        00000050 8F   DD 03F3                   PUSHL   #PSLBUFSZ
        000000FB'EF   9F 03F9                   PUSHAB  L^PSLBUFFER
        00000243'EF   9F 03FF                   PUSHAB  L^APSLMNE
                   55   DD 0405                   PUSHL   R5
                   1F   DD 0407                   PUSHL   #31
     00000000'9F   0B   FB 0409                   CALLS   #11, a#DS$CVTREG
                 3F   11 0410   999 350$:    BRB     410$                       ; SKIP TO DISPLAY
```

```
                                  0412  1001 ;+
                                  0412  1002 ; ASCII examine.  Print the data in !AF format (non-printing characters appear
                                  0412  1003 ; as ".") and follow by hex printout.
                                  0412  1004 ;-
                                  0412  1005
                                  0412  1006 400$:
          56    54    01    78    0412  1007          ASHL    #1,R4,R6                  ; Calculate # hex digits to type
                      55    DD    0416  1008          PUSHL   R5                        ; Make data available in memory
                50    6E    9E    0418  1009          MOVAB   (SP),R0                   ; For convenience, point to it
                51    7E    DE    041B  1010          MOVAL   -(SP),R1                  ; Allocate a longword
                                  041E  1011          $FAO_S  L^FMTEXAM_ASCII,(R1),-    ; Format for typeout                [12]
                                  041E  1012                   L^EXAMQWDBUF,-           ;                                   [12]
                                  041E  1013                   R4,R0,R6,R5
                      55    DD    041E                        PUSHL   R5
                      56    DD    0420                        PUSHL   R6
                      50    DD    0422                        PUSHL   R0
                      54    DD    0424                        PUSHL   R4
             000000D3'EF    7F    0426                        PUSHAQ  L^EXAMQWDBUF
                      61    3F    042C                        PUSHAW  (R1)
             00000161'EF    7F    042E                        PUSHAQ  L^FMTEXAM_ASCII
        00000000'GF    07    FB    0434                        CALLS   #$$T2,G^SYS$FAO
                      51  8ED0    043B  1014          POPL    R1                        ; Get returned length
                51    51    3C    043E  1015          MOVZWL  R1,R1                     ; Clear upper word
                      8E    D4    0441  1016          CLRL    (SP)+                     ; De-allocate temporary
        000000D3'EF    51    A2    0443  1017          SUBW2   R1,L^EXAMQWDBUF           ; Cut buffer size                   [12]
        000000D7'EF    51    A0    044A  1018          ADDW2   R1,L^EXAMQWDBUF+4         ; Increase buffer address           [12]
                                  0451  1019
                                  0451  1020 ;+                                                                                ;G:11
                                  0451  1021 ; THEN PRINT THE OUTPUT BUFFER(S).
                                  0451  1022 ;-
                                  0451  1023
000000D3'EF    20    000000D3'EF    A3    0451  1024 410$:   SUBW3   L^EXAMQWDBUF,#EXAMSIZE,L^EXAMQWDBUF ; SET UP STRING LENGTH   [12]
     000000D7'EF    000000DB'EF    DE    045D  1025          MOVAL   L^EXAMBUFFER,L^EXAMQWDBUF+4 ; SET UP BUFFER POINTER         [12]
                                  0468  1026          $DS_PRINTF_S  L^FMTEXAM, -        ;                                   [12]
                                  0468  1027                   #EXAMQWDBUF, -           ; Address and contents
                                  0468  1028                   #PSLBUFFER               ; Register Mnemonics
             000000FB'8F    DD    0468                        PUSHL   #PSLBUFFER
             000000D3'8F    DD    046E                        PUSHL   #EXAMQWDBUF
             00000174'EF    9F    0474                        PUSHAB  L^FMTEXAM
        00000000'9F    03    FB    047A                        CALLS   #$$N, @#DS$PRINTF
                00C0 8F    BA    0481  1029          POPR    #^M<R6,R7>                ; Restore registers
                      05    0485  1030          RSB                                     ; Return
                                  0486  1031 ;                                                                                ;G:11
                                  0486  1032 ;*************************************************************************      ;G:9
                                  0486  1033 ;*                TESTING BI BUS ERR REG AREA                            *      ;G:9
                                  0486  1034 ;*************************************************************************      ;G:9
                                  0486  1035 ;++                                                                              ;G:11
                                  0486  1036 ; FUNCTIONAL DESCRIPTION:                                                        ;G:11
                                  0486  1037 ;                                                                                ;G:11
                                  0486  1038 ;       The Following procedures deal specifically with the NBIA's, NBIB's,      ;G:11
                                  0486  1039 ;       and BI'S register and address space.                                     ;G:11
                                  0486  1040 ;       The CHCK_TO_SEE_IF_IO_SPACE procedure test to see:                       ;G:11
                                  0486  1041 ;               a) if the machine we are on has NBIA'S, which at present         ;G:11
                                  0486  1042 ;                  time is the Naultus and JJJ.                                  ;G:11
                                  0486  1043 ;               b) if so, then the address to examine is checked to see          ;G:11
                                  0486  1044 ;                  if it is within in the I/O space.                             ;G:11
                                  0486  1045 ;               c) if so, the procedures to check the NBIA's and NBIB's          ;G:11
```

```
0486  1046 ;                    register and address space are executed.                    ;G:11
0486  1047 ;                                                                                ;G:11
0486  1048 ;       The reason for this extensive checking is due to the fact that when      ;G:11
0486  1049 ;       non-existence address space on the NBIA's node space is examined         ;G:11
0486  1050 ;       no Machine Check occurs.  Instead zero's are returned to the calling     ;G:11
0486  1051 ;       instruction, leaving to person to believe they examined a valid          ;G:11
0486  1052 ;       I/O location.                                                            ;G:11
0486  1053 ;                                                                                ;G:11
0486  1054 ; CALLING SEQUENCE:                                                             ;G:11
0486  1055 ;       JSB     CHCK_TO_SEE_IF_IO_SPACE                                          ;G:11
0486  1056 ;       BSBx    CHCK_TO_SEE_IF_IO_SPACE                                          ;G:11
0486  1057 ;                                                                                ;G:11
0486  1058 ; INPUT PARAMETERS:                                                            ;G:11
0486  1059 ;                                                                                ;G:11
0486  1060 ;       NONE                                                                     ;G:11
0486  1061 ;                                                                                ;G:11
0486  1062 ; IMPLICIT INPUTS:                                                             ;G:11
0486  1063 ;                                                                                ;G:11
0486  1064 ;       R3              Address to examine.                                      ;G:11
0486  1065 ;       R4              Number of bytes to show.                                 ;G:11
0486  1066 ;                                                                                ;G:11
0486  1067 ; OUTPUT PARAMETERS:                                                            ;G:11
0486  1068 ;                                                                                ;G:11
0486  1069 ;       NONE                                                                     ;G:11
0486  1070 ;                                                                                ;G:11
0486  1071 ; IMPLICIT OUTPUTS:                                                             ;G:11
0486  1072 ;                                                                                ;G:11
0486  1073 ;       R0              Containing the Status code.                              ;G:11
0486  1074 ;                                                                                ;G:11
0486  1075 ; COMPLETION CODES:                                                             ;G:11
0486  1076 ;                                                                                ;G:11
0486  1077 ;       NONE                                                                     ;G:11
0486  1078 ;                                                                                ;G:11
0486  1079 ; SIDE EFFECTS:                                                                 ;G:11
0486  1080 ;                                                                                ;G:11
0486  1081 ;       NONE                                                                     ;G:11
0486  1082 ;                                                                                ;G:11
0486  1083 ;--                                                                              ;G:11
```

```
                                0486  1085 CHCK_TO_SEE_IF_IO_SPACE:                                                  ;G:11
                                0486  1086                                                                            ;G:11
            0100 8F     BB      0486  1087          PUSHR   #^M<R8>                  ; Save                           ;G:11
 11   0000FE17'EF     91      048A  1088          CMPB    DSA$GL_SID+3,#17         ; JJJ machine?                   ;G:11
                 0B     13      0491  1089          BEQL    10$                      ;                                ;G:11
 06   0000FE17'EF     91      0493  1090          CMPB    DSA$GL_SID+3,#PR$_SID_TYP8NN    ; 8800 machine?                ;G:1
                 02     13      049A  1091          BEQL    10$                      ;                                ;G:11
                 58     11      049C  1092          BRB     70$                      ; Not on a NBIA machine.         ;G:11
                                049E  1093 ;++                                                                        ;G:11
                                049E  1094 ;        Find if MM is ON or OFF.                                          ;G:11
                                049E  1095 ;--                                                                        ;G:11
                                049E  1096                                                                            ;G:11
                 2A     BB      049E  1097 10$:     PUSHR   #^M<R1,R3,R5>            ; Save R1,R3 & R5.               ;G:11
             55  01     D0      04A0  1098          MOVL    #1,R5                    ; Pass examine code.             ;G:11
             53  38     D0      04A3  1099          MOVL    #PR$_MAPEN,R3            ; Pass IPR number.               ;G:11
                                04A6  1100          CMK     SGIPR                    ; Ch mode and examine IPR38.     ;G:11
                 7E     DC      04A6                MOVPSL  -(SP)
          06 6E  1A     E0      04A8                BBS     #PSL$V_IS, (SP), 30002$
                 8E     D4      04AC                CLRL    (SP)+
                 0A     BC      04AE                CHMK    #CMK$_SGIPR
                 06     11      04B0                BRB     30003$
      00000FC0'EF       16      04B2        30002$: JSB     CMK$SGIPR
                                04B8        30003$:
                 51     95      04B8  1101          TSTB    R1                       ; is mm on?                      ;G:11
                 2A     BA      04BA  1102          POPR    #^M<R1,R3,R5>            ; Restore R1,R3 & R5.            ;G:11
                 14     13      04BC  1103          BEQL    40$                      ; Branch if MM is Not ON.        ;G:11
                                04BE  1104                                                                            ;G:11
 53   60000000 8F     D1      04BE  1105          CMPL    #^X60000000,R3           ; Is Address in BI nodespace?    ;G:11
                 2F     14      04C5  1106          BGTR    70$                      ; NO! So EXIT.                   ;G:11
 53   70000000 8F     D1      04C7  1107          CMPL    #^X70000000,R3           ; Is address in Reserved         ;G:11
                                04CE  1108                                           ; Area?                          ;G:11
                 26     15      04CE  1109          BLEQ    70$                      ; YES! So EXIT.                  ;G:11
                 2A     14      04D0  1110          BGTR    80$                      ; NO! So contiue.                ;G:11
                                04D2  1111                                                                            ;G:11
 53   20000000 8F     D1      04D2  1112 40$:     CMPL    #^X20000000,R3           ; Is Address in BI nodespace?    ;G:11
                 1B     14      04D9  1113          BGTR    70$                      ; NO! So EXIT.                   ;G:11
 53   2FFFFFFB 8F     D1      04DB  1114          CMPL    #^X2FFFFFFB,R3           ; Is                             ;G:11
                                04E2  1115                                           ; 20000000 <= address <= 2ffffffb. ;G:11
                 18     18      04E2  1116          BGEQ    80$                      ; YES! So continue.              ;G:11
                                04E4  1117                                                                            ;G:11
 53   60000000 8F     D1      04E4  1118          CMPL    #^X60000000,R3           ; Is Address in BI nodespace?    ;G:11
                 09     14      04EB  1119          BGTR    70$                      ; NO! So EXIT.                   ;G:11
                                04ED  1120                                                                            ;G:11
 53   6FFFFFFB 8F     D1      04ED  1121          CMPL    #^X6FFFFFFB,R3           ; Is                             ;G:11
                                04F4  1122                                           ; 60000000 <= address <= 6ffffffb. ;G:11
                 06     18      04F4  1123          BGEQ    80$                      ; YES! So continue.              ;G:11
                                04F6  1124 ;        BLSS    70$                      ; NO! So EXIT.                   ;G:11
                                04F6  1125                                                                            ;G:11
             50  01     D0      04F6  1126 70$:     MOVL    S^#SS$_NORMAL,R0         ; Not a BI or NBIA Address.      ;G:11
               0061     31      04F9  1127          BRW     EXIT_CHCK_TO_SEE         ; EXIT.                          ;G:11
                                04FC  1128                                                                            ;G:11
 000005E0'EF    00     FB      04FC  1129 80$:     CALLS   #0,CHECK_CSR1            ; Check to see if BI adapter     ;G:11
                                0503  1130                                           ; is present.                    ;G:11
             05 50     E8      0503  1131          BLBS    R0,90$                   ; Yes! go to 90$.                ;G:11
                                0506  1132                                           ; NO! Error.                     ;G:11
                 50     D4      0506  1133          CLRL    R0                       ; If nothing present at the      ;G:11
                                0508  1134                                           ; address to examine and it is   ;G:11
```

```
                     0052   31  0508  1135          BRW     EXIT_CHCK_TO_SEE          ; EXIT.                                  ;G:11
00000651'EF            00   FB  050B  1136 90$:     CALLS   #0,SET_LOOP_BACK_BIT      ; Enable BIIC maint Loopback             ;G:11
                                0512  1137                                            ; bit located in CSR 0.                  ;G:11
00000562'EF            00   FB  0512  1138          CALLS   #0,CLEAR_NEX_BIT          ; Clear the Bus Error Register.          ;G:11
0000068E'EF            00   FB  0519  1139          CALLS   #0,CLEAR_LOOP_BACK_BIT    ; Disable BIIC maint Loopback            ;G:11
                                0520  1140                                            ; bit located in CSR 0.                  ;G:11
                       7E   D4  0520  1141          CLRL    -(SP)                     ; SPACE FOR DATA                         ;G:11
                       6E   9F  0522  1142          PUSHAB  (SP)                      ; WHERE TO STORE CURRENT                 ;G:11
                                0524  1143                                            ; CONTENTS                               ;G:11
                       63   9F  0524  1144          PUSHAB  (R3)                      ; AND WHERE TO FETCH IT FROM             ;G:11
                       54   DD  0526  1145          PUSHL   R4                        ; NUMBER OF BYTES TO SHOW                ;G:11
00000DC9'EF            03   FB  0528  1146          CALLS   #3,FETCH_STORE            ; READ THE NECESSARY BYTES               ;G:11
                  58   50   D0  052F  1147          MOVL    R0,R8                     ; Save status from Fetch_Store.          ;G:11
                  5E   04   C0  0532  1148          ADDL2   #4,SP                     ; Reset the stack.                       ;G:11
                     05 58   E8  0535  1149          BLBS    R8,100$                   ; Sucess continue.                       ;G:11
                       50   D4  0538  1150          CLRL    R0                        ; Error Returned from                    ;G:11
                                053A  1151                                            ; Fetch_Store.                           ;G:11
                     0020   31  053A  1152          BRW     EXIT_CHCK_TO_SEE          ; EXIT.                                  ;G:11
                                053D  1153                                            ; Nothing present at the address         ;G:11
                                053D  1154                                            ; to examine. So exit.                   ;G:11
                                053D  1155                                                                                     ;G:11
00000651'EF            00   FB  053D  1156 100$:    CALLS   #0,SET_LOOP_BACK_BIT      ; Enable BIIC maint Loopback             ;G:11
                                0544  1157                                            ; bit located in CSR 0.                  ;G:11
0000058B'EF            00   FB  0544  1158          CALLS   #0,CHECK_NEX_BIT          ; Check for non-existent                 ;G:11
                                054B  1159                                            ; address.                               ;G:11
                  58   50   D0  054B  1160          MOVL    R0,R8                     ; Save status from Check NEX             ;G:11
                                054E  1161                                            ; bit.                                   ;G:11
0000068E'EF            00   FB  054E  1162          CALLS   #0,CLEAR_LOOP_BACK_BIT    ; Disable BIIC maint Loopback            ;G:11
                                0555  1163                                            ; bit located in CSR 0.                  ;G:11
                                0555  1164                                            ; Was addres to examine on NBIA          ;G:11
                                0555  1165                                            ; present?                               ;G:11
                  50   01   D0  0555  1166          MOVL    S^#SS$_NORMAL,R0          ; Assume a success.                      ;G:11
                     02 58   E8  0558  1167          BLBS    R8,EXIT_CHCK_TO_SEE       ; Sucess continue.                       ;G:11
                       50   D4  055B  1168          CLRL    R0                        ; Error Returned from                    ;G:11
                                055D  1169                                            ; Check NEX Bit.                         ;G:11
                                055D  1170                                            ; No!                                    ;G:11
                                055D  1171                                            ; Nothing present at the address         ;G:11
                                055D  1172                                            ; to examine. So exit.                   ;G:11
                                055D  1173 EXIT_CHCK_TO_SEE:                          ; EXIT.                                  ;G:11
                  0100 8F   BA  055D  1174          POPR    #^M<R8>                   ; Restore                                ;G:11
                       05   0561  1175          RSB                               ; Don't check the bus error              ;G:11
                                0562  1176                                                                                     ;G:11
                                0562  1177 ;++                                                                                 ;G:11
                                0562  1178 ;  Implicit input R3 contains address to examine                                    ;G:11
                                0562  1179 ;--                                                                                 ;G:11
                           0010 0562  1180 .ENTRY  CLEAR_NEX_BIT,^M<R4>                    ; Save scratch space             ;G:11
      6D   00000E45'EF     9E  0564  1181          MOVAB   L^FS_HANDLR,(FP)          ; Set up exception handler               ;G:11
                       54   D4  056B  1182          clrl    R4                        ; clear R4 for temp. usage               ;G:11
                  51   53   D0  056D  1183          MOVL    R3,R1                     ; Save desired address in R1.            ;G:11
                  50   01   D0  0570  1184          MOVL    S^#SS$_NORMAL,R0          ; Assume a success.                      ;G:11
54    53   F1FFFFFF 8F   CB  0573  1185          bicl3   #^XF1FFFFFF,R3,R4         ; Find the X in 2X000000                 ;G:10
                                057B  1186                                            ; X = 0,2,4,6,8, and A.                  ;G:10
      54   60000000 8F   C0  057B  1187          addl2   #^X60000000,R4            ; to find which NBIB Bus                 ;G:11
                                0582  1188                                            ; error register to look                 ;G:9
                                0582  1189                                            ; at on which NBIA.                      ;G:9
   08 A4   7FFF0007 8F   D0  0582  1190          MOVL    #^X7FFF0007,BIIC$L_BER(R4)    ; clear bus error register               ;G:11
                                058A  1191                                                                                     ;G:9
```

```
        058A  1192 EXIT_CLEAR_NEX_BIT:                                                  ;G:9
        058A  1193                                                                      ;G:9
   04   058A  1194         RET                                  ; Return                ;G:11
```

```
                                058B  ;++                                                                          ;G:11
                                058B  ;  Implicit input R3 contains address to examine                             ;G:9
                                058B  ;--                                                                          ;G:11
                          0030  058B  .ENTRY  CHECK_NEX_BIT,^M<R4,R5>                  ; Save scratch space        ;G:11
      6D   00000E45'EF    9E    058D          MOVAB   L^FS_HANDLR,(FP)                 ; Set up exception handler  ;G:11
                    54    D4    0594          clrl    R4                               ; clear R4 for temp. usage  ;G:9
                    55    D4    0596          clrl    R5                               ; clear R5 for temp. usage  ;G:9
                51  53    D0    0598          MOVL    R3,R1                            ; Save desired address in R1. ;G:11
                50  01    D0    059B          MOVL    S^#SS$_NORMAL,R0                 ; Assume a success.         ;G:11
                                059E  ; Find node space base address                                               ;G:10
                                059E                                                   ; Find which NBIB to use    ;G:9
                                059E                                                   ; by finding the X in       ;G:9
  54  53   F1FFFFFF 8F    CB    059E          bicl3   #^XF1FFFFFF,R3,R4                ; 2X000000,                 ;G:11
                                05A6                                                   ; X = 0,2,4,6,8,& A.        ;G:10
      54   60000000 8F    C0    05A6          addl2   #^X60000000,R4                   ; Add 20000000 to find which ;G:11
                                05AD                                                   ; NBIB Bus error register to ;G:11
                                05AD                                                   ; look at.                  ;G:9
           55   08 A4    D0    05AD          movl    BIIC$L_BER(R4),R5                ; Check NEX bit.            ;G:9
      55   00020000 8F    D3    05B1          BITL    #BIIC$M_NEX,R5                   ; if NEX not set            ;G:11
                                05B8                                                   ; in the Bus Error Register ;G:9
                    25    13    05B8          beql    EXIT_CHECK_NEX_BIT               ; then exit                 ;G:11
   08 A4   00020000 8F    C8    05BA          BISL2   #BIIC$M_NEX,BIIC$L_BER(R4)       ; else "1" to clear.        ;G:9
      50   000001AB'EF    9E    05C2          MOVAB   L^T_MACHCK,R0                    ; Point to error text       ;G:9
                51  53    D0    05C9          MOVL    R3,R1                            ; Save desired address in R1. ;G:11
                                05CC          $PRINTI_S L^FMT_EXCEPTION,R0,R1          ; Type the error text       ;G:9
                    51    DD    05CC                  PUSHL   R1
                    50    DD    05CE                  PUSHL   R0
           000001F9'EF    9F    05D0                  PUSHAB  L^FMT_EXCEPTION
      00000000'EF   03    FB    05D6                  CALLS   #$$N, DSX$PRINTI
                    50    D4    05DD          clrl    R0                               ; Return Error Status.      ;G:11
                                05DF  ;       RET                                      ; Return.                   ;G:11
                                05DF                                                                               ;G:9
                                05DF  EXIT_CHECK_NEX_BIT:                                                          ;G:9
                                05DF                                                                               ;G:9
                          04    05DF          RET                                      ; Return                    ;G:11
```

```
                                05E0  1228 ;++                                                                                  ;G:11
                                05E0  1229 ;  Implicit input R3 contains address to examine                                     ;G:9
                                05E0  1230 ;--                                                                                  ;G:11
                          0030  05E0  1231 .ENTRY  CHECK_CSR1,^M<R4,R5>                          ; Save scratch space            ;G:11
      6D   00000E45'EF    9E    05E2  1232         MOVAB   L^FS_HANDLR,(FP)                      ; Set up exception handler      ;G:11
              51    53    D0    05E9  1233         MOVL    R3,R1                                 ; Save desired address in R1.   ;G:11
                                05EC  1234 ; Find node space base address                                                        ;G:9
                    54    D4    05EC  1235         clrl    R4                                    ; clear R4 for temp. usage      ;G:9
                    55    D4    05EE  1236         clrl    R5                                    ; clear R5 for temp. usage      ;G:9
                                05F0  1237                                                       ; Find the X in 2X000000        ;G:9
                                05F0  1238                                                       ; to find which NBIA CSR 1      ;G:9
                                05F0  1239                                                       ; resiter to use.               ;G:9
                                05F0  1240                                                       ; CSR 1 is located at address:  ;G:9
                                05F0  1241                                                       ;          2   X     0    8    ;G:11
                                05F0  1242                                                       ;          0010 ---- 0000 1000  ;G:9
                                05F0  1243                                                       ; 1's comp 0000 1100 0000 0000  ;G:10
                                05F0  1244                                                       ; mask     1111 0011 1111 1111  ;G:11
  54   53   F3FFFFFF 8F    CB    05F0  1245         bicl3   #^XF3FFFFFF,R3,R4                     ; where X = 0,4,or 8.           ;G:10
       54   60080000 8F    C0    05F8  1246         addl2   #^X60080000,R4                        ; Add the address offset        ;G:11
                                05FF  1247                                                       ; to R4.                        ;G:11
            55    04 A4    D0    05FF  1248         MOVL    NBIA$L_CSR1(R4),R5                    ; Get the contains of the       ;G:11
                                0603  1249                                                       ; CSR1 register and put         ;G:11
                                0603  1250                                                       ; it into r5.                   ;G:11
                                0603  1251                                                                                      ;G:10
      54   53    01    19    EF    0603  1252         EXTZV   #25,#1,R3,R4                          ; Extract the second bit        ;G:10
                                0608  1253                                                       ; position of X in the address  ;G:10
                                0608  1254                                                       ; contained in R3.              ;G:10
                                0608  1255                                                       ; This bit will determine       ;G:10
                                0608  1256                                                       ; which BI the examine          ;G:11
                                0608  1257                                                       ; command is trying fetch.      ;G:11
                                0608  1258                                                                                      ;G:10
                    50    D4    0608  1259         CLRL    R0                                    ; Clear R0 to store the two     ;G:10
      50   55    02    01    EF    060A  1260         EXTZV   #1,#2,R5,R0                           ; bits that flag if either      ;G:10
                                060F  1261                                                       ; of the BI's are present.      ;G:11
                                060F  1262         CASE    R0,<20$,30$,40$,50$> TYPE=B           ; Any Bi's present?             ;G:9
          03'   00    50    8F    060F               CASEB   R0,#0,S^#<<30005$-30004$>/2>-1
                                0613       30004$:
                          0008' 0613               .SIGNED_WORD    20$-30004$
                          0026' 0615               .SIGNED_WORD    30$-30004$
                          0030' 0617               .SIGNED_WORD    40$-30004$
                          003A' 0619               .SIGNED_WORD    50$-30004$
                                061B       30005$:
                                061B  1263 ;+                                                                                   ;G:9
                                061B  1264 ;       no BI's present - then continue                                              ;G:9
                                061B  1265 ;-                                                                                   ;G:9
      50   000001AB'EF    9E    061B  1266 20$:    MOVAB   L^T_MACHCK,R0                         ; Point to error text           ;G:9
              51    53    D0    0622  1267         MOVL    R3,R1                                 ; Get virtual address           ;G:9
                                0625  1268         $PRINTI_S L^FMT_EXCEPTION,R0,R1               ; Type the error text           ;G:9
                    51    DD    0625                       PUSHL   R1
                    50    DD    0627                       PUSHL   R0
          000001F9'EF    9F    0629                       PUSHAB  L^FMT_EXCEPTION
      00000000'EF    03    FB    062F                       CALLS   #$$N, DSX$PRINTI
                    50    D4    0636  1269         CLRL    R0                                                                   ;G:11
                          04    0638  1270         RET                                           ; Return with error status.     ;G:11
                                0639  1271                                                                                      ;G:9
                                0639  1272 ;+                                                                                   ;G:9
                                0639  1273 ;       only BI#0 present                                                            ;G:9
```

```
                    0639  1274 ;-                                                                  ;G:11
          54   D5   0639  1275 30$:    TSTL    R4                          ; The 2nd bit position in   ;G:10
                    063B  1276                                             ; X should = 0.             ;G:10
          DE   12   063B  1277         BNEQ    20$                         ; Report an error tring     ;G:10
                    063D  1278                                             ; to access BI#1, when      ;G:9
                    063D  1279                                             ; not present.              ;G:9
                    063D  1280 ;       BEQL    35$                         ; Address in R3 is accessing ;G:11
                    063D  1281                                             ; BI#0.                     ;G:11
                    063D  1282                                                                         ;G:10
     50   01   D0   063D  1283 35$:    MOVL    S^#SS$_NORMAL,R0            ; Success, found the BI.    ;G:11
        000D   31   0640  1284         BRW     EXIT_CHECK_CSR1             ; continue                  ;G:9
                    0643  1285                                                                         ;G:11
                    0643  1286 ;+                                                                      ;G:9
                    0643  1287 ;       only BI#1 present                                               ;G:9
                    0643  1288 ;-                                                                      ;G:9
          54   D5   0643  1289 40$:    TSTL    R4                          ; The 2nd bit position in   ;G:10
                    0645  1290                                             ; X should = 1.             ;G:10
          D4   13   0645  1291         BEQL    20$                         ; Report an error tring     ;G:10
                    0647  1292                                             ; to access BI#0, when      ;G:10
                    0647  1293                                             ; not present.              ;G:10
                    0647  1294 ;       BEQL    45$                         ; Address in R3 is accessing ;G:11
                    0647  1295                                             ; BI#1.                     ;G:11
                    0647  1296                                                                         ;G:10
     50   01   D0   0647  1297 45$:    MOVL    S^#SS$_NORMAL,R0            ; Success, found the BI.    ;G:9
        0003   31   064A  1298         BRW     EXIT_CHECK_CSR1             ; continue                  ;G:9
                    064D  1299 ;+                                                                      ;G:9
                    064D  1300 ;       both BI#0 and BI#1 present                                      ;G:9
                    064D  1301 ;-                                                                      ;G:9
     50   01   D0   064D  1302 50$:    MOVL    S^#SS$_NORMAL,R0            ; Success, found the BI.    ;G:9
                    0650  1303 ;       BRW     EXIT_CHECK_CSR1             ; continue                  ;G:11
                    0650  1304                                                                         ;G:9
                    0650  1305                                                                         ;G:9
                    0650  1306 EXIT_CHECK_CSR1:                                                        ;G:9
                    0650  1307                                                                         ;G:9
               04   0650  1308         RET                                 ; Return                    ;G:11
```

```
                                  0651  1310 ;++                                                                                  ;G:11
                                  0651  1311 ;  Implicit input R3 contains address to examine                                     ;G:9
                                  0651  1312 ;--                                                                                  ;G:11
                            0030  0651  1313 .ENTRY  SET_LOOP_BACK_BIT,^M<R4,R5>                ; Save scratch space            ;G:11
        6D   00000E45'EF     9E   0653  1314         MOVAB   L^FS_HANDLR,(FP)                   ; Set up exception handler      ;G:11
                 51   53     D0   065A  1315         MOVL    R3,R1                              ; Save desired address in R1.   ;G:11
                 50   01     D0   065D  1316         MOVL    S^#SS$_NORMAL,R0                   ; Assume a success.             ;G:11
                      54     D4   0660  1317         clrl    R4                                 ; clear some user space         ;G:11
                      55     D4   0662  1318         clrl    R5                                                                 ;G:9
                                  0664  1319                                                    ; Find which NBIA CSR 0 resiter ;G:1
                                  0664  1320                                                    ; to use.                       ;G:9
                                  0664  1321                                                    ; CSR 0 is located at address: ;G:9
                                  0664  1322                                                    ;          2   X     0    8    ;G:9
                                  0664  1323                                                    ;          0010 ---- 0000 1000 ;G:9
                                  0664  1324                                                    ; 1's comp 0000 1100 0000 0000 ;G:10
                                  0664  1325                                                    ; mask     1111 0011 1111 1111 ;G:10
   54   53   F3FFFFFF 8F     CB   0664  1326         bicl3   #^XF3FFFFFF,R3,R4                  ; where X = 0,4,or 8.           ;G:10
        54   60080000 8F     C0   066C  1327         addl2   #^X60080000,R4                     ; Find CSR 0 at address         ;G:11
                                  0673  1328                                                    ; ^X2X080000                    ;G:9
        64   00010000 8F     C8   0673  1329         BISL2   #NBIA$M_BILP,NBIA$L_CSR0(R4)       ; enable BIIC maint. loopback ;G:9
                                  067A  1330                                                                                     ;G:9
   55   53   F3FFFFFF 8F     CB   067A  1331         bicl3   #^XF3FFFFFF,R3,R5                  ; R5 now points at the          ;G:11
                                  0682  1332                                                    ; base bi address to            ;G:9
                                  0682  1333                                                    ;  ^X2X000000                   ;G:11
                                  0682  1334                                                    ; where X = 0,4,or 8.           ;G:10
                                  0682  1335                                                                                     ;G:10
        55   60000000 8F     C0   0682  1336         addl2   #^X60000000,R5                     ; Find CSR 0 at address         ;G:11
                                  0689  1337                                                    ; ^X2X000000                    ;G:9
             28 A5   08     C8   0689  1338         BISL2   #BIIC$M_RTOEVEN,BIIC$L_BCICR(R5) ; enable retry timeout          ;G:9
                                  068D  1339                                                                                     ;G:9
                                  068D  1340 EXIT_SET_LOOP:                                                                      ;G:11
                                  068D  1341                                                                                     ;G:11
                            04    068D  1342         RET                                        ; Return                        ;G:11
```

```
                                068E  1344 ;++                                                                          ;G:11
                                068E  1345 ;  Implicit input R3 contains address to examine                             ;G:9
                                068E  1346 ;--                                                                          ;G:11
                          0010  068E  1347 .ENTRY  CLEAR_LOOP_BACK_BIT,^M<R4>                ; Save scratch space        ;G:11
      6D   00000E45'EF    9E    0690  1348         MOVAB   L^FS_HANDLR,(FP)                  ; Set up exception handler  ;G:11
                51   53   D0    0697  1349         MOVL    R3,R1                             ; Save desired address in R1. ;G:11
                50   01   D0    069A  1350         MOVL    S^#SS$_NORMAL,R0                  ; Assume a success.         ;G:11
                     54   D4    069D  1351         clrl    R4                                ; clear some user space     ;G:9
                                069F  1352                                                   ; Find which NBIA CSR 0 resiter ;G:1
                                069F  1353                                                   ; to use.                   ;G:10
                                069F  1354                                                   ; CSR 0 is located at address: ;G:10
                                069F  1355                                                   ;          2   X     0    8   ;G:10
                                069F  1356                                                   ;          0010 ---- 0000 1000 ;G:10
                                069F  1357                                                   ; 1's comp 0000 1100 0000 0000 ;G:10
                                069F  1358                                                   ; mask     1111 0011 1111 1111 ;G:10
   54   53   F3FFFFFF 8F   CB    069F  1359         bicl3   #^XF3FFFFFF,R3,R4                 ; where X = 0,4,or 8.       ;G:10
        54   60080000 8F   C0    06A7  1360         addl2   #^X60080000,R4                    ; Find CSR 0 at address     ;G:11
                                06AE  1361                                                   ; ^X2X080000                ;G:9
        64   00010000 8F   CA    06AE  1362         BICL2   #NBIA$M_BILP,NBIA$L_CSR0(R4)      ; disable BIIC maint. loopback ;G:9
                                06B5  1363 EXIT_CLEAR_LOOP:                                                             ;G:11
                                06B5  1364                                                                              ;G:11
                          04    06B5  1365         RET                                       ; Return                    ;G:11
```

```
                        06B6  1367          .SBTTL  DEPOSIT MEMORY AND REGISTERS SUBROUTINE
                        06B6  1368 ;++
                        06B6  1369 ; FUNCTIONAL DESCRIPTION:
                        06B6  1370 ;
                        06B6  1371 ;       LOCATES AND MODIFIES MEMORY OR GENERAL REGISTERS AS SPECIFIED
                        06B6  1372 ;       BY THE OPERATOR.
                        06B6  1373 ;       ALL SUPERVISOR OVERHEAD (I.E., STACK & REGISTER USAGE)
                        06B6  1374 ;       IS TRANSPARENT TO THE OPERATOR.
                        06B6  1375 ;
                        06B6  1376 ; CALLING SEQUENCE:
                        06B6  1377 ;
                        06B6  1378 ;       BSBW    VRDEPOSIT
                        06B6  1379 ;
                        06B6  1380 ; INPUT PARAMETERS:
                        06B6  1381 ;
                        06B6  1382 ;       R2      = BASE OF CLI DATA FRAME.
                        06B6  1383 ;       CLI$L_FLAGS(R2)          ; SIZE SPECIFIERS
                        06B6  1384 ;       CLI$L_ADDRESS(R2)        ; ADDRESS SPECIFIER
                        06B6  1385 ;       CLI$L_DATA(R2)           ; ITEM TO BE STORED
                        06B6  1386 ;
                        06B6  1387 ; IMPLICIT INPUTS:
                        06B6  1388 ;
                        06B6  1389 ;       (AP) = BASE ADDRESS OF PROGRAM REGISTER CONTEXT
                        06B6  1390 ;       DFLTSIZE                         ; DEFAULT SIZE IN BYTES
                        06B6  1391 ;
                        06B6  1392 ; OUTPUT PARAMETERS:
                        06B6  1393 ;
                        06B6  1394 ;       NONE
                        06B6  1395 ;
                        06B6  1396 ; IMPLICIT OUTPUTS:
                        06B6  1397 ;
                        06B6  1398 ;       (AP) = BASE ADDRESS OF PROGRAM REGISTER CONTEXT (MODIFIED)
                        06B6  1399 ;
                        06B6  1400 ; COMPLETION CODES:
                        06B6  1401 ;
                        06B6  1402 ;       NONE
                        06B6  1403 ;
                        06B6  1404 ; SIDE EFFECTS:
                        06B6  1405 ;
                        06B6  1406 ;       NONE
                        06B6  1407 ;
                        06B6  1408 ;--                                                          ;G:11
```

```
                          06B6  VRDEPOSIT::                                  ;
          0118 8F    BB   06B6          PUSHR   #^M<R3,R4,R8>               ; SAVE SOME REGISTERS                  ;G:5
                          06BA
                          06BA  10$:
      53   18 A2    D0   06BA          MOVL    CLI$L_ADDRESS(R2),R3        ; Get address
                          06BE
                          06BE  ;+
                          06BE  ; FIRST, DETERMINE LOCATION OF ITEM SPECIFIED.  IF A REGISTER,
                          06BE  ; IT'S STORED SOMEWHERE IN MEMORY AT THIS POINT IN TIME.
                          06BE  ;-
                          06BE
      3E 62   14    E1   06BE          BBC     #CLI$V_REG,CLI$L_FLAGS(R2),20$ ; Branch if not external reg
         10   53    D1   06C2          CMPL    R3,#16                      ; REG ADR EXCEED 'PSL' ?
              10    1B   06C5          BLEQU   15$                                                                  ;G:6
                          06C7
                          06C7          $DS_PRINTF_S  L^FMTINVLDREG         ; COMPLAIN ABOUT REGISTER NAME          [12]
     0000013A'EF    9F   06C7                  PUSHAB  L^FMTINVLDREG
 00000000'9F   01    FB   06CD                  CALLS   #$$N, a#DS$PRINTF
            0175    31   06D4          BRW     VRDEPOSITX                  ; AND EXIT
                          06D7                                              ;
                          06D7
     00000000'EF    95   06D7  15$:    TSTB    MP$GB_SETCPU                ; See if we set cpu to an AP            [18]
              1B    13   06DD          BEQL    17$                         ; Branch if not AP                      [18]
     000001E1'EF    94   06DF          CLRB    MP$GB_FUNCTION              ; Set function to DEPOSIT               [18]
     00000000'EF    16   06E5          JSB     MP$_GET_GPR                 ; Get the address of the register       [18]
           03 50    E8   06EB          BLBS    R0,16$                      ; Success?                              [18]
                          06EE                                              ; Yes, then branch                      [18]
                          06EE                                              ; Else, AP did not respond in time
            015B    31   06EE          BRW     VRDEPOSITX                  ; AND EXIT                              [18]
 53  000001EA'EF    D0   06F1  16$:    MOVL    MP$GL_REG_ADDRESS ,R3       ; and put it in R3                      [18]
              1E    11   06F8          BRB     30$                         ; Continue
                          06FA
      53   6C43    DE   06FA  17$:    MOVAL   (AP)[R3],R3                 ; Calculate real address
              18    11   06FE          BRB     30$                         ; Continue
                          0700
      14 62   1A    E0   0700  20$:    BBS     #CLI$V_PREG,CLI$L_FLAGS(R2),30$ ; Branch if not memory
 07 0444 C2   02    E1   0704          BBC     #CLI$V_BASE_QUAL, CLI$L_FLAGS2(R2), 25$                          ;[20
   53   0448 C2    C0   070A          ADDL2   CLI$L_TEMP_BASE(R2), R3 ;Add Temp Base Adr, or                   [20]
              07    11   070F          BRB     30$                         ;                                       [20]
 53  0000009C'EF    C0   0711  25$:    ADDL2   L^BASEADDRESS,R3            ; Compute memory address                [12]
                          0718  30$:
                          0718
                          0718  ;+
                          0718  ; DETERMINE SIZE OF ITEM, USE DEFAULT IF NOT SPECIFIED.
                          0718  ;-
                          0718
         54   04    D0   0718          MOVL    #4,R4                                ; YES, SET SIZE IN BYTES
      15 62   0F    E0   071B          BBS     #CLI$V_LONG,CLI$L_FLAGS(R2),79$ ; BRANCH IF LONGWORD SPECIFIED ;G:5
         54   02    D0   071F          MOVL    #2,R4                                ; YES, SET SIZE IN BYTES
      0E 62   0E    E0   0722          BBS     #CLI$V_WORD,CLI$L_FLAGS(R2),79$ ; BRANCH IF WORD SPECIFIED    ;G:5
         54   01    D0   0726          MOVL    #1,R4                                ; YES, SET SIZE IN BYTES
      07 62   0D    E0   0729          BBS     #CLI$V_BYTE,CLI$L_FLAGS(R2),79$ ; BRANCH IF BYTE SPECIFIED    ;G:5
 54  00000098'EF    D0   072D          MOVL    L^DFLTSIZE,R4               ; ELSE USE DEFAULT SIZE IN BYTES        [12]
                          0734  79$:                                                                                ;G:5
```

```
                                0734  1463 ;+
                                0734  1464 ; INSERT THE TARGET ITEM INTO MEMORY
                                0734  1465 ;-
                                0734  1466
                     0619   30  0734  1467          BSBW    RBREAK_OUT                  ; REMOVE ALL BREAKPOINTS
                                0737  1468
                  03 62   1A   E1  0737  1469          BBC     #CLI$V_PREG,CLI$L_FLAGS(R2),80$ ; IF NOT IPR treat as memory    [28]
                     0027   31  073B  1470          BRW     90$                             ; ELSE treat as IPR             ;G:5
                                073E  1471                                                                                  ;G:5
         03 0000FE00'EF   1C   E0  073E  1472 80$:    BBS     #DSA$V_USER,L^DSA$GL_FLAGS,81$ ; IF user mode THEN branch       [28]
                     05A5   30  0746  1473          BSBW    SAVE_SCB_VECTORS            ; SAVE PROGRAM'S SCB VECTORS    ;G:5
                                0749  1474                                              ; AND RE-INSERT SUPERVISORS       [28]
                                0749  1475                                                                                  ;G:5
                       63   9F  0749  1476 81$:    PUSHAB  (R3)                        ; ADDRESS TO STORE IT           ;G:5
                     1C A2  9F  074B  1477          PUSHAB  CLI$L_DATA(R2)              ; ADDRESS OF DATA TO STORE
                       54   DD  074E  1478          PUSHL   R4                          ; NUMBER OF BYTES TO STORE
            00000DC9'EF   03   FB  0750  1479          CALLS   #3,FETCH_STORE          ; STORE THOSE BYTES THERE       ;G:5
         03 0000FE00'EF   1C   E0  0757  1480          BBS     #DSA$V_USER,L^DSA$GL_FLAGS,82$ ; IF user mode THEN branch       [28]
                     0556   30  075F  1481          BSBW    RESTORE_SCB_VECTORS         ; RESTORE PROGRAM'S VECTORS       [28]
                                0762  1482                                                                                  ;G:6
                                0762  1483 82$:                                                                            ;G:5
                     0085   31  0762  1484          BRW     100$                        ; Continue                      ;G:5
                                0765  1485 ;
                   54   01   D0  0765  1486 90$:    MOVL    #1,R4                       ; In case NEXT used, increment by 1
                       55   D4  0768  1487          CLRL    R5                          ; CMK$SGIPR code for DEPOSIT function
                 51   1C A2   D0  076A  1488          MOVL    CLI$L_DATA(R2),R1           ; Data value to store   [25]     ;G:2
      10 0000FE00'EF   1C   E1  076E  1489          BBC     #DSA$V_USER,L^DSA$GL_FLAGS,94$      ; User mode?
            00000000'EF   9F  0776  1490          PUSHAB  L^T_EMESSG1                 ; User mode error message       [12]  ;G:2
         00000000'EF   01   FB  077C  1491          CALLS   #1,DS$PRINTF                ; Type it
                     00C6   31  0783  1492          BRW     VRDEPOSITX                  ; Leave this place
                                0786  1493 94$:
            00000000'EF   95   0786  1494          TSTB    MP$GB_SETCPU                ; See if we set cpu to an AP      [18]
                       31   13  078C  1495          BEQL    96$                         ; Branch if not AP                [18]
                   54   01   D0  078E  1496          MOVL    #1,R4                       ; In case NEXT used, increment by 1 [18]
            000001E1'EF   94   0791  1497          CLRB    MP$GB_FUNCTION              ; CMK$SGIPR code for DEPOSIT function [18]
         000001F6'EF   51   D0  0797  1498          MOVL    R1,MP$GL_SAVED_R1           ; STORE r1 = value to deposit     [18]
            00000000'EF   16  079E  1499          JSB     MP$_GET_IPR                 ; Get the Value of the ip register [18]
         55 000001E6'EF   D0  07A4  1500          MOVL    MP$GL_IPR_VALUE ,R5         ; and put it in R5                [18]
         50 000001F2'EF   D0  07AB  1501          MOVL    MP$GL_RET_STATUS,R0         ; Also, store the returned status in r0 [18]
           03 000001E2'EF   E9  07B2  1502          BLBC    MP$GL_IPR_STATUS,95$        ; Check status of GET_IPR routine [18]
                     002E   31  07B9  1503          BRW     100$                                                        ;G:5
                     008D   31  07BC  1504 95$:    BRW     VRDEPOSITX                  ; Exit if ERROR routine         ;G:5
                                07BF  1505
      03 0000FE00'EF   1C   E0  07BF  1506 96$:    BBS     #DSA$V_USER,L^DSA$GL_FLAGS,98$ ; IF user mode THEN branch       [28]
                     0524   30  07C7  1507          BSBW    SAVE_SCB_VECTORS            ; SAVE PROGRAM'S SCB VECTORS    ;G:5
                                07CA  1508                                              ; AND RE-INSERT SUPERVISORS       [28]
                                07CA  1509 98$:    CMK     SGIPR                       ; Store/Get IPR value via CHMK trap ;G:5
                       7E   DC  07CA                 MOVPSL  -(SP)
                 06 6E   1A   E0  07CC                 BBS     #PSL$V_IS,(SP),30006$
                       8E   D4  07D0                 CLRL    (SP)+
                       0A   BC  07D2                 CHMK    #CMK$_SGIPR
                       06   11  07D4                 BRB     30007$
            00000FC0'EF   16  07D6          30006$: JSB     CMK$SGIPR
                                07DC          30007$:
                 55   51   D0  07DC  1510          MOVL    R1,R5                       ; Save read-back verify value
                                07DF  1511                                                                                  ;G:5
      03 0000FE00'EF   1C   E0  07DF  1512 99$:    BBS     #DSA$V_USER,L^DSA$GL_FLAGS,100$ ; IF user mode THEN branch      [28]
```

```
                    04CE   30  07E7  1513          BSBW    RESTORE_SCB_VECTORS     ; RESTORE PROGRAM'S VECTORS             [28]
                                07EA  1514                                                                                ;G:5
                                07EA  1515 100$:
                                07EA  1516
                      01   BB  07EA  1517          PUSHR   #^M<R0>                 ; SAVE RETURN CODE
                    058C   30  07EC  1518          BSBW    RBREAK_IN               ; PUT BREAKPOINTS BACK
                      01   BA  07EF  1519          POPR    #^M<R0>                 ; RESTORE RETURN CODE
                                07F1  1520
                   2B 50   E8  07F1  1521          BLBS    R0,120$                 ; Continue if no error
                54 62   1A  E1  07F4  1522          BBC     #CLI$V_PREG,CLI$L_FLAGS(R2),VRDEPOSITX ; Exit if not IPR
                09 50   01  E0  07F8  1523          BBS     #1,R0,110$              ; Was it the DEPOSIT that failed?
           50   00000224'EF  9E  07FC  1524          MOVAB   L^T_PREGWRITE,R0        ; Yes--set up correct error message     [12]
                      07   11  0803  1525          BRB     115$                    ; Continue                              [12]
           50   0000021A'EF  9E  0805  1526 110$:   MOVAB   L^T_PREGREAD,R0        ; Error was on read-back                [12]
                                080C  1527 115$:   $PRINTI_S       L^FMT_BADPREG,R0,R3 ; Type error message               [12]
                      53   DD  080C                PUSHL   R3
                      50   DD  080E                PUSHL   R0
                0000022D'EF  9F  0810                PUSHAB  L^FMT_BADPREG
           00000000'EF   03  FB  0816                CALLS   #$$N, DSX$PRINTI
                      2D   11  081D  1528          BRB     VRDEPOSITX              ; Exit routine now.
                                081F  1529
                                081F  1530 ;+                                                                             ;G:9
                                081F  1531 ; IF "NEXT" IS NOT ZERO, DECREMENT IT AND LOOP BACK FOR NEXT ITEM.
                                081F  1532 ;  (EXCEPT WHEN DEPOSITING REGISTERS AND "PSL" HAS JUST BEEN MODIFIED)
                                081F  1533 ;-
                                081F  1534
                30 A2   D5  081F  1535 120$:   TSTL    CLI$L_NEXT(R2)          ; All specified items displayed?
                   1F   13  0822  1536          BEQL    150$                    ; YES, EXIT
                                0824  1537                                  ;
             08 62   14  E1  0824  1538          BBC     #CLI$V_REG,CLI$L_FLAGS(R2),125$ ; Skip if not registers
             10   18 A2  D1  0828  1539          CMPL    CLI$L_ADDRESS(R2),#PSLREG ; POINTING AT "PSL" ?
                   15   13  082C  1540          BEQL    150$                    ; YES, THEN IT'S TIME TO EXIT
                   04   11  082E  1541          BRB     128$                    ; Increment
             05 62   1A  E1  0830  1542 125$:   BBC     #CLI$V_PREG,CLI$L_FLAGS(R2),130$ ; Skip if not IPRs
                18 A2  D6  0834  1543 128$:   INCL    CLI$L_ADDRESS(R2)       ; Bump to next register
                   04   11  0837  1544          BRB     140$                    ; AND SKIP TO LOOP BACK
                                0839  1545                                  ;
             18 A2   54   C0  0839  1546 130$:   ADDL2   R4,CLI$L_ADDRESS(R2)    ; BUMP TO NEXT DATA ITEM
                30 A2   D7  083D  1547 140$:   DECL    CLI$L_NEXT(R2)          ; DO ACCOUNTING
                 FE77   31  0840  1548          BRW     10$                     ; GO DO WHOLE THING AGAIN
                                0843  1549
             02 62   1A  E0  0843  1550 150$:   BBS     #CLI$V_PREG,CLI$L_FLAGS(R2),160$ ; Branch if IPR
                   03   11  0847  1551          BRB     VRDEPOSITX              ; Then exit
                 FA33   30  0849  1552 160$:   BSBW    VRTYPEXAMINE            ; Only do display part of VREXAMINE
                                084C  1553
                                084C  1554 VRDEPOSITX:                          ;
                0118 8F   BA  084C  1555          POPR    #^M<R3,R4,R8>           ; RESTORE REGISTERS                     ;G:5
                                0850  1556          RSB                     ; RETURN
```

```
0851  1558          .SBTTL  SET BREAKPOINT SUBROUTINE
0851  1559 ;++
0851  1560 ; FUNCTIONAL DESCRIPTION:
0851  1561 ;
0851  1562 ;       SAVES AN 'OPCODE' FROM THE SPECIFIED ADDRESS AND REPLACES
0851  1563 ;       IT WITH A BREAKPOINT CODE                                   ;G:5
0851  1564 ;
0851  1565 ; CALLING SEQUENCE:
0851  1566 ;
0851  1567 ;       BSBW    VRSETBRK
0851  1568 ;
0851  1569 ; INPUT PARAMETERS:
0851  1570 ;
0851  1571 ;       CLI$L_ADDRESS(DS$GL_CLIBASE)
0851  1572 ;       CLI$L_FLAGS(DS$GL_CLIBASE)
0851  1573 ;
0851  1574 ; IMPLICIT INPUTS:      NONE
0851  1575 ;
0851  1576 ; OUTPUT PARAMETERS:    NONE
0851  1577 ;
0851  1578 ; IMPLICIT OUTPUTS:     NONE
0851  1579 ;
0851  1580 ; COMPLETION CODES:     NONE
0851  1581 ;
0851  1582 ; SIDE EFFECTS:         NONE
0851  1583 ;--
```

```
                        0851  1585 VRSETBRK::
                  1F    BB  0851  1586          PUSHR   #^M<R0,R1,R2,R3,R4>     ; SAVE WORKING REGISTERS                ;G:6
                  54    D4  0853  1587          CLRL    R4                                                              ;G:6
                04F8    30  0855  1588          BSBW    RBREAK_OUT              ; REMOVE ALL BREAKPOINTS
          52  00000000'EF  DE  0858  1589          MOVAL   L^DS$GL_CLIBASE, R2     ; GET CLI ARGUMENT FRAME BASE.  [12]
           4E 62    17    E4  085F  1590          BBSC    #CLI$V_KERNEL, -        ; SET HIDDEN BRK IF KERNEL REQ
                                1591                  CLI$L_FLAGS(R2), 10$
           50   18 A2    D0  0863  1592          MOVL    CLI$L_ADDRESS(R2), R0   ;GET ADDRESS GIVEN              [20]
                                1593
        0C 0444 C2    02    E1  0867  1594          BBC     #CLI$V_BASE_QUAL, -     ;                               [20]
                                086D  1595                  CLI$L_FLAGS2(R2), 3$    ;                               [20]
           50   0448 C2    C0  086D  1596          ADDL2   CLI$L_TEMP_BASE(R2), R0 ;Add Temp Base,                 [20]  ;G:6
           54   0448 C2    D0  0872  1597          MOVL    CLI$L_TEMP_BASE(R2), R4 ;Move Temp Base Address to R4           ;G:6
                                0877  1598                                          ;to be store in a base address table  ;G:7
                  0E    11  0877  1599          BRB     6$                      ;                               [20]
          50  0000009C'EF  C0  0879  1600 3$:     ADDL2   L^BASEADDRESS, R0       ;Add Def Base Adr.              [12]
          54  0000009C'EF  D0  0880  1601          MOVL    L^BASEADDRESS, R4       ;Move Base Address to R4                ;G:6
                                0887  1602                                          ;to be store in a base address table  ;G:6
              53    50    D0  0887  1603 6$:     MOVL    R0,R3                   ;Save A Copy Of The Address     [20]
                                088A  1604
                014D    30  088A  1605          BSBW    FIND_BPT                ; SEE IF IT'S ALREADY THERE
                  07 50   E9  088D  1606          BLBC    R0, 8$                  ; NOT FOUND, INSERT IN AN EMPTY         ;G:6
                                0890  1607                                          ; SLOT                                  ;G:6
                  54    D5  0890  1608          TSTL    R4                      ; SEE IF A NEW BASE IS GOING TO         ;G:6
                                0892  1609                                          ; INSERTED AT BREAK REFERENCE           ;G:6
                  13    12  0892  1610          BNEQ    9$                      ; MODIFY OLD BASE                       ;G:6
                0033    31  0894  1611          BRW     VRSETBRKX               ; NO CHANGE NEEDED, EXIT QUIETLY        ;G:6
                                0897  1612                                                                              ;G:6
                  50    D4  0897  1613 8$:     CLRL    R0                      ; TRY FOR AN EMPTY SLOT                 ;G:6
                013E    30  0899  1614          BSBW    FIND_BPT                ; LOCATE EMPTY SLOT
              1C 50     E9  089C  1615          BLBC    R0, 20$                 ; BRANCH IF NO FREE SLOTS
    00000014'EF41     53    D0  089F  1616          MOVL    R3, L^DS$AA_BPTADDR[R1] ; STORE ADDRESS OF BPT IN TABLE [12]
    00000054'EF41     54    D0  08A7  1617 9$:     MOVL    R4, L^DS$AA_BPTBASE[R1] ; STORE BASE ADDRESS CORRESPONDING      ;G:6
                                08AF  1618                                          ; TO BIAS ADDRESS IN DS$AA_BPTADDR      ;G:6
                                08AF  1619                                          ; TABLE                                 ;G:7
                  19    11  08AF  1620          BRB     VRSETBRKX               ; EXIT
                                08B1  1621
    00000014'EF   18 A2    D0  08B1  1622 10$:    MOVL    CLI$L_ADDRESS(R2), -
                                08B9  1623                  L^DS$AA_BPTADDR         ; SET HIDDEN BREAKPOINT         [12]
                  0F    11  08B9  1624          BRB     VRSETBRKX               ; EXIT
                                08BB  1625
                                08BB  1626 20$:    $DS_PRINTF_S  L^FMTNOBPTSLEFT,#BPTMAX ; NO MORE BREAK POINTS    [12]
                  0F    DD  08BB                      PUSHL   #BPTMAX
          00000182'EF   9F  08BD                      PUSHAB  L^FMTNOBPTSLEFT
       00000000'9F      02  08C3                      CALLS   #$$N, a#DS$PRINTF
                                08CA  1627
                                08CA  1628 VRSETBRKX:
                04AE    30  08CA  1629          BSBW    RBREAK_IN               ; PUT ALL BREAKPOINTS BACK IN
                  1F    BA  08CD  1630          POPR    #^M<R0,R1,R2,R3,R4>     ; RESTORE REGISTERS                     ;G:6
                        05  08CF  1631          RSB                             ; RETURN
```

```
                        08D0  1633          .SBTTL  CLEAR BREAKPOINT SUBROUTINE
                        08D0  1634 ;++
                        08D0  1635 ; FUNCTIONAL DESCRIPTION:
                        08D0  1636 ;
                        08D0  1637 ;       RESTORES THE SAVED 'OPCODE' TO THE SPECIFIED ADDRESS,
                        08D0  1638 ;       IF IT IS A KNOWN BREAKPOINT
                        08D0  1639 ;
                        08D0  1640 ; CALLING SEQUENCE:
                        08D0  1641 ;
                        08D0  1642 ;       BSBW    VRCLRBRK
                        08D0  1643 ;
                        08D0  1644 ; INPUT PARAMETERS:
                        08D0  1645 ;
                        08D0  1646 ;       R2      = BASE OF CLI DATA FRAME.
                        08D0  1647 ;       CLI$L_ADDRESS(R2)
                        08D0  1648 ; IMPLICIT INPUTS:
                        08D0  1649 ;
                        08D0  1650 ;       CLI$L_DATA(R2)          ; IF -1, INDICATES "ALL"
                        08D0  1651 ;
                        08D0  1652 ; OUTPUT PARAMETERS:    NONE
                        08D0  1653 ;
                        08D0  1654 ; IMPLICIT OUTPUTS:     NONE
                        08D0  1655 ;
                        08D0  1656 ; COMPLETION CODES:     NONE
                        08D0  1657 ;
                        08D0  1658 ; SIDE EFFECTS:         NONE
                        08D0  1659 ;--
```

```
                                08D0  VRCLRBRK::
                     07   BB    08D0          PUSHR   #^M<R0,R1,R2>            ; SAVE WORKING REGISTERS
                   047B   30    08D2          BSBW    RBREAK_OUT               ; REMOVE ALL BREAKPOINTS
        52   00000000'EF  DE    08D5          MOVAL   L^DS$GL_CLIBASE, R2      ; BASE CLI DATA BASE                    [12]
                                08DC
     FFFFFFFF 8F   1C A2  D1    08DC          CMPL    CLI$L_DATA(R2),#-1       ; CHECK FOR 'ALL' ARGUMENT
                     3D   13    08E4          BEQL    30$                      ; YES, GO CLEAR THEM ALL
                                08E6
        09 0444 C2   02   E1    08E6          BBC     #CLI$V_BASE_QUAL, CLI$L_FLAGS2(R2), 3$                  ;[20]
    50   18 A2   0448 C2  C1    08EC          ADDL3   CLI$L_TEMP_BASE(R2), -   ;Add Temp Base Adr, or          [20]
                                08F3                  CLI$L_ADDRESS(R2),R0     ;                               [20]
                     09   11    08F3          BRB     6$                       ;                               [20]
  50   18 A2   0000009C'EF  C1    08F5  3$:     ADDL3   L^BASEADDRESS, -         ;Add Def Base Adr.              [12]
                                08FE                  CLI$L_ADDRESS(R2),R0     ;
                                08FE
                   00D9   30    08FE  6$:     BSBW    FIND_BPT                 ; LOCATE IT
                  10 50   E9    0901          BLBC    R0,10$                   ; NOT FOUND!
          00000014'EF41   D4    0904          CLRL    L^DS$AA_BPTADDR[R1]      ; REMOVE BREAKPOINT                     [12]
          00000054'EF41   D4    090B          CLRL    L^DS$AA_BPTBASE[R1]      ; REMOVE BASE ADDRESS CORRESPONDING   ;G:6
                                0912                                           ; TO BIAS ADDRESS IN DS$AA_BPTADDR    ;G:6
                                0912                                           ; TABLE                               ;G:7
                     23   11    0912          BRB     VRCLRBRKX                ; AND EXIT
                                0914  10$:
                                0914          $DS_PRINTF_S  L^FMTBPTNOTSET     ; WAS NOT SET !                         [12]
          0000011F'EF   9F      0914                  PUSHAB  L^FMTBPTNOTSET
      00000000'9F   01   FB    091A                  CALLS   #$$N, @#DS$PRINTF
                     14   11    0921          BRB     VRCLRBRKX                ; EXIT
                                0923
                                0923  30$:
               51   0F   D0    0923          MOVL    #BPTMAX,R1               ; MAX NUMBER OF BPT'S
          00000014'EF41   D4    0926  40$:    CLRL    L^DS$AA_BPTADDR[R1]      ; FREE UP THIS BREAKPOINT               [12]
          00000054'EF41   D4    092D          CLRL    L^DS$AA_BPTBASE[R1]      ; REMOVE BASE ADDRESS CORRESPONDING   ;G:6
                                0934                                           ; TO BIAS ADDRESS IN DS$AA_BPTADDR    ;G:6
                                0934                                           ; TABLE                               ;G:7
                  EF 51   F5    0934          SOBGTR  R1,40$                   ; CHECK WHOLE TABLE (EXCEPT [0])
                                0937
                                0937  VRCLRBRKX:                               ;
                   0441   30    0937          BSBW    RBREAK_IN                ; PUT BREAKPOINTS BACK IN
                     07   BA    093A          POPR    #^M<R0,R1,R2>            ; RESTORE REGISTERS
                          05    093C          RSB                              ; RETURN
```

```
                                093D          .SBTTL  DSP$REMOVEBREAK Remove breakpoints
                                093D  ;++
                                093D  ;
                                093D  ; FUNCTIONAL DESCRIPTION:
                                093D  ;
                                093D  ;       This routine can be called to remove breakpoints from
                                093D  ;       a section of memory.
                                093D  ;
                                093D  ; CALLING SEQUENCE:
                                093D  ;
                                093D  ;       CALLS/G arglist,DSP$REMOVEBREAK
                                093D  ;
                                093D  ; INPUT PARAMETERS:
                                093D  ;
                                093D  ;       0       #2
                                093D  ;       4       Lowest address of range
                                093D  ;       8(AP)   Highest address of range
                                093D  ;
                                093D  ; IMPLICIT INPUTS:
                                093D  ;
                                093D  ;       DSA$AA_BPTADDR[n]
                                093D  ;
                                093D  ; OUTPUT PARAMETERS:    NONE
                                093D  ;
                                093D  ; IMPLICIT OUTPUTS:
                                093D  ;
                                093D  ;       Some breakpoints are removed from DSA$AA_BPTADDR.
                                093D  ;
                                093D  ; COMPLETION CODES:     NONE
                                093D  ;
                                093D  ; SIDE EFFECTS:         NONE
                                093D  ;--
                                093D
                        001C    093D  .ENTRY  DSP$REMOVEBREAK,^M<R2,R3,R4>                                    ;G:6
                                093F
                  040E    30    093F          BSBW    RBREAK_OUT              ; Put opcodes back in memory
 53   00000014'EF      9E    0942          MOVAB   L^DS$AA_BPTADDR,R3      ; Base BPT address table                [12]
 54   00000054'EF      9E    0949          MOVAB   L^DS$AA_BPTBASE,R4      ; Base Address corresponding          ;G:6
                                0950                                          ; to BIAS ADDRESS in DS$AA_BPTADDR    ;G:6
                                0950                                          ; table                               ;G:7
        51    04 AC     7D    0950          MOVQ    4(AP),R1                ; Get low and high limits
           50    0F     D0    0954          MOVL    #BPTMAX,R0              ; Get length of breakpoint table
                                0957
         6340    51     D1    0957  10$:    CMPL    R1,(R3)[R0]             ; Compare lower with this BPT addr
                  0C     1A    095B          BGTRU   20$                     ; Branch if lower GTR this BPT
         6340    52     D1    095D          CMPL    R2,(R3)[R0]             ; Compare higher with this BPT addr
                  06     1B    0961          BLEQU   20$                     ; Branch if higher LSS this BPT
                6340     D4    0963          CLRL    (R3)[R0]                ; Remove the BPT
                6440     D4    0966          CLRL    (R4)[R0]                ; Remove Base Address corresponding   ;G:6
                                0969                                          ; to BIAS ADDRESS in DS$AA_BPTADDR    ;G:6
                                0969                                          ; table                               ;G:7
              EB 50      F5    0969  20$:    SOBGTR  R0,10$                  ; Count and continue
                                096C
                040C     30    096C          BSBW    RBREAK_IN               ; Put remaining breakpoints back
                          04    096F          RET                             ; Return
```

```
                        0970  1756          .SBTTL  SHOW BREAKPOINTS SUBROUTINE
                        0970  1757 ;++
                        0970  1758 ; FUNCTIONAL DESCRIPTION:
                        0970  1759 ;                                                                    ;G:7
                        0970  1760 ;       DISPLAYS ALL CURRENT BREAKPOINTS TO THE OPERATOR
                        0970  1761 ;
                        0970  1762 ; CALLING SEQUENCE:
                        0970  1763 ;
                        0970  1764 ;       BSBW    VRSHOWBRK
                        0970  1765 ;
                        0970  1766 ; INPUT PARAMETERS:     NONE
                        0970  1767 ;
                        0970  1768 ; IMPLICIT INPUTS:
                        0970  1769 ;
                        0970  1770 ;       DS$AA_BPTADDR                    ; ARRAY OF KNOWN BREAKPOINTS
                        0970  1771 ;
                        0970  1772 ; OUTPUT PARAMETERS:    NONE
                        0970  1773 ;
                        0970  1774 ; IMPLICIT OUTPUTS:     NONE
                        0970  1775 ;
                        0970  1776 ; COMPLETION CODES:     NONE
                        0970  1777 ;
                        0970  1778 ; SIDE EFFECTS:         NONE
                        0970  1779 ;--
                        0970  1780
                        0970  1781 VRSHOWBRK::                           ;
                0C   BB 0970  1782          PUSHR   #^M<R2,R3>           ; NEED A TEMPORARY
                53   D4 0972  1783          CLRL    R3                   ; SO FAR NO BREAK POINTS SET
                        0974  1784
              52   0F   D0 0974  1785          MOVL    #BPTMAX,R2           ; SET UP TABLE LENGTH
     00000014'EF42   D5 0977  1786 10$:       TSTL    L^DS$AA_BPTADDR[R2]  ; SCAN BREAKPOINT ADDRESSES          [12]
                44   13 097E  1787          BEQL    30$                  ; SKIP UNTIL FOUND A VALID BPT
                        0980  1788
             0D 53   00   E2 0980  1789          BBSS    #0,R3,20$            ; IF HEADER ALREADY OUT, SKIP
                        0984  1790          $DS_PRINTF_S  L^FMTBPTLST    ; DISPLAY A SMALL HEADER          [12]
        000000F0'EF   9F 0984                       PUSHAB  L^FMTBPTLST
     00000000'9F   01   FB 098A                     CALLS   #$$N, a#DS$PRINTF
                        0991  1791 20$:
00000014'EF42   00000054'EF42   C3 0991  1792          SUBL3   L^DS$AA_BPTBASE[R2],L^DS$AA_BPTADDR[R2],L^DS$AA_OFFSET    ;G:6
          00000094'EF           099E
                        09A3  1793                                           ;Calculate Offset to display ;G:6
                        09A3  1794          $DS_PRINTF_S  L^FMTBPTADR,L^DS$AA_BPTADDR[R2],L^DS$AA_BPTBASE[R2],-   ;G:6
                        09A3  1795                        L^DS$AA_OFFSET                                    ;G:6
          00000094'EF   DD 09A3                       PUSHL   L^DS$AA_OFFSET
        00000054'EF42   DD 09A9                       PUSHL   L^DS$AA_BPTBASE[R2]
        00000014'EF42   DD 09B0                       PUSHL   L^DS$AA_BPTADDR[R2]
          000000C6'EF   9F 09B7                       PUSHAB  L^FMTBPTADR
     00000000'9F   04   FB 09BD                     CALLS   #$$N, a#DS$PRINTF
                        09C4  1796                                           ; DISPLAY 'PC' OF BRKPNT     [12]  ;G:6
                        09C4  1797 30$:
             B0 52   F5 09C4  1798          SOBGTR  R2,10$               ; GO TRY SOME MORE (EXCEPT [0])
             0D 53   E8 09C7  1799          BLBS    R3,VRSHOWBRKX        ; EXIT IF THERE WERE ANY BREAKPOINTS
                        09CA  1800
                        09CA  1801          $DS_PRINTF_S    L^FMTBPTNONE ; 'NONE CURRENTLY SET'            [12]
          0000010A'EF   9F 09CA                       PUSHAB  L^FMTBPTNONE
     00000000'9F   01   FB 09D0                     CALLS   #$$N, a#DS$PRINTF
                        09D7  1802
```

```
                    09D7  1803 VRSHOWBRKX:
              0C    BA    09D7  1804          POPR    #^M<R2,R3>              ; RESTORE TEMPORARIES
                    05    09D9  1805          RSB                             ; RETURN
```

```
                        09DA  1807          .SBTTL  FIND_BPT        FIND BPT IN BPT TABLE
                        09DA  1808 ;++
                        09DA  1809 ; FUNCTIONAL DESCRIPTION:
                        09DA  1810 ;                                                                    ;G:7
                        09DA  1811 ;       Locate a specific breakpoint in the breakpoint table.
                        09DA  1812 ;
                        09DA  1813 ; CALLING SEQUENCE:
                        09DA  1814 ;
                        09DA  1815 ;       BSBW    FIND_BPT
                        09DA  1816 ;
                        09DA  1817 ; INPUT PARAMETERS:
                        09DA  1818 ;
                        09DA  1819 ;       R0      Address of desired BPT or zero if empty slot wanted
                        09DA  1820 ;
                        09DA  1821 ; IMPLICIT INPUTS:      NONE
                        09DA  1822 ;
                        09DA  1823 ; OUTPUT PARAMETERS:
                        09DA  1824 ;
                        09DA  1825 ;       R1      Index of BPT entry  (DS$AA_BPTADDR[x] as a LONGWORD)
                        09DA  1826 ;
                        09DA  1827 ; IMPLICIT OUTPUTS:     NONE
                        09DA  1828 ;
                        09DA  1829 ; RETURN CODES:
                        09DA  1830 ;
                        09DA  1831 ;       R0      SS$_NORMAL IF FOUND ELSE ZERO
                        09DA  1832 ;
                        09DA  1833 ; SIDE EFFECTS:         NONE
                        09DA  1834 ;--
                        09DA  1835
                        09DA  1836 FIND_BPT:
          51    0F    D0  09DA  1837          MOVL    #BPTMAX,R1              ; START AT THE TOP
                        09DD  1838 10$:
00000014'EF41   50    D1  09DD  1839          CMPL    R0,L^DS$AA_BPTADDR[R1]  ; IS IT?                                [12]
              06    13  09E5  1840          BEQL    20$                     ; YES, FOUND IT
           F3 51    F5  09E7  1841          SOBGTR  R1,10$                  ; CONTINUE UNTIL AFTER CHECKED [1]
              50    D4  09EA  1842          CLRL    R0                      ; SET NOT FOUND
                    05  09EC  1843          RSB                             ; RETURN NOT FOUND
          50    01    D0  09ED  1844 20$:    MOVL    #SS$_NORMAL,R0          ; SUCCESS
                    05  09F0  1845          RSB                             ; RETURN
```

```
                                09F1  1847          .SBTTL  DEBUGGER CONDITION HANDLER
                                09F1  1848 ;++
                                09F1  1849 ; FUNCTIONAL DESCRIPTION:
                                09F1  1850 ;
                                09F1  1851 ;       This routine is the secondary condition handler.
                                09F1  1852 ;       It is here to allow the supervisor to capture BPT and TBIT
                                09F1  1853 ;       traps. It discards all other conditions.
                                09F1  1854 ;
                                09F1  1855 ; CALLING SEQUENCE:
                                09F1  1856 ;
                                09F1  1857 ;       STANDARD PROCEEDURE CALL WITH STANDARD EXCEPTION ARGS
                                09F1  1858 ;
                                09F1  1859 ; INPUT PARAMETERS:
                                09F1  1860 ;
                                09F1  1861 ;       STANDARD EXCEPTION SIGNAL AND MECHANISM ARRAYS
                                09F1  1862 ;
                                09F1  1863 ;
                                09F1  1864 ; IMPLICIT INPUTS:      NONE
                                09F1  1865 ;
                                09F1  1866 ; OUTPUT PARAMETERS:    NONE
                                09F1  1867 ;
                                09F1  1868 ; IMPLICIT OUTPUTS:     NONE
                                09F1  1869 ;
                                09F1  1870 ; RETURN CODES:
                                09F1  1871 ;
                                09F1  1872 ;       SS$_CONTINUE    if one of our break points or T-bit.
                                09F1  1873 ;       SS$_RESIGNAL    otherwise
                                09F1  1874 ;
                                09F1  1875 ; SIDE EFFECTS:
                                09F1  1876 ;
                                09F1  1877 ;       UNKNOWN SINCE THE OPERATOR CAN CHANGE THINGS WHILE IN COMMAND MODE
                                09F1  1878 ;--
                         0000   09F1  1879 .ENTRY  COND_DEBUG,^M<>
                                09F3  1880
          50    0000'8F    3C   09F3  1881          MOVZWL  #SS$_RESIGNAL,R0        ; ASSUME IT'S SOMETHING ELSE
            51    04 BC    DE   09F8  1882          MOVAL   @4(AP), R1              ; GET SIGNAL ARRAY POINTER
04 A1    00000000'8F    D1   09FC  1883          CMPL    #SS$_BREAK, 4(R1)       ; IS THIS A BREAKPOINT CONDITION?
                  11    12   0A04  1884          BNEQ    20$                     ; NO, TRY T-BIT
                                0A06  1885          $MP_SET_INTERLOCK #MP$V_IL_CNDB ; Interlock routine     [17][21][23]
                  07    DD   0A06                       PUSHL   #MP$V_IL_CNDB
                  08    DD   0A08                       PUSHL   #$SRVCODE_SET_INTERLOCK
   00000000'9F    02    FB   0A0A                       CALLS   #2, @#DS$SERVICE_DISPATCHER
                0051    30   0A11  1886          BSBW    DBG_BREAK               ; HANDLE IT
                001B    31   0A14  1887          BRW     COND_DEBUG_X            ; EXIT
                             0A17  1888 20$:
04 A1    00000000'8F    D1   0A17  1889          CMPL    #SS$_TBIT, 4(R1)        ; IS THIS A T-BIT TRAP?
                  03    13   0A1F  1890          BEQL    30$                     ; YES, CONTINUE
                0040    31   0A21  1891          BRW     QUICK_X                 ; NO, EXIT                      [21]
                             0A24  1892 30$:
                             0A24  1893          $MP_SET_INTERLOCK #MP$V_IL_CNDB ; Interlock routine     [17][21][23]
                  07    DD   0A24                       PUSHL   #MP$V_IL_CNDB
                  08    DD   0A26                       PUSHL   #$SRVCODE_SET_INTERLOCK
   00000000'9F    02    FB   0A28                       CALLS   #2, @#DS$SERVICE_DISPATCHER
                020F    30   0A2F  1894          BSBW    DBG_TBIT                ; HANDLE T-BIT
                             0A32  1895
                             0A32  1896 COND_DEBUG_X:                           ;                               [17]
                             0A32  1897
```

```
                        0A32  1898 ;+
                        0A32  1899 ; NOTE: The Ap will clear the interlock (in MP$_COND_DEBUG before going to
                        0A32  1900 ;       its idle loop in order to allow other cpu's to use the service. The
                        0A32  1901 ;       following code prohibits an Ap that is continuing from a BPT from
                        0A32  1902 ;       executing two successive clears of interlock.
                        0A32  1903 ;-
                        0A32  1904
        00000000'EF  D5 0A32  1905          TSTL    MP$GR_BOOTED_PROCESSORS ; Are we an mp system?                  [19]
                  1F 13 0A38  1906          BEQL    40$                     ; Not mp, therefore branch              [19]
              5E  04 C2 0A3A  1907          SUBL2   #4,SP                   ; Reseve Storage        [23]
                 5E DD 0A3D  1908          PUSHL   SP                      ; Storage for CPU identifier    [19][23]
     00000000'EF  01 FB 0A3F  1909          CALLS   #1, MP$_GET_PROCESSOR_ID        ; Get current CPU identifier    [19]
  6E 00000000'EF 91 0A46  1910          CMPB    DS$GB_PRIMARY_CPU_IDENTIFIER,(SP) ; Are we the primary? [19][23]
                  02 12 0A4D  1911          BNEQ    35$                     ; Were the Ap, exit [19][23]
                  05 11 0A4F  1912          BRB     37$                     ; Primary flow [23]
              5E  04 C0 0A51  1913 35$:     ADDL2   #4,SP                           ; Reset the stack       [23]
                  0E 11 0A54  1914          BRB     QUICK_X                         ; [23]
              5E  04 C0 0A56  1915 37$:     ADDL2   #4,SP                           ; Reset the stack       [23]
                        0A59  1916 40$:     $MP_CLEAR_INTERLOCK #MP$V_IL_CNDB ; CLEAR Interlocked routine   [17][23]
                  07 DD 0A59                        PUSHL   #MP$V_IL_CNDB
                  09 DD 0A5B                        PUSHL   #$SRVCODE_CLEAR_INTERLOCK
     00000000'9F  02 FB 0A5D                        CALLS   #2, a#DS$SERVICE_DISPATCHER
                        0A64  1917
                  04    0A64  1918 QUICK_X:         RET                             ; RETURN                [21]
```

```
                        0A65  1920          .SBTTL  BREAKPOINT CONDITION SUBROUTINE
                        0A65  1921 ;++
                        0A65  1922 ; FUNCTIONAL DESCRIPTION:
                        0A65  1923 ;
                        0A65  1924 ;       This routine setups the context necessary and announces the break point.
                        0A65  1925 ;
                        0A65  1926 ; CALLING SEQUENCE:
                        0A65  1927 ;
                        0A65  1928 ;       BSBW    DBG_BREAK
                        0A65  1929 ;
                        0A65  1930 ; INPUT PARAMETERS:
                        0A65  1931 ;
                        0A65  1932 ;       STANDARD EXCEPTION ARGS
                        0A65  1933 ;
                        0A65  1934 ; IMPLICIT INPUTS:      NONE
                        0A65  1935 ;
                        0A65  1936 ; OUTPUT PARAMETERS:    NONE
                        0A65  1937 ;
                        0A65  1938 ; IMPLICIT OUTPUTS:     NONE
                        0A65  1939 ;
                        0A65  1940 ; COMPLETION CODES:     NONE
                        0A65  1941 ;
                        0A65  1942 ; SIDE EFFECTS:         NONE
                        0A65  1943 ;--
```

```
                                0A65  1945 DBG_BREAK:
                                0A65  1946
                                0A65  1947 ;+
                                0A65  1948 ; DETERMINE IF THIS IS A KNOWN BREAKPOINT
                                0A65  1949 ; IF NOT, "RESIGNAL" THE EXCEPTION HANDLER
                                0A65  1950 ;-
                                0A65  1951
            50    04 BC   DE    0A65  1952          MOVAL   @4(AP),R0                ; GET ADDR OF SIGNAL ARRAY              ;G:6
            50    08 A0   D0    0A69  1953          MOVL    8(R0),R0                 ; GET PC OF BREAKPOINT
                                0A6D  1954
 00000014'EF      50    D1    0A6D  1955          CMPL    R0,L^DS$AA_BPTADDR       ; HIDDEN BREAKPOINT?                    [12]
                  1A    12    0A74  1956          BNEQ    10$                      ; Branch if not
                  50    DD    0A76  1957          PUSHL   R0                       ; Address to store opcode
      00000001'EF       9F    0A78  1958          PUSHAB  L^DS$AB_BPTINST          ; Address of Saved opcode               [12]
                  01    DD    0A7E  1959          PUSHL   #1                       ; Length to store
 00000DC9'EF      03    FB    0A80  1960          CALLS   #3,FETCH_STORE           ; Restore the Opcode
      00000014'EF       D4    0A87  1961          CLRL    L^DS$AA_BPTADDR          ; Clear hidden breakpoint               [12]
                00B7    31    0A8D  1962          BRW     CALL_CLI                 ; Enter CLI now                         ;G:6
                                0A90  1963 10$:
                FF47    30    0A90  1964          BSBW    FIND_BPT                 ; LOCATE THE BREAKPOINT
                06 50   E8    0A93  1965          BLBS    R0,15$                   ; FOUND, TYPE THE PC                    [19]
                                0A96  1966
            50    0000'8F   3C    0A96  1967          MOVZWL  #SS$_RESIGNAL,R0         ; NOT OURS
                  05    0A9B  1968          RSB                              ; RETURN
                                0A9C  1969
      00000000'EF       D5    0A9C  1970 15$:     TSTL    MP$GR_BOOTED_PROCESSORS ; Are we an mp system?                   [19]
                  70    13    0AA2  1971          BEQL    17$                      ; Not mp, therefore branch              [19]
  00000000'EF   00000014'EF41   D0    0AA4  1972          MOVL    DS$AA_BPTADDR[R1],MP$GL_AP_BKPT_STORE ; Store Ap breakpoint info[19]
00000014'EF41   00000054'EF41   C3    0AB0  1973          SUBL3   L^DS$AA_BPTBASE[R1],L^DS$AA_BPTADDR[R1],L^DS$AA_OFFSET        ;G:8
      00000094'EF               0ABD
                                0AC2  1974                                   ;Calculate Offset to display            ;G:8
  00000000'EF   00000054'EF41   D0    0AC2  1975          MOVL    DS$AA_BPTBASE[R1],MP$GL_AP_BASE_ADDR_BKPT                ;G:7
    00000000'EF   00000094'EF   D0    0ACE  1976          MOVL    DS$AA_OFFSET,MP$GL_AP_OFFSET_BKPT                        ;G:7
      00000000'EF       16    0AD9  1977          JSB     MP$_COND_DEBUG           ; Call mp code                          [19]
                                0ADF  1978
                                0ADF  1979 ;++                                                                           [19]
                                0ADF  1980 ; If the Ap of the breakpoint is resumed is will return here, restore the     [19]
                                0ADF  1981 ; context, and REI back to the instruction that causes the BPT.               [19]
                                0ADF  1982 ;--                                                                           [19]
                                0ADF  1983
                  5E    04    C2    0ADF  1984          SUBL2   #4,SP                            ; Reserve storage       [23]
                  5E    DD    0AE2  1985          PUSHL   SP                       ; Storage for CPU identifier    [19]
            00000000'EF   01    FB    0AE4  1986          CALLS   #1, MP$_GET_PROCESSOR_ID         ; Get current CPU identifier    [19]
          6E    00000000'EF   91    0AEB  1987          CMPB    DS$GB_PRIMARY_CPU_IDENTIFIER,(SP) ; Are we the primary? [19][23]
                  1D    13    0AF2  1988          BEQL    16$                      ; Were the Primary, branch.     [19]
                  5E    04    C0    0AF4  1989          ADDL2   #4,SP                     ; Reset the stack               [23]
                                0AF7  1990
                                0AF7  1991 ; Even though the Ap does not call CLI, it must execute the same code such    ;G:11
                                0AF7  1992 ; that the Ap's context is restored.                                          ;G:11
                                0AF7  1993
            50    04 AC   7D    0AF7  1994          MOVQ    4(AP),R0                 ; GET SIGNAL AND MECHANISM POINTERS
            7E    08 A0   7D    0AFB  1995          MOVQ    8(R0),-(SP)              ; PC/PSL TO STACK
                  10 A0   DF    0AFF  1996          PUSHAL  16(R0)                   ; SP TO STACK
            7E    08 AD   7D    0B02  1997          MOVQ    8(FP),-(SP)              ; AP/FP TO STACK
                0FFC 8F   BB    0B06  1998          PUSHR   #^XFFC                   ; R11, R10, . .., R2 TO STACK
            7E    0C A1   7D    0B0A  1999          MOVQ    12(R1),-(SP)             ; R0/R1 TO STACK
                  0069    31    0B0E  2000          BRW     CONT                     ; CONTINUE CONTEXT RESTORATION  [19]
```

```
                                0B11  2001
                                0B11  2002 ;++
                                0B11  2003 ; DISPLAY THE 'PC' TO THE OPERATOR
                                0B11  2004 ; THEN CALL THE COMMAND LINE INTERPRETER
                                0B11  2005 ;-
                                0B11  2006
                   5E   04  C0  0B11  2007 16$:    ADDL2   #4,SP                          ; Reset the stack       [23]
00000014'EF41   00000054'EF41  C3  0B14  2008 17$:    SUBL3   L^DS$AA_BPTBASE[R1],L^DS$AA_BPTADDR[R1],L^DS$AA_OFFSET          ;G:6
                  00000094'EF      0B21
                                0B26  2009                                             ;Calculate Offset to display            ;G:6
                                0B26  2010          $DS_PRINTF_S  L^FMTBPT,L^DS$AA_BPTADDR[R1],L^DS$AA_BPTBASE[R1],-       ;G:6
                                0B26  2011                        L^DS$AA_OFFSET                                               ;G:6
                  00000094'EF   DD  0B26                        PUSHL   L^DS$AA_OFFSET
                00000054'EF41   DD  0B2C                        PUSHL   L^DS$AA_BPTBASE[R1]
                00000014'EF41   DD  0B33                        PUSHL   L^DS$AA_BPTADDR[R1]
                  00000085'EF   9F  0B3A                        PUSHAB  L^FMTBPT
              00000000'9F   04  FB  0B40                        CALLS   #$$N, a#DS$PRINTF
                                0B47  2012                                             ; DISPLAY BRKPNT & ITS 'PC'     [12][19] ;G:
                                0B47  2013
                                0B47  2014 CALL_CLI:
                50   04 AC   7D  0B47  2015          MOVQ    4(AP),R0                  ; GET SIGNAL AND MECHANISM POINTERS
                7E   08 A0   7D  0B4B  2016          MOVQ    8(R0),-(SP)               ; PC/PSL TO STACK
                   10 A0   DF  0B4F  2017          PUSHAL  16(R0)                    ; SP TO STACK
                7E   08 AD   7D  0B52  2018          MOVQ    8(FP),-(SP)               ; AP/FP TO STACK
                   0FFC 8F   BB  0B56  2019          PUSHR   #^XFFC                    ; R11, R10, . . ., R2 TO STACK
                7E   0C A1   7D  0B5A  2020          MOVQ    12(R1),-(SP)              ; R0/R1 TO STACK
                                0B5E  2021
                  00000000'EF   16  0B5E  2022          JSB     SCRIPT$STOP               ; Get out of script mode        [14]
                                0B64  2023
              00000000'EF   6E  FA  0B64  2024 10$:    CALLG   (SP),L^DS$CLI             ; GO TALK TO OPERATOR                   [16]
                                0B6B  2025
                                0B6B  2026 ; OK, NOW RESTORE THE SAVED CONTEXT IN SUCH A WAY THAT ANY MODIFICATIONS
                                0B6B  2027 ; WILL TAKE EFFECT AFTER FINAL RETURN TO THE PROGRAM
                                0B6B  2028 ;-
                                0B6B  2029
                  00000000'EF   D5  0B6B  2030          TSTL    MP$GR_BOOTED_PROCESSORS ; Are we an mp system?                  [19]
                        07      13  0B71  2031          BEQL    CONT                    ; Not mp, therefore branch              [19]
              00000000'EF   00  FB  0B73  2032          CALLS   #0,MP$_RESUME_ATTACHED_PROCESSORS ; Call mp code                 [19]
                                0B7A  2033
                   50   04 AC   7D  0B7A  2034 CONT:    MOVQ    4(AP),R0                ; GET SIGNAL AND MECHANISM POINTERS     [16]
                   0C A1   8E   7D  0B7E  2035          MOVQ    (SP)+,12(R1)            ; R0/R1 BACK TO MECHANISM ARRAY
                      0FFC 8F   BA  0B82  2036          POPR    #^XFFC                  ; R2 - R11 BACK TO REGISTERS
              000000B0'EF   8E   7D  0B86  2037          MOVQ    (SP)+,L^NEW_AP_FP       ; AP/FP SAFE                            [12]
              000000B8'EF   8E   D0  0B8D  2038          MOVL    (SP)+,L^NEW_SP          ; SP TO A SAFE PLACE                    [12]
04 AE   40000010 8F   CA  0B94  2039          BICL2   #PSL$M_TP!PSL$M_TBIT,4(SP) ; MAY HAVE BEEN SET BY OPERATOR               [12]
              000000BC'EF   8E   7D  0B9C  2040          MOVQ    (SP)+,L^NEW_PC_PSL      ; PC/PSL TO A SAFE PLACE                [12]
                      0C A0   DC  0BA3  2041          MOVPSL  12(R0)                  ; PUT CURR PSL ON ORIGINAL STACK
                08 A0   AF'AF   9E  0BA6  2042          MOVAB   B^200$,8(R0)            ; PUT LOCAL PC ON ORIGINAL STACK
                                0BAB  2043
                      50   00'  D0  0BAB  2044          MOVL    S^#SS$_CONTINUE,R0      ; INDICATE "HANDLED"
                                05  0BAE  2045          RSB                             ; RETURN TO EXCEPTION HANDLER
                                0BAF  2046
                                0BAF  2047 ;+
                                0BAF  2048 ; THE FOLLOWING CODE IS EXECUTED BY THE 'REI' AT THE END OF THE
                                0BAF  2049 ; EXCEPTION HANDLER.  THIS FACILITATES THE MODIFICATION OF THE
                                0BAF  2050 ; 'SP', 'PC' & 'PSL' (BY THE OPERATOR) BEFORE CONTROL RETURNS TO
                                0BAF  2051 ; THE DIAGNOSTIC PROGRAM.
```

```
                                 0BAF  2052 ;-
                                 0BAF  2053
                                 0BAF  2054 200$:
                      03   BB    0BAF  2055          PUSHR   #^M<R0,R1>                ; SAVE THESE
                    019C   30    0BB1  2056          BSBW    RBREAK_OUT               ; REMOVE BREAKPOINTS/PUT OPCODES BACK
                      03   BA    0BB4  2057          POPR    #^M<R0,R1>               ; RESTORE THEM
          00000014'EF      D4    0BB6  2058          CLRL    DS$AA_BPTADDR            ; DON'T RESTORE NULL BREAKPOINT
    5C    000000B0'EF      7D    0BBC  2059          MOVQ    L^NEW_AP_FP,AP           ; SET NEW AP/FP                          [12]
    5E    000000B8'EF      D0    0BC3  2060          MOVL    L^NEW_SP,SP              ; JAM A NEW POINTER INTO 'SP'            [12]
    7E    000000BC'EF      7D    0BCA  2061          MOVQ    L^NEW_PC_PSL,-(SP)       ; SETUP FOR REI                          [12]
          04 AE    10      C8    0BD1  2062          BISL    #PSL$M_TBIT,4(SP)        ; SET THE T-BIT                          [12]
    00000000'EF    01      88    0BD5  2063          BISB2   #1@V_TBIT,L^DEBUG$GB_FLAGS  ; SET T-BIT EXPECTED FLAG            [12]
                                 0BDC  2064
          00000000'EF      D5    0BDC  2065          TSTL    MP$GR_BOOTED_PROCESSORS          ; Are we an mp system?   [19]
                      5C   13    0BE2  2066          BEQL    210$                             ; Not mp, therefore branch [19]
                5E    04   C2    0BE4  2067          SUBL2   #4,SP                            ; Reserve storage       [23]
                      5E   DD    0BE7  2068          PUSHL   SP                               ; Storage for CPU identifier [23]
    00000000'EF    01      FB    0BE9  2069          CALLS   #1, MP$_GET_PROCESSOR_ID         ; Get current CPU identifier
    6E    00000000'EF      91    0BF0  2070          CMPB    DS$GB_PRIMARY_CPU_IDENTIFIER,(SP); Are we the primary? [19]
                      44   13    0BF7  2071          BEQL    205$                             ; Branch if Pp [23]
                5E    04   C0    0BF9  2072          ADDL2   #4,SP                            ; Reset the stack [23]
                                 0BFC  2073 ;++
                                 0BFC  2074 ; The following code is used to restore GPR context of an Ap in       [19]
                                 0BFC  2075 ; the event the user DEPOSITS via SET CPU after hitting an Ap BPT.
                                 0BFC  2076 ;--
                                 0BFC  2077
    50    00000000'EF      7D    0BFC  2078          MOVQ    MP$GR_SAVED_GPRS,R0      ; Restore Ap GPR's               [19]
    52    00000008'EF      7D    0C03  2079          MOVQ    MP$GR_SAVED_GPRS+8,R2    ; ...
    54    00000010'EF      7D    0C0A  2080          MOVQ    MP$GR_SAVED_GPRS+16,R4   ; ...
    56    00000018'EF      7D    0C11  2081          MOVQ    MP$GR_SAVED_GPRS+24,R6   ; ...
    58    00000020'EF      7D    0C18  2082          MOVQ    MP$GR_SAVED_GPRS+32,R8   ; ...
    5A    00000028'EF      7D    0C1F  2083          MOVQ    MP$GR_SAVED_GPRS+40,R10  ; ...
    5C    00000030'EF      7D    0C26  2084          MOVQ    MP$GR_SAVED_GPRS+48,AP   ; ...
    5E    00000038'EF      D0    0C2D  2085          MOVL    MP$GR_SAVED_GPRS+56,SP   ; ...
    6E    0000003C'EF      D0    0C34  2086          MOVL    MP$GR_SAVED_GPRS+60,(SP) ; Restore PC                     [19]
                      03   11    0C3B  2087          BRB     210$                     ; [23]
                5E    04   C0    0C3D  2088 205$:    ADDL2   #4,SP                ; Reset the stack       [23]
                           02    0C40  2089 210$:    REI                          ; RETURN TO PROGRAM
```

```
                        .SBTTL  TBIT CONDITION SUBROUTINE
                ;++
                ; FUNCTIONAL DESCRIPTION:
                ;
                ;
                ; CALLING SEQUENCE:
                ;
                ;       BSBW    DBG_TBIT
                ;
                ; INPUT PARAMETERS:     NONE
                ;
                ; IMPLICIT INPUTS:      NONE
                ;
                ; OUTPUT PARAMETERS:    NONE
                ;
                ; IMPLICIT OUTPUTS:     NONE
                ;
                ; COMPLETION CODES:     NONE
                ;
                ; SIDE EFFECTS:         NONE                                    ;G:6
                ;--
```

```
                                0C41  2113 DBG_TBIT:
          50   0000'8F    3C   0C41  2114          MOVZWL  #SS$_RESIGNAL,R0          ; PREPARE FOR NOT WANTING THIS
   69 00000000'EF    00    E5   0C46  2115          BBCC    #V_TBIT,L^DEBUG$GB_FLAGS,40$  ; EXIT IF NOT OUR T-BIT          [12
                                0C4E  2116                                          ;                                          [27]
      00000000'EF    01    E5   0C4E  2117          BBCC    #V_STEP,L^DEBUG$GB_FLAGS -    ;                                  [12]
                     4B         0C55  2118                  , 20$                   ; FINISH UP IF NOT STEPPING
            50   04 AC    D0   0C56  2119          MOVL    4(AP),R0                ; GET ADDRESS OF SIGNAL ARGS
                     7E    DF   0C5A  2120          PUSHAL  -(SP)                   ; STORE CONTENTS HERE
                  08 A0    DD   0C5C  2121          PUSHL   8(R0)                   ; CURRENT PC
                     04    DD   0C5F  2122          PUSHL   #4                      ; FETCH 4 BYTES
      00000DC9'EF    03    FB   0C61  2123          CALLS   #3,FETCH_STORE          ; GET CONTENTS
                                0C68  2124 ;                                                                                ;G:4
                   0110    30   0C68  2125          BSBW    RBREAK_IN               ; RE-INSERT ALL BREAKPOINTS              [27]
                                0C6B  2126 ;                                                                                ;G:6
            50   04 AC    D0   0C6B  2127          MOVL    4(AP),R0                ; GET ADDRESS OF SIGNAL ARGS AGAIN
                  08 A0    DD   0C6F  2128          PUSHL   8(R0)                   ; PUT PC ON STACK
         000000BB'EF       9F   0C72  2129          PUSHAB  L^FMTSTEP               ; ADDRESS OF TEXT                        [12]
      00000000'9F    03    FB   0C78  2130          CALLS   #3,@#DS$PRINTF          ; PRINT 'PC: CONTENTS'
                                0C7F  2131
      50   00000000'EF    DE   0C7F  2132          MOVAL   L^DS$GL_CLIBASE,R0      ; BASE CLI DATA                          [12]
              03 1C A0    F5   0C86  2133          SOBGTR  CLI$L_DATA(R0),10$      ; LAST PASS?
                   FEBA    31   0C8A  2134          BRW     CALL_CLI                ; ENTER COMMAND INTERPRETER
                                0C8D  2135 10$:                                                                             ;G:6
                   00C0    30   0C8D  2136          BSBW    RBREAK_OUT              ; RESTORE OPCODES
      00000000'EF    03    88   0C90  2137          BISB    #M_TBIT!M_STEP,L^DEBUG$GB_FLAGS ; SET STEPPING AND T-BIT EXPECT [12]
            50   04 AC    D0   0C97  2138          MOVL    4(AP),R0                ; GET ADDRESS OF SIGNAL ARRAY
            0C A0    10    C8   0C9B  2139          BISL    #PSL$M_TBIT, 12(R0)     ; SET THE T-BIT
                     0F    11   0C9F  2140          BRB     30$                     ; EXIT HANDLED
                                0CA1  2141 20$:
                   00D7    30   0CA1  2142          BSBW    RBREAK_IN               ;
            50   04 BC    DE   0CA4  2143          MOVAL   @4(AP),R0               ; GET ADDRESS OF SIGNAL ARRAY
   0C A0   40000010 8F    CA   0CA8  2144          BICL    #PSL$M_TBIT!PSL$M_TP,12(R0) ; CLEAR T-BIT(S)
                                0CB0  2145 30$:
      50   00000000'8F    D0   0CB0  2146          MOVL    #SS$_CONTINUE,R0        ; INDICATE "HANDLED"
                                0CB7  2147 40$:
                           05   0CB7  2148          RSB                             ; RETURN
```

```
                        0CB8  2150          .SBTTL  RESTORE SCB VECTORS SUBROUTINE                                    ;G:5
                        0CB8  2151 ;++                                                                                ;G:5
                        0CB8  2152 ; FUNCTIONAL DESCRIPTION:                                                          ;G:5
                        0CB8  2153 ;                                                                                  ;G:5
                        0CB8  2154 ;       RESTORES VECTORS SAVED DURING THE EXAMINE AND DEPOSIT COMMANDS              ;G:5
                        0CB8  2155 ;                                                                                  ;G:5
                        0CB8  2156 ; CALLING SEQUENCE:                                                                ;G:5
                        0CB8  2157 ;                                                                                  ;G:5
                        0CB8  2158 ;       BSBW    RESTORE_SCB_VECTORS                                                ;G:6
                        0CB8  2159 ;                                                                                  ;G:5
                        0CB8  2160 ; INPUT PARAMETERS:                                                                ;G:5
                        0CB8  2161 ;                                                                                  ;G:5
                        0CB8  2162 ;       NONE                                                                       ;G:5
                        0CB8  2163 ;                                                                                  ;G:5
                        0CB8  2164 ; IMPLICIT INPUTS:                                                                 ;G:5
                        0CB8  2165 ;                                                                                  ;G:5
                        0CB8  2166 ;       SAVE_SCB_VEC                    ; SAVED SCB VECTORS                        ;G:5
                        0CB8  2167 ;       SCB_BASE                        ; SUPERVISORS SCB VECTORS                  ;G:5
                        0CB8  2168 ;                                                                                  ;G:5
                        0CB8  2169 ; OUTPUT PARAMETERS:    NONE                                                       ;G:5
                        0CB8  2170 ;                                                                                  ;G:5
                        0CB8  2171 ; IMPLICIT OUTPUTS:     NONE                                                       ;G:5
                        0CB8  2172 ;                                                                                  ;G:5
                        0CB8  2173 ;       SCB_BASE                        ; SUPERVISORS SCB VECTORS                  ;G:5
                        0CB8  2174 ;                                                                                  ;G:5
                        0CB8  2175 ; COMPLETION CODES:     NONE                                                       ;G:5
                        0CB8  2176 ;                                                                                  ;G:5
                        0CB8  2177 ; SIDE EFFECTS:         NONE                                                       ;G:5
                        0CB8  2178 ;--                                                                                ;G:5
                        0CB8  2179 RESTORE_SCB_VECTORS:                                                               ;G:5
2D 0000FE00'EF   1C  E0 0CB8  2180          BBS     #DSA$V_USER, L^DSA$GL_FLAGS, 10$ ; IF user mode THEN branch    [28]
           0100 8F   BB 0CC0  2181          PUSHR   #^M8                                                           ;G:5
                        0CC4  2182 ;+                                                                                 ;G:5
                        0CC4  2183 ;  RESTORE DIAGNOSTIC PROGRAM'S VECTORS                                            ;G:5
                        0CC4  2184 ;-                                                                                 ;G:5
                     58 D4  0CC4  2185          CLRL    R8                                                         ;G:5
   58   000000A0'EF   DE  0CC6  2186          MOVAL   SAVE_SCB_VEC,R8         ; Base Addresss of Saved Vectors      ;G:5
   00000004'EF   88  D0  0CCD  2187          MOVL    (R8)+,SCB_BASE+^X4      ; Re-insert Saved Mchk Handler        [28]
   00000018'EF   88  D0  0CD4  2188          MOVL    (R8)+,SCB_BASE+^X18     ; Re-insert Saved Reserv Op Handler
   00000020'EF   88  D0  0CDB  2189          MOVL    (R8)+,SCB_BASE+^X20     ; Re-insert Saved Acc Vio Handler
   00000024'EF   88  D0  0CE2  2190          MOVL    (R8)+,SCB_BASE+^X24     ; Re-insert Saved Trans Not Valid Handler
           0100 8F   BA  0CE9  2191          POPR    #^M8                                                       ;G:5
                        0CED  2192 10$:                                                                               ;G:5
                     05 0CED  2193          RSB                                                                    ;G:5
                        0CEE  2194                                                                                    ;G:5
                        0CEE  2195                                                                                    ;G:5
```

```
                     0CEE  2197          .SBTTL  TEMPORARY SCB VECTOR STORAGE SUBROUTINE                          ;G:5
                     0CEE  2198 ;++                                                                               ;G:5
                     0CEE  2199 ; FUNCTIONAL DESCRIPTION:                                                         ;G:5
                     0CEE  2200 ;                                                                                 ;G:5
                     0CEE  2201 ;       SAVES SCB VECTORS AND REINSERTS SUPERVISOR'S VECTORS (HANDLERS)            ;G:5
                     0CEE  2202 ;                                                                                 ;G:5
                     0CEE  2203 ; CALLING SEQUENCE:                                                               ;G:5
                     0CEE  2204 ;                                                                                 ;G:5
                     0CEE  2205 ;       BSBW    SAVE_SCB_VECTORS                NO PARAMETERS                     ;G:5
                     0CEE  2206 ;                                                                                 ;G:5
                     0CEE  2207 ; INPUT PARAMETERS:     NONE                                                      ;G:5
                     0CEE  2208 ;                                                                                 ;G:5
                     0CEE  2209 ; IMPLICIT INPUTS:                                                                ;G:5
                     0CEE  2210 ;                                                                                 ;G:5
                     0CEE  2211 ;       SAVE_SCB_VEC                    ; STORAGE FOR SAVED VECTORS               ;G:5
                     0CEE  2212 ;       SCB_IMAGE                       ; INITIAL SCB VECTORS                     ;G:5
                     0CEE  2213 ;       SCB_BASE                        ; MODIFIABLE SCB VECTORS                  ;G:5
                     0CEE  2214 ;                                                                                 ;G:5
                     0CEE  2215 ; OUTPUT PARAMETERS:    NONE                                                      ;G:5
                     0CEE  2216 ;                                                                                 ;G:5
                     0CEE  2217 ; IMPLICIT OUTPUTS:                                                               ;G:6
                     0CEE  2218 ;                                                                                 ;G:5
                     0CEE  2219 ;       SAVE_SCB_VEC                    ; STORAGE FOR SAVED VECTORS               ;G:5
                     0CEE  2220 ;       SCB_IMAGE                       ; INITIAL SCB VECTORS                     ;G:5
                     0CEE  2221 ;       SCB_BASE                        ; MODIFIABLE SCB VECTORS                  ;G:5
                     0CEE  2222 ;                                                                                 ;G:5
                     0CEE  2223 ; COMPLETION CODES:     NONE                                                      ;G:5
                     0CEE  2224 ;                                                                                 ;G:5
                     0CEE  2225 ; SIDE EFFECTS:         NONE                                                      ;G:5
                     0CEE  2226 ;--                                                                               ;G:5
                     0CEE  2227                                                                                   ;G:5
                     0CEE  2228 SAVE_SCB_VECTORS:                                                                 ;G:5
59 0000FE00'EF   1C  E0  0CEE  2229          BBS     #DSA$V_USER, L^DSA$GL_FLAGS, 10$ ; IF user mode THEN branch  [28]
          0100 8F    BB  0CF6  2230          PUSHR   #^M<R8>                 ; SAVE TEMPORARY STORAGE              ;G:5
                     0CFA  2231 ;+                                                                                ;G:5
                     0CFA  2232 ;  SAVE DIAGNOSTIC PROGRAM'S VECTORS                                              ;G:6
                     0CFA  2233 ;-                                                                                ;G:5
              58     D4  0CFA  2234          CLRL    R8                      ;
   58 000000A0'EF    DE  0CFC  2235          MOVAL   SAVE_SCB_VEC,R8         ; Base Address of Saved Vectors
   88 00000004'EF    D0  0D03  2236          MOVL    SCB_BASE+^X4,(R8)+      ; Save Machine Check Address
   88 00000018'EF    D0  0D0A  2237          MOVL    SCB_BASE+^X18,(R8)+     ; Save Reserved Operand Address
   88 00000020'EF    D0  0D11  2238          MOVL    SCB_BASE+^X20,(R8)+     ; Save Access Violation Address
   88 00000024'EF    D0  0D18  2239          MOVL    SCB_BASE+^X24,(R8)+     ; Save Translation Not Valid Address
                     0D1F  2240 ;+                                                                                ;G:5
                     0D1F  2241 ;  RESTORE SUPERVISOR'S VECTORS                                                   ;G:5
                     0D1F  2242 ;-                                                                                ;G:5
   00000004'EF       D0  0D1F  2243          MOVL    SCB_IMAGE+^X4,-                                              ;G:6
   00000004'EF           0D25  2244                  SCB_BASE+^X4            ; Restore Supervisors MCHK handler
   00000018'EF       D0  0D2A  2245          MOVL    SCB_IMAGE+^X18,-                                             ;G:6
   00000018'EF           0D30  2246                  SCB_BASE+^X18           ; Restore Supervisors Reserved Operand handl
   00000020'EF       D0  0D35  2247          MOVL    SCB_IMAGE+^X20,-                                             ;G:6
   00000020'EF           0D3B  2248                  SCB_BASE+^X20           ; Restore Supervisors Access Violation handl
   00000024'EF       D0  0D40  2249          MOVL    SCB_IMAGE+^X24,-                                             ;G:6
   00000024'EF           0D46  2250                  SCB_BASE+^X24           ; Restore Supervisors Trans not valid handle
          0100 8F    BA  0D4B  2251          POPR    #^M<R8>                                                      ;G:5
                     0D4F  2252 10$:                                                                              ;G:5
                     05  0D4F  2253          RSB                             ; RETURN                          ;G:5
```

```
                        0D50  2254                                                    ;G:5
```

```
                        0D50  2256          .SBTTL  TEMPORARY BREAKPOINT REMOVAL SUBROUTINE
                        0D50  2257 ;++
                        0D50  2258 ; FUNCTIONAL DESCRIPTION:
                        0D50  2259 ;
                        0D50  2260 ;       REMOVES KNOWN BREAKPOINTS
                        0D50  2261 ;
                        0D50  2262 ; CALLING SEQUENCE:
                        0D50  2263 ;
                        0D50  2264 ;       BSBW    RBREAK_OUT              NO PARAMETERS
                        0D50  2265 ;
                        0D50  2266 ; INPUT PARAMETERS:     NONE
                        0D50  2267 ;
                        0D50  2268 ; IMPLICIT INPUTS:
                        0D50  2269 ;
                        0D50  2270 ;       DS$AA_BPTADDR                   ; ARRAY OF KNOWN BREAKPOINTS
                        0D50  2271 ;       DS$AB_BPTINST                   ; ARRAY OF SAVED 'OPCODES'
                        0D50  2272 ;
                        0D50  2273 ; OUTPUT PARAMETERS:    NONE
                        0D50  2274 ;
                        0D50  2275 ; IMPLICIT OUTPUTS:     NONE
                        0D50  2276 ;
                        0D50  2277 ; COMPLETION CODES:     NONE
                        0D50  2278 ;
                        0D50  2279 ; SIDE EFFECTS:         NONE
                        0D50  2280 ;--
                        0D50  2281
                        0D50  2282 RBREAK_OUT:
            04   BB    0D50  2283          PUSHR   #^M<R2>                 ; PRESERVE A TEMPORARY
          52     0F    D0    0D52  2284          MOVL    #BPTMAX,R2              ; SET UP TABLE LENGTH
00000014'EF42    D5    0D55  2285 10$:     TSTL    L^DS$AA_BPTADDR[R2]     ; SCAN FOR KNOWN BREAKPOINTS        [12]
            17   13    0D5C  2286          BEQL    20$                     ; SKIP IF NOT SET
                        0D5E  2287                                          ;
00000014'EF42    DD    0D5E  2288          PUSHL   L^DS$AA_BPTADDR[R2]     ; ADDRESS TO STORE ORIGINAL OPCODE  [12]
00000001'EF42    9F    0D65  2289          PUSHAB  L^DS$AB_BPTINST[R2]     ; ADDRESS OF DATA TO STORE          [12]
            01   DD    0D6C  2290          PUSHL   #1                      ; ONLY 1 BYTE
00000DC9'EF      03    FB    0D6E  2291          CALLS   #3,FETCH_STORE          ; STORE ORIGINAL OPCODE BACK
                        0D75  2292 20$:
          DD 52    F4    0D75  2293          SOBGEQ  R2,10$                  ; LOOP UNTIL DONE (INCLUDING [0])
            04   BA    0D78  2294          POPR    #^M<R2>                 ; RESTORE TEMPORARY
                 05    0D7A  2295          RSB                             ; RETURN
                        0D7B  2296                                                                  ;G:5
```

```
                        0D7B  2298          .SBTTL  BREAKPOINT REPLACEMEMT SUBROUTINE
                        0D7B  2299 ;++
                        0D7B  2300 ; FUNCTIONAL DESCRIPTION:
                        0D7B  2301 ;
                        0D7B  2302 ;       RESTORES ALL KNOWN BREAKPOINTS
                        0D7B  2303 ;
                        0D7B  2304 ; CALLING SEQUENCE:
                        0D7B  2305 ;
                        0D7B  2306 ;       BSBW    RBREAK_IN                                        ;G:6
                        0D7B  2307 ;
                        0D7B  2308 ; INPUT PARAMETERS:
                        0D7B  2309 ;
                        0D7B  2310 ;       NONE
                        0D7B  2311 ;
                        0D7B  2312 ; IMPLICIT INPUTS:
                        0D7B  2313 ;
                        0D7B  2314 ;       DS$AA_BPTADDR                    ; ARRAY OF KNOWN BREAKPOINTS
                        0D7B  2315 ;       DS$AB_BPTINST                    ; ARRAY OF SAVED 'OPCODES'
                        0D7B  2316 ;
                        0D7B  2317 ; OUTPUT PARAMETERS:    NONE
                        0D7B  2318 ;
                        0D7B  2319 ; IMPLICIT OUTPUTS:     NONE
                        0D7B  2320 ;
                        0D7B  2321 ; COMPLETION CODES:     NONE
                        0D7B  2322 ;
                        0D7B  2323 ; SIDE EFFECTS:         NONE
                        0D7B  2324 ;--
                        0D7B  2325
                        0D7B  2326 RBREAK_IN:                                                       ;
            04    BB    0D7B  2327          PUSHR   #^M<R2>                                       ; PRESERVE A TEMPORARY
                        0D7D  2328                                                                  ;
          52    0F    D0  0D7D  2329          MOVL    #BPTMAX,R2                                    ; SET UP TABLE LENGTH
 00000014'EF42    D5    0D80  2330 10$:      TSTL    L^DS$AA_BPTADDR[R2]                           ; SCAN FOR KNOWN BREAKPOINTS          [12]
            3A    13    0D87  2331          BEQL    30$                                           ; SKIP IF NOT SET                     [12]
                        0D89  2332                                                                  ;                                     [12]
 00000001'EF42    9F    0D89  2333          PUSHAB  L^DS$AB_BPTINST[R2]                           ; ADDRESS TO STORE ORIGINAL OPCODE    [12]
 00000014'EF42    DD    0D90  2334          PUSHL   L^DS$AA_BPTADDR[R2]                           ; ADDRESS TO INSERT BREAKPOINT        [12]
            01    DD    0D97  2335          PUSHL   #1                                            ; INSERT ONLY ONE BYTE
00000DC9'EF    03    FB  0D99  2336          CALLS   #3,FETCH_STORE                                ; SAVE OPCODE
          19 50    E9    0DA0  2337          BLBC    R0,20$                                        ; CAN'T READ, REMOVE BREAKPOINT
                        0DA3  2338
 00000014'EF42    DD    0DA3  2339          PUSHL   L^DS$AA_BPTADDR[R2]                           ; ADDRESS TO INSERT BREAKPOINT        [12]
   00000006'EF    9F    0DAA  2340          PUSHAB  L^BPT_LITERAL                                 ; BPT INSTRUCTION                     [12]
            01    DD    0DB0  2341          PUSHL   #1                                            ; INSERT 1 BYTE
00000DC9'EF    03    FB  0DB2  2342          CALLS   #3,FETCH_STORE                                ; STORE IT
          07 50    E8    0DB9  2343          BLBS    R0,30$                                        ; OK, NEXT
                        0DBC  2344 20$:
 00000014'EF42    D4    0DBC  2345          CLRL    L^DS$AA_BPTADDR[R2]                           ; REMOVE BREAKPOINT                   [12]
          BA 52    F4    0DC3  2346 30$:      SOBGEQ  R2,10$                                        ; LOOP UNTIL DONE (INCLUDING [0])
                        0DC6  2347                                                                  ;
            04    BA    0DC6  2348          POPR    #^M<R2>                                       ; RESTORE TEMPORARY
                  05    0DC8  2349          RSB                                                   ; RETURN
```

```
                     0DC9  2351          .SBTTL  FETCH_STORE     COPY BYTE ROUTINE
                     0DC9  2352 ;++
                     0DC9  2353 ; FUNCTIONAL DESCRIPTION:
                     0DC9  2354 ;
                     0DC9  2355 ;       This routine will copy bytes of memory from one place to another.
                     0DC9  2356 ;
                     0DC9  2357 ; CALLING SEQUENCE:
                     0DC9  2358 ;
                     0DC9  2359 ;       CALLG   (AP),FETCH_STORE
                     0DC9  2360 ;
                     0DC9  2361 ; INPUT PARAMETERS:
                     0DC9  2362 ;
                     0DC9  2363 ;        4(AP)  Count of bytes to store
                     0DC9  2364 ;        8(AP)  Address to fetch data from
                     0DC9  2365 ;       12(AP)  Address to store data
                     0DC9  2366 ;
                     0DC9  2367 ; IMPLICIT INPUTS:      NONE
                     0DC9  2368 ;
                     0DC9  2369 ; OUTPUT PARAMETERS:    NONE
                     0DC9  2370 ;
                     0DC9  2371 ; IMPLICIT OUTPUTS:     NONE
                     0DC9  2372 ;
                     0DC9  2373 ; COMPLETION CODES:
                     0DC9  2374 ;
                     0DC9  2375 ;       SS$_NORMAL      If all went well
                     0DC9  2376 ;       DS$_MACHCK      If bad addresses
                     0DC9  2377 ;       SS$_ACCVIO      If memory managment faults
                     0DC9  2378 ;       DS$_TRANSL      If translation not valid fault
                     0DC9  2379 ;
                     0DC9  2380 ; SIDE EFFECTS:
                     0DC9  2381 ;
                     0DC9  2382 ;       Memory as specified by 12(AP) is changed
                     0DC9  2383 ;--                                                          ;G:6
                     0DC9  2384          $OFFSET 0,NEGATIVE,<-
                     0DC9  2385                  <DATA,8>, -             ; Space to save data
                     0DC9  2386                  <ARG1,6*4>, -           ; Space for SETPRT arglist
                     0DC9  2387                  <ADR1,8>, -             ; Descriptor of page(s)
                     0DC9  2388                  <ARG2,6*4>, -           ; Space for SETPRT arglist
                     0DC9  2389                  <ADR2,8>, -             ; Descriptor of page(s)
                     0DC9  2390                  <LOCAL,0>>              ; Length of local storage required
                     0DC9                .SAVE   LOCAL_BLOCK
                     0DC9                .PSECT $ABS$ ABS
                00000000  FE70          .=0
                FFFFFFF8  0000          .BLKB   -8
                          FFF8      DATA:
                FFFFFFE0  FFF8          .BLKB   -6*4
                          FFE0      ARG1:
                FFFFFFD8  FFE0          .BLKB   -8
                          FFD8      ADR1:
                FFFFFFC0  FFD8          .BLKB   -6*4
                          FFC0      ARG2:
                FFFFFFB8  FFC0          .BLKB   -8
                          FFB8      ADR2:
                          FFB8      LOCAL:
                      00000DC9          .RESTORE
```

```
                    003C  0DC9  2392 .ENTRY  FETCH_STORE,^M<R2,R3,R4,R5>
                          0DCB  2393
          55    5D    D0  0DCB  2394         MOVL    FP,R5                    ; Base of local storage
      5E    B8 AD    9E  0DCE  2395         MOVAB   LOCAL(FP),SP             ; Allocate space for local storage
            F0 AD    D4  0DD2  2396         CLRL    ARG1+SETPRT$_PROT(FP)    ; Mark protection not changed
            D0 AD    D4  0DD5  2397         CLRL    ARG2+SETPRT$_PROT(FP)    ; Mark protection not changed
                          0DD8  2398
  6D  00000E45'EF    9E  0DD8  2399         MOVAB   L^FS_HANDLR,(FP)         ; Set exception handler                [12]
                          0DDF  2400                                                                                ;G:5
                          0DDF  2401                                                                                ;G:5
      52    04 AC    7D  0DDF  2402         MOVQ    4(AP),R2                 ; Get Length and source address        ;G:5
          51    53    D0  0DE3  2403         MOVL    R3,R1                    ; Desired address
                          0DE6  2404
    63    52    00    0C  0DE6  2405         PROBER  #PSL$C_KERNEL,R2,(R3)    ; Readable?
                06    12  0DEA  2406         BNEQ    10$                      ; Branch if readable
          50    00'   D0  0DEC  2407         MOVL    S^#PRT$C_UR,R0           ; Desired protection
             010F    30  0DEF  2408         BSBW    FS_SETUP                 ; Setup and set protections
                          0DF2  2409
      53    08 AC    D0  0DF2  2410 10$:    MOVL    8(AP),R3                 ; Get source address
      54    F8 AD    9E  0DF6  2411         MOVAB   DATA(FP),R4              ; Intermediate
             0023    30  0DFA  2412         BSBW    FS_COPY                  ; Copy from (R3)+ to (R4)+ by R2
             0197    30  0DFD  2413         BSBW    FS_RESET                 ; Put input protections back
                          0E00  2414
      54    0C AC    D0  0E00  2415         MOVL    12(AP),R4                ; Output address
          51    54    D0  0E04  2416         MOVL    R4,R1                    ; Desired address
    64    52    00    0D  0E07  2417         PROBEW  #PSL$C_KERNEL,R2,(R4)    ; Writeable?
                06    12  0E0B  2418         BNEQ    20$                      ; YES, DO IT
          50    00'   D0  0E0D  2419         MOVL    S^#PRT$C_UW,R0           ; Desired protection
             00EE    30  0E10  2420         BSBW    FS_SETUP                 ; Setup and set protections
                          0E13  2421
      53    F8 AD    9E  0E13  2422 20$:    MOVAB   DATA(FP),R3              ; Source for copy
                07    10  0E17  2423         BSBB    FS_COPY                  ; Copy data to target
             017B    30  0E19  2424         BSBW    FS_RESET                 ; Put output protections back
          50    01    D0  0E1C  2425         MOVL    S^#SS$_NORMAL,R0         ; Success!
                      04  0E1F  2426         RET
```

```
                        0E20  2428 ;+
                        0E20  2429 ; Copy data from one place to another, respect desired length Q,L,W,B
                        0E20  2430 ; Read every address so we get machine checks instead of write timeouts
                        0E20  2431 ;       R1 = address to report if error
                        0E20  2432 ;       R2 = length 0-0F
                        0E20  2433 ;       R3 = source address
                        0E20  2434 ;       R4 = destination address
                        0E20  2435 ;-
                        0E20  2436 FS_COPY:
06 52    03    E1       0E20  2437          BBC     #3,R2,10$               ; Branch if NOT quadword
   64    64    7D       0E24  2438          MOVQ    (R4),(R4)               ; Read to check for accessability
   84    83    7D       0E27  2439          MOVQ    (R3)+,(R4)+             ; Copy quadword
05 52    02    E1       0E2A  2440 10$:     BBC     #2,R2,20$               ; Branch if NOT longword
   64    D5             0E2E  2441          TSTL    (R4)                    ; Check accessability
   84    83    D0       0E30  2442          MOVL    (R3)+,(R4)+             ; Copy longword
05 52    01    E1       0E33  2443 20$:     BBC     #1,R2,30$               ; Branch if NOT word
   64    B5             0E37  2444          TSTW    (R4)                    ; Check accessability
   84    83    B0       0E39  2445          MOVW    (R3)+,(R4)+             ; Copy word
      05 52    E9       0E3C  2446 30$:     BLBC    R2,40$                  ; Branch if NOT byte
   64    95             0E3F  2447          TSTB    (R4)                    ; Check accessability
   84    83    90       0E41  2448          MOVB    (R3)+,(R4)+             ; Copy byte
               05       0E44  2449 40$:     RSB
                        0E45  2450
```

```
                                0E45  2452 ;+
                                0E45  2453 ; Exception handler for FETCH_STORE and FETCH_STOR_PREG routines.
                                0E45  2454 ;-                                                                  ;G:11
                                0E45  2455 FS_HANDLR:                                                          ;G:11
                          0020  0E45  2456         .WORD   ^M<R5>                 ; Need this register for old FP
                                0E47  2457 ;+                                                                  ;G:5
                                0E47  2458 ;  RESTORE DIAGNOSTIC PROGAM'S SCB VECTORS                          ;G:5
                                0E47  2459 ;-                                                                  ;G:5
                                0E47  2460                                                                     ;G:5
    25 0000FE00'EF    1C    E0  0E47  2461         BBS     #DSA$V_USER, L^DSA$GL_FLAGS, 109$ ; IF user mode THEN branch  [28]
                      58    D4  0E4F  2462         CLRL    R8                                                  ;G:5
       58    000000A0'EF    DE  0E51  2463         MOVAL   SAVE_SCB_VEC,R8        ; Base Addresss of Saved Vectors  ;G:5
       00000004'EF    88    D0  0E58  2464         MOVL    (R8)+,SCB_BASE+^X4     ; Re-insert Saved Mchk Handler  [28]
       00000018'EF    88    D0  0E5F  2465         MOVL    (R8)+,SCB_BASE+^X18    ; Re-insert Saved Reserv Op Handler
       00000020'EF    88    D0  0E66  2466         MOVL    (R8)+,SCB_BASE+^X20    ; Re-insert Saved Acc Vio Handler
       00000024'EF    88    D0  0E6D  2467         MOVL    (R8)+,SCB_BASE+^X24    ; Re-insert Saved Trans Not Valid Handler
                                0E74  2468                                                                     ;G:5
             50    04 AC    7D  0E74  2469 109$:   MOVQ    4(AP),R0               ; Get address of mech/signal args  ;G:5
             55    04 A1    D0  0E78  2470         MOVL    4(R1),R5               ; Get FP at time of exception
    04 A0    00660088 8F    D1  0E7C  2471         CMPL    #DS$_MCHK,4(R0)        ; MACHINE CHECK?
                      0D    12  0E84  2472         BNEQ    110$                   ; NO, TRY NEXT
       50    000001AB'EF    9E  0E86  2473         MOVAB   L^T_MACHCK,R0          ; POINT TO ERROR TEXT  [12]
             51    10 A1    D0  0E8D  2474         MOVL    16(R1),R1              ; GET VIRTURAL ADDRESS
                      45    11  0E91  2475         BRB     150$                   ; AND PRINT IT
    04 A0    006600A0 8F    D1  0E93  2476 110$:   CMPL    #DS$_TRANSL,4(R0)      ; TRANSLATION NOT VALID?
                      0D    12  0E9B  2477         BNEQ    120$                   ; NO, TRY NEXT
             51    0C A0    D0  0E9D  2478         MOVL    8+4(R0),R1             ; Get virtural address
       50    000001E0'EF    9E  0EA1  2479         MOVAB   L^T_TRANSL,R0          ; POINT TO ERROR TEXT  [12]
                      2E    11  0EA8  2480         BRB     150$                   ; PRINT
    04 A0    00000000'8F    D1  0EAA  2481 120$:   CMPL    #SS$_ACCVIO,4(R0)      ; ACCESS VIOLATION?
                      0D    12  0EB2  2482         BNEQ    130$                   ; No, try next
             51    0C A0    D0  0EB4  2483         MOVL    8+4(R0),R1             ; Get virtural address
       50    000001CC'EF    9E  0EB8  2484         MOVAB   L^T_ACCVIO,R0          ; POINT TO TEXT  [12]
                      17    11  0EBF  2485         BRB     150$                   ; PRINT
                                0EC1  2486 130$:
    04 A0    00000000'8F    D1  0EC1  2487         CMPL    #SS$_ROPRAND,4(R0)     ; Invalid operand? (must be IPR if so)
                      07    12  0EC9  2488         BNEQ    145$                   ; Nope.
          25 0C A1    00    E4  0ECB  2489         BBSC    #0,12(R1),155$         ; Clear success bit in return code
                      23    11  0ED0  2490         BRB     155$                   ; Exit
                                0ED2  2491 145$:
             50    0000'8F    3C  0ED2  2492         MOVZWL  #SS$_RESIGNAL,R0       ; PAWN IT OFF ON SOMEONE ELSE
                      04    0ED7  2493         RET                            ; RETURN FROM CONDITION HANDLER
                                0ED8  2494
                                0ED8  2495 150$:   $PRINTI_S L^FMT_EXCEPTION,R0,R1 ; TYPE THE ERROR TEXT  [12]
                      51    DD  0ED8                 PUSHL   R1
                      50    DD  0EDA                 PUSHL   R0
          000001F9'EF       9F  0EDC                 PUSHAB  L^FMT_EXCEPTION
    00000000'EF       03    FB  0EE2                 CALLS   #$$N, DSX$PRINTI
             50    04 AC    7D  0EE9  2496         MOVQ    4(AP),R0               ; SIGNAL AND MECHANISM ADDRESSES  ;G:11
          0C A1    04 A0    D0  0EED  2497         MOVL    4(R0),12(R1)           ; Put condition in R0
                   00A2     30  0EF2  2498         BSBW    FS_RESET               ; Put protections back
                                0EF5  2499 155$:   $UNWIND_S                      ; Return to caller
                      00    DD  0EF5                 PUSHL   #0
                      00    DD  0EF7                 PUSHL   #0
    00000000'GF       02    FB  0EF9                 CALLS   #2,G^SYS$UNWIND
                      04    0F00  2500         RET                            ; RETURN
```

```
                                0F01   2502 ;+
                                0F01   2503 ; Set protections for page(s)
                                0F01   2504 ;       R0 = desired protection
                                0F01   2505 ;       R1 = desired address, preserved
                                0F01   2506 ;       R2 = length of area, 0-F
                                0F01   2507 ;-
                                0F01   2508 FS_SETUP:
                          02    BB    0F01   2509         PUSHR   #^M<R1>                 ; Save address
                       F0 AD    50    9A    0F03   2510         MOVZBL  R0,ARG1+SETPRT$_PROT(FP); Set desired protection
                       D0 AD    50    9A    0F07   2511         MOVZBL  R0,ARG2+SETPRT$_PROT(FP); Set desired protection
                    50    01FF  8F    3C    0F0B   2512         MOVZWL  #^X1FF,R0               ; Byte within page bits
                 D8 AD    51    50    CB    0F10   2513         BICL3   R0,R1,ADR1(FP)          ; Starting address for this page
                    51    FF A142    9E    0F15   2514         MOVAB   -1(R1)[R2],R1           ; Address of last byte to be affected
                 DC AD    51    50    CB    0F1A   2515         BICL3   R0,R1,ADR1+4(FP)        ; Ending address
                   DC AD    D8 AD    D1    0F1F   2516         CMPL    ADR1(FP),ADR1+4(FP)     ; Start same as end?
                            2B    13    0F24   2517         BEQL    20$                     ; Branch if only one page need modifications
                                        0F26   2518
                   B8 AD    DC AD    D0    0F26   2519         MOVL    ADR1+4(FP),ADR2(FP)     ; Set start of page
                   BC AD    B8 AD    D0    0F2B   2520         MOVL    ADR2(FP),ADR2+4(FP)     ; Set end of page
                   D4 AD    D2 AD    DE    0F30   2521         MOVAL   ARG2+SETPRT$_PROT+2(FP), -
                                        0F35   2522                 ARG2+SETPRT$_PRVPRT(FP) ; Address to return protection
                            C8 AD    7C    0F35   2523         CLRQ    ARG2+SETPRT$_RETADR(FP) ; No return address and kernel mode
                   C4 AD    B8 AD    7E    0F38   2524         MOVAQ   ADR2(FP), -
                                        0F3D   2525                 ARG2+SETPRT$_INADR(FP)  ; Address of start and end pages
                      C0 AD    05    D0    0F3D   2526         MOVL    #SETPRT$_NARGS,ARG2(FP) ; Set count of args
                                        0F41   2527
          00000000'EF    C0 AD    FA    0F41   2528         CALLG   ARG2(FP),SYS$SETPRT     ; Set the protection
                            2E 50    E9    0F49   2529         BLBC    R0,30$                  ; Branch if it failed
                   D0 AD    40 8F    88    0F4C   2530         BISB    #64,ARG2+SETPRT$_PROT(FP); Flag protection changed
                                        0F51   2531
                   DC AD    D8 AD    D0    0F51   2532 20$:    MOVL    ADR1(FP),ADR1+4(FP)     ; Set end address of range
                   F4 AD    F2 AD    DE    0F56   2533         MOVAL   ARG1+SETPRT$_PROT+2(FP), -
                                        0F5B   2534                 ARG1+SETPRT$_PRVPRT(FP) ; Address to return protection
                            E8 AD    7C    0F5B   2535         CLRQ    ARG1+SETPRT$_RETADR(FP) ; No return address and kernel mode
                   E4 AD    D8 AD    7E    0F5E   2536         MOVAQ   ADR1(FP), -
                                        0F63   2537                 ARG1+SETPRT$_INADR(FP)  ; Address of start and end pages
                      E0 AD    05    D0    0F63   2538         MOVL    #SETPRT$_NARGS,ARG1(FP) ; Set count of args
                                        0F67   2539
          00000000'EF    E0 AD    FA    0F67   2540         CALLG   ARG1(FP),SYS$SETPRT     ; Set the protection
                            08 50    E9    0F6F   2541         BLBC    R0,30$                  ; Branch if it failed
                   F0 AD    40 8F    88    0F72   2542         BISB    #64,ARG1+SETPRT$_PROT(FP); Flag protection changed
                            02    BA    0F77   2543         POPR    #^M<R1>                 ; Restore R1
                                  05    0F79   2544         RSB
                                        0F7A   2545
                      52    50    D0    0F7A   2546 30$:    MOVL    R0,R2                   ; Save SETPRT return code
                                        0F7D   2547                                         ; Address already on stack
                00001CC'EF    9F    0F7D   2548         PUSHAB  L^T_ACCVIO              ; ADDRESS OF ACCESS VIOLATION INSERT    [12]
                00001F9'EF    9F    0F83   2549         PUSHAB  L^FMT_EXCEPTION         ; FAO STRING                            [12]
             00000000'EF    03    FB    0F89   2550         CALLS   #3, DSX$PRINTI          ; TYPE ACCESS VIOLATION TEXT
                                        0F90   2551
                      0004  30    0F90   2552         BSBW    FS_RESET                ; Reset the protections
                   50    52    D0    0F93   2553         MOVL    R2,R0                   ; Restore return code
                                  04    0F96   2554         RET                             ; RETURN TO CALLER OF FETCH_STORE
                                        0F97   2555 ;+
                                        0F97   2556 ; Routine to restore protections on pages changed
                                        0F97   2557 ;       R5 = FP of local data structure
                                        0F97   2558 ;-
```

```
                        0F97  2559 FS_RESET:
          50   F0 A5    9E  0F97  2560          MOVAB   ARG1+SETPRT$_PROT(R5),R0; Address of protections
          0C 60   06    E5  0F9B  2561          BBCC    #6,(R0),10$             ; Branch if protection not changed
          60   02 A0    90  0F9F  2562          MOVB    2(R0),(R0)              ; Put old protection in arglist
00000000'EF   E0 A5    FA  0FA3  2563          CALLG   ARG1(R5),SYS$SETPRT     ; Set protection back
                        0FAB  2564
          50   D0 A5    9E  0FAB  2565 10$:     MOVAB   ARG2+SETPRT$_PROT(R5),R0; Address of protections
          0C 60   06    E5  0FAF  2566          BBCC    #6,(R0),20$             ; Branch if protection not changed
          60   02 A0    90  0FB3  2567          MOVB    2(R0),(R0)              ; Put old protection in arglist
00000000'EF   C0 A5    FA  0FB7  2568          CALLG   ARG2(R5),SYS$SETPRT     ; Set protection back
                        0FBF  2569
                        05  0FBF  2570 20$:     RSB                             ; Return
                            0FC0  2571
```

```
                        0FC0  2573          .SBTTL  Handle EXAMINE/DEPOSIT of IPRs in KERNEL mode
                        0FC0  2574 ;+
                        0FC0  2575 ; CHMK handler: gets control via CHMK dispatch routine.  It calls routine
                        0FC0  2576 ; FETCH_STOR_PREG, in KERNEL mode, to allow use of MFPR/MTPR instructions
                        0FC0  2577 ; and handling of possible exception due to access
                        0FC0  2578 ;       PARAMETERS:
                        0FC0  2579 ;               R1      Value to deposit (if function is DEPOSIT)
                        0FC0  2580 ;               R3      IPR code
                        0FC0  2581 ;               R5      function code: 1 if EXAMINE, 0 if DEPOSIT
                        0FC0  2582 ;       RETURN:
                        0FC0  2583 ;               R1      Value examined--is "read-back" of deposited
                        0FC0  2584 ;                       value if function is DEPOSIT
                        0FC0  2585 ;-
                        0FC0  2586 CMK$SGIPR::
                  51    DD    0FC0  2587          PUSHL   R1                      ; Data, if deposit (else save space)
                  6E    DF    0FC2  2588          PUSHAL  (SP)                    ; Address of where to put/get data    ;G:11
                  55    DD    0FC4  2589          PUSHL   R5                      ; Flags word to determine if exam/dep
                  53    DD    0FC6  2590          PUSHL   R3                      ; Register Code
           D6'AF  03    FB    0FC8  2591          CALLS   #3,B^FETCH_STOR_PREG    ; Do it
                  02    BA    0FCC  2592          POPR    #^M<R1>                 ; Get data back if examine (else clear stack
     00000000'EF  51    D0    0FCE  2593          MOVL    R1,DS$GL_IPR_VALUE      ; Variable to store value if called by a bli
                        02    0FD5  2594          REI                             ; Return from the interrupt
                        0FD6  2595
```

```
                                0FD6  2597 .SBTTL  FETCH_STOR_PREG Move data to/from IPR
                                0FD6  2598 ;++
                                0FD6  2599 ; FUNCTIONAL DESCRIPTION:
                                0FD6  2600 ;
                                0FD6  2601 ;       This routine will either copy data from memory to an internal CPU
                                0FD6  2602 ;       register (DEPOSIT) or move data from an internal CPU register into
                                0FD6  2603 ;       memory (EXAMINE).  If function is DEPOSIT, it will also preform an
                                0FD6  2604 ;       EXAMINE to the same IPR, providing a verify read-back.
                                0FD6  2605 ;
                                0FD6  2606 ; CALLING SEQUENCE:
                                0FD6  2607 ;
                                0FD6  2608 ;       CALLS   #3,FETCH_STOR_PREG
                                0FD6  2609 ;
                                0FD6  2610 ; INPUT PARAMETERS:
                                0FD6  2611 ;
                                0FD6  2612 ;       4(AP)   The code for the desired IPR (range 0 to FF(X))
                                0FD6  2613 ;       8(AP)   A flag (=1 for EXAMINE, =0 for DEPOSIT)
                                0FD6  2614 ;       12(AP)  Address of location to get/store data
                                0FD6  2615 ;
                                0FD6  2616 ; IMPLICIT INPUTS:      None
                                0FD6  2617 ;
                                0FD6  2618 ; OUTPUT PARAMETERS:    None
                                0FD6  2619 ;
                                0FD6  2620 ; IMPLICIT OUTPUTS:     None
                                0FD6  2621 ;
                                0FD6  2622 ; COMPLETION CODES:
                                0FD6  2623 ;
                                0FD6  2624 ;       R0 bits define operations completed:
                                0FD6  2625 ;              bit0 set = no error
                                0FD6  2626 ;              bit1 set = DEPOSIT completed with no error
                                0FD6  2627 ;
                                0FD6  2628 ; SIDE EFFECTS:         None
                                0FD6  2629 ;--
                                0FD6  2630
                          000C  0FD6  2631 .ENTRY  FETCH_STOR_PREG,^M<R2,R3>
6D   FFFFFE67 EF    9E  0FD8  2632          MOVAB   L^FS_HANDLR,(FP)        ; Set up exception handler              [12]
     52    04 AC    D0  0FDF  2633          MOVL    4(AP),R2                ; Get IPR code
     53    0C AC    D0  0FE3  2634          MOVL    12(AP),R3               ; Get memory address
        50    01    D0  0FE7  2635          MOVL    #1,R0                   ; Presume success
     07 08 AC    E8  0FEA  2636          BLBS    8(AP),10$               ; EXAMINE only
        52    63    DA  0FEE  2637          MTPR    (R3),R2                 ; Attempt to move data to register    ;G:11
     00 50    01    E2  0FF1  2638          BBSS    #1,R0,10$               ; DEPOSIT worked--now do read-back
        63    52    DB  0FF5  2639 10$:     MFPR    R2,(R3)                 ; Try to move data from register
                    04  0FF8  2640          RET
```

```
                                0FF9  2642 .SBTTL  DSV$DEBUG - Process DEBUG Command                                [14]
                                0FF9  2643 ;++                                                                        [14]
                                0FF9  2644 ; FUNCTIONAL DESCRIPTION                                                   [14]
                                0FF9  2645 ;       This routine will process the DEBUG command by allocating      [14]
                                0FF9  2646 ;       memory space for the debugger, loading the debugger, and       [14]
                                0FF9  2647 ;       then calling it.                                               [14]
                                0FF9  2648 ;                                                                          [14]
                                0FF9  2649 ; CALLING SEQUENCE                                                         [14]
                                0FF9  2650 ;       BSBW    DSV$DEBUG                                                  [14]
                                0FF9  2651 ;                                                                          [14]
                                0FF9  2652 ; INPUT PARAMETERS                                                         [14]
                                0FF9  2653 ;       NONE                                                           [14]
                                0FF9  2654 ;                                                                          [14]
                                0FF9  2655 ; OUTPUT PARAMETERS                                                        [14]
                                0FF9  2656 ;       NONE                                                           [14]
                                0FF9  2657 ;                                                                          [14]
                                0FF9  2658 ;--                                                                        [14]
                                0FF9  2659
                   00000002     0FF9  2660 TRANS_VECTOR_OFFSET = 2                ;BYTE OFFSET FROM TOP OF IMAGE  [14]
                                0FF9  2661                                        ;   HEADER, CONTAINING OFFSET   [14]
                                0FF9  2662                                        ;   TO TRANSFER VECTOR ARRAY    [14]
                                0FF9  2663
45 58 45 2E 00001001'010E0000'  0FF9  2664 DBG_DEF:        .ASCID /.EXE/          ;                              [14]
                                1005  2665 DSV$DEBUG::                            ;                              [14]
                         1A  E1 1005  2666         BBC     #DSA$V_DEBUG,-         ;IF DEBUGGER ALREADY LOADED    [14]
                00000FE00'EF     1007  2667                 DSA$GL_FLAGS,5$        ;THEN                          [14]
                        0111  31 100D  2668         BRW     27$                    ;   DON'T RELOAD               [14]
                                1010  2669 5$:     $DS_PRINTF_S    FMT_DBG_MSG    ;PRINT MESSAGE                 [14]
                00000163'EF  9F 1010                PUSHAB  FMT_DBG_MSG
             00000000'9F     01 FB 1016             CALLS   #$$N, a#DS$PRINTF
                         1C  E1 101D  2670         BBC     #DSA$V_USER,-          ;IF USER MODE                  [14]
                   48 0000FE00'EF   101F  2671             DSA$GL_FLAGS,10$       ;THEN                          [14]
000001C9'EF      000FFFFF  8F D0 1025  2672         MOVL    #^X000FFFFF,-          ;   SET VA FOR TOP OF DEBUGGER [14]
                                1030  2673                 DBG_ADDR_REQ+4         ;    (1000K)                   [14]
                00010E00  8F C3 1030  2674         SUBL3   #DEBUGGER_SIZE,-       ;   SUBTRACT DEBUGGER SIZE     [14]
                000001C9'EF     1036  2675                 DBG_ADDR_REQ+4,-       ;    FROM TOP ADDRESS          [14]
                000001C5'EF     103B  2676                 DBG_ADDR_REQ           ;    AND STORE AS START VA     [14]
                                1040  2677         $CRETVA_S       DBG_ADDR_REQ, - ;   CALL SYSTEM SERVICE TO ALLO-[14]
                                1040  2678                         DBG_ADDR_RTN   ;    CATE MEMORY FOR DEBUGGER  [14]
                          00 DD 1040                PUSHL   #0
                000001CD'EF  7F 1042                PUSHAQ  DBG_ADDR_RTN
                000001C5'EF  7F 1048                PUSHAQ  DBG_ADDR_REQ
             00000000'GF     03 FB 104E             CALLS   #3,G^SYS$CRETVA
000001D5'EF      000001CD'EF  D0 1055  2679         MOVL    DBG_ADDR_RTN,DEBUG_LO  ;   STORE DEBUGGER LOW ADDRESS  [14]
000001D9'EF      000001D1'EF  D0 1060  2680         MOVL    DBG_ADDR_RTN+4,DEBUG_HI ;  STORE DEBUGGER HIGH ADDRESS [14]
                         5A  11 106B  2681         BRB     20$                    ;ELSE                          [14]
                00010E00  8F C3 106D  2682 10$:     SUBL3   #DEBUGGER_SIZE,-       ;   SUBTRACT DEBUGGER SIZE     [14]
                00000000'EF     1073  2683                 DS$GL_MEMSIZE,-        ;    FROM TOP ADDRESS          [14]
                000001CD'EF     1078  2684                 DBG_ADDR_RTN           ;    AND STORE AS START VA     [14]
000001CD'EF     00000200  8F C2 107D  2685         SUBL2   #512,DBG_ADDR_RTN      ;    DON'T USE TOP PAGE OF MEM. [14]
                                1088  2686                                        ;    (IT'S USED BY A DIAGNOSTIC!)[14]
00000000'EF     00000200  8F C3 1088  2687         SUBL3   #512,DS$GL_MEMSIZE,-   ;   TOP OF DEBUGGER AT TOP OF MEM[14]
                000001D9'EF     1093  2688                 DEBUG_HI               ;    MINUS LAST PAGE           [14]
000001D5'EF      000001CD'EF  D0 1098  2689         MOVL    DBG_ADDR_RTN,DEBUG_LO  ;   BOTTOM OF DEBUGGER         [14]
000001DD'EF      000001D5'EF  D0 10A3  2690         MOVL    DEBUG_LO,SYMTAB_HI     ;   ALSO WHERE SYM. TABLES START[14]
                00000000'EF  16 10AE  2691         JSB     MAP_DEBUGGER           ;   MAP MEMORY SPACE FOR DEBUGGER[14]
                      10 50  E8 10B4  2692         BLBS    R0,20$                 ;   IF MAPPING ERROR THEN      [14]
```

```
                          10B7  2693          $DS_PRINTF_S    FMT_NO_ROOM     ;       PRINT MSG                       [14]
      00000192'EF   9F    10B7                        PUSHAB  FMT_NO_ROOM
00000000'9F   01    FB    10BD                        CALLS   #$$N, a#DS$PRINTF
            00AB    31    10C4  2694          BRW     DSV$DEBUG_EXIT          ;       LEAVE                           [14]
                          10C7  2695 20$:
              00    DD    10C7  2696          PUSHL   #0                              ;FAKE VBN NUMBER                [22]
      000001FA'EF   DF    10C9  2697          PUSHAL  RET_REC                         ;LONGWORD TO RECEICE REC. ATTR. [22]
      000001FE'EF   DF    10CF  2698          PUSHAL  RET_LEN                         ;LONGWORD TO RECEIVE LENGTH     [22]
      000001CD'EF   DD    10D5  2699          PUSHL   DBG_ADDR_RTN                    ;ADDRESS TO LOAD DEBUGGER       [14]
      00010E00 8F   DD    10DB  2700          PUSHL   #DEBUGGER_SIZE                  ;LENGTH OF LOAD AREA            [14]
      FFFFFF12 EF   7F    10E1  2701          PUSHAQ  L^DBG_DEF                       ;ADDRESS OF FILE DEFAULTS       [14]
            08 A2   7F    10E7  2702          PUSHAQ  CLI$Q_FILE(R2)                  ;ADDRESS OF FILE DESCRIPTOR     [14]
00000000'EF   07    FB    10EA  2703          CALLS   #7,L^DSX$LOAD                   ;LOAD THE DEBUGGER              [14]
      00000000'EF   16    10F1  2704          JSB     DSR$COMPLETION                  ;TYPE ERROR TEXT IF NECESSARY   [14]
            09 50   E8    10F7  2705          BLBS    R0,25$                          ;IF ERROR THEN                  [14]
      00000000'EF   16    10FA  2706          JSB     UNMAP_DEBUGGER                  ;   UNMAP MEMORY WE JUST ALLOC'D[14]
            006F    31    1100  2707          BRW     DSV$DEBUG_EXIT                  ;   LEAVE                        [14]
                          1103  2708 25$:     $DS_PRINTF_S    FMT_DBG_LOAD,-          ;PRINT MESSAGE                  [14]
                          1103  2709                          DBG_ADDR_RTN    ;               [14]
      000001CD'EF   DD    1103                        PUSHL   DBG_ADDR_RTN
      00000179'EF   9F    1109                        PUSHAB  FMT_DBG_LOAD
00000000'9F   02    FB    110F                        CALLS   #$$N, a#DS$PRINTF
      04000000 8F   C8    1116  2710          BISL    #1@DSA$V_DEBUG,-                ;SET DEBUGGER RESIDENT FLAG     [14]
      0000FE00'EF         111C  2711          DSA$GL_FLAGS                    ;               [14]
              0E    BB    1121  2712 27$:     PUSHR   #^M<R1,R2,R3>                   ;SAVE REGISTERS                 [14]
51    80000000 8F   D0    1123  2713          MOVL    #^X80000000,R1                  ;SET DS_ENVIRON BIT             [14]
              1C    E1    112A  2714          BBC     #DSA$V_USER,-                   ;IF USER MODE                   [14]
  07 0000FE00'EF          112C  2715                  DSA$GL_FLAGS,30$                ;THEN                           [14]
51    40000000 8F   C8    1132  2716          BISL    #1@30,R1                        ;   SET USER MODE BIT           [14]
              51    DD    1139  2717 30$:     PUSHL   R1                              ;CLI STATUS BITS                [14]
              00    DD    113B  2718          PUSHL   #0                              ;NULL ARGUMENT                  [14]
      00000000'EF   DF    113D  2719          PUSHAL  DIAG_FILE_NAME                  ;PASS ADDR. OF COUNTED STRING   [14]
      00000000'EF   DF    1143  2720          PUSHAL  IMAGE_HEADER                    ;PASS ADDR. OF IMAGE HEADER     [14]
              00    DD    1149  2721 50$:     PUSHL   #0                              ;NULL ARGUMENT                  [14]
      00001173'EF   DF    114B  2722          PUSHAL  TRANS_VECTOR                    ;TRANSFER ADDRESS VECTOR        [14]
51    000001CD'EF   D0    1151  2723          MOVL    DBG_ADDR_RTN,R1                 ;PUT START OF DEBUGGER IMAGE    [14]
                          1158  2724                                                  ; HEADER IN R1                  [14]
  52    02 A1   9A    1158  2725          MOVZBL  TRANS_VECTOR_OFFSET(R1),R2;GET OFFSET TO TRANSFER VECTOR[14]
53    52    51    C1    115C  2726          ADDL3   R1,R2,R3                        ;GET ADDRESS OF VECTOR          [14]
      53    04    C0    1160  2727          ADDL2   #4,R3                           ;GET SECOND ENTRY               [14]
      51    63    C0    1163  2728          ADDL2   (R3),R1                         ;MAKE TRANSFER ADDRESS ABSOLUTE [14]
      61    06    FB    1166  2729          CALLS   #6,(R1)                         ;CALL THE DEBUGGER              [14]
                          1169  2730 CONT_FROM_DEBUG:                               ;                               [14]
              0E    BA    1169  2731          POPR    #^M<R1,R2,R3>                   ;RESTORE REGISTERS              [14]
5E    00000058 8F   C0    116B  2732          ADDL2   #<22*4>,SP                      ;RESTORE STACK (DEBUGGER MESSED [14]
                          1172  2733                                                  ; IT UP).                       [14]
                          1172  2734 DSV$DEBUG_EXIT:                                ;                               [14]
                    05    1172  2735          RSB                                     ;RETURN                         [14]
                          1173  2736 TRANS_VECTOR:                                   ;USED BY DEBUGGER               [14]
                00000000  1173  2737                      .LONG   0                       ;                       [14]
                00001167' 1177  2738                      .LONG   CONT_FROM_DEBUG-2;                              [14]
                          117B  2739
                          117B  2740          .END
```

$$ARGS	=	00000004		D		CLEAR_NEX_BIT		00000562	RG	D	04			
$$N	=	00000002		D		CLI$K_BUFSIZ	=	00000100		D				
$$T1	=	00000014		D		CLI$K_SIZE		0000044C		D				
$$T2	=	00000007		D		CLI$L_ADDRESS		00000018		D				
$ER	=	00000001		D		CLI$L_COMMAND		00000004		D				
$MODULE		00000000	R	D	03	CLI$L_DATA		0000001C		D				
$SRVCODE_BOOTATTACHED	=	00000000		D		CLI$L_FLAGS		00000000		D				
$SRVCODE_CLEAR_INTERLOCK	=	00000009		D		CLI$L_FLAGS2		00000444		D				
$SRVCODE_GETSYSBUF	=	00000004		D		CLI$L_LAST		00000024		D				
$SRVCODE_HALTATTACHED	=	00000002		D		CLI$L_NEXT		00000030		D				
$SRVCODE_INTERLOCK_TEST	=	00000007		D		CLI$L_PASS		0000002C		D				
$SRVCODE_PPSCB	=	0000000A		D		CLI$L_SUBT		00000028		D				
$SRVCODE_PRINTREV	=	00000006		D		CLI$L_TEMP_BASE		00000448		D				
$SRVCODE_RELSYSBUF	=	00000005		D		CLI$L_TEST		00000020		D				
$SRVCODE_SET_INTERLOCK	=	00000008		D		CLI$M_START_OR_RUN	=	00000008		D				
$SRVCODE_SHOWIDLE	=	00000003		D		CLI$Q_BUFQWD		00000034		D				
$SRVCODE_STARTATTACHED	=	00000001		D		CLI$Q_FILE		00000008		D				
AAP		00000323	R	D	03	CLI$Q_SECTION		00000010		D				
ADR1		FFFFFFD8		D		CLI$Q_TIME		0000043C		D				
ADR2		FFFFFFB8		D		CLI$T_BUFFER		0000003C		D				
AEM		0000029F	R	D	03	CLI$V_ADAPTER	=	00000018		D				
AFP		00000326	R	D	03	CLI$V_ADR	=	0000000B		D				
AKM		00000298	R	D	03	CLI$V_ASCII	=	00000013		D				
APC		0000032C	R	D	03	CLI$V_BASE_QUAL	=	00000002		D				
APSL		0000032F	R	D	03	CLI$V_BREAK	=	0000000A		D				
APSLMNE		00000243	RG	D	03	CLI$V_BRIEF	=	0000001B		D				
AR0		000002FD	R	D	03	CLI$V_BYTE	=	0000000D		D				
AR1		00000300	R	D	03	CLI$V_CLEAR	=	00000002		D				
AR10		0000031B	R	D	03	CLI$V_DEC	=	00000010		D				
AR11		0000031F	R	D	03	CLI$V_DEFAULT	=	0000000C		D				
AR2		00000303	R	D	03	CLI$V_DEPOSIT	=	00000019		D				
AR3		00000306	R	D	03	CLI$V_EVENT	=	00000008		D				
AR4		00000309	R	D	03	CLI$V_EXAM	=	00000005		D				
AR5		0000030C	R	D	03	CLI$V_FLAGS	=	00000009		D				
AR6		0000030F	R	D	03	CLI$V_HEX	=	00000012		D				
AR7		00000312	R	D	03	CLI$V_KERNEL	=	00000017		D				
AR8		00000315	R	D	03	CLI$V_LOAD	=	00000006		D				
AR9		00000318	R	D	03	CLI$V_LONG	=	0000000F		D				
ARG1		FFFFFFE0		D		CLI$V_NEXT	=	00000001		D				
ARG2		FFFFFFC0		D		CLI$V_NOALLOC	=	00000000		D				
ASM		000002A9	R	D	03	CLI$V_NOTNUF	=	00000001		D				
ASP		00000329	R	D	03	CLI$V_OCT	=	00000011		D				
AUM		000002B4	R	D	03	CLI$V_PREG	=	0000001A		D				
BASEADDRESS		0000009C	R	D	02	CLI$V_QA	=	00000007		D				
BIIC$L_BCICR	=	00000028		D		CLI$V_QACKLOOPLOOPS	=	0000001C		D				
BIIC$L_BER	=	00000008		D		CLI$V_QAERRORPRINTS	=	0000001B		D				
BIIC$M_NEX	=	00020000		D		CLI$V_QAMULTIPLEPASS	=	0000001F		D				
BIIC$M_RTOEVEN	=	00000008		D		CLI$V_QASUBTESTLOOPS	=	0000001E		D				
BIT...	=	0000000F		D		CLI$V_QATESTLOOPS	=	0000001D		D				
BPTCODE	=	00000003	G	D		CLI$V_REG	=	00000014		D				
BPTMAX	=	0000000F	G	D		CLI$V_REQUIRED	=	00000000		D				
BPT_LITERAL		00000006	R	D	03	CLI$V_RUN	=	00000015		D				
CALL_CLI		00000B47	R	D	04	CLI$V_SET	=	00000003		D				
CHCK_TO_SEE_IF_IO_SPACE		00000486	R	D	04	CLI$V_SHOW	=	00000004		D				
CHECK_CSR1		000005E0	RG	D	04	CLI$V_START_OR_RUN	=	00000003		D				
CHECK_NEX_BIT		0000058B	RG	D	04	CLI$V_VALSEC	=	00000016		D				
CLEAR_LOOP_BACK_BIT		0000068E	RG	D	04	CLI$V_WORD	=	0000000E		D				

```
CMK$SGIPR                       00000FC0 RG  D  04      DS$M_CTRLO                      = 00010000    D
CMK$_APBOOT                   = 00000004     D        DS$M_DEVFLG                     = 00000200    D
CMK$_ASTEXIT                  = 00000000     D        DS$M_DISABLCC                   = 01000000    D
CMK$_CANTIM                   = 0000000B     D        DS$M_DONFLG                     = 00002000    D
CMK$_HIBER                    = 00000007     D        DS$M_ERRFLG                     = 00000010    D
CMK$_INITSCB                  = 00000008     D        DS$M_EXCEPT                     = 00080000    D
CMK$_LAST                     = 0000000E     D        DS$M_EXETST                     = 00040000    D
CMK$_MMENABLE                 = 00000003     D        DS$M_HLTFLG                     = 00000008    D
CMK$_RCONSOLE                 = 00000001     D        DS$M_LODFLG                     = 00000002    D
CMK$_REFRESH                  = 00000005     D        DS$M_MEMMGT                     = 00008000    D
CMK$_SCHDWK                   = 00000006     D        DS$M_NI                         = 04000000    D
CMK$_SETIMR                   = 0000000C     D        DS$M_OUTPUT                     = 00800000    D
CMK$_SETIPL                   = 00000009     D        DS$M_RUBFLG                     = 00000020    D
CMK$_SETPRT                   = 0000000D     D        DS$M_SCRIPT                     = 00200000    D
CMK$_SGIPR                    = 0000000A     D        DS$M_SETIMR                     = 02000000    D
CMK$_TCONSOLE                 = 00000002     D        DS$M_STRFLG                     = 00000004    D
COND_DEBUG                      000009F1 RG  D  04      DS$M_SUBT                       = 00004000    D
COND_DEBUG_X                    00000A32 R   D  04      DS$M_SYSFLG                     = 00000400    D
CONT                            00000B7A R   D  04      DS$M_TIMED                      = 02000000    D
CONT_FROM_DEBUG                 00001169 R   D  04      DS$M_TIMED_OUT                  = 08000000    D
DATA                            FFFFFFF8     D          DS$M_TIMRON                     = 00020000    D
DBG_ADDR_REQ                    000001C5 R   D  02      DS$PRINTF                         ********  X   04
DBG_ADDR_RTN                    000001CD RG  D  02      DS$SERVICE_DISPATCHER             ********  X   04
DBG_BREAK                       00000A65 R   D  04      DS$V_ABRTFLG                    = 00000006    D
DBG_DEF                         00000FF9 R   D  04      DS$V_BADTIME                    = 00000014    D
DBG_TBIT                        00000C41 R   D  04      DS$V_BATCH                      = 00000016    D
DEBUG$GB_FLAGS                  00000000 RG  D  02      DS$V_BRKCLR                     = 0000000C    D
DEBUGGER_SIZE                 = 00010E00     D        DS$V_BRKPT                      = 0000000B    D
DEBUG_HI                        000001D9 RG  D  02      DS$V_CHARFLG                    = 00000008    D
DEBUG_LO                        000001D5 RG  D  02      DS$V_CMDFLG                     = 00000007    D
DFLTSIZE                        00000098 R   D  02      DS$V_CTRLC                      = 00000000    D
DIAG_FILE_NAME                  ********   GX   00      DS$V_CTRLO                      = 00000010    D
DIR...                        = FFFFFFFF     D        DS$V_DEVFLG                     = 00000009    D
DS$AA_BPTADDR                   00000014 RG  D  02      DS$V_DISABLCC                   = 00000018    D
DS$AA_BPTBASE                   00000054 RG  D  02      DS$V_DONFLG                     = 0000000D    D
DS$AA_OFFSET                    00000094 R   D  02      DS$V_ERRFLG                     = 00000004    D
DS$AB_BPTINST                   00000001 RG  D  02      DS$V_EXCEPT                     = 00000013    D
DS$CLI                          ********     X  04      DS$V_EXETST                     = 00000012    D
DS$CVTREG                       ********     X  04      DS$V_HLTFLG                     = 00000003    D
DS$GB_PRIMARY_CPU_IDENTIFIER    ********     X  04      DS$V_LODFLG                     = 00000001    D
DS$GL_CLIBASE                   ********     X  04      DS$V_MEMMGT                     = 0000000F    D
DS$GL_IPR_VALUE                 ********     X  00      DS$V_NI                         = 0000001A    D
DS$GL_MEMSIZE                   ********     X  04      DS$V_OUTPUT                     = 00000017    D
DS$GL_RADIX                     ********     X  04      DS$V_RUBFLG                     = 00000005    D
DS$K_ERROR                    = 00000002       D        DS$V_SCRIPT                     = 00000015    D
DS$K_NORMAL                   = 00000001       D        DS$V_SETIMR                     = 00000019    D
DS$K_SEVERE                   = 00000004       D        DS$V_STRFLG                     = 00000002    D
DS$K_SUBSYS                   = 00000066       D        DS$V_SUBT                       = 0000000E    D
DS$K_WARNING                  = 00000000       D        DS$V_SYSFLG                     = 0000000A    D
DS$M_ABRTFLG                  = 00000040       D        DS$V_TIMED                      = 00000019    D
DS$M_BADTIME                  = 00100000       D        DS$V_TIMED_OUT                  = 0000001B    D
DS$M_BATCH                    = 00400000       D        DS$V_TIMRON                     = 00000011    D
DS$M_BRKCLR                   = 00001000       D        DS$_AP_NORMAL_BREAK             = 00660150    D
DS$M_BRKPT                    = 00000800       D        DS$_ARITH                       = 006600D0    D
DS$M_CHARFLG                  = 00000100       D        DS$_ASBE                        = 00660118    D
DS$M_CMDFLG                   = 00000080       D        DS$_BADLINK                     = 006600F0    D
DS$M_CTRLC                    = 00000001       D        DS$_BADTYPE                     = 006600E8    D
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DS$_BIIC	= 00660120	D	DSA$GL_UNITS		0000FE0C		D		
DS$_CHME	= 006600A8	D	DSA$GQ_MSGPTR		0000FE68		D		
DS$_CHMK	= 006600E0	D	DSA$GT_DEVNAM		0000FE5C		D		
DS$_DEVNAME	= 00660108	D	DSA$V_DEBUG	=	0000001A		D		
DS$_ERROR	= 00660002	D	DSA$V_USER	=	0000001C		D		
DS$_FHWE	= 00660068	D	DSP$REMOVEBREAK		0000093D	RG	D	04	
DS$_FRAGBUF	= 00660080	D	DSR$COMPLETION		********		X	04	
DS$_ICBUSY	= 006600C8	D	DSV$DEBUG		00001005	RG	D	04	
DS$_ICERR	= 006600C0	D	DSV$DEBUG_EXIT		00001172	R	D	04	
DS$_IHWE	= 00660060	D	DSX$LOAD		********		X	04	
DS$_ILLCHAR	= 00660018	D	DSX$PRINTI		********		X	04	
DS$_ILLPAGCNT	= 00660078	D	EXAMBUFFER		000000DB	R	D	02	
DS$_ILLUNIT	= 00660100	D	EXAMQWDBUF		000000D3	R	D	02	
DS$_INIT_FAIL	= 00660140	D	EXAMSIZE	=	00000020		D		
DS$_INSFMEM	= 00660050	D	EXIT_CHCK_TO_SEE		0000055D	R	D	04	
DS$_INVCPU	= 00660130	D	EXIT_CHECK_CSR1		00000650	R	D	04	
DS$_IPL2HI	= 006600B8	D	EXIT_CHECK_NEX_BIT		000005DF	R	D	04	
DS$_IVADDR	= 00660040	D	EXIT_CLEAR_LOOP		000006B5	R	D	04	
DS$_IVVECT	= 00660038	D	EXIT_CLEAR_NEX_BIT		0000058A	R	D	04	
DS$_KRNLSTK	= 00660090	D	EXIT_SET_LOOP		0000068D	R	D	04	
DS$_LOGIC	= 00660070	D	FAOARG		0000015F	R	D	02	
DS$_MCHK	= 00660088	D	FAOL$_CTRSTR	=	00000004		D		
DS$_MEM_ALLOC_ERR	= 00660138	D	FAOL$_NARGS	=	00000004		D		
DS$_MMOFF	= 00660058	D	FAOL$_OUTBUF	=	0000000C		D		
DS$_NEEDUNIT	= 006600F8	D	FAOL$_OUTLEN	=	00000008		D		
DS$_NODE	= 00660128	D	FAOL$_PRMLST	=	00000010		D		
DS$_NOPCS	= 00660110	D	FAOLST		0000014B	R	D	02	
DS$_NORMAL	= 00660001	D	FETCH_STORE		00000DC9	RG	D	04	
DS$_NOSUPPORT	= 006600B1	D	FETCH_STOR_PREG		00000FD6	RG	D	04	
DS$_NOTALLOWMP	= 00660148	D	FIND_BPT		000009DA	R	D	04	
DS$_NOTDON	= 00660030	D	FMTBPT		00000085	RG	D	03	
DS$_NOTIMP	= 006600B0	D	FMTBPTADR		000000C6	R	D	03	
DS$_NULLSTR	= 00660010	D	FMTBPTLST		000000F0	R	D	03	
DS$_OVERFLOW	= 00660008	D	FMTBPTNONE		0000010A	R	D	03	
DS$_POWER	= 00660098	D	FMTBPTNOTSET		0000011F	R	D	03	
DS$_PROGERR	= 00660020	D	FMTDIRECTIVE		000000C8	R	D	02	
DS$_SEVERE	= 00660004	D	FMTEXAM		00000174	R	D	03	
DS$_TRANSL	= 006600A0	D	FMTEXAM_ASCII		00000161	R	D	03	
DS$_TRUNCATE	= 00660028	D	FMTINVLDREG		0000013A	R	D	03	
DS$_UNEXPINT	= 006600D8	D	FMTNOBPTSLEFT		00000182	R	D	03	
DS$_UNSUPPDEV	= 00660158	D	FMTSTEP		000000BB	R	D	03	
DS$_VASFULL	= 00660048	D	FMT_BADPREG		0000022D	R	D	03	
DS$_WARNING	= 00660000	D	FMT_BASE_OUT		00000007	R	D	03	
DSA$AL_APTMAIL	0000FE00	D	FMT_BYTE		00000080	R	D	03	
DSA$AT_APTTXT	0000FA00	D	FMT_DBG_LOAD		00000179	R	D	02	
DSA$GL_APTCOM	0000FE04	D	FMT_DBG_MSG		00000163	R	D	02	
DSA$GL_DEVLEN	0000FE58	D	FMT_DEC		00000064	R	D	03	
DSA$GL_ERRNO	0000FE44	D	FMT_DFLT_OUT		0000002D	R	D	03	
DSA$GL_EVENT	0000FE48	D	FMT_EXCEPTION		000001F9	R	D	03	
DSA$GL_FLAGS	0000FE00	D	FMT_HEX		00000058	R	D	03	
DSA$GL_MSGTYP	0000FE40	D	FMT_LONG		00000072	R	D	03	
DSA$GL_PASSES	0000FE08	D	FMT_NO_ROOM		00000192	R	D	02	
DSA$GL_PASSNO	0000FE54	D	FMT_OCT		0000006C	R	D	03	
DSA$GL_SECTNO	0000FE10	D	FMT_WORD		0000007B	R	D	03	
DSA$GL_SID	0000FE14	D	FS_COPY		00000E20	R	D	04	
DSA$GL_SUBTNO	0000FE4C	D	FS_HANDLR		00000E45	R	D	04	
DSA$GL_TESTNO	0000FE50	D	FS_RESET		00000F97	R	D	04	

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FS_SETUP                        00000F01 R  D  04
HTAB                          = 00000009    D
ID_TEMP                         000000C4 R  D  02
IMAGE_HEADER                    ********    X  04
INITBASE                      = 00000000    D
INITSIZE                      = 00000004    D
LOCAL                           FFFFFFB8    D
MAP_DEBUGGER                    ********    X  04
MODELST                         00000284 RG D  03
MP$GB_FUNCTION                  000001E1 RG D  02
MP$GB_SETCPU                    ********    X  00
MP$GL_AP_BASE_ADDR_BKPT         ********W GX  00
MP$GL_AP_BKPT_STORE             ********W GX  00
MP$GL_AP_OFFSET_BKPT            ********W GX  00
MP$GL_IPR_STATUS                000001E2 RG D  02
MP$GL_IPR_VALUE                 000001E6 RG D  02
MP$GL_REG_ADDRESS               000001EA RG D  02
MP$GL_REG_VALUE                 000001EE RG D  02
MP$GL_RET_STATUS                000001F2 RG D  02
MP$GL_SAVED_R1                  000001F6 RG D  02
MP$GR_BOOTED_PROCESSORS         ********    X  00
MP$GR_SAVED_GPRS                ********W GX  00
MP$GT_DEVICE_NAME               ********    X  00
MP$V_IL_ALLN                  = 00000004    D
MP$V_IL_CNDB                  = 00000007    D
MP$V_IL_CNHN                  = 00000006    D
MP$V_IL_DELN                  = 00000005    D
MP$V_IL_DSBK                  = 00000008    D
MP$V_IL_ERSP                  = 00000003    D
MP$V_IL_GTLN                  = 00000009    D
MP$V_IL_NUMT                  = 00000000    D
MP$V_IL_PRNT                  = 00000001    D
MP$V_IL_RRPT                  = 00000002    D
MP$_COND_DEBUG                  ********W GX  00
MP$_GET_GPR                     ********W GX  00
MP$_GET_IPR                     ********W GX  00
MP$_GET_PROCESSOR_ID            ********W GX  00
MP$_RESUME_ATTACHED_PROCESSORS  ********W GX  00
M_STEP                        = 00000002    D
M_TBIT                        = 00000001    D
NBIA$L_CSR0                   = 00000000    D
NBIA$L_CSR1                   = 00000004    D
NBIA$M_BILP                   = 00010000    D
NEW_AP_FP                       000000B0 R  D  02
NEW_PC_PSL                      000000BC R  D  02
NEW_SP                          000000B8 R  D  02
PR$_MAPEN                     = 00000038    D
PR$_SID_TYP8NN                = 00000006    D
PRGT_AP_NAME                    00000159 RG D  03
PRT$C_UR                        ********    X  04
PRT$C_UW                        ********    X  04
PSL$C_KERNEL                  = 00000000    D
PSL$M_TBIT                    = 00000010    D
PSL$M_TP                      = 40000000    D
PSL$V_IS                      = 0000001A    D
PSLBUFFER                       000000FB R  D  02
PSLBUFSZ                      = 00000050    D
PSLREG                        = 00000010    D
QUICK_X                         00000A64 R  D  04
RBREAK_IN                       00000D7B R  D  04
RBREAK_OUT                      00000D50 R  D  04
REGNAMLST                       000002B9 R  D  03
RESTORE_SCB_VECTORS             00000CB8 R  D  04
RET_LEN                         000001FE R  D  02
RET_REC                         000001FA R  D  02
SAVABS...                     = FFFFFFB8    D
SAVE_SCB_VEC                    000000A0 R  D  02
SAVE_SCB_VECTORS                00000CEE R  D  04
SCB_BASE                        ********    X  04
SCB_IMAGE                       ********    X  04
SCRIPT$STOP                     ********    X  04
SETPRT$_ACMODE                = 0000000C    D
SETPRT$_INADR                 = 00000004    D
SETPRT$_NARGS                 = 00000005    D
SETPRT$_PROT                  = 00000010    D
SETPRT$_PRVPRT                = 00000014    D
SETPRT$_RETADR                = 00000008    D
SET_LOOP_BACK_BIT               00000651 RG D  04
SIZ...                        = 00000001    D
SS$_ACCVIO                      ********    X  04
SS$_BREAK                       ********    X  04
SS$_CONTINUE                    ********    X  04
SS$_NORMAL                    = 00000001    D
SS$_RESIGNAL                    ********    X  04
SS$_ROPRAND                     ********    X  04
SS$_TBIT                        ********    X  04
SYMTAB_HI                       000001DD RG D  02
SYS$CRETVA                      ********   GX  04
SYS$FAO                         ********    X  04
SYS$FAOL                        ********   GX  04
SYS$SETPRT                      ********    X  04
SYS$UNWIND                      ********   GX  04
TRANS_VECTOR                    00001173 R  D  04
TRANS_VECTOR_OFFSET           = 00000002    D
T_ACCVIO                        000001CC R  D  03
T_EMESSG1                       ********    X  04
T_MACHCK                        000001AB R  D  03
T_PREGREAD                      0000021A R  D  03
T_PREGWRITE                     00000224 R  D  03
T_TRANSL                        000001E0 R  D  03
UNMAP_DEBUGGER                  ********    X  04
VRCLRBRK                        000008D0 RG D  04
VRCLRBRKX                       00000937 R  D  04
VRDEPOSIT                       000006B6 RG D  04
VRDEPOSITX                      0000084C R  D  04
VREXAMINE                       000000CA RG D  04
VREXAMINEX                      00000277 R  D  04
VRSETBASE                       00000000 RG D  04
VRSETBRK                        00000851 RG D  04
VRSETBRKX                       000008CA R  D  04
VRSETDFLT                       0000001D RG D  04
VRSHOWBASE                      00000009 RG D  04
VRSHOWBRK                       00000970 RG D  04
VRSHOWBRKX                      000009D7 R  D  04
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VRSHOWDFLT                      00000060 RG D  04
VRTYPEXAMINE                    0000027F R  D  04
V_STEP                        = 00000001    D
V_TBIT                        = 00000000    D
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Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	FFFFFFF8 (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
WORK	00000202 (514.)	02 (2.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC LONG
DATA	00000333 (819.)	03 (3.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC BYTE
CODE	0000117B (4475.)	04 (4.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC BYTE

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$ARGS	=00000004	323 (3)	264 (2) 323 (3)
$$N	=00000002	2709 (45)	1028 (17) 1220 (19) 1268 (20) #-1425 (24)
			1527 (25) 1626 (27) #-1684 (29) #-1790 (31)
			1795 (31) #-1801 (31) 2011 (35) 2495 (44)
			#-2669 (45) #-2693 (45) 2709 (45) 542 (8)
			690 (12) #-753 (13) 870 (14)
$$T1	=00000014	323 (3)	264 (2) 323 (3)
$$T2	=00000007	1013 (17)	1013 (17)
$ER	=00000001	358 (4)	
$MODULE	00000000-R	358 (4)	
$SRVCODE_BOOTATTACHED	=00000000	1916 (33)	
$SRVCODE_CLEAR_INTERLOCK	=00000009	1916 (33)	#-1916 (33)
$SRVCODE_GETSYSBUF	=00000004	1916 (33)	
$SRVCODE_HALTATTACHED	=00000002	1916 (33)	
$SRVCODE_INTERLOCK_TEST	=00000007	1916 (33)	
$SRVCODE_PPSCB	=0000000A	1916 (33)	
$SRVCODE_PRINTREV	=00000006	1916 (33)	
$SRVCODE_RELSYSBUF	=00000005	1916 (33)	
$SRVCODE_SET_INTERLOCK	=00000008	1916 (33)	#-1885 (33) #-1893 (33)
$SRVCODE_SHOWIDLE	=00000003	1916 (33)	
$SRVCODE_STARTATTACHED	=00000001	1916 (33)	
AAP	00000323-R	454 (6)	436 (6)
ADR1	FFFFFFD8	2390 (42)	#-2513 (45) #-2515 (45) #-2516 (45) #-2519 (45)
			#-2532 (45) 2536 (45)
ADR2	FFFFFFB8	2390 (42)	#-2519 (45) #-2520 (45) 2524 (45)
AEM	0000029F-R	419 (5)	414 (5)
AFP	00000326-R	455 (6)	437 (6)
AKM	00000298-R	418 (5)	413 (5)
APC	0000032C-R	457 (6)	439 (6)
APSL	0000032F-R	458 (6)	440 (6)
APSLMNE	00000243-R	408 (5)	998 (16)
AR0	000002FD-R	442 (6)	424 (6)
AR1	00000300-R	443 (6)	425 (6)
AR10	0000031B-R	452 (6)	434 (6)
AR11	0000031F-R	453 (6)	435 (6)
AR2	00000303-R	444 (6)	426 (6)
AR3	00000306-R	445 (6)	427 (6)
AR4	00000309-R	446 (6)	428 (6)
AR5	0000030C-R	447 (6)	429 (6)
AR6	0000030F-R	448 (6)	430 (6)
AR7	00000312-R	449 (6)	431 (6)
AR8	00000315-R	450 (6)	432 (6)
AR9	00000318-R	451 (6)	433 (6)
ARG1	FFFFFFE0	2390 (42)	#-2396 (43) #-2510 (45) 2533 (45) #-2534 (45)
			#-2535 (45) #-2537 (45) #-2538 (45) 2540 (45)
			#-2542 (45) 2560 (45) 2563 (45)
ARG2	FFFFFFC0	2390 (42)	#-2397 (43) #-2511 (45) 2521 (45) #-2522 (45)
			#-2523 (45) #-2525 (45) #-2526 (45) 2528 (45)
			#-2530 (45) 2565 (45) 2568 (45)
ASM	000002A9-R	420 (5)	415 (5)

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ASP                             00000329-R   456   (6)      438   (6)
AUM                             000002B4-R   421   (5)      416   (5)
BASEADDRESS                     0000009C-R   299   (3)    #-1447  (24)   #-1600  (27)   #-1601  (27)   #-1673  (29)
                                                          #-500   (7)    #-542   (8)    #-776   (13)
BIIC$L_BCICR                    =00000028                  #-1338  (21)
BIIC$L_BER                      =00000008                  #-1190  (18)   #-1213  (19)   #-1217  (19)
BIIC$M_NEX                      =00020000                  #-1214  (19)   #-1217  (19)
BIIC$M_RTOEVEN                  =00000008                  #-1338  (21)
BIT...                          =0000000F    266   (2)      260   (2)      261   (2)      266   (2)
BPTCODE                         =00000003    244   (2)      359   (4)
BPTMAX                          =0000000F    246   (2)    #-1626  (27)   #-1688  (29)   #-1741  (30)   #-1785  (31)
                                                          #-1837  (32)   #-2284  (40)   #-2329  (41)    288   (3)
                                                            291   (3)      293   (3)
BPT_LITERAL                     00000006-R   359   (4)     2340   (41)
CALL_CLI                        00000B47-R  2014  (35)   #-1962  (35)   #-2134  (37)
CHCK_TO_SEE_IF_IO_SPACE         00000486-R  1085  (18)   #-820   (14)
CHECK_CSR1                      000005E0-R  1231  (20)    1129   (18)
CHECK_NEX_BIT                   0000058B-R  1199  (19)    1158   (18)
CLEAR_LOOP_BACK_BIT             0000068E-R  1347  (22)    1139   (18)    1162   (18)
CLEAR_NEX_BIT                   00000562-R  1180  (18)    1138   (18)
CLI$K_BUFSIZ                    =00000100    259   (2)      259   (2)
CLI$K_SIZE                      0000044C     259   (2)
CLI$L_ADDRESS                   00000018     259   (2)    #-1414  (24)   #-1539  (25)   #-1543  (25)   #-1546  (25)
                                                          #-1592  (27)   #-1622  (27)   #-1671  (29)   #-1674  (29)
                                                          #-500   (7)    #-742   (13)   #-785   (13)   #-883   (14)
                                                          #-887   (14)   #-889   (14)   #-891   (14)   #-940   (15)
                                                          #-995   (16)
CLI$L_COMMAND                   00000004     259   (2)
CLI$L_DATA                      0000001C     259   (2)     1477   (25)   #-1488  (25)   #-1666  (29)   #-2133  (37)
CLI$L_FLAGS                     00000000     259   (2)     1421   (24)    1443   (24)    1455   (24)    1457   (24)
                                                           1459   (24)    1469   (25)    1522   (25)    1538   (25)
                                                           1542   (25)    1550   (25)    1591   (27)     591   (10)
                                                            593   (10)     595   (10)     604   (10)     606   (10)
                                                            608   (10)     749   (13)     771   (13)     783   (13)
                                                            784   (13)     789   (13)     791   (13)     799   (14)
                                                            867   (14)     882   (14)     886   (14)     915   (14)
                                                            917   (14)     919   (14)     941   (15)     945   (15)
                                                            971   (16)     974   (16)     994   (16)
CLI$L_FLAGS2                    00000444     259   (2)     1444   (24)    1595   (27)    1669   (29)     773   (13)
CLI$L_LAST                      00000024     259   (2)
CLI$L_NEXT                      00000030     259   (2)    #-1535  (25)   #-1547  (25)   #-880   (14)   #-892   (14)
CLI$L_PASS                      0000002C     259   (2)
CLI$L_SUBT                      00000028     259   (2)
CLI$L_TEMP_BASE                 00000448     259   (2)    #-1445  (24)   #-1596  (27)   #-1597  (27)   #-1670  (29)
                                                          #-774   (13)
CLI$L_TEST                      00000020     259   (2)
CLI$M_START_OR_RUN              =00000008    259   (2)
CLI$Q_BUFQWD                    00000034     259   (2)
CLI$Q_FILE                      00000008     259   (2)     2702   (45)
CLI$Q_SECTION                   00000010     259   (2)
CLI$Q_TIME                      0000043C     259   (2)
CLI$T_BUFFER                    0000003C     259   (2)
CLI$V_ADAPTER                   =00000018    259   (2)
CLI$V_ADR                       =0000000B    259   (2)
CLI$V_ASCII                     =00000013    259   (2)    #-971   (16)
CLI$V_BASE_QUAL                 =00000002    259   (2)    #-1444  (24)   #-1594  (27)   #-1669  (29)   #-772   (13)
CLI$V_BREAK                     =0000000A    259   (2)
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CLI$V_BRIEF                =0000001B     259    (2)
CLI$V_BYTE                 =0000000D     259    (2)    #-1459   (24)   #-604    (10)   #-791    (13)
CLI$V_CLEAR                =00000002     259    (2)
CLI$V_DEC                  =00000010     259    (2)    #-593    (10)   #-917    (14)
CLI$V_DEFAULT              =0000000C     259    (2)
CLI$V_DEPOSIT              =00000019     259    (2)
CLI$V_EVENT                =00000008     259    (2)
CLI$V_EXAM                 =00000005     259    (2)
CLI$V_FLAGS                =00000009     259    (2)
CLI$V_HEX                  =00000012     259    (2)    #-595    (10)   #-915    (14)
CLI$V_KERNEL               =00000017     259    (2)    #-1590   (27)
CLI$V_LOAD                 =00000006     259    (2)
CLI$V_LONG                 =0000000F     259    (2)    #-1455   (24)   #-608    (10)   #-783    (13)
CLI$V_NEXT                 =00000001     259    (2)
CLI$V_NOALLOC              =00000000     259    (2)
CLI$V_NOTNUF               =00000001     259    (2)
CLI$V_OCT                  =00000011     259    (2)    #-591    (10)   #-919    (14)
CLI$V_PREG                 =0000001A     259    (2)    #-1443   (24)   #-1469   (25)   #-1522   (25)   #-1542   (25)
                                                       #-1550   (25)   #-770    (13)   #-799    (14)   #-867    (14)
                                                       #-886    (14)   #-945    (15)   #-974    (16)
CLI$V_QA                   =00000007     259    (2)
CLI$V_QACKLOOPLOOPS        =0000001C     259    (2)
CLI$V_QAERRORPRINTS        =0000001B     259    (2)
CLI$V_QAMULTIPLEPASS       =0000001F     259    (2)
CLI$V_QASUBTESTLOOPS       =0000001E     259    (2)
CLI$V_QATESTLOOPS          =0000001D     259    (2)
CLI$V_REG                  =00000014     259    (2)    #-1421   (24)   #-1538   (25)   #-749    (13)   #-784    (13)
                                                       #-882    (14)   #-941    (15)   #-994    (16)
CLI$V_REQUIRED             =00000000     259    (2)
CLI$V_RUN                  =00000015     259    (2)
CLI$V_SET                  =00000003     259    (2)
CLI$V_SHOW                 =00000004     259    (2)
CLI$V_START_OR_RUN         =00000003     259    (2)      259    (2)
CLI$V_VALSEC               =00000016     259    (2)
CLI$V_WORD                 =0000000E     259    (2)    #-1457   (24)   #-606    (10)   #-789    (13)
CMK$SGIPR                   00000FC0-R   2586   (45)     1100   (18)     1509   (25)     858    (14)
CMK$_APBOOT                =00000004     266    (2)
CMK$_ASTEXIT               =00000000     266    (2)
CMK$_CANTIM                =0000000B     266    (2)
CMK$_HIBER                 =00000007     266    (2)
CMK$_INITSCB               =00000008     266    (2)
CMK$_LAST                  =0000000E     266    (2)
CMK$_MMENABLE              =00000003     266    (2)
CMK$_RCONSOLE              =00000001     266    (2)
CMK$_REFRESH               =00000005     266    (2)
CMK$_SCHDWK                =00000006     266    (2)
CMK$_SETIMR                =0000000C     266    (2)
CMK$_SETIPL                =00000009     266    (2)
CMK$_SETPRT                =0000000D     266    (2)
CMK$_SGIPR                 =0000000A     266    (2)    #-1100   (18)   #-1509   (25)   #-858    (14)
CMK$_TCONSOLE              =00000002     266    (2)
COND_DEBUG                  000009F1-R   1879   (33)
COND_DEBUG_X                00000A32-R   1896   (33)   #-1887   (33)
CONT                        00000B7A-R   2034   (35)   #-2000   (35)   #-2031   (35)
CONT_FROM_DEBUG             00001169-R   2730   (45)     2738   (45)
DATA                        FFFFFFF8     2390   (42)     2411   (43)     2422   (43)
DBG_ADDR_REQ                000001C5-R   335    (3)    #-2673   (45)   #-2675   (45)   #-2676   (45)     2678   (45)
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DBG_ADDR_RTN                    000001CD-R   337    (3)     2678   (45)   #-2679   (45)   #-2680   (45)   #-2684   (45)
                                                          #-2685   (45)   #-2689   (45)   #-2699   (45)   #-2709   (45)
                                                          #-2723   (45)
DBG_BREAK                       00000A65-R  1945   (35)  #-1886   (33)
DBG_DEF                         00000FF9-R  2664   (45)    2701   (45)
DBG_TBIT                        00000C41-R  2113   (37)  #-1894   (33)
DEBUG$GB_FLAGS                  00000000-R   281    (3)  #-2063   (35)     2115   (37)     2117   (37)   #-2137   (37)
DEBUGGER_SIZE                  =00010E00     254    (2)  #-2674   (45)   #-2682   (45)   #-2700   (45)
DEBUG_HI                        000001D9-R   340    (3)  #-2680   (45)   #-2688   (45)
DEBUG_LO                        000001D5-R   339    (3)  #-2679   (45)   #-2689   (45)   #-2690   (45)
DFLTSIZE                        00000098-R   296    (3)  #-1460   (24)   #-605    (10)   #-607    (10)   #-609    (10)
                                                          #-675    (12)   #-792    (13)
DIAG_FILE_NAME                  00000000-XR                  2719   (45)     273    (3)
DIR...                         =FFFFFFFF    2390   (42)    2390   (42)
DS$AA_BPTADDR                   00000014-R   290    (3)  #-1616   (27)   #-1623   (27)   #-1678   (29)   #-1689   (29)
                                                            1736   (30)   #-1786   (31)   #-1792   (31)   #-1795   (31)
                                                          #-1839   (32)   #-1955   (35)   #-1961   (35)   #-1972   (35)
                                                          #-1973   (35)   #-2008   (35)   #-2011   (35)   #-2058   (35)
                                                          #-2285   (40)   #-2288   (40)   #-2330   (41)   #-2334   (41)
                                                          #-2339   (41)   #-2345   (41)
DS$AA_BPTBASE                   00000054-R   292    (3)  #-1617   (27)   #-1679   (29)   #-1690   (29)     1737   (30)
                                                          #-1792   (31)   #-1795   (31)   #-1973   (35)   #-1975   (35)
                                                          #-2008   (35)   #-2011   (35)
DS$AA_OFFSET                    00000094-R   294    (3)  #-1792   (31)   #-1795   (31)   #-1973   (35)   #-1976   (35)
                                                          #-2008   (35)   #-2011   (35)
DS$AB_BPTINST                   00000001-R   287    (3)    1958   (35)     2289   (40)     2333   (41)
DS$CLI                          00000000-XR                  2024   (35)
DS$CVTREG                       00000000-XR                   998   (16)
DS$GB_PRIMARY_CPU_IDENTIFIER    00000000-XR                #-1910   (33)   #-1987   (35)   #-2070   (35)
DS$GL_CLIBASE                   00000000-XR                  1589   (27)     1664   (29)     2132   (37)
DS$GL_IPR_VALUE                 00000000-XR                   224    (2)   #-2593   (45)
DS$GL_MEMSIZE                   00000000-XR                #-2683   (45)   #-2687   (45)
DS$GL_RADIX                     00000000-XR                #-592    (10)   #-594    (10)   #-596    (10)   #-664    (12)
                                                          #-922    (14)   #-925    (14)
DS$K_ERROR                     =00000002     261    (2)
DS$K_NORMAL                    =00000001     261    (2)
DS$K_SEVERE                    =00000004     261    (2)
DS$K_SUBSYS                    =00000066     261    (2)      261    (2)
DS$K_WARNING                   =00000000     261    (2)
DS$M_ABRTFLG                   =00000040     260    (2)
DS$M_BADTIME                   =00100000     260    (2)
DS$M_BATCH                     =00400000     260    (2)
DS$M_BRKCLR                    =00001000     260    (2)
DS$M_BRKPT                     =00000800     260    (2)
DS$M_CHARFLG                   =00000100     260    (2)
DS$M_CMDFLG                    =00000080     260    (2)
DS$M_CTRLC                     =00000001     260    (2)
DS$M_CTRLO                     =00010000     260    (2)
DS$M_DEVFLG                    =00000200     260    (2)
DS$M_DISABLCC                  =01000000     260    (2)
DS$M_DONFLG                    =00002000     260    (2)
DS$M_ERRFLG                    =00000010     260    (2)
DS$M_EXCEPT                    =00080000     260    (2)
DS$M_EXETST                    =00040000     260    (2)
DS$M_HLTFLG                    =00000008     260    (2)
DS$M_LODFLG                    =00000002     260    (2)
DS$M_MEMMGT                    =00008000     260    (2)
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DS$M_NI                         =04000000     260     (2)
DS$M_OUTPUT                     =00800000     260     (2)
DS$M_RUBFLG                     =00000020     260     (2)
DS$M_SCRIPT                     =00200000     260     (2)
DS$M_SETIMR                     =02000000     260     (2)
DS$M_STRFLG                     =00000004     260     (2)
DS$M_SUBT                       =00004000     260     (2)
DS$M_SYSFLG                     =00000400     260     (2)
DS$M_TIMED                      =02000000     260     (2)
DS$M_TIMED_OUT                  =08000000     260     (2)
DS$M_TIMRON                     =00020000     260     (2)
DS$PRINTF                        00000000-XR                    1028    (17)    1425    (24)    1491    (25)    1626    (27)
                                                                1684    (29)    1790    (31)    1795    (31)    1801    (31)
                                                                2011    (35)    2130    (37)    2669    (45)    2693    (45)
                                                                2709    (45)    542     (8)     690     (12)    753     (13)
                                                                838     (14)    970     (16)
DS$SERVICE_DISPATCHER            00000000-XR                    1885    (33)    1893    (33)    1916    (33)
DS$V_ABRTFLG                    =00000006     260     (2)
DS$V_BADTIME                    =00000014     260     (2)
DS$V_BATCH                      =00000016     260     (2)
DS$V_BRKCLR                     =0000000C     260     (2)
DS$V_BRKPT                      =0000000B     260     (2)
DS$V_CHARFLG                    =00000008     260     (2)
DS$V_CMDFLG                     =00000007     260     (2)
DS$V_CTRLC                      =00000000     260     (2)
DS$V_CTRLO                      =00000010     260     (2)
DS$V_DEVFLG                     =00000009     260     (2)
DS$V_DISABLCC                   =00000018     260     (2)
DS$V_DONFLG                     =0000000D     260     (2)
DS$V_ERRFLG                     =00000004     260     (2)
DS$V_EXCEPT                     =00000013     260     (2)
DS$V_EXETST                     =00000012     260     (2)
DS$V_HLTFLG                     =00000003     260     (2)
DS$V_LODFLG                     =00000001     260     (2)
DS$V_MEMMGT                     =0000000F     260     (2)
DS$V_NI                         =0000001A     260     (2)
DS$V_OUTPUT                     =00000017     260     (2)
DS$V_RUBFLG                     =00000005     260     (2)
DS$V_SCRIPT                     =00000015     260     (2)
DS$V_SETIMR                     =00000019     260     (2)
DS$V_STRFLG                     =00000002     260     (2)
DS$V_SUBT                       =0000000E     260     (2)
DS$V_SYSFLG                     =0000000A     260     (2)
DS$V_TIMED                      =00000019     260     (2)
DS$V_TIMED_OUT                  =0000001B     260     (2)
DS$V_TIMRON                     =00000011     260     (2)
DS$_AP_NORMAL_BREAK             =00660150     261     (2)
DS$_ARITH                       =006600D0     261     (2)
DS$_ASBE                        =00660118     261     (2)
DS$_BADLINK                     =006600F0     261     (2)
DS$_BADTYPE                     =006600E8     261     (2)
DS$_BIIC                        =00660120     261     (2)
DS$_CHME                        =006600A8     261     (2)
DS$_CHMK                        =006600E0     261     (2)
DS$_DEVNAME                     =00660108     261     (2)
DS$_ERROR                       =00660002     261     (2)
DS$_FHWE                        =00660068     261     (2)
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DS$_FRAGBUF                     =00660080     261     (2)
DS$_ICBUSY                      =006600C8     261     (2)
DS$_ICERR                       =006600C0     261     (2)
DS$_IHWE                        =00660060     261     (2)
DS$_ILLCHAR                     =00660018     261     (2)
DS$_ILLPAGCNT                   =00660078     261     (2)
DS$_ILLUNIT                     =00660100     261     (2)
DS$_INIT_FAIL                   =00660140     261     (2)
DS$_INSFMEM                     =00660050     261     (2)
DS$_INVCPU                      =00660130     261     (2)
DS$_IPL2HI                      =006600B8     261     (2)
DS$_IVADDR                      =00660040     261     (2)
DS$_IVVECT                      =00660038     261     (2)
DS$_KRNLSTK                     =00660090     261     (2)
DS$_LOGIC                       =00660070     261     (2)
DS$_MCHK                        =00660088     261     (2)     #-2471    (44)
DS$_MEM_ALLOC_ERR               =00660138     261     (2)
DS$_MMOFF                       =00660058     261     (2)
DS$_NEEDUNIT                    =006600F8     261     (2)
DS$_NODE                        =00660128     261     (2)
DS$_NOPCS                       =00660110     261     (2)
DS$_NORMAL                      =00660001     261     (2)
DS$_NOSUPPORT                   =006600B1     261     (2)
DS$_NOTALLOWMP                  =00660148     261     (2)
DS$_NOTDON                      =00660030     261     (2)
DS$_NOTIMP                      =006600B0     261     (2)       261     (2)
DS$_NULLSTR                     =00660010     261     (2)
DS$_OVERFLOW                    =00660008     261     (2)
DS$_POWER                       =00660098     261     (2)
DS$_PROGERR                     =00660020     261     (2)
DS$_SEVERE                      =00660004     261     (2)
DS$_TRANSL                      =006600A0     261     (2)     #-2476    (44)
DS$_TRUNCATE                    =00660028     261     (2)
DS$_UNEXPINT                    =006600D8     261     (2)
DS$_UNSUPPDEV                   =00660158     261     (2)
DS$_VASFULL                     =00660048     261     (2)
DS$_WARNING                     =00660000     261     (2)       261     (2)
DSA$GL_FLAGS                     0000FE00                       1472    (25)      1480    (25)      1489    (25)      1506    (25)
                                                                1512    (25)      2180    (38)      2229    (39)      2461    (44)
                                                                2667    (45)      2671    (45)    #-2711    (45)      2715    (45)
                                                                802     (14)      816     (14)      836     (14)      855     (14)
                                                                861     (14)
DSA$GL_SID                       0000FE14                     #-1088    (18)    #-1090    (18)
DSA$V_DEBUG                     =0000001A                     #-2666    (45)    #-2710    (45)
DSA$V_USER                      =0000001C                     #-1472    (25)    #-1480    (25)    #-1489    (25)    #-1506    (25)
                                                              #-1512    (25)    #-2180    (38)    #-2229    (39)    #-2461    (44)
                                                              #-2670    (45)    #-2714    (45)    #-802     (14)    #-816     (14)
                                                              #-836     (14)    #-855     (14)    #-861     (14)
DSP$REMOVEBREAK                  0000093D-R    1733    (30)
DSR$COMPLETION                   00000000-XR                    2704    (45)
DSV$DEBUG                        00001005-R    2665    (45)
DSV$DEBUG_EXIT                   00001172-R    2734    (45)  #-2694    (45)    #-2707    (45)
DSX$LOAD                         00000000-XR                    2703    (45)
DSX$PRINTI                       00000000-XR                    1220    (19)      1268    (20)      1527    (25)      2495    (44)
                                                                2550    (45)      870     (14)
EXAMBUFFER                       000000DB-R    314     (3)     1025    (17)      313     (3)       937     (15)
EXAMQWDBUF                       000000D3-R    312     (3)     1013    (17)    #-1017    (17)    #-1018    (17)    #-1024    (17)
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                                                #-1025  (17)    #-1028  (17)      323   (3)     #-936   (15)
                                                #-937   (15)    #-946   (15)   #-947   (15)    #-948   (15)
                                                #-953   (15)    #-954   (15)   #-955   (15)    #-957   (15)
                                                #-958   (15)    #-959   (15)   #-986   (16)    #-987   (16)
                                                #-988   (16)
EXAMSIZE                =00000020       247 (2) #-1024  (17)      313   (3)      315   (3)     #-936   (15)
EXIT_CHCK_TO_SEE         0000055D-R     1173 (18) #-1127  (18)  #-1135  (18)   #-1152  (18)    #-1167  (18)
EXIT_CHECK_CSR1          00000650-R     1306 (20) #-1284  (20)  #-1298  (20)
EXIT_CHECK_NEX_BIT       000005DF-R     1224 (19) #-1216  (19)
EXIT_CLEAR_LOOP          000006B5-R     1363 (22)
EXIT_CLEAR_NEX_BIT       0000058A-R     1192 (18)
EXIT_SET_LOOP            0000068D-R     1340 (21)
FAOARG                   0000015F-R      325 (3)    323   (3)  #-939   (15)   #-943   (15)    #-950   (15)
                                                #-984   (16)
FAOL$_CTRSTR            =00000004        323 (3)
FAOL$_NARGS             =00000004        323 (3)
FAOL$_OUTBUF            =0000000C        323 (3)
FAOL$_OUTLEN            =00000008        323 (3)
FAOL$_PRMLST            =00000010        323 (3)
FAOLST                   0000014B-R      319 (3)    952   (15)     985   (16)
FETCH_STORE              00000DC9-R     2392 (43)  1146   (18)    1479   (25)    1960   (35)     2123   (37)
                                                   2291   (40)    2336   (41)    2342   (41)      812   (14)
FETCH_STOR_PREG          00000FD6-R     2631 (45)  2591   (45)
FIND_BPT                 000009DA-R     1836 (32) #-1605  (27)  #-1614  (27)   #-1676  (29)    #-1964  (35)
FMTBPT                   00000085-R      377 (4)    2011   (35)
FMTBPTADR                000000C6-R      381 (4)    1795   (31)
FMTBPTLST                000000F0-R      383 (4)    1790   (31)
FMTBPTNONE               0000010A-R      385 (4)    1801   (31)
FMTBPTNOTSET             0000011F-R      387 (4)    1684   (29)
FMTDIRECTIVE             000000C8-R      308 (3)     323   (3)  #-914   (14)   #-929   (14)    #-942   (15)
                                                #-949   (15)  #-982   (16)   #-983   (16)
FMTEXAM                  00000174-R      395 (4)    1028   (17)
FMTEXAM_ASCII            00000161-R      393 (4)    1013   (17)
FMTINVLDREG              0000013A-R      389 (4)    1425   (24)     753   (13)
FMTNOBPTSLEFT            00000182-R      397 (4)    1626   (27)
FMTSTEP                  000000BB-R      379 (4)    2129   (37)
FMT_BADPREG              0000022D-R      407 (5)    1527   (25)     870   (14)
FMT_BASE_OUT             00000007-R      361 (4)     542   (8)
FMT_BYTE                 00000080-R      375 (4)     684   (12)
FMT_DBG_LOAD             00000179-R      333 (3)    2709   (45)
FMT_DBG_MSG              00000163-R      332 (3)    2669   (45)
FMT_DEC                  00000064-R      367 (4)     671   (12)
FMT_DFLT_OUT             0000002D-R      363 (4)     690   (12)
FMT_EXCEPTION            000001F9-R      404 (5)    1220   (19)    1268   (20)    2495   (44)     2549   (45)
FMT_HEX                  00000058-R      365 (4)     667   (12)
FMT_LONG                 00000072-R      371 (4)     678   (12)
FMT_NO_ROOM              00000192-R      334 (3)    2693   (45)
FMT_OCT                  0000006C-R      369 (4)     673   (12)
FMT_WORD                 0000007B-R      373 (4)     682   (12)
FS_COPY                  00000E20-R     2436 (44) #-2412  (43)  #-2423  (43)
FS_HANDLR                00000E45-R     2455 (44)  1181   (18)    1200   (19)    1232   (20)     1314   (21)
                                                   1348   (22)    2399   (43)    2632   (45)
FS_RESET                 00000F97-R     2559 (45) #-2413  (43)  #-2424  (43)   #-2498  (44)    #-2552  (45)
FS_SETUP                 00000F01-R     2508 (45) #-2408  (43)  #-2420  (43)
HTAB                    =00000009        243 (2)
ID_TEMP                  000000C4-R      306 (3)
IMAGE_HEADER             00000000-XR            2720   (45)
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INITBASE                        =00000000     249    (2)      300    (3)
INITSIZE                        =00000004     250    (2)      297    (3)
LOCAL                            FFFFFFB8     2390   (42)     2395   (43)
MAP_DEBUGGER                     00000000-XR                   2691   (45)
MODELST                          00000284-R    412    (5)      998    (16)
MP$GB_FUNCTION                   000001E1-R    343    (3)    #-1431   (24)   #-1497   (25)   #-758    (13)   #-844    (14)
MP$GB_SETCPU                     00000000-XR                  #-1429   (24)   #-1494   (25)    225     (2)    #-756    (13)
                                                              #-841    (14)   #-966    (16)
MP$GL_AP_BASE_ADDR_BKPT          00000000-XR                  #-1975   (35)    231     (2)
MP$GL_AP_BKPT_STORE              00000000-XR                  #-1972   (35)    230     (2)
MP$GL_AP_OFFSET_BKPT             00000000-XR                  #-1976   (35)    232     (2)
MP$GL_IPR_STATUS                 000001E2-R    344    (3)    #-1502   (25)   #-850    (14)
MP$GL_IPR_VALUE                  000001E6-R    345    (3)    #-1500   (25)   #-847    (14)
MP$GL_REG_ADDRESS                000001EA-R    346    (3)    #-1437   (24)
MP$GL_REG_VALUE                  000001EE-R    347    (3)      764    (13)
MP$GL_RET_STATUS                 000001F2-R    348    (3)    #-1501   (25)   #-849    (14)
MP$GL_SAVED_R1                   000001F6-R    349    (3)    #-1498   (25)   #-845    (14)
MP$GR_BOOTED_PROCESSORS          00000000-XR                  #-1905   (33)   #-1970   (35)   #-2030   (35)   #-2065   (35)
                                                                227     (2)
MP$GR_SAVED_GPRS                 00000000-XR                  #-2078   (35)   #-2079   (35)   #-2080   (35)   #-2081   (35)
                                                              #-2082   (35)   #-2083   (35)   #-2084   (35)   #-2085   (35)
                                                              #-2086   (35)    236     (2)
MP$GT_DEVICE_NAME                00000000-XR                   225     (2)     968     (16)
MP$V_IL_ALLN                    =00000004     218    (2)
MP$V_IL_CNDB                    =00000007     218    (2)    #-1885   (33)   #-1893   (33)   #-1916   (33)
MP$V_IL_CNHN                    =00000006     218    (2)
MP$V_IL_DELN                    =00000005     218    (2)
MP$V_IL_DSBK                    =00000008     218    (2)
MP$V_IL_ERSP                    =00000003     218    (2)
MP$V_IL_GTLN                    =00000009     218    (2)
MP$V_IL_NUMT                    =00000000     218    (2)
MP$V_IL_PRNT                    =00000001     218    (2)
MP$V_IL_RRPT                    =00000002     218    (2)
MP$_COND_DEBUG                   00000000-XR                  1977    (35)    233     (2)
MP$_GET_GPR                      00000000-XR                  1432    (24)    226     (2)    229     (2)    759     (13)
MP$_GET_IPR                      00000000-XR                  1499    (25)    226     (2)    229     (2)    846     (14)
MP$_GET_PROCESSOR_ID             00000000-XR                  1909    (33)   1986    (35)   2069    (35)    234     (2)
MP$_RESUME_ATTACHED_PROCESSORS   00000000-XR                  2032    (35)    235     (2)
M_STEP                          =00000002     286    (3)    #-2137   (37)
M_TBIT                          =00000001     284    (3)    #-2137   (37)
NBIA$L_CSR0                     =00000000                    #-1329   (21)   #-1362   (22)
NBIA$L_CSR1                     =00000004                    #-1248   (20)
NBIA$M_BILP                     =00010000                    #-1329   (21)   #-1362   (22)
NEW_AP_FP                        000000B0-R    302    (3)    #-2037   (35)   #-2059   (35)
NEW_PC_PSL                       000000BC-R    304    (3)    #-2040   (35)   #-2061   (35)
NEW_SP                           000000B8-R    303    (3)    #-2038   (35)   #-2060   (35)
PR$_MAPEN                       =00000038                    #-1099   (18)
PR$_SID_TYP8NN                  =00000006                    #-1090   (18)
PRNT_AP_NAME                     00000159-R    391    (4)      969    (16)
PRT$C_UR                         00000000-XR                  #-2407   (43)
PRT$C_UW                         00000000-XR                  #-2419   (43)
PSL$C_KERNEL                    =00000000                    #-2405   (43)   #-2417   (43)
PSL$M_TBIT                      =00000010                    #-2039   (35)   #-2062   (35)   #-2139   (37)   #-2144   (37)
PSL$M_TP                        =40000000                    #-2039   (35)   #-2144   (37)
PSL$V_IS                        =0000001A     266    (2)    #-1100   (18)   #-1509   (25)   #-858    (14)
PSLBUFFER                        000000FB-R    316    (3)    #-1028   (17)   #-965    (16)    998     (16)
PSLBUFSZ                        =00000050     248    (2)      317    (3)    #-998    (16)
```

```
PSLREG                          =00000010     245   (2)    #-1539  (25)   #-785   (13)   #-883   (14)   #-995   (16)
QUICK_X                          00000A64-R   1918  (33)   #-1891  (33)   #-1914  (33)
RBREAK_IN                        00000D7B-R   2326  (41)   #-1518  (25)   #-1629  (27)   #-1696  (29)   #-1753  (30)
                                                          #-2125  (37)   #-2142  (37)   #-900   (14)
RBREAK_OUT                       00000D50-R   2282  (40)   #-1467  (25)   #-1588  (27)   #-1663  (29)   #-1735  (30)
                                                          #-2056  (35)   #-2136  (37)   #-739   (13)
REGNAMLST                        000002B9-R   423   (6)    #-943   (15)
RESTORE_SCB_VECTORS              00000CB8-R   2179  (38)   #-1481  (25)   #-1513  (25)   #-827   (14)   #-863   (14)
RET_LEN                          000001FE-R   352   (3)      2698  (45)
RET_REC                          000001FA-R   351   (3)      2697  (45)
SAVABS...                       =FFFFFFB8     2390  (42)
SAVE_SCB_VEC                     000000A0-R   301   (3)      2186  (38)     2235  (39)     2463  (44)
SAVE_SCB_VECTORS                 00000CEE-R   2228  (39)   #-1473  (25)   #-1507  (25)   #-804   (14)   #-856   (14)
SCB_BASE                         00000000-XR              #-2187  (38)   #-2188  (38)   #-2189  (38)   #-2190  (38)
                                                          #-2236  (39)   #-2237  (39)   #-2238  (39)   #-2239  (39)
                                                          #-2244  (39)   #-2246  (39)   #-2248  (39)   #-2250  (39)
                                                          #-2464  (44)   #-2465  (44)   #-2466  (44)   #-2467  (44)
SCB_IMAGE                        00000000-XR              #-2243  (39)   #-2245  (39)   #-2247  (39)   #-2249  (39)
SCRIPT$STOP                      00000000-XR                2022  (35)
SETPRT$_ACMODE                  =0000000C     264   (2)
SETPRT$_INADR                   =00000004     264   (2)   #-2525  (45)   #-2537  (45)
SETPRT$_NARGS                   =00000005     264   (2)   #-2526  (45)   #-2538  (45)
SETPRT$_PROT                    =00000010     264   (2)   #-2396  (43)   #-2397  (43)   #-2510  (45)   #-2511  (45)
                                                            2521  (45)   #-2530  (45)     2533  (45)   #-2542  (45)
                                                            2560  (45)     2565  (45)
SETPRT$_PRVPRT                  =00000014     264   (2)   #-2522  (45)   #-2534  (45)
SETPRT$_RETADR                  =00000008     264   (2)   #-2523  (45)   #-2535  (45)
SET_LOOP_BACK_BIT                00000651-R   1313  (21)     1136  (18)     1156  (18)
SIZ...                          =00000001     260   (2)      260  (2)
SS$_ACCVIO                       00000000-XR              #-2481  (44)
SS$_BREAK                        00000000-XR              #-1883  (33)
SS$_CONTINUE                     00000000-XR              #-2044  (35)   #-2146  (37)
SS$_NORMAL                      =00000001     252   (2)   #-1126  (18)   #-1166  (18)   #-1184  (18)   #-1204  (19)
                                                          #-1283  (20)   #-1297  (20)   #-1302  (20)   #-1316  (21)
                                                          #-1350  (22)   #-1844  (32)   #-2425  (43)
SS$_RESIGNAL                     00000000-XR              #-1881  (33)   #-1967  (35)   #-2114  (37)   #-2492  (44)
SS$_ROPRAND                      00000000-XR              #-2487  (44)
SS$_TBIT                         00000000-XR              #-1889  (33)
SYMTAB_HI                        000001DD-R   341   (3)   #-2690  (45)
SYS$CRETVA                       00000000-XR                2678  (45)
SYS$FAO                          00000000-XR                1013  (17)
SYS$FAOL                         00000000-XR                952   (15)     985   (16)
SYS$SETPRT                       00000000-XR                2528  (45)     2540  (45)     2563  (45)     2568  (45)
SYS$UNWIND                       00000000-XR                2499  (44)
TRANS_VECTOR                     00001173-R   2736  (45)     2722  (45)
TRANS_VECTOR_OFFSET             =00000002     2660  (45)   #-2725  (45)
T_ACCVIO                         000001CC-R   402   (5)      2484  (44)     2548  (45)
T_EMESSG1                        00000000-XR                1490  (25)     837   (14)
T_MACHCK                         000001AB-R   401   (5)      1218  (19)     1266  (20)     2473  (44)
T_PREGREAD                       0000021A-R   405   (5)      1526  (25)     869   (14)
T_PREGWRITE                      00000224-R   406   (5)      1524  (25)
T_TRANSL                         000001E0-R   403   (5)      2479  (44)
UNMAP_DEBUGGER                   00000000-XR                2706  (45)
VRCLRBRK                         000008D0-R   1661  (29)
VRCLRBRKX                        00000937-R   1695  (29)   #-1682  (29)   #-1685  (29)
VRDEPOSIT                        000006B6-R   1410  (24)
VRDEPOSITX                       0000084C-R   1554  (25)   #-1426  (24)   #-1436  (24)   #-1492  (25)   #-1504  (25)
```

```
                                                        #-1522   (25)   #-1528   (25)   #-1551   (25)
VREXAMINE                    000000CA-R   737    (13)
VREXAMINEX                   00000277-R   899    (14)   #-754    (13)   #-763    (13)   #-830    (14)   #-839    (14)
                                                        #-852    (14)   #-871    (14)   #-881    (14)   #-884    (14)
                                                        #-888    (14)
VRSETBASE                    00000000-R   499    (7)
VRSETBRK                     00000851-R   1585   (27)
VRSETBRKX                    000008CA-R   1628   (27)   #-1611   (27)   #-1620   (27)   #-1624   (27)
VRSETDFLT                    0000001D-R   584    (10)
VRSHOWBASE                   00000009-R   540    (8)
VRSHOWBRK                    00000970-R   1781   (31)
VRSHOWBRKX                   000009D7-R   1803   (31)   #-1799   (31)
VRSHOWDFLT                   00000060-R   655    (12)
VRTYPEXAMINE                 0000027F-R   911    (14)   #-1552   (25)   #-872    (14)
V_STEP                      =00000001     285    (3)    #-2117   (37)     286    (3)
V_TBIT                      =00000000     283    (3)    #-2063   (35)   #-2115   (37)     284    (3)

                                          +-------------------------+
                                          ! Performance indicators !
                                          +-------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    25    00:00:00.03    00:00:00.20
Command processing               930    00:00:00.36    00:00:01.87
Pass 1                           947    00:00:03.91    00:00:06.66
Symbol table sort                  0    00:00:00.25    00:00:00.26
Pass 2                            61    00:00:01.53    00:00:03.23
Symbol table output                2    00:00:00.07    00:00:00.17
Psect synopsis output              2    00:00:00.00    00:00:00.00
Cross-reference output             7    00:00:00.38    00:00:00.59
Assembler run totals            1976    00:00:06.53    00:00:12.98

The working set limit was 2900 pages.
219676 bytes (430 pages) of virtual memory were used to buffer the intermediate code.
There were 50 pages of symbol table space allocated to hold 860 non-local and 164 local symbols.
2740 source lines were read in Pass 1, producing 102 object records in Pass 2.
46 pages of virtual memory were used to define 38 macros.

                                          +---------------------------+
                                          ! Macro library statistics !
                                          +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              9
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                9
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           2
SYS$COMMON:[SYSLIB]STARLET.MLB;2                      18
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                38

971 GETS were required to define 38 macros.
```

```
There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 89 ALLOCATE DEVICE
(1) 211 DEALLOCATE DEVICE
(1) 286 LOCK I/O DATA BASE AND SEARCH FOR DEVICE
(1) 302 DECREMENT REFERENCE COUNT, CLEAR OWNERSHIP, AND CALL DRIVER
(1) 328 DSX$MOUNT - Mount a device
(1) 365 DSX$DISMOUNT - Dismount a device

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element DEVALC.MAR
0000     2 ; *1     6-FEB-1986 15:16:54 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element DEVALC.MAR
0000     4         .TITLE  DEVALC  *** DEVALC device allocation routines
0000     5         .IDENT  /05-05/
0000     6
0000     7 ;
0000     8 ;******************************************************************************
0000     9 ;*                                                                            *
0000    10 ;*  COPYRIGHT (c) 1977, 1978, 1979, 1980, 1984                                *
0000    11 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                          *
0000    12 ;*                                                                            *
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0000    16 ;*  COPIES  THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY    *
0000    17 ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE  IS  HEREBY    *
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0000    19 ;*                                                                            *
0000    20 ;*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE    *
0000    21 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT   *
0000    22 ;*  CORPORATION.                                                              *
0000    23 ;*                                                                            *
0000    24 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS    *
0000    25 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                   *
0000    26 ;*                                                                            *
0000    27 ;******************************************************************************
0000    28 ;
0000    29 ; D. N. CUTLER 9-SEP-76
0000    30 ;
0000    31 ; MODIFICATION HISTORY:
0000    32 ;
0000    33 ;                N. HOWGATE      17-FEB-78       VERSION 02 (ESSAA-4.00).
0000    34 ;       01       DIAGNOSTIC SUPERVISOR INTEGRATION
0000    35 ;                Dave Butenhof   13-may-1980, Version 5.4
0000    36 ;       02       Modify VMS V2.0 source to supervisor environment.
0000    37 ;
0000    38 ;       V02      LMK0001         LEN KAWELL              20-JAN-1980
0000    39 ;                ADDED NONSHAREABLE DEVICE ALLOCATION PRIVILEGE CHECK.
0000    40 ;
0000    41 ;       [03]     Richard Brown   12-July-84      Version 7.0
0000    42 ;                Added DSX$MOUNT and DSX$DISMOUNT
0000    43 ;
0000    44 ;       [04]     Richard Brown   20-Sep-84       Version 7.1
0000    45 ;                Removed DSX$MOUNT and DSX$DISMOUNT.
0000    46 ;
0000    47 ;       05       Ron Parker      6-NOV-1984
0000    48 ;                Fixed trucation error
0000    49 ;
0000    50 ; SYSTEM SERVICES FOR DEVICE ALLOCATION
0000    51 ;
0000    52 ;       ALLOCATE DEVICE
0000    53 ;       DEALLOCATE DEVICE
0000    54 ;
0000    55 ; MACRO LIBRARY CALLS
0000    56 ;
0000    57
```

```
                        0000     58          $ALLOCDEF                       ; $ALLOC CALL OFFSETS
                        0000     59          $DALLOCDEF                      ;$DALLOC CALL OFFSETS
                        0000     60          $DDBDEF                         ;DEFINE DDB OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .IIF    NB,DDB$L_LINK,  DDB$L_LINK:
                00000004 0000                        .BLKL   1
                        0004                 .IIF    NB,DDB$L_UCB,   DDB$L_UCB:
                00000008 0004                        .BLKL   1
                        0008                 .IIF    NB,DDB$W_SIZE,  DDB$W_SIZE:
                0000000A 0008                        .BLKW   1
                        000A                 .IIF    NB,DDB$B_TYPE,  DDB$B_TYPE:
                0000000B 000A                        .BLKB   1
                0000000C 000B                        .BLKB   1
                        000C                 .IIF    NB,DDB$L_DDT,   DDB$L_DDT:
                00000010 000C                        .BLKL   1
                        0010                 .IIF    NB,DDB$L_ACPD,  DDB$L_ACPD:
                00000013 0010                        .BLKB   3
                        0013                 .IIF    NB,DDB$B_ACPCLASS,      DDB$B_ACPCLASS:
                00000014 0013                        .BLKB   1
                        0014                 .IIF    NB,DDB$T_NAME,  DDB$T_NAME:
                00000015 0014                        .BLKB   1
                00000024 0015                        .BLKB   15
                        0024                 .IIF    NB,DDB$T_DRVNAME,       DDB$T_DRVNAME:
                00000025 0024                        .BLKB   1
                00000034 0025                        .BLKB   15
                        0034                 .IIF    NB,DDB$C_LENGTH,        DDB$C_LENGTH:
                        0034                 .IIF    NB,DDB$K_LENGTH,        DDB$K_LENGTH:
                        0000                 .RESTORE
                        0000     61          $DDTDEF                         ;DEFINE DDT OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 0034                .=0
                        0000                 .IIF    NB,DDT$L_START, DDT$L_START:
                00000004 0000                        .BLKL   1
                        0004                 .IIF    NB,DDT$L_UNSOLINT,      DDT$L_UNSOLINT:
                00000008 0004                        .BLKL   1
                        0008                 .IIF    NB,DDT$L_FDT,   DDT$L_FDT:
                0000000C 0008                        .BLKL   1
                        000C                 .IIF    NB,DDT$L_CANCEL,        DDT$L_CANCEL:
                00000010 000C                        .BLKL   1
                        0010                 .IIF    NB,DDT$L_REGDUMP,       DDT$L_REGDUMP:
                00000014 0010                        .BLKL   1
                        0014                 .IIF    NB,DDT$W_DIAGBUF,       DDT$W_DIAGBUF:
                00000016 0014                        .BLKW   1
                        0016                 .IIF    NB,DDT$W_ERRORBUF,      DDT$W_ERRORBUF:
                00000018 0016                        .BLKW   1
                        0018                 .IIF    NB,DDT$L_UNITINIT,      DDT$L_UNITINIT:
                0000001C 0018                        .BLKL   1
                        001C                 .IIF    NB,DDT$L_ALTSTART,      DDT$L_ALTSTART:
                00000020 001C                        .BLKL   1
                        0000                 .RESTORE
                        0000     62          $DEVDEF                         ;DEFINE DEVICE CHARACTERISTICS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 0034                .=0
                        0000                 .RESTORE
                        0000     63          $PCBDEF                         ;DEFINE PCB OFFSETS
```

```
                        0000            .SAVE   LOCAL_BLOCK
                        0000            .PSECT  $ABS$,ABS
                00000000  0034            .=0
                        0000            .IIF    NB,PCB$L_SQFL,  PCB$L_SQFL:
                00000004  0000                            .BLKL   1
                        0004            .IIF    NB,PCB$L_SQBL,  PCB$L_SQBL:
                00000008  0004                            .BLKL   1
                        0008            .IIF    NB,PCB$W_SIZE,  PCB$W_SIZE:
                0000000A  0008                            .BLKW   1
                        000A            .IIF    NB,PCB$B_TYPE,  PCB$B_TYPE:
                0000000B  000A                            .BLKB   1
                        000B            .IIF    NB,PCB$B_PRI,   PCB$B_PRI:
                0000000C  000B                            .BLKB   1
                        000C            .IIF    NB,PCB$B_ASTACT,        PCB$B_ASTACT:
                0000000D  000C                            .BLKB   1
                        000D            .IIF    NB,PCB$B_ASTEN, PCB$B_ASTEN:
                0000000E  000D                            .BLKB   1
                        000E            .IIF    NB,PCB$W_MTXCNT,        PCB$W_MTXCNT:
                00000010  000E                            .BLKW   1
                        0010            .IIF    NB,PCB$L_ASTQFL,        PCB$L_ASTQFL:
                00000014  0010                            .BLKL   1
                        0014            .IIF    NB,PCB$L_ASTQBL,        PCB$L_ASTQBL:
                00000018  0014                            .BLKL   1
                        0018            .IIF    NB,PCB$L_PHYPCB,        PCB$L_PHYPCB:
                0000001C  0018                            .BLKL   1
                        001C            .IIF    NB,PCB$L_OWNER, PCB$L_OWNER:
                00000020  001C                            .BLKL   1
                        0020            .IIF    NB,PCB$L_WSSWP, PCB$L_WSSWP:
                00000024  0020                            .BLKL   1
                        0024            .IIF    NB,PCB$L_STS,   PCB$L_STS:
                00000028  0024                            .BLKL   1
                        0028            .IIF    NB,PCB$L_WTIME, PCB$L_WTIME:
                0000002C  0028                            .BLKL   1
                        002C            .IIF    NB,PCB$W_STATE, PCB$W_STATE:
                0000002E  002C                            .BLKW   1
                        002E            .IIF    NB,PCB$B_WEFC,  PCB$B_WEFC:
                0000002F  002E                            .BLKB   1
                        002F            .IIF    NB,PCB$B_PRIB,  PCB$B_PRIB:
                00000030  002F                            .BLKB   1
                        0030            .IIF    NB,PCB$W_APTCNT,        PCB$W_APTCNT:
                00000032  0030                            .BLKW   1
                        0032            .IIF    NB,PCB$W_TMBU,  PCB$W_TMBU:
                00000034  0032                            .BLKW   1
                        0034            .IIF    NB,PCB$W_GPGCNT,        PCB$W_GPGCNT:
                00000036  0034                            .BLKW   1
                        0036            .IIF    NB,PCB$W_PPGCNT,        PCB$W_PPGCNT:
                00000038  0036                            .BLKW   1
                        0038            .IIF    NB,PCB$W_ASTCNT,        PCB$W_ASTCNT:
                0000003A  0038                            .BLKW   1
                        003A            .IIF    NB,PCB$W_BIOCNT,        PCB$W_BIOCNT:
                0000003C  003A                            .BLKW   1
                        003C            .IIF    NB,PCB$W_BIOLM, PCB$W_BIOLM:
                0000003E  003C                            .BLKW   1
                        003E            .IIF    NB,PCB$W_DIOCNT,        PCB$W_DIOCNT:
                00000040  003E                            .BLKW   1
                        0040            .IIF    NB,PCB$W_DIOLM, PCB$W_DIOLM:
                00000042  0040                            .BLKW   1
```

```
                        0042          .IIF    NB,PCB$W_PRCCNT,        PCB$W_PRCCNT:
00000044                0042                  .BLKW   1
                        0044          .IIF    NB,PCB$T_TERMINAL,      PCB$T_TERMINAL:
0000004C                0044                  .BLKB   8
                        004C          .IIF    NB,PCB$L_PQB,   PCB$L_PQB:
                        004C          .IIF    NB,PCB$L_EFWM,  PCB$L_EFWM:
00000050                004C                  .BLKL   1
                        0050          .IIF    NB,PCB$L_EFCS,  PCB$L_EFCS:
00000054                0050                  .BLKL   1
                        0054          .IIF    NB,PCB$L_EFCU,  PCB$L_EFCU:
00000058                0054                  .BLKL   1
                        0058          .IIF    NB,PCB$L_EFC2P, PCB$L_EFC2P:
0000005C                0058                  .BLKL   1
                        005C          .IIF    NB,PCB$L_EFC3P, PCB$L_EFC3P:
00000060                005C                  .BLKL   1
                        0060          .IIF    NB,PCB$L_PID,   PCB$L_PID:
00000064                0060                  .BLKL   1
                        0064          .IIF    NB,PCB$L_PHD,   PCB$L_PHD:
00000068                0064                  .BLKL   1
                        0068          .IIF    NB,PCB$T_LNAME, PCB$T_LNAME:
00000078                0068                  .BLKB   16
                        0078          .IIF    NB,PCB$L_JIB,   PCB$L_JIB:
0000007C                0078                  .BLKL   1
                        007C          .IIF    NB,PCB$Q_PRIV,  PCB$Q_PRIV:
00000084                007C                  .BLKQ   1
                        0084          .IIF    NB,PCB$L_ARB,   PCB$L_ARB:
00000088                0084                  .BLKL   1
                        0088          .IIF    NB,PCB$L_UIC,   PCB$L_UIC:
                        0088          .IIF    NB,PCB$W_MEM,   PCB$W_MEM:
0000008A                0088                  .BLKW   1
                        008A          .IIF    NB,PCB$W_GRP,   PCB$W_GRP:
0000008C                008A                  .BLKW   1
                        008C          .IIF    NB,PCB$C_LENGTH,        PCB$C_LENGTH:
                        008C          .IIF    NB,PCB$K_LENGTH,        PCB$K_LENGTH:
                        0000          .RESTORE
                        0000    64    $PRDEF                          ;DEFINE PROCESSOR REGISTERS
                        0000          .SAVE   LOCAL_BLOCK
                        0000          .PSECT  $ABS$,ABS
00000000                008C          .=0
                        0000          .RESTORE
                        0000    65    $PRVDEF                         ;DEFINE PRIVILEGE BITS
                        0000          .SAVE   LOCAL_BLOCK
                        0000          .PSECT  $ABS$,ABS
00000000                008C          .=0
                        0000          .RESTORE
                        0000    66    $PSLDEF                         ;DEFINE PROCESSOR STATUS FIELDS
                        0000          .SAVE   LOCAL_BLOCK
                        0000          .PSECT  $ABS$,ABS
00000000                008C          .=0
                        0000          .RESTORE
                        0000    67    $SSDEF                          ;DEFINE SYSTEM STATUS VALUES
                        0000          .SAVE   LOCAL_BLOCK
                        0000          .PSECT  $ABS$,ABS
00000000                008C          .=0
                        0000          .RESTORE
                        0000    68    $UCBDEF                         ;DEFINE UCB OFFSETS
                        0000          .SAVE   LOCAL_BLOCK
```

```
                    0000            .PSECT  $ABS$,ABS
          00000000  008C            .=0
                    0000            .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                    0000            .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
          00000004  0000                    .BLKL   1
                    0004            .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                    0004            .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
          00000008  0004                    .BLKL   1
                    0008            .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
          0000000A  0008                    .BLKW   1
                    000A            .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
          0000000B  000A                    .BLKB   1
                    000B            .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
          0000000C  000B                    .BLKB   1
                    000C            .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                    000C            .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                    000C            .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
          0000000D  000C                    .BLKB   1
          00000010  000D                    .BLKB   3
                    0010            .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                    0010            .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
          00000014  0010                    .BLKL   1
                    0014            .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                    0014            .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                    0014            .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
          00000016  0014                    .BLKW   1
                    0016            .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
          00000018  0016                    .BLKW   1
                    0018            .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                    0018            .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
          0000001A  0018                    .BLKW   1
                    001A            .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                    001A            .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
          0000001C  001A                    .BLKW   1
                    001C            .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
          00000020  001C                    .BLKL   1
                    0020            .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
          00000024  0020                    .BLKL   1
                    0024            .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
          00000028  0024                    .BLKL   1
                    0028            .IIF    NB,UCB$L_PID,   UCB$L_PID:
          0000002C  0028                    .BLKL   1
                    002C            .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
          00000030  002C                    .BLKL   1
                    0030            .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
          00000034  0030                    .BLKL   1
                    0034            .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
          00000038  0034                    .BLKL   1
                    0038            .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
          00000039  0038                    .BLKB   1
                    0039            .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
          0000003A  0039                    .BLKB   1
                    003A            .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
          0000003C  003A                    .BLKW   1
                    003C            .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
                    003C            .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
                    003C            .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
```

```
                    0000003D  003C                        .BLKB   1
                              003D              .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
                              003D              .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
                    0000003E  003D                        .BLKB   1
                              003E              .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
                              003E              .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
                    0000003F  003E                        .BLKB   1
                              003F              .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
                    00000040  003F                        .BLKB   1
                              0040              .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
                    00000044  0040                        .BLKL   1
                              0044              .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
                    00000048  0044                        .BLKL   1
                              0048              .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
                    0000004A  0048                        .BLKW   1
                              004A              .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
                              004A              .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
                    0000004B  004A                        .BLKB   1
                              004B              .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
                    0000004C  004B                        .BLKB   1
                              004C              .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
                    00000050  004C                        .BLKL   1
                              0050              .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
                    00000052  0050                        .BLKW   1
                              0052              .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
                              0052              .IIF    NB,UCB$B_STATE, UCB$B_STATE:
                    00000053  0052                        .BLKB   1
                              0053              .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
                    00000054  0053                        .BLKB   1
                              0054              .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
                    00000058  0054                        .BLKL   1
                              0058              .IIF    NB,UCB$W_STS,   UCB$W_STS:
                    0000005A  0058                        .BLKW   1
                              005A              .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
                    0000005C  005A                        .BLKW   1
                              005C              .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
                              005C              .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
                    00000060  005C                        .BLKL   1
                              0060              .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
                    00000064  0060                        .BLKL   1
                              0064              .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
                              0064              .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
                    00000068  0064                        .BLKL   1
                              0068              .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
                    0000006C  0068                        .BLKL   1
                              006C              .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
                    0000006E  006C                        .BLKW   1
                              006E              .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
                    00000070  006E                        .BLKW   1
                              0070              .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
                    00000071  0070                        .BLKB   1
                              0071              .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
                    00000072  0071                        .BLKB   1
                              0072              .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
                    00000074  0072                        .BLKW   1
                              0074              .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
                              0074              .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
```

```
00000000  0074          . = 0
          0000          .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002  0000                          .BLKW   1
00000074  0002          . = 116
          0074          .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078  0074                          .BLKL   1
          0078          .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C  0078                          .BLKL   1
          007C          .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080  007C                          .BLKL   1
          0080          .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084  0080                          .BLKL   1
          0084          .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088  0084                          .BLKL   1
          0088          .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C  0088                          .BLKL   1
          008C          .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090  008C                          .BLKL   1
          0090          .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
          0090          .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074  0090          . = 116
          0074          .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075  0074                          .BLKB   1
          0075          .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076  0075                          .BLKB   1
          0076          .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077  0076                          .BLKB   1
          0077          .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078  0077                          .BLKB   1
          0078          .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C  0078                          .BLKL   1
0000007E  007C                          .BLKW   1
          007E          .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080  007E                          .BLKW   1
          0080          .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084  0080                          .BLKL   1
00000080  0084          . = 128
00000084  0080                          .BLKL   1
          0084          .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088  0084                          .BLKL   1
          0088          .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A  0088                          .BLKW   1
          008A          .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C  008A                          .BLKW   1
          008C          .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
          008C          .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E  008C                          .BLKW   1
          008E          .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090  008E                          .BLKW   1
          0090          .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092  0090                          .BLKW   1
          0092          .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
00000094  0092                          .BLKW   1
          0094          .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095  0094                          .BLKB   1
          0095          .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096  0095                          .BLKB   1
```

```
                        0096            .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098  0096                                  .BLKW   1
00000096  0098          . = 150
00000098  0096                                  .BLKW   1
                        0098            .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C  0098                                  .BLKL   1
                        009C            .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0  009C                                  .BLKL   1
                        00A0            .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
000000A4  00A0                                  .BLKL   1
                        00A4            .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
000000A6  00A4                                  .BLKW   1
                        00A6            .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
000000A7  00A6                                  .BLKB   1
000000A8  00A7                                  .BLKB   1
00000074  00A8          . = 116
00000078  0074                                  .BLKL   1
0000007C  0078                                  .BLKL   1
00000080  007C                                  .BLKL   1
00000084  0080                                  .BLKL   1
00000088  0084                                  .BLKL   1
0000008C  0088                                  .BLKL   1
                        008C            .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
00000090  008C                                  .BLKL   1
00000094  0090                                  .BLKL   1
00000098  0094                                  .BLKL   1
0000009C  0098                                  .BLKL   1
                        009C            .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
0000009D  009C                                  .BLKB   1
                        009D            .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
0000009E  009D                                  .BLKB   1
                        009E            .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
0000009F  009E                                  .BLKB   1
000000A0  009F                                  .BLKB   1
                        00A0            .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
000000A1  00A0                                  .BLKB   1
                        00A1            .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
000000A2  00A1                                  .BLKB   1
                        00A2            .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
000000A3  00A2                                  .BLKB   1
000000A4  00A3                                  .BLKB   1
                        00A4            .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
000000A5  00A4                                  .BLKB   1
                        00A5            .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
000000A7  00A5                                  .BLKW   1
000000A8  00A7                                  .BLKB   1
                        00A8            .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
000000AC  00A8                                  .BLKL   1
000000B0  00AC                                  .BLKL   1
000000B4  00B0                                  .BLKL   1
000000B8  00B4                                  .BLKL   1
                        00B8            .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
000000BC  00B8                                  .BLKL   1
                        00BC            .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
                        00BC            .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
00000074  00BC          . = 116
                        0074            .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
```

```
00000078  0074                                  .BLKL   1
          0078                  .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
0000007C  0078                                  .BLKL   1
          007C                  .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
0000007E  007C                                  .BLKW   1
00000080  007E                                  .BLKW   1
          0000                  .RESTORE
          0000
          0000                  $DS_DSADEF                      ; Define VDS flags              [03]
          0000  ;
          0000  ; LOCAL SYMBOLS
          0000  ;
          0000  ; ARGUMENT LIST OFFSET DEFINITIONS FOR ALLOCATE DEVICE
          0000  ;
          0000
00000004  0000  DEVNAM=4                                  ;ADDRESS OF DEVICE NAME STRING DESCRIPTOR
00000008  0000  PHYLEN=8                                  ;ADDRESS TO STORE LENGTH OF PHYSICAL NAME
0000000C  0000  PHYBUF=12                                 ;ADDRESS OF PHYSICAL NAME BUFFER DESCRIPTOR
00000010  0000  ALACMODE=16                               ;ACCESS MODE
          0000
          0000  ;
          0000  ; ARGUMENT LIST OFFSET DEFINITIONS FOR DEALLOCATE DEVICE
          0000  ;
          0000
00000004  0000  DEVNAM=4                                  ;ADDRESS OF DEVICE NAME STRING DESCRIPTOR
00000008  0000  DLACMODE=8                                ;ACCESS MODE
```

```
0000     89          .SBTTL  ALLOCATE DEVICE
0000     90 ;+
0000     91 ; EXE$ALLOC - ALLOCATE DEVICE
0000     92 ;
0000     93 ; THIS SERVICE PROVIDES THE CAPABILITY TO RESERVE A DEVICE FOR EXCLUSIVE
0000     94 ; USE.
0000     95 ;
0000     96 ; INPUTS:
0000     97 ;
0000     98 ;       DEVNAM(AP) = ADDRESS OF DEVICE NAME STRING DESCRIPTOR.
0000     99 ;       PHYLEN(AP) = ADDRESS TO STORE LENGTH OF PHYSICAL NAME.
0000    100 ;       PHYBUF(AP) = ADDRESS OF PHYSICAL NAME BUFFER DESCRIPTOR.
0000    101 ;       ALACMODE(AP) = ACCESS MODE DEVICE IS TO BE ALLOCATED TO.
0000    102 ;
0000    103 ;       R4 = CURRENT PROCESS PCB ADDRESS.
0000    104 ;
0000    105 ; OUTPUTS:
0000    106 ;
0000    107 ;       R0 LOW BIT CLEAR INDICATES FAILURE TO ALLOCATE DEVICE.
0000    108 ;
0000    109 ;               R0 = SS$_ACCVIO - DEVICE NAME STRING, DEVICE NAME STRING
0000    110 ;                    DESCRIPTOR, OR PHYSICAL NAME BUFFER DESCRIPTOR
0000    111 ;                    CANNOT BE READ BY CALLING ACCESS MODE, OR PHYSICAL
0000    112 ;                    NAME BUFFER CANNOT BE WRITTEN BY CALLING ACCESS
0000    113 ;                    MODE.
0000    114 ;
0000    115 ;               R0 = SS$_DEVALLOC - DEVICE ALREADY ALLOCATED TO ANOTHER
0000    116 ;                    PROCESS.
0000    117 ;
0000    118 ;               R0 = SS$_DEVMOUNT - DEVICE CURRENTLY MOUNTED AND CANNOT
0000    119 ;                    BE ALLOCATED.
0000    120 ;
0000    121 ;               R0 = SS$_IVDEVNAM - DEVICE NAME STRING CONTAINS INVALID
0000    122 ;                    CHARACTERS OR NO DEVICE NAME STRING DESCRIPTOR
0000    123 ;                    SPECIFIED.
0000    124 ;
0000    125 ;               R0 = SS$_IVLOGNAM - ZERO OR GREATER THAN MAXIMUM LENGTH
0000    126 ;                    DEVICE NAME STRING SPECIFIED.
0000    127 ;
0000    128 ;               R0 = SS$_NONLOCAL - SPECIFIED DEVICE EXISTS ON A REMOTE
0000    129 ;                    SYSTEM.
0000    130 ;
0000    131 ;               R0 = SS$_NOPRIV - DEVICE CURRENTLY SPOOLED AND PROCESS DOES
0000    132 ;                    NOT HAVE PRIVILEGE TO ALLOCATE.
0000    133 ;
0000    134 ;               R0 = SS$_NOSUCHDEV - SPECIFIED DEVICE DOES NOT EXIST ON
0000    135 ;                    HOST SYSTEM OR NO ALLOCATABLE UNIT CAN BE FOUND.
0000    136 ;
0000    137 ;       R0 LOW BIT SET INDICATES SUCCESSFUL COMPLETION.
0000    138 ;
0000    139 ;               R0 = SS$_DEVALRALLOC - DEVICE IS ALREADY ALLOCATED TO CALLING
0000    140 ;                    PROCESS.
0000    141 ;
0000    142 ;               R0 = SS$_BUFFEROVF - NORMAL COMPLETION, PHYSICAL NAME OVER-
0000    143 ;                    FLOWED PHYSICAL NAME BUFFER.
0000    144 ;
0000    145 ;               R0 = SS$_NORMAL - NORMAL COMPLETION, PHYSICAL NAME TRANSFERED
```

```
                                0000   146 ;                           TO PHYSICAL NAME BUFFER.
                                0000   147 ;-
                                0000   148
                             00000000  149          .PSECT  SEP,    SHR,    EXE,    WRT,    LONG
                                0000   150          MODNAM  SYSDEVALC
 43 4C 41 56 45 44 53 59 53 00' 0000      $MODULE:          .ASCIC  \SYSDEVALC\
                                09  0000
                               007C  000A   151          .ENTRY  EXE$ALLOC,^M<R2,R3,R4,R5,R6>
          54   00000000'EF    9E  000C   152          MOVAB   DS$AX_SOFTPCB,R4        ;SOFTWARE PCB TO R4
              55   0144 8F    3C  0013   153          MOVZWL  #SS$_IVDEVNAM,R5        ;SET INVALID DEVICE NAME STATUS
                     00F0     30  0018   154          BSBW    SEARCHDEV               ;LOCK I/O DATA BASE AND GET DEVICE NAME
                       3F     13  001B   155          BEQL    27$                     ;IF EQL NO DEVICE NAME SPECIFIED
                     FFE0'    30  001D   156          BSBW    IOC$SEARCHGEN           ;SEARCH FOR GENERIC DEVICE
                  55   50     D0  0020   157          MOVL    R0,R5                   ;SAVE SEARCH STATUS
                    36 55     E9  0023   158          BLBC    R5,27$                  ;IF LBC SEARCH FAILURE
                  56   51     D0  0026   159          MOVL    R1,R6                   ;SAVE DEVICE UCB ADDRESS
                                0029   160 ;
                                0029   161 ; RETURN PHYSICAL DEVICE NAME
                                0029   162 ;
               51   0C AC     D0  0029   163          MOVL    PHYBUF(AP),R1           ;GET ADDRESS OF NAME BUFFER DESCRIPTOR
                      1C     13  002D   164          BEQL    20$                     ;IF EQL NONE
                  50   61     3C  002F   165          MOVZWL  (R1),R0                 ;GET LENGTH OF NAME BUFFER
                       17     13  0032   166          BEQL    20$                     ;IF EQL ZERO LENGTH BUFFER
               51   04 A1     D0  0034   167          MOVL    4(R1),R1                ;GET ADDRESS OF NAME BUFFER
               53   08 AC     D0  0038   168          MOVL    PHYLEN(AP),R3           ;GET ADDRESS TO STORE NAME LENGTH
                       00     13  003C   169          BEQL    10$                     ;IF EQL NONE
                     FFBF'    30  003E   170 10$:     BSBW    IOC$CVT_DEVNAM          ;CONVERT DEVICE NAME AND UNIT
                  55   50     D0  0041   171          MOVL    R0,R5                   ;SAVE COMPLETION STATUS
                       53     D5  0044   172          TSTL    R3                      ;ADDRESS TO STORE LENGTH SPECIFIED?
                       03     13  0046   173          BEQL    20$                     ;IF EQL NONE SPECIFIED
                  63   51     B0  0048   174          MOVW    R1,(R3)                 ;INSERT LENGTH OF CONVERTED STRING
                                004B   175 ;
                                004B   176 ; CHECK IF PROCESS ALREADY ALLOCATED DEVICE OR CAN ALLOCATE THE DEVICE
                                004B   177 ;
            50   28 A6     D0  004B   178 20$:     MOVL    UCB$L_PID(R6),R0        ;GET PROCESS ID OF OWNER
                       0D     13  004F   179          BEQL    30$                     ;IF EQL DEVICE NOT OWNED
            60 A4      50     D1  0051   180          CMPL    R0,PCB$L_PID(R4)        ;OWNED BY CURRENT PROCESS?
                       1D     13  0055   181          BEQL    60$                     ;IF EQL YES
         55   0840 8F     3C  0057   182 25$:     MOVZWL  #SS$_DEVALLOC,R5        ;SET DEVICE ALREADY ALLOCATED
                       42     11  005C   183 27$:     BRB     80$                     ;
                                005E   184
      02 34 A6       06     E1  005E   185 30$:     BBC     #DEV$V_SPL,UCB$L_DEVCHAR(R6),40$ ;IF CLR, DEVICE NOT SPOOLED
                       05     11  0063   186          BRB     47$                     ;
                  50 A6       B5  0065   187 40$:     TSTW    UCB$W_REFC(R6)          ;ANY CHANNELS ASSIGNED TO DEVICE?
                       ED     12  0068   188          BNEQ    25$                     ;IF NEQ YES
                    00AE      31  006A   189 47$:     BRW     NOPRIV                  ;ELSE NO PRIVILEGE
                       31     11  006D   190 50$:     BRB     80$                     ;
                  55   0C     3C  006F   191 55$:     MOVZWL  #SS$_ACCVIO,R5          ;SET ACCESS VIOLATION STATUS
                       2C     11  0072   192          BRB     80$                     ;
                                0074   193
                  55   01     B1  0074   194 60$:     CMPW    #SS$_NORMAL,R5          ;NORMAL COMPLETION STATUS?
                       0A     12  0077   195          BNEQ    70$                     ;IF NEQ NO
      05 34 A6       17     E1  0079   196          BBC     #DEV$V_ALL,UCB$L_DEVCHAR(R6),70$ ;IF CLR, DEVICE NOT ALLOCATED
       55   0641 8F     3C  007E   197          MOVZWL  #SS$_DEVALRALLOC,R5     ;SET DEVICE ALREADY ALLOCATED STATUS
                                0083   198 ;
                                0083   199 ; ALLOCATE THE DEVICE BY SETTING OWNER PID, SETTING ALLOCATED CHARACTERISTIC,
                                0083   200 ; INCREMENTING THE REFERENCE COUNT, AND SETTING THE ALLOCATOR'S ACCESS MODE
```

```
                                  0083   201 ;
          28 A6    60 A4    D0   0083   202 70$:    MOVL    PCB$L_PID(R4),UCB$L_PID(R6) ;SET OWNER PROCESS ID
          13 34 A6    17    E2   0088   203         BBSS    #DEV$V_ALL,UCB$L_DEVCHAR(R6),80$ ;IF SET, DEVICE ALREADY ALLOCATED
                   50 A6    B6   008D   204         INCW    UCB$W_REFC(R6)          ;INCREMENT REFERENCE COUNT
   50   10 AC    02    00    EF   0090   205         EXTZV   #0,#2,ALACMODE(AP),R0   ;GET SPECIFIED ACCESS MODE
             00000000'EF     16   0096   206         JSB     EXE$MAXACMODE           ;MAXIMIZE ACCESS MODE
              53 A6    50    90   009C   207         MOVB    R0,UCB$B_AMOD(R6)       ;SET ALLOCATING ACCESS MODE
                 50    55    D0   00A0   208 80$:    MOVL    R5,R0                   ;SET FINAL STATUS
                     FF5A'   31   00A3   209         BRW     IOC$UNLOCK              ;
```

```
                                00A6   211          .SBTTL  DEALLOCATE DEVICE
                                00A6   212 ;+
                                00A6   213 ; EXE$DALLOC - DEALLOCATE DEVICE
                                00A6   214 ;
                                00A6   215 ; THIS SERVICE PROVIDES THE CAPABILITY TO RELINQUISH EXCLUSIVE USE OF A
                                00A6   216 ; DEVICE.
                                00A6   217 ;
                                00A6   218 ; INPUTS:
                                00A6   219 ;
                                00A6   220 ;       DEVNAM(AP) = ADDRESS OF DEVICE NAME STRING DESCRIPTOR. ZERO
                                00A6   221 ;                    IMPLIES ALL.
                                00A6   222 ;       DLACMODE(AP) = ACCESS MODE FOR DEALLOCATION.
                                00A6   223 ;
                                00A6   224 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                                00A6   225 ;
                                00A6   226 ; OUTPUTS:
                                00A6   227 ;
                                00A6   228 ;       R0 LOW BIT CLEAR INDICATES FAILURE TO DEALLOCATE DEVICE.
                                00A6   229 ;
                                00A6   230 ;              R0 = SS$_ACCVIO - DEVICE NAME STRING OR DEVICE NAME STRING
                                00A6   231 ;                   DESCRIPTOR CANNOT BE READ BY CALLING ACCESS MODE.
                                00A6   232 ;
                                00A6   233 ;              R0 = SS$_DEVASSIGN - DEVICE CANNOT BE DEALLOCATED BECAUSE
                                00A6   234 ;                   PROCESS STILL HAS CHANNELS ASSIGNED.
                                00A6   235 ;
                                00A6   236 ;              R0 = SS$_DEVNOTALLOC - DEVICE NOT ALLOCATED OR NOT ALLOCATED
                                00A6   237 ;                   TO PROCESS.
                                00A6   238 ;
                                00A6   239 ;              R0 = SS$_IVDEVNAM - DEVICE NAME STRING CONTAINS INVALID
                                00A6   240 ;                   CHARACTERS.
                                00A6   241 ;
                                00A6   242 ;              R0 = SS$_IVLOGNAM - ZERO OR GREATER THAN MAXIMUM LENGTH
                                00A6   243 ;                   DEVICE NAME STRING SPECIFIED.
                                00A6   244 ;
                                00A6   245 ;              R0 = SS$_NOPRIV - CALLING ACCESS MODE DOES NOT HAVE PRIVILEGE
                                00A6   246 ;                   TO DEALLOCATE DEVICE.
                                00A6   247 ;
                                00A6   248 ;              R0 = SS$_NOSUCHDEV - SPECIFIED DEVICE DOES NOT EXIST ON
                                00A6   249 ;                   HOST SYSTEM.
                                00A6   250 ;
                                00A6   251 ;       R0 LOW BIT SET INDICATES SUCCESSFUL COMPLETION.
                                00A6   252 ;
                                00A6   253 ;              R0 = SS$_NORMAL - NORMAL COMPLETION.
                                00A6   254 ;-
                                00A6   255
                         003C   00A6   256          .ENTRY  EXE$DALLOC,^M<R2,R3,R4,R5>
54   00000000'EF          9E   00A8   257          MOVAB   DS$AX_SOFTPCB,R4        ;SOFTWARE PCB TO R4
                        5A    10   00AF   258          BSBB    SEARCHDEV               ;LOCK I/O DATA BASE AND SEARCH FOR DEVICE
                        1B    13   00B1   259          BEQL    10$                     ;IF EQL NO DEVICE NAME SPECIFIED
                  FF4A'       30   00B3   260          BSBW    IOC$SEARCHDEV           ;SEARCH FOR PHYSICAL DEVICE
                50 50         E9   00B6   261          BLBC    R0,50$                  ;IF LBC SEARCH FAILURE
           60 A4   28 A1      D1   00B9   262          CMPL    UCB$L_PID(R1),PCB$L_PID(R4) ;DEVICE ALLOCATED TO CURRENT PROCESS?
                        44    12   00BE   263          BNEQ    40$                     ;IF NEQ NO
              50 A1     01    B1   00C0   264          CMPW    #1,UCB$W_REFC(R1)       ;REFERENCE COUNT ONE?
                        43    12   00C4   265          BNEQ    50$                     ;IF NEQ NO
            00000126'EF         16   00C6   266          JSB     DECREF                  ;DECREMENT REFERENCE COUNT AND CALL DRIVER
                        52    11   00CC   267          BRB     NORMAL                  ;
```

```
                53   00000000'EF   9E   00CE   268 10$:    MOVAB   L^IOC$GL_DEVLIST-DDB$L_LINK,R3 ;GET ADDRESS OF I/O DATABASE LISTHEAD
                     53    63     D0   00D5   269 20$:    MOVL    DDB$L_LINK(R3),R3          ;GET ADDRESS OF NEXT DDB
                           46     13   00D8   270          BEQL    NORMAL                     ;IF EQL END OF LIST
                      51    D8 A3  9E   00DA   271          MOVAB   DDB$L_UCB-UCB$L_LINK(R3),R1 ;GET ADDRESS OF NEXT UCB ADDRESS
                      51    2C A1  D0   00DE   272 30$:    MOVL    UCB$L_LINK(R1),R1          ;GET ADDRESS OF NEXT UCB
                           F1     13   00E2   273          BEQL    20$                        ;IF EQL END OF LIST
                   60 A4    28 A1  D1   00E4   274          CMPL    UCB$L_PID(R1),PCB$L_PID(R4) ;DEVICE ALLOCATED TO CURRENT PROCESS?
                           F3     12   00E9   275          BNEQ    30$                        ;IF NEQ NO
                      53 A1  55     91   00EB   276          CMPB    R5,UCB$B_AMOD(R1)          ;CAN ACCESS MODE DEALLOCATE DEVICE?
                           ED     14   00EF   277          BGTR    30$                        ;IF GTR NO
                   E8 34 A1  17     E1   00F1   278          BBC     #DEV$V_ALL,UCB$L_DEVCHAR(R1),30$ ;IF CLR, DEVICE NOT ALLOCATED
                      50 A1  01     B1   00F6   279          CMPW    #1,UCB$W_REFC(R1)          ;REFERENCE COUNT ONE?
                           E2     12   00FA   280          BNEQ    30$                        ;IF NEQ NO
                    00000126'EF   16   00FC   281          JSB     DECREF                     ;DECREMENT REFERENCE COUNT AND CALL DRIVER
                           DA     11   0102   282          BRB     30$                        ;
                    50    0858 8F   3C   0104   283 40$:    MOVZWL  #SS$_DEVNOTALLOC,R0        ;SET DEVICE NOT ALLOCATED TO PROCESS
                           18     11   0109   284 50$:    BRB     UNLOCK                     ;
```

```
                        010B   286          .SBTTL  LOCK I/O DATA BASE AND SEARCH FOR DEVICE
                        010B   287 ;
                        010B   288 ; SUBROUTINE TO LOCK I/O DATA BASE, SEARCH FOR DEVICE, AND CHECK FOR MAILBOX.
                        010B   289 ;
                        010B   290
                        010B   291 SEARCHDEV:                                   ;LOCK I/O DATA BASE AND SEARCH FOR DEVICE
      51   04 AC   D0   010B   292          MOVL    DEVNAM(AP),R1                ;GET ADDRESS OF DEVICE NAME STRING DESCRIPTO
           09   13   010F   293          BEQL    10$                          ;IF EQL NONE
      50   0C   3C   0111   294          MOVZWL  #SS$_ACCVIO,R0               ;SET ACCESS VIOLATION STATUS
                     0114   295          IFNORD  #8,(R1),UNLOCK               ;CAN DEVICE NAME DESCRIPTOR BE READ?
  61  08   00   0C 0114                   PROBER  #0,#8,(R1)
           09   13   0118                 BEQL    UNLOCK
                05   011A   296 10$:     RSB                                  ;
      50   24   3C   011B   297 NOPRIV:  MOVZWL  #SS$_NOPRIV,R0               ;SET NO PRIVILEGE
           03   11   011E   298          BRB     UNLOCK                       ;
      50   01   3C   0120   299 NORMAL:  MOVZWL  #SS$_NORMAL,R0               ;SET NORMAL COMPLETION
          FEDA' 31   0123   300 UNLOCK:  BRW     IOC$UNLOCK                   ;UNLOCK I/O DATA BASE AND RETURN
```

```
                        0126    302          .SBTTL  DECREMENT REFERENCE COUNT, CLEAR OWNERSHIP, AND CALL DRIVER
                        0126    303 ;
                        0126    304 ; SUBROUTINE TO DECREMENT REFERENCE COUNT, CLEAR OWNERSHIP, AND CALL DRIVER
                        0126    305 ;
                        0126    306
                        0126    307 DECREF:                                                     ;
00 34 A1    17    E5    0126    308          BBCC    #DEV$V_ALL,UCB$L_DEVCHAR(R1),10$ ;CLEAR DEVICE ALLOCATED
      50 A1    B7    012B    309 10$:     DECW    UCB$W_REFC(R1)              ;DECREMENT REFERENCE COUNT
      28 A1    D4    012E    310          CLRL    UCB$L_PID(R1)               ;CLEAR OWNER PROCESS ID
         2A    BB    0131    311          PUSHR   #^M<R1,R3,R5>               ;SAVE REGISTERS
   50   24 A1    D0    0133    312          MOVL    UCB$L_DDB(R1),R0            ;GET ADDRESS OF DDB
   50   0C A0    D0    0137    313          MOVL    DDB$L_DDT(R0),R0            ;GET ADDRESS OF DDT
      55   51    D0    013B    314          MOVL    R1,R5                       ;SET ADDRESS OF DEVICE UCB
           52    D4    013E    315          CLRL    R2                          ;CLEAR CHANNEL NUMBER
                        0140    316          DSBINT  UCB$B_FIPL(R5)              ;RAISE TO DRIVER FORK LEVEL
      7E   12    DB    0140                 MFPR    S^#PR$_IPL,-(SP)
   12   0B A5    DA    0143                 MTPR    UCB$B_FIPL(R5),S^#PR$_IPL
   53   4C A5    D0    0147    317          MOVL    UCB$L_IRP(R5),R3            ;GET ADDRESS OF CURRENT I/O PACKET
   51   0C A0    D0    014B    318          MOVL    DDT$L_CANCEL(R0), R1        ; Get Cancel entry point
   06 51    10    E0    014F    319          BBS     #16, R1, 20$                ; +++++ Skip if Supervisor absolute
      51    50    C0    0153    320          ADDL2   R0, R1                      ; +++++ Convert to absolute
      51    50    C2    0156    321          SUBL    R0,R1                       ;SUBTRACT OUT BASE ADDRESS
           61    16    0159    322 20$:     JSB     (R1)                        ;CALL CANCEL I/O ROUTINE
                        015B    323          ENBINT                              ;ENABLE INTERRUPTS
      12   8E    DA    015B                 MTPR    (SP)+,S^#PR$_IPL
           2A    BA    015E    324          POPR    #^M<R1,R3,R5>               ;RESTORE REGISTERS
                 05    0160    325          RSB                                 ;
                        0161    326
```

```
0161    328 .sbttl  DSX$MOUNT - Mount a device                                          [03]
0161    329
0161    330 ;++                                                                         [03]
0161    331 ; Functional Description:                                                   [03]
0161    332 ;                                                                           [03]
0161    333 ;       Calls the VMS $MOUNT service.                                       [03]
0161    334 ;                                                                           [03]
0161    335 ; Inputs:                                                                   [03]
0161    336 ;                                                                           [03]
0161    337 ;       4(AP) - Address of list of item identifiers                         [03]
0161    338 ;                                                                           [03]
0161    339 ; Implicit Inputs:                                                          [03]
0161    340 ;                                                                           [03]
0161    341 ;       DSA$GL_FLAGS                                                        [03]
0161    342 ;                                                                           [03]
0161    343 ; Outputs:                                                                  [03]
0161    344 ;                                                                           [03]
0161    345 ; Implicit Outputs:                                                         [03]
0161    346 ;                                                                           [03]
0161    347 ; Side Effects:                                                             [03]
0161    348 ;                                                                           [03]
0161    349 ; Return Status:                                                            [03]
0161    350 ;                                                                           [03]
0161    351 ;       The return status from VMS is passed to the caller.                 [03]
0161    352 ;--                                                                         [03]
0161    353
0161    354 ;[04] .ENTRY    DSX$MOUNT, ^M<>         ;                                   [03]
0161    355 ;[04]   BBS     #DSA$V_USER, -   ; IF executing in standalone mode          [03]
0161    356 ;[04]           DSA$GL_FLAGS,10$; THEN                                      [03]
0161    357 ;[04]   MOVL    #SS$_NORMAL, R0 ;       Set SS$_NORMAL return code.         [03]
0161    358 ;[04]   BRB     20$             ;       Just return.                        [03]
0161    359 ;[04] 10$:                              ; ELSE (user mode)                  [03]
0161    360 ;[04]   PUSHL   4(AP)           ;       Pass argument.                      [03]
0161    361 ;[04]   CALLS   #1,G^SYS$MOUNT  ;       Call service.                       [03]
0161    362 ;[04] 20$:      RET                     ; Return.                           [03]
0161    363 ;[04]
```

```
0161    365 .sbttl  DSX$DISMOUNT - Dismount a device
0161    366
0161    367 ;++                                                                 [03]
0161    368 ; Functional Description:                                           [03]
0161    369 ;                                                                   [03]
0161    370 ;       Calls the VMS $DISMOU service.                              [03]
0161    371 ;                                                                   [03]
0161    372 ; Inputs:                                                           [03]
0161    373 ;                                                                   [03]
0161    374 ;       4(AP) - Addr. of char. string descriptor pointing to the    [03]
0161    375 ;               device name                                         [03]
0161    376 ;       8(AP) - Options flag                                        [03]
0161    377 ;                                                                   [03]
0161    378 ; Implicit Inputs:                                                  [03]
0161    379 ;                                                                   [03]
0161    380 ;       DSA$GL_FLAGS                                                [03]
0161    381 ;                                                                   [03]
0161    382 ; Outputs:                                                          [03]
0161    383 ;                                                                   [03]
0161    384 ; Implicit Outputs:                                                 [03]
0161    385 ;                                                                   [03]
0161    386 ; Side Effects:                                                     [03]
0161    387 ;                                                                   [03]
0161    388 ; Return Status:                                                    [03]
0161    389 ;                                                                   [03]
0161    390 ;       The return status from VMS is passed to the caller.         [03]
0161    391 ;--                                                                 [03]
0161    392
0161    393 ;[04] .ENTRY DSX$DISMOUNT, ^M<> ;                                   [03]
0161    394 ;[04]   BBS     #DSA$V_USER, -  ; IF executing in standalone mode   [03]
0161    395 ;[04]           DSA$GL_FLAGS,10$; THEN                              [03]
0161    396 ;[04]   MOVL    #SS$_NORMAL, R0 ;       Set SS$_NORMAL return code. [03]
0161    397 ;[04]   BRB     20$             ;       Just return.                [03]
0161    398 ;[04] 10$:                              ; ELSE (user mode)                [03]
0161    399 ;[04]   PUSHL   8(AP)           ;       Pass arguments.             [03]
0161    400 ;[04]   PUSHL   4(AP)           ;                                   [03]
0161    401 ;[04]   CALLS   #2,G^SYS$DISMOU ;       Call service.               [03]
0161    402 ;[04] 20$:      RET                     ; Return.                         [03]
0161    403
0161    404         .END
```

```
$$ARGS                          = 00000002     D
$$T1                            = 0000000C     D
$ER                             = 00000001     D
$MODULE                           00000000 R   D   02
ALACMODE                        = 00000010     D
ALLOC$_ACMODE                   = 00000010     D
ALLOC$_DEVNAM                   = 00000004     D
ALLOC$_NARGS                    = 00000004     D
ALLOC$_PHYBUF                   = 0000000C     D
ALLOC$_PHYLEN                   = 00000008     D
DALLOC$_ACMODE                  = 00000008     D
DALLOC$_DEVNAM                  = 00000004     D
DALLOC$_NARGS                   = 00000002     D
DDB$B_ACPCLASS                    00000013     D
DDB$B_TYPE                        0000000A     D
DDB$C_LENGTH                      00000034     D
DDB$K_LENGTH                      00000034     D
DDB$L_ACPD                        00000010     D
DDB$L_DDT                         0000000C     D
DDB$L_LINK                        00000000     D
DDB$L_UCB                         00000004     D
DDB$T_DRVNAME                     00000024     D
DDB$T_NAME                        00000014     D
DDB$W_SIZE                        00000008     D
DDT$L_ALTSTART                    0000001C     D
DDT$L_CANCEL                      0000000C     D
DDT$L_FDT                         00000008     D
DDT$L_REGDUMP                     00000010     D
DDT$L_START                       00000000     D
DDT$L_UNITINIT                    00000018     D
DDT$L_UNSOLINT                    00000004     D
DDT$W_DIAGBUF                     00000014     D
DDT$W_ERRORBUF                    00000016     D
DECREF                            00000126 R   D   02
DEV$V_ALL                       = 00000017     D
DEV$V_SPL                       = 00000006     D
DEVNAM                          = 00000004     D
DLACMODE                        = 00000008     D
DS$AX_SOFTPCB                     ********   X   02
DSA$AL_APTMAIL                    0000FE00     D
DSA$AT_APTTXT                     0000FA00     D
DSA$GL_APTCOM                     0000FE04     D
DSA$GL_DEVLEN                     0000FE58     D
DSA$GL_ERRNO                      0000FE44     D
DSA$GL_EVENT                      0000FE48     D
DSA$GL_FLAGS                      0000FE00     D
DSA$GL_MSGTYP                     0000FE40     D
DSA$GL_PASSES                     0000FE08     D
DSA$GL_PASSNO                     0000FE54     D
DSA$GL_SECTNO                     0000FE10     D
DSA$GL_SID                        0000FE14     D
DSA$GL_SUBTNO                     0000FE4C     D
DSA$GL_TESTNO                     0000FE50     D
DSA$GL_UNITS                      0000FE0C     D
DSA$GQ_MSGPTR                     0000FE68     D
DSA$GT_DEVNAM                     0000FE5C     D
EXE$ALLOC                         0000000A RG  D   02
EXE$DALLOC                        000000A6 RG  D   02
EXE$MAXACMODE                     ********     X   02
IOC$CVT_DEVNAM                    ********     X   02
IOC$GL_DEVLIST                    ********     X   02
IOC$SEARCHDEV                     ********     X   02
IOC$SEARCHGEN                     ********     X   02
IOC$UNLOCK                        ********     X   02
NOPRIV                            0000011B R   D   02
NORMAL                            00000120 R   D   02
PCB$B_ASTACT                      0000000C     D
PCB$B_ASTEN                       0000000D     D
PCB$B_PRI                         0000000B     D
PCB$B_PRIB                        0000002F     D
PCB$B_TYPE                        0000000A     D
PCB$B_WEFC                        0000002E     D
PCB$C_LENGTH                      0000008C     D
PCB$K_LENGTH                      0000008C     D
PCB$L_ARB                         00000084     D
PCB$L_ASTQBL                      00000014     D
PCB$L_ASTQFL                      00000010     D
PCB$L_EFC2P                       00000058     D
PCB$L_EFC3P                       0000005C     D
PCB$L_EFCS                        00000050     D
PCB$L_EFCU                        00000054     D
PCB$L_EFWM                        0000004C     D
PCB$L_JIB                         00000078     D
PCB$L_OWNER                       0000001C     D
PCB$L_PHD                         00000064     D
PCB$L_PHYPCB                      00000018     D
PCB$L_PID                         00000060     D
PCB$L_PQB                         0000004C     D
PCB$L_SQBL                        00000004     D
PCB$L_SQFL                        00000000     D
PCB$L_STS                         00000024     D
PCB$L_UIC                         00000088     D
PCB$L_WSSWP                       00000020     D
PCB$L_WTIME                       00000028     D
PCB$Q_PRIV                        0000007C     D
PCB$T_LNAME                       00000068     D
PCB$T_TERMINAL                    00000044     D
PCB$W_APTCNT                      00000030     D
PCB$W_ASTCNT                      00000038     D
PCB$W_BIOCNT                      0000003A     D
PCB$W_BIOLM                       0000003C     D
PCB$W_DIOCNT                      0000003E     D
PCB$W_DIOLM                       00000040     D
PCB$W_GPGCNT                      00000034     D
PCB$W_GRP                         0000008A     D
PCB$W_MEM                         00000088     D
PCB$W_MTXCNT                      0000000E     D
PCB$W_PPGCNT                      00000036     D
PCB$W_PRCCNT                      00000042     D
PCB$W_SIZE                        00000008     D
PCB$W_STATE                       0000002C     D
PCB$W_TMBU                        00000032     D
PHYBUF                          = 0000000C     D
PHYLEN                          = 00000008     D
```

PR$_IPL	= 00000012	D		UCB$L_DX_BUF	00000098	D
SEARCHDEV	0000010B	R	D	02	UCB$L_DX_RXDB	000000A0	D
SIZ...	= 00000001		D		UCB$L_EMB	00000078	D
SS$_ACCVIO	= 0000000C		D		UCB$L_FIRST	00000014	D
SS$_DEVALLOC	= 00000840		D		UCB$L_FPC	0000000C	D
SS$_DEVALRALLOC	= 00000641		D		UCB$L_FQBL	00000004	D
SS$_DEVNOTALLOC	= 00000858		D		UCB$L_FQFL	00000000	D
SS$_IVDEVNAM	= 00000144		D		UCB$L_FR3	00000010	D
SS$_NOPRIV	= 00000024		D		UCB$L_FR4	00000014	D
SS$_NORMAL	= 00000001		D		UCB$L_IOQBL	00000044	D
UCB$B_AMOD	00000053		D		UCB$L_IOQFL	00000040	D
UCB$B_CEX	00000077		D		UCB$L_IRP	0000004C	D
UCB$B_CM1	0000004A		D		UCB$L_LINK	0000002C	D
UCB$B_CM2	0000004B		D		UCB$L_LOGADR	00000064	D
UCB$B_DEVCLASS	00000038		D		UCB$L_MAXBLOCK	00000084	D
UCB$B_DEVTYPE	00000039		D		UCB$L_MB_MBX	0000007C	D
UCB$B_DIPL	00000052		D		UCB$L_MB_PORT	0000008C	D
UCB$B_DX_SCTCNT	000000A6		D		UCB$L_MB_RAST	00000078	D
UCB$B_ERTCNT	00000070		D		UCB$L_MB_SHB	00000080	D
UCB$B_ERTMAX	00000071		D		UCB$L_MB_WAST	00000074	D
UCB$B_FEX	00000076		D		UCB$L_MB_WIOQBL	00000088	D
UCB$B_FIPL	0000000B		D		UCB$L_MB_WIOQFL	00000084	D
UCB$B_LOCSRV	0000003C		D		UCB$L_MEDIA	0000008C	D
UCB$B_OFFNDX	00000094		D		UCB$L_NT_DATSSB	00000074	D
UCB$B_OFFRTC	00000095		D		UCB$L_NT_INTSSB	00000078	D
UCB$B_REMSRV	0000003D		D		UCB$L_OPCNT	00000060	D
UCB$B_SECTORS	0000003C		D		UCB$L_OWNUIC	0000001C	D
UCB$B_SLAVE	00000074		D		UCB$L_PID	00000028	D
UCB$B_SPR	00000075		D		UCB$L_RQBL	00000004	D
UCB$B_STATE	00000052		D		UCB$L_RQFL	00000000	D
UCB$B_TRACKS	0000003D		D		UCB$L_SVAPTE	00000068	D
UCB$B_TT_CRFILL	0000009D		D		UCB$L_SVPN	00000064	D
UCB$B_TT_DECRF	000000A1		D		UCB$L_TT_DECHAR	000000A8	D
UCB$B_TT_DELFF	000000A2		D		UCB$L_TT_RDUE	0000008C	D
UCB$B_TT_DESPEE	000000A0		D		UCB$L_TT_RTIMOU	000000B8	D
UCB$B_TT_DETYPE	000000A4		D		UCB$L_VCB	00000030	D
UCB$B_TT_LFFILL	0000009E		D		UCB$T_PARTNER	0000000C	D
UCB$B_TT_SPEED	0000009C		D		UCB$W_BCNT	0000006E	D
UCB$B_TYPE	0000000A		D		UCB$W_BCR	00000096	D
UCB$B_VERTSZ	0000003F		D		UCB$W_BOFF	0000006C	D
UCB$C_LENGTH	00000074		D		UCB$W_BUFQUO	00000018	D
UCB$C_MB_LENGTH	00000090		D		UCB$W_BYTESTOGO	0000003E	D
UCB$C_TT_LENGTH	000000BC		D		UCB$W_CHARGE	0000004A	D
UCB$K_LENGTH	00000074		D		UCB$W_CYLINDERS	0000003E	D
UCB$K_MB_LENGTH	00000090		D		UCB$W_DA	0000008C	D
UCB$K_TT_LENGTH	000000BC		D		UCB$W_DC	0000008E	D
UCB$L_AMB	00000054		D		UCB$W_DEVBUFSIZ	0000003A	D
UCB$L_ASTQBL	00000010		D		UCB$W_DEVSTS	0000005A	D
UCB$L_ASTQFL	0000000C		D		UCB$W_DIRSEQ	00000088	D
UCB$L_CPID	0000005C		D		UCB$W_DSTADDR	00000018	D
UCB$L_CRB	00000020		D		UCB$W_DX_BCR	000000A4	D
UCB$L_DDB	00000024		D		UCB$W_EC1	00000090	D
UCB$L_DEVCHAR	00000034		D		UCB$W_EC2	00000092	D
UCB$L_DEVDEPEND	0000003C		D		UCB$W_ERRCNT	00000072	D
UCB$L_DPC	00000080		D		UCB$W_FUNC	0000007E	D
UCB$L_DUETIM	0000005C		D		UCB$W_MB_SEED	00000000	D
UCB$L_DX_BFPNT	0000009C		D		UCB$W_MSGCNT	00000016	D

```
UCB$W_MSGMAX                 00000014    D
UCB$W_NT_CHAN                0000007C    D
UCB$W_OFFSET                 0000008A    D
UCB$W_REFC                   00000050    D
UCB$W_SIZE                   00000008    D
UCB$W_SRCADDR                0000001A    D
UCB$W_STS                    00000058    D
UCB$W_TT_DESIZE              000000A5    D
UCB$W_UNIT                   00000048    D
UCB$W_VPROT                  0000001A    D
UNLOCK                       00000123 R  D  02

                                        +----------------+
                                        ! Psect synopsis !
                                        +----------------+

PSECT name                  Allocation          PSECT No.  Attributes
----------                  ----------          ---------  ----------
.  ABS  .                   00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                       0000FE70  (65136.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
SEP                         00000161  (  353.)  02 (  2.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD    WRT NOVEC LONG
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$ARGS	=00000002	59 (1)	58 (1) 59 (1)
$$T1	=0000000C	59 (1)	58 (1) 59 (1)
$ER	=00000001	150 (1)	
$MODULE	00000000-R	150 (1)	
ALACMODE	=00000010	80 (1)	205 (1)
ALLOC$_ACMODE	=00000010	58 (1)	
ALLOC$_DEVNAM	=00000004	58 (1)	
ALLOC$_NARGS	=00000004	58 (1)	
ALLOC$_PHYBUF	=0000000C	58 (1)	
ALLOC$_PHYLEN	=00000008	58 (1)	
DALLOC$_ACMODE	=00000008	59 (1)	
DALLOC$_DEVNAM	=00000004	59 (1)	
DALLOC$_NARGS	=00000002	59 (1)	
DDB$L_DDT	0000000C		#-313 (1)
DDB$L_LINK	00000000		268 (1) #-269 (1)
DDB$L_UCB	00000004		271 (1)
DDT$L_CANCEL	0000000C		#-318 (1)
DECREF	00000126-R	307 (1)	266 (1) 281 (1)
DEV$V_ALL	=00000017		#-196 (1) #-203 (1) #-278 (1) #-308 (1)
DEV$V_SPL	=00000006		#-185 (1)
DEVNAM	=00000004	86 (1)	#-292 (1)
DLACMODE	=00000008	87 (1)	
DS$AX_SOFTPCB	00000000-XR		152 (1) 257 (1)
EXE$ALLOC	0000000A-R	151 (1)	
EXE$DALLOC	000000A6-R	256 (1)	
EXE$MAXACMODE	00000000-XR		206 (1)
IOC$CVT_DEVNAM	00000000-XR		#-170 (1)
IOC$GL_DEVLIST	00000000-XR		268 (1)
IOC$SEARCHDEV	00000000-XR		#-260 (1)
IOC$SEARCHGEN	00000000-XR		#-156 (1)
IOC$UNLOCK	00000000-XR		#-209 (1) #-300 (1)
NOPRIV	0000011B-R	297 (1)	#-189 (1)
NORMAL	00000120-R	299 (1)	#-267 (1) #-270 (1)
PCB$L_PID	00000060		#-180 (1) #-202 (1) #-262 (1) #-274 (1)
PHYBUF	=0000000C	79 (1)	#-163 (1)
PHYLEN	=00000008	78 (1)	#-168 (1)
PR$_IPL	=00000012		#-316 (1) #-323 (1)
SEARCHDEV	0000010B-R	291 (1)	#-154 (1) #-258 (1)
SS$_ACCVIO	=0000000C		#-191 (1) #-294 (1)
SS$_DEVALLOC	=00000840		#-182 (1)
SS$_DEVALRALLOC	=00000641		#-197 (1)
SS$_DEVNOTALLOC	=00000858		#-283 (1)
SS$_IVDEVNAM	=00000144		#-153 (1)
SS$_NOPRIV	=00000024		#-297 (1)
SS$_NORMAL	=00000001		#-194 (1) #-299 (1)
UCB$B_AMOD	00000053		#-207 (1) #-276 (1)
UCB$B_FIPL	0000000B		#-316 (1)
UCB$L_DDB	00000024		#-312 (1)
UCB$L_DEVCHAR	00000034		185 (1) 196 (1) 203 (1) 278 (1) 308 (1)

```
UCB$L_IRP                  0000004C                  #-317    (1)
UCB$L_LINK                 0000002C                    271    (1)    #-272    (1)
UCB$L_PID                  00000028                  #-178    (1)    #-202    (1)    #-262    (1)    #-274    (1)
                                                     #-310    (1)
UCB$W_REFC                 00000050                  #-187    (1)    #-204    (1)    #-264    (1)    #-279    (1)
                                                     #-309    (1)
UNLOCK                     00000123-R   300    (1)   #-284    (1)    #-295    (1)    #-298    (1)

                                        +-------------------------+
                                        ! Performance indicators !
                                        +-------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    38    00:00:00.03    00:00:00.25
Command processing               933    00:00:00.27    00:00:01.01
Pass 1                           621    00:00:02.63    00:00:04.11
Symbol table sort                  0    00:00:00.29    00:00:00.29
Pass 2                            24    00:00:00.72    00:00:01.37
Symbol table output                2    00:00:00.04    00:00:00.07
Psect synopsis output              2    00:00:00.00    00:00:00.01
Cross-reference output             4    00:00:00.05    00:00:00.17
Assembler run totals            1626    00:00:04.03    00:00:07.28

The working set limit was 2900 pages.
159281 bytes (312 pages) of virtual memory were used to buffer the intermediate code.
There were 60 pages of symbol table space allocated to hold 1055 non-local and 20 local symbols.
404 source lines were read in Pass 1, producing 73 object records in Pass 2.
28 pages of virtual memory were used to define 27 macros.

                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                  1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1                7
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1               0
SYS$COMMON:[SYSLIB]LIB.MLB;2                             3
SYS$COMMON:[SYSLIB]STARLET.MLB;2                        11
SYS$COMMON:[SYSLIB]STARLET.MLB;2                         0
TOTALS (all libraries)                                  22

1331 GETS were required to define 22 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(3) 65 DS$GPHARD Retreive address of P-table
(4) 120 DSP$GEN_PTABLES Setup UUT's to test

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element DEVICE.MAR
0000     2 ; *1     6-FEB-1986 15:16:57 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element DEVICE.MAR
0000     4         .TITLE  DEVICE  *** DEVICE Handle PTABLEs
0000     5         .IDENT  /06-01/
0000     6         .LIST   MEB
0000     7         .NLIST  CND
0000     8         .DSABL  GBL
0000     9
0000    10 ;
0000    11 ; COPYRIGHT (C) 1977, 1980
0000    12 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    13 ;
0000    14 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0000    15 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
0000    16 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
0000    17 ; MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
0000    18 ; EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
0000    19 ; TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
0000    20 ; REMAIN IN DEC.
0000    21 ;
0000    22 ; THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
0000    23 ; AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
0000    24 ; CORPORATION.
0000    25 ;
0000    26 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0000    27 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    28
0000    29 ;++
0000    30 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR.
0000    31 ;
0000    32 ; ABSTRACT:
0000    33 ;
0000    34 ; ENVIRONMENT:
0000    35 ;
0000    36 ; AUTHOR:       R. RIGGS        15-JAN-79       VERSION 01.
0000    37 ;               Dave Butenhof, 17-feb-1981, version 6.3
0000    38 ;       01      Fix linker truncation errors; change DSA$x_? references
0000    39 ;               to longword relative.
0000    40 ;--
```

```
                                0000     42 ;
                                0000     43 ; MACRO LIBRARIES:
                                0000     44 ;
                                0000     45
                                0000     46
                    00000001    0000     47 SS$_NORMAL=1
                                0000     51          $DS_HPODEF
                                0000                .SAVE   LOCAL_BLOCK
                                0000                .IIF    NB,HP$Q_DEVICE, HP$Q_DEVICE:
                    00000008    0000                .IIF    NB,.BLKQ,       .BLKQ   1
                                0008                .IIF    NB,HP$W_SIZE,   HP$W_SIZE:
                    0000000A    0008                .IIF    NB,.BLKW,       .BLKW   1
                                000A                .IIF    NB,HP$B_FLAGS,  HP$B_FLAGS:
                    0000000B    000A                .IIF    NB,.BLKB,       .BLKB   1
                                000B                .IIF    NB,HP$B_DRIVE,  HP$B_DRIVE:
                    0000000C    000B                .IIF    NB,.BLKB,       .BLKB   1
                                000C                .IIF    NB,HP$T_DEVICE, HP$T_DEVICE:
                    00000018    000C                .IIF    NB,.BLKB,       .BLKB   12
                                0018                .IIF    NB,HP$A_DEVICE, HP$A_DEVICE:
                    0000001C    0018                .IIF    NB,.BLKL,       .BLKL   1
                                001C                .IIF    NB,HP$A_DVA,    HP$A_DVA:
                    00000020    001C                .IIF    NB,.BLKL,       .BLKL   1
                                0020                .IIF    NB,HP$A_LINK,   HP$A_LINK:
                    00000024    0020                .IIF    NB,.BLKL,       .BLKL   1
                                0024                .IIF    NB,HP$W_VECTOR, HP$W_VECTOR:
                    00000026    0024                .IIF    NB,.BLKW,       .BLKW   1
                                0026                .IIF    NB,HP$T_TYPE,   HP$T_TYPE:
                    00000032    0026                .IIF    NB,.BLKB,       .BLKB   12
                                0032                .IIF    NB,HP$A_DEPENDENT,      HP$A_DEPENDENT:
                                0000                .RESTORE
                                0000     52         $DS_HDRDEF
                                0000     53         $DS_DSADEF
                                0000     54         $DS_DSDEF
                                0000     58
                                0000     59         .EXTRN  DS$GA_SELECTS, DS$GA_SELECTED, DS$GA_PTABLE
                                0000     60         .EXTRN  DS$PRINTF,      DS_ERRSUP,      DS$GPHARD
                                0000     61
                            00000000     62         .PSECT  DATA, SHR,NOEXE, NOWRT, BYTE
                                0000     63         MODNAM  <DEVICE>
45 43 49 56 45 44 00'       0000        $MODULE:    .ASCIC  \DEVICE\
                            06  0000
```

```
                                0007     65          .SBTTL  DS$GPHARD       Retreive address of P-table
                             00000000    66          .PSECT  CODE, SHR, NOWRT, EXE, BYTE
                                0000     67 ;++
                                0000     68 ; FUNCTIONAL DESCRIPTION:
                                0000     69 ;
                                0000     70 ;       Given a logical unit number, This routine returns the base
                                0000     71 ;       address of the associated P-table.
                                0000     72 ;
                                0000     73 ; CALLING SEQUENCE:
                                0000     74 ;
                                0000     75 ;       DS$GPHARD(UNIT,%REF(ADDRESS))
                                0000     76 ;
                                0000     77 ; INPUT PARAMETERS:
                                0000     78 ;
                                0000     79 ;       4(AP)   Logical unit number
                                0000     80 ;
                                0000     81 ; IMPLICIT INPUTS:
                                0000     82 ;
                                0000     83 ;       DS$GA_SELECTED  List of P-tables of units to be tested.
                                0000     84 ;
                                0000     85 ; OUTPUT PARAMETERS:
                                0000     86 ;
                                0000     87 ;       8(AP)   Address of longword to receive the address for this unit
                                0000     88 ;
                                0000     89 ; IMPLICIT OUTPUTS:
                                0000     90 ;
                                0000     91 ;       R1      Same as 8(AP)
                                0000     92 ;
                                0000     93 ; COMPLETION CODES:
                                0000     94 ;
                                0000     95 ;       SS$_NORMAL      If unit number was in range
                                0000     96 ;       DS$_ERROR       If unit number was too large (unsigned)
                                0000     97 ;
                                0000     98 ; SIDE EFFECTS:
                                0000     99 ;
                                0000    100 ;       R1      Returns with address of specified P-table
                                0000    101 ;--
                                0000    102
                         0004   0000    103 .ENTRY  DSX$GPHARD,^M<R2>
                                0002    104
51   00000000'EF        DE      0002    105         MOVAL   DS$GA_SELECTED,R1       ; Address table
 50    04 AC           01      C1      0009    106         ADDL3   #1,4(AP),R0     ; Change to origin 1
          61           50      D1      000E    107         CMPL    R0,(R1)         ; Compare with length of select table
                       17      1A      0011    108         BGTRU   10$             ; Branch if unit too large for table
0000FE0C'EF            50      D1      0013    109         CMPL    R0,L^DSA$GL_UNITS       ; Compare with number of units tested
                       0E      1A      001A    110         BGTRU   10$             ; Branch if unit too large
        51      6140   D0      001C    111         MOVL    (R1)[R0],R1             ; Get address of P-table
      08 BC     51     D0      0020    112         MOVL    R1,@8(AP)               ; Store where user wants it
                       04      13      0024    113         BEQL    10$             ; Branch if bogus
          50   01      D0      0026    114         MOVL    S^#SS$_NORMAL,R0        ; Set success
                       04      0029    115         RET                             ; Return to user
                               002A    116 10$:
50   00660002 8F        D0      002A    117         MOVL    #DS$_ERROR,R0           ; Spaz
                       04      0031    118         RET
```

```
                     0032   120          .SBTTL  DSP$GEN_PTABLES Setup UUT's to test
                00000032    121          .PSECT  CODE, SHR, NOWRT, EXE, BYTE
                     0032   122 ;++
                     0032   123 ; FUNCTIONAL DESCRIPTION:
                     0032   124 ;
                     0032   125 ;       This routine compares the unit types selected by the select
                     0032   126 ;       command with the device types the current program tests
                     0032   127 ;       and enters them in DS$GA_SELECTED.
                     0032   128 ;
                     0032   129 ; CALLING SEQUENCE:
                     0032   130 ;
                     0032   131 ;       CALLG   #0,DSP$GEN_PTABLES
                     0032   132 ;
                     0032   133 ; INPUT PARAMETERS:     NONE
                     0032   134 ;
                     0032   135 ; IMPLICIT INPUTS:
                     0032   136 ;
                     0032   137 ;       DS$GA_PTABLES, DS$GA_SELECTS
                     0032   138 ;       PROGRAM HEADER
                     0032   139 ;
                     0032   140 ; OUTPUT PARAMETERS:    NONE
                     0032   141 ;
                     0032   142 ; IMPLICIT OUTPUTS:
                     0032   143 ;
                     0032   144 ;       The P-TABLE's for the program
                     0032   145 ;
                     0032   146 ;--
```

```
                        007C  0032   148 .ENTRY  DSP$GEN_PTABLES,^M<R2,R3,R4,R5,R6>
                              0034   149
            0000FE0C'EF   D4  0034   150         CLRL    L^DSA$GL_UNITS          ; Clear count of units to test
            00000220'EF   D5  003A   151         TSTL    L$L_UNIT
                      65  13  0040   152         BEQL    60$                     ; EXIT IF NOT TESTING ANY UNITS
      56    00000000'EF   DE  0042   153         MOVAL   DS$GA_PTABLE,R6         ; Point to P-table list
            55    66      D0  0049   154         MOVL    (R6),R5                 ; Get count of entries
   50 00000000'EF   55    E1  004C   155 10$:    BBC     R5,DS$GA_SELECTS,50$    ; Branch if not selected
                              0054   156
      54    0000021C 9F     D0  0054   157         MOVL    @#L$A_DEVP,R4           ; Get address of DEVTYP in program
                        4A  13  005B   158         BEQL    60$                     ; Branch if none
                  53    84  D0  005D   159         MOVL    (R4)+,R3                ; Get count of entries
                        45  13  0060   160         BEQL    60$                     ; Branch if none
                              0062   161 20$:
                  51    84  D0  0062   162         MOVL    (R4)+,R1                ; Get address of ASCIC devtype
                  50    81  9A  0065   163         MOVZBL  (R1)+,R0                ; Get length of devtype
               52    6645   D0  0068   164         MOVL    (R6)[R5],R2             ; Get address of P-table
                        36  13  006C   165         BEQL    50$                     ; Branch if no P-table
               52    26 A2   9E  006E   166         MOVAB   HP$T_TYPE(R2),R2        ; Point to type
                  50    82  91  0072   167         CMPB    (R2)+,R0                ; Compare string lengths
                        2A  12  0075   168         BNEQ    40$                     ; Branch if no match
                  82    81  91  0077   169 30$:    CMPB    (R1)+,(R2)+             ; Compare
                        25  12  007A   170         BNEQ    40$                     ; Branch if not the same
                     F8 50  F5  007C   171         SOBGTR  R0,30$                  ; Branch if more to compare
   50   0000FE0C'EF   01  C1  007F   172         ADDL3   #1,L^DSA$GL_UNITS,R0    ; Get next unit number
        00000220'EF   50  D1  0087   173         CMPL    R0,L$L_UNIT             ; Program test enough units?
                      17  14  008E   174         BGTR    60$                     ; Already selected enough units
            0000FE0C'EF   D6  0090   175         INCL    L^DSA$GL_UNITS          ; Update units being tested
 00000000'EF40    6645   D0  0096   176         MOVL    (R6)[R5],DS$GA_SELECTED[R0] ; Insert P-table as new unit
                      03  11  009F   177         BRB     50$                     ; Branch since match found
                              00A1   178 40$:
                  BE 53   F5  00A1   179         SOBGTR  R3,20$                  ; Count and continue in DEVTYP list
                              00A4   180 50$:
                  A5 55   F5  00A4   181         SOBGTR  R5,10$                  ; Next P-table
                              00A7   182 60$:
                        04  00A7   183         RET                             ; Return
                              00A8   184
                              00A8   185         .END
```

```
$ER                             = 00000001    D
$MODULE                           00000000 R  D   02
BIT...                          = 00660160    D
DS$GA_PTABLE                      ********    X   00
DS$GA_SELECTED                    ********    X   00
DS$GA_SELECTS                     ********    X   00
DS$GPHARD                         ********    X   00
DS$K_ERROR                      = 00000002    D
DS$K_NORMAL                     = 00000001    D
DS$K_SEVERE                     = 00000004    D
DS$K_SUBSYS                     = 00000066    D
DS$K_WARNING                    = 00000000    D
DS$PRINTF                         ********    X   00
DS$_AP_NORMAL_BREAK             = 00660150    D
DS$_ARITH                       = 006600D0    D
DS$_ASBE                        = 00660118    D
DS$_BADLINK                     = 006600F0    D
DS$_BADTYPE                     = 006600E8    D
DS$_BIIC                        = 00660120    D
DS$_CHME                        = 006600A8    D
DS$_CHMK                        = 006600E0    D
DS$_DEVNAME                     = 00660108    D
DS$_ERROR                       = 00660002    D
DS$_FHWE                        = 00660068    D
DS$_FRAGBUF                     = 00660080    D
DS$_ICBUSY                      = 006600C8    D
DS$_ICERR                       = 006600C0    D
DS$_IHWE                        = 00660060    D
DS$_ILLCHAR                     = 00660018    D
DS$_ILLPAGCNT                   = 00660078    D
DS$_ILLUNIT                     = 00660100    D
DS$_INIT_FAIL                   = 00660140    D
DS$_INSFMEM                     = 00660050    D
DS$_INVCPU                      = 00660130    D
DS$_IPL2HI                      = 006600B8    D
DS$_IVADDR                      = 00660040    D
DS$_IVVECT                      = 00660038    D
DS$_KRNLSTK                     = 00660090    D
DS$_LOGIC                       = 00660070    D
DS$_MCHK                        = 00660088    D
DS$_MEM_ALLOC_ERR               = 00660138    D
DS$_MMOFF                       = 00660058    D
DS$_NEEDUNIT                    = 006600F8    D
DS$_NODE                        = 00660128    D
DS$_NOPCS                       = 00660110    D
DS$_NORMAL                      = 00660001    D
DS$_NOSUPPORT                   = 006600B1    D
DS$_NOTALLOWMP                  = 00660148    D
DS$_NOTDON                      = 00660030    D
DS$_NOTIMP                      = 006600B0    D
DS$_NULLSTR                     = 00660010    D
DS$_OVERFLOW                    = 00660008    D
DS$_POWER                       = 00660098    D
DS$_PROGERR                     = 00660020    D
DS$_SEVERE                      = 00660004    D
DS$_TRANSL                      = 006600A0    D
DS$_TRUNCATE                    = 00660028    D
DS$_UNEXPINT                    = 006600D8    D
DS$_UNSUPPDEV                   = 00660158    D
DS$_VASFULL                     = 00660048    D
DS$_WARNING                     = 00660000    D
DSA$AL_APTMAIL                    0000FE00    D
DSA$AT_APTTXT                     0000FA00    D
DSA$GL_APTCOM                     0000FE04    D
DSA$GL_DEVLEN                     0000FE58    D
DSA$GL_ERRNO                      0000FE44    D
DSA$GL_EVENT                      0000FE48    D
DSA$GL_FLAGS                      0000FE00    D
DSA$GL_MSGTYP                     0000FE40    D
DSA$GL_PASSES                     0000FE08    D
DSA$GL_PASSNO                     0000FE54    D
DSA$GL_SECTNO                     0000FE10    D
DSA$GL_SID                        0000FE14    D
DSA$GL_SUBTNO                     0000FE4C    D
DSA$GL_TESTNO                     0000FE50    D
DSA$GL_UNITS                      0000FE0C    D
DSA$GQ_MSGPTR                     0000FE68    D
DSA$GT_DEVNAM                     0000FE5C    D
DSP$GEN_PTABLES                   00000032 RG D   03
DSX$GPHARD                        00000000 RG D   03
DS_ERRSUP                         ********    X   00
HP$A_DEPENDENT                    00000032    D
HP$A_DEVICE                       00000018    D
HP$A_DVA                          0000001C    D
HP$A_LINK                         00000020    D
HP$B_DRIVE                        0000000B    D
HP$B_FLAGS                        0000000A    D
HP$Q_DEVICE                       00000000    D
HP$T_DEVICE                       0000000C    D
HP$T_TYPE                         00000026    D
HP$W_SIZE                         00000008    D
HP$W_VECTOR                       00000024    D
L$A_CCP                           00000240    D
L$A_DEVP                          0000021C    D
L$A_DREG                          00000224    D
L$A_DTP                           00000218    D
L$A_ICP                           0000023C    D
L$A_LASTADR                       00000214    D
L$A_NAME                          00000208    D
L$A_REPP                          00000244    D
L$A_SECNAM                        00000250    D
L$A_STATAB                        00000248    D
L$A_TSTCNT                        00000254    D
L$L_ENVIRON                       00000204    D
L$L_ERRTYP                        0000024C    D
L$L_HEADLENGTH                    00000200    D
L$L_REV                           0000020C    D
L$L_UNIT                          00000220    D
L$L_UNUSED                        00000228    D
L$L_UPDATE                        00000210    D
SIZ...                          = 00000001    D
SS$_NORMAL                      = 00000001    D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000FE70 (65136.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
DATA	00000007 (7.)	02 (2.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC BYTE
CODE	000000A8 (168.)	03 (3.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC BYTE

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$ER	=00000001	63 (2)	
$MODULE	00000000-R	63 (2)	
BIT...	=00660160	54 (2)	54 (2)
DS$GA_PTABLE	00000000-XR		153 (5) 59 (2)
DS$GA_SELECTED	00000000-XR		105 (3) #-176 (5) 59 (2)
DS$GA_SELECTS	00000000-XR		155 (5) 59 (2)
DS$GPHARD	00000000-XR		60 (2)
DS$K_ERROR	=00000002	54 (2)	
DS$K_NORMAL	=00000001	54 (2)	
DS$K_SEVERE	=00000004	54 (2)	
DS$K_SUBSYS	=00000066	54 (2)	54 (2)
DS$K_WARNING	=00000000	54 (2)	
DS$PRINTF	00000000-XR		60 (2)
DS$_AP_NORMAL_BREAK	=00660150	54 (2)	
DS$_ARITH	=006600D0	54 (2)	
DS$_ASBE	=00660118	54 (2)	
DS$_BADLINK	=006600F0	54 (2)	
DS$_BADTYPE	=006600E8	54 (2)	
DS$_BIIC	=00660120	54 (2)	
DS$_CHME	=006600A8	54 (2)	
DS$_CHMK	=006600E0	54 (2)	
DS$_DEVNAME	=00660108	54 (2)	
DS$_ERROR	=00660002	54 (2)	#-117 (3)
DS$_FHWE	=00660068	54 (2)	
DS$_FRAGBUF	=00660080	54 (2)	
DS$_ICBUSY	=006600C8	54 (2)	
DS$_ICERR	=006600C0	54 (2)	
DS$_IHWE	=00660060	54 (2)	
DS$_ILLCHAR	=00660018	54 (2)	
DS$_ILLPAGCNT	=00660078	54 (2)	
DS$_ILLUNIT	=00660100	54 (2)	
DS$_INIT_FAIL	=00660140	54 (2)	
DS$_INSFMEM	=00660050	54 (2)	
DS$_INVCPU	=00660130	54 (2)	
DS$_IPL2HI	=006600B8	54 (2)	
DS$_IVADDR	=00660040	54 (2)	
DS$_IVVECT	=00660038	54 (2)	
DS$_KRNLSTK	=00660090	54 (2)	
DS$_LOGIC	=00660070	54 (2)	
DS$_MCHK	=00660088	54 (2)	
DS$_MEM_ALLOC_ERR	=00660138	54 (2)	
DS$_MMOFF	=00660058	54 (2)	
DS$_NEEDUNIT	=006600F8	54 (2)	
DS$_NODE	=00660128	54 (2)	
DS$_NOPCS	=00660110	54 (2)	
DS$_NORMAL	=00660001	54 (2)	
DS$_NOSUPPORT	=006600B1	54 (2)	
DS$_NOTALLOWMP	=00660148	54 (2)	
DS$_NOTDON	=00660030	54 (2)	
DS$_NOTIMP	=006600B0	54 (2)	54 (2)

```
DS$_NULLSTR                =00660010      54      (2)
DS$_OVERFLOW               =00660008      54      (2)
DS$_POWER                  =00660098      54      (2)
DS$_PROGERR                =00660020      54      (2)
DS$_SEVERE                 =00660004      54      (2)
DS$_TRANSL                 =006600A0      54      (2)
DS$_TRUNCATE               =00660028      54      (2)
DS$_UNEXPINT               =006600D8      54      (2)
DS$_UNSUPPDEV              =00660158      54      (2)
DS$_VASFULL                =00660048      54      (2)
DS$_WARNING                =00660000      54      (2)      54      (2)
DSA$GL_UNITS                0000FE0C                      #-109    (3)    #-150    (5)    #-172    (5)    #-175    (5)
DSP$GEN_PTABLES             00000032-R    148      (5)
DSX$GPHARD                  00000000-R    103      (3)
DS_ERRSUP                   00000000-XR                    60      (2)
HP$T_TYPE                   00000026                      166      (5)
L$A_DEVP                    0000021C                     #-157     (5)
L$L_UNIT                    00000220                     #-151     (5)    #-173    (5)
SS$_NORMAL                 =00000001      47      (2)     #-114     (3)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	28	00:00:00.03	00:00:00.20
Command processing	888	00:00:00.23	00:00:01.09
Pass 1	445	00:00:00.93	00:00:02.30
Symbol table sort	0	00:00:00.02	00:00:00.06
Pass 2	33	00:00:00.21	00:00:00.38
Symbol table output	2	00:00:00.01	00:00:00.06
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	4	00:00:00.03	00:00:00.04
Assembler run totals	1404	00:00:01.48	00:00:04.15

```
The working set limit was 1900 pages.
53950 bytes (106 pages) of virtual memory were used to buffer the intermediate code.
There were 10 pages of symbol table space allocated to hold 175 non-local and 7 local symbols.
185 source lines were read in Pass 1, producing 30 object records in Pass 2.
17 pages of virtual memory were used to define 15 macros.
```

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	4
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	5
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	10

```
249 GETS were required to define 10 macros.
```

```
ZZ-ECSAA-10.11  VAX-11 Macro Run Statistics                    3-MAY-1988       Fiche 6 Frame M14          Sequence 1211
DEVICE                        *** DEVICE Handle PTABLEs          21-MAR-1988 17:50:03  VAX/VMS Macro V04-00        Page  10
VAX-11 Macro Run Statistics                                       3-JAN-1985 16:50:18  DEVICE.MAR;1                      (5)

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element DIRECTORY.B32
;    0002  0      ! *13    9-DEC-1987 09:52:51 BARANSKI "merging 10B1"
;    0003  0      ! *12    2-NOV-1987 15:41:42 BAGGETT "FINISHED"
;    0004  0      ! *11    2-NOV-1987 15:21:08 MI "FIXED THE BUG CAUSING OCCASIONAL ACCESS VIOLATION WHILEDOING DIRECTORY"
;    0005  0      !  10B1  2-NOV-1987 15:01:25 BAGGETT "FINISHED"
;    0006  0      ! *10   14-APR-1987 16:30:11 MARTIN "UPDATED FOR PSTAR"
;    0007  0      ! *9     4-DEC-1986 15:35:43 MARTIN "<no reason given>"
;    0008  0      ! *8    20-AUG-1986 09:16:14 MARTIN "<no reason given>"
;    0009  0      ! *7    20-AUG-1986 09:14:29 MARTIN "MADE DOCUMENTATION ADDITION"
;    0010  0      ! *6    18-AUG-1986 10:09:57 MARTIN "MODIFIED MAIN CODE"
;    0011  0      ! *5    23-JUL-1986 10:06:41 MARTIN "AVOID UD. BUG"
;    0012  0      ! *4    28-MAY-1986 10:55:05 SALEM "DONE"
;    0013  0      ! *3    27-MAY-1986 15:13:43 SALEM "ALL DONE"
;    0014  0      ! *2     8-APR-1986 15:40:55 SALEM "DONE"
;    0015  0      ! *1     6-FEB-1986 15:17:24 DS ""
;    0016  0      ! DEC/CMS REPLACEMENT HISTORY, Element DIRECTORY.B32
;    0017  0      %title '*** DIRECTORY Handle DIRECTORY command'
;    0018  0      module directory (                              ! Supervisor DIRECTORY command
;    0019  0                        ident = '10.10-13',                                    !G:13
;    0020  0                        Debug,
;    0021  0                        OptLevel = 3
;    0022  0                        ) =
;    0023  0      !
;    0024  0      ! Copyright (c) 1980, 1982, 1983, 1984, 1986, 1987                       !G:10
;    0025  0      ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
;    0026  0      !
;    0027  0      ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
;    0028  0      ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
;    0029  0      ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
;    0030  0      ! MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
;    0031  0      ! EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
;    0032  0      ! TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
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;    0037  0      ! CORPORATION.
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;    0039  0      ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
;    0040  0      ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
;    0041  0      !
;    0042  0
;    0043  0      !++
;    0044  0      ! FACILITY:
;    0045  0      !       DIAGNOSTIC SUPERVISOR TEST PROGRAM
;    0046  0      !
;    0047  0      ! ABSTRACT:
;    0048  0      !
;    0049  0      !       Read and print directories for supported mass storage volume formats:
;    0050  0      !       ODS-1/2 disks, ANSI magtapes, and RT-11 console media
;    0051  0      !
;    0052  0      !
;    0053  0      ! ENVIRONMENT:  DIAGNOSTIC SUPERVISOR
;    0054  0      !
;    0055  0      ! AUTHOR: Dave Butenhof         1-oct-1980
;    0056  0      !
;    0057  0      ! MODIFIED BY:
```

```
;    0058  0     !                 Dave Butenhof, 18-mar-1981, version 6.3
;    0059  0     !          01     Allow ODS subdirectory support under user mode.
;    0060  0     !                -Dave butenhof, 02-Jun-1981, version 6.3
;    0061  0     !          02     Change library specs for more flexibility
;    0062  0     !                 - Dave butenhof, 26-Jun-1981, version 6.4
;    0063  0     !          03     Fix to use BOO$QIO instead of DSP$XX_READ (the latter does
;    0064  0     !                 not do error retries, nor does it handle errors well).
;    0065  0     !          04     - Dave Butenhof, 31-aug-1981, version 6.5
;    0066  0     !                 Support DQ device type (IDC disks) for Nebula.  Disks are
;    0067  0     !                 R80 and RI02.
;    0068  0     !          05     - dave butenhof, 16-Sep-1981, version 6.5
;    0069  0     !                 Fix directory so unattached device results in 'nice' error
;    0070  0     !                 message, not general RMS$_DEV.
;    0071  0     !
;    0072  0     !          06     - Jack Stansbury, 22-Oct-1981, Version 6.-
;    0073  0     !                 Fixed a truncation error by changing the PSECT declarations to
;    0074  0     !                 conform to the .MAR file's PSECT's.
;    0075  0     !
;    0076  0     !          07     - Dave Butenhof, 26-Oct-1981, Version 6.-
;    0077  0     !                 Alter call to LOC$PTABLE to include adapter address
;    0078  0     !                 argument.
;    0079  0     !
;    0080  0     !          08     - Dave Butenhof, 12-Jan-1982, Version 6.6
;    0081  0     !                 Set up Control C trap in DIRECTORY routines; this will allow
;    0082  0     !                 closing of any open files.
;    0083  0     !
;    0084  0     !          09     - Dave Butenhof, 25-Jan-1982, Version 6.6
;    0085  0     !                 Use DSR$ALLOCATE_PSEUDO_RPB routine instead of explicit init.
;    0086  0     !
;    0087  0     !          10     - Dave Butenhof, 03-Feb-1982, Version 6.6
;    0088  0     !                 Add ability to check filespec against (wildcarded) argument
;    0089  0     !                 before typing.  This is almost free, since the checking
;    0090  0     !                 routine exists in HELP already for checking keywords.  All
;    0091  0     !                 we need here is minimal pre-parsing to add 'implicit
;    0092  0     !                 wildcards', and the code to call the compare routine.
;    0093  0     !
;    0094  0     !          11     Dave Butenhof, 15-Apr-1982
;    0095  0     !                 Add UDA50 disk support.
;    0096  0     !
;    0097  0     !          12     Dave Butenhof, 24-May-1982
;    0098  0     !                 Add TM78 support (by removing special case code which disallows
;    0099  0     !                  TU78)
;    0100  0     !
;    0101  0     !          13     M. Baggett,     9-March-1983, Version 6.11
;    0102  0     !                 Added support for CI-HSC50 and RC25/RCF25.
;    0103  0     !
;    0104  0     !          14     Bob Bergazzi    May 17, 1983    Version 6.11
;    0105  0     !                 Changed the order of searching the libraries.
;    0106  0     !          15     M. Baggett      11-Oct-1983     Version 6.13
;    0107  0     !                 Added support for CI-HSC50 magtape.
;    0108  0     !
;    0109  0     !          16     Bob Bergazzi    April 13, 1984  Version 7.0
;    0110  0     !                 Added support for ZZZ console storage device in ODS format.
;    0111  0     !                 to DSX$DIRECTORY routine.
;    0112  0     !
;    0113  0     !          17     Bob Bergazzi    May 21, 1984    Version 7.0
;    0114  0     !                 Added support for DIR/WIDE, which displays the directory
```

```
;    0115  0     !                 1 filename per line. This avoids the truncation of
;    0116  0     !                 long filenames under VMS V4.
;    0117  0     !
;    0118  0     !       18        RE MUSE          22 MAY,1984     Version 7.0
;    0119  0     !                 increased buffer size to handle long filenames for VMS v4
;    0120  0     !
;    0121  0     !       19        M. Baggett       2-Nov-1984      version 7.1
;    0122  0     !                 Added support for TK50. Suppress re-inits for DIRECTORY
;    0123  0     !
;    0124  0     !       20        M. Baggett       26-NOV-1984     Version 8.0
;    0125  0     !                 Added support for RUX50 devices.
;    0126  0     !
;    0127  0     !       21        J. Shelhamer     18 Dec, 1984    Version 8.0
;    0128  0     !                 Fixed bug with Directory for RT-11 devices. A pattern match was
;    0129  0     !                 looking for a version number (wild-carded).
;    0130  0     !
;    0131  0     !       22        M. Baggett       1-Jun-1985      Version 8.3
;    0132  0     !                 Added support for ultrix disk files.
;    0133  0     !
;    0134  0     !       23        Bob Bergazzi     20-Aug-1985     Version 8.3
;    0135  0     !                 Added support for AAA console storage device in ODS format.
;    0136  0     !                 to DSX$DIRECTORY routine.
;    0137  0     !
;    0138  0     !       24        M. Baggett       27-Aug-1985     Version 9.0
;    0139  0     !                 Added support for RD52, RD53.
;    0140  0     !                                                                                !G:2
;    0141  0     !       25        Ted Salem        7-April-1986    Version 10.0                    !G:2
;    0142  0     !                 Added support to the Console on ANDROMEDA.                      !G:2
;    0143  0     !                                                                                !G:11
;    0144  0     !       26        Ingrid Martin / Steve Meier                                     !G:6
;    0145  0     !                                  11-August-1986   Version 10.3                 !G:7
;    0146  0     !                 Revised the main code to allow directories of logical names,   !G:6
;    0147  0     !                 and removed the requirement to attach a device when doing a directory. (USER MODE ONLY) !G:6
;    0148  0     !                 [Lines 1000 - 1100 have been rearranged/changed accordingly]   !G:6
;    0149  0     !                                                                                !G:9
;    0150  0     !       27        Ingrid Martin   25-October-1986 Version 10.3                    !G:10
;    0151  0     !                 Enhanced the directory command such that logical names and     !G:9
;    0152  0     !                 searchlists are allowed online.  VMS does the actual directory !G:9
;    0153  0     !                 for ODS-1, ODS-2 and ANSI formats via new routine VMS_DIR.     !G:9
;    0154  0     !                                                                                !G:10
;    0155  0     !       28        Ingrid Martin   30-Mar-1987     Version 10.7                    !G:10
;    0156  0     !                 Updates for RRR.                                               !G:10
;    0157  0     !                                                                                !G:10
;    0158  0     !       29        Ingrid Martin   14-Apr-1987     Version 10.7                    !G:10
;    0159  0     !                 More updates                                                   !G:10
;    0160  0     !                                                                                !G:11
;    0161  0     !       11        Jason Mi         28-Oct-1987     Version 10.10                  !G:13
;    0162  0     !                 Fixed the bug causing access violation while doing a "DIRECTORY".  !G:11
;    0163  0     !                                                                                !G:12
;    0164  0     !       10B1      M. Baggett       28-Oct-1987     Version 10.10-12               !G:13
;    0165  0     !                 Added flags to directory command so tape driver can avoid unnecessary drive clear commands. !G:12
;    0166  0     !--
;    0167  0
;    0168  1     begin
;    0169  1     !
;    0170  1     ! Table of contents:
;    0171  1     !
```

```
;    0172  1      !                                                                                    !G:13
;    0173  1      ! Include files:
;    0174  1      !
;    0175  1
;    0176  1      library '$diag';                !
;    0177  1
;    0178  1      library '$ds';                  !
;    0179  1
;    0180  1      library 'sys$library:lib';      !
;    0181  1
;    0182  1      !
;    0183  1      ! Macros:
;    0184  1      !
;    0185  1
;    0186  1
;    0187  1      !
;    0188  1      ! psect definitions:
;    0189  1      !
;    0190  1
;    0191  1      psect
;    0192  1          plit  = data ( noexecute, share, nowrite, addressing_mode (long_relative));          !
;    0193  1
;    0194  1      psect
;    0195  1          own   = work ( noexecute, noshare,  write, addressing_mode (long_relative));          !
;    0196  1
;    0197  1      psect
;    0198  1          global = work ( noexecute, noshare,  write, addressing_mode (long_relative));         !
;    0199  1
;    0200  1      psect
;    0201  1          code   = code ( execute, share, nowrite, addressing_mode(long_relative));             !
;    0202  1
;    0203  1      !
;    0204  1      ! equated symbols:
;    0205  1      !
;    0206  1      $ds_dsadef;                                     ! Define DSA locations
;    0207  1
;    0208  1      MAP
;    0209  1          DSA$GL_SID : BLOCK;                                                              !
;    0210  1
;    0211  1      bind
;    0212  1          f_!inc = $ascic ('!AD!/');
;    0213  1
;    0214  1      linkage
;    0215  1          jsb_fake = jsb : nopreserve (2),
;    0216  1          jsb_scan = jsb (register = 3, register = 4, register = 5) : nopreserve (2);
;    0217  1
;    0218  1      !
;    0219  1      ! Own storage:
;    0220  1      !
;    0221  1          Own                                         !                                    [08]
;    0222  1              FileSpecMatch : Block [8, Byte],        !                                    [10]
;    0223  1              ControlCFlag : Byte;                    !                                    [08]
;    0224  1
;    0225  1          GLOBAL                                      !                                    [17]
;    0226  1              WIDE_FLAG : BYTE,                       ! A 1 value indicates /WIDE was typed, 0 value - no /WIDE    [17]
;    0227  1              end_size : BYTE;                        ! Size of ultrix directory string after OPEN                 [22]
;    0228  1
```

```
;   0229  1     !
;   0230  1     ! Literals                                    !                                                  [16]
;   0231  1     !
;   0232  1
;   0233  1     LITERAL
;   0234  1             ultrix_v_mode = 0,                    !                                                  [22]    !G:10
;   0235  1             pr$_sid_typ8RR = 17;                  ! RRR (this can be removed when the macro shows up) [28] !G:10
;   0236  1
;   0237  1     !
;   0238  1     ! External references:
;   0239  1     !
;   0240  1
;   0241  1     external literal
;   0242  1         def$c_ultrix_len,                         ! Length of file spec backup            [22]
;   0243  1         def$c_bkstp_len,                          ! Length of file spec backup                                  !G:3
;   0244  1         pr$_sys_typ900;                           ! System type for Andromeda [25]                              !G:3
;   0245  1
;   0246  1     external
;   0247  1         Ultrix_flags : Byte addressing_mode (long_relative),        ! Flag for ULTRIX disk structure [22]
;   0248  1         DS$gb_systype: Byte addressing_mode (long_relative),        ! Byte for System Type                        [25] !G:4
;   0249  1         begin_bliss : addressing_mode (long_relative),      ! Address of BEGIN code
;   0250  1         ds$gl_clibase : addressing_mode (long_relative),
;   0251  1         boo$select,                               ! Non-interrupt "QIO" package stuff
;   0252  1         boo$al_vector : addressing_mode (long_relative),
;   0253  1         def$q_backstop : addressing_mode (long_relative),   ! "last-chance" file spec backup string
;   0254  1         def$q_ultrix : addressing_mode (long_relative),     ! "last-chance" file spec backup string [22]
;   0255  1         def$q_dev : bblock addressing_mode (long_relative), ! Descriptor of system default device
;   0256  1         def$q_dir : bblock addressing_mode (long_relative); ! Descriptor of system default directory
;   0257  1
;   0258  1     external routine
;   0259  1         boo$qio : addressing_mode (long_relative),
;   0260  1         scan$numeric : jsb_scan addressing_mode (long_relative),
;   0261  1         kb_check : jsb_none addressing_mode (long_relative),
;   0262  1         script$flush : jsb_none addressing_mode (long_relative),
;   0263  1         init_context : jsb_none addressing_mode (long_relative),
;   0264  1         ds_cleanup : jsb_none addressing_mode (long_relative),
;   0265  1         qio$cleanup,
;   0266  1         breakup_file,
;   0267  1         Dsr$Key_Equal,                        ! compare two keywords                                                  [10]
;   0268  1         loc$ptable : jsb_loc$ptable addressing_mode (long_relative),        !                                      [05]
;   0269  1         Dsr$Allocate_Pseudo_RPB : Addressing_Mode (Long_Relative),  !                                              [09]
;   0270  1         Dsr$DeAllocate_Pseudo_RPB : Addressing_Mode (Long_Relative),        !                                      [09]
;   0271  1         dsr$completion : jsb_0,                                                                          !G:9
;   0272  1         sys$search : addressing_mode (general),                                                          !G:9
;   0273  1         lib$signal : addressing_mode (general),                                                          !G:9
;   0274  1         sys$parse : addressing_mode (general),                                                           !G:9
;   0275  1         sys$getsyi : addressing_mode (general);                                                          !G:9
;   0276  1                                                                                                          !G:9
```

```
;   0278  1     %sbttl 'print a directory heading'              ! begin [27]                                    !G:9
;   0279  1     routine header (nam_blk, device_d) : novalue =                                                  !G:9
;   0280  1                                                                                                     !G:9
;   0281  1     !+                                                                                              !G:9
;   0282  1     ! function:                                                                                     !G:11
;   0283  1     !       print a directory heading,  device:[directory]                                          !G:9
;   0284  1     !                                                                                               !G:9
;   0285  1     ! input:                                                                                        !G:11
;   0286  1     !       descriptor of a full file specification, device:[directory]filename.typ;ver             !G:11
;   0287  1     !                                                                                               !G:9
;   0288  1     ! output:                                                                                       !G:11
;   0289  1     !       descriptor of device and directory parts, device:[dir]                                  !G:9
;   0290  1     !-                                                                                              !G:9
;   0291  1                                                                                                     !G:9
;   0292  1                                                                                                     !G:9
;   0293  2     begin                                                                                           !G:9
;   0294  2     bind                                                                                            !G:9
;   0295  2        nam = .nam_blk,                                                                              !G:9
;   0296  2        dev_d = .device_d;                                                                           !G:9
;   0297  2     map                                                                                             !G:9
;   0298  2        nam : block [ ,byte],                                                                        !G:9
;   0299  2        dev_d : bblock [dsc$c_s_bln];                                                                !G:9
;   0300  2             ch$move (.nam [nam$b_dev], .nam [nam$l_dev], .dev_d [dsc$a_pointer]);                   !G:9
;   0301  2             ch$move (.nam [nam$b_dir], .nam [nam$l_dir], .dev_d [dsc$a_pointer] + .nam [nam$b_dev]);  !G:9
;   0302  2             dev_d [dsc$w_length] = (.nam [nam$b_dev] + .nam [nam$b_dir]);                           !G:9
;   0303  2             $ds_printf ($ascic ('!/!/Directory !AS!/!/'),dev_d);                  ! print heading !G:9
;   0304  1     end;                                                                          ! end [27]      !G:9


                                                                        .TITLE  DIRECTORY *** DIRECTORY Handle DIRECTORY comman
;                                                                                                          d
                                                                        .IDENT  \10.10-13\

                                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                                  2F  21  44  41  21  05  00000 P.AAA:  .ASCII  <5>\!AD!/\                                  ;
20  79  72  6F  74  63  65  72  69  44  2F  21  2F  21  15  00006 P.AAB:  .ASCII  <21>\!/!/Directory !AS!/!/\                  ;
                                2F  21  2F  21  53  41  21  00015                                                          ;

                                                                        .PSECT  WORK,NOEXE,2

                                                            00000 FILESPECMATCH:
                                                                        .BLKB   8
                                                            00008 CONTROLCFLAG:
                                                                        .BLKB   1
                                                            00009 WIDE_FLAG::
                                                                        .BLKB   1
                                                            0000A END_SIZE::
                                                                        .BLKB   1

                                                                 DSA$AL_APTMAIL=     65024
                                                                 DSA$GL_FLAGS=       65024
                                                                 DSA$GL_APTCOM=      65028
                                                                 DSA$GL_PASSES=      65032
                                                                 DSA$GL_UNITS=       65036
                                                                 DSA$GL_SECTNO=      65040
                                                                 DSA$GL_SID=         65044
```

```
                                                  DSA$GL_MSGTYP=      65088
                                                  DSA$GL_ERRNO=       65092
                                                  DSA$GL_EVENT=       65096
                                                  DSA$GL_SUBTNO=      65100
                                                  DSA$GL_TESTNO=      65104
                                                  DSA$GL_PASSNO=      65108
                                                  DSA$GL_DEVLEN=      65112
                                                  DSA$GL_DEVNAM=      65116
                                                  DSA$GL_MSGPTR=      65128
                                                  F_LINE=             P.AAA
                                                          .EXTRN  DEF$C_ULTRIX_LEN
                                                          .EXTRN  DEF$C_BKSTP_LEN
                                                          .EXTRN  PR$_SYS_TYP900, ULTRIX_FLAGS
                                                          .EXTRN  DS$GB_SYSTYPE, BEGIN_BLISS
                                                          .EXTRN  DS$GL_CLIBASE, BOO$SELECT
                                                          .EXTRN  BOO$AL_VECTOR, DEF$Q_BACKSTOP
                                                          .EXTRN  DEF$Q_ULTRIX, DEF$Q_DEV
                                                          .EXTRN  DEF$Q_DIR, BOO$QIO
                                                          .EXTRN  SCAN$NUMERIC, KB_CHECK
                                                          .EXTRN  SCRIPT$FLUSH, INIT_CONTEXT
                                                          .EXTRN  DS_CLEANUP, QIO$CLEANUP
                                                          .EXTRN  BREAKUP_FILE, DSR$KEY_EQUAL
                                                          .EXTRN  LOC$PTABLE, DSR$ALLOCATE_PSEUDO_RPB
                                                          .EXTRN  DSR$DEALLOCATE_PSEUDO_RPB
                                                          .EXTRN  DSR$COMPLETION, SYS$SEARCH
                                                          .EXTRN  LIB$SIGNAL, SYS$PARSE
                                                          .EXTRN  SYS$GETSYI, DS$PRINTF

                                                          .PSECT  CODE,NOWRT,  SHR,2

                                          00FC 00000 HEADER: .WORD   Save R2,R3,R4,R5,R6,R7                    ; 0279
                          56       04   AC  7D 00002         MOVQ    NAM_BLK, R6                               ; 0295
                          50       39   A6  9A 00006         MOVZBL  57(R6), R0                                ; 0300
          04   B7       44   B6           50  28 0000A         MOVC3   R0, @68(R6), @4(R7)                       ;
                          51       3A   A6  9A 00010         MOVZBL  58(R6), R1                                ; 0301
                          50       39   A6  9A 00014         MOVZBL  57(R6), R0                                ;
                          50       04   A7  C0 00018         ADDL2   4(R7), R0                                 ;
               60       48   B6           51  28 0001C         MOVC3   R1, @72(R6), (R0)                         ;
                          50       39   A6  9A 00021         MOVZBL  57(R6), R0                                ; 0302
                          51       3A   A6  9A 00025         MOVZBL  58(R6), R1                                ;
               67           50           51  A1 00029         ADDW3   R1, R0, (R7)                              ;
                                        57  DD 0002D         PUSHL   R7                                        ; 0303
                             00000000'  EF  9F 0002F         PUSHAB  P.AAB                                     ;
                00000000G  9F           02  FB 00035         CALLS   #2, @#DS$PRINTF                           ;
                                            04 0003C         RET                                               ; 0304

; Routine Size:  61 bytes,    Routine Base:  CODE + 0000

;   0305  1                                                                                                !G:9
```

```
;   0307  1     %sbttl 'put 1 line of the directory on the screen'                  ! begin [27]                    !G:9
;   0308  1     routine put_line (line_d, ptr) : novalue =                                                          !G:11
;   0309  1                                                                                                         !G:9
;   0310  2     begin                                                                                               !G:9
;   0311  2     map                                                                                                 !G:9
;   0312  2        line_d : ref bblock;                                                                             !G:9
;   0313  2             $ds_printf ($ascic ('!AS!/'),.line_d);                                                      !G:9
;   0314  2             ch$fill (%c' ',80, .line_d [dsc$a_pointer]);                                                !G:9
;   0315  2             (.ptr) <0,8,0> = 0;                                         ! ptr to end of line is reset   !G:9
;   0316  1     end;                                                                ! end [27]                      !G:9


                                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                                2F  21  53  41  21  05  0001C P.AAC:   .ASCII  <5>\!AS!/\                                  ;


                                                                        .PSECT  CODE,NOWRT,  SHR,2

                                                   003C 00000 PUT_LINE:
                                                                        .WORD   Save R2,R3,R4,R5                            ; 0308
                                    52        04   AC  D0 00002         MOVL    LINE_D, R2                                  ; 0313
                                                   52  DD 00006         PUSHL   R2                                          ;
                                       00000000'   EF  9F 00008         PUSHAB  P.AAC                                       ;
                          00000000G  9F            02  FB 0000E         CALLS   #2, @#DS$PRINTF                             ;
    0050   8F          20            6E            00  2C 00015         MOVC5   #0, (SP), #32, #80, @4(R2)                  ; 0314
                                              04   B2     0001C                                                             ;
                                              08   BC  94 0001E         CLRB    @PTR                                        ; 0315
                                                      04 00021         RET                                                 ; 0316

; Routine Size:  34 bytes,    Routine Base:  CODE + 003D

;   0317  1                                                                                                         !G:9
```

```
;    0319  1     %sbttl 'directory for online ODS-1, ODS-2, ANSI directories'    ! begin [27]                                  !G:9
;    0320  1     routine VMS_dir =                                                                                             !G:9
;    0321  1                                                                                                                   !G:9
;    0322  1     !+                                                                                                            !G:9
;    0323  1     ! Function                                                                                                    !G:9
;    0324  1     !       sends the full file specification of a directory to VMS                                               !G:11
;    0325  1     !       (via $parse and $search) and then prints the directory                                                !G:9
;    0326  1     !       (columns or with the /WIDE switch)                                                                    !G:9
;    0327  1     !                                                                                                             !G:11
;    0328  1     ! Input                                                                                                       !G:9
;    0329  1     !       none                                                                                                  !G:9
;    0330  1     ! Output                                                                                                      !G:9
;    0331  1     !       none                                                                                                  !G:9
;    0332  1     !                                                                                                             !G:9
;    0333  1     ! Condition Code sent to dsr$completion if the action was not successful                                      !G:9
;    0334  1     !-                                                                                                            !G:9
;    0335  1                                                                                                                   !G:9
;    0336  2     begin                                                                                                         !G:11
;    0337  2         local                                                                                                     !G:9
;    0338  2             user_spec : bblock [dsc$c_s_bln] initial (0),                                                         !G:9
;    0339  2             file_buf : block [48, byte],                ! 39.3;3                                                  !G:9
;    0340  2             filename_d : bblock [dsc$c_s_bln] initial (                                                           !G:9
;    0341  2                         long (0),                                                                                 !G:9
;    0342  2                         long (file_buf)),                                                                         !G:9
;    0343  2             line_buf : block [80,byte] initial (%ascii ' '),                                                      !G:9
;    0344  2             line_d : bblock [dsc$c_s_bln] initial (                                                               !G:9
;    0345  2                         long (80),                                                                                !G:9
;    0346  2                         long (line_buf)),                                                                         !G:9
;    0347  2             dev_buf : block [nam$c_namlength, byte],                                                              !G:9
;    0348  2             device_d : bblock [dsc$c_s_bln] initial (                                                             !G:9
;    0349  2                         long (0),                                                                                 !G:9
;    0350  2                         long (dev_buf)),                                                                          !G:9
;    0351  2             files : long initial (0),                                                                             !G:9
;    0352  2             total_files : long initial (0),                                                                       !G:9
;    0353  2             total_dirs : long initial (0),                                                                        !G:9
;    0354  2             status : long initial (0),                                                                            !G:9
;    0355  2             stat2 : long initial (0),                                                                             !G:9
;    0356  2             def_spec : long initial (%ascid '*.*;*'),                                                             !G:9
;    0357  2             ptr : byte initial (0),                                                                               !G:9
;    0358  2             same_dir : byte initial (0);                                                                          !G:9
;    0359  2                                                                                                                   !G:9
;    0360  2          own                                                                                                      !G:9
;    0361  2             res_str : bblock [nam$c_maxrss],                ! output from $search                             !G:9
;    0362  2             spec : bblock [nam$c_maxrss],                                                                         !G:9
;    0363  2             exp_str : bblock [nam$c_maxrss],                ! expanded string buffer                          !G:9
;    0364  2             nam_blk : $nam_decl,                                                                                  !G:9
;    0365  2             fab_blk : $fab_decl;                                                                                  !G:9
;    0366  2                                                                                                                   !G:9
;    0367  2         bind                                                                                                      !G:9
;    0368  2             default = .def_spec;                                                                                  !G:9
;    0369  2         map                                                                                                       !G:9
;    0370  2             default : bblock [dsc$c_s_bln];                                                                       !G:9
;    0371  2                                                                                                                   !G:9
;    0372  2             ! move user-supplied filespec from ds$gl_clibase to user_spec                                         !G:9
;    0373  2             ch$move (.(ds$gl_clibase + 8), .(ds$gl_clibase+12), spec);                                            !G:11
;    0374  2             user_spec [dsc$w_length] = .(ds$gl_clibase + 8);                                                      !G:11
;    0375  2             user_spec [dsc$a_pointer] = spec;                                                                     !G:9
```

```
;    0376  2              !                                                                                          !G:9
;    0377  2              ! initialize the nam and fab blocks                                                        !G:11
; P  0378  2              $nam_init                                                                                  !G:11
; P  0379  2                      (nam = nam_blk,                                                                    !G:9
; P  0380  2                       rsa = res_str,                                                                    !G:9
; P  0381  2                       rss = nam$c_maxrss,                                                               !G:9
; P  0382  2                       esa = exp_str,                                                                    !G:9
;    0383  2                       ess = nam$c_maxrss);                                                              !G:9
; P  0384  2              $fab_init                                                                                  !G:11
; P  0385  2                      (fop = nam,                                                                        !G:9
; P  0386  2                       fab = fab_blk,                                                                    !G:11
; P  0387  2                       nam = nam_blk,                                                                    !G:9
; P  0388  2                       fna = spec,                                                                       !G:11
; P  0389  2                       fns = .user_spec [dsc$w_length],                                                  !G:9
; P  0390  2                       dna = .default [dsc$a_pointer],                                                   !G:9
;    0391  2                       dns = .default [dsc$w_length]);                                                   !G:9
;    0392  2              !                                                                                          !G:9
;    0393  2              ! analize file spec to prepare for wildcard processing to be used in Search service.  If wildcards or !G:11
;    0394  2              ! logical names (including a searchlist) are present in the file spec, RMS allocates internal data !G:11
;    0395  2              ! structures to store the context for subsequent searches.                                 !G:9
;    0396  2              !                                                                                          !G:9
;    0397  2              status = sys$parse (fab_blk);                                                              !G:9
;    0398  2              !                                                                                          !G:9
;    0399  2              if .status eql rms$_suc                                                                    !G:11
;    0400  2              then                                                                                       !G:9
;    0401  3                begin                                                                                    !G:9
;    0402  3                    ! scan a directory file for an entry that matches the file spec specified by the expanded  !G:11
;    0403  3                    ! string.  Upon finding a match, RMS returns the file spec in the resultant string.  !G:9
;    0404  3                    stat2 = (sys$search (fab_blk));                    ! this call to $search used initially !G:9
;    0405  3                    !                                                                                    !G:9
;    0406  3                    ch$fill (%c' ',80, .line_d [dsc$a_pointer]);                                         !G:9
;    0407  3                    while .stat2 eql rms$_suc do                                                         !G:9
;    0408  4                     begin                                                                               !G:9
;    0409  4                       if .files eql 0                                  ! beginning of algorithm?         !G:9
;    0410  4                       then header (nam_blk,device_d);                  ! print "Directory blah:[blah]"   !G:9
;    0411  4                       !                                                                                 !G:9
;    0412  4                       ! if resultant file spec from $search does not have the same device:[dir] as the previous !G:11
;    0413  4                       ! previous file spec then print buffer if not empty and print new header, ie Directory blah:[blah] !
;    0414  4                       same_dir = ch$eql (.device_d [dsc$w_length], .device_d [dsc$a_pointer],            !G:9
;    0415  4                                  (.nam_blk[nam$b_dev] + .nam_blk[nam$b_dir]), .nam_blk[nam$l_dev]);       !G:9
;    0416  4                       if .same_dir eql 0                               ! new directory, ie searchlist    !G:9
;    0417  5                       then begin                                                                        !G:11
;    0418  5                            if .ptr neq 0 then put_line (line_d, ptr);                                   !G:9
;    0419  5                            if .files neq 1                                                              !G:11
;    0420  6                            then $ds_printf ($ascic ('!/Total of !ZL Files.!/'), .files)                 !G:9
;    0421  5                            else $ds_printf ($ascic ('!/Total of !ZL File.!/'), .files);                 !G:9
;    0422  5                            total_files = .total_files + .files;         ! searchlists, ie multiple directories !G:9
;    0423  5                            files = 0;                                                                   !G:11
;    0424  5                            total_dirs = .total_dirs + 1;                ! searchlists                   !G:9
;    0425  5                            header (nam_blk,device_d);                   ! print new heading             !G:9
;    0426  4                        end;                                                                             !G:9
;    0427  4                       !                                                                                 !G:9
;    0428  4                       ! move the filename.typ;ver from the resultant string in the name block to filename_d  !G:9
;    0429  4                       filename_d [dsc$w_length] = .nam_blk[nam$b_name] + .nam_blk[nam$b_type] + .nam_blk[nam$b_ver]; !G:11
;    0430  4                       ch$move (.filename_d [dsc$w_length],.nam_blk[nam$l_name],.filename_d [dsc$a_pointer]);  !G:11
;    0431  4                       !                                                                                 !G:9
;    0432  4                       files = .files + 1;                                                               !G:9
```

```
;   0433  4                 if .wide_flag                                                   ! /WIDE switch          !G:9
;   0434  5                 then begin                                                      ! print 1 file per line !G:9
;   0435  5                         ch$move (.filename_d [dsc$w_length], .filename_d [dsc$a_pointer], .line_d [dsc$a_pointer]);
;   0436  5                         put_line (line_d, ptr);                                                         !G:9
;   0437  5                     end                                                                                 !G:9
;   0438  4                 else                                                                                    !G:11
;   0439  5                     BEGIN                                                       ! put x (x<=4) filenames in line_d !
;   0440  5                         if (80 - .ptr) gtr .filename_d [dsc$w_length]           ! will the filename fit on the line?
;   0441  6                         then begin                                              ! yes                   !G:9
;   0442  6                             !                                                                           !G:9
;   0443  6                             ! move the filename into line_buf;                                          !G:11
;   0444  6                             ! ptr = ptr + length of filename + length of column, 20 - (length of filename mod 20) !G
;   0445  6                             ! if line_buf is full, then print it                                        !G:9
;   0446  6                             ch$move (.filename_d [dsc$w_length], .filename_d [dsc$a_pointer],           !G:11
;   0447  6                                     .line_d [dsc$a_pointer] + .ptr);                                    !G:9
;   0448  6                             ptr = .ptr + .filename_d [dsc$w_length] + 20 - (.filename_d [dsc$w_length] mod 20); !G:9
;   0449  6                             if .ptr geq 80                                                              !G:11
;   0450  6                             then put_line (line_d, ptr);                                                !G:9
;   0451  6                           end                                                                           !G:9
;   0452  5                         else                                                                            !G:11
;   0453  5                           !                                                                             !G:9
;   0454  5                           ! if the new filename does not fit in the line_buf then print the line_buf, and then !G:9
;   0455  5                           ! move the new filename into line_buf and update the pointer                  !G:9
;   0456  6                           begin                                                                         !G:11
;   0457  6                              put_line (line_d, ptr);                                                    !G:9
;   0458  6                              ch$move (.filename_d [dsc$w_length], .filename_d [dsc$a_pointer],          !G:11
;   0459  6                                      .line_d [dsc$a_pointer]);                                          !G:9
;   0460  6                              ptr = .filename_d [dsc$w_length] + 20 - (.filename_d [dsc$w_length] mod 20); !G:9
;   0461  5                           end;                                                                          !G:9
;   0462  4                     END;                                                ! end if not wide               !G:9
;   0463  4                 stat2 = (sys$search (fab_blk));                         ! this call to $search is used to loop on !G
;   0464  3               end;                                                      ! end while sys$search          !G:9
;   0465  3               if .stat2 eql rms$_nmf                                    ! no more files found           !G:9
;   0466  4               then  begin                                               ! to get RMS$_NMF, >= 1 file match occurred
;   0467  4                         if .ptr neq 0                                                                   !G:11
;   0468  4                         then put_line (line_d, ptr);                    ! is there still stuff in the line buffer !G
;   0469  4                         if .files neq 1                                                                 !G:11
;   0470  5                         then $ds_printf ($ascic ('!/Total of !ZL Files.!/'), .files)                    !G:9
;   0471  4                         else $ds_printf ($ascic ('!/Total of !ZL File.!/'), .files);                    !G:9
;   0472  4                         if .total_dirs neq 0                            ! is it a searchlist?           !G:9
;   0473  5                         then begin                                                                      !G:9
;   0474  5                               total_files = .total_files + .files;                                      !G:9
;   0475  5                               total_dirs = .total_dirs + 1;                                             !G:9
;   0476  5                               $ds_printf ($ascic ('!/Grand total of !ZL directories, !ZL files.!/'), .total_dirs, .
;   0477  4                             end;                                                                        !G:11
;   0478  4                         stat2 = rms$_suc;                                                               !G:9
;   0479  4                         return .stat2;                                                                  !G:9
;   0480  4                     end                                                                                 !G:9
;   0481  3               else return .stat2                                                                        !G:9
;   0482  3             end                                                                                         !G:9
;   0483  2               else return .status;                                      ! is sys$parse status isn't normal !G:9
;   0484  1     end;    ! end begin                                                 ! end [27]                      !G:9
```

.PSECT DATA,NOWRT,NOEXE, SHR,2

```
                                                                  00022          .BLKB   2
                                                  00  00  00  20  00024 P.AAD:   .ASCII  \ \<0><0><0>                                  ;
                                  00  00  00  2A  3B  2A  2E  2A  00028 P.AAF:   .ASCII  \*.*;*\<0><0><0>                              ;
                                                      010E0005    00030 P.AAE:   .LONG   17694725                                      ;
                                                      00000000'   00034          .ADDRESS P.AAF                                        ;
4C  5A  21  20  66  6F  20  6C  61  74  6F  54  2F  21  17  00038 P.AAG:   .ASCII  <23>\!/Total of !ZL Files.!/\                  ;
                        2F  21  2E  73  65  6C  69  46  20  00047                                                                ;
4C  5A  21  20  66  6F  20  6C  61  74  6F  54  2F  21  16  00050 P.AAH:   .ASCII  <22>\!/Total of !ZL File.!/\                   ;
                            2F  21  2E  65  6C  69  46  20  0005F                                                                ;
4C  5A  21  20  66  6F  20  6C  61  74  6F  54  2F  21  17  00067 P.AAI:   .ASCII  <23>\!/Total of !ZL Files.!/\                  ;
                        2F  21  2E  73  65  6C  69  46  20  00076                                                                ;
4C  5A  21  20  66  6F  20  6C  61  74  6F  54  2F  21  16  0007F P.AAJ:   .ASCII  <22>\!/Total of !ZL File.!/\                   ;
                            2F  21  2E  65  6C  69  46  20  0008E                                                                ;
20  6C  61  74  6F  74  20  64  6E  61  72  47  2F  21  2E  00096 P.AAK:   .ASCII  \.!/Grand total of !ZL directories, !ZL f\      ;
72  6F  74  63  65  72  69  64  20  4C  5A  21  20  66  6F  000A5                                                                ;
                    66  20  4C  5A  21  20  2C  73  65  69  000B4                                                                ;
                                2F  21  2E  73  65  6C  69  000BE          .ASCII  \iles.!/\                                     ;

                                                                           .PSECT  WORK,NOEXE,2

                                                                  0000B          .BLKB   1
                                                                  0000C RES_STR:.BLKB   255
                                                                  0010B          .BLKB   1
                                                                  0010C SPEC:    .BLKB   255
                                                                  0020B          .BLKB   1
                                                                  0020C EXP_STR:.BLKB   255
                                                                  0030B          .BLKB   1
                                                                  0030C NAM_BLK:.BLKB   96
                                                                  0036C FAB_BLK:.BLKB   80

                                                                        $RMS_PTR=           NAM_BLK
                                                                        $RMS_PTR=           FAB_BLK


                                                                           .PSECT  CODE,NOWRT,  SHR,2

                                                      0FFC 00000 VMS_DIR:.WORD   Save R2,R3,R4,R5,R6,R7,R8,R9,R10,R11          ; 0320
                                  5E      FE54  CE  9E 00002          MOVAB   -428(SP), SP                                  ;
                                            F8  AD  7C 00007          CLRQ    USER_SPEC                                     ; 0338
                                            C0  AD  D4 0000A          CLRL    FILENAME_D                                    ; 0342
                              C4  AD        C8  AD  9E 0000D          MOVAB   FILE_BUF, FILENAME_D+4                        ;
0050  8F          00 00000000'  EF            04  2C 00012          MOVC5   #4, P.AAD, #0, #80, LINE_BUF                  ; 0343
                                          FF70  CD     0001D                                                                ;
                          FF68  CD        50  8F  9A 00020          MOVZBL  #80, LINE_D                                   ; 0346
                          FF6C  CD      FF70  CD  9E 00026          MOVAB   LINE_BUF, LINE_D+4                            ;
                                            0C  AE  D4 0002D          CLRL    DEVICE_D                                      ; 0350
                            10  AE        14  AE  9E 00030          MOVAB   DEV_BUF, DEVICE_D+4                           ;
                                            04  AE  D4 00035          CLRL    TOTAL_FILES                                   ; 0352
                                                5B  D4 00038          CLRL    TOTAL_DIRS                                    ; 0353
                                                57  D4 0003A          CLRL    STATUS                                        ; 0354
                                                59  7C 0003C          CLRQ    FILES                                         ; 0351
                                  56 00000000'  EF  9E 0003E          MOVAB   P.AAE, DEF_SPEC                               ; 0356
                                            08  AE  94 00045          CLRB    PTR                                           ; 0357
                                                6E  94 00048          CLRB    SAME_DIR                                      ; 0358
          00000000'  EF 00000000G  FF 00000000G  EF  28 0004A          MOVC3   DS$GL_CLIBASE+8, aDS$GL_CLIBASE+12, SPEC      ; 0373
                            F8  AD 00000000G  EF  B0 0005A          MOVW    DS$GL_CLIBASE+8, USER_SPEC                    ; 0374
                            FC  AD 00000000'  EF  9E 00062          MOVAB   SPEC, USER_SPEC+4                             ; 0375
```

```
    0060   8F            00            6E                00  2C 0006A          MOVC5   #0, (SP), #0, #96, $RMS_PTR                ; 0383
                                                 00000000'  EF     00071
                                                                                ;
                                    00000000'  EF     6002   8F  B0 00076      MOVW    #24578, $RMS_PTR                          ;
                                    00000000'  EF            01  8E 0007F      MNEGB   #1, $RMS_PTR+2                            ;
                                    00000000'  EF 00000000'  EF  9E 00086      MOVAB   RES_STR, $RMS_PTR+4                       ;
                                    00000000'  EF            01  8E 00091      MNEGB   #1, $RMS_PTR+10                           ;
                                    00000000'  EF 00000000'  EF  9E 00098      MOVAB   EXP_STR, $RMS_PTR+12                      ;
    0050   8F            00            6E                00  2C 000A3          MOVC5   #0, (SP), #0, #80, $RMS_PTR               ; 0391
                                                 00000000'  EF     000AA
                                                                                ;
                                    00000000'  EF     5003   8F  B0 000AF      MOVW    #20483, $RMS_PTR                          ;
                                    00000000'  EF 01000000   8F  D0 000B8      MOVL    #16777216, $RMS_PTR+4                     ;
                                    00000000'  EF            02  90 000C3      MOVB    #2, $RMS_PTR+22                           ;
                                    00000000'  EF            02  90 000CA      MOVB    #2, $RMS_PTR+31                           ;
                                    00000000'  EF 00000000'  EF  9E 000D1      MOVAB   NAM_BLK, $RMS_PTR+40                      ;
                                    00000000'  EF 00000000'  EF  9E 000DC      MOVAB   SPEC, $RMS_PTR+44                         ;
                                    00000000'  EF       04   A6  D0 000E7      MOVL    4(DEF_SPEC), $RMS_PTR+48                  ;
                                    00000000'  EF       F8   AD  90 000EF      MOVB    USER_SPEC, $RMS_PTR+52                    ;
                                    00000000'  EF            66  90 000F7      MOVB    (DEF_SPEC), $RMS_PTR+53                   ;
                                                 00000000'  EF  9F 000FE      PUSHAB  FAB_BLK                                   ; 0397
                                    00000000G  00            01  FB 00104      CALLS   #1, SYS$PARSE                             ;
                                               57            50  D0 0010B      MOVL    R0, STATUS                                ;
                                    00010001   8F            57  D1 0010E      CMPL    STATUS, #65537                            ; 0399
                                                             03  13 00115      BEQL    1$                                        ;
                                                           01B1  31 00117      BRW     20$                                       ;
                                                 00000000'  EF  9F 0011A 1$:    PUSHAB  FAB_BLK                                   ; 0404
                                    00000000G  00            01  FB 00120      CALLS   #1, SYS$SEARCH                            ;
                                               5A            50  D0 00127      MOVL    R0, STAT2                                 ;
    0050   8F            20            6E                00  2C 0012A          MOVC5   #0, (SP), #32, #80, @LINE_D+4             ; 0406
                                          FF6C   DD           00131
                                                                                ;
                                 00010001   8F                5A  D1 00134 2$:  CMPL    STAT2, #65537                             ; 0407
                                                              03  13 0013B      BEQL    3$                                        ;
                                                            012C  31 0013D      BRW     14$                                       ;
                                                              59  D5 00140 3$:  TSTL    FILES                                     ; 0409
                                                              0E  12 00142      BNEQ    4$                                        ;
                                                       0C     AE  9F 00144      PUSHAB  DEVICE_D                                  ; 0410
                                                 00000000'  EF  9F 00147      PUSHAB  NAM_BLK                                   ;
                                          FE4F   CF            02  FB 0014D      CALLS   #2, HEADER                                ;
                                               50 00000000'  EF  9A 00152 4$:  MOVZBL  NAM_BLK+57, R0                            ; 0415
                                               51 00000000'  EF  9A 00159      MOVZBL  NAM_BLK+58, R1                            ;
                                               50            51  C0 00160      ADDL2   R1, R0                                    ;
                                                             54  D4 00163      CLRL    R4                                        ; 0414
        50         00       10   BE       0C     AE  2D 00165      CMPC5   DEVICE_D, @DEVICE_D+4, #0, R0, @NAM_BLK+68        ;
                                                 00000000'  FF     0016C
                                                                                ;
                                                             02  12 00171      BNEQ    5$                                        ;
                                                             54  D6 00173      INCL    R4                                        ;
                                               6E            54  90 00175 5$:  MOVB    R4, SAME_DIR                              ;
                                                             45  12 00178      BNEQ    9$                                        ; 0416
                                                       08    AE  95 0017A      TSTB    PTR                                       ; 0418
                                                             0C  13 0017D      BEQL    6$                                        ;
                                                       08    AE  9F 0017F      PUSHAB  PTR                                       ;
                                                    FF68     CD  9F 00182      PUSHAB  LINE_D                                    ;
                                          FE53   CF            02  FB 00186      CALLS   #2, PUT_LINE                              ;
                                               01            59  D1 0018B 6$:  CMPL    FILES, #1                                 ; 0419
                                                             0A  13 0018E      BEQL    7$                                        ;
                                                             59  DD 00190      PUSHL   FILES                                     ; 0420
                                                 00000000'  EF  9F 00192      PUSHAB  P.AAG                                     ;
                                                             08  11 00198      BRB     8$                                        ;
```

```
                                                  59  DD 0019A 7$:     PUSHL   FILES                                          ; 0421
                                        00000000'  EF  9F 0019C         PUSHAB  P.AAH                                          ;
                        00000000G  9F              02  FB 001A2 8$:     CALLS   #2, @#DS$PRINTF                                ;
                                04  AE              59  C0 001A9         ADDL2   FILES, TOTAL_FILES                             ; 0422
                                                    59  D4 001AD         CLRL    FILES                                          ; 0423
                                                    5B  D6 001AF         INCL    TOTAL_DIRS                                     ; 0424
                                            0C      AE  9F 001B1         PUSHAB  DEVICE_D                                       ; 0425
                                        00000000'  EF  9F 001B4         PUSHAB  NAM_BLK                                        ;
                            FDE2  CF              02  FB 001BA         CALLS   #2, HEADER                                     ;
                                  50 00000000'    EF  9A 001BF 9$:     MOVZBL  NAM_BLK+59, R0                                 ; 0429
                                  51 00000000'    EF  9A 001C6         MOVZBL  NAM_BLK+60, R1                                 ;
                                  50              51  C0 001CD         ADDL2   R1, R0                                         ;
                                  52 00000000'    EF  9A 001D0         MOVZBL  NAM_BLK+61, R2                                 ;
                C0   AD           50              52  A1 001D7         ADDW3   R2, R0, FILENAME_D                             ;
                                  57        C0    AD  3C 001DC         MOVZWL  FILENAME_D, R7                                 ; 0430
                C4   BD 00000000' FF              57  28 001E0         MOVC3   R7, @NAM_BLK+76, @FILENAME_D+4                 ;
                                                    59  D6 001E9         INCL    FILES                                          ; 0432
                                  09 00000000'    EF  E9 001EB         BLBC    WIDE_FLAG, 10$                                 ; 0433
            FF6C   DD       C4  BD              57  28 001F2         MOVC3   R7, @FILENAME_D+4, @LINE_D+4                   ; 0435
                                                    35  11 001F9         BRB     11$                                            ; 0436
      7E          00            57              01  7A 001FB 10$:    EMUL    #1, R7, #0, -(SP)                              ; 0448
      58          58            8E              14  7B 00200         EDIV    #20, (SP)+, R8, R8                             ;
                                  56        08    AE  9A 00205         MOVZBL  PTR, R6                                        ; 0440
                                  50        B0    A6  9E 00209         MOVAB   -80(R6), R0                                    ;
                                  50              50  CE 0020D         MNEGL   R0, R0                                         ;
                                  57              50  D1 00210         CMPL    R0, R7                                         ;
                                                    29  15 00213         BLEQ    12$                                            ;
            FF6C DD46       C4  BD              57  28 00215         MOVC3   R7, @FILENAME_D+4, @LINE_D+4[R6]               ; 0447
                  50            56              57  C1 0021D         ADDL3   R7, R6, R0                                     ; 0448
                                  50              58  C2 00221         SUBL2   R8, R0                                         ;
                08   AE           50              14  81 00224         ADDB3   #20, R0, PTR                                   ;
                                50  8F        08    AE  91 00229         CMPB    PTR, #80                                       ; 0449
                                                    29  1F 0022E         BLSSU   13$                                            ;
                                            08    AE  9F 00230 11$:    PUSHAB  PTR                                            ; 0450
                                          FF68    CD  9F 00233         PUSHAB  LINE_D                                         ;
                            FDA2  CF              02  FB 00237         CALLS   #2, PUT_LINE                                   ;
                                                    1B  11 0023C         BRB     13$                                            ;
                                            08    AE  9F 0023E 12$:    PUSHAB  PTR                                            ; 0457
                                          FF68    CD  9F 00241         PUSHAB  LINE_D                                         ;
                            FD94  CF              02  FB 00245         CALLS   #2, PUT_LINE                                   ;
            FF6C   DD       C4  BD              57  28 0024A         MOVC3   R7, @FILENAME_D+4, @LINE_D+4                   ; 0459
                                  57              58  C2 00251         SUBL2   R8, R7                                         ; 0460
                08   AE           57              14  81 00254         ADDB3   #20, R7, PTR                                   ;
                                        00000000'  EF  9F 00259 13$:    PUSHAB  FAB_BLK                                        ; 0463
                        00000000G  00              01  FB 0025F         CALLS   #1, SYS$SEARCH                                 ;
                                  5A              50  D0 00266         MOVL    R0, STAT2                                      ;
                                                FEC8  31 00269         BRW     2$                                             ;
                        000182CA  8F              5A  D1 0026C 14$:    CMPL    STAT2, #99018                                  ; 0465
                                                    52  12 00273         BNEQ    19$                                            ;
                                            08    AE  95 00275         TSTB    PTR                                            ; 0467
                                                    0C  13 00278         BEQL    15$                                            ;
                                            08    AE  9F 0027A         PUSHAB  PTR                                            ; 0468
                                          FF68    CD  9F 0027D         PUSHAB  LINE_D                                         ;
                            FD58  CF              02  FB 00281         CALLS   #2, PUT_LINE                                   ;
                                  01              59  D1 00286 15$:    CMPL    FILES, #1                                      ; 0469
                                                    0A  13 00289         BEQL    16$                                            ;
                                                    59  DD 0028B         PUSHL   FILES                                          ; 0470
```

```
                                  00000000'  EF  9F 0028D          PUSHAB  P.AAI                                  ;
                                             08  11 00293          BRB     17$                                    ;
                                             59  DD 00295 16$:     PUSHL   FILES                                  ; 0471
                                  00000000'  EF  9F 00297          PUSHAB  P.AAJ                                  ;
                     00000000G  9F           02  FB 0029D 17$:     CALLS   #2, a#DS$PRINTF                        ;
                                             5B  D5 002A4          TSTL    TOTAL_DIRS                             ; 0472
                                             18  13 002A6          BEQL    18$                                    ;
                           04   AE           59  C0 002A8          ADDL2   FILES, TOTAL_FILES                     ; 0474
                                             5B  D6 002AC          INCL    TOTAL_DIRS                             ; 0475
                                       04    AE  DD 002AE          PUSHL   TOTAL_FILES                            ; 0476
                                             5B  DD 002B1          PUSHL   TOTAL_DIRS                             ;
                                  00000000'  EF  9F 002B3          PUSHAB  P.AAK                                  ;
                     00000000G  9F           03  FB 002B9          CALLS   #3, a#DS$PRINTF                        ;
                                5A 00010001  8F  D0 002C0 18$:     MOVL    #65537, STAT2                          ; 0478
                                50           5A  D0 002C7 19$:     MOVL    STAT2, R0                              ; 0479
                                                 04 002CA          RET                                            ;
                                50           57  D0 002CB 20$:     MOVL    STATUS, R0                             ; 0399
                                                 04 002CE          RET                                            ; 0483

; Routine Size:  719 bytes,    Routine Base:  CODE + 005F


;   0485  1                                                                                                  !G:11
;   0486  1                                                                                                  !G:11
;   0487  1                                                                                                  !G:9
;   0488  1                                                                                                  !G:9
;   0489  1                                                                                                  !G:9
;   0490  1                                                                                                  !G:9
;   0491  1
```

```
;    0493  1     %Sbttl  'Put filename to buffer, if matches pattern'
;    0494  1     ;
;    0495  1     Routine PutBuffer (count, Buffer, Desc) : NoValue =                                          !G:9
;    0496  2         Begin
;    0497  2
;    0498  2     !+
;    0499  2     ! Function:
;    0500  2     !       Includes a filename within the printout buffer, if it matches the
;    0501  2     !       specified pattern, or if there is no pattern.
;    0502  2     !
;    0503  2     !       count           Address of count longword (number of count typed)                    !G:9
;    0504  2     !       Buffer          Address of directory line buffer descriptor
;    0505  2     !       Desc            Address of file name buffer descriptor (at end of
;    0506  2     !                       'Buffer' buffer.
;    0507  2     !
;    0508  2     !-
;    0509  2
;    0510  2         Local                                   !                                                [10]
;    0511  2             Wild;                               ! Dummy for key comparison routine               [10]
;    0512  2
;    0513  2         Map                                     !                                                [10]
;    0514  2             Buffer : Ref Block [, Byte],        !                                                [10]
;    0515  2             Desc : Ref Block [, Byte];          !                                                [10]
;    0516  2
;    0517  2         If .filespecMatch [Dsc$W_Length] Eql 0      ! If no pattern                              [10]
;    0518  2          Or Dsr$Key_Equal (.Desc, filespecMatch, Wild)      ! .. or pattern matches              [10]
;    0519  2         Then                                    !                                                [10]
;    0520  3             Begin                               !                                                [10]
;    0521  3             .count = ..count + 1;               ! count this file                                [10]
;    0522  3
;    0523  3             IF .WIDE_FLAG                                                ! DIR/WIDE              [17]
;    0524  4             THEN BEGIN                                                   !                       [17]
;    0525  4                     Buffer [Dsc$W_Length] = .Buffer [Dsc$W_Length] + .Desc [Dsc$W_Length];       !  [17]
;    0526  4                     $Ds_PrintF ($Ascic ('!AS!/'), Buffer [Dsc$W_Length]);   ! Print out buffer  [17]
;    0527  4                     Buffer [Dsc$W_Length] = 0;                              ! Reset buffer length [17]
;    0528  4                     Ch$Fill (%C' ', 132, .Buffer [Dsc$A_Pointer])           ! Fill with blanks   [17]
;    0529  4                 END
;    0530  3             ELSE If (Buffer [Dsc$W_Length] = .Buffer [Dsc$W_Length] + .Desc [Dsc$W_Length]) Gtr 60  !  [10]
;    0531  3                     Then                                !                                        [10]
;    0532  4                         Begin                           !                                        [10]
;    0533  4                         $Ds_PrintF ($Ascic ('!AS!/'), Buffer [Dsc$W_Length]);       ! Print out buffer  [10]
;    0534  4                         Buffer [Dsc$W_Length] = 0;  ! Reset buffer length                        [10]
;    0535  4                         Ch$Fill (%C' ', 80, .Buffer [Dsc$A_Pointer]);       ! Fill with blanks   [10]
;    0536  4                         End                             !                                        [10]
;    0537  4
;    0538  3             End                                 !                                                [10]
;    0539  3
;    0540  1     End;                                        !                                                [10]


                                                            .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                            2F  21  53  41  21  05  000C5 P.AAL:  .ASCII  <5>\!AS!/\                          ;
                            2F  21  53  41  21  05  000CB P.AAM:  .ASCII  <5>\!AS!/\                          ;
```

```
                                                                .PSECT  CODE,NOWRT,  SHR,2

                                                  01FC 00000 PUTBUFFER:
                                                                .WORD   Save R2,R3,R4,R5,R6,R7,R8                    ; 0495
                                  58 00000000G  9F  9E 00002    MOVAB   @#DS$PRINTF, R8                              ;
                                  57 00000000'  EF  9E 00009    MOVAB   FILESPECMATCH, R7                            ;
                                  5E            04  C2 00010    SUBL2   #4, SP                                       ;
                                                67  B5 00013    TSTW    FILESPECMATCH                                ; 0517
                                                0F  13 00015    BEQL    1$                                           ;
                                        4080    8F  BB 00017    PUSHR   #^M<R7,SP>                                   ; 0518
                                          0C    AC  DD 0001B    PUSHL   DESC                                         ;
                          0000G   CF            03  FB 0001E    CALLS   #3, DSR$KEY_EQUAL                            ;
                                  4E            50  E9 00023    BLBC    R0, 3$                                       ;
                                          04    BC  D6 00026 1$:  INCL    @COUNT                                       ; 0521
                                  56      08    AC  D0 00029    MOVL    BUFFER, R6                                   ; 0525
                                  1B      09    A7  E9 0002D    BLBC    WIDE_FLAG, 2$                                ; 0523
                                  66      0C    BC  A0 00031    ADDW2   @DESC, (R6)                                  ; 0525
                                                56  DD 00035    PUSHL   R6                                           ; 0526
                                     00000000'  EF  9F 00037    PUSHAB  P.AAL                                        ;
                                  68            02  FB 0003D    CALLS   #2, DS$PRINTF                                ;
                                                66  B4 00040    CLRW    (R6)                                         ; 0527
  0084   8F          20           6E            00  2C 00042    MOVC5   #0, (SP), #32, #132, @4(R6)                  ; 0528
                                          04    B6     00049                                                         ;
                                                    04 0004B    RET                                                  ;
                                  50            66  3C 0004C 2$:  MOVZWL  (R6), R0                                     ; 0530
                                  51      0C    BC  3C 0004F    MOVZWL  @DESC, R1                                    ;
                                  50            51  C0 00053    ADDL2   R1, R0                                       ;
                                  66            50  B0 00056    MOVW    R0, (R6)                                     ;
                                  3C            50  D1 00059    CMPL    R0, #60                                      ;
                                                16  15 0005C    BLEQ    3$                                           ;
                                                56  DD 0005E    PUSHL   R6                                           ; 0533
                                     00000000'  EF  9F 00060    PUSHAB  P.AAM                                        ;
                                  68            02  FB 00066    CALLS   #2, DS$PRINTF                                ;
                                                66  B4 00069    CLRW    (R6)                                         ; 0534
  0050   8F          20           6E            00  2C 0006B    MOVC5   #0, (SP), #32, #80, @4(R6)                   ; 0535
                                          04    B6     00072                                                         ;
                                                    04 00074 3$:  RET                                                  ; 0540

; Routine Size:  117 bytes,    Routine Base:  CODE + 032E
```

```
;   0542  1     %sbttl 'RAD50'
;   0543  1     ;
;   0544  1     routine rad50 (data, address) =
;   0545  2         begin
;   0546  2
;   0547  2     !++
;   0548  2     ! Functional description:
;   0549  2     !       Routine to convert RAD50 to ASCII
;   0550  2     !       writes the converted characters into a byte vector at ADDRESS
;   0551  2     !       Routine value is number of characters that were non blank
;   0552  2     !
;   0553  2     ! Formal parameters:
;   0554  2     !
;   0555  2     !       data    16 bit quantity containing 3 rad50 characters
;   0556  2     !       address address of byte vector to receive the 3 characters in ascii
;   0557  2     !
;   0558  2     ! Completion codes:     none
;   0559  2     !
;   0560  2     !--
;   0561  2
;   0562  2         map
;   0563  2             address : ref vector [3, byte];         ! Map out where to store data
;   0564  2
;   0565  2         local
;   0566  2             ptr;                                    ! Point to first space in string
;   0567  2
;   0568  2         bind
;   0569  2             xlate = uplit byte(%ascii' ABCDEFGHIJKLMNOPQRSTUVWXYZ$.?0123456789')
;   0570  2             : vector [40, byte];
;   0571  2
;   0572  2         address [0] = .xlate [.data/1600];
;   0573  2         address [1] = .xlate [(.data/40) mod 40];
;   0574  2         address [2] = .xlate [.data mod 40];
;   0575  2
;   0576  2         if ch$fail (ptr = ch$find_ch (3, ch$ptr (.address), %c' ')) then 3 else ch$diff (.ptr, ch$ptr (.address))
;   0577  2
;   0578  1         end;


                                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

4E  4D  4C  4B  4A  49  48  47  46  45  44  43  42  41  20  000D1 P.AAN:  .ASCII  \ ABCDEFGHIJKLMNOPQRSTUVWXYZ$.?0123456789\  ;
3F  2E  24  5A  59  58  57  56  55  54  53  52  51  50  4F  000E0                                                          ;
                    39  38  37  36  35  34  33  32  31  30  000EF                                                          ;

                                                                XLATE=              P.AAN


                                                                        .PSECT  CODE,NOWRT,  SHR,2

                                                    000C 00000 RAD50:   .WORD   Save R2,R3                                  ; 0544
                                    53 00000000'  EF  9E 00002          MOVAB   XLATE, R3                                   ;
                                    52        08  AC  D0 00009          MOVL    ADDRESS, R2                                 ; 0572
                        50      04  AC 00000640   8F  C7 0000D          DIVL3   #1600, DATA, R0                             ;
                                    62          6340  90 00016          MOVB    XLATE[R0], (R2)                             ;
                        50      04  AC            28  C7 0001A          DIVL3   #40, DATA, R0                               ; 0573
```

```
        7E          00          50          01  7A 0001F        EMUL    #1, R0, #0, -(SP)                   ;
        50          50          8E          28  7B 00024        EDIV    #40, (SP)+, R0, R0                  ;
                        01      A2        6340  90 00029        MOVB    XLATE[R0], 1(R2)                    ;
        7E          00      04  AC          01  7A 0002E        EMUL    #1, DATA, #0, -(SP)                 ; 0574
        50          50          8E          28  7B 00034        EDIV    #40, (SP)+, R0, R0                  ;
                        02      A2        6340  90 00039        MOVB    XLATE[R0], 2(R2)                    ;
                    62          03          20  3A 0003E        LOCC    #32, #3, (R2)                       ; 0576
                                            02  12 00042        BNEQ    1$                                  ;
                                            51  D4 00044        CLRL    R1                                  ;
                                            51  D5 00046 1$:    TSTL    PTR                                 ;
                                            05  12 00048        BNEQ    2$                                  ;
                                51          03  D0 0004A        MOVL    #3, R1                              ;
                                            03  11 0004D        BRB     3$                                  ;
                                51          52  C2 0004F 2$:    SUBL2   R2, R1                              ;
                                50          51  D0 00052 3$:    MOVL    R1, R0                              ; 0578
                                                04 00055        RET                                         ;

; Routine Size:  86 bytes,    Routine Base:  CODE + 03A3
```

```
;    0580  1      %sbttl 'format_ultrix'
;    0581  1      routine format_ultrix (length, dir, buffer, count) : novalue =
;    0582  1
;    0583  1      !++
;    0584  1      ! Functional description:
;    0585  1      !
;    0586  1      !       This routine will format an ultrix directory record
;    0587  1      !
;    0588  1      !       Record format from $GET
;    0589  1      !       31                                  0
;    0590  1      !       ----------------------------------+
;    0591  1      !       |       INODE NUMBER              |
;    0592  1      !       ----------------------------------|
;    0593  1      !       | Name len    |  Structure len    |
;    0594  1      !       +----------------------------------|
;    0595  1      !       |  file name padded to next       |
;    0596  1      !       . longword boundary               .
;    0597  1      !       .                                 .
;    0598  1      !       .                                 .
;    0599  1      !
;    0600  1      !
;    0601  1      !
;    0602  1      ! Formal parameters:
;    0603  1      !
;    0604  1      !       length  length of record
;    0605  1      !       dir     Address of record
;    0606  1      !       buffer  Address of descriptor of output buffer
;    0607  1      !
;    0608  1      !       count   address of longword to get count of files
;    0609  1      !--
;    0610  1
;    0611  2          begin
;    0612  2
;    0613  2          local
;    0614  2              desc : block [8, byte];                 ! Desc. of area for fao output
;    0615  2
;    0616  2          map
;    0617  2              dir : ref block [, byte],               ! Address of record
;    0618  2              buffer : ref block [8, byte];           ! Address of buffer descriptor
;    0619  2
;    0620  2      IF .WIDE_FLAG
;    0621  3                  THEN BEGIN
;    0622  3                       if (.buffer [dsc$w_length] mod 132) neq 0
;    0623  3                       THEN                                                              !
;    0624  3                            buffer [dsc$w_length] = .buffer [dsc$w_length] + 132 - (.buffer [dsc$w_length] mod 132);
;    0625  3                       desc [dsc$w_length] = 132;                                        !
;    0626  3                       desc [dsc$a_pointer] = .buffer [dsc$a_pointer] + .buffer [dsc$w_length];
;    0627  3                       $fao ($ascid ('!AD'), desc, desc, .dir[6,0,16,0], dir[8,0,32,0]);
;    0628  3                       END
;    0629  3                  ELSE BEGIN
;    0630  3                       if (.buffer [dsc$w_length] mod 20) neq 0
;    0631  3                          then
;    0632  3                           buffer [dsc$w_length] = .buffer [dsc$w_length] + 20 - (.buffer [dsc$w_length] mod 20);
;    0633  3
;    0634  3                       desc [dsc$w_length] = 19;
;    0635  3                       desc [dsc$a_pointer] = .buffer [dsc$a_pointer] + .buffer [dsc$w_length];
;    0636  4                       $fao ($ascid ('!19<!AD!>'),desc , desc, .dir[6,0,16,0], dir[8,0,32,0] ) !
```

```
;   0637  2                 END;
;   0638  2             PutBuffer (.Count, .Buffer, Desc)
;   0639  2
;   0640  1         end;


                                                                  .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                                        44  41  21  000F9 P.AAP:  .ASCII  \!AD\                                  ;
                                          00000003  000FC P.AAO:  .LONG   3                                       ;
                                          00000000' 00100         .ADDRESS P.AAP                                  ;
                    3E  21  44  41  21  3C  39  31  21  00104 P.AAR:  .ASCII  \!19<!AD!>\                             ;
                                                      0010D         .BLKB   3
                                          00000009  00110 P.AAQ:  .LONG   9                                       ;
                                          00000000' 00114         .ADDRESS P.AAR                                  ;

                                                                  .EXTRN  SYS$FAO

                                                                  .PSECT  CODE,NOWRT,  SHR,2

                                             001C 00000 FORMAT_ULTRIX:
                                                                  .WORD   Save R2,R3,R4                           ; 0581
                                 5E             08  C2 00002      SUBL2   #8, SP                                  ;
                                 52        0C   AC  D0 00005      MOVL    BUFFER, R2                              ; 0622
                                 50        08   AC  D0 00009      MOVL    DIR, R0                                 ; 0627
                                 53        08   A0  9E 0000D      MOVAB   8(R0), R3                               ;
                                 43 00000000'   EF  E9 00011      BLBC    WIDE_FLAG, 2$                           ; 0620
                                 51             62  3C 00018      MOVZWL  (R2), R1                                ; 0622
          7E          00         51             01  7A 0001B      EMUL    #1, R1, #0, -(SP)                       ;
          51          51         8E 00000084    8F  7B 00020      EDIV    #132, (SP)+, R1, R1                     ;
                                                51  D5 00029      TSTL    R1                                      ;
                                                0D  13 0002B      BEQL    1$                                      ;
                                 54             62  3C 0002D      MOVZWL  (R2), R4                                ; 0624
                      51         54             51  C3 00030      SUBL3   R1, R4, R1                              ;
                      62         51      0084   8F  A1 00034      ADDW3   #132, R1, (R2)                          ;
                                 6E        84   8F  9B 0003A 1$:  MOVZBW  #132, DESC                              ; 0625
                                 51             62  3C 0003E      MOVZWL  (R2), R1                                ; 0626
                            04   AE        04 B241  9E 00041      MOVAB   @4(R2)[R1], DESC+4                      ;
                                                53  DD 00047      PUSHL   R3                                      ; 0627
                                 7E        06   A0  3C 00049      MOVZWL  6(R0), -(SP)                            ;
                                           08   AE  9F 0004D      PUSHAB  DESC                                    ;
                                           0C   AE  9F 00050      PUSHAB  DESC                                    ;
                                   00000000'    EF  9F 00053      PUSHAB  P.AAO                                   ;
                                                3A  11 00059      BRB     4$                                      ;
                                 51             62  3C 0005B 2$:  MOVZWL  (R2), R1                                ; 0630
          7E          00         51             01  7A 0005E      EMUL    #1, R1, #0, -(SP)                       ;
          51          51         8E             14  7B 00063      EDIV    #20, (SP)+, R1, R1                      ;
                                                51  D5 00068      TSTL    R1                                      ;
                                                0B  13 0006A      BEQL    3$                                      ;
                                 54             62  3C 0006C      MOVZWL  (R2), R4                                ; 0632
                      51         54             51  C3 0006F      SUBL3   R1, R4, R1                              ;
                      62         51             14  A1 00073      ADDW3   #20, R1, (R2)                           ;
                                 6E             13  B0 00077 3$:  MOVW    #19, DESC                               ; 0634
                                 51             62  3C 0007A      MOVZWL  (R2), R1                                ; 0635
                            04   AE        04 B241  9E 0007D      MOVAB   @4(R2)[R1], DESC+4                      ;
                                                53  DD 00083      PUSHL   R3                                      ; 0636
```

```
                                7E        06   A0  3C 00085          MOVZWL  6(R0), -(SP)                          ;
                                          08   AE  9F 00089          PUSHAB  DESC                                  ;
                                          0C   AE  9F 0008C          PUSHAB  DESC                                  ;
                                   00000000'   EF  9F 0008F          PUSHAB  P.AAQ                                 ;
                        00000000G  00          05  FB 00095 4$:      CALLS   #5, SYS$FAO                           ;
                                        4004   8F  BB 0009C          PUSHR   #^M<R2,SP>                            ; 0638
                                          10   AC  DD 000A0          PUSHL   COUNT                                 ;
                            FE8D   CF          03  FB 000A3          CALLS   #3, PUTBUFFER                         ;
                                                   04 000A8          RET                                           ; 0640

; Routine Size:  169 bytes,    Routine Base:  CODE + 03F9


;   0641  1
;   0642  1
```

```
;    0644  1     %sbttl 'format_ods1'
;    0645  1     routine format_ods1 (length, dir, buffer, count) : novalue =
;    0646  1
;    0647  1     !++
;    0648  1     ! Functional description:
;    0649  1     !
;    0650  1     !       This routine will format a ODS-1 directory record for STANDALONE        [27]                    !G:9
;    0651  1     !
;    0652  1     ! Formal parameters:
;    0653  1     !
;    0654  1     !       length  length of record
;    0655  1     !       dir     Address of record
;    0656  1     !       buffer  Address of descriptor of output buffer
;    0657  1     !
;    0658  1     !       count   address of longword to get count of files
;    0659  1     !--
;    0660  1
;    0661  2         begin
;    0662  2
;    0663  2         local
;    0664  2             desc : block [8, byte],                 ! Desc. of area for fao output
;    0665  2             name : vector [16, byte],               ! ASCIC file name
;    0666  2             type : vector [4, byte];                ! ascic file type
;    0667  2
;    0668  2         map
;    0669  2             dir : ref block [, byte],               ! Address of record
;    0670  2             buffer : ref block [8, byte];           ! Address of buffer descriptor
;    0671  2
;    0672  2         if .dir [0, 0, 16, 0] neq 0
;    0673  2         then
;    0674  3             begin
;    0675  3
;    0676  3             if (.buffer [dsc$w_length] mod 20) neq 0
;    0677  3             then
;    0678  3                 buffer [dsc$w_length] = .buffer [dsc$w_length] + 20 - (.buffer [dsc$w_length] mod 20);
;    0679  3
;    0680  3             name [0] = rad50 (.dir [6, 0, 16, 0], name [1]) + rad50 (.dir [8, 0, 16, 0], name [4]) + rad50 (.dir
;    0681  3                 [10, 0, 16, 0], name [7]);
;    0682  3             type [0] = rad50 (.dir [12, 0, 16, 0], type [1]);
;    0683  3             desc [dsc$w_length] = 19;
;    0684  3             desc [dsc$a_pointer] = .buffer [dsc$a_pointer] + .buffer [dsc$w_length];
;    0685  3             $fao ($ascid ('!19<!AC.!AC;!UW!>'), desc, desc, name, type, .dir [14, 0, 16, 0]);       !               [10]
;    0686  3             PutBuffer (.Count, .Buffer, Desc)
;    0687  2             end;
;    0688  2
;    0689  1         end;


                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

57  55  21  3B  43  41  21  2E  43  41  21  3C  39  31  21  00118 P.AAT:  .ASCII  \!19<!AC.!AC;!UW!>\                    ;
                                                    3E  21  00127                                                       ;
                                                            00129          .BLKB   3
                                                00000011    0012C P.AAS:   .LONG   17                                  ;
                                                00000000'   00130          .ADDRESS P.AAT                          ;
```

```
                                                                .PSECT  CODE,NOWRT,  SHR,2

                                          003C 00000 FORMAT_ODS1:
                                                                .WORD   Save R2,R3,R4,R5                        ; 0645
                          55      FEFB    CF   9E 00002         MOVAB   RAD50, R5                               ;
                          5E              1C   C2 00007         SUBL2   #28, SP                                 ;
                          53        08    AC   D0 0000A         MOVL    DIR, R3                                 ; 0672
                                          63   B5 0000E         TSTW    (R3)                                    ;
                                          01   12 00010         BNEQ    1$                                      ;
                                               04 00012         RET                                             ;
                          54        0C    AC   D0 00013 1$:     MOVL    BUFFER, R4                              ; 0676
                          50              64   3C 00017         MOVZWL  (R4), R0                                ;
      7E          00      50              01   7A 0001A         EMUL    #1, R0, #0, -(SP)                       ;
      50          50      8E              14   7B 0001F         EDIV    #20, (SP)+, R0, R0                      ;
                                          50   D5 00024         TSTL    R0                                      ;
                                          0B   13 00026         BEQL    2$                                      ;
                          51              64   3C 00028         MOVZWL  (R4), R1                                ; 0678
                  50      51              50   C3 0002B         SUBL3   R0, R1, R0                              ;
                  64      50              14   A1 0002F         ADDW3   #20, R0, (R4)                           ;
                                    05    AE   9F 00033 2$:     PUSHAB  NAME+1                                  ; 0680
                          7E        06    A3   3C 00036         MOVZWL  6(R3), -(SP)                            ;
                          65              02   FB 0003A         CALLS   #2, RAD50                               ;
                          52              50   D0 0003D         MOVL    R0, R2                                  ;
                                    08    AE   9F 00040         PUSHAB  NAME+4                                  ;
                          7E        08    A3   3C 00043         MOVZWL  8(R3), -(SP)                            ;
                          65              02   FB 00047         CALLS   #2, RAD50                               ;
                          52              50   C0 0004A         ADDL2   R0, R2                                  ;
                                    0B    AE   9F 0004D         PUSHAB  NAME+7                                  ; 0681
                          7E        0A    A3   3C 00050         MOVZWL  10(R3), -(SP)                           ;
                          65              02   FB 00054         CALLS   #2, RAD50                               ;
              04    AE    52              50   81 00057         ADDB3   R0, R2, NAME                            ;
                                    01    AE   9F 0005C         PUSHAB  TYPE+1                                  ; 0682
                          7E        0C    A3   3C 0005F         MOVZWL  12(R3), -(SP)                           ;
                          65              02   FB 00063         CALLS   #2, RAD50                               ;
                          6E              50   90 00066         MOVB    R0, TYPE                                ;
                      14  AE              13   B0 00069         MOVW    #19, DESC                               ; 0683
                          50              64   3C 0006D         MOVZWL  (R4), R0                                ; 0684
                      18  AE        04 B440    9E 00070         MOVAB   @4(R4)[R0], DESC+4                      ;
                          7E        0E    A3   3C 00076         MOVZWL  14(R3), -(SP)                           ; 0685
                                    04    AE   9F 0007A         PUSHAB  TYPE                                    ;
                                    0C    AE   9F 0007D         PUSHAB  NAME                                    ;
                                    20    AE   9F 00080         PUSHAB  DESC                                    ;
                                    24    AE   9F 00083         PUSHAB  DESC                                    ;
                              00000000'   EF   9F 00086         PUSHAB  P.AAS                                   ;
                  00000000G   00          06   FB 0008C         CALLS   #6, SYS$FAO                             ;
                                    14    AE   9F 00093         PUSHAB  DESC                                    ; 0686
                                          54   DD 00096         PUSHL   R4                                      ;
                                    10    AC   DD 00098         PUSHL   COUNT                                   ;
                      8B  A5              03   FB 0009B         CALLS   #3, PUTBUFFER                           ;
                                               04 0009F         RET                                             ; 0689

; Routine Size:  160 bytes,    Routine Base:  CODE + 04A2
```

```
;    0691  1     %sbttl 'format_ods2'
;    0692  1     routine format_ods2 (length, dir, buffer, count) : novalue =
;    0693  1
;    0694  1     !++
;    0695  1     ! Functional description:
;    0696  1     !
;    0697  1     !       This routine will format an ODS-2 directory record for STANDALONE        [27]                    !G:9
;    0698  1     !
;    0699  1     ! Formal parameters:
;    0700  1     !
;    0701  1     !       length  length of record
;    0702  1     !       dir     Address of record
;    0703  1     !       buffer  Address of descriptor of output buffer
;    0704  1     !
;    0705  1     !       count   address of longword to get file count
;    0706  1     !--
;    0707  1
;    0708  2         begin
;    0709  2
;    0710  2         local
;    0711  2             desc : block [8, byte];
;    0712  2
;    0713  2         map
;    0714  2             dir : ref block [, byte],               ! Address of record
;    0715  2             buffer : ref block [8, byte];           ! Address of buffer descriptor
;    0716  2
;    0717  2         bind
;    0718  2             ver_offset = -2 + dir$c_length + ((.dir [-2 + dir$b_namecount] + 1) and not 1);
;    0719  2
;    0720  2         incr index from ver_offset to .length - 1 by 8 do
;    0721  3             begin
;    0722  3             IF .WIDE_FLAG                                                                                   !
;    0723  4                THEN BEGIN                                                                                   !
;    0724  4                     if (.buffer [dsc$w_length] mod 132) neq 0                                               !
;    0725  4                        then                                                                                 !
;    0726  4                         buffer [dsc$w_length] = .buffer [dsc$w_length] + 132 - (.buffer [dsc$w_length] mod 132);  !
;    0727  4                     desc [dsc$w_length] = 132;                                                              !
;    0728  4                     desc [dsc$a_pointer] = .buffer [dsc$a_pointer] + .buffer [dsc$w_length];                !
;    0729  5                     $fao ($ascid ('!AC;!UW'), desc, desc, dir [-2 + dir$b_namecount], .dir [.index, 0, 16, 0])  !
;    0730  4                     END                                                                                     !
;    0731  4                ELSE BEGIN                                                                                   !
;    0732  4                     if (.buffer [dsc$w_length] mod 20) neq 0                                                !
;    0733  4                        then                                                                                 !
;    0734  4                         buffer [dsc$w_length] = .buffer [dsc$w_length] + 20 - (.buffer [dsc$w_length] mod 20);
;    0735  4
;    0736  4                     desc [dsc$w_length] = 19;
;    0737  4                     desc [dsc$a_pointer] = .buffer [dsc$a_pointer] + .buffer [dsc$w_length];
;    0738  5                     $fao ($ascid ('!19<!AC;!UW!>'), desc, desc, dir [-2 + dir$b_namecount], .dir [.index, 0, 16, 0])
;    0739  3                     END;
;    0740  3             PutBuffer (.Count, .Buffer, Desc)
;    0741  2             end;
;    0742  2
;    0743  1         end;


                                                                .PSECT  DATA,NOWRT,NOEXE,  SHR,2
```

```
                                57  55  21  3B  43  41  21  00134 P.AAV:  .ASCII  \!AC;!UW\                          ;
                                                            0013B         .BLKB   1
                                                  00000007  0013C P.AAU:  .LONG   7                                  ;
                                                  00000000' 00140         .ADDRESS P.AAV                             ;
      3E  21  57  55  21  3B  43  41  21  3C  39  31  21  00144 P.AAX:  .ASCII  \!19<!AC;!UW!>\                     ;
                                                            00151         .BLKB   3
                                                  0000000D  00154 P.AAW:  .LONG   13                                 ;
                                                  00000000' 00158         .ADDRESS P.AAX                             ;


                                                                        .PSECT  CODE,NOWRT,  SHR,2

                                                     003C 00000 FORMAT_ODS2:
                                                                        .WORD   Save R2,R3,R4,R5                    ; 0692
                                        5E            08  C2 00002      SUBL2   #8, SP                              ;
                                        52        08  AC  7D 00005      MOVQ    DIR, R2                             ; 0718
                                        50        03  A2  9A 00009      MOVZBL  3(R2), R0                           ;
                                                      50  D6 0000D      INCL    R0                                  ;
                                        50            01  8A 0000F      BICB2   #1, R0                              ;
                                        54        04  A0  9E 00012      MOVAB   4(R0), R4                           ; 0720
                        55        04    AC            01  C3 00016      SUBL3   #1, LENGTH, R5                      ;
                                                    00A0  31 0001B      BRW     6$                                  ;
                                        46 00000000'  EF  E9 0001E 1$:  BLBC    WIDE_FLAG, 3$                       ; 0722
                                        50            63  3C 00025      MOVZWL  (R3), R0                            ; 0724
      7E                00            50            01  7A 00028      EMUL    #1, R0, #0, -(SP)                   ;
      50                50            8E 00000084   8F  7B 0002D      EDIV    #132, (SP)+, R0, R0                 ;
                                                      50  D5 00036      TSTL    R0                                  ;
                                                      0D  13 00038      BEQL    2$                                  ;
                                        51            63  3C 0003A      MOVZWL  (R3), R1                            ; 0726
                        50            51            50  C3 0003D      SUBL3   R0, R1, R0                          ;
                        63            50      0084  8F  A1 00041      ADDW3   #132, R0, (R3)                      ;
                                        6E        84  8F  9B 00047 2$:  MOVZBW  #132, DESC                          ; 0727
                                        50            63  3C 0004B      MOVZWL  (R3), R0                            ; 0728
                                04    AE        04 B340  9E 0004E      MOVAB   @4(R3)[R0], DESC+4                  ;
                                                    6442  9F 00054      PUSHAB  (INDEX)[R2]                         ; 0729
                                        7E            9E  3C 00057      MOVZWL  @(SP)+, -(SP)                       ;
                                                  03  A2  9F 0005A      PUSHAB  3(R2)                               ;
                                                  08  AE  9F 0005D      PUSHAB  DESC                                ;
                                                  0C  AE  9F 00060      PUSHAB  DESC                                ;
                                           00000000'  EF  9F 00063      PUSHAB  P.AAU                               ;
                                                      3D  11 00069      BRB     5$                                  ;
                                        50            63  3C 0006B 3$:  MOVZWL  (R3), R0                            ; 0732
      7E                00            50            01  7A 0006E      EMUL    #1, R0, #0, -(SP)                   ;
      50                50            8E            14  7B 00073      EDIV    #20, (SP)+, R0, R0                  ;
                                                      50  D5 00078      TSTL    R0                                  ;
                                                      0B  13 0007A      BEQL    4$                                  ;
                                        51            63  3C 0007C      MOVZWL  (R3), R1                            ; 0734
                        50            51            50  C3 0007F      SUBL3   R0, R1, R0                          ;
                        63            50            14  A1 00083      ADDW3   #20, R0, (R3)                       ;
                                        6E            13  B0 00087 4$:  MOVW    #19, DESC                           ; 0736
                                        50            63  3C 0008A      MOVZWL  (R3), R0                            ; 0737
                                04    AE        04 B340  9E 0008D      MOVAB   @4(R3)[R0], DESC+4                  ;
                                                    6442  9F 00093      PUSHAB  (INDEX)[R2]                         ; 0738
                                        7E            9E  3C 00096      MOVZWL  @(SP)+, -(SP)                       ;
                                                  03  A2  9F 00099      PUSHAB  3(R2)                               ;
```

```
                                  08   AE  9F 0009C          PUSHAB  DESC                                  ;
                                  0C   AE  9F 0009F          PUSHAB  DESC                                  ;
                            00000000'  EF  9F 000A2          PUSHAB  P.AAW                                 ;
                  00000000G  00        05  FB 000A8 5$:      CALLS   #5, SYS$FAO                           ;
                                 4008  8F  BB 000AF          PUSHR   #^M<R3,SP>                            ; 0740
                                   10  AC  DD 000B3          PUSHL   COUNT                                 ;
                      FD31   CF        03  FB 000B6          CALLS   #3, PUTBUFFER                         ;
                             54        08  C0 000BB          ADDL2   #8, INDEX                             ;
                             55        54  D1 000BE 6$:      CMPL    INDEX, R5                             ;
                                       03  14 000C1          BGTR    7$                                    ;
                                     FF58  31 000C3          BRW     1$                                    ;
                                           04 000C6 7$:      RET                                           ; 0743

; Routine Size:  199 bytes,    Routine Base:  CODE + 0542
```

```
;    0745  1      %sbttl 'RT-11 directory'
;    0746  1      routine rt11_direct (q_device, count) =                                                    !G:6
;    0747  2          begin
;    0748  2
;    0749  2          bind
;    0750  2              l = .q_device : word;
;    0751  2
;    0752  2          local
;    0753  2              segment,
;    0754  2              extra_length,
;    0755  2              address_first,
;    0756  2              RPB : Ref Block [, byte],        ! Fake RPB                                        [09]
;    0757  2              segblk : bblock [1024], ! Buffer to read segment
;    0758  2              t_buffer : bblock [80], ! Buffer for directory line
;    0759  2              name : vector [7, byte],         ! Buffer for ASCIC file name
;    0760  2              type : vector [4, byte],         ! Buffer for ASCIC file type
;    0761  2              OutBuffer : BBlock [Dsc$C_S_Bln],        ! Descriptor for buffer                   [10]
;    0762  2              q_buffer : bblock [dsc$c_s_bln];         ! Descriptor for FAO
;    0763  2
;    0764  2          RPB = Dsr$Allocate_Pseudo_RPB (BTD$K_Console, 0, 0, 0, 1, 0);       !                 [09]
;    0765  2          segment = 1;
;    0766  2          OutBuffer [Dsc$W_Length] = 0;
;    0767  2          OutBuffer [Dsc$A_Pointer] = T_Buffer;
;    0768  2          $ds_printf ($ascic ('!/!/Directory !AS!/!/'), .q_device);                              !G:10
;    0769  2          ch$fill (%c' ', 80, t_buffer);
;    0770  2          If .FileSpecMatch[Dsc$W_Length] Neq 0
;    0771  2              Then FileSpecMatch[Dsc$W_Length] = .FileSpecMatch[Dsc$W_Length] - 2;    ! Shorten string by 2, don't    [21]
;    0772  2                                                                                     ! look for version number.     [21]
;    0773  2
;    0774  2      while 1 do
;    0775  3          begin
;    0776  3
;    0777  3          local
;    0778  3              status;
;    0779  3
;    0780  3          if .segment eql 0 then exitloop;
;    0781  3
;    0782  4          if not (status = boo$qio (segblk,        ! Read directory segment                          [03]
;    0783  4              1024,                !  two blocks long                                           [03]
;    0784  4              4 + .segment*2,      !  from disk logical block                                   [03]
;    0785  4              io$_readlblk,        !                                                            [03]
;    0786  4              0,                   !  physical address                                          [03]
;    0787  4              .rpb))               !  address of rpb                                            [03]
;    0788  3          then return .status;     !                                                            [03]
;    0789  3
;    0790  3          segment = .segblk [rt$w_segment];        ! Link to next segment
;    0791  3          extra_length = .segblk [rt$w_extralen]; ! Variable part size
;    0792  3          address_first = segblk [rt$w_first] - rt$_fixed - .extra_length;
;    0793  3
;    0794  3          while 1 do
;    0795  4              begin
;    0796  4
;    0797  4              bind
;    0798  4                  entry = (address_first = .address_first + rt$_fixed + .extra_length) : bblock;
;    0799  4
;    0800  4              if .entry [rt$v_endseg] then exitloop;      ! End of segment
;    0801  4
```

```
;   0802  4                 if .entry [rt$v_perm]                   ! Only list permanent files
;   0803  4                 then
;   0804  5                     begin
;   0805  6                     name [0] = rad50 (.(entry [rt$l_filename])<0, 16>, name [1]) + rad50 (.(entry [rt$l_filename]
;   0806  5                         )<16, 16>, name [4]);
;   0807  5                     type [0] = rad50 (.entry [rt$w_filetype], type [1]);
;   0808  5                     q_buffer [dsc$w_length] = 19;   ! Set up FAO output buffer
;   0809  5                     q_buffer [dsc$a_pointer] = .OutBuffer [Dsc$A_Pointer] + .OutBuffer [Dsc$W_Length];      !       [10]
;   0810  5                     $fao ($ascid ('!19<!AC.!AC!>'), q_buffer, q_buffer, name, type);        !                       [10]
;   0811  5                     PutBuffer (.Count, OutBuffer, Q_Buffer) !                                                       [10]
;   0812  5                     end
;   0813  5
;   0814  3                 end;                                    !                                                           [08]
;   0815  3
;   0816  3                 If .ControlCFlag            !                                                                       [09]
;   0817  3                 Then                        !                                                                       [09]
;   0818  4                     Begin                   !                                                                       [09]
;   0819  4                     Dsr$DeAllocate_Pseudo_RPB (.RPB);       !                                                       [09]
;   0820  4                     Return Rms$_Normal      ! Abort gracefully on ^C                                                [09]
;   0821  3                     End;                    !                                                                       [09]
;   0822  3
;   0823  2             end;
;   0824  2
;   0825  2         if .OutBuffer [Dsc$W_Length] gtr 0 then $ds_printf ($Ascic ('!AS!/'), OutBuffer);   !                       [10]
;   0826  2
;   0827  2         Dsr$DeAllocate_Pseudo_RPB (.RPB);
;   0828  2         rms$_normal
;   0829  1         end;                                            ! of rt11_direct


                                                                                .PSECT  DATA,NOWRT,NOEXE,  SHR,2

20  79  72  6F  74  63  65  72  69  44  2F  21  2F  21  15  0015C P.AAY:  .ASCII  <21>\!/!/Directory !AS!/!/\                    ;
                                2F  21  2F  21  53  41  21  0016B                                                                ;
        3E  21  43  41  21  2E  43  41  21  3C  39  31  21  00172 P.ABA:  .ASCII  \!19<!AC.!AC!>\                                  ;
                                                            0017F         .BLKB   1
                                                    0000000D  00180 P.AAZ:  .LONG   13                                              ;
                                                    00000000' 00184         .ADDRESS P.ABA                                          ;
                                    2F  21  53  41  21  05  00188 P.ABB:  .ASCII  <5>\!AS!/\                                       ;


                                                                                .PSECT  CODE,NOWRT,  SHR,2

                                                        0FFC 00000 RT11_DIRECT:
                                                                                .WORD   Save R2,R3,R4,R5,R6,R7,R8,R9,R10,R11            ; 0746
                                    5B 00000000G  9F  9E 00002          MOVAB   @#DS$PRINTF, R11                                ;
                                    5A 00000000'  EF  9E 00009          MOVAB   FILESPECMATCH, R10                              ;
                                    59 00000000'  EF  9E 00010          MOVAB   P.AAY, R9                                       ;
                                    58     FD7F   CF  9E 00017          MOVAB   RAD50, R8                                       ;
                                    5E     FB94   CE  9E 0001C          MOVAB   -1132(SP), SP                                   ;
                                    7E            01  7D 00021          MOVQ    #1, -(SP)                                       ; 0764
                                                  7E  7C 00024          CLRQ    -(SP)                                           ;
                                                  7E  D4 00026          CLRL    -(SP)                                           ;
                                    7E       40   8F  9A 00028          MOVZBL  #64, -(SP)                                      ;
                        00000000G   EF            06  FB 0002C          CALLS   #6, DSR$ALLOCATE_PSEUDO_RPB                     ;
```

```
                                57          50  D0 00033        MOVL    R0, RPB                                  ;
                                56          01  D0 00036        MOVL    #1, SEGMENT                              ; 0765
                                        0C  AE  B4 00039        CLRW    OUTBUFFER                                ; 0766
                        10      AE      1C  AE  9E 0003C        MOVAB   T_BUFFER, OUTBUFFER+4                    ; 0767
                                        04  AC  DD 00041        PUSHL   Q_DEVICE                                 ; 0768
                                            59  DD 00044        PUSHL   R9                                       ;
                                6B          02  FB 00046        CALLS   #2, DS$PRINTF                            ;
  0050   8F          20         6E          00  2C 00049        MOVC5   #0, (SP), #32, #80, T_BUFFER             ; 0769
                                        1C  AE     00050                                                         ;
                                            6A  B5 00052        TSTW    FILESPECMATCH                            ; 0770
                                            03  13 00054        BEQL    1$                                       ;
                                6A          02  A2 00056        SUBW2   #2, FILESPECMATCH                        ; 0771
                                            56  D5 00059 1$:    TSTL    SEGMENT                                  ; 0780
                                            03  12 0005B        BNEQ    2$                                       ;
                                          00A2  31 0005D        BRW     6$                                       ;
                                            57  DD 00060 2$:    PUSHL   RPB                                      ; 0787
                                7E          21  7D 00062        MOVQ    #33, -(SP)                               ; 0785
                   7E           56          01  78 00065        ASHL    #1, SEGMENT, -(SP)                       ; 0784
                                6E          04  C0 00069        ADDL2   #4, (SP)                                 ;
                                7E    0400  8F  3C 0006C        MOVZWL  #1024, -(SP)                             ; 0783
                                      0080  CE  9F 00071        PUSHAB  SEGBLK                                   ; 0782
                   00000000G    EF          06  FB 00075        CALLS   #6, BOO$QIO                              ;
                                01          50  E8 0007C        BLBS    STATUS, 3$                               ;
                                            04  0007F           RET                                              ;
                                56      6E  AE  3C 00080 3$:    MOVZWL  SEGBLK+2, SEGMENT                        ; 0790
                                54      72  AE  3C 00084        MOVZWL  SEGBLK+6, EXTRA_LENGTH                   ; 0791
                                50      68  AE  9E 00088        MOVAB   SEGBLK-4, R0                             ; 0792
                   52           50          54  C3 0008C        SUBL3   EXTRA_LENGTH, R0, ADDRESS_FIRST          ;
                                52      0E A442 9E 00090 4$:    MOVAB   14(EXTRA_LENGTH)[ADDRESS_FIRST], -       ; 0798
                                                                        ADDRESS_FIRST                            ;
                                53          52  D0 00095        MOVL    ADDRESS_FIRST, R3                        ;
                   5F           63          0B  E0 00098        BBS     #11, (R3), 5$                            ; 0800
                   F0           63          0A  E1 0009C        BBC     #10, (R3), 4$                            ; 0802
                                        15  AE  9F 000A0        PUSHAB  NAME+1                                   ; 0805
                                7E      02  A3  3C 000A3        MOVZWL  2(R3), -(SP)                             ;
                                68          02  FB 000A7        CALLS   #2, RAD50                                ;
                                55          50  D0 000AA        MOVL    R0, R5                                   ;
                                        18  AE  9F 000AD        PUSHAB  NAME+4                                   ; 0806
                                7E      04  A3  3C 000B0        MOVZWL  4(R3), -(SP)                             ; 0805
                                68          02  FB 000B4        CALLS   #2, RAD50                                ;
          14   AE               55          50  81 000B7        ADDB3   R0, R5, NAME                             ;
                                        01  AE  9F 000BC        PUSHAB  TYPE+1                                   ; 0807
                                7E      06  A3  3C 000BF        MOVZWL  6(R3), -(SP)                             ;
                                68          02  FB 000C3        CALLS   #2, RAD50                                ;
                                6E          50  90 000C6        MOVB    R0, TYPE                                 ;
                        04      AE          13  B0 000C9        MOVW    #19, Q_BUFFER                            ; 0808
                                50      0C  AE  3C 000CD        MOVZWL  OUTBUFFER, R0                            ; 0809
                        08      AE      10 BE40 9E 000D1        MOVAB   @OUTBUFFER+4[R0], Q_BUFFER+4             ;
                                            5E  DD 000D7        PUSHL   SP                                       ; 0810
                                        18  AE  9F 000D9        PUSHAB  NAME                                     ;
                                        0C  AE  9F 000DC        PUSHAB  Q_BUFFER                                 ;
                                        10  AE  9F 000DF        PUSHAB  Q_BUFFER                                 ;
                                        24  A9  9F 000E2        PUSHAB  P.AAZ                                    ;
                   00000000G    00          05  FB 000E5        CALLS   #5, SYS$FAO                              ;
                                        04  AE  9F 000EC        PUSHAB  Q_BUFFER                                 ; 0811
                                        10  AE  9F 000EF        PUSHAB  OUTBUFFER                                ;
                                        08  AC  DD 000F2        PUSHL   COUNT                                    ;
```

```
                8B   A8          03  FB 000F5        CALLS   #3, PUTBUFFER                          ;
                                 95  11 000F9        BRB     4$                                     ; 0794
                     11      08  AA  E8 000FB 5$:    BLBS    CONTROLCFLAG, 7$                       ; 0816
                                FF57 31 000FF        BRW     1$                                     ;
                             0C  AE  B5 00102 6$:    TSTW    OUTBUFFER                              ; 0825
                                 09  13 00105        BEQL    7$                                     ;
                             0C  AE  9F 00107        PUSHAB  OUTBUFFER                              ;
                             2C  A9  9F 0010A        PUSHAB  P.ABB                                  ;
                     6B          02  FB 0010D        CALLS   #2, DS$PRINTF                          ;
                                 57  DD 00110 7$:    PUSHL   RPB                                    ; 0827
          00000000G  EF          01  FB 00112        CALLS   #1, DSR$DEALLOCATE_PSEUDO_RPB          ;
                     50 00010001 8F  D0 00119        MOVL    #65537, R0                             ; 0829
                                     04 00120        RET                                            ;

; Routine Size:  289 bytes,    Routine Base:  CODE + 0609
```

```
;    0831  1      %sbttl 'ANSI directory'
;    0832  1      routine ansi_direct (filespec, count) =
;    0833  1
;    0834  1      !++
;    0835  1      ! Functional description:
;    0836  1      !
;    0837  1      !       Search through a tape to find all files, and list them on the
;    0838  1      !       console.
;    0839  1      !
;    0840  1      !       If double tape marks are found instead of a file header the
;    0841  1      !       tape is rewound and the search continued until the first file found is
;    0842  1      !       encountered again.
;    0843  1      !
;    0844  1      !       STANDALONE                [27]                                    !G:9
;    0845  1      !                                                                         !G:9
;    0846  1      ! Formal parameters:
;    0847  1      !       filespec        address of filespec block
;    0848  1      !       count           address of longword to get file count
;    0849  1      !
;    0850  1      ! Implicit inputs:
;    0851  1      !       none
;    0852  1      !
;    0853  1      ! Outputs:
;    0854  1      !       count           count of files
;    0855  1      !
;    0856  1      ! Implicit outputs:
;    0857  1      !       none
;    0858  1      !
;    0859  1      ! Routine value:
;    0860  1      !
;    0861  1      !       Standard RMS completion codes
;    0862  1      !
;    0863  1      ! Side effects:
;    0864  1      !
;    0865  1      !       The device and associated channel are accessed
;    0866  1      !
;    0867  1      !--
;    0868  1
;    0869  2          begin
;    0870  2          external routine
;    0871  2              sys$search : addressing_mode (absolute),
;    0872  2              sys$open : addressing_mode (absolute);
;    0873  2
;    0874  2          bind routine
;    0875  2              next_file =
;    0876  2
;    0877  2                  if .dsa$v_user then sys$search else sys$open;
;    0878  2
;    0879  2          local
;    0880  2              filenam : bblock [nam$c_maxrss],
;    0881  2              filedesc : bblock [dsc$c_s_bln],
;    0882  2              res_len,
;    0883  2              status,
;    0884  2              fab : $fab_decl,                        ! FAB for open
;    0885  2              nam : $nam_decl,
;    0886  2              result : bblock [nam$c_maxrss],         ! Space for resultant string
;    0887  2              expand : bblock [nam$c_maxrss],         ! Space for expanded string
```

```
;    0888  2              first_file : bblock [132],              ! First file found
;    0889  2              first_len,
;    0890  2              buffer : vector [132, byte],            ! Space for output
;    0891  2              OutBuffer : BBlock [8];                 ! Descriptor for output                                  [10]
;    0892  2
;    0893  2          ch$fill (%c' ', 132, buffer);               ! Clear output buffer
;    0894  2          OutBuffer [Dsc$W_Length] = 0;               !                                                        [10]
;    0895  2          OutBuffer [Dsc$A_Pointer] = Buffer;         !                                                        [10]
;    0896  2          first_len = 132;
;    0897  2          ch$fill (0, 132, first_file);
;    0898  2          $ds_printf ($ascic ('!/!/Directory !AS!/!/'), .filespec);                                    !G:10
;    0899  2          filedesc [dsc$w_length] = nam$c_maxrss;
;    0900  2          filedesc [dsc$a_pointer] = filenam;
;    0901  2          $fao ($ascid ('!AS*.*;*'), filedesc, filedesc, .filespec);
;    0902  2          $fab_init (fab = fab, nam = nam, fop = rwo, fna = filenam, fns = .filedesc [dsc$w_length]);
;    0903  2          $nam_init (nam = nam, ess = nam$c_maxrss, rss = nam$c_maxrss, esa = expand, rsa = result);
;    0904  2
;    0905  2          if .dsa$v_user
;    0906  2          then
;    0907  2                                                      ! Init wildcard context
;    0908  3              begin
;    0909  3
;    0910  3              local
;    0911  3                  status;
;    0912  3
;    0913  3              status = $parse (fab = fab);
;    0914  3
;    0915  3              if not .status then return .status
;    0916  3
;    0917  2              end;
;    0918  2
;    0919  2          while (status = next_file (fab); fab [fab$v_rwo] = 0; .status) do
;    0920  3              begin
;    0921  3
;    0922  3              local
;    0923  3                  nam_len,
;    0924  3                  nam_ptr;
;    0925  3
;    0926  3              if not .dsa$v_user                      ! If we did an OPEN,
;    0927  3              then                                    !  we have to CLOSE, too.
;    0928  4                  begin
;    0929  4                  status = $close (fab = fab);
;    0930  4
;    0931  4                  if not .status then exitloop
;    0932  4
;    0933  3                  end;
;    0934  3
;    0935  3              res_len = .nam [nam$b_rsl];
;    0936  3
;    0937  3              if ch$compare (.first_len, first_file, .res_len, result, 0) eql 0 then exitloop;
;    0938  3
;    0939  3              if .(first_file)<0, 8> eql 0 then ch$move (first_len = .res_len, result, first_file);
;    0940  3
;    0941  3              nam_ptr = ch$find_ch (.res_len, result, %c':') + 1;     ! Look for end of "MTAn:"
;    0942  3              nam_len = .res_len - (.nam_ptr - result);
;    0943  3              FileDesc [Dsc$W_Length] = .Nam_Len;
;    0944  3              FileDesc [Dsc$A_Pointer] = .Nam_Ptr;
```

```
;   0945  3            IF .WIDE_FLAG
;   0946  3               THEN Ch$Copy (.nam_len, .nam_ptr, %c' ', 132, buffer + .OutBuffer [Dsc$W_Length])          !      [17]
;   0947  3               ELSE Ch$Copy (.nam_len, .nam_ptr, %c' ', 19, buffer + .OutBuffer [Dsc$W_Length]);          !      [10]
;   0948  3            PutBuffer (.Count, OutBuffer, FileDesc);        !                                                  [10]
;   0949  3            If .ControlCFlag Then Return Rms$_Normal;       ! Abort gracefully on ^C                           [08]
;   0950  3
;   0951  2            end;
;   0952  2
;   0953  2         if .OutBuffer [Dsc$W_Length] gtr 0 then $ds_printf ($Ascic ('!AS!/'), OutBuffer);   !                  [10]
;   0954  2
;   0955  2         if .status eql rms$_nmf then status = rms$_normal;
;   0956  2
;   0957  2         .status
;   0958  1         end;                                          ! of ansi_direct


                                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

20  79  72  6F  74  63  65  72  69  44  2F  21  2F  21  15  0018E P.ABC:  .ASCII  <21>\!/!/Directory !AS!/!/\                ;
                                2F  21  2F  21  53  41  21  0019D                                                          ;
                            2A  3B  2A  2E  2A  53  41  21  001A4 P.ABE:  .ASCII  \!AS*.*;*\                                 ;
                                                00000008  001AC P.ABD:  .LONG   8                                          ;
                                                00000000' 001B0         .ADDRESS P.ABE                                     ;
                                    2F  21  53  41  21  05  001B4 P.ABF:  .ASCII  <5>\!AS!/\                                 ;

                                                                        .EXTRN  SYS$OPEN, SYS$CLOSE

                                                                        .PSECT  CODE,NOWRT,  SHR,2

                                                    0FFC 00000 ANSI_DIRECT:
                                                                        .WORD   Save R2,R3,R4,R5,R6,R7,R8,R9,R10,R11       ; 0832
                                5B 00000000'  EF  9E 00002              MOVAB   P.ABC, R11                                 ;
                                5E     FB38   CE  9E 00009              MOVAB   -1224(SP), SP                              ;
        5A 0000FE03   9F        01            04  EF 0000E              EXTZV   #4, #1, @#^X0000FE03, R10                  ; 0877
                                09            5A  E9 00017              BLBC    R10, 1$                                    ;
                                58 00000000G  8F  D0 0001A              MOVL    #SYS$SEARCH, R8                            ;
                                              07  11 00021              BRB     2$                                         ;
                                58 00000000G  8F  D0 00023 1$:          MOVL    #SYS$OPEN, R8                              ;
  0084   8F           20        6E            00  2C 0002A 2$:          MOVC5   #0, (SP), #32, #132, BUFFER                ; 0893
                                        08    AE     00031                                                                ;
                                              6E  B4 00033              CLRW    OUTBUFFER                                  ; 0894
                            04  AE      08    AE  9E 00035              MOVAB   BUFFER, OUTBUFFER+4                        ; 0895
                                59      84    8F  9A 0003A              MOVZBL  #132, FIRST_LEN                            ; 0896
  0084   8F           00        6E            00  2C 0003E              MOVC5   #0, (SP), #0, #132, FIRST_FILE             ; 0897
                                      008C    CE     00045                                                                ;
                                        04    AC  DD 00048              PUSHL   FILESPEC                                   ; 0898
                                              5B  DD 0004B              PUSHL   R11                                        ;
                        00000000G  9F         02  FB 0004D              CALLS   #2, @#DS$PRINTF                            ;
                            FEF8   CD     FF  8F  9B 00054              MOVZBW  #255, FILEDESC                             ; 0899
                            FEFC   CD   FF00  CD  9E 0005A              MOVAB   FILENAM, FILEDESC+4                        ; 0900
                                        04    AC  DD 00061              PUSHL   FILESPEC                                   ; 0901
                                      FEF8    CD  9F 00064              PUSHAB  FILEDESC                                   ;
                                      FEF8    CD  9F 00068              PUSHAB  FILEDESC                                   ;
                                        1E    AB  9F 0006C              PUSHAB  P.ABD                                      ;
                        00000000G  00         04  FB 0006F              CALLS   #4, SYS$FAO                                ;
  0050   8F           00        6E            00  2C 00076              MOVC5   #0, (SP), #0, #80, $RMS_PTR                ; 0902
```

```
                                        FEA8   CD      0007D                                                                  ;
                          FEA8   CD     5003   8F  B0 00080          MOVW    #20483, $RMS_PTR                                  ;
                          FEAC   CD       80   8F  9A 00087          MOVZBL  #128, $RMS_PTR+4                                  ;
                          FEBE   CD            02  90 0008D          MOVB    #2, $RMS_PTR+22                                   ;
                          FEC7   CD            02  90 00092          MOVB    #2, $RMS_PTR+31                                   ;
                          FED0   CD     FE48   CD  9E 00097          MOVAB   NAM, $RMS_PTR+40                                  ;
                          FED4   CD     FF00   CD  9E 0009E          MOVAB   FILENAM, $RMS_PTR+44                              ;
                          FEDC   CD     FEF8   CD  90 000A5          MOVB    FILEDESC, $RMS_PTR+52                             ;
  0060   8F          00          6E            00  2C 000AC          MOVC5   #0, (SP), #0, #96, $RMS_PTR                       ; 0903
                                        FE48   CD      000B3                                                                  ;
                          FE48   CD     6002   8F  B0 000B6          MOVW    #24578, $RMS_PTR                                  ;
                          FE4A   CD            01  8E 000BD          MNEGB   #1, $RMS_PTR+2                                    ;
                          FE4C   CD     0210   CE  9E 000C2          MOVAB   RESULT, $RMS_PTR+4                                ;
                          FE52   CD            01  8E 000C9          MNEGB   #1, $RMS_PTR+10                                   ;
                          FE54   CD     0110   CE  9E 000CE          MOVAB   EXPAND, $RMS_PTR+12                               ;
                                  0F            5A  E9 000D5          BLBC    R10, 3$                                           ; 0905
                                        FEA8   CD  9F 000D8          PUSHAB  FAB                                               ; 0913
                      00000000G   00            01  FB 000DC          CALLS   #1, SYS$PARSE                                     ;
                                  01            50  E8 000E3          BLBS    STATUS, 3$                                        ; 0915
                                                    04 000E6          RET                                                       ;
                                        FEA8   CD  9F 000E7 3$:      PUSHAB  FAB                                               ; 0919
                                  68            01  FB 000EB          CALLS   #1, (R8)                                          ;
                                  56            50  D0 000EE          MOVL    R0, STATUS                                        ;
                          FEAC   CD       80   8F  8A 000F1          BICB2   #128, FAB+4                                       ;
                                  11            56  E9 000F7          BLBC    STATUS, 4$                                        ;
                                  14            5A  E8 000FA          BLBS    R10, 5$                                           ; 0926
                                        FEA8   CD  9F 000FD          PUSHAB  FAB                                               ; 0929
                      00000000G   00            01  FB 00101          CALLS   #1, SYS$CLOSE                                     ;
                                  56            50  D0 00108          MOVL    R0, STATUS                                        ;
                                  03            56  E8 0010B 4$:      BLBS    STATUS, 5$                                        ; 0931
                                           008D   31 0010E            BRW     12$                                               ;
                                  57     FE4B   CD  9A 00111 5$:      MOVZBL  NAM+3, RES_LEN                                    ; 0935
                                  54            01  D0 00116          MOVL    #1, R4                                            ; 0937
        57          00     008C   CE            59  2D 00119          CMPC5   FIRST_LEN, FIRST_FILE, #0, RES_LEN, RESULT        ;
                                        0210   CE      00120                                                                  ;
                                                  03  1A 00123          BGTRU   6$                                                ;
                                  54            01  D9 00125          SBWC    #1, R4                                            ;
                                                  54  D5 00128 6$:      TSTL    R4                                                ;
                                                  72  13 0012A          BEQL    12$                                               ;
                                        008C   CE  95 0012C          TSTB    FIRST_FILE                                        ; 0939
                                                  0B  12 00130          BNEQ    7$                                                ;
                                  59            57  D0 00132          MOVL    RES_LEN, FIRST_LEN                                ;
              008C   CE     0210   CE            57  28 00135          MOVC3   RES_LEN, RESULT, FIRST_FILE                       ;
              0210   CE            57            3A  3A 0013D 7$:      LOCC    #58, RES_LEN, RESULT                              ; 0941
                                                  02  12 00143          BNEQ    8$                                                ;
                                                  51  D4 00145          CLRL    R1                                                ;
                                                  51  D6 00147 8$:      INCL    NAM_PTR                                           ;
                                  50     0210   CE  9E 00149          MOVAB   RESULT, R0                                        ; 0942
                                  50            51  C2 0014E          SUBL2   NAM_PTR, R0                                       ;
                          52      50            57  C1 00151          ADDL3   RES_LEN, R0, NAM_LEN                              ;
                          FEF8   CD            52  B0 00155          MOVW    NAM_LEN, FILEDESC                                 ; 0943
                          FEFC   CD            51  D0 0015A          MOVL    NAM_PTR, FILEDESC+4                               ; 0944
                                  50            6E  3C 0015F          MOVZWL  OUTBUFFER, R0                                     ; 0946
                                  0C 00000000'  EF  E9 00162          BLBC    WIDE_FLAG, 9$                                     ; 0945
  0084   8F          20            61            52  2C 00169          MOVC5   NAM_LEN, (NAM_PTR), #32, #132, BUFFER[R0]         ; 0946
                                           08 AE40      00170                                                                  ;
                                                  08  11 00173          BRB     10$                                               ;
```

```
        13          20          61          52  2C 00175 9$:    MOVC5   NAM_LEN, (NAM_PTR), #32, #19, BUFFER[R0]    ; 0947
                                      08 AE40     0017A                                                           ;
                                    FEF8   CD  9F 0017D 10$:   PUSHAB  FILEDESC                                    ; 0948
                                      04   AE  9F 00181        PUSHAB  OUTBUFFER                                   ;
                                      08   AC  DD 00184        PUSHL   COUNT                                       ;
                      FA78   CF           03  FB 00187        CALLS   #3, PUTBUFFER                               ;
                             03 00000000' EF  E8 0018C        BLBS    CONTROLCFLAG, 11$                           ; 0949
                                        FF51  31 00193        BRW     3$                                          ;
                             50 00010001  8F  D0 00196 11$:   MOVL    #65537, R0                                  ;
                                              04 0019D        RET                                                 ;
                                          6E  B5 0019E 12$:   TSTW    OUTBUFFER                                   ; 0953
                                          0C  13 001A0        BEQL    13$                                         ;
                                          5E  DD 001A2        PUSHL   SP                                          ;
                                      26  AB  9F 001A4        PUSHAB  P.ABF                                       ;
                   00000000G  9F          02  FB 001A7        CALLS   #2, a#DS$PRINTF                             ;
                   000182CA   8F          56  D1 001AE 13$:   CMPL    STATUS, #99018                              ; 0955
                                          07  12 001B5        BNEQ    14$                                         ;
                             56 00010001  8F  D0 001B7        MOVL    #65537, STATUS                              ;
                             50           56  D0 001BE 14$:   MOVL    STATUS, R0                                  ; 0958
                                              04 001C1        RET                                                 ;

; Routine Size:  450 bytes,    Routine Base:  CODE + 072A
```

```
;   0960  1     %sbttl 'ods directory'
;   0961  1     routine ods_direct (q_filspec, count, ultrix_wcard) =
;   0962  2         begin
;   0963  2
;   0964  2         local
;   0965  2             status,
;   0966  2             fab : $fab_decl,                        ! FAB block to read directory file
;   0967  2             rab : $rab_decl,                        ! RAB block
;   0968  2             buffer : bblock [512],                  ! Buffer to read record into
;   0969  2             t_directory : bblock [8],               ! Buffer for parsed directory
;   0970  2             q_directory : bblock [dsc$c_s_bln],     ! Descriptor of parsed directory
;   0971  2             base_directory : bblock [dsc$c_s_bln],  ! Descriptor of direct                          !
;   0972  2             q_file : bblock [dsc$c_s_bln],          ! Descriptor for file name
;   0973  2             t_file : bblock [512],                  ! Space for file name           [18]
;   0974  2             q_buffer : bblock [dsc$c_s_bln],        ! Descriptor for output buffer
;   0975  2             t_buffer : bblock [132];                ! Buffer to build file list     [18]
;   0976  2
;   0977  2         bind
;   0978  2             base_direct = $ascid ('0,0'),           ! Normal base directory                         !
;   0979  2             q_direct = .q_filspec + dsc$c_s_bln : bblock;   ! Directory descriptor
;   0980  2
;   0981  2         local
;   0982  2             left,
;   0983  2             right,
;   0984  2             p_dot,                                                                                  !
;   0985  2             l_dot,                                                                                  !
;   0986  2             p_lpart,
;   0987  2             p_rpart,
;   0988  2             l_rpart,
;   0989  2             l_lpart,
;   0990  2             p_comma,
;   0991  2             l_rest,
;   0992  2             start_size :BYTE;                       !                       [22]
;   0993  2
;   0994  2                                                                                             !G:9
;   0995  2         q_file [dsc$w_length] = 512 ;               !                       [18]
;   0996  2         q_file [dsc$a_pointer] = t_file;
;   0997  2
;   0998  2         IF  (.ultrix_flags)<ultrix_v_mode,1>                                ! [22]
;   0999  2             THEN
;   1000  3             begin
;   1001  3             $fao    ($ascid ('!AS!AS!AS!AS'), q_file,q_file,.q_filspec,.q_filspec+8,.q_filspec+16,.q_filspec+24);
;   1002  3             $ds_printf      ($ascic ('!/!/Directory_!AS !/!/'),q_file);             ! [22]          !G:10
;   1003  3             start_size =  .q_file<0,8> ;    ! Save original length of file string [22]
;   1004  3             end_size = q_file = .q_file -.ultrix_wcard;     ! Cut off the wildcarded part       [22]
;   1005  3             END
;   1006  2             ELSE
;   1007  3             BEGIN
;   1008  3         ch$move (8, base_direct, base_directory);   ! Assume normal directory                      !
;   1009  3         p_lpart = .q_direct [dsc$a_pointer] + 1;    ! Point past "["
;   1010  3         l_rest = .q_direct [dsc$w_length] - 2;      ! Exclude brackets
;   1011  3         p_comma = ch$find_ch (.l_rest, .p_lpart, %c',');    ! Find ',' if any
;   1012  3
;   1013  3         if .p_comma neq 0                           ! If there was a comma ("[octal,octal]")
;   1014  3         then
;   1015  4             begin
;   1016  4             p_rpart = .p_comma + 1;
```

```
;    1017  4              l_lpart = .p_comma - .p_lpart;          ! Length of left number
;    1018  4              l_rpart = .l_rest - .l_lpart - 1;       ! Length of right number
;    1019  4              left = scan$numeric (8, .l_lpart, .p_lpart);
;    1020  4              right = scan$numeric (8, .l_rpart, .p_rpart);
;    1021  4              q_directory [dsc$a_pointer] = t_directory;
;    1022  4              q_directory [dsc$w_length] = 8;
;    1023  5              $fao ($ascid ('!30L!30L'), q_directory, q_directory, .left, .right)
;    1024  4              end
;    1025  3          else
;    1026  4              begin                                   ! Copy string, without '[]'                              !
;    1027  4              q_directory [dsc$w_length] = .q_direct [dsc$w_length] - 2;                                       !
;    1028  4              q_directory [dsc$a_pointer] = .q_direct [dsc$a_pointer] + 1                                      !
;    1029  3              end;                                                                                             !
;    1030  3      !
;    1031  3      ! Print out the header
;    1032  3      !
;    1033  3          $ds_printf ($ascic ('!/!/Directory !AS[!AS]!/!/'), .q_filspec, q_directory);        ! Print header  !G:10
;    1034  3      !                                                                                                        !
;    1035  3      ! Now, check for subdirectories, and kluge string around                                                 !
;    1036  3      !                                                                                                        !
;    1037  3          p_dot = ch$find_ch (.l_rest, .p_lpart, %c'.');                                                       !
;    1038  3                                                                                                               !
;    1039  3          if not ch$fail (.p_dot)                 ! If there are subdirectories                            !
;    1040  3          then                                                                                                 !
;    1041  4              begin                                                                                            !
;    1042  4                                                                                                               !
;    1043  4              local                                                                                            !
;    1044  4                  last_dot;                                                                                    !
;    1045  4                                                                                                               !
;    1046  4              while not ch$fail (.p_dot) do       ! Find last dot                                          !
;    1047  5                  begin                                                                                        !
;    1048  5                  last_dot = .p_dot;                                                                           !
;    1049  5                  p_dot = ch$find_ch (.l_rest - (.p_dot - .p_lpart) - 1,                                       !
;    1050  5                      .p_dot + 1, %c'.')                                                                       !
;    1051  4                  end;                                                                                         !
;    1052  4                                                                                                               !
;    1053  4              base_directory [dsc$w_length] = .last_dot - .p_lpart;                                            !
;    1054  4              base_directory [dsc$a_pointer] = .p_lpart;                                                       !
;    1055  4              q_directory [dsc$w_length] = .l_rest - (.last_dot - .p_lpart) - 1;                               !
;    1056  4              q_directory [dsc$a_pointer] = .last_dot + 1                                                      !
;    1057  3              end;                                                                                             !
;    1058  3
;    1059  3      !
;    1060  3      ! Now get the filename to look up
;    1061  3      !
; P  1062  3          $fao ($ascid ('!AS[!AS]!AS.DIR;0'),     ! Create file to look up (directory)                         !
;    1063  3              q_file, q_file, .q_filspec, base_directory, q_directory);                                        !
;    1064  3
;    1065  2              END;                                                                    ! [22]
;    1066  2
;    1067  2          $fab_init (fab = fab, dnm = '.dir', fna = .q_file [dsc$a_pointer], fns = .q_file [dsc$w_length], fac = get);
;    1068  2          $rab_init (rab = rab, fab = fab, ubf = buffer, usz = 512);
;    1069  2
;    1070  3          if not (status = $open (fab = fab))
;    1071  2          then
;    1072  3              return (selectone .status of
;    1073  3                      set
```

```
;    1074  3                    [rms$_fnf] : rms$_dnf;
;    1075  3                    [otherwise] : .status
;    1076  2                    tes);
;    1077  2          IF  (.ultrix_flags)<ultrix_v_mode,1>                              ! [22]
;    1078  2              THEN
;    1079  2              IF .end_size   EQL  .start_size
;    1080  2                 Then filespecmatch[dsc$w_length] = 0; ! If file string was not shorten no matching file given
;    1081  3          if not (status = $connect (rab = rab))
;    1082  2          then
;    1083  3              begin
;    1084  3              $close (fab = fab);
;    1085  3              return .status
;    1086  2              end;
;    1087  2
;    1088  2          ch$fill (%c' ', 132, t_buffer);                    !       [18]
;    1089  2          q_buffer [dsc$w_length] = 0;
;    1090  2          q_buffer [dsc$a_pointer] = t_buffer;
;    1091  2
;    1092  2          while (status = $get (rab = rab)) do
;    1093  3              Begin
;    1094  3
;    1095  3          IF  (.ultrix_flags)<ultrix_v_mode,1>                              ! [22]
;    1096  3              THEN
;    1097  3                      format_ULTRIX (.rab [rab$w_rsz], .rab [rab$l_rbf], q_buffer, .count) ! [22]
;    1098  3              ELSE
;    1099  4              BEGIN
;    1100  4              case .fab [fab$b_rfm] from fab$c_fix to fab$c_var of
;    1101  4                  set
;    1102  4
;    1103  4                  [fab$c_fix] :
;    1104  4                      format_ods1 (.rab [rab$w_rsz], .rab [rab$l_rbf], q_buffer, .count);
;    1105  4
;    1106  4                  [fab$c_var] :
;    1107  4                      format_ods2 (.rab [rab$w_rsz], .rab [rab$l_rbf], q_buffer, .count);
;    1108  4
;    1109  4                  [outrange] :
;    1110  5                      begin
;    1111  5                      $close (fab = fab);
;    1112  5                      return ss$_filestruct          ! Bad file structure level
;    1113  4                      end;
;    1114  4                  tes;
;    1115  4
;    1116  3                  END;                                                  ! [22]
;    1117  3              If .ControlCFlag Then Exitloop          ! Close file and leave on ^C                    [08]
;    1118  3
;    1119  2              End;
;    1120  2
;    1121  2          if .q_buffer [dsc$w_length] neq 0 then $ds_printf ($ascic ('!AS!/'), q_buffer);
;    1122  2
;    1123  2          $close (fab = fab);
;    1124  3          (selectone .status of
;    1125  3              set
;    1126  3              [rms$_eof] : rms$_normal;
;    1127  3              [otherwise] : .status
;    1128  3              tes)
;    1129  1          end;
```

```
                                                                                .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                                                  30  2C  30  001BA P.ABH:  .ASCII  \0,0\                                  ;
                                                              001BD         .BLKB   3
                                                    00000003  001C0 P.ABG:  .LONG   3                                      ;
                                                    00000000' 001C4         .ADDRESS P.ABH                                 ;
                53  41  21  53  41  21  53  41  21  53  41  21  001C8 P.ABJ:  .ASCII  \!AS!AS!AS!AS\                         ;
                                                    0000000C  001D4 P.ABI:  .LONG   12                                     ;
                                                    00000000' 001D8         .ADDRESS P.ABJ                                 ;
5F  79  72  6F  74  63  65  72  69  44  2F  21  2F  21  16  001DC P.ABK:  .ASCII  <22>\!/!/Directory_!AS !/!/\                ;
                            2F  21  2F  21  20  53  41  21  001EB                                                          ;
                            4C  4F  33  21  4C  4F  33  21  001F3 P.ABM:  .ASCII  \!3OL!3OL\                              ;
                                                              001FB         .BLKB   1
                                                    00000008  001FC P.ABL:  .LONG   8                                      ;
                                                    00000000' 00200         .ADDRESS P.ABM                                 ;
20  79  72  6F  74  63  65  72  69  44  2F  21  2F  21  1A  00204 P.ABN:  .ASCII  <26>\!/!/Directory !AS[!AS]!/!/\            ;
            2F  21  2F  21  5D  53  41  21  5B  53  41  21  00213                                                          ;
52  49  44  2E  53  41  21  5D  53  41  21  5B  53  41  21  0021F P.ABP:  .ASCII  \!AS[!AS]!AS.DIR;0\                      ;
                                                      30  3B  0022E                                                          ;
                                                    00000011  00230 P.ABO:  .LONG   17                                     ;
                                                    00000000' 00234         .ADDRESS P.ABP                                 ;
                                                  72  69  64  2E  00238 P.ABQ:  .ASCII  \.dir\                                 ;
                                          2F  21  53  41  21  05  0023C P.ABR:  .ASCII  <5>\!AS!/\                              ;

                                                                  BASE_DIRECT=        P.ABG
                                                                                .EXTRN  SYS$CONNECT, SYS$GET

                                                                                .PSECT  CODE,NOWRT,  SHR,2

                                                      0FFC 00000 ODS_DIRECT:
                                                                                .WORD   Save R2,R3,R4,R5,R6,R7,R8,R9,R10,R11   ; 0961
                                  5E      FABC   CE  9E 00002                   MOVAB   -1348(SP), SP                          ;
                                  56        04   AC  D0 00007                   MOVL    Q_FILSPEC, R6                          ; 0979
                                  57        08   A6  9E 0000B                   MOVAB   8(R6), R7                              ;
                          0290    CE      0200   8F  B0 0000F                   MOVW    #512, Q_FILE                           ; 0995
                          0294    CE      0090   CE  9E 00016                   MOVAB   T_FILE, Q_FILE+4                       ; 0996
                                  4C 00000000G   EF  E9 0001D                   BLBC    ULTRIX_FLAGS, 1$                       ; 0998
                                            18   A6  9F 00024                   PUSHAB  24(R6)                                 ; 1001
                                            10   A6  9F 00027                   PUSHAB  16(R6)                                 ;
                                            08   A6  9F 0002A                   PUSHAB  8(R6)                                  ;
                                                 56  DD 0002D                   PUSHL   R6                                     ;
                                          02A0   CE  9F 0002F                   PUSHAB  Q_FILE                                 ;
                                          02A4   CE  9F 00033                   PUSHAB  Q_FILE                                 ;
                                     00000000'   EF  9F 00037                   PUSHAB  P.ABI                                  ;
                      00000000G   00             07  FB 0003D                   CALLS   #7, SYS$FAO                            ;
                                          0290   CE  9F 00044                   PUSHAB  Q_FILE                                 ; 1002
                                     00000000'   EF  9F 00048                   PUSHAB  P.ABK                                  ;
                      00000000G   9F             02  FB 0004E                   CALLS   #2, a#DS$PRINTF                        ;
                                  6E      0290   CE  90 00055                   MOVB    Q_FILE, START_SIZE                     ; 1003
                  50      0290    CE        0C   AC  C3 0005A                   SUBL3   ULTRIX_WCARD, Q_FILE, R0               ; 1004
                          0290    CE             50  D0 00061                   MOVL    R0, Q_FILE                             ;
                      00000000'   EF             50  90 00066                   MOVB    R0, END_SIZE                           ;
                                             00FA  31 0006D                   BRW     9$                                     ;
          0298    CE 00000000'   EF             08  28 00070 1$:               MOVC3   #8, BASE_DIRECT, BASE_DIRECTORY        ; 1008
                  53        04   A7             01  C1 0007A                   ADDL3   #1, 4(R7), R3                          ; 1009
```

```
                        52          67  3C 0007F        MOVZWL  (R7), R2                                ; 1010
                        52          02  C2 00082        SUBL2   #2, R2                                  ;
                        57          52  7D 00085        MOVQ    R2, L_REST                              ;
          68            57          2C  3A 00088        LOCC    #44, L_REST, (P_LPART)                  ; 1011
                                    02  12 0008C        BNEQ    2$                                      ;
                                    51  D4 0008E        CLRL    R1                                      ;
                                    51  D5 00090 2$:    TSTL    P_COMMA                                 ; 1013
                                    55  13 00092        BEQL    3$                                      ;
                        5A      01  A1  9E 00094        MOVAB   1(R1), P_RPART                          ; 1016
          50            51          58  C3 00098        SUBL3   P_LPART, P_COMMA, L_LPART               ; 1017
          54            57          50  C3 0009C        SUBL3   L_LPART, L_REST, R4                     ; 1018
                        59      FF  A4  9E 000A0        MOVAB   -1(R4), L_RPART                         ;
                        55          58  D0 000A4        MOVL    P_LPART, R5                             ; 1019
                        54          50  D0 000A7        MOVL    L_LPART, R4                             ;
                        53          08  D0 000AA        MOVL    #8, R3                                  ;
                        00000000G   EF  16 000AD        JSB     SCAN$NUMERIC                            ;
                        5B          50  D0 000B3        MOVL    R0, LEFT                                ;
                        54          59  7D 000B6        MOVQ    L_RPART, R4                             ; 1020
                        53          08  D0 000B9        MOVL    #8, R3                                  ;
                        00000000G   EF  16 000BC        JSB     SCAN$NUMERIC                            ;
                FD60    CD    FD64  CD  9E 000C2        MOVAB   T_DIRECTORY, Q_DIRECTORY+4              ; 1021
                02A0    CE          08  B0 000C9        MOVW    #8, Q_DIRECTORY                         ; 1022
                                    50  DD 000CE        PUSHL   RIGHT                                   ; 1023
                                    5B  DD 000D0        PUSHL   LEFT                                    ;
                              FD5C  CD  9F 000D2        PUSHAB  Q_DIRECTORY                             ;
                              FD5C  CD  9F 000D6        PUSHAB  Q_DIRECTORY                             ;
                        00000000'   EF  9F 000DA        PUSHAB  P.ABL                                   ;
          00000000G     00          05  FB 000E0        CALLS   #5, SYS$FAO                             ;
                                    0A  11 000E7        BRB     4$                                      ;
                02A0    CE          52  B0 000E9 3$:    MOVW    R2, Q_DIRECTORY                         ; 1027
                FD60    CD          53  D0 000EE        MOVL    R3, Q_DIRECTORY+4                       ; 1028
                              02A0  CE  9F 000F3 4$:    PUSHAB  Q_DIRECTORY                             ; 1033
                                    56  DD 000F7        PUSHL   R6                                      ;
                        00000000'   EF  9F 000F9        PUSHAB  P.ABN                                   ;
          00000000G     9F          03  FB 000FF        CALLS   #3, a#DS$PRINTF                         ;
          68            57          2E  3A 00106        LOCC    #46, L_REST, (P_LPART)                  ; 1037
                                    02  12 0010A        BNEQ    5$                                      ;
                                    51  D4 0010C        CLRL    R1                                      ;
                                    51  D5 0010E 5$:    TSTL    P_DOT                                   ; 1039
                                    39  13 00110        BEQL    8$                                      ;
                                    51  D5 00112 6$:    TSTL    P_DOT                                   ; 1046
                                    17  13 00114        BEQL    7$                                      ;
                        52          51  D0 00116        MOVL    P_DOT, LAST_DOT                         ; 1048
          55            58          51  C3 00119        SUBL3   P_DOT, P_LPART, R5                      ; 1049
                        50      FF A547  9E 0011D        MOVAB   -1(R5)[L_REST], R0                      ;
     01   A1            50          2E  3A 00122        LOCC    #46, R0, 1(P_DOT)                       ; 1050
                                    E9  12 00127        BNEQ    6$                                      ;
                                    51  D4 00129        CLRL    R1                                      ;
                                    E5  11 0012B        BRB     6$                                      ;
          50            52          58  C3 0012D 7$:    SUBL3   P_LPART, LAST_DOT, R0                   ; 1053
                0298    CE          50  B0 00131        MOVW    R0, BASE_DIRECTORY                      ;
                029C    CE          58  D0 00136        MOVL    P_LPART, BASE_DIRECTORY+4               ; 1054
          54            57          50  C3 0013B        SUBL3   R0, L_REST, R4                          ; 1055
    02A0  CE            54          01  A3 0013F        SUBW3   #1, R4, Q_DIRECTORY                     ;
                FD60    CD      01  A2  9E 00145        MOVAB   1(R2), Q_DIRECTORY+4                    ; 1056
                              02A0  CE  9F 0014B 8$:    PUSHAB  Q_DIRECTORY                             ; 1063
                              029C  CE  9F 0014F        PUSHAB  BASE_DIRECTORY                          ;
```

```
                                                  56  DD 00153          PUSHL   R6                                          ;
                                            029C  CE  9F 00155          PUSHAB  Q_FILE                                      ;
                                            02A0  CE  9F 00159          PUSHAB  Q_FILE                                      ;
                                        00000000'  EF  9F 0015D          PUSHAB  P.ABO                                       ;
                        00000000G  00              06  FB 00163          CALLS   #6, SYS$FAO                                 ;
  0050   8F          00            6E              00  2C 0016A 9$:      MOVC5   #0, (SP), #0, #80, $RMS_PTR                 ; 1067
                                              B0  AD     00171                                                              ;
                              B0  AD        5003  8F  B0 00173          MOVW    #20483, $RMS_PTR                            ;
                              C6  AD              02  90 00179          MOVB    #2, $RMS_PTR+22                             ;
                              CF  AD              02  90 0017D          MOVB    #2, $RMS_PTR+31                             ;
                              DC  AD        0294  CE  D0 00181          MOVL    Q_FILE+4, $RMS_PTR+44                       ;
                              E0  AD 00000000'    EF  9E 00187          MOVAB   P.ABQ, $RMS_PTR+48                          ;
                              E4  AD        0290  CE  90 0018F          MOVB    Q_FILE, $RMS_PTR+52                         ;
                              E5  AD              04  90 00195          MOVB    #4, $RMS_PTR+53                             ;
  0044   8F          00            6E              00  2C 00199          MOVC5   #0, (SP), #0, #68, $RMS_PTR                 ; 1068
                                            FF6C  CD     001A0                                                              ;
                            FF6C  CD        4401  8F  B0 001A3          MOVW    #17409, $RMS_PTR                            ;
                              8C  AD        0200  8F  B0 001AA          MOVW    #512, $RMS_PTR+32                           ;
                              90  AD        FD6C  CD  9E 001B0          MOVAB   BUFFER, $RMS_PTR+36                         ;
                              A8  AD          B0  AD  9E 001B6          MOVAB   FAB, $RMS_PTR+60                            ;
                                              B0  AD  9F 001BB          PUSHAB  FAB                                         ; 1070
                        00000000G  00              01  FB 001BE          CALLS   #1, SYS$OPEN                                ;
                                   56              50  D0 001C5          MOVL    R0, STATUS                                  ;
                                   11              56  E8 001C8          BLBS    STATUS, 10$                                 ;
                        00018292   8F              56  D1 001CB          CMPL    STATUS, #98962                              ; 1074
                                                   39  12 001D2          BNEQ    12$                                         ;
                                   50 0001C04A     8F  D0 001D4          MOVL    #114762, R0                                 ;
                                                      04 001DB          RET                                                 ;
                                   0F 00000000G    EF  E9 001DC 10$:     BLBC    ULTRIX_FLAGS, 11$                           ; 1077
                                   6E 00000000'    EF  91 001E3          CMPB    END_SIZE, START_SIZE                        ; 1079
                                                   06  12 001EA          BNEQ    11$                                         ;
                                      00000000'    EF  B4 001EC          CLRW    FILESPECMATCH                               ; 1080
                                            FF6C  CD  9F 001F2 11$:     PUSHAB  RAB                                         ; 1081
                        00000000G  00              01  FB 001F6          CALLS   #1, SYS$CONNECT                             ;
                                   56              50  D0 001FD          MOVL    R0, STATUS                                  ;
                                   0D              56  E8 00200          BLBS    STATUS, 13$                                 ;
                                              B0  AD  9F 00203          PUSHAB  FAB                                         ; 1084
                        00000000G  00              01  FB 00206          CALLS   #1, SYS$CLOSE                               ;
                                                 00BA  31 0020D 12$:     BRW     22$                                         ; 1085
  0084   8F          20            6E              00  2C 00210 13$:     MOVC5   #0, (SP), #32, #132, T_BUFFER               ; 1088
                                              04  AE     00217                                                              ;
                                            0088  CE  B4 00219          CLRW    Q_BUFFER                                    ; 1089
                            008C  CE          04  AE  9E 0021D          MOVAB   T_BUFFER, Q_BUFFER+4                        ; 1090
                                            FF6C  CD  9F 00223 14$:     PUSHAB  RAB                                         ; 1092
                        00000000G  00              01  FB 00227          CALLS   #1, SYS$GET                                 ;
                                   56              50  D0 0022E          MOVL    R0, STATUS                                  ;
                                   64              56  E9 00231          BLBC    STATUS, 20$                                 ;
                                   15 00000000G    EF  E9 00234          BLBC    ULTRIX_FLAGS, 15$                           ; 1095
                                              08  AC  DD 0023B          PUSHL   COUNT                                       ; 1097
                                            008C  CE  9F 0023E          PUSHAB  Q_BUFFER                                    ;
                                              94  AD  DD 00242          PUSHL   RAB+40                                      ;
                                   7E         8E  AD  3C 00245          MOVZWL  RAB+34, -(SP)                               ;
                            F8BF  CF              04  FB 00249          CALLS   #4, FORMAT_ULTRIX                           ;
                                                   41  11 0024E          BRB     19$                                         ;
                      01           01         CF  AD  8F 00250 15$:     CASEB   FAB+31, #1, #1                              ; 1100
                                 0029            0014     00255 16$:     .WORD   17$-16$,-                                   ;
                                                                                 18$-16$                                     ;
```

```
                                  B0   AD  9F 00259          PUSHAB  FAB                                  ; 1111
          00000000G  00              01  FB 0025C          CALLS   #1, SYS$CLOSE                        ;
                     50       08C0   8F  3C 00263          MOVZWL  #2240, R0                            ; 1112
                                         04 00268          RET                                          ;
                                  08   AC  DD 00269 17$:    PUSHL   COUNT                                ; 1104
                                008C   CE  9F 0026C          PUSHAB  Q_BUFFER                             ;
                                  94   AD  DD 00270          PUSHL   RAB+40                               ;
                     7E           8E   AD  3C 00273          MOVZWL  RAB+34, -(SP)                        ;
              F93A   CF              04  FB 00277          CALLS   #4, FORMAT_ODS1                      ;
                                     13  11 0027C          BRB     19$                                  ;
                                  08   AC  DD 0027E 18$:    PUSHL   COUNT                                ; 1107
                                008C   CE  9F 00281          PUSHAB  Q_BUFFER                             ;
                                  94   AD  DD 00285          PUSHL   RAB+40                               ;
                     7E           8E   AD  3C 00288          MOVZWL  RAB+34, -(SP)                        ;
              F9C5   CF              04  FB 0028C          CALLS   #4, FORMAT_ODS2                      ;
                     8B 00000000'    EF  E9 00291 19$:     BLBC    CONTROLCFLAG, 14$                    ; 1117
                                0088   CE  B5 00298 20$:     TSTW    Q_BUFFER                             ; 1121
                                     11  13 0029C          BEQL    21$                                  ;
                                0088   CE  9F 0029E          PUSHAB  Q_BUFFER                             ;
                           00000000'   EF  9F 002A2          PUSHAB  P.ABR                                ;
          00000000G  9F              02  FB 002A8          CALLS   #2, a#DS$PRINTF                      ;
                                  B0   AD  9F 002AF 21$:    PUSHAB  FAB                                  ; 1123
          00000000G  00              01  FB 002B2          CALLS   #1, SYS$CLOSE                        ;
          0001827A   8F              56  D1 002B9          CMPL    STATUS, #98938                       ; 1126
                                     08  12 002C0          BNEQ    22$                                  ;
                     50 00010001     8F  D0 002C2          MOVL    #65537, R0                           ;
                                         04 002C9          RET                                          ;
                     50              56  D0 002CA 22$:     MOVL    STATUS, R0                           ; 1124
                                         04 002CD          RET                                          ; 1129

; Routine Size:  718 bytes,    Routine Base:  CODE + 08EC
```

```
;    1131  1      %sbttl 'Main code'
;    1132  1
;    1133  1      global routine dsx$directory (cli_block) : cali_cli novalue =
;    1134  1
;    1135  1      !++
;    1136  1      !
;    1137  1      ! Functional description:
;    1138  1      !       This code just lists the file names and versions in a directory
;    1139  1      !
;    1140  1      ! Inputs:
;    1141  1      !       cli_block               pointer to cli block
;    1142  1      !
;    1143  1      ! Implicit inputs:
;    1144  1      !       none
;    1145  1      !
;    1146  1      ! Outputs:
;    1147  1      !       none
;    1148  1      !
;    1149  1      ! Implicit outputs:
;    1150  1      !       types directory of device
;    1151  1      !
;    1152  1      ! Side effects:
;    1153  1      !       accesses device via RMS
;    1154  1      !
;    1155  1      ! Return status:
;    1156  1      !       none
;    1157  1      !--
;    1158  1
;    1159  2          begin
;    1160  2
;    1161  2          Routine InterceptControlC =
;    1162  3              Begin
;    1163  4              (ControlCFlag = 1)      ! Just set the flag
;    1164  2              End;



                                        0000 00000 INTERCEPTCONTROLC:
                                                   .WORD   Save nothing                                    ; 1161
                    00000000'  EF          01  90 00002        MOVB    #1, CONTROLCFLAG                    ; 1163
                               50          01  D0 00009        MOVL    #1, R0                              ; 1164
                                           04 0000C            RET                                         ;

; Routine Size:  13 bytes,    Routine Base:  CODE + 0BBA


;    1165  2
;    1166  2          External Routine
;    1167  2              PPA$DIRECTORY : Addressing_Mode (Long_Relative) WEAK,   !                  [25]  !G:2
;    1168  2              sys$getdvi : addressing_mode (general); !                                  [26] gets information about
;    1169  2                                                                                              !G:6
;    1170  2                                                                                              !G:11
;    1171  2          local                                                                               !G:11
;    1172  2              count,
;    1173  2              length,
```

```
;    1174  2              pointer,
;    1175  2              status,                                 !                                   [05]            !G:6
;    1176  2              ppa_stat,                               !                                   [25]            !G:11
;    1177  2              ultrix_wcard :BYTE,                     ! Length of filename if wildcards present [22] !G:6
;    1178  2              FileMatch : Vector [Nam$C_MaxRss, Byte], !                                   [10]            !G:6
;    1179  2              q_fileblock : bblock [dsc$c_s_bln*5];    ! File part descriptors                             !G:6
;    1180  2
;    1181  2                                                                                                          !G:2
;    1182  2          map
;    1183  2              cli_block : ref bblock;
;    1184  2
;    1185  2          Bind                        !                                                                   [10]
;    1186  2              WildCardMask = $Ascid ('*.*;*') : Block [, Byte];       !                                   [10]
;    1187  2
;    1188  2          ControlCFlag = 0;                           ! Initially clear the flag                          [08]
;    1189  2          $Ds_CntrlC (AstAdr = InterceptControlC);    ! Set Control C handler
;    1190  2
;    1191  2          IF  (.ultrix_flags)<ultrix_v_mode,1>                                        ! [22]
;    1192  2              THEN
;    1193  3              BEGIN
;    1194  3          CH$FILL(0,dsc$c_s_bln*5, Q_FILEBLOCK);                  ! Clear out                     [22]
;    1195  3          breakup_file (def$c_ultrix_len, def$q_ultrix, q_fileblock); ! Merge last-chance spec
;    1196  3          breakup_file (.def$q_dev [dsc$w_length], .def$q_dev [dsc$a_pointer], q_fileblock);
;    1197  3                                                      ! Merge default device
;    1198  3          breakup_file (.def$q_dir [dsc$w_length], .def$q_dir [dsc$a_pointer], q_fileblock);
;    1199  3                                                      ! Merge default directory
;    1200  3              END                                                         ! [22]
;    1201  2              ELSE
;    1202  3              BEGIN
;    1203  3          breakup_file (def$c_bkstp_len, def$q_backstop, q_fileblock);        ! Merge last-chance spec
;    1204  3          breakup_file (.def$q_dev [dsc$w_length], .def$q_dev [dsc$a_pointer], q_fileblock);
;    1205  3                                                      ! Merge default device
;    1206  3          breakup_file (.def$q_dir [dsc$w_length], .def$q_dir [dsc$a_pointer], q_fileblock);
;    1207  3                                                      ! Merge default directory
;    1208  3          BreakUp_File (.WildCardMask [Dsc$W_Length], .WildCardMask [Dsc$A_Pointer], Q_FileBlock);    !      [10]
;    1209  2              END;                                                        ! [22]
;    1210  2          breakup_file (.cli_block [cli$w_file_len], .cli_block [cli$l_file_adr], q_fileblock);
;    1211  2                                                      ! Merge operator file spec
;    1212  2          FileSpecMatch [Dsc$W_Length] = 0;           ! Initialize descriptor                             [10]
;    1213  2          FileSpecMatch [Dsc$A_Pointer] = FileMatch;  !                                                   [10]
;    1214  2
;    1215  2          Incr Index From 2 to 4 Do                   ! Merge the final spec                              [10]
;    1216  3              Begin                                   !                                                   [10]
;    1217  3
;    1218  3              Bind                                    !                                                   [10]
;    1219  3                  Desc = Q_FileBlock + .Index*8 : Block [, Byte];     !                                   [10]
;    1220  3
;    1221  3              If .Desc [Dsc$W_Length] + .FileSpecMatch [Dsc$W_Length] Gtr Nam$C_MaxRss        !           [10]
;    1222  3              Then                                    !                                                   [10]
;    1223  3                  Exitloop;                           !                                                   [10]
;    1224  3
;    1225  3              If .Desc [Dsc$W_Length] Neq 0           !                                                   [10]
;    1226  3               And .Desc [Dsc$A_Pointer] Neq 0        !                                                   [10]
;    1227  3              Then                                    !                                                   [10]
;    1228  4                  Begin                               !                                                   [10]
;    1229  4
;    1230  4                  Bind                                !                                                   [10]
```

```
;    1231  4                    Destination = .FileSpecMatch [Dsc$W_Length] + .FileSpecMatch [Dsc$A_Pointer];   !                [10]
;    1232  4
;    1233  4                Ch$Move (                                   !                                                    [10]
;    1234  4                    .Desc [Dsc$W_Length],                   !                                                    [10]
;    1235  4                    .Desc [Dsc$A_Pointer],                  !                                                    [10]
;    1236  4                    Destination);                           !                                                    [10]
;    1237  4
;    1238  4                If .Index Eql 4                             ! Make sure Version starts with ';', not '.'         [10]
;    1239  4                Then                                        !                                                    [10]
;    1240  4                    Ch$WChar (%C';', Destination);          !                                                    [10]
;    1241  4
;    1242  4                FileSpecMatch [Dsc$W_Length] = .FileSpecMatch [Dsc$W_Length] + .Desc [Dsc$W_Length];        !   [10]
;    1243  4                End                                         !                                                    [10]
;    1244  4
;    1245  2            End;
;    1246  2        If (.ultrix_flags)<ultrix_v_mode,1>                 ! If ultrix get the file name only                   [22]
;    1247  2            THEN
;    1248  3            BEGIN
;    1249  3            LOCAL
;    1250  3              p_nam;
;    1251  3            p_nam = .FileSpecMatch [Dsc$A_Pointer]+.FileSpecMatch [Dsc$W_Length] -1; ! Point to end of string   [22]
;    1252  3            ultrix_wcard = 0;                               ! Initialize length                                  [22]
;    1253  3            WHILE   (.p_nam GTR .FileSpecMatch [Dsc$A_Pointer]) AND (.(.p_nam)<0,8> NEQ %C')' ) DO
;    1254  4              BEGIN
;    1255  4              IF     .(.p_nam)<0,8> EQL %C'/'! Search for last '/'                                              [22]
;    1256  4                THEN
;    1257  5                    BEGIN
;    1258  5                      FileSpecMatch [Dsc$W_Length] = .FileSpecMatch [Dsc$A_Pointer]+.FileSpecMatch [Dsc$W_Length] -1 -.p
;    1259  5                      CH$MOVE(.FileSpecMatch [Dsc$W_Length],.p_nam+1,.FileSpecMatch [Dsc$A_Pointer]); ! Move filename [2
;    1260  5                      EXITLOOP
;    1261  5                    END
;    1262  4                ELSE
;    1263  5                    BEGIN
;    1264  5                    IF .(.p_nam)<0,8> EQL %C'*' OR .(.p_nam)<0,8> EQL %C'%' THEN ultrix_wcard = 1; ! Check for wardcard
;    1265  5                  p_nam = .p_nam -1;                        ! Check previous character                           [22]
;    1266  4                  END;
;    1267  3              END;
;    1268  3              IF  .ultrix_wcard  THEN ultrix_wcard = .filespecmatch[dsc$w_length]+1; ! Set to length of wildcarded name
;    1269  2            END;
;    1270  2
;    1271  2        If Ch$Eql (                                         ! Don't bother matching if it's all wildcarded       [10]
;    1272  2            .FileSpecMatch [Dsc$W_Length],                  !                                                    [10]
;    1273  2            .FileSpecMatch [Dsc$A_Pointer],                 !                                                    [10]
;    1274  2            .WildCardMask [Dsc$W_Length],                   !                                                    [10]
;    1275  2            .WildCardMask [Dsc$A_Pointer],                  !                                                    [10]
;    1276  2            0)                                              !  (0 fill)                                          [10]
;    1277  2        Then                                                !                                                    [10]
;    1278  2            FileSpecMatch [Dsc$W_Length] = 0;               !                                                    [10]
;    1279  2
;    1280  3        begin
;    1281  3                                                                                                             !G:11
;    1282  3        global register
;    1283  3            zero = 0,
;    1284  3            one = 1;
;    1285  3                                                                                                             !G:11
;    1286  3        global                                                                                               !G:12
;    1287  3            dir_flags : byte;                               ! Flags for directory commands                   !G:13
```

```
;   1288  3                                                                                                  !G:12
;   1289  3         linkage
;   1290  3             jsb_device = jsb (register = 4, register = 5) : global (zero = 0, one = 1)
;   1291  3             nopreserve (2, 3);
;   1292  3                                                                                                  !G:11
;   1293  3                                                                                                  !G:12
;   1294  3         global literal                                                                           !G:12
;   1295  3             dir_v_cmm    = 0,                        ! Flag for directory command in progress    !G:13
;   1296  3             dir_v_drvclr = 1;                        ! Flag for drive clear allowed. Start of command.  !G:13
;   1297  3                                                                                                  !G:12
;   1298  3         literal                                                                                  !G:11
;   1299  3             max_devname_len = 64;                    ! size of dev name returned by getdvi  [26]  !G:6
;   1300  3                                                                                                  !G:6
;   1301  3         local                                                                                    !G:11
;   1302  3             console : initial (uplit (%ascii 'CSA')),! console string                  [26]  !G:6
;   1303  3             ptable : ref bblock field ($ds_hpo_f),  ! ptable of target dev                      !G:6
;   1304  3             dollar,                                 ! pointer to the "$" in the device name [26]  !G:6
;   1305  3             len,                                                                                 !G:6
;   1306  3             status,                                 ! return status                     [26]  !G:6
;   1307  3             dev_class,                              ! i.e. tape or disk                 [26]  !G:6
;   1308  3             class_len,                              ! length of class type              [26]  !G:6
;   1309  3             dev_len,                                ! length of dev name                [26]  !G:6
;   1310  3             dev_name : block [max_devname_len,byte], ! name of target dev               [26]  !G:6
;   1311  3             itmlst : block [28,byte] initial (      ! input to sys$getdvi               [26]  !G:6
;   1312  3                     word (4),word (DVI$_DEVCLASS),  !                                          !G:11
;   1313  3                     long (dev_class),               !                                          !G:11
;   1314  3                     long (class_len),               !                                          !G:11
;   1315  3                     word (64),word (dvi$_devnam),   !                                          !G:11
;   1316  3                     long (dev_name),                !                                          !G:11
;   1317  3                     long (dev_len),                 !                                          !G:11
;   1318  3                     long (0));                      !                                          !G:11
;   1319  3                                                                                                  !G:11
;   1320  3             count = 0;                                                  ! Initialize file count !G:6
;   1321  3             If not .Dsa$V_User                                          ! if stand alone    [26] !G:9
;   1322  4             then BEGIN                                                                           !G:9
;   1323  4                     dir_flags<dir_v_cmm,1> = 1;     ! Set for directory command                  !G:13
;   1324  4                     dir_flags<dir_v_drvclr,1> =1;   ! Set for drive clear first time in driver   !G:13
;   1325  4                     if ch$eql(3,.q_fileblock [dsc$a_pointer],3,.console) then   ! if dev is the console [26]
;   1326  5                        (selectone .DSA$GL_SID[PR$V_SID_TYPE] of          ! what kind of system is this?  begin [27] !
;   1327  5                           set                                                                   !G:9
;   1328  5                             [pr$_sid_TYP780,                                ! VAX 11/780        !G:9
;   1329  5                              pr$_sid_TYP750,                                ! VAX 11/750        !G:9
;   1330  5                              pr$_sid_TYP730,                                ! VAX 11/730        !G:9
;   1331  5                              pr$_sid_TYP790]:                          ! VAX 8600                !G:9
;   1332  5                                     status = RT11_DIRECT (q_fileblock, count);                   !G:9
;   1333  5                             [pr$_sid_TYP8SS,                          ! VAX SCORPIO             !G:10
;   1334  5                              pr$_sid_TYP8NN,                          ! VAX NAUTILUS            !G:10
;   1335  5                              pr$_sid_TYP8RR]:                         ! VAX RRR [28]            !G:10
;   1336  5                                     status = ODS_DIRECT (q_fileblock, count, .ultrix_wcard);     !G:9
;   1337  5                             [pr$_sid_TYPUV]:                          ! microVAX chip           !G:9
;   1338  6                                     begin                                                        !G:9
;   1339  6                                         if .DS$GB_SYSTYPE eql PR$_SYS_TYP900 ! ANDROMEDA         !G:9
;   1340  7                                             then begin                                           !G:9
;   1341  7                                                     ppa_stat = PPA$DIRECTORY (q_fileblock);      !G:9
;   1342  7                                                     return .ppa_stat                             !G:9
;   1343  7                                                 end                                              !G:9
;   1344  6                                         else return 0;                                           !G:9
```

```
;   1345  5                                 end;                                                                    !G:9
;   1346  5                         [otherwise]:                                                                    !G:11
;   1347  5                                 status = ODS_DIRECT (q_fileblock, count, .ultrix_wcard);                !G:9
;   1348  5                       tes)                                                                              !G:9
;   1349  4                 else                        ! STANDALONE, NON CONSOLE DEVICE                end [27]    !G:9
;   1350  5                     begin                                                                               !G:9
;   1351  5                         len = .q_fileblock [dsc$w_length] - 1;                                          !G:6
;   1352  5                         loc$ptable (.len, .q_fileblock [dsc$a_pointer], -1; ptable);    ! [07]           !G:6
;   1353  5                         if .ptable eql 0                                                ! is device attached? !G:9
;   1354  6                         then $ds_printf ($ascic('!/%DS-F-DEVNATT, Device not attached!/'))              !G:9
;   1355  5                         else                                                                            !G:11
;   1356  6                                 (selectone .(ptable [hp$t_type] + 1)<0, 16> of          ! determine device class !G:
;   1357  6                                         set                                                             !G:11
;   1358  6                                            [%ascii'RP', %ascii'RM', %ascii'RK', %ascii'DI',%ascii'RC',          ! [1
;   1359  6                                             %ascii'R8', %Ascii'RA', %ascii'RL', %Ascii'RX', %Ascii'RD'] :       ! [2
;   1360  6                                                 status = ods_direct (q_fileblock, count, .ultrix_wcard);        ! [2
;   1361  6                                            [%ascii'TA',%ascii'TE',%Ascii 'TK', %Ascii'TU', %ascii'TS'] : !G:11
;   1362  6                                                 status = ansi_direct (q_fileblock, count);                     ! [1
;   1363  6                                            [otherwise] : status = rms$_dev;                                !G:6
;   1364  5                                         tes);                                                           !G:6
;   1365  4                     end;                                                                                !G:10
;   1366  4                 if .status<0,1,1>                                                                       !G:11
;   1367  4                 then $ds_printf ($ascic ('!/Total of !ZL files.!/'), .count);                           !G:11
;   1368  4                 dsr$completion(.status);                                                                !G:11
;   1369  4                 dir_flags=0;                                                    ! clear flags           !G:13
;   1370  4             END                                                                 ! END if standalone     !G:9
;   1371  3         else                                                                    ! if in user mode       !G:6
;   1372  4             BEGIN                                                                                       !G:9
;   1373  4                 status = sys$getdvi(0,0,q_fileblock,itmlst,0,0,0,0);            ! get device info  [26] !G:6
;   1374  4                 if .status eql ss$_normal                                       !                  [26] !G:9
;   1375  5                 then begin                                                                              !G:9
;   1376  5                         dollar = ch$find_ch (.dev_len, dev_name, %ascii '$');! skip past first $, ie $node$generic[2
;   1377  6                         if not (.dollar eql 0)                          ! if we found a $ in device name        [26
;   1378  5                         then (itmlst + 16) = .dollar + 1;               ! move pointer to first char after $node$[26
;   1379  5                         if ch$eql(3,.(itmlst+16),3,.console)            ! if dev is the console                 [26
;   1380  6                         then $ds_printf ($ascic('!/%DS-F-USER, can''t access console in user mode.!/')) ![26] !G:9
;   1381  6                         else if (.dev_class eql DC$_DISK) or (.dev_class eql DC$_TAPE)                  !G:11
;   1382  5                         then status = vms_dir ()                ! if dev is a disk or tape              [27] !G:9
;   1383  5                         else $ds_printf ($ascic('!/%DS-F-ILDEVCLS, illegal device class for directory!/'));     ![26
;   1384  5                         dsr$completion (.status);               ! abort if error occurred while listing directory[26
;   1385  5                     end                                         ! end if status is normal               !G:9
;   1386  4                 else dsr$completion (.status);                  ! if status isn't normal call DSR$COMPLETION     [27
;   1387  3             END;                                                ! END if user mode                      !G:9
;   1388  3         If .ControlCFlag Then Return;                                                   ! No final printout on ^C !G
;   1389  3         $Ds_CntrlC ();                                                                  ! Return ^C control to kerne
;   1390  2         end;                                                                                            !G:6
;   1391  1         end;                                        ! Of dsx$directory


                                                                .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                        2A  3B  2A  2E  2A  00242 P.ABT:  .ASCII  \*.*;*\                                   ;
                                            00247         .BLKB   1
                                00000005    00248 P.ABS:  .LONG   5                                         ;
                                00000000'   0024C         .ADDRESS P.ABT                                    ;
                            00  41  53  43  00250 P.ABU:  .ASCII  \CSA\<0>                                  ;
```

```
                                                  0004  00254 P.ABV:  .WORD   4                                          ;
                                                  0004  00256         .WORD   4                                          ;
                                              00000000  00258         .LONG   0                                          ;
                                              00000000  0025C         .LONG   0                                          ;
                                                  0040  00260         .WORD   64                                         ;
                                                  0020  00262         .WORD   32                                         ;
                                              00000000  00264         .LONG   0                                          ;
                                              00000000  00268         .LONG   0                                          ;
                                              00000000  0026C         .LONG   0                                          ;
54  41  4E  56  45  44  2D  46  2D  53  44  25  2F  21  26  00270 P.ABW:  .ASCII  \&!/%DS-F-DEVNATT, Device not attached!/\   ;
61  20  74  6F  6E  20  65  63  69  76  65  44  20  2C  54  0027F                                                   ;
                        2F  21  64  65  68  63  61  74  74  0028E                                                   ;
4C  5A  21  20  66  6F  20  6C  61  74  6F  54  2F  21  17  00297 P.ABX:  .ASCII  <23>\!/Total of !ZL files.!/\              ;
                        2F  21  2E  73  65  6C  69  66  20  002A6                                                   ;
20  2C  52  45  53  55  2D  46  2D  53  44  25  2F  21  32  002AF P.ABY:  .ASCII  \2!/%DS-F-USER, can't access console in u\  ;
6F  63  20  73  73  65  63  63  61  20  74  27  6E  61  63  002BE                                                   ;
                    75  20  6E  69  20  65  6C  6F  73  6E  002CD                                                   ;
                2F  21  2E  65  64  6F  6D  20  72  65  73  002D7         .ASCII  \ser mode.!/\                             ;
43  56  45  44  4C  49  2D  46  2D  53  44  25  2F  21  36  002E2 P.ABZ:  .ASCII  \6!/%DS-F-ILDEVCLS, illegal device class \  ;
76  65  64  20  6C  61  67  65  6C  6C  69  20  2C  53  4C  002F1                                                   ;
                    20  73  73  61  6C  63  20  65  63  69  00300                                                   ;
2F  21  79  72  6F  74  63  65  72  69  64  20  72  6F  66  0030A         .ASCII  \for directory!/\                         ;

                                                                          .PSECT  WORK,NOEXE,2

                                                          003BC DIR_FLAGS::
                                                                          .BLKB   1

                                                                  WILDCARDMASK=       P.ABS
                                                                  DIR_V_CMM==         0
                                                                  DIR_V_DRVCLR==      1
                                                                          .EXTRN  SYS$GETDVI, DS$CNTRLC
                                                                          .WEAK   PPA$DIRECTORY

                                                                          .PSECT  CODE,NOWRT,  SHR,2

                                                  0FFC  00000         .ENTRY  DSX$DIRECTORY, Save R2,R3,R4,R5,R6,R7,R8,-  ; 1133
                                                                              R9,R10,R11                                 ;
                                5B        EE   AF  9E  00002         MOVAB   INTERCEPTCONTROLC, R11                     ;
                                5A 00000000'   EF  9E  00006         MOVAB   WILDCARDMASK+4, R10                        ;
                                59 00000000'   EF  9E  0000D         MOVAB   FILESPECMATCH, R9                          ;
                                5E      FE6C   CE  9E  00014         MOVAB   -404(SP), SP                               ;
                                56             52  D0  00019         MOVL    R2, R6                                     ;
                                          08   A9  94  0001C         CLRB    CONTROLCFLAG                               ; 1188
                                               7E  D4  0001F         CLRL    -(SP)                                      ; 1189
                                               5B  DD  00021         PUSHL   R11                                        ;
                        00000000G  9F          02  FB  00023         CALLS   #2, a#DS$CNTRLC                            ;
                                42 00000000G   EF  E9  0002A         BLBC    ULTRIX_FLAGS, 1$                           ; 1191
        28          00          6E             00  2C  00031         MOVC5   #0, (SP), #0, #40, Q_FILEBLOCK             ; 1194
                                          6C   AE      00036                                                           ;
                                          6C   AE  9F  00038         PUSHAB  Q_FILEBLOCK                                ; 1195
                                   00000000G   EF  9F  0003B         PUSHAB  DEF$Q_ULTRIX                               ;
                                   00000000G   8F  DD  00041         PUSHL   #DEF$C_ULTRIX_LEN                          ;
                            0000G  CF          03  FB  00047         CALLS   #3, BREAKUP_FILE                           ;
                                          6C   AE  9F  0004C         PUSHAB  Q_FILEBLOCK                                ; 1196
                                   00000000G   EF  DD  0004F         PUSHL   DEF$Q_DEV+4                                ;
                                7E 00000000G   EF  3C  00055         MOVZWL  DEF$Q_DEV, -(SP)                           ;
```

```
                0000G  CF            03  FB 0005C        CALLS   #3, BREAKUP_FILE                          ;
                                 6C  AE  9F 00061        PUSHAB  Q_FILEBLOCK                               ; 1198
                          00000000G  EF  DD 00064        PUSHL   DEF$Q_DIR+4                               ;
                       7E 00000000G  EF  3C 0006A        MOVZWL  DEF$Q_DIR, -(SP)                          ;
                                     47  11 00071        BRB     2$                                        ;
                                 6C  AE  9F 00073 1$:    PUSHAB  Q_FILEBLOCK                               ; 1203
                          00000000G  EF  9F 00076        PUSHAB  DEF$Q_BACKSTOP                            ;
                          00000000G  8F  DD 0007C        PUSHL   #DEF$C_BKSTP_LEN                          ;
                0000G  CF            03  FB 00082        CALLS   #3, BREAKUP_FILE                          ;
                                 6C  AE  9F 00087        PUSHAB  Q_FILEBLOCK                               ; 1204
                          00000000G  EF  DD 0008A        PUSHL   DEF$Q_DEV+4                               ;
                       7E 00000000G  EF  3C 00090        MOVZWL  DEF$Q_DEV, -(SP)                          ;
                0000G  CF            03  FB 00097        CALLS   #3, BREAKUP_FILE                          ;
                                 6C  AE  9F 0009C        PUSHAB  Q_FILEBLOCK                               ; 1206
                          00000000G  EF  DD 0009F        PUSHL   DEF$Q_DIR+4                               ;
                       7E 00000000G  EF  3C 000A5        MOVZWL  DEF$Q_DIR, -(SP)                          ;
                0000G  CF            03  FB 000AC        CALLS   #3, BREAKUP_FILE                          ;
                                 6C  AE  9F 000B1        PUSHAB  Q_FILEBLOCK                               ; 1208
                                     6A  DD 000B4        PUSHL   WILDCARDMASK+4                            ;
                       7E        FC  AA  3C 000B6        MOVZWL  WILDCARDMASK, -(SP)                       ;
                0000G  CF            03  FB 000BA 2$:    CALLS   #3, BREAKUP_FILE                          ;
                                 6C  AE  9F 000BF        PUSHAB  Q_FILEBLOCK                               ; 1210
                                 0C  A6  DD 000C2        PUSHL   12(CLI_BLOCK)                             ;
                       7E        08  A6  3C 000C5        MOVZWL  8(CLI_BLOCK), -(SP)                       ;
                0000G  CF            03  FB 000C9        CALLS   #3, BREAKUP_FILE                          ;
                                     69  B4 000CE        CLRW    FILESPECMATCH                             ; 1212
                  04   A9      0094  CE  9E 000D0        MOVAB   FILEMATCH, FILESPECMATCH+4                ; 1213
                       57            02  D0 000D6        MOVL    #2, INDEX                                 ; 1215
                       56        6C AE47  7E 000D9 3$:    MOVAQ   Q_FILEBLOCK[INDEX], R6                    ; 1219
                       50            66  3C 000DE        MOVZWL  (R6), R0                                  ; 1221
                       51            69  3C 000E1        MOVZWL  FILESPECMATCH, R1                         ;
                       50            51  C0 000E4        ADDL2   R1, R0                                    ;
            000000FF   8F            50  D1 000E7        CMPL    R0, #255                                  ;
                                     24  14 000EE        BGTR    6$                                        ;
                                     66  B5 000F0        TSTW    (R6)                                      ; 1225
                                     1C  13 000F2        BEQL    5$                                        ;
                                 04  A6  D5 000F4        TSTL    4(R6)                                     ; 1226
                                     17  13 000F7        BEQL    5$                                        ;
                       58            69  3C 000F9        MOVZWL  FILESPECMATCH, R8                         ; 1231
                       58        04  A9  C0 000FC        ADDL2   FILESPECMATCH+4, R8                       ;
        68        04   B6            66  28 00100        MOVC3   (R6), @4(R6), (R8)                        ; 1235
                       04            57  D1 00105        CMPL    INDEX, #4                                 ; 1238
                                     03  12 00108        BNEQ    4$                                        ;
                       68            3B  90 0010A        MOVB    #59, (R8)                                 ; 1240
                       69            66  A0 0010D 4$:    ADDW2   (R6), FILESPECMATCH                       ; 1242
        C5             57            04  F3 00110 5$:    AOBLEQ  #4, INDEX, 3$                             ; 1215
                       49 00000000G  EF  E9 00114 6$:    BLBC    ULTRIX_FLAGS, 12$                         ; 1246
                       56            69  3C 0011B        MOVZWL  FILESPECMATCH, R6                         ; 1251
                       56        04  A9  C0 0011E        ADDL2   FILESPECMATCH+4, R6                       ;
                                     56  D7 00122        DECL    P_NAM                                     ;
                                     57  94 00124        CLRB    ULTRIX_WCARD                              ; 1252
                  04   A9            56  D1 00126 7$:    CMPL    P_NAM, FILESPECMATCH+4                    ; 1253
                                     31  15 0012A        BLEQ    11$                                       ;
                       29            66  91 0012C        CMPB    (P_NAM), #41                              ;
                                     2C  13 0012F        BEQL    11$                                       ;
                       2F            66  91 00131        CMPB    (P_NAM), #47                              ; 1255
                                     16  12 00134        BNEQ    8$                                        ;
```

```
                                50          69  3C 00136          MOVZWL  FILESPECMATCH, R0                                  ; 1258
                                50      04  A9  C0 00139          ADDL2   FILESPECMATCH+4, R0                                ;
                                50          56  C2 0013D          SUBL2   P_NAM, R0                                          ;
                    69          50          01  A3 00140          SUBW3   #1, R0, FILESPECMATCH                              ;
                04  B9      01  A6          69  28 00144          MOVC3   FILESPECMATCH, 1(P_NAM), @FILESPECMATCH+4          ; 1259
                                            11  11 0014A          BRB     11$                                                ; 1260
                                2A          66  91 0014C 8$:      CMPB    (P_NAM), #42                                       ; 1264
                                            05  13 0014F          BEQL    9$                                                 ;
                                25          66  91 00151          CMPB    (P_NAM), #37                                       ;
                                            03  12 00154          BNEQ    10$                                                ;
                                57          01  90 00156 9$:      MOVB    #1, ULTRIX_WCARD                                   ;
                                            56  D7 00159 10$:     DECL    P_NAM                                              ; 1265
                                            C9  11 0015B          BRB     7$                                                 ; 1253
                                04          57  E9 0015D 11$:     BLBC    ULTRIX_WCARD, 12$                                  ; 1268
                    57          69          01  81 00160          ADDB3   #1, FILESPECMATCH, ULTRIX_WCARD                    ;
    FC   AA         00      04  B9          69  2D 00164 12$:     CMPC5   FILESPECMATCH, @FILESPECMATCH+4, #0, -             ; 1276
                                        00  BA     0016B                  WILDCARDMASK, @WILDCARDMASK+4                      ;
                                            02  12 0016D          BNEQ    13$                                                ;
                                            69  B4 0016F          CLRW    FILESPECMATCH                                      ; 1278
                                56      04  AA  9E 00171 13$:     MOVAB   P.ABU, CONSOLE                                     ; 1302
                10  AE      08  AA          1C  28 00175          MOVC3   #28, P.ABV, ITMLST                                 ; 1318
                            14  AE          6E  9E 0017B          MOVAB   DEV_CLASS, ITMLST+4                                ; 1313
                            18  AE      04  AE  9E 0017F          MOVAB   CLASS_LEN, ITMLST+8                                ; 1314
                            20  AE      2C  AE  9E 00184          MOVAB   DEV_NAME, ITMLST+16                                ; 1316
                            24  AE      08  AE  9E 00189          MOVAB   DEV_LEN, ITMLST+20                                 ; 1317
                                        0C  AE  D4 0018E          CLRL    COUNT                                              ; 1320
                    03 0000FE03  9F         04  E1 00191          BBC     #4, @#^X0000FE03, 14$                              ; 1322
                                        012B  31 00199          BRW     30$                                                ;
                        03BC  C9          03  88 0019C 14$:     BISB2   #3, DIR_FLAGS                                      ; 1323
                    66      70  BE          03  29 001A1          CMPC3   #3, @Q_FILEBLOCK+4, (CONSOLE)                      ; 1325
                                            5B  12 001A6          BNEQ    21$                                                ;
                                50 0000FE17  9F  9A 001A8          MOVZBL  @#^X0000FE17, R0                                   ; 1326
                                            12  15 001AF          BLEQ    15$                                                ; 1328
                                04          50  91 001B1          CMPB    R0, #4                                             ; 1331
                                            0D  1A 001B4          BGTRU   15$                                                ;
                                        0C  AE  9F 001B6          PUSHAB  COUNT                                              ; 1332
                                        70  AE  9F 001B9          PUSHAB  Q_FILEBLOCK                                        ;
                        FA4F  CB          02  FB 001BC          CALLS   #2, RT11_DIRECT                                    ;
                                            1D  11 001C1          BRB     18$                                                ;
                                05          50  91 001C3 15$:     CMPB    R0, #5                                             ; 1333
                                            05  1F 001C6          BLSSU   16$                                                ;
                                06          50  91 001C8          CMPB    R0, #6                                             ; 1334
                                            05  1B 001CB          BLEQU   17$                                                ;
                                11          50  91 001CD 16$:     CMPB    R0, #17                                            ; 1335
                                            11  12 001D0          BNEQ    19$                                                ;
                                7E          57  9A 001D2 17$:     MOVZBL  ULTRIX_WCARD, -(SP)                                ; 1336
                                        10  AE  9F 001D5          PUSHAB  COUNT                                              ;
                                        74  AE  9F 001D8          PUSHAB  Q_FILEBLOCK                                        ;
                        FD32  CB          03  FB 001DB          CALLS   #3, ODS_DIRECT                                     ;
                                        00BC  31 001E0 18$:     BRW     25$                                                ;
                                08          50  91 001E3 19$:     CMPB    R0, #8                                             ; 1337
                                            EA  12 001E6          BNEQ    17$                                                ;
00000000G  8F 00000000G  EF     08          00  ED 001E8          CMPZV   #0, #8, DS$GB_SYSTYPE, #PR$_SYS_TYP900             ; 1339
                                            01  13 001F5          BEQL    20$                                                ;
                                                04 001F7          RET                                                        ;
                                        6C  AE  9F 001F8 20$:     PUSHAB  Q_FILEBLOCK                                        ; 1341
                    00000000G  EF           01  FB 001FB          CALLS   #1, PPA$DIRECTORY                                  ;
```

```
                                                 04 00202                RET                                             ; 1344
                                  50      6C     AE 3C 00203 21$:        MOVZWL  Q_FILEBLOCK, LEN                        ; 1351
                                                 50 D7 00207             DECL    LEN                                     ;
                                  52             01 CE 00209             MNEGL   #1, R2                                  ; 1352
                                  51      70     AE D0 0020C             MOVL    Q_FILEBLOCK+4, R1                       ;
                                      00000000G  EF 16 00210             JSB     LOC$PTABLE                              ;
                                  52             51 D0 00216             MOVL    R1, R2                                  ;
                                                 0C 12 00219             BNEQ    22$                                     ; 1353
                                          24     AA 9F 0021B             PUSHAB  P.ABW                                   ; 1354
                          00000000G       9F     01 FB 0021E             CALLS   #1, @#DS$PRINTF                         ;
                                                 7B 11 00225             BRB     26$                                     ;
                                  50      27     A2 3C 00227 22$:        MOVZWL  39(PTABLE), R0                          ; 1356
                              3852        8F     50 B1 0022B             CMPW    R0, #14418                              ; 1359
                                                 A0 13 00230 23$:        BEQL    17$                                     ;
                              4152        8F     50 B1 00232             CMPW    R0, #16722                              ;
                                                 99 13 00237             BEQL    17$                                     ;
                              4352        8F     50 B1 00239             CMPW    R0, #17234                              ; 1358
                                                 92 13 0023E             BEQL    17$                                     ;
                              4452        8F     50 B1 00240             CMPW    R0, #17490                              ; 1359
                                                 8B 13 00245             BEQL    17$                                     ;
                              4944        8F     50 B1 00247             CMPW    R0, #18756                              ; 1358
                                                 84 13 0024C             BEQL    17$                                     ;
                              4B52        8F     50 B1 0024E             CMPW    R0, #19282                              ;
                                                 DB 13 00253             BEQL    23$                                     ;
                              4C52        8F     50 B1 00255             CMPW    R0, #19538                              ; 1359
                                                 D4 13 0025A             BEQL    23$                                     ;
                              4D52        8F     50 B1 0025C             CMPW    R0, #19794                              ; 1358
                                                 CD 13 00261             BEQL    23$                                     ;
                              5052        8F     50 B1 00263             CMPW    R0, #20562                              ;
                                                 C6 13 00268             BEQL    23$                                     ;
                              5852        8F     50 B1 0026A             CMPW    R0, #22610                              ; 1359
                                                 BF 13 0026F             BEQL    23$                                     ;
                              4154        8F     50 B1 00271             CMPW    R0, #16724                              ; 1361
                                                 1C 13 00276             BEQL    24$                                     ;
                              4554        8F     50 B1 00278             CMPW    R0, #17748                              ;
                                                 15 13 0027D             BEQL    24$                                     ;
                              4B54        8F     50 B1 0027F             CMPW    R0, #19284                              ;
                                                 0E 13 00284             BEQL    24$                                     ;
                              5354        8F     50 B1 00286             CMPW    R0, #21332                              ;
                                                 07 13 0028B             BEQL    24$                                     ;
                              5554        8F     50 B1 0028D             CMPW    R0, #21844                              ;
                                                 10 12 00292             BNEQ    27$                                     ;
                                      0C         AE 9F 00294 24$:        PUSHAB  COUNT                                   ; 1362
                                      70         AE 9F 00297             PUSHAB  Q_FILEBLOCK                             ;
                                  FB70        CB     02 FB 0029A         CALLS   #2, ANSI_DIRECT                         ;
                                  54             50 D0 0029F 25$:        MOVL    R0, STATUS                              ;
                                                 07 11 002A2 26$:        BRB     28$                                     ;
                                  54  000184C4   8F D0 002A4 27$:        MOVL    #99524, STATUS                          ; 1363
                                  0D             54 E9 002AB 28$:        BLBC    STATUS, 29$                             ; 1366
                                      0C         AE DD 002AE             PUSHL   COUNT                                   ; 1367
                                      4B         AA 9F 002B1             PUSHAB  P.ABX                                   ;
                          00000000G       9F     02 FB 002B4             CALLS   #2, @#DS$PRINTF                         ;
                                  50             54 D0 002BB 29$:        MOVL    STATUS, R0                              ; 1368
                                              0000G 30 002BE             BSBW    DSR$COMPLETION                          ;
                                          03BC   C9 94 002C1             CLRB    DIR_FLAGS                               ; 1369
                                                 60 11 002C5             BRB     38$                                     ;
                                                 7E 7C 002C7 30$:        CLRQ    -(SP)                                   ; 1373
```

```
                                        7E  7C 002C9          CLRQ    -(SP)                                  ;
                                  20    AE  9F 002CB          PUSHAB  ITMLST                                 ;
                                0080    CE  9F 002CE          PUSHAB  Q_FILEBLOCK                            ;
                                        7E  7C 002D2          CLRQ    -(SP)                                  ;
            00000000G  00               08  FB 002D4          CALLS   #8, SYS$GETDVI                         ;
                       54               50  D0 002DB          MOVL    R0, STATUS                             ;
                       01               54  D1 002DE          CMPL    STATUS, #1                             ; 1374
                                        3E  12 002E1          BNEQ    37$                                    ;
      2C   AE       08   AE             24  3A 002E3          LOCC    #36, DEV_LEN, DEV_NAME                 ; 1376
                                        02  12 002E9          BNEQ    31$                                    ;
                                        51  D4 002EB          CLRL    R1                                     ;
                                        51  D5 002ED 31$:     TSTL    DOLLAR                                 ; 1377
                                        05  13 002EF          BEQL    32$                                    ;
                  20   AE       01      A1  9E 002F1          MOVAB   1(R1), ITMLST+16                       ; 1378
           66     20   BE               03  29 002F6 32$:     CMPC3   #3, @ITMLST+16, (CONSOLE)              ; 1379
                                        05  12 002FB          BNEQ    33$                                    ;
                                  63    AA  9F 002FD          PUSHAB  P.ABY                                  ; 1380
                                        18  11 00300          BRB     36$                                    ;
                       01               6E  D1 00302 33$:     CMPL    DEV_CLASS, #1                          ; 1381
                                        05  13 00305          BEQL    34$                                    ;
                       02               6E  D1 00307          CMPL    DEV_CLASS, #2                          ;
                                        0A  12 0030A          BNEQ    35$                                    ;
                F4A5   CB               00  FB 0030C 34$:     CALLS   #0, VMS_DIR                            ; 1382
                       54               50  D0 00311          MOVL    R0, STATUS                             ;
                                        0B  11 00314          BRB     37$                                    ;
                                0096    CA  9F 00316 35$:     PUSHAB  P.ABZ                                  ; 1383
            00000000G  9F               01  FB 0031A 36$:     CALLS   #1, @#DS$PRINTF                        ;
                       50               54  D0 00321 37$:     MOVL    STATUS, R0                             ; 1386
                                      0000G  30 00324          BSBW    DSR$COMPLETION                         ;
                       09       08      A9  E8 00327 38$:     BLBS    CONTROLCFLAG, 39$                      ; 1388
                                        7E  7C 0032B          CLRQ    -(SP)                                  ; 1389
            00000000G  9F               02  FB 0032D          CALLS   #2, @#DS$CNTRLC                        ;
                                            04 00334 39$:     RET                                            ; 1391

; Routine Size:  821 bytes,    Routine Base:  CODE + 0BC7

;   1392  1                                                                                                  !G:11
```

```
;   1394  1     %sbttl 'Master routine'
;   1395  1
;   1396  1     global routine dsv$directory : jsb_fake novalue =
;   1397  2         begin
;   1398  2     !
;   1399  2     ! Initialize context to prevent continuation of diagnostic or script.
;   1400  2     !
;   1401  2         script$flush ();                        ! Flush any active scripts
;   1402  2         ds_cleanup ();                          ! Force abort of diagnostic if any
;   1403  2         init_context ();                        ! Clean up stacks, etc.
;   1404  3         begin
;   1405  3
;   1406  3         builtin
;   1407  3             sp;                                 ! 'Fake' return address to avoid trouble when BLISS does RSB
;   1408  3
;   1409  3         sp = .sp - 4;                           ! Do a PUSHAB L^BEGIN_BLISS
;   1410  3         .sp = begin_bliss                       !  (Set address for RSB)
;   1411  2         end;
;   1412  2         dsx$directory (ds$gl_clibase)
;   1413  1         end;                                    ! of dsv$directory



                                  00000000G  EF  16 00000 DSV$DIRECTORY::
                                                                  JSB     SCRIPT$FLUSH                        ; 1401
                                  00000000G  EF  16 00006         JSB     DS_CLEANUP                          ; 1402
                                  00000000G  EF  16 0000C         JSB     INIT_CONTEXT                        ; 1403
                              5E             04  C2 00012         SUBL2   #4, SP                              ; 1409
                              6E 00000000G   EF  9E 00015         MOVAB   BEGIN_BLISS, (SP)                   ; 1410
                              52 00000000G   EF  9E 0001C         MOVAB   DS$GL_CLIBASE, R2                   ; 1412
                        FCA3  CF             00  FB 00023         CALLS   #0, DSX$DIRECTORY                   ;
                                                 05 00028         RSB                                         ; 1413

; Routine Size:  41 bytes,    Routine Base:  CODE + 0EFC


;   1414  1
;   1415  1     end                                         ! End of module
;   1416  1
;   1417  0     eludom



                                  PSECT SUMMARY
;
;       Name                    Bytes                       Attributes
;
;  DATA                           793  NOVEC,NOWRT,  RD ,NOEXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  WORK                           957  NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  CODE                          3877  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  .  ABS  .                        0  NOVEC,NOWRT,NORD ,NOEXE,NOSHR,  LCL,  ABS,  CON,NOPIC,ALIGN(0)
```

Symbol	Type	Defined	Referenced ...
$ASCIC	Macro	Lib01	212 303 313 420 421 470 471 476 526 533 768 825 898 953 1002 1033 1121 1354 1367 1380 1383
$ASCID	Macro	Lib01	627 636 685 729 738 810 901 978 1001 1023 1062 1186
$CLOSE	KeyWMacr	Lib03	929 1084 1111 1123
$CONNECT	KeyWMacr	Lib03	1081
$DS_CNTRLC	KeyWMacr	Lib01	1189 1389
$DS_DSADEF	Macro	Lib01	206
$DS_HPO_F	Fieldset	Lib01	1303
$DS_PRINTF	Macro	Lib01	303 313 420 421 470 471 476 526 533 768 825 898 953 1002 1033 1121 1354 1367 1380 1383
$FAB_DECL	Macro	Lib03	365 884 966
$FAB_INIT	KeyWMacr	Lib03	384 902 1067
$FAO	Macro	Lib03	627 636 685 729 738 810 901 1001 1023 1062
$GET	KeyWMacr	Lib03	1092
$NAM_DECL	Macro	Lib03	364 885
$NAM_INIT	KeyWMacr	Lib03	378 903
$OPEN	KeyWMacr	Lib03	1070
$PARSE	KeyWMacr	Lib03	913
$RAB_DECL	Macro	Lib03	967
$RAB_INIT	KeyWMacr	Lib03	1068
$RMS_BITFLD_INI	Macro	Lib03	383 391 902 903 1067 1068
$RMS_BITS	Macro	Lib03	391 902 1067
$RMS_CODFLD_INI	Macro	Lib03	391 902 1067 1068
$RMS_OR	Macro	Lib03	391 902 1067
$RMS_PTR	Unbound		1068
	Bind	383	383=
	Bind	391	391=
	Bind	902	902=
	Bind	903	903=
	Bind	1067	1067=
	Bind	1068	1068=
$RMS_VALFLD_INI	Unbound		1068
	Macro	Lib03	383 391 902 903 1067 1068
ADDRESS	RoutForm	544	563m 572a= 573a= 574a= 576a. 576.
ADDRESS_FIRST	Local	755	792= 798= 798.
ANSI_DIRECT	Routine	832	1362c
BASE_DIRECT	Bind	978	1008.
BASE_DIRECTORY	Local	971	1008= 1053= 1054= 1063a
BBLOCK	Structur	Lib02	255 256 299 312 338 340 344 348 361 362 363 370 757 758 761 762 798 880 881 886 887 888 891 968 969 970 971 972 973 974 975 979 1179 1183 1303
BEGIN_BLISS	External	249	1410a
BOO$AL_VECTOR	External	252	
BOO$QIO	ExtRout	259	782c
BOO$SELECT	External	251	
BREAKUP_FILE	ExtRout	266	1195c 1196c 1198c 1203c 1204c 1206c 1208c 1210c
BTD$K_CONSOLE	Literal	Lib03	764
BUFFER	RoutForm	495	514m 525a= 525a. 526. 527a= 528a= 530a= 530a. 533. 534a= 535a=
	RoutForm	581	618m 622a. 624a= 624a. 626a. 630a. 632a= 632a. 635a. 638.

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Symbol                        Type  Defined  Referenced ...
------------------------- -------- ----- ----------------
                          RoutForm   645   670m    676a.   678a=   678a.   684a.   686.
                          RoutForm   692   715m    724a.   726a=   726a.   728a.   732a.   734a=   734a.   737a.   740.
                          Local      890   893=    895a    946a    947a
                          Local      968  1068a
CALL_CLI                  Linkage  Lib02  1133
CLASS_LEN                 Local     1308  1314a
CLI$L_FILE_ADR            Macro    Lib02  1210
CLI$W_FILE_LEN            Macro    Lib02  1210
CLI_BLOCK                 RoutForm  1133  1183m   1210a.
CONSOLE                   Local     1302  1302=   1325a.  1379a.
CONTROLCFLAG              Own        223   816.    949.   1117.   1163=   1188=   1388.
COUNT                     RoutForm   495   521a=   521a.
                          RoutForm   581   638.
                          RoutForm   645   686.
                          RoutForm   692   740.
                          RoutForm   746   811.
                          RoutForm   832   948.
                          RoutForm   961  1097.   1104.   1107.
                          Local     1172  1320=   1332a   1336a   1347a   1360a   1362a   1367.
DATA                      RoutForm   544   572.    573.    574.
DC$_DISK                  Literal  Lib03  1381
DC$_TAPE                  Literal  Lib03  1381
DEF$C_BKSTP_LEN           ExtLit     243  1203a
DEF$C_ULTRIX_LEN          ExtLit     242  1195a
DEF$Q_BACKSTOP            External   253  1203a
DEF$Q_DEV                 External   255  1196.   1204.
DEF$Q_DIR                 External   256  1198.   1206.
DEF$Q_ULTRIX              External   254  1195a
DEFAULT                   Bind       368   370m    391.
DEF_SPEC                  Local      356   356=    368.
DESC                      RoutForm   495   515m    518.    525a.   530a.
                          Local      614   625=    626=    627a    634=    635=    636a    638a
                          Local      664   683=    684=    685a    686a
                          Local      711   727=    728=    729a    736=    737=    738a    740a
                          Bind      1219  1221.   1225.   1226.   1234.   1235a.  1242.
DESTINATION               Bind      1231  1236=   1240=
DEVICE_D                  RoutForm   279   296.
                          Local      348   348=    410a    414.    414a.   425a
DEV_BUF                   Local      347   350a
DEV_CLASS                 Local     1307  1313a   1381.
DEV_D                     Bind       296   299m    300a=   301.    302=    303a
DEV_LEN                   Local     1309  1317a   1376.
DEV_NAME                  Local     1310  1316a   1376.
DIR                       RoutForm   581   617m    627a.   627aa   636a.   636aa
                          RoutForm   645   669m    672a.   680a.   682a.   685a.
                          RoutForm   692   714m    718a.   729aa   729a.   738aa   738a.
DIR$B_NAMECOUNT           Macro    Lib03   718     729     738
DIR$C_LENGTH              Literal  Lib03   718
DIR_FLAGS                 Global    1287  1323=   1324=   1369=
DIR_V_CMM                 GlobLit   1295  1323
DIR_V_DRVCLR              GlobLit   1296  1324
DOLLAR                    Local     1304  1376=   1377.   1378.
DS$CNTRLC                 ExtRout   1189  1189c   1389e   1389c
DS$GB_SYSTYPE             External   248  1339.
DS$GL_CLIBASE             External   250   373.    373a.   374.   1412a
```

Symbol	Type	Defined	Referenced ...									
DS$PRINTF	ExtRout	303	303c	313e	313c	420e	420c	421e	421c	470e	470c	471e	471c
			476e	476c	526e	526c	533e	533c	768e	768c	825e	825c	898e
			898c	953e	953c	1002e	1002c	1033e	1033c	1121e	1121c	1354e	1354c
			1367e	1367c	1380e	1380c	1383e	1383c					
DSA$AL_APTMAIL	Bind	206	206										
DSA$GL_APTCOM	Bind	206											
DSA$GL_DEVLEN	Bind	206											
DSA$GL_DEVNAM	Bind	206											
DSA$GL_ERRNO	Bind	206											
DSA$GL_EVENT	Bind	206											
DSA$GL_FLAGS	Bind	206	877	905	926	1321							
DSA$GL_MSGPTR	Bind	206											
DSA$GL_MSGTYP	Bind	206											
DSA$GL_PASSES	Bind	206											
DSA$GL_PASSNO	Bind	206											
DSA$GL_SECTNO	Bind	206											
DSA$GL_SID	Bind	206	209m	1326									
DSA$GL_SUBTNO	Bind	206											
DSA$GL_TESTNO	Bind	206											
DSA$GL_UNITS	Bind	206											
DSA$V_USER	Macro	Lib01	877	905	926	1321							
DSC$A_POINTER	Macro	Lib03	300	301	314	375	390	406	414	430	435	446	447
			458	459	528	535	626	635	684	728	737	767	809
			895	900	944	996	1009	1021	1028	1054	1056	1067	1090
			1196	1198	1204	1206	1208	1213	1226	1231	1235	1251	1253
			1258	1259	1273	1275	1325	1352					
DSC$C_S_BLN	Literal	Lib03	299	338	340	344	348	370	761	762	881	970	971
			972	974	979	1179	1194						
DSC$W_LENGTH	Macro	Lib03	302	374	389	391	414	429	430	435	440	446	448
			458	460	517	525	526	527	530	533	534	622	624
			625	626	630	632	634	635	676	678	683	684	724
			726	727	728	732	734	736	737	766	770	771	808
			809	825	894	899	902	943	946	947	953	995	1010
			1022	1027	1053	1055	1067	1080	1089	1121	1196	1198	1204
			1206	1208	1212	1221	1225	1231	1234	1242	1251	1258	1259
			1268	1272	1274	1278	1351						
DSR$ALLOCATE_PSEUDO_RPB	ExtRout	269	764c										
DSR$COMPLETION	ExtRout	271	1368c	1384c	1386c								
DSR$DEALLOCATE_PSEUDO_RPB	ExtRout	270	819c	827c									
DSR$KEY_EQUAL	ExtRout	267	518c										
DSV$DIRECTORY	GlobRout	1396											
DSX$DIRECTORY	GlobRout	1133	1412c										
DS_CLEANUP	ExtRout	264	1402c										
DVI$_DEVCLASS	Literal	Lib03	1312										
DVI$_DEVNAM	Literal	Lib03	1315										
END_SIZE	Global	227	1004=	1079.									
ENTRY	Bind	798	800.	802.	805.	807.							
EXPAND	Local	887	903a										
EXP_STR	Own	363	383a										
EXTRA_LENGTH	Local	754	791=	792.	798.								
FAB	Local	884	902a	913a	919a	919=	929a						
	Local	966	1067a	1068a	1070a	1084a	1100.	1111a	1123a				
FAB$B_BID	Macro	Lib03	391	902	1067								
FAB$B_BKS	Macro	Lib03	391	902	1067								
FAB$B_BLN	Macro	Lib03	391	902	1067								

Symbol	Type	Defined	Referenced ...									
FAB$B_DNS	Macro	Lib03	391	902	1067							
FAB$B_FAC	Macro	Lib03	391	902	1067							
FAB$B_FNS	Macro	Lib03	391	902	1067							
FAB$B_FSZ	Macro	Lib03	391	902	1067							
FAB$B_JOURNAL	Macro	Lib03	391	902	1067							
FAB$B_ORG	Macro	Lib03	391	902	1067							
FAB$B_RAT	Macro	Lib03	391	902	1067							
FAB$B_RFM	Macro	Lib03	391	902	1067	1100						
FAB$B_RTV	Macro	Lib03	391	902	1067							
FAB$B_RU_FACILITY	Macro	Lib03	391	902	1067							
FAB$B_SHR	Macro	Lib03	391	902	1067							
FAB$C_BID	Literal	Lib03	391	902	1067							
FAB$C_BLN	Literal	Lib03	365	391	884	902	966	1067				
FAB$C_FIX	Literal	Lib03	1100	1103								
FAB$C_VAR	Literal	Lib03	391	902	1067	1100	1106					
FAB$L_ALQ	Macro	Lib03	391	902	1067							
FAB$L_CTX	Macro	Lib03	391	902	1067							
FAB$L_DNA	Macro	Lib03	391	902	1067							
FAB$L_FNA	Macro	Lib03	391	902	1067							
FAB$L_FOP	Macro	Lib03	391	902	1067							
FAB$L_MRN	Macro	Lib03	391	902	1067							
FAB$L_NAM	Macro	Lib03	391	902	1067							
FAB$L_XAB	Macro	Lib03	391	902	1067							
FAB$M_GET	Literal	Lib03	391	902	1067							
FAB$M_NAM	Literal	Lib03	391									
FAB$M_RWO	Literal	Lib03	902									
FAB$V_CHAN_MODE	Macro	Lib03	391	902	1067							
FAB$V_FILE_MODE	Macro	Lib03	391	902	1067							
FAB$V_LNM_MODE	Macro	Lib03	391	902	1067							
FAB$V_RWO	Macro	Lib03	919									
FAB$W_BLS	Macro	Lib03	391	902	1067							
FAB$W_DEQ	Macro	Lib03	391	902	1067							
FAB$W_GBC	Macro	Lib03	391	902	1067							
FAB$W_MRS	Macro	Lib03	391	902	1067							
FAB_BLK	Own	365	391a	397a	404a	463a						
FILEDESC	Local	881	899=	900=	901a	902.	943=	944=	948a			
FILEMATCH	Local	1178	1213a									
FILENAM	Local	880	900a	902a								
FILENAME_D	Local	340	340=	429=	430.	430a=	435.	435a.	440.	446.	446a.	448.	458.
			458a.	460.									
FILES	Local	351	351=	409.	419.	420.	421.	422.	423=	432=	432.	469.	470.
			471.	474.									
FILESPEC	RoutForm	832	898.	901.									
FILESPECMATCH	Own	222	517.	518a	770.	771=	771.	1080=	1212=	1213=	1221.	1231.	1242=
			1242.	1251.	1253.	1258=	1258.	1259.	1259a=	1268.	1272.	1273a.	1278=
FILE_BUF	Local	339	342a									
FIRST_FILE	Local	888	897=	937.	939.	939=						
FIRST_LEN	Local	889	896=	937.	939=							
FORMAT_ODS1	Routine	645	1104c									
FORMAT_ODS2	Routine	692	1107c									
FORMAT_ULTRIX	Routine	581	1097c									
F_LINE	Bind	212										
HEADER	Routine	279	410c	425c								
HP$T_TYPE	Field	Lib01	1356									
INDEX	Local	720	729.	738.								

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Symbol                        Type  Defined  Referenced ...
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                          Local     1215  1219.   1238.
INIT_CONTEXT              ExtRout    263  1403c
INTERCEPTCONTROLC         Routine   1161  1189a
IO$_READLBLK              Literal  Lib03   785
ITMLST                    Local     1311  1311=   1318=   1373a   1378=   1379a.
JSB_0                     Linkage  Lib02   271
JSB_DEVICE                Linkage   1290
JSB_FAKE                  Linkage    215  1396
JSB_LOC$PTABLE            Linkage  Lib02   268
JSB_NONE                  Linkage  Lib02   261     262     263     264
JSB_SCAN                  Linkage    216   260
KB_CHECK                  ExtRout    261
L                         Bind       750
LAST_DOT                  Local     1044  1048=   1053.   1055.   1056.
LEFT                      Local      982  1019=   1023.
LEN                       Local     1305  1351=   1352.
LENGTH                    RoutForm   581
                          RoutForm   645
                          RoutForm   692   720.
                          Local     1173
LIB$SIGNAL                ExtRout    273
LINE_BUF                  Local      343   343=    346a
LINE_D                    RoutForm   308   312m    313.    314a=
                          Local      344   344=    406a=   418a    435a=   436a    447.    450a    457a    459a=   468a
LNM$C_NAMLENGTH           Literal  Lib03   347
LOC$PTABLE                ExtRout    268  1352c
L_DOT                     Local      985
L_LPART                   Local      989  1017=   1018.   1019.
L_REST                    Local      991  1010=   1011.   1018.   1037.   1049.   1055.
L_RPART                   Local      988  1018=   1020.
MAX_DEVNAME_LEN           Literal   1299  1310
NAM                       Bind       295   298m    300.    300a.   301.    301a.   302.
                          Local      885   902a    903a    935.
NAM$B_BID                 Macro    Lib03   383     903
NAM$B_BLN                 Macro    Lib03   383     903
NAM$B_DEV                 Macro    Lib03   300     301     302     415
NAM$B_DIR                 Macro    Lib03   301     302     415
NAM$B_ESS                 Macro    Lib03   383     903
NAM$B_NAME                Macro    Lib03   429
NAM$B_NOP                 Macro    Lib03   383     903
NAM$B_RSL                 Macro    Lib03   935
NAM$B_RSS                 Macro    Lib03   383     903
NAM$B_TYPE                Macro    Lib03   429
NAM$B_VER                 Macro    Lib03   429
NAM$C_BID                 Literal  Lib03   383     903
NAM$C_BLN                 Literal  Lib03   364     383     885     903
NAM$C_MAXRSS              Literal  Lib03   361     362     363     383     880     886     887     899     903     1178    1221
NAM$L_DEV                 Macro    Lib03   300     415
NAM$L_DIR                 Macro    Lib03   301
NAM$L_ESA                 Macro    Lib03   383     903
NAM$L_NAME                Macro    Lib03   430
NAM$L_RLF                 Macro    Lib03   383     903
NAM$L_RSA                 Macro    Lib03   383     903
NAME                      Local      665   680=    680a    681a    685a
                          Local      759   805=    805a    806a    810a
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Symbol	Type	Defined	Referenced ...
NAM_BLK	RoutForm	279	295.
	Own	364	383a 391a 410a 415. 415a. 425a 429. 430a.
NAM_LEN	Local	923	942= 943. 946. 947.
NAM_PTR	Local	924	941= 942. 944. 946a. 947a.
NEXT_FILE	BindRout	875	919c
ODS_DIRECT	Routine	961	1336c 1347c 1360c
ONE	GlobReg	1284	
OUTBUFFER	Local	761	766= 767= 809. 811a 825. 825a
	Local	891	894= 895= 946. 947. 948a 953. 953a
POINTER	Local	1174	
PPA$DIRECTORY	ExtRout	1167	1341c
PPA_STAT	Local	1176	1341= 1342.
PR$V_SID_TYPE	Macro	Lib03	1326
PR$_SID_TYP730	Literal	Lib03	1330
PR$_SID_TYP750	Literal	Lib03	1329
PR$_SID_TYP780	Literal	Lib03	1328
PR$_SID_TYP790	Literal	Lib03	1331
PR$_SID_TYP8NN	Literal	Lib03	1334
PR$_SID_TYP8RR	Literal	235	1335
PR$_SID_TYP8SS	Literal	Lib03	1333
PR$_SID_TYPUV	Literal	Lib03	1337
PR$_SYS_TYP900	ExtLit	244	1339
PTABLE	Local	1303	1352= 1353. 1356.
PTR	RoutForm	308	315a=
	Local	357	357= 418. 418a 436a 440. 447. 448= 448. 449. 450a 457a
			460= 467. 468a
	Local	566	576= 576.
PUTBUFFER	Routine	495	638c 686c 740c 811c 948c
PUT_LINE	Routine	308	418c 436c 450c 457c 468c
P_COMMA	Local	990	1011= 1013. 1016. 1017.
P_DOT	Local	984	1037= 1039. 1046. 1048. 1049= 1049. 1050.
P_LPART	Local	986	1009= 1011a. 1017. 1019. 1037a. 1049. 1053. 1054. 1055.
P_NAM	Local	1250	1251= 1253. 1253a. 1255a. 1258. 1259. 1264a. 1265= 1265.
P_RPART	Local	987	1016= 1020.
QIO$CLEANUP	ExtRout	265	
Q_BUFFER	Local	762	808= 809= 810a 811a
	Local	974	1089= 1090= 1097a 1104a 1107a 1121. 1121a
Q_DEVICE	RoutForm	746	750. 768.
Q_DIRECT	Bind	979	1009. 1010. 1027. 1028.
Q_DIRECTORY	Local	970	1021= 1022= 1023a 1027= 1028= 1033a 1055= 1056= 1063a
Q_FILE	Local	972	995= 996= 1001a 1002a 1003. 1004= 1004. 1063a 1067.
Q_FILEBLOCK	Local	1179	1194= 1195a 1196a 1198a 1203a 1204a 1206a 1208a 1210a 1219a 1325a.
			1332a 1336a 1341a 1347a 1351. 1352. 1360a 1362a 1373a
Q_FILSPEC	RoutForm	961	979. 1001. 1033. 1063.
RAB	Local	967	1068a 1081a 1092a 1097. 1104. 1107.
RAB$B_BID	Macro	Lib03	1068
RAB$B_BLN	Macro	Lib03	1068
RAB$B_KRF	Macro	Lib03	1068
RAB$B_KSZ	Unbound		1068
RAB$B_MBC	Macro	Lib03	1068
RAB$B_MBF	Macro	Lib03	1068
RAB$B_RAC	Macro	Lib03	1068
RAB$B_TMO	Macro	Lib03	1068
RAB$C_BID	Literal	Lib03	1068
RAB$C_BLN	Literal	Lib03	967 1068

Symbol	Type	Defined	Referenced ...
RAB$L_BKT	Macro	Lib03	1068
RAB$L_CTX	Macro	Lib03	1068
RAB$L_FAB	Macro	Lib03	1068
RAB$L_KBF	Unbound		1068
RAB$L_RBF	Macro	Lib03	1068 1097 1104 1107
RAB$L_RHB	Macro	Lib03	1068
RAB$L_ROP	Macro	Lib03	1068
RAB$L_UBF	Macro	Lib03	1068
RAB$L_XAB	Macro	Lib03	1068
RAB$W_RSZ	Macro	Lib03	1068 1097 1104 1107
RAB$W_USZ	Macro	Lib03	1068
RAD50	Routine	544	680c 682c 805c 807c
RESULT	Local	886	903a 937. 939. 941. 942a
RES_LEN	Local	882	935= 937. 939. 941. 942.
RES_STR	Own	361	383a
RIGHT	Local	983	1020= 1023.
RMS$_DEV	Literal	Lib03	1363
RMS$_DNF	Literal	Lib03	1074
RMS$_EOF	Literal	Lib03	1126
RMS$_FNF	Literal	Lib03	1074
RMS$_NMF	Literal	Lib03	465 955
RMS$_NORMAL	Literal	Lib03	820 828 949 955 1126
RMS$_SUC	Literal	Lib03	399 407 478
RPB	Local	756	764= 787. 819. 827.
RT$L_FILENAME	Macro	Lib02	805
RT$V_ENDSEG	Macro	Lib02	800
RT$V_PERM	Macro	Lib02	802
RT$W_EXTRALEN	Macro	Lib02	791
RT$W_FILETYPE	Macro	Lib02	807
RT$W_FIRST	Macro	Lib02	792
RT$W_SEGMENT	Macro	Lib02	790
RT$_FIXED	Literal	Lib02	792 798
RT11_DIRECT	Routine	746	1332c
SAME_DIR	Local	358	358= 414= 416.
SCAN$NUMERIC	ExtRout	260	1019c 1020c
SCRIPT$FLUSH	ExtRout	262	1401c
SDL$STARLET_CONCAT	Macro	Lib03	913 929 1070 1081 1084 1092 1111 1123
SDL$STARLET_OPT	Macro	Lib03	913 929 1070 1081 1084 1092 1111 1123
SDL$STARLET_REQ	Macro	Lib03	913 929 1070 1081 1084 1092 1111 1123
SEGBLK	Local	757	782a 790. 791. 792a
SEGMENT	Local	753	765= 780. 784. 790=
SP	Builtin	1407	1409= 1409. 1410a=
SPEC	Own	362	373= 375a 391a
SS$_FILESTRUCT	Literal	Lib03	1112
SS$_NORMAL	Literal	Lib03	1374
START_SIZE	Local	992	1003= 1079.
STAT2	Local	355	355= 404= 407. 463= 465. 478= 479. 481.
STATUS	Local	354	354= 397= 399. 483.
	Local	778	782= 788.
	Local	883	919= 919. 929= 931. 955. 955= 957.
	Local	911	913= 915.
	Local	965	1070= 1072. 1075. 1081= 1085. 1092= 1124. 1127.
	Local	1175	
	Local	1306	1332= 1336= 1347= 1360= 1362= 1363= 1366. 1368. 1373= 1374. 1382= 1384. 1386.

Symbol	Type	Defined	Referenced ...									
SYS$CLOSE	ExtRout	929	929c	1084e	1084c	1111e	1111c	1123e	1123c			
SYS$CONNECT	ExtRout	1081	1081c									
SYS$FAO	ExtRout	627	627c	636e	636c	685e	685c	729e	729c	738e	738c	810e	810c
			901e	901c	1001e	1001c	1023e	1023c	1063e	1063c			
SYS$GET	ExtRout	1092	1092c									
SYS$GETDVI	ExtRout	1168	1373c									
SYS$GETSYI	ExtRout	275										
SYS$OPEN	ExtRout	872	877a	1070e	1070c							
SYS$PARSE	ExtRout	274	397c	913e	913c							
SYS$SEARCH	ExtRout	272	404c	463c	871e	877a						
TOTAL_DIRS	Local	353	353=	424=	424.	472.	475=	475.	476.			
TOTAL_FILES	Local	352	352=	422=	422.	474=	474.	476.				
TYPE	Local	666	682=	682a	685a							
	Local	760	807=	807a	810a							
T_BUFFER	Local	758	767a	769=								
	Local	975	1088=	1090a								
T_DIRECTORY	Local	969	1021a									
T_FILE	Local	973	996a									
ULTRIX_FLAGS	External	247	998.	1077.	1095.	1191.	1246.					
ULTRIX_V_MODE	Literal	234	998	1077	1095	1191	1246					
ULTRIX_WCARD	RoutForm	961	1004.									
	Local	1177	1252=	1264=	1268.	1268=	1336.	1347.	1360.			
USER_SPEC	Local	338	338=	374=	375=	391.						
VER_OFFSET	Bind	718	720									
VMS_DIR	Routine	320	1382c									
WIDE_FLAG	Global	226	433.	523.	620.	722.	945.					
WILD	Local	511	518a									
WILDCARDMASK	Bind	1186	1208.	1274.	1275a.							
XLATE	Bind	569	572.	573.	574.							
ZERO	GlobReg	1283										

CROSS REFERENCE MAP

Line #	Event	File ...
1	Source (start)	DISK$DS:[DS.LOCAL.RELEASE.WORK]DIRECTORY.B32;1
18	Module DIRECTORY	
176	Library #1	DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
178	Library #2	DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
180	Library #3	SYS$COMMON:[SYSLIB]LIB.L32;3
1417	Eludom DIRECTORY	

```
        KEY TO REFERENCE TYPE FLAGS

            .   Fetch
            =   Store
            c   Routine call
            a   Address use
            @   Indirect use
            e   External, external routine, or external literal declaration
            f   Forward or forward routine declaration
            h   Condition handler enabling
            m   Map declaration
            u   Undeclare declaration


;                           Library Statistics
;
;                                          -------- Symbols --------      Pages       Processing
;       File                               Total    Loaded   Percent      Mapped      Time
;
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
;                                            942        20         2        96          00:00.0
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
;                                            675        15         2        47          00:00.0
;  SYS$COMMON:[SYSLIB]LIB.L32;3             21522       125         0      1156          00:00.9




;                                   COMMAND QUALIFIERS

;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:DIRECTORY.B32

; Size:          3877 code + 1750 data bytes
; Run Time:         00:12.4
; Elapsed Time:     00:16.5
; Lines/CPU Min:     6861
; Lexemes/CPU-Min:127685
; Memory Used:  378 pages
; Compilation Complete
```

Table of contents

(1)   184   Libraries and Symbol Definitions
(1)   218   Work Declarations
(1)   230   Data Declarations
(1)   279   Dispatch Routine
(1)   543   DSX$EndPass Routine
(1)   641   DS_Cleanup Routine
(1)   723   DSX$DoSummary and VRSummary Routines
(1)   782   VRShowStatus Routine

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element DISPAT.MAR
0000     2 ; *6    11-FEB-1988 13:39:45 MCCARRON "Changed copyright date"
0000     3 ; *5     8-FEB-1988 16:49:03 MCCARRON "Changed according to printrev changes"
0000     4 ; *4    19-OCT-1987 17:30:33 LI "Fixed the EndPass error message on subtest#"
0000     5 ; *3    20-MAY-1986 10:28:40 BERGAZZI "/TIME"
0000     6 ; *2    19-MAY-1986 16:41:40 BERGAZZI "/TIME"
0000     7 ; *1     6-FEB-1986 15:17:28 DS ""
0000     8 ; DEC/CMS REPLACEMENT HISTORY, Element DISPAT.MAR
0000     9         .TITLE  DISPAT  *** DISPAT Diagnostic test sequence control
0000    10         .IDENT  /10.11-6/                                              ;G:6
0000    11         .NoShow Conditionals
0000    12
0000    13 ;
0000    14 ; Copyright (c) 1977, 1982, 1985, 1986, 1988                           ;G:6
0000    15 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    16 ;
0000    17 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0000    18 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
0000    19 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
0000    20 ; MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
0000    21 ; EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
0000    22 ; TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
0000    23 ; REMAIN IN DEC.
0000    24 ;
0000    25 ; THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
0000    26 ; AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
0000    27 ; CORPORATION.
0000    28 ;
0000    29 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0000    30 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    31
0000    32 ;++
0000    33 ; FACILITY:
0000    34 ;       VAX DIAGNOSTIC SUPERVISOR.
0000    35 ;
0000    36 ; ABSTRACT:
0000    37 ;
0000    38 ; ENVIRONMENT:
0000    39 ;
0000    40 ; AUTHOR:
0000    41 ;       KEN CHAPMAN     10-NOV-77       VERSION 01.
0000    42 ;
```

```
                        0000     44 ; MODIFIED BY:
                        0000     45 ;                    TOM SOUTTER     14-NOV-77       VERSION 02.
                        0000     46 ;         01         DSPR #24 & #25 -- CLEANUP SEQUENCING PROBLEMS.
                        0000     47 ;                    N.  HOWGATE     16-NOV-77       VERSION 03.
                        0000     48 ;         02         DSPR #42 -- APT FUNCTION UPDATE
                        0000     49 ;                    TOM SOUTTER     08-DEC-77       VERSION 04.
                        0000     50 ;         03         TURNED ON EXECUTION INFO. MESSAGES.
                        0000     51 ;         04         DSPR #43 -- AUTOMATIC "DOSUMMARY" IN FINAL "ENDPASS".
                        0000     52 ;         05         DSPR #64 -- CHECK LOAD FLAG FOR SUMMARY COMMAND.
                        0000     53 ;         06         SET EXECUTE FLAG BEFORE CHECKING EXIT TEST STATUS. (KWC)
                        0000     54 ;                    NICK HOWGATE    30-DEC-77       VERSION 05.
                        0000     55 ;         07         DSX$ENDPASS - CHANGE REFERENCE TO DSA$GL_PASSES
                        0000     56 ;                    Roger Riggs     12-Jun-78       VERSION 08
                        0000     57 ;         08         Standardizing primary messages (first pass done/end run)
                        0000     58 ;         09         Check flag DS$V_DONFLG in DS$GL_FLAGS so cleanup is done
                        0000     59 ;                    only once.
                        0000     60 ;         10         Fix to use .ENTRY and .VECTOR in proceedures
                        0000     61 ;                    Roger Riggs     12-Jun-1978
                        0000     62 ;         11         Removed deallocate from cleanup code.
                        0000     63 ;                    Cancel ^O before calling summary  and end pass message
                        0000     64 ;                    Dave Butenhof   15-feb-80
                        0000     65 ;         12         Add hooks for 'ERROR SEARCH' function
                        0000     66 ;                    Roger Riggs,    12-Mar-1980
                        0000     67 ;         13         Added call to INITSCB and reset memory management after cleanup
                        0000     68 ;                    also call QIO$CLEANUP only if program is SEP_FUNCTIONAL
                        0000     69 ;
                        0000     70 ;                    Dave Butenhof   30-jun-1980, version 5.5
                        0000     71 ;         14         Correct word displaced mode to longword displaced
                        0000     72 ;         15         Support DS RMS by calling cleanup routine to avoid
                        0000     73 ;                    cluttering pool space in case of errors
                        0000     74 ;
                        0000     75 ;                    Dave Butenhof, 03-oct-1980, version 6.1
                        0000     76 ;         16         Change some more word-relative references to longword relative
                        0000     77 ;         17         Clear DS$V_CTRLC bit before doing $DS_CNTRLC call; this is to
                        0000     78 ;                    prevent probably undesired control C at next call to KB_CHECK,
                        0000     79 ;                    if control C's were disabled by previous program.
                        0000     80 ;                    Dave Butenhof, 29-dec-1980, version 6.2
                        0000     81 ;         18         More word relative references to longword.  This is getting
                        0000     82 ;                    quite un-fun.
                        0000     83 ;                    Dave Butenhof, 17-feb-1981, version 6.3
                        0000     84 ;         19         More of same.  ALL DSA$?_? references this time.
                        0000     85 ;         20         - dave butenhof, 06-Oct-1981, version 6.5
                        0000     86 ;                    Add SHOW STATUS command
                        0000     87 ;         21         - Dave Butenhof, 02-Nov-1981, version 6.-
                        0000     88 ;                    Fix truncation errors
```

```
0000     90 ;        22      - Jack Stansbury, 03-Nov-1981, Version 6.-
0000     91 ;                Added calls to QA$Main for the QA enhancements. Also fixed
0000     92 ;                some truncation errors. Also changed PSECTs a bit. Added
0000     93 ;                .LIBRARY statements for $DS, $DIAG, and LIB.
0000     94 ;
0000     95 ;        23      - Dave Butenhof, 16-Nov-1981, version 6.5
0000     96 ;                Modified the text (and corrected a bug) in the SHOW STATUS
0000     97 ;                command.
0000     98 ;
0000     99 ;        24      - Dave Butenhof, 19-Nov-1981, version 6.5
0000    100 ;                Modify to use typecodes on all output messages.
0000    101 ;
0000    102 ;        25      - Jack Stansbury, 21-Nov-1981, Version 6.5
0000    103 ;                Commented out several of the calls to QA_MAIN because it
0000    104 ;                appears as though they will not be needed for the 6.5 DS
0000    105 ;                version. Made several other small code changes to the DISPATCH
0000    106 ;                routine for QA.
0000    107 ;
0000    108 ;        26      - Jack Stansbury, 21-Nov-1981, Version 6.5
0000    109 ;                Changed DSX$ENDPASS routine slightly to accomadate QA.
0000    110 ;
0000    111 ;        27      - Jack Stansbury, 16-Dec-1981, Version 6.6
0000    112 ;                Added the DS_QADEFS macro definition.
0000    113 ;
0000    114 ;        28      - Dave Butenhof, 29-Dec-1981, Version 6.6
0000    115 ;                Print out all error counts on Summary command.
0000    116 ;
0000    117 ;        29      - Jack Stansbury, 6-Jan-1982, Version 6.6
0000    118 ;                Changed EndPass routine slightly to accomodate the
0000    119 ;                new way of implementing QA (with the QA Start Loop).
0000    120 ;
0000    121 ;        30      - Dave Butenhof, 12-Jan-1982, Version 6.6
0000    122 ;                Fix EndPass message to avoid losing end of message on
0000    123 ;                narrow screen.
0000    124 ;
0000    125 ;        31      - Jack Stansbury, 15-Jan-1982, Version 6.6
0000    126 ;                Made changes to the Dispatch routine for the Loop on Subtest
0000    127 ;                QA check routine.
0000    128 ;
0000    129 ;        32      - Jack Stansbury, 9-Mar-1982, Version 6.6
0000    130 ;                Inserted some new DS macros that will help these routines
0000    131 ;                be more understandable.
0000    132 ;
0000    133 ;        33      Marion Baggett, 9-Apr-1982, Version 6.7
0000    134 ;                Added NoShow Conditionals after the .IDENT
0000    135 ;
0000    136 ;        34      Dave Butenhof, 20-Apr-1982, Verison 6.7
0000    137 ;                Add kluge code in DS_CLEANUP; if standalone on 730,
0000    138 ;                reset IDC to prevent extra interrupts.
0000    139 ;
0000    140 ;        35      Jack Stansbury, 13-September-1982, Version 6.9
0000    141 ;                Fixed some truncation errors. I didn't mark those that I fixed.
0000    142 ;
0000    143 ;        36      Jack Stansbury, 15-September-1982, Version 6.9
0000    144 ;                Changed the VRSummary and VRShowStatus routines to call the
0000    145 ;                DSR$CheckLoad routine defined in ShowMem.
0000    146 ;
```

```
0000    147 ;       37      Jack Stansbury, 8-Mar-1983, Version 6.11
0000    148 ;               Changed the VRShowStatus routine to look for the user's PC
0000    149 ;               on the stack (in the CLI args).
0000    150 ;
0000    151 ;       38      Amy Iorio, 7-January-1985, Version 8.0
0000    152 ;               Added error message to be reported when subtest requested
0000    153 ;               which is greater than the number of existing subtests.
0000    154 ;
0000    155 ;       39      Amy Iorio, 9-January-1985, Version 8.0
0000    156 ;               Changed FMTLSTPAS in order to print
0000    157 ;               pass counts greater than 100,000 out.
0000    158 ;
0000    159 ;       40      Domenic Andella, 18-Mar-1985, Version 8.2
0000    160 ;               Add call in DS_CLEANUP to MP$_DEALL_MEMORY
0000    161 ;               to check for and deallocate any mp memory.
0000    162 ;
0000    163 ;       41      Amy Iorio, 8-May-1985, Version 8.2
0000    164 ;               Fix to loop-on-subtest.
0000    165 ;
0000    166 ;       42      Domenic Andella, 11-Dec-1985    Version 9.1
0000    167 ;               Add external symbol MP$_DEALL_MEMORY
0000    168 ;
0000    169 ;       43      Bob Bergazzi    16-May-1986     Version 10.1                    ;G:2
0000    170 ;               Cancel /TIME in DS_CLEANUP.                                     ;G:2
0000    171 ;                                                                               ;G:4
0000    172 ;               Daniel Li       19-Oct-1987     Version 10.10                   ;G:4
0000    173 ;               Commented out move subtno inst. in EndPass routine to print     ;G:4
0000    174 ;               correct subtest# of last test in the error on subtest message.  ;G:4
0000    175 ;                                                                               ;G:4
0000    176 ;               Paul McCarron   4-Feb-1988      Version 10.11                   ;G:5
0000    177 ;               Added calls to DSX$DEALLOCATE to make DISPAT compatible         ;G:5
0000    178 ;               with changes in allocation in DSX$PRINTREV.                     ;G:5
0000    179 ;                                                                               ;G:5
0000    180 ;               Paul McCarron   11-Feb-1988     Version 10.11                   ;G:6
0000    181 ;               Fixed copyright date to 1988                                    ;G:6
0000    182 ;--
```

```
                        0000    184          .SBTTL  Libraries and Symbol Definitions
                        0000    185 ;
                        0000    186 ; INCLUDE FILES:                                                    ;G:5
                        0000    187 ;
                        0000    188
                        0000    189          .LIBRARY        /SYS$LIBRARY:LIB/       ;                  [22]  ;G:2
                        0000    190          .LIBRARY        /$DS/                   ;                  [22]  ;G:2
                        0000    191          .LIBRARY        /$DIAG/                 ;                  [22]  ;G:2
                        0000    192
                        0000    193 ;
                        0000    194 ;       EXTERNAL SYMBOLS
                        0000    195 ;
                        0000    196          .EXTRN  MP$_DEALL_MEMORY                ;                  [42]
                        0000    197
                        0000    198
                        0000    199 ;
                        0000    200 ; MACROS:
                        0000    201 ;
                        0000    202
                        0000    203 ;
                        0000    204 ; EQUATED SYMBOLS:
                        0000    205 ;                                                                   ;G:5
                        0000    206          $PrDef                          ; Define PR codes           [34]
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .RESTORE
                        0000    207          $DS_ENVDEF
                        0000    208          $DS_DSADEF
                        0000    209          $DS_HDRDEF
                        0000    210          APTDEF
                        0000    211          CLIDEF                  ; Cli$L_ definitions                [31]
                        0000    212          DSFDEF
                        0000    213          DSPDEF
                        0000    214          DSQA                    ; DSQA$K constant definitions      [22]
                        0000    215          DS_QADEFS               ; Other QA$K constant definitions  [25]
                        0000    216          $DS_TYPEDEF             ; Define type codes                [24]
```

```
                     0000   218          .SUBTITLE       Work Declarations
                 00000000   219          .PSECT  Work, NoExe, NoShr, Wrt, Long          ;                    [22]
                     0000   220
                     0000   221 ;
                     0000   222 ; OWN STORAGE:
                     0000   223 ;
                     0000   224
         00000004    0000   225 A_TESTPTR:      .BLKL   1       ; POINTER TO CURRENT TEST CODE.
         00000008    0004   226 A_DATAPTR:      .BLKL   1       ; POINTER TO CURRENT TEST DATA.
         0000000C    0008   227 REQ_SUB:        .BLKL   1       ; SUBT. # THAT IS GREATER THAN SUBT. THAT EXIST
                     000C   228
```

```
                                    000C   230          .SUBTITLE       Data Declarations
                                00000000   231          .PSECT  Data, NoExe, Shr, NoWrt, Long          ;                    [22]
                                    0000   232
                                    0000   233          MODNAM  DISPATCH
        48 43 54 41 50 53 49 44 00' 0000       $MODULE:        .ASCIC  \DISPATCH\
                                08  0000
                                    0009   234
                                    0009   235 T_NOSUB:
20 3A 47 4E 49 4E 52 41 57 2F 21 00' 0009   236          .ASCIC \!/WARNING: Specified subtest number (!UW) too large.  !/\-      ;[38
75 73 20 64 65 69 66 69 63 65 70 53  0015
72 65 62 6D 75 6E 20 74 73 65 74 62  0021
6C 20 6F 6F 74 20 29 57 55 21 28 20  002D
57 55 21 2F 21 20 20 2E 65 67 72 61  0039
6E 69 20 73 74 73 65 74 62 75 73 20  0045
65 77 20 57 55 21 20 74 73 65 74 20  0051
2E 64 65 74 75 63 65 78 65 20 65 72  005D
                              2F 21  0069
                                61  0009
                                    006B   237                  \!UW subtests in test !UW were executed.!/\                  ;[38
                                    006B   238 T_NOEXE:
73 65 74 20 6F 4E 20 3F 3F 2F 21 00' 006B   239          .ASCIC  \!/?? No tests in this section.!/\      ;                    [24]
73 20 73 69 68 74 20 6E 69 20 73 74  0077
        2F 21 2E 6E 6F 69 74 63 65  0083
                                20  006B
                                    008C   240
                                    008C   241 FMTPASONE:
20 74 73 72 69 46 20 2E 2E 2F 21 00' 008C   242          .ASCIC  "!/.. First pass done, !UW error!%S detected, time is !%D!/" ;  [30]
21 20 2C 65 6E 6F 64 20 73 73 61 70  0098
20 53 25 21 72 6F 72 72 65 20 57 55  00A4
69 74 20 2C 64 65 74 63 65 74 65 64  00B0
   2F 21 44 25 21 20 73 69 20 65 6D  00BC
                                3A  008C
                                    00C7   243
                                    00C7   244 FMTLSTPAS:
66 6F 20 64 6E 45 20 2E 2E 2F 21 00' 00C7   245          .ASCIC  "!/.. End of run, !UW error!%S detected, pass count is !UL,!/"-;[30]
72 65 20 57 55 21 20 2C 6E 75 72 20  00D3
63 65 74 65 64 20 53 25 21 72 6F 72  00DF
6F 63 20 73 73 61 70 20 2C 64 65 74  00EB
21 2C 4C 55 21 20 73 69 20 74 6E 75  00F7
                                2F  0103
21 20 73 69 20 65 6D 69 74 20 20 20  0104   246                  "   time is !%D!/"                  ;                    [30]
                        2F 21 44 25  0110
                                4C  00C7
```

```
                                                0114   248 FMTSEARCH:
20 72 6F 72 72 45 20 2E 2E 2F 21 00'            0114   249         .ASCIC  "!/.. Error search: new test limit is !UL, time is !%D!/" ;     [30]
20 77 65 6E 20 3A 68 63 72 61 65 73             0120
69 20 74 69 6D 69 6C 20 74 73 65 74             012C
20 65 6D 69 74 20 2C 4C 55 21 20 73             0138
            2F 21 44 25 21 20 73 69             0144
                                  37            0114
                                                014C   250
                                                014C   251 FMTTRACE:
3A 42 55 21 20 74 73 65 54 2F 21 00'            014C   252         .ASCIC  "!/Test !UB: !AC"
                        43 41 21 20             0158
                                  0F            014C
                                                015C   253
                                                015C   254 FMT_SUMMARY:                                                ;                     [28]
6F 20 79 72 61 6D 6D 75 53 2F 21 00'            015C   255         .ascic  "!/Summary of !AC, Rev !UL.!UL:!/" -    ;                     [28]
21 20 76 65 52 20 2C 43 41 21 20 66             0168
         2F 21 3A 4C 55 21 2E 4C 55             0174
6D 61 72 67 6F 72 70 20 4C 5A 21 20             017D   256                 " !ZL program detected error!%S " -     ;                     [28]
72 65 20 64 65 74 63 65 74 65 64 20             0189
               20 53 25 21 72 6F 72             0195
21 20 2C 64 72 61 48 20 4C 5A 21 28             019C   257                 "(!ZL Hard, !ZL Soft, !ZL" -            ;                     [28]
4C 5A 21 20 2C 74 66 6F 53 20 4C 5A             01A8
4C 5A 21 20 2C 6D 65 74 73 79 53 20             01B4   258                 " System, !ZL Device).!/" -             ;                     [28]
   2F 21 2E 29 65 63 69 76 65 44 20             01C0
69 76 72 65 70 75 53 20 4C 5A 21 20             01CB   259                 " !ZL Supervisor detected error!%S.!/!/"       ;             [28]
64 65 74 63 65 74 65 64 20 72 6F 73             01D7
2F 21 2E 53 25 21 72 6F 72 72 65 20             01E3
                                2F 21           01EF
                                  94            015C
```

```
                                        01F1   261 Fmt_ShowStatus_No_PC:                                    ;                                [37]
21 20 66 6F 20 73 75 74 61 74 53 00'    01F1   262         .Ascic  "Status of !AC, Rev !UL.!UL!/" -          ;                                [37]
2E 4C 55 21 20 76 65 52 20 2C 43 41     01FD
                  2F 21 4C 55 21        0209
69 74 63 65 53 5B 5F 21 44 25 21 20     020E   263                 " !%D!_[Section !AC]!_[!ZL error!%S]!/" -      ;                      [37]
5A 21 5B 5F 21 5D 43 41 21 20 6E 6F     021A
21 5D 53 25 21 72 6F 72 72 65 20 4C     0226
                              2F        0232
21 5D 4C 5A 21 20 74 73 65 54 5B 20     0233   264                 " [Test !ZL]!_[Subtest !ZL]!/" -          ;                      [37]
5A 21 20 74 73 65 74 62 75 53 5B 5F     023F
                  2F 21 5D 4C           024B
21 5D 4C 5A 21 20 73 73 61 50 5B 20     024F   265                 " [Pass !ZL]!/"                           ;                      [37]
                              2F        025B
                              6A        01F1
                                        025C   266
                                        025C   267 FMT_SHOWSTATUS:
21 20 66 6F 20 73 75 74 61 74 53 00'    025C   268         .ascic  "Status of !AC, Rev !UL.!UL!/" -          ;                      [23]
2E 4C 55 21 20 76 65 52 20 2C 43 41     0268
                  2F 21 4C 55 21        0274
69 74 63 65 53 5B 5F 21 44 25 21 20     0279   269                 " !%D!_[Section !AC]!_[!ZL error!%S]!/" -      ;                      [23]
5A 21 5B 5F 21 5D 43 41 21 20 6E 6F     0285
21 5D 53 25 21 72 6F 72 72 65 20 4C     0291
                              2F        029D
21 5D 4C 5A 21 20 74 73 65 54 5B 20     029E   270                 " [Test !ZL]!_[Subtest !ZL]!/" -          ;                      [23]
5A 21 20 74 73 65 74 62 75 53 5B 5F     02AA
                  2F 21 5D 4C           02B6
21 5D 4C 5A 21 20 73 73 61 50 5B 20     02BA   271                 " [Pass !ZL]!_[User PC !XL]!/"  ;                                [23]
5B 21 20 43 50 20 72 65 73 55 5B 5F     02C6
                  2F 21 5D 4C           02D2
                              79        025C
                                        02D6   272
                                        02D6   273 FMT_NODIAG:
6E 67 61 69 64 20 6F 4E 20 3F 3F 00'    02D6   274         .ascic  '?? No diagnostic running.!/'   ;                                [23]
6E 69 6E 6E 75 72 20 63 69 74 73 6F     02E2
                  2F 21 2E 67           02EE
                              1B        02D6
                                        02F2   275
                                        02F2   276 T_TSTABO:
   5D 64 65 74 72 6F 62 61 5B 20 00'    02F2   277         .ASCIC  " [aborted]"
                              0A        02F2
```

```
                     02FD   279          .SBTTL  Dispatch Routine
                  00000000  280          .PSECT  Code, Exe, Shr, NoWrt, Long     ;                    [22]
                     0000   281 ;++
                     0000   282 ; FUNCTIONAL DESCRIPTION:
                     0000   283 ;
                     0000   284 ;       This routine is called to initiate the test program.
                     0000   285 ;       It takes case of calling initialization sections, individual
                     0000   286 ;       tests and finally cleanup code.
                     0000   287 ;
                     0000   288 ; CALLING SEQUENCE:
                     0000   289 ;
                     0000   290 ;       BSBW    DISPATCH
                     0000   291 ;
                     0000   292 ; INPUT PARAMETERS:
                     0000   293 ;
                     0000   294 ;       DS$GL_FSTTEST   = FIRST TEST NUMBER
                     0000   295 ;       DS$GL_LSTTEST   = NUMBER OF LAST TEST TO EXECUTE
                     0000   296 ;
                     0000   297 ; IMPLICIT INPUTS:      NONE
                     0000   298 ;
                     0000   299 ; OUTPUT PARAMETERS:    NONE
                     0000   300 ;
                     0000   301 ; IMPLICIT OUTPUTS:     NONE
                     0000   302 ;
                     0000   303 ; COMPLETION CODES:     NONE
                     0000   304 ;
                     0000   305 ; SIDE EFFECTS:         NONE
                     0000   306 ;--
```

```
                        0000    308 DISPATCH::
          00000000'EF   D4  0000    309         CLRL    L^DS$GL_ERRCNT          ; START WITH NO ERRORS
          00000000'EF   D4  0006    310         Clrl    L^Ds$GL_HardErr_Count   ; Clear out error counters              [28]
          00000000'EF   D4  000C    311         Clrl    L^Ds$GL_SoftErr_Count   ;                                       [28]
          00000000'EF   D4  0012    312         Clrl    L^Ds$GL_SysErr_Count    ;                                       [28]
          00000000'EF   D4  0018    313         Clrl    L^Ds$GL_DevErr_Count    ;                                       [28]
          00000000'EF   D4  001E    314         Clrl    L^Ds$GL_ErrSup_Count    ;                                       [28]
          0000FE54'EF   D4  0024    315         CLRL    L^DSA$GL_PASSNO         ; START ON FIRST PASS
                        002A    316         Set_Pass0                       ; Indicate first pass ever              [32]
0000FE00'EF   1D  E2  002A                    BBSS    #DSA$V_Pass0, -         ; Branch if PASS0 bit is set to         [29]
                00  0031                      L^DSA$GL_Flags, 30000$          ; ...
                    0032    30000$:                                         ; ... here. Set bit regardless.         [29]
                    0032    317
                    0032    318 FIRSTTEST:
                    0032    319
                    0032    320         ;+
                    0032    321         ; Perform the initialization code for the diagnostic.
                    0032    322         ; Test 0, Subtest 1 => initialization code
                    0032    323         ; Test 0, Subtest 2 => cleanup code
                    0032    324         ;-
                    0032    325
     0000FE50'EF    D4  0032    326         CLRL    L^DSA$GL_TESTNO         ; TEST 0,
0000FE4C'EF   01    D0  0038    327         MOVL    #1, L^DSA$GL_SUBTNO     ; SUBTEST 1 INDICATES INIT.
                    003F    328
                    003F    329         QA_MAIN Dispat_Before_Init      ; Call QA$Main                          [22]
                13  DD  003F               PUSHL   #DSQA$K_Dispat_Before_Init
00000000'9F   01    FB  0041               CALLS   #1, a#QA$MAIN
                    0048    330
     0000023C'FF    00  FB  0048    331         CALLS   #0, aL$A_ICP            ; Execute initialization code.
0000FE50'EF   00000000'EF   D0  004F    332         MOVL    L^DS$GL_FSTTEST, -      ; LOAD NUMBER OF FIRST TEST
                            005A    333           L^DSA$GL_TESTNO
                            005A    334
                            005A    335         QA_MAIN Dispat_After_Init       ; Call QA$Main                          [22]
                14  DD  005A               PUSHL   #DSQA$K_Dispat_After_Init
00000000'9F   01    FB  005C               CALLS   #1, a#QA$MAIN
                    0063    336
          0000FE4C'EF   D4  0063    337         CLRL    L^DSA$GL_SUBTNO         ; RESET SUBTEST NUMBER.
0000FE00'EF   1D  E5  0069    338         BBCC    #DSA$V_PASS0, -         ; Clear first pass flag.
                07  0070    339           L^DSA$GL_FLAGS, CALLTEST
0000FE54'EF   01    D0  0071    340         MOVL    #1, L^DSA$GL_PASSNO     ; START ON FIRST PASS
```

```
                                0078   342 CALLTEST:
                                0078   343
                                0078   344         ;+
                                0078   345         ; Set up everything to call a test in the diagnostic.
                                0078   346         ;-
                                0078   347
                                0078   348         QA_MAIN Dispat_CallTest          ; Call QA$Main                          [22]
                          15    DD     0078               PUSHL   #DSQA$K_Dispat_CallTest
          00000000'9F     01    FB     007A               CALLS   #1, a#QA$MAIN
                                0081   349         Clear_ErrFlg                     ; Clear the error flag                  [32]
          00000000'EF     04    E4     0081               BBSC    #DS$V_ErrFlg, -  ; Branch if ERRFLG bit is set to        [29]
                          00    0088                       L^DS$GL_Flags, 30001$ ; ...                                   [29]
                                0089   30001$:                                    ; ... here. Clear bit regardless.       [29]
                                0089   350
                                0089   351         ;+
                                0089   352         ; Compute the starting address of the next test to execute.
                                0089   353         ; Use the DSA$GL_TESTNO to compute the address. If no more tests,
                                0089   354         ; go to 130$ label.
                                0089   355         ;-
                                0089   356
     5C   0000FE50'EF     01    C3     0089   357         SUBL3   #1, L^DSA$GL_TESTNO, AP          ; GET INDEX INTO DISPATCH TBL
                       5C    18    C4     0091   358         MULL2   #DSP$K_SIZE, AP
        5C   00000218'FF4C    9E     0094   359         MOVAB   @L$A_DTP[AP], AP                 ; GET ADDRESS OF DISP TBL ENTRY.
      00000000'EF    0C AC    D0     009C   360         MOVL    DSP$A_TEST(AP), -                ; GET TEST CODE POINTER.
                                00A4   361                   L^A_TESTPTR
                          03    12     00A4   362         BNEQ    20$                              ; If not equal to zero, branch
                       01DF     31     00A6   363         BRW     130$                             ; Was equal to zero
                                00A9   364
   00 BC     0000FE50'EF     91     00A9   365 20$:     CMPB    L^DSA$GL_TESTNO, -               ; CHECK TEST NUMBER.
                                00B1   366                   @DSP$A_BASE(AP)
                          14    13     00B1   367         BEQL    30$                              ; If they are equal, branch
                                00B3   368         ERRSUP_S                                 ; Otherwise, error in DS
                00000000'EF     DF     00B3               PUSHAL  $MODULE
                          00    DD     00B9               PUSHL   #0
                          01    DD     00BB               PUSHL   #$ER
             00000000'EF    03    FB     00BD               CALLS   #3, DS_ERRSUP
                       01F0     31     00C4   369         BRW     DISPATCH_X
                                00C7   370
03 10 AC     0000FE10'EF     E0     00C7   371 30$:     BBS     L^DSA$GL_SECTNO, -               ; Check for right section
                                00D0   372                   DSP$Q_SECTION(AP), 35$
                       010A     31     00D0   373         BRW     115$                             ; Branch if bit clear
```

```
                                  00D3          ;+
                                  00D3          ; If TRACE flag is set, print the trace message.
                                  00D3          ;-
                                  00D3
                                  00D3  35$:    Br_If_Not_Trace 40$                     ; If not tracing, branch        [32]
      0000FE00'EF    0A    E1     00D3          BBC     #DSA$V_Trace, -                 ; If bit not set, branch        [29]
                     19           00DA                    L^DSA$GL_Flags, 40$            ;                               [29]
                                  00DB          $PRINT  #ds$k_type_program_info,-       ; Print info message            [24]
                                  00DB                    #ds$k_printf, -                ; .. use PRINTF                 [24]
                                  00DB                    L^FMTTRACE, -                  ; .. Trace message              [24]
                                  00DB                    @DSP$A_BASE(AP), -             ; .. test number                [24]
                                  00DB                    DSP$A_MSG(AP)                  ; .. and test name              [24]
                 04 AC    DD      00DB                  PUSHL   DSP$A_MSG(AP)
                 00 BC    DD      00DE                  PUSHL   @DSP$A_BASE(AP)
          0000014C'EF     9F      00E1                  PUSHAB  L^FMTTRACE
              7E    01    9A      00E7                  movzbl  #ds$k_printf, -(sp)
              7E    17    98      00EA                  cvtbl   #ds$k_type_program_info, -(sp)
      00000000'GF    05    FB     00ED                  CALLS   #$$N+2, G^DSX$PRINT
                                  00F4
   00000004'EF    08 AC    D0     00F4  40$:    MOVL    DSP$A_DATA(AP), -               ; GET DATA TABLE ENTRY.
                                  00FC                    L^A_DATAPTR
                                  00FC
          00000000'EF     D4      00FC  50$:    CLRL    L^DS$GA_CHKLPPC                 ; CLEAR THE CHECK_LOOP P.C.
          0000FE4C'EF     D4      0102          CLRL    L^DSA$GL_SUBTNO                 ; START WITH SUBTEST ZERO
                                  0108          Clear_Subt                              ; Clear the subtest flag        [32]
      00000000'EF    0E    E4     0108          BBSC    #DS$V_Subt, -           ; Branch if SUBT bit is set to          [29]
                     00           010F                    L^DS$GL_Flags, 30002$ ; ...                                   [29]
                                  0110      30002$:                               ; ... here. Clear bit regardless.       [29]
                                  0110
                                  0110          ;+
                                  0110          ; Call the test that is numbered DSA$GL_TESTNO.
                                  0110          ;-
                                  0110
00000000'FF   00000004'FF    FA   0110          CALLG   @L^A_DATAPTR, -                 ; CALL THE TEST.
                                  011B                  @L^A_TESTPTR
          0000FE50'EF     D1      011B          CMPL    L^DSA$GL_TESTNO,-               ; If test = last save the subtest #
          00000000'EF             0121                    L^DS$GL_LSTTEST
                     0B    12     0126          BNEQ    60$                             ; Don't save subtest #
          0000FE4C'EF     D0      0128          MOVL    L^DSA$GL_SUBTNO,-               ; Keep number of subt. saved
          00000008'EF             012E                    L^REQ_SUB
                                  0133          ;+
                                  0133          ; The test will come back to here assuming there were
                                  0133          ; no strange escapes from the test.
                                  0133          ;-
                                  0133
                                  0133  60$:    Set_ExeTst                              ; Set execute flag              [32]
      00000000'EF    12    E2     0133          BBSS    #DS$V_ExeTst, -         ; Branch if EXETST bit is set to        [29]
                     00           013A                    L^DS$GL_Flags, 30003$ ; ...                                   [29]
                                  013B      30003$:                               ; ... here. Set bit regardless.         [29]
                                  013B          Br_If_Not_ErrFlg        100$            ; Branch if no errors           [32]
      00000000'EF    04    E1     013B          BBC     #DS$V_ErrFlg, -                 ; If bit not set, branch        [29]
                     5A           0142                    L^DS$GL_Flags, 100$            ;                               [29]
                                  0143          Br_If_Not_Search        100$            ; Branch if not searching       [32]
      0000FE00'EF    0E    E1     0143          BBC     #DSA$V_Search, -                ; If bit not set, branch        [29]
                     52           014A                    L^DSA$GL_Flags, 100$           ;                               [29]
```

```
                                014B   413          ;+
                                014B   414          ; This section is for performing SEARCHing using the search flag.
                                014B   415          ;-
                                014B   416
                                014B   417          Clear_ErrFlg                                    ; Clear the error flag          [32]
          00000000'EF   04   E4 014B                BBSC    #DS$V_ErrFlg, -                         ; Branch if ERRFLG bit is set to [29]
                        00      0152                          L^DS$GL_Flags, 30004$ ; ...                                       [29]
                                0153          30004$:                                             ; ... here. Clear bit regardless. [29]
 00000000'EF   0000FE50'EF   D0 0153   418          MOVL    L^DSA$GL_TESTNO,L^DS$GL_LSTTEST ; Copy test number to limit
 FFFFFFFF 8F   00000000'EF   F1 015E   419          ACBL    L^DS$GL_FSTTEST,#-1, -                  ; Decrement last test, and be
               00000000'EF      0169
                        0012    016E   420                    L^DS$GL_LSTTEST,80$                   ;   sure it's in range--else bad
 0000FE08'EF   0000FE54'EF   D0 0170   421          MOVL    L^DSA$GL_PASSNO,L^DSA$GL_PASSES ; Pretend we just did last pass
          000002B8'EF   00   FB 017B   422          CALLS   #0,L^DSX$ENDPASS                        ; Now 'fake' an EOP to stop testing
                                0182   423                                                          ; DSX$ENDPASS will not return here!
                                0182   424
                                0182   425 80$:     $PRINT  #ds$k_type_program_info, -              ; Print search message          [24]
                                0182   426                    #ds$k_printf, -                       ; .. use PRINTF                 [24]
                                0182   427                    L^FMTSEARCH, -                        ; .. SEARCH message             [24]
                                0182   428                    L^DS$GL_LSTTEST, -                    ; .. test number                [24]
                                0182   429                    #0                                    ; .. and current time           [24]
                        00      0182                  PUSHL   #0
               00000000'EF      0184                  PUSHL   L^DS$GL_LSTTEST
               00000114'EF      018A                  PUSHAB  L^FMTSEARCH
                     7E   01   0190                  movzbl  #ds$k_printf, -(sp)
                     7E   17   0193                  cvtbl   #ds$k_type_program_info, -(sp)
          00000000'GF   05   FB 0196                  CALLS   #$$N+2, G^DSX$PRINT
```

```
                          019D   431          ;+
                          019D   432          ; If the test did an ABORT, R0 will be clear. If it is clear and the
                          019D   433          ; trace flag is set, print a message saying that the test was aborted
                          019D   434          ; and go on with the next test in the sequence.
                          019D   435          ;-
                          019D   436
                   1D 50  E8  019D   437 100$:   BLBS    R0, 110$                        ; If success, branch
                          01A0   438           Br_If_Not_Trace 115$                      ; If not Tracing, branch around [32]
          0000FE00'EF  0A  E1  01A0             BBC     #DSA$V_Trace, -                 ; If bit not set, branch        [29]
                       35      01A7               L^DSA$GL_Flags, 115$                 ;                               [29]
                          01A8   439           $print  #ds$k_type_abort_test,-          ; Print abort test message      [24]
                          01A8   440                   #ds$k_printi, -                 ; .. use PRINTI (was TYPMSG)    [24]
                          01A8   441                   L^T_TSTABO                      ; .. ABORT text                 [24]
              000002F2'EF  9F  01A8                    PUSHAB  L^T_TSTABO
                     7E  00  9A  01AE                  movzbl  #ds$k_printi, -(sp)
                     7E  13  98  01B1                  cvtbl   #ds$k_type_abort_test, -(sp)
          00000000'GF  03  FB  01B4                    CALLS   #$$N+2, G^DSX$PRINT
                       20  11  01BB   442           BRB     115$
                          01BD   443
                          01BD   444          ;+
                          01BD   445          ; Check to see if the same test should be called again with
                          01BD   446          ; another data argument list. If so, compute address of new
                          01BD   447          ; data and go back to call the same test again.
                          01BD   448          ;-
                          01BD   449
          50  00000004'EF  D0  01BD   450 110$:   MOVL    L^A_DATAPTR, R0                 ; GET POINTER TO ARG LIST
                     51   60  D0  01C4   451           MOVL    (R0),R1                   ; GET COUNT OF ARGS IN LIST
                          14  13  01C7   452           BEQL    115$                      ; END OF DATA LIST, DO NEXT TEST
      00000004'EF  04 A041  DE  01C9   453           MOVAL   4(R0)[R1], L^A_DATAPTR    ; POINT PAST ARG LIST
                00000004'FF  D5  01D2   454           TSTL    @L^A_DATAPTR              ; END OF LIST OF ARG LISTS?
                          03  13  01D8   455           BEQL    115$                      ; Yes--next test
                        FF1F  31  01DA   456           BRW     50$                       ; Repeat test with next arg list
```

```
                                01DD          ;+                                                                  [25]
                                01DD          ; Check to see if QA is running AND if several cases of check      [25]
                                01DD          ; routines are currently executing. If both are true, perform special [25]
                                01DD          ; code to accomplish the checks.                                    [25]
                                01DD          ;-
                                01DD
                                01DD  115$:   Br_If_QA        117$                  ; If running QA, branch       [32]
        0000FE00'EF   0F   E0   01DD          BBS     #DSA$V_QA, -                  ; If bit set, branch          [29]
                      03        01E4                    L^DSA$GL_Flags, 117$        ;                             [29]
                    0092   31   01E5          BRW     125$                          ; QA is not set, branch around. [31]
                                01E8
        00000000'EF   03   E1   01E8  117$:   BBC     S^#QA$K_Loop_On_Subtest, -    ; If the Loop on Subtest check [31]
                      5B        01EF                    L^QA$AOB_Check_State, 122$  ; is not running, branch.     [31]
                                01F0
                                01F0          ;+
                                01F0          ; This is for the Loop on Subtest check only.                       [31]
                                01F0          ; We have finished running one test and all its subtests. Reset the [31]
                                01F0          ; subtest number, and add one to both the first and last test numbers. [31]
                                01F0          ; Make these changes in both the CLI data vector and the DS (DSA)   [31]
                                01F0          ; data areas.                                                       [31]
                                01F0          ;-
                                01F0
        51   0000FE50'EF   D0   01F0          MOVL    L^DSA$GL_TestNo, R1           ; Get the current test number. [31]
        50   0000FE08'EF   D0   01F7          MOVL    L^DSA$GL_PASSES, R0           ; Save the Passes count.       [31]
        0000FE08'EF   01   D0   01FE          MOVL    #1, L^DSA$GL_PASSES           ; Set to 1 in case we take the [31]
                                0205                                                ; branch to 130$.              [31]
  0002 51  01   00000000'EF   3D   0205          ACBW    L^QA$W_Save_Last, #1, R1, 121$ ; Branch if (R1 + 1) LEQ the [31]
                                020F                                                ; saved last test number.      [31]
                      77   11   020F          BRB     130$                          ; Otherwise, done all the tests.[31]
                                0211
        0000[illegible]08'EF   50   D0   0211  121$:   MOVL    R0, L^DSA$GL_PASSES           ; Restore Passes count.       [31]
        50   00000000'EF   DE   0218          MOVAL   L^DS$GL_CLIBASE, R0           ; Address the CLI data vector. [31]
        00000028 E0   01   D0   021F          MOVL    #1, L^CLI$L_SUBT (R0)         ; Set the Subtest number to 1. [31]
        00000000'EF   01   D0   0226          MOVL    #1, L^DS$GL_SUBTEST           ; Ditto.                      [31]
                                022D
        00000020 E0   51   D0   022D          MOVL    R1, L^CLI$L_TEST (R0)         ; Increment First test.       [31]
        00000000'EF   51   D0   0234          MOVL    R1, L^DS$GL_FSTTEST           ; Ditto.                      [31]
        00000024 E0   51   D0   023B          MOVL    R1, L^CLI$L_LAST (R0)         ; Increment Last test.        [31]
        00000000'EF   51   D0   0242          MOVL    R1, L^DS$GL_LSTTEST           ; Ditto.                      [31]
                      2F   11   0249          BRB     125$                          ; Go execute another test.    [31]
```

```
                00000000'EF   02   E1  024B   497 122$:   BBC     S^#QA$K_Loop_On_Test, -          ; If the Loop on Test check is  [25]
                              0B       0252   498             L^QA$AOB_Check_State, 123$       ; not running, branch           [25]
                00000000'EF   04   E0  0253   499             BBS     S^#QA$K_Loop_Test_Done, -        ; If done looping on this test, [25]
                              1F       025A   500             L^QA$AOB_Flags, 125$             ; branch                        [25]
                          FE1A   31   025B   501             BRW     CallTest                         ; Not done looping => run again [25]
                                      025E   502
                00000000'EF   04   E1  025E   503 123$:   BBC     S^#QA$K_Run_Backwards, -         ; If the Run Backwards check is [25]
                              14       0265   504               L^QA$AOB_Check_State, 125$     ; not running, branch           [25]
                                      0266   505
    FFFFFFFF 8F   00000000'EF   F1  0266   506 124$:   ACBL    L^DS$GL_FSTTEST,   -             ; Subtract one from DSA$GL_TESTNO,[2
                  0000FE50'EF       0271
                                    0276   507               #-1,               -             ; compare that to DS$GL_FSTTEST,[25]
                          FE00      0276   508               L^DSA$GL_TESTNO, -               ; if the former is greater than [25]
                                    0278   509               CALLTEST                         ; or equal to the latter, branch.[25
                            0E  11  0278   510             BRB     130$                             ; Otherwise, we are done Run    [25]
                                    027A   511                                              ; Backwards check.              [25]
                                    027A   512             ;+                                                               [25]
                                    027A   513             ; This is the normal way to advance through the tests.           [25]
                                    027A   514             ; Add one to the DSA$GL_TESTNO, if it is less than or equal to the [25]
                                    027A   515             ; DS$GL_LSTTEST, branch back to CALLTEST and call the next test. [25]
                                    027A   516             ;-                                                               [25]
                                    027A   517
0000FE50'EF   01   00000000'EF   F1  027A   518 125$:   ACBL    L^DS$GL_LSTTEST, #1, -
                          FDF0      0286   519               L^DSA$GL_TESTNO, CALLTEST        ; Do next test until reaches LSTTEST
```

```
                                0288   521          ;+
                                0288   522          ; Come to here if there are no more tests to execute in the sequence.
                                0288   523          ; Go back to FIRSTTEST and perform the initialization code again (and
                                0288   524          ; perhaps call DSX$ENDPASS in the init code).
                                0288   525          ;-
                                0288   526
                                0288   527 130$:    Br_If_Not_ExeTst        140$                ; Branch if no test executed.   [32]
      00000000'EF    12    E1   0288                BBC     #DS$V_ExeTst, -                     ; If bit not set, branch        [29]
                     14         028F                          L^DS$GL_Flags, 140$               ;                               [29]
                                0290   528          Clear_ExeTst                                ; Clear the execute flag        [32]
      00000000'EF    12    E4   0290                BBSC    #DS$V_ExeTst, -             ; Branch if EXETST bit is set to        [29]
                     00         0297                          L^DS$GL_Flags, 30005$ ; ...                                     [29]
                                0298        30005$:                                     ; ... here. Clear bit regardless.       [29]
                                0298   529          QA_MAIN Dispat_Done_Tests                   ; Call QA$Main.                 [31]
                     18    DD   0298                PUSHL   #DSQA$K_Dispat_Done_Tests
      00000000'9F    01    FB   029A                CALLS   #1, @#QA$MAIN
                   FD8E    31   02A1   530          BRW     FIRSTTEST                           ; GO RUN ANOTHER PASS
                                02A4   531
                                02A4   532          ;+
                                02A4   533          ; If there were no tests executed in this section, come to here.
                                02A4   534          ;-
                                02A4   535
                                02A4   536 140$:    $print  #ds$k_type_no_tests, -              ; No tests in section           [24]
                                02A4   537                    #ds$k_printi, -                   ; .. use PRINTI (was TYPMSG)    [24]
                                02A4   538                    L^T_NOEXE                         ; .. 'no tests in section'      [24]
          0000006B'EF    9F    02A4                        PUSHAB  L^T_NOEXE
                7E    00    9A   02AA                        movzbl  #ds$k_printi, -(sp)
                7E    12    98   02AD                        cvtbl   #ds$k_type_no_tests, -(sp)
      00000000'GF    03    FB   02B0                        CALLS   #$$N+2, G^DSX$PRINT
                                02B7   539
                                02B7   540 DISPATCH_X:
                          05    02B7   541          RSB                                         ; RETURN TO COMMAND MODE
```

```
02B8          .SBTTL  DSX$EndPass Routine
02B8    ;++
02B8    ; FUNCTIONAL DESCRIPTION:
02B8    ;
02B8    ;       This routine is called to mark the end of a 'PASS'.
02B8    ;       If enough passes have been run execute user summary and cleanup code.
02B8    ;
02B8    ; CALLING SEQUENCE:
02B8    ;
02B8    ;       CALLx   #0,a#DSX$ENDPASS
02B8    ;
02B8    ; INPUT PARAMETERS:     NONE
02B8    ;
02B8    ; IMPLICIT INPUTS:      NONE
02B8    ;
02B8    ; OUTPUT PARAMETERS:    NONE
02B8    ;
02B8    ; IMPLICIT OUTPUTS:     NONE                                                    ;G:5
02B8    ;
02B8    ; COMPLETION CODES:     NONE
02B8    ;
02B8    ; SIDE EFFECTS:         NONE
02B8    ;--
```

```
                          0004  02B8   567 .ENTRY  DSX$ENDPASS,^M<R2>
                                02BA   568
                                02BA   569        QA_MAIN Dispat_DSX$EndPass_Bgn  ; Call QA$Main                          [22]
                       01   DD  02BA              PUSHL   #DSQA$K_Dispat_DSX$EndPass_Bgn
             00000000'9F   01   FB  02BC              CALLS   #1, a#QA$MAIN
                                02C3   570
                  0000FE08'EF   D5  02C3   571        TSTL    L^DSA$GL_PASSES         ; If passes = 0, => run for infinity
                           03   12  02C9   572        BNEQ    1$                      ; If = 0, branch                         [38]
                         00CA   31  02CB   573        BRW     10$                     ; extended branch                        [38]
                                02CE   574
    0000FE54'EF   0000FE08'EF   D1  02CE   575 1$:     CMPL    L^DSA$GL_PASSES, -      ; Compare passes and passno
                                02D9   576                       L^DSA$GL_PASSNO
                           03   1B  02D9   577        BLEQU   2$                      ; If passes > passno, branch             [38]
                         00BA   31  02DB   578        BRW     10$                     ; extended branch                        [38]
                                02DE   579
                                02DE   580                                          ; If passno >= passes, continue on       [29]
                                02DE   581 2$:     Clear_CtrlO                     ; Clear ^O flag                          [32]
             00000000'EF   10   E4  02DE              BBSC    #DS$V_CtrlO, -          ; Branch if CTRLO bit is set to
                           00   02E5                        L^DS$GL_Flags, 30006$ ; ...
                                02E6        30006$:                                 ; ... here. Clear bit regardless.
                                02E6   582        $DS_SUMMARY_S                   ; Execute diagnostics summary section
             00000000'9F   00   FB  02E6              CALLS   #0, a#DS$SUMMARY
                  000003D2'EF   16  02ED   583        JSB     DS_CLEANUP              ; Execute diagnostics cleanup section
                                02F3   584        Clear_CtrlO                     ; Clear ^O flag                          [32]
             00000000'EF   10   E4  02F3              BBSC    #DS$V_CtrlO, -          ; Branch if CTRLO bit is set to
                           00   02FA                        L^DS$GL_Flags, 30007$ ; ...
                                02FB        30007$:                                 ; ... here. Clear bit regardless.
                  00000000'EF   16  02FB   585        JSB     INIT_CONTEXT            ; Reset stacks and processor mode        [26]
                                0301   586
                  00000000'EF   D5  0301   587        TSTL    L^DS$GL_SUBTEST         ; If subt. = 0 no size error             [38]
                           42   13  0307   588        BEQL    4$                      ;                                        [38]
                                0309   589
               51 00000254'EF   D0  0309   590        MOVL    L^L$A_TSTCNT,R1         ; If last test in diagnostic..           [41]
             00000000'EF   61   D1  0310   591        CMPL    (R1),L^DS$GL_LSTTEST    ; see if subtests exist                  [41]
                           0D   12  0317   592        BNEQ    3$                      ; print as is if not last test           [41]
00000000'EF   0000FE4C'EF   D1  0319   593        CMPL    L^DSA$GL_SUBTNO,L^DS$GL_SUBTEST; mov correct tests executed into pri
                           25   1E  0324   594        BGEQU   4$                      ; don't print if 0 executed              [41]
                                0326   595        ;MOVL   L^DSA$GL_SUBTNO,L^REQ_SUB;                                       [41]
                                0326   596                                          ; commented out this incorrect move instruct
                                0326   597
                                0326   598 3$:     $PRINT  #ds$k_type_program_end,-; Print 'error on subtest #'             [38]
                                0326   599                  #ds$k_printf, -        ; .. use PRINTF                          [38]
                                0326   600                  L^T_NOSUB,-            ; .. format text                         [38]
                                0326   601                  L^DS$GL_SUBTEST,-      ; .. number specified                    [38]
                                0326   602                  L^REQ_SUB,-            ; .. number of subtests present          [38]
                                0326   603                  L^DS$GL_LSTTEST        ; .. last test executed                  [38]
             00000000'EF   DD  0326              PUSHL   L^DS$GL_LSTTEST
             00000008'EF   DD  032C              PUSHL   L^REQ_SUB
             00000000'EF   DD  0332              PUSHL   L^DS$GL_SUBTEST
             00000009'EF   9F  0338              PUSHAB  L^T_NOSUB
                       7E   01  9A  033E              movzbl  #ds$k_printf, -(sp)
                       7E   10  98  0341              cvtbl   #ds$k_type_program_end, -(sp)
             00000000'GF   06  FB  0344              CALLS   #$$N+2, G^DSX$PRINT
                                034B   604
                                034B   605 4$:     $PRINT  #ds$k_type_program_end,-; Print 'run finished'                    [24]
                                034B   606                  #ds$k_printf, -        ; .. use PRINTF                          [24]
                                034B   607                  L^FMTLSTPAS, -         ; .. format text                         [24]
```

```
                          034B   608          L^DS$GL_ERRCNT, -      ; .. count of error                [24]
                          034B   609          L^DSA$GL_PASSNO, -     ; .. pass count                    [24]
                          034B   610          #0                     ; .. current time                  [24]
                 00   DD  034B              PUSHL   #0
        0000FE54'EF   DD  034D              PUSHL   L^DSA$GL_PASSNO
        00000000'EF   DD  0353              PUSHL   L^DS$GL_ERRCNT
        000000C7'EF   9F  0359              PUSHAB  L^FMTLSTPAS
            7E   01   9A  035F              movzbl  #ds$k_printf, -(sp)
            7E   10   98  0362              cvtbl   #ds$k_type_program_end, -(sp)
    00000000'GF   06   FB  0365              CALLS   #$$N+2, G^DSX$PRINT
                          036C   611
```

```
                          036C   613          QA_MAIN Dispat_DSX$EndPass_Mid  ; Call QA$Main                          [29]
                 00   DD  036C               PUSHL   #DSQA$K_Dispat_DSX$EndPass_Mid
      00000000'9F    01   FB  036E               CALLS   #1, a#QA$MAIN
                          0375   614          Br_If_Not_QA    5$              ; If not running QA, branch around       [32]
      0000FE00'EF    0F   E1  0375               BBC     #DSA$V_QA, -            ; If bit not set, branch         [29]
                      06       037C                 L^DSA$GL_Flags, 5$          ;                                [29]
           00000000'EF    17   037D   615          JMP     VRRestart               ; Running QA: loop back to VRRestart [29]
                          0383   616                                             ; for the next QA check.           [29]
                          0383   617 5$:                                         ;                                  [29]
                          0383   618          Set_CmdFlg                      ; Set command mode                       [32]
      00000000'EF    07   E2  0383               BBSS    #DS$V_CmdFlg, -         ; Branch if CMDFLG bit is set to [29]
                      00       038A                 L^DS$GL_Flags, 30008$   ; ...                                [29]
                          038B       30008$:                                   ; ... here. Set bit regardless.    [29]
      0000FE40'EF    0A   D0  038B   619          MOVL    #APM$_DONE, -           ; INDICATE PROCESSING COMPLETE
                          0392   620                  L^DSA$GL_MSGTYP
           00000000'EF    17   0392   621          JMP     BEGIN                   ; Clean up the world and go back to CLI
                          0398   622
      0000FE54'EF    01   D1  0398   623 10$:     CMPL    #1, L^DSA$GL_PASSNO     ; IS THIS THE FIRST PASS?
                      1B   12  039F   624          BNEQ    20$                     ; SKIP IF NOT
                          03A1   625
                          03A1   626          $PRINT  #ds$k_type_first_pass, -; Print first pass message       [24]
                          03A1   627                  #ds$k_printf, -         ; .. use PRINTF                  [24]
                          03A1   628                  L^FMTPASONE, -          ; .. format                      [24]
                          03A1   629                  L^DS$GL_ERRCNT, -       ; .. error count so far          [24]
                          03A1   630                  #0                      ; .. current time                [24]
                 00   DD  03A1               PUSHL   #0
           00000000'EF    DD  03A3               PUSHL   L^DS$GL_ERRCNT
           000000BC'EF    9F  03A9               PUSHAB  L^FMTPASONE
                 7E    01   9A  03AF               movzbl  #ds$k_printf, -(sp)
                 7E    11   98  03B2               cvtbl   #ds$k_type_first_pass, -(sp)
      00000000'GF    05   FB  03B5               CALLS   #$$N+2, G^DSX$PRINT
                          03BC   631
           0000FE54'EF    D6  03BC   632 20$:     INCL    L^DSA$GL_PASSNO         ; COUNT THIS PASS
                          03C2   633
                          03C2   634 DSX$ENDPASS_X:
                          03C2   635
                          03C2   636          QA_MAIN Dispat_DSX$EndPass_End  ; Call QA$Main                   [22]
                 02   DD  03C2               PUSHL   #DSQA$K_Dispat_DSX$EndPass_End
      00000000'9F    01   FB  03C4               CALLS   #1, a#QA$MAIN
                          03CB   637
           00000000'EF    16  03CB   638          JSB     KB_CHECK                ; CHECK KEYBOARD STATUS.
                          04  03D1   639          RET
```

```
                        03D2    641          .SBTTL  DS_Cleanup Routine
                        03D2    642 ;++
                        03D2    643 ; FUNCTIONAL DESCRIPTION:
                        03D2    644 ;
                        03D2    645 ;       EXECUTE USER'S CLEANUP CODE AND DEALLOCATE DEVICES.
                        03D2    646 ;
                        03D2    647 ; CALLING SEQUENCE:
                        03D2    648 ;
                        03D2    649 ;       BSBW    DS_CLEANUP
                        03D2    650 ;
                        03D2    651 ; INPUT PARAMETERS:     NONE
                        03D2    652 ;
                        03D2    653 ; IMPLICIT INPUTS:
                        03D2    654 ;
                        03D2    655 ;       L$A_CCP         = USER'S CLEANUP ROUTINE ADDRESS.
                        03D2    656 ;       L$L_UNIT        = MAXIMUM NUMBER OF UNITS.
                        03D2    657 ;
                        03D2    658 ; OUTPUT PARAMETERS:    NONE
                        03D2    659 ;
                        03D2    660 ; IMPLICIT OUTPUTS:     NONE
                        03D2    661 ;
                        03D2    662 ; COMPLETION CODES:     NONE
                        03D2    663 ;
                        03D2    664 ; SIDE EFFECTS:         NONE
                        03D2    665 ;--
```

```
                                03D2   667 DS_CLEANUP::
                                03D2   668         Br_If_StrFlg    1$                  ; If started, continue on                [32]
        00000000'EF   02   E0   03D2               BBS     #DS$V_StrFlg, -                     ; If bit set, branch              [29]
                      03        03D9                         L^DS$GL_Flags, 1$                 ;                                 [29]
                    00D0   31   03DA   669         BRW     30$                         ; Exit if not started                    [22]
                                03DD   670
                                03DD   671 1$:     Br_If_Not_DonFlg        2$          ; If not done already, branch around     [32]
        00000000'EF   0D   E1   03DD               BBC     #DS$V_DonFlg, -                     ; If bit not set, branch          [29]
                      03        03E4                         L^DS$GL_Flags, 2$                 ;                                 [29]
                    00C5   31   03E5   672         BRW     30$                         ; Exit if cleanup already done           [22]
                                03E8   673
                                03E8   674 2$:     Set_DonFlg                          ; Indicate that cleanup has been done    [32]
        00000000'EF   0D   E2   03E8               BBSS    #DS$V_DonFlg, -             ; Branch if DONFLG bit is set to         [29]
                      00        03EF                         L^DS$GL_Flags, 30009$ ; ...                                      [29]
                                03F0       30009$:                                     ; ... here. Set bit regardless.          [29]
                      07   BB   03F0   675         PUSHR   #^M<R0,R1,R2>               ; SAVE REGISTERS.
                                03F2   676
                                03F2   677         QA_MAIN Dispat_DS_Cleanup_Bgn       ;                                        [22]
                      03   DD   03F2               PUSHL   #DSQA$K_Dispat_DS_Cleanup_Bgn
        00000000'9F   01   FB   03F4               CALLS   #1, @#QA$MAIN
                                03FB   678
                                03FB   679         Clear_CtrlC                         ; Clear ^C pending bit to avoid ^C       [32]
        00000000'EF   00   E4   03FB               BBSC    #DS$V_CtrlC, -              ; Branch if CTRLC bit is set to          [29]
                      00        0402                         L^DS$GL_Flags, 30010$ ; ...                                      [29]
                                0403       30010$:                                     ; ... here. Clear bit regardless.        [29]
                                0403   680                                             ; ... on cleanup.                [32]  ;G:2
                                0403   681         $DS_CNTRLC_S                        ; DELETE USER CONTROL-C HANDLER
                      00   DD   0403                       PUSHL   #0
                      00   DD   0405                       PUSHL   #0
        00000000'9F   02   FB   0407                       CALLS   #2, @#DS$CNTRLC
                                040E   682         $CANTIM_S                           ; CANCEL ALL TIMERS
                      7E   7C   040E                       CLRQ    -(SP)
        00000000'GF   02   FB   0410                       CALLS   #2,G^SYS$CANTIM
00000000'EF   02000000 8F   CA   0417   683         BICL2   #DS$M_TIMED,DS$GL_FLAGS ; Cancel /TIME                    [43]  ;G:2
              0000FE50'EF   D4   0422   684         CLRL    L^DSA$GL_TESTNO             ; TEST 0,
        0000FE4C'EF   02   D0   0428   685         MOVL    #2, L^DSA$GL_SUBTNO         ; SUBTEST 2 INDICATES CLEANUP.
                                042F   686
        00000240'FF   00   FB   042F   687         CALLS   #0, @L$A_CCP                ; EXECUTE USER'S CLEANUP.
```

```
                                  0436   689          Br_If_User      20$                 ; Branch if user mode          [32]  ;G:2
        0000FE00'EF    1C    E0   0436                BBS     #DSA$V_User, -                      ; If bit set, branch          [28]
                       56         043D                          L^DSA$GL_Flags, 20$               ;                             [28]
        03   00000000'EF    91    043E   690          CmpB    L^Exe$GB_CpuType, -         ; Check if CPU is                     [34]
                                  0445   691                   #Pr$_Sid_Typ730            ; .. a Nebula                         [34]
                       1C    12   0445   692          BNeq    3$                          ; Skip if not                         [34]
        50   00F26200'EF    9E    0447   693          MovAB   Ioc$K_IOSpace!^XF26200, R0          ; Address of IDC              [34]
        51   00000004'EF    DE    044E   694          MovAL   L^Scb_Base+4, R1            ; Get mchk handler address            [34]
                       61    DD   0455   695          PushL   (R1)                        ; Save old one                        [34]
        61   00000000'EF    9E    0457   696          MovAB   L^Tst$MChk, (R1)            ; Use common cheap one                [34]
                       60    D4   045E   697          ClrL    (R0)                        ; Clear register                      [34]
                       61  8ED0   0460   698          PopL    (R1)                        ; Restore old handler                 [34]
                                  0463   699
  02   00000204'EF   02    00    ED   0463   700 3$:     CMPZV   #0,#2,L$L_ENVIRON, -
                                  046C   701                   #SEP_FUNCTIONAL            ; SEP_FUNCTIONAL
                       07    12   046C   702          BNEQ    5$                          ; Branch if not
        00000000'EF    6C    FA   046E   703          CALLG   (AP), L^QIO$CLEANUP         ; CLEAN AFTER QIO IF NECESSARY
                                  0475   704
        00000000'EF    00    FB   0475   705 5$:     CALLS   #0, L^DS$INITSCB            ; Re-initialize the SCB too.
             00000000'EF    16    047C   706          JSB     L^RMS$CLEANUP               ; Clean up RMS storage
        50   00000000'EF    9A    0482   707          MOVZBL  L^DS$GB_MM_ENB, R0          ; Get state of memory managment
                       03    13   0489   708          BEQL    10$                         ; Branch if not enabled
                  50   01    D0   048B   709          MOVL    #1,R0                       ; Set to enable
                                  048E   710
             00000000'EF    16    048E   711 10$:    JSB     L^DSR$MMENABLE              ; Set MM according to R0
                                  0494   712
                                  0494   713 20$:    QA_MAIN Dispat_DS_Cleanup_End       ;                                     [22]
                       04    DD   0494                PUSHL   #DSQA$K_Dispat_DS_Cleanup_End
        00000000'9F    01    FB   0496                CALLS   #1, a#QA$MAIN
                                  049D   714
        00000000'EF    00    FB   049D   715          CALLS   #0,MP$_DEALL_MEMORY         ; Deallocate any MP memory            [40]
                                  04A4   716                                                                                  ;G:5
        00000000'EF    00    FB   04A4   717          CALLS   #0,DSX$DEALLOCATE           ; Deallocate memory used in DSX$PRINTREV ;G:
                                  04AB   718                                                                                  ;G:5
                       07    BA   04AB   719          POPR    #^M<R0,R1,R2>               ; RESTORE REGISTERS.                  [22]
                                  04AD   720
                       05         04AD   721 30$:    RSB                                 ; RETURN.
```

```
                        .SBTTL  DSX$DoSummary and VRSummary Routines
                ;++
                ; FUNCTIONAL DESCRIPTION:
                ;
                ;
                ; CALLING SEQUENCE:
                ;
                ;       CALLS   #0,DS$SUMMARY   -or-
                ;       BSBW    VRSUMMARY               from command scanner
                ;
                ; INPUT PARAMETERS:     NONE
                ;
                ; IMPLICIT INPUTS:      NONE
                ;
                ; OUTPUT PARAMETERS:    NONE
                ;
                ; IMPLICIT OUTPUTS:     NONE
                ;
                ; COMPLETION CODES:     NONE
                ;
                ; SIDE EFFECTS:         NONE
                ;--
```

```
                        0000  04AE    746 .ENTRY  DSX$DOSUMMARY,^M<>
          00000000'EF   0E    90  04B0  747         Movb    #Ds$K_Type_Summary, -           ; Set Type code to              [28]
                              04B7  748                   L^Ds$GB_TypeCode                ; .. Summary                    [28]
                        71    10  04B7  749         Bsbb    Display_Summary                 ; Type out Summary stuff        [28]
                00000000'EF   16  04B9  750         JSB     KB_CHECK
                              04  04BF  751         RET
                              04C0  752
                              04C0  753 VRSUMMARY::
                00000000'EF   16  04C0  754         Jsb     DSR$CheckLoad                   ; Check to see if a program is  [36]
                      4D 50   E9  04C6  755         Blbc    R0, 10$                         ; . . . loaded. If not, branch  [36]
                              04C9  756
                              04C9  757         $Print  #-ds$k_type_summary, -          ; Summary type (sticky)         [28]
                              04C9  758                   #ds$k_printf, -                 ; .. use PRINTF                 [28]
                              04C9  759                   L^Fmt_Summary, -                ; .. format string              [28]
                              04C9  760                   L^I$a_name, -                   ; .. diagnostic name            [28]
                              04C9  761                   L^I$I_rev, -                    ; .. revision level             [28]
                              04C9  762                   L^I$I_update, -                 ; .. update level               [28]
                              04C9  763                   L^ds$gl_errcnt, -               ; .. error counter              [28]
                              04C9  764                   L^Ds$GL_HardErr_Count, -        ; .. Hard error counter         [28]
                              04C9  765                   L^Ds$GL_SoftErr_Count, -        ; .. Soft error counter         [28]
                              04C9  766                   L^Ds$GL_SysErr_Count, -         ; .. System error counter       [28]
                              04C9  767                   L^Ds$GL_DevErr_Count, -         ; .. Device error counter       [28]
                              04C9  768                   L^Ds$GL_ErrSup_Count            ; .. ErrSup counter             [28]
          00000000'EF   DD    04C9                  PUSHL   L^Ds$GL_ErrSup_Count
          00000000'EF   DD    04CF                  PUSHL   L^Ds$GL_DevErr_Count
          00000000'EF   DD    04D5                  PUSHL   L^Ds$GL_SysErr_Count
          00000000'EF   DD    04DB                  PUSHL   L^Ds$GL_SoftErr_Count
          00000000'EF   DD    04E1                  PUSHL   L^Ds$GL_HardErr_Count
          00000000'EF   DD    04E7                  PUSHL   L^ds$gl_errcnt
          00000210'EF   DD    04ED                  PUSHL   L^I$I_update
          0000020C'EF   DD    04F3                  PUSHL   L^I$I_rev
          00000208'EF   DD    04F9                  PUSHL   L^I$a_name
          0000015C'EF   9F    04FF                  PUSHAB  L^Fmt_Summary
             7E   01    9A  0505                    movzbl  #ds$k_printf, -(sp)
           7E   F2 8F    98  0508                    cvtbl   #-ds$k_type_summary, -(sp)
00000000'GF     0C    FB  050C                      CALLS   #$$N+2, G^DSX$PRINT
                15    10  0513  769         Bsbb    Display_Summary                 ; Type out Summary stuff        [28]
                      05  0515  770         Rsb                                     ;                               [28]
```

```
                                0516   772 10$:    $Print  #ds$k_type_command_err, -       ; Command error                    [28]
                                0516   773                   #ds$k_printf, -             ; .. use PRINTF                    [28]
                                0516   774                   L^fmt_nodiag                ; Print 'no diagnostic loaded'     [28]
                000002D6'EF   9F  0516                       PUSHAB  L^fmt_nodiag
                     7E   01  9A  051C                       movzbl  #ds$k_printf, -(sp)
                     7E   15  98  051F                       cvtbl   #ds$k_type_command_err, -(sp)
          00000000'GF   03  FB  0522                       CALLS   #$$N+2, G^DSX$PRINT
                            05  0529   775          Rsb                                ;                                  [28]
                                052A   776
                                052A   777 Display_Summary:                             ; Execute Summary command          [28]
          00000244'FF   00  FB  052A   778          Calls   #0, @L$A_Repp              ; Call user report code.           [28]
               00000000'EF  94  0531   779          Clrb    L^Ds$GB_TypeCode           ; Clear sticky type code           [28]
                            05  0537   780          Rsb                                ;                                  [28]
```

```
0538    782          .SBTTL  VRShowStatus Routine
0538    783 ;++
0538    784 ; Functional Description:
0538    785 ;       Execute a SHOW STATUS command (print test, section, etc).
0538    786 ;
0538    787 ; Calling sequence:
0538    788 ;
0538    789 ;       BSBW    VRSHOWSTATUS
0538    790 ;
0538    791 ; Input parameters: none
0538    792 ;
0538    793 ; Implicit inputs: none
0538    794 ;
0538    795 ; Outputs: none
0538    796 ;
0538    797 ; Implicit outputs: none
0538    798 ;
0538    799 ; Completion codes: none
0538    800 ;
0538    801 ;--
```

```
                                0538   VRShowStatus::                                  ;                                [20]
          00000000'EF    16     0538           Jsb     DSR$CheckLoad                   ; Check to see if a program is   [36]
                 03 50   E8     053E           Blbs    R0, 5$                          ; ... loaded. If so, skip over   [37]
                  00AF   31     0541           Brw     100$                            ; Not loaded, print error mess.  [37]
                                0544
           50   3C AC    D0     0544   5$:     MovL    60(AP), R0                      ; Get the PC from the CLI args   [37]
      50   00010000 8F   D1     0548           CmpL    #^X00010000, R0                 ; Is this a real user PC?        [37]
                    07   14     054F           Bgtr    10$                             ; Yes, branch around             [37]
                                0551
      00000000'EF   00   FB     0551           Calls   #0, L^DSR$Find_User_PC          ; Get last user PC from stack    [37]
                                0558
   51   0000FE10'EF   01   C1   0558   10$:    addl3   #1, dsa$gl_sectno, r1           ; Get offset in section table    [23]
      51   00000250'FF41   D0   0560           movl    @l$a_secnam[r1], r1             ; Get ASCIC name address         [23]
                                0568
                50   00   D1   0568           CmpL    #0, R0                          ; Is this really a valid PC?     [37]
                    44   13     056B           Beql    50$                             ; No, branch                     [37]
                                056D
                                056D           $print  #ds$k_type_command_out, -       ; Command output message         [24]
                                056D                     #ds$k_printf, -               ; .. use PRINTF                  [24]
                                056D                     L^fmt_showstatus, -           ; .. format string               [24]
                                056D                     l$a_name, -                   ; .. diagnostic name             [20]
                                056D                     l$l_rev, -                    ; .. revision level              [23]
                                056D                     l$l_update, -                 ; .. update level                [23]
                                056D                     #0, -                         ; .. current time                [23]
                                056D                     r1, -                         ; .. address of section name     [20]
                                056D                     ds$gl_errcnt, -               ; .. error counter               [23]
                                056D                     dsa$gl_testno, -              ; .. test number                 [20]
                                056D                     dsa$gl_subtno, -              ; .. subtest number              [20]
                                056D                     dsa$gl_passno, -              ; .. pass number                 [20]
                                056D                     r0                            ; .. User PC of ^C               [20]
                    50   DD     056D                   PUSHL   r0
          0000FE54'EF   DD     056F                   PUSHL   dsa$gl_passno
          0000FE4C'EF   DD     0575                   PUSHL   dsa$gl_subtno
          0000FE50'EF   DD     057B                   PUSHL   dsa$gl_testno
          00000000'EF   DD     0581                   PUSHL   ds$gl_errcnt
                    51   DD     0587                   PUSHL   r1
                    00   DD     0589                   PUSHL   #0
          00000210'EF   DD     058B                   PUSHL   l$l_update
          0000020C'EF   DD     0591                   PUSHL   l$l_rev
          00000208'EF   DD     0597                   PUSHL   l$a_name
          0000025C'EF   9F     059D                   PUSHAB  L^fmt_showstatus
                7E   01   9A   05A3                   movzbl  #ds$k_printf, -(sp)
                7E   16   98   05A6                   cvtbl   #ds$k_type_command_out, -(sp)
      00000000'GF   0D   FB   05A9                   CALLS   #$$N+2, G^DSX$PRINT
                        05     05B0           rsb                                     ;                                [20]
                                05B1
                                05B1   50$:    $print  #ds$k_type_command_out, -       ; Command output message         [24]
                                05B1                     #ds$k_printf, -               ; .. use PRINTF                  [24]
                                05B1                     L^Fmt_ShowStatus_No_PC, -     ; .. format string               [24]
                                05B1                     l$a_name, -                   ; .. diagnostic name             [20]
                                05B1                     l$l_rev, -                    ; .. revision level              [23]
                                05B1                     l$l_update, -                 ; .. update level                [23]
                                05B1                     #0, -                         ; .. current time                [23]
                                05B1                     r1, -                         ; .. address of section name     [20]
                                05B1                     ds$gl_errcnt, -               ; .. error counter               [23]
                                05B1                     dsa$gl_testno, -              ; .. test number                 [20]
                                05B1                     dsa$gl_subtno, -              ; .. subtest number              [20]
```

```
                          05B1   846                 dsa$gl_passno                  ; .. pass number                [37]
      0000FE54'EF   DD    05B1                     PUSHL   dsa$gl_passno
      0000FE4C'EF   DD    05B7                     PUSHL   dsa$gl_subtno
      0000FE50'EF   DD    05BD                     PUSHL   dsa$gl_testno
      00000000'EF   DD    05C3                     PUSHL   ds$gl_errcnt
               51   DD    05C9                     PUSHL   r1
               00   DD    05CB                     PUSHL   #0
      00000210'EF   DD    05CD                     PUSHL   l$l_update
      0000020C'EF   DD    05D3                     PUSHL   l$l_rev
      00000208'EF   DD    05D9                     PUSHL   l$a_name
      000001F1'EF   9F    05DF                     PUSHAB  L^Fmt_ShowStatus_No_PC
          7E   01   9A    05E5                     movzbl  #ds$k_printf, -(sp)
          7E   16   98    05E8                     cvtbl   #ds$k_type_command_out, -(sp)
  00000000'GF   0C   FB    05EB                     CALLS   #$$N+2, G^DSX$PRINT
                    05    05F2   847         rsb                                    ;                               [20]
                          05F3   848
                          05F3   849 100$:   $print  #ds$k_type_command_err, -      ; Command error                 [24]
                          05F3   850                 #ds$k_printf, -               ; .. use PRINTF                 [24]
                          05F3   851                 L^fmt_nodiag                  ; Print 'no diagnostic running' [20]
      000002D6'EF   9F    05F3                     PUSHAB  L^fmt_nodiag
          7E   01   9A    05F9                     movzbl  #ds$k_printf, -(sp)
          7E   15   98    05FC                     cvtbl   #ds$k_type_command_err, -(sp)
  00000000'GF   03   FB    05FF                     CALLS   #$$N+2, G^DSX$PRINT
                    05    0606   852         rsb                                    ;                               [20]
                          0607   853         .END
```

```
$$N                             = 00000001     D
$$T1                            = 00000001     D
$ER                             = 00000002     D
$MODULE                           00000000 R   D   03
APC$_ABORT                      = 00000006     D
APC$_CONTINUE                   = 00000009     D
APC$_DUMP                       = 00000003     D
APC$_NOP                        = 00000000     D
APC$_START                      = 00000005     D
APC$_ZERO                       = 00000004     D
APM$_ABTDON                     = 00000006     D
APM$_DEVERR                     = 00000002     D
APM$_DONE                       = 0000000A     D
APM$_EXCEPT                     = 0000000B     D
APM$_HARDERR                    = 00000003     D
APM$_MORE                       = 00000008     D
APM$_NOMES                      = 00000000     D
APM$_PREPERR                    = 0000000C     D
APM$_PRGERR                     = 00000005     D
APM$_SOFTERR                    = 00000004     D
APM$_SPOOL                      = 00000009     D
APM$_SYSERR                     = 00000001     D
A_DATAPTR                         00000004 R   D   02
A_TESTPTR                         00000000 R   D   02
BEGIN                             ********     X   04
BIT...                          = 00000004     D
CALLTEST                          00000078 R   D   04
CEP_FUNCTIONAL                  = 00000000     D
CEP_REPAIR                      = 00000001     D
CLI$K_BUFSIZ                    = 00000100     D
CLI$K_SIZE                        0000044C     D
CLI$L_ADDRESS                     00000018     D
CLI$L_COMMAND                     00000004     D
CLI$L_DATA                        0000001C     D
CLI$L_FLAGS                       00000000     D
CLI$L_FLAGS2                      00000444     D
CLI$L_LAST                        00000024     D
CLI$L_NEXT                        00000030     D
CLI$L_PASS                        0000002C     D
CLI$L_SUBT                        00000028     D
CLI$L_TEMP_BASE                   00000448     D
CLI$L_TEST                        00000020     D
CLI$M_START_OR_RUN              = 00000008     D
CLI$Q_BUFQWD                      00000034     D
CLI$Q_FILE                        00000008     D
CLI$Q_SECTION                     00000010     D
CLI$Q_TIME                        0000043C     D
CLI$T_BUFFER                      0000003C     D
CLI$V_ADAPTER                   = 00000018     D
CLI$V_ADR                       = 0000000B     D
CLI$V_ASCII                     = 00000013     D
CLI$V_BASE_QUAL                 = 00000002     D
CLI$V_BREAK                     = 0000000A     D
CLI$V_BRIEF                     = 0000001B     D
CLI$V_BYTE                      = 0000000D     D
CLI$V_CLEAR                     = 00000002     D
CLI$V_DEC                       = 00000010     D
CLI$V_DEFAULT                   = 0000000C     D
CLI$V_DEPOSIT                   = 00000019     D
CLI$V_EVENT                     = 00000008     D
CLI$V_EXAM                      = 00000005     D
CLI$V_FLAGS                     = 00000009     D
CLI$V_HEX                       = 00000012     D
CLI$V_KERNEL                    = 00000017     D
CLI$V_LOAD                      = 00000006     D
CLI$V_LONG                      = 0000000F     D
CLI$V_NEXT                      = 00000001     D
CLI$V_NOALLOC                   = 00000000     D
CLI$V_NOTNUF                    = 00000001     D
CLI$V_OCT                       = 00000011     D
CLI$V_PREG                      = 0000001A     D
CLI$V_QA                        = 00000007     D
CLI$V_QACKLOOPLOOPS             = 0000001C     D
CLI$V_QAERRORPRINTS             = 0000001B     D
CLI$V_QAMULTIPLEPASS            = 0000001F     D
CLI$V_QASUBTESTLOOPS            = 0000001E     D
CLI$V_QATESTLOOPS               = 0000001D     D
CLI$V_REG                       = 00000014     D
CLI$V_REQUIRED                  = 00000000     D
CLI$V_RUN                       = 00000015     D
CLI$V_SET                       = 00000003     D
CLI$V_SHOW                      = 00000004     D
CLI$V_START_OR_RUN              = 00000003     D
CLI$V_VALSEC                    = 00000016     D
CLI$V_WORD                      = 0000000E     D
DISPATCH                          00000000 RG  D   04
DISPATCH_X                        000002B7 R   D   04
DISPLAY_SUMMARY                   0000052A R   D   04
DS$CNTRLC                         ********     X   04
DS$GA_CHKLPPC                     ********     X   04
DS$GB_MM_ENB                      ********     X   04
DS$GB_TYPECODE                    ********     X   04
DS$GL_CLIBASE                     ********     X   04
DS$GL_DEVERR_COUNT                ********     X   04
DS$GL_ERRCNT                      ********     X   04
DS$GL_ERRSUP_COUNT                ********     X   04
DS$GL_FLAGS                       ********     X   04
DS$GL_FSTTEST                     ********     X   04
DS$GL_HARDERR_COUNT               ********     X   04
DS$GL_LSTTEST                     ********     X   04
DS$GL_SOFTERR_COUNT               ********     X   04
DS$GL_SUBTEST                     ********     X   04
DS$GL_SYSERR_COUNT                ********     X   04
DS$INITSCB                        ********     X   04
DS$K_BBC                        = 0000001D   G D
DS$K_BBCC                       = 00000021   G D
DS$K_BBCCI                      = 00000023   G D
DS$K_BBCS                       = 0000001F   G D
DS$K_BBS                        = 0000001C   G D
DS$K_BBSC                       = 00000020   G D
DS$K_BBSS                       = 0000001E   G D
DS$K_BBSSI                      = 00000022   G D
DS$K_BCC_M                      = 0000001B   G D
DS$K_BCS_M                      = 0000001A   G D
```

```
DS$K_BEQLU_B                    = 00000005  G D
DS$K_BEQLU_M                    = 00000011  G D
DS$K_BEQL_B                     = 00000004  G D
DS$K_BEQL_M                     = 00000010  G D
DS$K_BERROR                     = 00000026  G D
DS$K_BGEQU_B                    = 00000007  G D
DS$K_BGEQU_M                    = 00000013  G D
DS$K_BGEQ_B                     = 00000006  G D
DS$K_BGEQ_M                     = 00000012  G D
DS$K_BGTRU_B                    = 00000009  G D
DS$K_BGTRU_M                    = 00000015  G D
DS$K_BGTR_B                     = 00000008  G D
DS$K_BGTR_M                     = 00000014  G D
DS$K_BLBC                       = 00000025  G D
DS$K_BLBS                       = 00000024  G D
DS$K_BLEQU_B                    = 00000003  G D
DS$K_BLEQU_M                    = 0000000F  G D
DS$K_BLEQ_B                     = 00000002  G D
DS$K_BLEQ_M                     = 0000000E  G D
DS$K_BLSSU_B                    = 00000001  G D
DS$K_BLSSU_M                    = 0000000D  G D
DS$K_BLSS_B                     = 00000000  G D
DS$K_BLSS_M                     = 0000000C  G D
DS$K_BNEQU_B                    = 0000000B  G D
DS$K_BNEQU_M                    = 00000017  G D
DS$K_BNEQ_B                     = 0000000A  G D
DS$K_BNEQ_M                     = 00000016  G D
DS$K_BNERROR                    = 00000027  G D
DS$K_BVC_M                      = 00000019  G D
DS$K_BVS_M                      = 00000018  G D
DS$K_DS_STARTING_LOCATION       = 00010000    D
DS$K_PRINTB                     = 00000002    D
DS$K_PRINTF                     = 00000001    D
DS$K_PRINTI                     = 00000000    D
DS$K_PRINTX                     = 00000003    D
DS$K_TYPE_ABORT_PROGRAM         = 00000014    D
DS$K_TYPE_ABORT_TEST            = 00000013    D
DS$K_TYPE_COMMAND_ERR           = 00000015    D
DS$K_TYPE_COMMAND_OUT           = 00000016    D
DS$K_TYPE_CRD_AUTOTEST          = 0000001A    D
DS$K_TYPE_DS_PROMPT             = 00000001    D
DS$K_TYPE_DS_START              = 0000001D    D
DS$K_TYPE_ERRDEV                = 00000008    D
DS$K_TYPE_ERRHARD               = 00000006    D
DS$K_TYPE_ERROR_BODY            = 00000009    D
DS$K_TYPE_ERROR_END             = 0000000A    D
DS$K_TYPE_ERRPREP               = 0000001B    D
DS$K_TYPE_ERRSOFT               = 00000007    D
DS$K_TYPE_ERRSUP                = 00000004    D
DS$K_TYPE_ERRSYS                = 00000005    D
DS$K_TYPE_ERR_HALT              = 0000000D    D
DS$K_TYPE_EXCEPTION             = 0000000C    D
DS$K_TYPE_EXCEPTION_HEAD        = 0000000B    D
DS$K_TYPE_FIRST_PASS            = 00000011    D
DS$K_TYPE_GENERAL               = 00000000    D
DS$K_TYPE_GENERAL_ERROR         = 00000003    D
DS$K_TYPE_NO_TESTS              = 00000012    D
DS$K_TYPE_PARAM_ERROR           = 0000001C    D
DS$K_TYPE_PROGRAM_END           = 00000010    D
DS$K_TYPE_PROGRAM_INFO          = 00000017    D
DS$K_TYPE_PROGRAM_START         = 0000000F    D
DS$K_TYPE_QIO_INVADP            = 00000024    D
DS$K_TYPE_QIO_NODRIVER          = 00000022    D
DS$K_TYPE_QIO_WRONGVER          = 00000023    D
DS$K_TYPE_SCRIPT_ECHO           = 00000021    D
DS$K_TYPE_SCRIPT_PNF            = 0000001E    D
DS$K_TYPE_SCRIPT_PROMPT         = 00000020    D
DS$K_TYPE_SCRIPT_SKIP           = 0000001F    D
DS$K_TYPE_SEQUENCE_ERROR        = 00000019    D
DS$K_TYPE_START_ERR             = 00000018    D
DS$K_TYPE_START_LIST            = 00000025    D
DS$K_TYPE_SUMMARY               = 0000000E    D
DS$K_TYPE_USER_PROMPT           = 00000002    D
DS$M_ABRTFLG                    = 00000040    D
DS$M_BADTIME                    = 00100000    D
DS$M_BATCH                      = 00400000    D
DS$M_BRKCLR                     = 00001000    D
DS$M_BRKPT                      = 00000800    D
DS$M_CHARFLG                    = 00000100    D
DS$M_CMDFLG                     = 00000080    D
DS$M_CTRLC                      = 00000001    D
DS$M_CTRLO                      = 00010000    D
DS$M_DEVFLG                     = 00000200    D
DS$M_DISABLCC                   = 01000000    D
DS$M_DONFLG                     = 00002000    D
DS$M_ERRFLG                     = 00000010    D
DS$M_EXCEPT                     = 00080000    D
DS$M_EXETST                     = 00040000    D
DS$M_HLTFLG                     = 00000008    D
DS$M_LODFLG                     = 00000002    D
DS$M_MEMMGT                     = 00008000    D
DS$M_NI                         = 04000000    D
DS$M_OUTPUT                     = 00800000    D
DS$M_RUBFLG                     = 00000020    D
DS$M_SCRIPT                     = 00200000    D
DS$M_SETIMR                     = 02000000    D
DS$M_STRFLG                     = 00000004    D
DS$M_SUBT                       = 00004000    D
DS$M_SYSFLG                     = 00000400    D
DS$M_TIMED                      = 02000000    D
DS$M_TIMED_OUT                  = 08000000    D
DS$M_TIMRON                     = 00020000    D
DS$SUMMARY                        ********  X   04
DS$V_ABRTFLG                    = 00000006    D
DS$V_BADTIME                    = 00000014    D
DS$V_BATCH                      = 00000016    D
DS$V_BRKCLR                     = 0000000C    D
DS$V_BRKPT                      = 0000000B    D
DS$V_CHARFLG                    = 00000008    D
DS$V_CMDFLG                     = 00000007    D
DS$V_CTRLC                      = 00000000    D
DS$V_CTRLO                      = 00000010    D
DS$V_DEVFLG                     = 00000009    D
DS$V_DISABLCC                   = 00000018    D
```

```
DS$V_DONFLG                     = 0000000D    D
DS$V_ERRFLG                     = 00000004    D
DS$V_EXCEPT                     = 00000013    D
DS$V_EXETST                     = 00000012    D
DS$V_HLTFLG                     = 00000003    D
DS$V_LODFLG                     = 00000001    D
DS$V_MEMMGT                     = 0000000F    D
DS$V_NI                         = 0000001A    D
DS$V_OUTPUT                     = 00000017    D
DS$V_RUBFLG                     = 00000005    D
DS$V_SCRIPT                     = 00000015    D
DS$V_SETIMR                     = 00000019    D
DS$V_STRFLG                     = 00000002    D
DS$V_SUBT                       = 0000000E    D
DS$V_SYSFLG                     = 0000000A    D
DS$V_TIMED                      = 00000019    D
DS$V_TIMED_OUT                  = 0000001B    D
DS$V_TIMRON                     = 00000011    D
DSA$AL_APTMAIL                    0000FE00    D
DSA$AT_APTTXT                     0000FA00    D
DSA$GL_APTCOM                     0000FE04    D
DSA$GL_DEVLEN                     0000FE58    D
DSA$GL_ERRNO                      0000FE44    D
DSA$GL_EVENT                      0000FE48    D
DSA$GL_FLAGS                      0000FE00    D
DSA$GL_MSGTYP                     0000FE40    D
DSA$GL_PASSES                     0000FE08    D
DSA$GL_PASSNO                     0000FE54    D
DSA$GL_SECTNO                     0000FE10    D
DSA$GL_SID                        0000FE14    D
DSA$GL_SUBTNO                     0000FE4C    D
DSA$GL_TESTNO                     0000FE50    D
DSA$GL_UNITS                      0000FE0C    D
DSA$GQ_MSGPTR                     0000FE68    D
DSA$GT_DEVNAM                     0000FE5C    D
DSA$V_PASS0                     = 0000001D    D
DSA$V_QA                        = 0000000F    D
DSA$V_SEARCH                    = 0000000E    D
DSA$V_TRACE                     = 0000000A    D
DSA$V_USER                      = 0000001C    D
DSP$A_BASE                        00000000    D
DSP$A_DATA                        00000008    D
DSP$A_MSG                         00000004    D
DSP$A_TEST                        0000000C    D
DSP$K_SIZE                      = 00000018    D
DSP$Q_SECTION                     00000010    D
DSQA$K_DISPAT_AFTER_INIT        = 00000014    D
DSQA$K_DISPAT_BEFORE_INIT       = 00000013    D
DSQA$K_DISPAT_CALLTEST          = 00000015    D
DSQA$K_DISPAT_DONE_TESTS        = 00000018    D
DSQA$K_DISPAT_DSX$ENDPASS_BGN   = 00000001    D
DSQA$K_DISPAT_DSX$ENDPASS_END   = 00000002    D
DSQA$K_DISPAT_DSX$ENDPASS_MID   = 00000000    D
DSQA$K_DISPAT_DS_CLEANUP_BGN    = 00000003    D
DSQA$K_DISPAT_DS_CLEANUP_END    = 00000004    D
DSQA$K_DUMMY_1                  = 00000007    D
DSQA$K_ERROR_ERROR_BGN          = 00000006    D
DSQA$K_ERROR_ERROR_END          = 00000005    D
DSQA$K_KERNEL_INIT_CONTEXT      = 00000008    D
DSQA$K_LOOP_DSX$BGNSUB          = 00000009    D
DSQA$K_LOOP_DSX$CKLOOP          = 0000000B    D
DSQA$K_LOOP_DSX$ENDSUB          = 0000000A    D
DSQA$K_PARAM_DSX$GETADDRESS     = 0000000E    D
DSQA$K_PARAM_DSX$GETDATA        = 0000000C    D
DSQA$K_PARAM_DSX$GETLOGICAL     = 0000000F    D
DSQA$K_PARAM_DSX$GETSTRING      = 00000010    D
DSQA$K_PARAM_DSX$GETVIELD       = 0000000D    D
DSQA$K_QA_DSX$BRANCH            = 00000011    D
DSQA$K_START_BEFORE_HEADER      = 00000017    D
DSQA$K_START_VRRESTART          = 00000012    D
DSQA$K_START_VRSTART            = 00000016    D
DSR$CHECKLOAD                     ********    X   04
DSR$FIND_USER_PC                  ********    X   04
DSR$MMENABLE                      ********    X   04
DSX$DEALLOCATE                    ********    X   04
DSX$DOSUMMARY                     000004AE RG D   04
DSX$ENDPASS                       000002B8 RG D   04
DSX$ENDPASS_X                     000003C2 R  D   04
DSX$PRINT                         ********    X   04
DS_CLEANUP                        000003D2 RG D   04
DS_ERRSUP                         ********    X   04
ENV$M_DOMAIN                    = 00000002    D
ENV$M_LEVEL                     = 00000001    D
ENV$M_SUPER                     = 000003FC    D
ENV$S_DOMAIN                    = 00000001    D
ENV$S_LEVEL                     = 00000001    D
ENV$S_SUPER                     = 00000008    D
ENV$V_DOMAIN                    = 00000001    D
ENV$V_LEVEL                     = 00000000    D
ENV$V_SUPER                     = 00000002    D
ENV$_CPU                        = 00000000    D
ENV$_FUNCTIONAL                 = 00000000    D
ENV$_REPAIR                     = 00000001    D
ENV$_SUPER                      = 00000001    D
ENV$_SYSTEM                     = 00000001    D
EXE$GB_CPUTYPE                    ********    X   04
FALSE                           = 00000000    D
FIRSTTEST                         00000032 R  D   04
FMTLSTPAS                         000000C7 R  D   03
FMTPASONE                         0000008C R  D   03
FMTSEARCH                         00000114 R  D   03
FMTTRACE                          0000014C R  D   03
FMT_NODIAG                        000002D6 R  D   03
FMT_SHOWSTATUS                    0000025C R  D   03
FMT_SHOWSTATUS_NO_PC              000001F1 R  D   03
FMT_SUMMARY                       0000015C R  D   03
INIT_CONTEXT                      ********    X   04
IOC$K_IOSPACE                     ********    X   04
KB_CHECK                          ********    X   04
L$A_CCP                           00000240    D
L$A_DEVP                          0000021C    D
L$A_DREG                          00000224    D
L$A_DTP                           00000218    D
L$A_ICP                           0000023C    D
```

```
L$A_LASTADR                     00000214    D
L$A_NAME                        00000208    D
L$A_REPP                        00000244    D
L$A_SECNAM                      00000250    D
L$A_STATAB                      00000248    D
L$A_TSTCNT                      00000254    D
L$L_ENVIRON                     00000204    D
L$L_ERRTYP                      0000024C    D
L$L_HEADLENGTH                  00000200    D
L$L_REV                         0000020C    D
L$L_UNIT                        00000220    D
L$L_UNUSED                      00000228    D
L$L_UPDATE                      00000210    D
MP$_DEALL_MEMORY                ********  X   00
OFF                           = 00000000    D
ON                            = 00000001    D
PR$_SID_TYP730                = 00000003    D
QA$AOB_CHECK_STATE              ********  X   04
QA$AOB_FLAGS                    ********  X   04
QA$K_ABORT_NOW                = 00000007    D
QA$K_APT_PHASE_ONE            = 0000000B    D
QA$K_APT_PHASE_TWO            = 0000000C    D
QA$K_BAD_ADDRESS              = 00000009    D
QA$K_CONTROL_C_CONT           = 0000000A    D
QA$K_DEALLOCATION             = 0000000E    D
QA$K_ERROR_PHASE_ONE          = 00000005    D
QA$K_ERROR_PHASE_THREE        = 00000007    D
QA$K_ERROR_PHASE_TWO          = 00000006    D
QA$K_FAILURE                  = 00000000    D
QA$K_FIRST_BRANCH_CODE        = 00000000    D
QA$K_FIRST_TIME               = 00000005    D
QA$K_INIT_CONTEXT_DONE        = 00000003    D
QA$K_LAST_BRANCH_CODE         = 00000025    D
QA$K_LOOP_ON_SUBTEST          = 00000003    D
QA$K_LOOP_ON_TEST             = 00000002    D
QA$K_LOOP_TEST_DONE           = 00000004    D
QA$K_MEMORY_MANAGE            = 0000000D    D
QA$K_MULTIPLE_PASS            = 00000001    D
QA$K_NODEF                    = 00000000    D
QA$K_NORMAL_START             = 00000000    D
QA$K_NO_HEADER                = 00000006    D
QA$K_NUMBER_OF_CHECKS         = 0000000F    D
QA$K_NUMBER_QA_FLAGS          = 00000008    D
QA$K_NUMB_ROUTINE_STATES      = 00000004    D
QA$K_QA_DEBUG                 = 00000001    D
QA$K_QA_DONE                  = 00000002    D
QA$K_RUN_BACKWARDS            = 00000004    D
QA$K_SECTION                  = 00000008    D
QA$K_SUCCESS                  = 00000001    D
QA$MAIN                         ********  X   04
QA$V_CHECK_DONE               = 00000003    D
QA$V_DOING_CLEANUP            = 00000002    D
QA$V_ERROR_FOUND              = 00000001    D
QA$V_INIT_DONE                = 00000000    D
QA$W_SAVE_LAST                  ********  X   04
QIO$CLEANUP                     ********  X   04
REQ_SUB                         00000008 R  D   02
RMS$CLEANUP                     ********  X   04
SCB_BASE                        ********  X   04
SEP_FUNCTIONAL                = 00000002    D
SEP_REPAIR                    = 00000003    D
SIZ...                        = 00000001    D
SYS$CANTIM                      ********  GX  04
TRUE                          = 00000001    D
TST$MCHK                        ********  X   04
T_NOEXE                         0000006B R  D   03
T_NOSUB                         00000009 R  D   03
T_TSTABO                        000002F2 R  D   03
VRRESTART                       ********  X   04
VRSHOWSTATUS                    00000538 RG D   04
VRSUMMARY                       000004C0 RG D   04
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000FE70 (65136.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
WORK	0000000C (12.)	02 (2.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC LONG
DATA	000002FD (765.)	03 (3.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC LONG
CODE	00000607 (1543.)	04 (4.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

```
                                  +-------------------------+
                                  ! Symbol Cross Reference !
                                  +-------------------------+

SYMBOL                      VALUE       DEFINITION      REFERENCES...
------                      -----       ----------      -------------
$$N                        =00000001    851    (1)      384    (1)      429    (1)    #-441    (1)    #-538    (1)
                                                        603    (1)      610    (1)      630    (1)      768    (1)
                                                      #-774    (1)      832    (1)      846    (1)    #-851    (1)
$$T1                       =00000001    682    (1)      682    (1)
$ER                        =00000002    368    (1)    #-368    (1)
$MODULE                     00000000-R  233    (1)      368    (1)
APC$_ABORT                 =00000006    210    (1)
APC$_CONTINUE              =00000009    210    (1)
APC$_DUMP                  =00000003    210    (1)
APC$_NOP                   =00000000    210    (1)
APC$_START                 =00000005    210    (1)
APC$_ZERO                  =00000004    210    (1)
APM$_ABTDON                =00000006    210    (1)
APM$_DEVERR                =00000002    210    (1)
APM$_DONE                  =0000000A    210    (1)    #-619    (1)
APM$_EXCEPT                =0000000B    210    (1)
APM$_HARDERR               =00000003    210    (1)
APM$_MORE                  =00000008    210    (1)
APM$_NOMES                 =00000000    210    (1)
APM$_PREPERR               =0000000C    210    (1)
APM$_PRGERR                =00000005    210    (1)
APM$_SOFTERR               =00000004    210    (1)
APM$_SPOOL                 =00000009    210    (1)
APM$_SYSERR                =00000001    210    (1)
A_DATAPTR                   00000004-R  226    (1)    #-387    (1)      397    (1)    #-450    (1)    #-453    (1)
                                                      #-454    (1)
A_TESTPTR                   00000000-R  225    (1)    #-361    (1)      398    (1)
BEGIN                       00000000-XR                621    (1)
BIT...                     =00000004    216    (1)      207    (1)      212    (1)      214    (1)      215    (1)
                                                        216    (1)
CALLTEST                    00000078-R  342    (1)    #-339    (1)    #-501    (1)    #-509    (1)    #-519    (1)
CEP_FUNCTIONAL             =00000000    207    (1)
CEP_REPAIR                 =00000001    207    (1)
CLI$K_BUFSIZ               =00000100    211    (1)      211    (1)
CLI$K_SIZE                  0000044C    211    (1)
CLI$L_ADDRESS               00000018    211    (1)
CLI$L_COMMAND               00000004    211    (1)
CLI$L_DATA                  0000001C    211    (1)
CLI$L_FLAGS                 00000000    211    (1)
CLI$L_FLAGS2                00000444    211    (1)
CLI$L_LAST                  00000024    211    (1)    #-493    (1)
CLI$L_NEXT                  00000030    211    (1)
CLI$L_PASS                  0000002C    211    (1)
CLI$L_SUBT                  00000028    211    (1)    #-488    (1)
CLI$L_TEMP_BASE             00000448    211    (1)
CLI$L_TEST                  00000020    211    (1)    #-491    (1)
CLI$M_START_OR_RUN         =00000008    211    (1)
CLI$Q_BUFQWD                00000034    211    (1)
CLI$Q_FILE                  00000008    211    (1)
CLI$Q_SECTION               00000010    211    (1)
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CLI$Q_TIME                       0000043C     211    (1)
CLI$T_BUFFER                     0000003C     211    (1)
CLI$V_ADAPTER                   =00000018     211    (1)
CLI$V_ADR                       =0000000B     211    (1)
CLI$V_ASCII                     =00000013     211    (1)
CLI$V_BASE_QUAL                 =00000002     211    (1)
CLI$V_BREAK                     =0000000A     211    (1)
CLI$V_BRIEF                     =0000001B     211    (1)
CLI$V_BYTE                      =0000000D     211    (1)
CLI$V_CLEAR                     =00000002     211    (1)
CLI$V_DEC                       =00000010     211    (1)
CLI$V_DEFAULT                   =0000000C     211    (1)
CLI$V_DEPOSIT                   =00000019     211    (1)
CLI$V_EVENT                     =00000008     211    (1)
CLI$V_EXAM                      =00000005     211    (1)
CLI$V_FLAGS                     =00000009     211    (1)
CLI$V_HEX                       =00000012     211    (1)
CLI$V_KERNEL                    =00000017     211    (1)
CLI$V_LOAD                      =00000006     211    (1)
CLI$V_LONG                      =0000000F     211    (1)
CLI$V_NEXT                      =00000001     211    (1)
CLI$V_NOALLOC                   =00000000     211    (1)
CLI$V_NOTNUF                    =00000001     211    (1)
CLI$V_OCT                       =00000011     211    (1)
CLI$V_PREG                      =0000001A     211    (1)
CLI$V_QA                        =00000007     211    (1)
CLI$V_QACKLOOPLOOPS             =0000001C     211    (1)
CLI$V_QAERRORPRINTS             =0000001B     211    (1)
CLI$V_QAMULTIPLEPASS            =0000001F     211    (1)
CLI$V_QASUBTESTLOOPS            =0000001E     211    (1)
CLI$V_QATESTLOOPS               =0000001D     211    (1)
CLI$V_REG                       =00000014     211    (1)
CLI$V_REQUIRED                  =00000000     211    (1)
CLI$V_RUN                       =00000015     211    (1)
CLI$V_SET                       =00000003     211    (1)
CLI$V_SHOW                      =00000004     211    (1)
CLI$V_START_OR_RUN              =00000003     211    (1)      211    (1)
CLI$V_VALSEC                    =00000016     211    (1)
CLI$V_WORD                      =0000000E     211    (1)
DISPATCH                         00000000-R   308    (1)
DISPATCH_X                       000002B7-R   540    (1)    #-369    (1)
DISPLAY_SUMMARY                  0000052A-R   777    (1)    #-749    (1)    #-769    (1)
DS$CNTRLC                        00000000-XR                  681    (1)
DS$GA_CHKLPPC                    00000000-XR                #-389    (1)
DS$GB_MM_ENB                     00000000-XR                #-707    (1)
DS$GB_TYPECODE                   00000000-XR                #-748    (1)    #-779    (1)
DS$GL_CLIBASE                    00000000-XR                  487    (1)
DS$GL_DEVERR_COUNT               00000000-XR                #-313    (1)    #-768    (1)
DS$GL_ERRCNT                     00000000-XR                #-309    (1)    #-610    (1)    #-630    (1)    #-768    (1)
                                                            #-832    (1)    #-846    (1)
DS$GL_ERRSUP_COUNT               00000000-XR                #-314    (1)    #-768    (1)
DS$GL_FLAGS                      00000000-XR                  349    (1)      391    (1)      409    (1)      410    (1)
                                                            417    (1)      527    (1)      528    (1)      581    (1)
                                                            584    (1)      618    (1)      668    (1)      671    (1)
                                                            674    (1)      679    (1)    #-683    (1)
DS$GL_FSTTEST                    00000000-XR                #-332    (1)    #-419    (1)    #-492    (1)    #-506    (1)
DS$GL_HARDERR_COUNT              00000000-XR                #-310    (1)    #-768    (1)
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DS$GL_LSTTEST	00000000-XR			#-400	(1)	#-418	(1)	#-420	(1)	#-429	(1)		
				#-494	(1)	#-518	(1)	#-591	(1)	#-603	(1)		
DS$GL_SOFTERR_COUNT	00000000-XR			#-311	(1)	#-768	(1)						
DS$GL_SUBTEST	00000000-XR			#-489	(1)	#-587	(1)	#-593	(1)	#-603	(1)		
DS$GL_SYSERR_COUNT	00000000-XR			#-312	(1)	#-768	(1)						
DS$INITSCB	00000000-XR			705	(1)								
DS$K_BBC	=0000001D	215	(1)										
DS$K_BBCC	=00000021	215	(1)										
DS$K_BBCCI	=00000023	215	(1)										
DS$K_BBCS	=0000001F	215	(1)										
DS$K_BBS	=0000001C	215	(1)										
DS$K_BBSC	=00000020	215	(1)										
DS$K_BBSS	=0000001E	215	(1)										
DS$K_BBSSI	=00000022	215	(1)										
DS$K_BCC_M	=0000001B	215	(1)										
DS$K_BCS_M	=0000001A	215	(1)										
DS$K_BEQLU_B	=00000005	215	(1)										
DS$K_BEQLU_M	=00000011	215	(1)										
DS$K_BEQL_B	=00000004	215	(1)										
DS$K_BEQL_M	=00000010	215	(1)										
DS$K_BERROR	=00000026	215	(1)										
DS$K_BGEQU_B	=00000007	215	(1)										
DS$K_BGEQU_M	=00000013	215	(1)										
DS$K_BGEQ_B	=00000006	215	(1)										
DS$K_BGEQ_M	=00000012	215	(1)										
DS$K_BGTRU_B	=00000009	215	(1)										
DS$K_BGTRU_M	=00000015	215	(1)										
DS$K_BGTR_B	=00000008	215	(1)										
DS$K_BGTR_M	=00000014	215	(1)										
DS$K_BLBC	=00000025	215	(1)	215	(1)								
DS$K_BLBS	=00000024	215	(1)										
DS$K_BLEQU_B	=00000003	215	(1)										
DS$K_BLEQU_M	=0000000F	215	(1)										
DS$K_BLEQ_B	=00000002	215	(1)										
DS$K_BLEQ_M	=0000000E	215	(1)										
DS$K_BLSSU_B	=00000001	215	(1)										
DS$K_BLSSU_M	=0000000D	215	(1)										
DS$K_BLSS_B	=00000000	215	(1)	215	(1)								
DS$K_BLSS_M	=0000000C	215	(1)										
DS$K_BNEQU_B	=0000000B	215	(1)										
DS$K_BNEQU_M	=00000017	215	(1)										
DS$K_BNEQ_B	=0000000A	215	(1)										
DS$K_BNEQ_M	=00000016	215	(1)										
DS$K_BNERROR	=00000027	215	(1)										
DS$K_BVC_M	=00000019	215	(1)										
DS$K_BVS_M	=00000018	215	(1)										
DS$K_DS_STARTING_LOCATION	=00010000	215	(1)										
DS$K_PRINTB	=00000002	216	(1)										
DS$K_PRINTF	=00000001	216	(1)	#-384	(1)	#-429	(1)	#-603	(1)	#-610	(1)		
				#-630	(1)	#-768	(1)	#-774	(1)	#-832	(1)		
				#-846	(1)	#-851	(1)						
DS$K_PRINTI	=00000000	216	(1)	#-441	(1)	#-538	(1)						
DS$K_PRINTX	=00000003	216	(1)										
DS$K_TYPE_ABORT_PROGRAM	=00000014	216	(1)										
DS$K_TYPE_ABORT_TEST	=00000013	216	(1)	#-441	(1)								
DS$K_TYPE_COMMAND_ERR	=00000015	216	(1)	#-774	(1)	#-851	(1)						
DS$K_TYPE_COMMAND_OUT	=00000016	216	(1)	#-832	(1)	#-846	(1)						

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DS$K_TYPE_CRD_AUTOTEST          =0000001A     216     (1)
DS$K_TYPE_DS_PROMPT             =00000001     216     (1)
DS$K_TYPE_DS_START              =0000001D     216     (1)
DS$K_TYPE_ERRDEV                =00000008     216     (1)
DS$K_TYPE_ERRHARD               =00000006     216     (1)
DS$K_TYPE_ERROR_BODY            =00000009     216     (1)
DS$K_TYPE_ERROR_END             =0000000A     216     (1)
DS$K_TYPE_ERRPREP               =0000001B     216     (1)
DS$K_TYPE_ERRSOFT               =00000007     216     (1)
DS$K_TYPE_ERRSUP                =00000004     216     (1)
DS$K_TYPE_ERRSYS                =00000005     216     (1)
DS$K_TYPE_ERR_HALT              =0000000D     216     (1)
DS$K_TYPE_EXCEPTION             =0000000C     216     (1)
DS$K_TYPE_EXCEPTION_HEAD        =0000000B     216     (1)
DS$K_TYPE_FIRST_PASS            =00000011     216     (1)     #-630     (1)
DS$K_TYPE_GENERAL               =00000000     216     (1)
DS$K_TYPE_GENERAL_ERROR         =00000003     216     (1)
DS$K_TYPE_NO_TESTS              =00000012     216     (1)     #-538     (1)
DS$K_TYPE_PARAM_ERROR           =0000001C     216     (1)
DS$K_TYPE_PROGRAM_END           =00000010     216     (1)     #-603     (1)     #-610     (1)
DS$K_TYPE_PROGRAM_INFO          =00000017     216     (1)     #-384     (1)     #-429     (1)
DS$K_TYPE_PROGRAM_START         =0000000F     216     (1)
DS$K_TYPE_QIO_INVADP            =00000024     216     (1)
DS$K_TYPE_QIO_NODRIVER          =00000022     216     (1)
DS$K_TYPE_QIO_WRONGVER          =00000023     216     (1)
DS$K_TYPE_SCRIPT_ECHO           =00000021     216     (1)
DS$K_TYPE_SCRIPT_PNF            =0000001E     216     (1)
DS$K_TYPE_SCRIPT_PROMPT         =00000020     216     (1)
DS$K_TYPE_SCRIPT_SKIP           =0000001F     216     (1)
DS$K_TYPE_SEQUENCE_ERROR        =00000019     216     (1)
DS$K_TYPE_START_ERR             =00000018     216     (1)
DS$K_TYPE_START_LIST            =00000025     216     (1)
DS$K_TYPE_SUMMARY               =0000000E     216     (1)     #-747     (1)     #-768     (1)
DS$K_TYPE_USER_PROMPT           =00000002     216     (1)
DS$M_ABRTFLG                    =00000040     212     (1)
DS$M_BADTIME                    =00100000     212     (1)
DS$M_BATCH                      =00400000     212     (1)
DS$M_BRKCLR                     =00001000     212     (1)
DS$M_BRKPT                      =00000800     212     (1)
DS$M_CHARFLG                    =00000100     212     (1)
DS$M_CMDFLG                     =00000080     212     (1)
DS$M_CTRLC                      =00000001     212     (1)
DS$M_CTRLO                      =00010000     212     (1)
DS$M_DEVFLG                     =00000200     212     (1)
DS$M_DISABLCC                   =01000000     212     (1)
DS$M_DONFLG                     =00002000     212     (1)
DS$M_ERRFLG                     =00000010     212     (1)
DS$M_EXCEPT                     =00080000     212     (1)
DS$M_EXETST                     =00040000     212     (1)
DS$M_HLTFLG                     =00000008     212     (1)
DS$M_LODFLG                     =00000002     212     (1)
DS$M_MEMMGT                     =00008000     212     (1)
DS$M_NI                         =04000000     212     (1)
DS$M_OUTPUT                     =00800000     212     (1)
DS$M_RUBFLG                     =00000020     212     (1)
DS$M_SCRIPT                     =00200000     212     (1)
DS$M_SETIMR                     =02000000     212     (1)
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DS$M_STRFLG                     =00000004     212     (1)
DS$M_SUBT                       =00004000     212     (1)
DS$M_SYSFLG                     =00000400     212     (1)
DS$M_TIMED                      =02000000     212     (1)     #-683     (1)
DS$M_TIMED_OUT                  =08000000     212     (1)
DS$M_TIMRON                     =00020000     212     (1)
DS$SUMMARY                       00000000-XR                    582     (1)
DS$V_ABRTFLG                    =00000006     212     (1)
DS$V_BADTIME                    =00000014     212     (1)
DS$V_BATCH                      =00000016     212     (1)
DS$V_BRKCLR                     =0000000C     212     (1)
DS$V_BRKPT                      =0000000B     212     (1)
DS$V_CHARFLG                    =00000008     212     (1)
DS$V_CMDFLG                     =00000007     212     (1)     #-618     (1)
DS$V_CTRLC                      =00000000     212     (1)     #-679     (1)
DS$V_CTRLO                      =00000010     212     (1)     #-581     (1)     #-584     (1)
DS$V_DEVFLG                     =00000009     212     (1)
DS$V_DISABLCC                   =00000018     212     (1)
DS$V_DONFLG                     =0000000D     212     (1)     #-671     (1)     #-674     (1)
DS$V_ERRFLG                     =00000004     212     (1)     #-349     (1)     #-410     (1)     #-417     (1)
DS$V_EXCEPT                     =00000013     212     (1)
DS$V_EXETST                     =00000012     212     (1)     #-409     (1)     #-527     (1)     #-528     (1)
DS$V_HLTFLG                     =00000003     212     (1)
DS$V_LODFLG                     =00000001     212     (1)
DS$V_MEMMGT                     =0000000F     212     (1)
DS$V_NI                         =0000001A     212     (1)
DS$V_OUTPUT                     =00000017     212     (1)
DS$V_RUBFLG                     =00000005     212     (1)
DS$V_SCRIPT                     =00000015     212     (1)
DS$V_SETIMR                     =00000019     212     (1)
DS$V_STRFLG                     =00000002     212     (1)     #-668     (1)
DS$V_SUBT                       =0000000E     212     (1)     #-391     (1)
DS$V_SYSFLG                     =0000000A     212     (1)
DS$V_TIMED                      =00000019     212     (1)
DS$V_TIMED_OUT                  =0000001B     212     (1)
DS$V_TIMRON                     =00000011     212     (1)
DSA$GL_FLAGS                     0000FE00                     316     (1)     339     (1)     379     (1)     411     (1)
                                                              438     (1)     464     (1)     614     (1)     689     (1)
DSA$GL_MSGTYP                    0000FE40                    #-620     (1)
DSA$GL_PASSES                    0000FE08                    #-421     (1)    #-479     (1)    #-480     (1)    #-486     (1)
                                                             #-571     (1)    #-575     (1)
DSA$GL_PASSNO                    0000FE54                    #-315     (1)    #-340     (1)    #-421     (1)    #-576     (1)
                                                             #-610     (1)    #-623     (1)    #-632     (1)    #-832     (1)
                                                             #-846     (1)
DSA$GL_SECTNO                    0000FE10                    #-371     (1)    #-814     (1)
DSA$GL_SUBTNO                    0000FE4C                    #-327     (1)    #-337     (1)    #-390     (1)    #-402     (1)
                                                             #-593     (1)    #-685     (1)    #-832     (1)    #-846     (1)
DSA$GL_TESTNO                    0000FE50                    #-326     (1)    #-333     (1)    #-357     (1)    #-365     (1)
                                                             #-399     (1)    #-418     (1)    #-478     (1)    #-508     (1)
                                                             #-519     (1)    #-684     (1)    #-832     (1)    #-846     (1)
DSA$V_PASSO                     =0000001D                    #-316     (1)    #-338     (1)
DSA$V_QA                        =0000000F                    #-464     (1)    #-614     (1)
DSA$V_SEARCH                    =0000000E                    #-411     (1)
DSA$V_TRACE                     =0000000A                    #-379     (1)    #-438     (1)
DSA$V_USER                      =0000001C                    #-689     (1)
DSP$A_BASE                       00000000     213     (1)    #-366     (1)    #-384     (1)
DSP$A_DATA                       00000008     213     (1)    #-386     (1)
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DSP$A_MSG                        00000004     213    (1)     #-384    (1)
DSP$A_TEST                       0000000C     213    (1)     #-360    (1)
DSP$K_SIZE                      =00000018     213    (1)     #-358    (1)
DSP$Q_SECTION                    00000010     213    (1)       372    (1)
DSQA$K_DISPAT_AFTER_INIT        =00000014     214    (1)     #-335    (1)
DSQA$K_DISPAT_BEFORE_INIT       =00000013     214    (1)     #-329    (1)
DSQA$K_DISPAT_CALLTEST          =00000015     214    (1)     #-348    (1)
DSQA$K_DISPAT_DONE_TESTS        =00000018     214    (1)     #-529    (1)
DSQA$K_DISPAT_DSX$ENDPASS_BGN   =00000001     214    (1)     #-569    (1)
DSQA$K_DISPAT_DSX$ENDPASS_END   =00000002     214    (1)     #-636    (1)
DSQA$K_DISPAT_DSX$ENDPASS_MID   =00000000     214    (1)     #-613    (1)
DSQA$K_DISPAT_DS_CLEANUP_BGN    =00000003     214    (1)     #-677    (1)
DSQA$K_DISPAT_DS_CLEANUP_END    =00000004     214    (1)     #-713    (1)
DSQA$K_DUMMY_1                  =00000007     214    (1)
DSQA$K_ERROR_ERROR_BGN          =00000006     214    (1)
DSQA$K_ERROR_ERROR_END          =00000005     214    (1)
DSQA$K_KERNEL_INIT_CONTEXT      =00000008     214    (1)
DSQA$K_LOOP_DSX$BGNSUB          =00000009     214    (1)
DSQA$K_LOOP_DSX$CKLOOP          =0000000B     214    (1)
DSQA$K_LOOP_DSX$ENDSUB          =0000000A     214    (1)
DSQA$K_PARAM_DSX$GETADDRESS     =0000000E     214    (1)
DSQA$K_PARAM_DSX$GETDATA        =0000000C     214    (1)
DSQA$K_PARAM_DSX$GETLOGICAL     =0000000F     214    (1)
DSQA$K_PARAM_DSX$GETSTRING      =00000010     214    (1)
DSQA$K_PARAM_DSX$GETVIELD       =0000000D     214    (1)
DSQA$K_QA_DSX$BRANCH            =00000011     214    (1)
DSQA$K_START_BEFORE_HEADER      =00000017     214    (1)
DSQA$K_START_VRRESTART          =00000012     214    (1)
DSQA$K_START_VRSTART            =00000016     214    (1)
DSR$CHECKLOAD                    00000000-XR                754    (1)      804    (1)
DSR$FIND_USER_PC                 00000000-XR                812    (1)
DSR$MMENABLE                     00000000-XR                711    (1)
DSX$DEALLOCATE                   00000000-XR                717    (1)
DSX$DOSUMMARY                    000004AE-R   746    (1)
DSX$ENDPASS                      000002B8-R   567    (1)     422    (1)
DSX$ENDPASS_X                    000003C2-R   634    (1)
DSX$PRINT                        00000000-XR                384    (1)      429    (1)      441    (1)      538    (1)
                                                            603    (1)      610    (1)      630    (1)      768    (1)
                                                            774    (1)      832    (1)      846    (1)      851    (1)
DS_CLEANUP                       000003D2-R   667    (1)     583    (1)
DS_ERRSUP                        00000000-XR                368    (1)
ENV$M_DOMAIN                    =00000002     207    (1)
ENV$M_LEVEL                     =00000001     207    (1)
ENV$M_SUPER                     =000003FC     207    (1)
ENV$S_DOMAIN                    =00000001     207    (1)
ENV$S_LEVEL                     =00000001     207    (1)
ENV$S_SUPER                     =00000008     207    (1)
ENV$V_DOMAIN                    =00000001     207    (1)     207    (1)
ENV$V_LEVEL                     =00000000     207    (1)     207    (1)
ENV$V_SUPER                     =00000002     207    (1)
ENV$_CPU                        =00000000     207    (1)     207    (1)
ENV$_FUNCTIONAL                 =00000000     207    (1)     207    (1)
ENV$_REPAIR                     =00000001     207    (1)     207    (1)
ENV$_SUPER                      =00000001     207    (1)
ENV$_SYSTEM                     =00000001     207    (1)     207    (1)
EXE$GB_CPUTYPE                   00000000-XR               #-690    (1)
FALSE                           =00000000     215    (1)
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FIRSTTEST                    00000032-R   318    (1)    #-530    (1)
FMTLSTPAS                    000000C7-R   244    (1)      610    (1)
FMTPASONE                    0000008C-R   241    (1)      630    (1)
FMTSEARCH                    00000114-R   248    (1)      429    (1)
FMTTRACE                     0000014C-R   251    (1)      384    (1)
FMT_NODIAG                   000002D6-R   273    (1)      774    (1)      851    (1)
FMT_SHOWSTATUS               0000025C-R   267    (1)      832    (1)
FMT_SHOWSTATUS_NO_PC         000001F1-R   261    (1)      846    (1)
FMT_SUMMARY                  0000015C-R   254    (1)      768    (1)
INIT_CONTEXT                 00000000-XR                  585    (1)
IOC$K_IOSPACE                00000000-XR                  693    (1)
KB_CHECK                     00000000-XR                  638    (1)      750    (1)
L$A_CCP                      00000240                     687    (1)
L$A_DTP                      00000218                     359    (1)
L$A_ICP                      0000023C                     331    (1)
L$A_NAME                     00000208                  #-768    (1)    #-832    (1)    #-846    (1)
L$A_REPP                     00000244                     778    (1)
L$A_SECNAM                   00000250                  #-815    (1)
L$A_TSTCNT                   00000254                  #-590    (1)
L$L_ENVIRON                  00000204                     700    (1)
L$L_REV                      0000020C                  #-768    (1)    #-832    (1)    #-846    (1)
L$L_UPDATE                   00000210                  #-768    (1)    #-832    (1)    #-846    (1)
MP$_DEALL_MEMORY             00000000-XR                  196    (1)      715    (1)
OFF                         =00000000     215    (1)
ON                          =00000001     215    (1)
PR$_SID_TYP730              =00000003                  #-691    (1)
QA$AOB_CHECK_STATE           00000000-XR                  468    (1)      498    (1)      504    (1)
QA$AOB_FLAGS                 00000000-XR                  500    (1)
QA$K_ABORT_NOW              =00000007     215    (1)
QA$K_APT_PHASE_ONE          =0000000B     215    (1)
QA$K_APT_PHASE_TWO          =0000000C     215    (1)
QA$K_BAD_ADDRESS            =00000009     215    (1)
QA$K_CONTROL_C_CONT         =0000000A     215    (1)
QA$K_DEALLOCATION           =0000000E     215    (1)
QA$K_ERROR_PHASE_ONE        =00000005     215    (1)
QA$K_ERROR_PHASE_THREE      =00000007     215    (1)
QA$K_ERROR_PHASE_TWO        =00000006     215    (1)
QA$K_FAILURE                =00000000     215    (1)
QA$K_FIRST_BRANCH_CODE      =00000000     215    (1)
QA$K_FIRST_TIME             =00000005     215    (1)
QA$K_INIT_CONTEXT_DONE      =00000003     215    (1)
QA$K_LAST_BRANCH_CODE       =00000025     215    (1)
QA$K_LOOP_ON_SUBTEST        =00000003     215    (1)    #-467    (1)
QA$K_LOOP_ON_TEST           =00000002     215    (1)    #-497    (1)
QA$K_LOOP_TEST_DONE         =00000004     215    (1)    #-499    (1)
QA$K_MEMORY_MANAGE          =0000000D     215    (1)
QA$K_MULTIPLE_PASS          =00000001     215    (1)
QA$K_NODEF                  =00000000     215    (1)
QA$K_NORMAL_START           =00000000     215    (1)
QA$K_NO_HEADER              =00000006     215    (1)
QA$K_NUMBER_OF_CHECKS       =0000000F     215    (1)
QA$K_NUMBER_QA_FLAGS        =00000008     215    (1)
QA$K_NUMB_ROUTINE_STATES    =00000004     215    (1)
QA$K_QA_DEBUG               =00000001     215    (1)
QA$K_QA_DONE                =00000002     215    (1)
QA$K_RUN_BACKWARDS          =00000004     215    (1)    #-503    (1)
QA$K_SECTION                =00000008     215    (1)
```

```
QA$K_SUCCESS                =00000001     215    (1)
QA$MAIN                      00000000-XR                329    (1)      335    (1)      348    (1)      529    (1)
                                                        569    (1)      613    (1)      636    (1)      677    (1)
                                                        713    (1)
QA$V_CHECK_DONE             =00000003     215    (1)
QA$V_DOING_CLEANUP          =00000002     215    (1)
QA$V_ERROR_FOUND            =00000001     215    (1)
QA$V_INIT_DONE              =00000000     215    (1)
QA$W_SAVE_LAST               00000000-XR                #-482    (1)
QIO$CLEANUP                  00000000-XR                 703    (1)
REQ_SUB                      00000008-R    227    (1)   #-403    (1)    #-603    (1)
RMS$CLEANUP                  00000000-XR                 706    (1)
SCB_BASE                     00000000-XR                 694    (1)
SEP_FUNCTIONAL              =00000002     207    (1)   #-701    (1)
SEP_REPAIR                  =00000003     207    (1)
SIZ...                      =00000001     212    (1)    207    (1)      212    (1)
SYS$CANTIM                   00000000-XR                682    (1)
TRUE                        =00000001     215    (1)
TST$MCHK                     00000000-XR                696    (1)
T_NOEXE                      0000006B-R    238    (1)    538    (1)
T_NOSUB                      00000009-R    235    (1)    603    (1)
T_TSTABO                     000002F2-R    276    (1)    441    (1)
VRRESTART                    00000000-XR                615    (1)
VRSHOWSTATUS                 00000538-R    803    (1)
VRSUMMARY                    000004C0-R    753    (1)
```

+-------------------------+
! Performance indicators !
+-------------------------+

Phase	Page faults	CPU Time	Elapsed Time
Initialization	28	00:00:00.02	00:00:00.22
Command processing	914	00:00:00.28	00:00:00.96
Pass 1	840	00:00:02.63	00:00:05.68
Symbol table sort	0	00:00:00.15	00:00:00.15
Pass 2	44	00:00:00.82	00:00:01.63
Symbol table output	2	00:00:00.05	00:00:00.19
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	6	00:00:00.35	00:00:00.49
Assembler run totals	1838	00:00:04.30	00:00:09.32

The working set limit was 2900 pages.
172551 bytes (338 pages) of virtual memory were used to buffer the intermediate code.
There were 40 pages of symbol table space allocated to hold 569 non-local and 48 local symbols.
853 source lines were read in Pass 1, producing 62 object records in Pass 2.
64 pages of virtual memory were used to define 48 macros.

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              8
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1               28
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       9
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                45

813 GETS were required to define 45 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(2) 49 DECLARATIONS
(3) 135 RL01/2 Bootstrap driver code

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element DLBTDRIVR.MAR
0000     2 ; *1     6-FEB-1986 15:17:30 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element DLBTDRIVR.MAR
0000     4         .TITLE  DLBTDRIVR - RL01/2 BOOT DRIVER
0000     5         .IDENT  'V02-002'
0000     6
0000     7 ;
0000     8 ;*****************************************************************************
0000     9 ;*                                                                           *
0000    10 ;*  COPYRIGHT (c) 1979, 1980                                                 *
0000    11 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
0000    12 ;*                                                                           *
0000    13 ;*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND  COPIED   *
0000    14 ;*  ONLY  IN  ACCORDANCE  WITH  THE  TERMS  OF  SUCH  LICENSE AND WITH THE  *
0000    15 ;*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE OR  ANY  OTHER   *
0000    16 ;*  COPIES  THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY   *
0000    17 ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE  IS  HEREBY   *
0000    18 ;*  TRANSFERRED.                                                             *
0000    19 ;*                                                                           *
0000    20 ;*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE   *
0000    21 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT  *
0000    22 ;*  CORPORATION.                                                             *
0000    23 ;*                                                                           *
0000    24 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS   *
0000    25 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    26 ;*                                                                           *
0000    27 ;*****************************************************************************
0000    28 ;
0000    29
0000    30 ;++
0000    31 ; FACILITY:     BOOTS
0000    32 ;
0000    33 ; ABSTRACT:
0000    34 ;       This module contains the bootstrap device driver for
0000    35 ;       the RL01/2  disks.
0000    36 ;
0000    37 ; ENVIRONMENT:  IPL 31, kernel mode, code must be PIC
0000    38 ;
0000    39 ; AUTHOR:  Steve Beckhardt,     CREATION DATE:  31-Oct-1979
0000    40 ;  (Original author:  Charlie Franks)
0000    41 ;
0000    42 ; MODIFIED BY:
0000    43 ;
0000    44 ;       02-02   CAS0001         C.A. Samuelson          30-Apr-1980
0000    45 ;               Change interface to BOOTDRIVR for purge of UBA datapath
0000    46 ;
0000    47 ;--
```

```
                     0000     49          .SBTTL  DECLARATIONS
                     0000     50 ;
                     0000     51 ; INCLUDE FILES:
                     0000     52 ;
                     0000     53
                     0000     54          $BTDDEF                         ; Boot device types
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     55          $IODEF                          ; I/O function codes
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     56          $RPBDEF                         ; RPB offsets
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     57          $SSDEF                          ; Status codes
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     58          $UBADEF                         ; UBA definitions
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     59          $UBIDEF                         ; 11/750 UBA definitions
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     60
                     0000     61 ;
                     0000     62 ; MACROS:
                     0000     63 ;
                     0000     64
                     0000     65 ;
                     0000     66 ; EQUATED SYMBOLS:
                     0000     67 ;
                     0000     68 ;
                     0000     69 ; RL11/RL02 CONTROLLER REGISTER OFFSETS
                     0000     70 ;
                     0000     71
                     0000     72          $DEFINI RL                      ;START OF REGISTER DEFINITIONS
                     0000                 .SAVE   LOCAL_BLOCK
                     0000     73
                     0000     74 $DEF     RL_CS           .BLKW   1       ;CONTROL STATUS REGISTER (CSR)
                     0000                 .IIF    NB,RL_CS,       RL_CS:
00000002             0000                 .IIF    NB,,BLKW,       .BLKW   1
                     0002     75          _VIELD  RL_CS,0,<-              ;START OF CSR BIT DEFINITIONS
                     0002     76                  <DRDY,,M>,-             ; DRIVER READY
                     0002     77                  <FCODE,3>,-             ; FUNCTION CODE
                     0002     78                  <XBA,2>,-               ; BUS ADDRESS EXTENSION BITS
                     0002     79                  <IE,,M>,-               ; INTERRUPT ENABLE
                     0002     80                  <CRDY,,M>,-             ; CONTROLLER READY
                     0002     81                  <DS,2>,-                ; DRIVE SELECT
                     0002     82                  <OPI,,M>,-              ; OPERATION INCOMPLETE
                     0002     83                  <CRC,,M>,-              ; DATA CRC OR HEADER CRC
                     0002     84                  <DLT,,M>,-              ; DATA LATE OR HEADER NOT FOUND
                     0002     85                  <NXM,,M>,-              ; NON-EXISTENT MEMORY
                     0002     86                  <DE,,M>,-               ; DRIVE ERROR
                     0002     87                  <CE,,M>-                ; COMPOSITE ERROR
                     0002     88          >                               ;END CSR BIT DEFINITIONS
                     0002     89
                     0002     90 $DEF     RL_BA           .BLKW   1       ;BUS ADDRESS REGISTER (BAR)
```

```
                     0002                   .IIF    NB,RL_BA,       RL_BA:
00000004             0002                   .IIF    NB,.BLKW,       .BLKW   1
                     0004     91
                     0004     92 $DEF       RL_DA           .BLKW   1       ;DISK ADDRESS REGISTER (DAR)
                     0004                   .IIF    NB,RL_DA,       RL_DA:
00000006             0004                   .IIF    NB,.BLKW,       .BLKW   1
                     0006     93            _VIELD  RL_DA,0,<-              ;START OF DAR BIT DEFINITIONS
                     0006     94                    <MRK,,M>,-              ; MARK (ALWAYS 1)
                     0006     95                    <STS,,M>,-              ; GET STATUS
                     0006     96                    <,1>,-                  ; RESERVED BIT
                     0006     97                    <RST,,M>,-              ; RESET
                     0006     98                    <,12>-                  ; RESERVED BITS
                     0006     99            >                               ;END OF DAR BIT DEFINITIONS
                     0006    100
                     0006    101 $DEF       RL_MP           .BLKW   1       ;MULTIPURPOSE REGISTER (MPR)
                     0006                   .IIF    NB,RL_MP,       RL_MP:
00000008             0006                   .IIF    NB,.BLKW,       .BLKW   1
                     0008    102            _VIELD  RL_MP,0,<-              ;START OF MPR BIT DEFINITIONS
                     0008    103                    <STA,3>,-               ; DRIVE STATE
                     0008    104                    <BH,,M>,-               ; BRUSH HOME
                     0008    105                    <HO,,M>,-               ; HEADS OUT
                     0008    106                    <CO,,M>,-               ; COVER OPEN
                     0008    107                    <HS,,M>,-               ; HEAD SELECT
                     0008    108                    <TYP,,M>,-              ; DRIVE TYPE
                     0008    109                    <DSE,,M>,-              ; DRIVE SELECT ERROR
                     0008    110                    <VC,,M>,-               ; VOLUME CHECK
                     0008    111                    <WGE,,M>,-              ; WRITE GATE ERROR
                     0008    112                    <SPE,,M>,-              ; SPIN ERROR
                     0008    113                    <SKTO,,M>,-             ; SEEK TIME OUT
                     0008    114                    <WL,,M>,-               ; WRITE LOCK
                     0008    115                    <CHE,,M>,-              ; CURRENT HEAD ERROR
                     0008    116                    <WDE,,M>-               ; WRITE DATA ERROR
                     0008    117            >                               ;END OF MPR BIT DEFINITIONS
                     0008    118
                     0008    119            $DEFEND RL                      ;END RL11/RL02 REGISTER DEFINITIONS
                     0000                   .RESTORE
                     0000    120
                     0000    121
                     0000    122 ;
                     0000    123 ; OWN STORAGE:
                     0000    124 ;
                     0000    125
                     0000    126 ;
                     0000    127 ; Boot driver table entry
                     0000    128 ;
                     0000    129
                     0000    130            $BOOT_DRIVER    DEVTYPE = BTD$K_DL,-    ; Device type (DL)
                     0000    131                            SIZE = DL_DRVSIZ,-      ; Driver size
                     0000    132                            ADDR = DL_DRIVER,-      ; Driver address
                     0000    133                            DRIVRNAME = DLNAME      ; Driver file name
                  00000000                   .PSECT  BOOTDRIVR_4
                     FFFF 0000               .WORD   -1
                     0002 0002               .WORD   BTD$K_DL
00000000             0004                    .LONG   0
00000120'            0008                    .LONG   DL_DRVSIZ
00000000'            000C                    .LONG   DL_DRIVER-$TABLE
00000000             0010                    .LONG   0
```

```
                    00000113' 0014          .LONG   DLNAME-DL_DRIVER
                          00000000          .PSECT  BOOTDRIVR_2
```

```
                                0000   135          .SBTTL  RL01/2 Bootstrap driver code
                                0000   136
                                0000   137 ;++
                                0000   138 ;
                                0000   139 ; Inputs:
                                0000   140 ;
                                0000   141 ;       R3      - base address of adapter's register space
                                0000   142 ;       R5      - LBN FOR CURRENT PIECE OF TRANSFER
                                0000   143 ;       R6      - contains 0
                                0000   144 ;       R7      - address of device's CSR
                                0000   145 ;       R8      - SIZE OF TRANSFER IN BYTES
                                0000   146 ;       R9      - address of the RPB
                                0000   147 ;       R10     - starting address of transfer (byte offset in first
                                0000   148 ;                 page ORed with starting map register number)
                                0000   149 ;
                                0000   150 ;       FUNC(AP)- I/O operation (IO$_READLBLK or IO$_WRITELBLK only)
                                0000   151 ;       BUF(AP) - Buffer address
                                0000   152 ;       SIZE(AP)- Size of transfer
                                0000   153 ;
                                0000   154 ; Implicit inputs:
                                0000   155 ;
                                0000   156 ;       RPB$W_UNIT      - RPB field containing boot device unit number
                                0000   157 ;
                                0000   158 ; Outputs:
                                0000   159 ;
                                0000   160 ;       R0 - status code
                                0000   161 ;
                                0000   162 ;               SS$_NORMAL      - successful transfer
                                0000   163 ;               SS$_CTRLERR     - fatal controller error
                                0000   164 ;
                                0000   165 ;       R3 - must be preserved
                                0000   166 ;
                                0000   167 ;       This routine destroys R1, R2, R4, R5, R6. Within the
                                0000   168 ;       routine, register usage is as follows:
                                0000   169
                                0000   170 ;--
                                0000   171
                    00000004    0000   172 BUF = 4
                    00000008    0000   173 SIZE = 8
                    00000010    0000   174 FUNC = 16
                                0000   175
                                0000   176 DL_DRIVER:
                                0000   177
                                0000   178 ;
                                0000   179 ; RESET DRIVE AND WAIT FOR IT TO SPIN UP.
                                0000   180 ;
                                0000   181
                          50    0000   182          CLRL    R0                              ; CLEAR R0
50  02  08    64 A9   F0      0002   183          INSV    RPB$W_UNIT(R9),#8,#2,R0 ; GET UNIT NUMBER
          04 A7   0B    B0    0008   184          MOVW    #RL_DA_M_RST!-                  ; PUT RESET & GET STATUS IN DAR
                                000C   185                  RL_DA_M_STS!-
                                000C   186                  RL_DA_M_MRK,RL_DA(R7)
      67  50    04    A9      000C   187 10$:     BISW3   #4,R0,RL_CS(R7)                 ; EXECUTE DRIVE RESET
                  00F8  30      0010   188          BSBW    READY                           ; WAIT FOR CONTROLLER READY
          06 A7   1D    B3    0013   189          BITW    #RL_MP_M_HO!-                   ; HEADS,BRUSHES,STATE OK?
                                0017   190                  RL_MP_M_BH!5,RL_MP(R7)  ; ... (5 = SEEK LINEAR MODE STATE)
                    F3  13      0017   191          BEQL    10$                             ; BRANCH IF NOT: WAIT FOR DRIVE TO SPIN UP
```

```
                    67   01   B3  0019   192          BITW    #RL_CS_M_DRDY,RL_CS(R7) ; IS DRIVE READY?
                         EE   13  001C   193          BEQL    10$                     ; IF NOT, BRANCH TO WAIT FOR DRIVE READY
                                 001E   194
                                 001E   195 ;
                                 001E   196 ; FIND CURRENT DISK ADDRESS, CALCULATE CYLINDER DIFFERENCE, AND SEEK
                                 001E   197 ; DESIRED CYLINDER
                                 001E   198 ;
                                 001E   199
                67   50   08    A9  001E   200 20$:     BISW3   #8,R0,RL_CS(R7)         ; EXECUTE READ HEADER
                          00E6   30  0022   201          BSBW    READY                   ; WAIT FOR CONTROLLER READY
                             03  18  0025   202          BGEQ    30$                     ; BRANCH IF NO ERROR READING HEADER
                          00C8   31  0027   203          BRW     100$                    ; OTHERWISE, BRANCH TO ERROR HANDLING
          51    06 A7    3F    AB  002A   204 30$:     BICW3   #^O77,RL_MP(R7),R1      ; GET CURRENT CYL & SURFACE
                                 002F   205
                                 002F   206 ;
                                 002F   207 ; NOW CONVERT LOGICAL TO PHYSICAL
                                 002F   208 ;
                                 002F   209
                    55   02    C4  002F   210          MULL    #2,R5                   ; CONVERT LOGICAL BLOCKS TO SECTORS
                         56    D4  0032   211          CLRL    R6                      ; CLEAR HIGH PART OF DIVIDEND
  54    56   55   00000050 8F    7B  0034   212          EDIV    #80,R5,R6,R4            ; R6 = DESIRED CYL = LBN/(SECTORS/CYL)
                                 003D   213                                          ; R4 = REMAINING SECTORS
                         55    D4  003D   214          CLRL    R5                      ; CLEAR HIGH PART OF DIVIDEND
          54   55   54    28    7B  003F   215          EDIV    #40,R4,R5,R4            ; R5 = DESIRED SURFACE = R5/(SECT/SUR)
                                 0044   216                                          ; R4 = DESIRED SECTOR
          56   56   07    78  0044   217          ASHL    #7,R6,R6                ; SHIFT DESIRED CYLINDER INTO R6<15:7>
     56   01   06   55    F0  0048   218          INSV    R5,#6,#1,R6             ; INSERT DESIRED SURFACE BIT INTO R6<6>
                    51   56    B1  004D   219          CMPW    R6,R1                   ; IS A SEEK NEEDED?
                         2E   13  0050   220          BEQL    50$                     ; BRANCH IF NOT.
                                 0052   221
                                 0052   222 ;
                                 0052   223 ; NEED TO PERFORM A SEEK.
                                 0052   224 ;
                                 0052   225
          51   007F 8F    AA  0052   226          BICW    #^O177,R1               ; ISOLATE CURRENT CYLINDER IN R1
52        56   007F 8F    AB  0057   227 35$:     BICW3   #^O177,R6,R2            ; ISOLATE DESIRED CYLINDER IN R2
               51   52    A2  005D   228          SUBW    R2,R1                   ; SUBTRACT DESIRED FROM ACTUAL
                    08    13  0060   229          BEQL    40$                     ; BRANCH IF CURRENT = DESIRED CYLINDER
                    06    1E  0062   230          BCC     40$                     ; BRANCH IF CURRENT >= DESIRED CYLINDER
               51   51    AE  0064   231          MNEGW   R1,R1                   ; ACTUAL<DESIRED, MAKE POSITIVE DIFF
               51   04    A8  0067   232          BISW    #4,R1                   ; SET SIGN FOR MOVE TO CENTER OF DISK
51        01   04   55    F0  006A   233 40$:     INSV    R5,#4,#1,R1             ; INSERT SURFACE BIT IN R1<4>
     04 A7    51   01    A9  006F   234          BISW3   #RL_DA_M_MRK,R1,-       ; SET MARKER AND LOAD DIFFERENCE
                                 0074   235                  RL_DA(R7)               ; WORD.
          67   50   06    A9  0074   236          BISW3   #6,R0,RL_CS(R7)         ; EXECUTE SEEK FUNCTION
                    0090   30  0078   237          BSBW    READY                   ; WAIT FOR CONTROLLER READY OR ERROR
                       03  18  007B   238          BGEQ    50$                     ; BRANCH IF NO ERROR DURING SEEK
                    0072   31  007D   239          BRW     100$                    ; OTHERWISE, BRANCH DUE TO ERROR
                                 0080   240
                                 0080   241 ;
                                 0080   242 ; SEEK, IF ANY, IS COMPLETE. EXECUTE TRANSFER FUNCTION
                                 0080   243 ;
                                 0080   244
56   06   00   54    F0  0080   245 50$:     INSV    R4,#0,#6,R6             ; MERGE SECTOR WITH CYLINDER AND SURFACE
                                 0085   246                                          ; CYL=R6<15:7> SUR=R6<6> SEC=R6<5:0>
     04 A7   56   B0  0085   247          MOVW    R6,RL_DA(R7)            ; SET DESIRED DISK ADDRESS
     02 A7   5A   B0  0089   248          MOVW    R10,RL_BA(R7)           ; SET BUFFER ADDRESS
```

```
                52   58   B0  008D          MOVW    R8,R2                    ; GET WORKING COPY OF BYTES LEFT TO XFER
                                0090                                          ; AND ASSUME THIS IS LAST TRANSFER
            51  28   54   A3  0090          SUBW3   R4,#40,R1                ; R1 = SECTORS LEFT ON SURFACE
            51  0100 8F   A4  0094          MULW    #256,R1                  ; CONVERT TO BYTES LEFT ON SURFACE
                51   52   B1  0099          CMPW    R2,R1                    ; ARE ADDITIONAL TRANSFERS REQUIRED?
                     03   1B  009C          BLEQU   60$                      ; BRANCH IF ANSWER IS NO.
                52   51   B0  009E          MOVW    R1,R2                    ; SET BYTE COUNT FOR THIS TRANSFER
                52   02   A6  00A1  60$:    DIVW    #2,R2                    ; CALCULATE TRANSFER WORD COUNT
              06 A7   52   AE  00A4          MNEGW   R2,RL_MP(R7)             ; SET NEG TRANSFER WORD COUNT
                51   0C   B0  00A8          MOVW    #^XC,R1                  ; ASSUME READ FUNCTION
              20   10 AC   D1  00AB          CMPL    FUNC(AP),#IO$_WRITELBLK  ; IS IT A WRITE FUNCTION?
                     03   12  00AF          BNEQ    70$                      ; BRANCH IF NOT
                51   0A   B0  00B1          MOVW    #^XA,R1                  ; SET WRITE FUNCTION CODE
            67  51   50   A9  00B4  70$:    BISW3   R0,R1,RL_CS(R7)          ; MERGE UNIT # WITH FUNCTION AND EXECUTE
                   0050   30  00B8          BSBW    READY                    ; WAIT FOR CONTROLLER READY OR ERROR
                     35   19  00BB          BLSS    100$                     ; BRANCH ON ERROR
                52   02   A4  00BD  80$:    MULW    #2,R2                    ; FIND BYTES TRANSFERRED THIS TIME
                58   52   A2  00C0          SUBW    R2,R8                    ; UPDATE BYTES LEFT TO TRANSFER
                     1C   13  00C3          BEQL    90$                      ; BRANCH IF TRANSFER IS COMPLETE
                                00C5
                                00C5  ;
                                00C5  ; UPDATE PARAMETERS FOR NEXT TRANSFER
                                00C5  ;
                                00C5
      51   04 A7   007F 8F   AB  00C5          BICW3   #^O177,RL_DA(R7),R1      ; UPDATE CURRENT CYLINDER IN R1<15:7>
         56   04 A7   3F   A9  00CC          BISW3   #^O77,RL_DA(R7),R6       ; SET SECTOR BITS TO 1'S AND -
                     56   B6  00D1          INCW    R6                       ; UPDATE DESIRED DISK ADDRESS IN R6
      55   56   01   06   EF  00D3          EXTZV   #6,#1,R6,R5              ; UPDATE DESIRED SURFACE IN R5
                     54   D4  00D8          CLRL    R4                       ; UPDATE DESIRED SECTOR IN R4
              5A   02 A7   B0  00DA          MOVW    RL_BA(R7),R10            ; UPDATE DESIRED BUFFER ADDRESS
                   FF76   31  00DE          BRW     35$                      ; LOOP FOR NEXT TRANSFER
                                00E1
                                00E1  ;
                                00E1  ; TRANSFER COMPLETE - RETURN
                                00E1  ;
                                00E1
              51   08 AC   3C  00E1  90$:    MOVZWL  SIZE(AP),R1              ; SET TOTAL BYTES TRANSFERRED
                     07   12  00E5          BNEQ    95$                      ; BRANCH IF ORIGINAL SIZE WAS TRANSFERRED
         51   00008000 8F   D0  00E7          MOVL    #^X8000,R1               ; ELSE SIZE WAS FORCED TO 64K
                50   01   3C  00EE  95$:    MOVZWL  #SS$_NORMAL,R0           ; SET COMPLETION CODE
                          05  00F1          RSB                              ; AND RETURN
                                00F2
                                00F2  ;
                                00F2  ; RETRY ERROR
                                00F2  ;
                                00F2
              58   08 AC   3C  00F2  100$:   MOVZWL  SIZE(AP),R8              ; RESTORE BYTE SIZE OF TRANSFER IN R8
                     07   12  00F6          BNEQ    110$                     ; BRANCH IF SIZE WAS LEGAL
         58   00001F40 8F   D0  00F8          MOVL    #8000,R8                 ; ELSE FORCE TO 64K SIZE
      5A   04 AC   09   00   EF  00FF  110$:   EXTZV   #0,#9,BUF(AP),R10        ; RESTORE BYTE OFFSET IN R10
            50   0054 8F   3C  0105          MOVZWL  #SS$_CTRLERR,R0          ; SET FATAL CONTROLLER ERROR
                          05  010A          RSB                              ; AND ATTEMPT RETRY
                                010B
                                010B
                                010B  ;
                                010B  ; SUBROUTINE TO WAIT FOR CONTROLLER READY OR ERROR
                                010B  ;
```

```
                                    010B   306
                                    010B   307 READY:                                  ;
                 67   8080 8F   B3  010B   308         BITW    #^X8080,(R7)            ;CONTROLLER READY OR ERROR?
                           F9   13  0110   309         BEQL    READY                   ;IF EQL NO
                                05  0112   310         RSB                             ;
                                    0113   311
58 45 2E 52 45 56 49 52 44 4C 44 00' 0113   312 DLNAME: .ASCIC  /DLDRIVER.EXE/          ; Driver file name
                                45  011F
                                0C  0113
                                    0120   313
                         00000120   0120   314 DL_DRVSIZ=.-DL_DRIVER
                                    0120   315
                                    0120   316         .END
```

```
$TABLE                      = 00000000 R  D  02
BTD$K_DL                    = 00000002    D
BUF                         = 00000004    D
DLNAME                        00000113 R  D  03
DL_DRIVER                     00000000 R  D  03
DL_DRVSIZ                   = 00000120    D
FUNC                        = 00000010    D
IO$_WRITELBLK               = 00000020    D
READY                         0000010B R  D  03
RL_BA                         00000002    D
RL_CS                         00000000    D
RL_CS_M_DRDY                = 00000001    D
RL_DA                         00000004    D
RL_DA_M_MRK                 = 00000001    D
RL_DA_M_RST                 = 00000008    D
RL_DA_M_STS                 = 00000002    D
RL_MP                         00000006    D
RL_MP_M_BH                  = 00000008    D
RL_MP_M_HO                  = 00000010    D
RPB$W_UNIT                  = 00000064    D
SIZ...                      = 00000001    D
SIZE                        = 00000008    D
SS$_CTRLERR                 = 00000054    D
SS$_NORMAL                  = 00000001    D
```

```
                                  +-----------------+
                                  ! Psect synopsis !
                                  +-----------------+

PSECT name                  Allocation          PSECT No.  Attributes
----------                  ----------          ---------  ----------
.  ABS  .                   00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                       00000008  (    8.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
BOOTDRIVR_4                 00000018  (   24.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
BOOTDRIVR_2                 00000120  (  288.)  03 (  3.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$TABLE	=00000000-R	133 (2)	133 (2)
BTD$K_DL	=00000002		133 (2)
BUF	=00000004	172 (3)	298 (3)
DLNAME	00000113-R	312 (3)	133 (2)
DL_DRIVER	00000000-R	176 (3)	133 (2) 314 (3)
DL_DRVSIZ	=00000120	314 (3)	133 (2)
FUNC	=00000010	174 (3)	#-259 (3)
IO$_WRITELBLK	=00000020		#-259 (3)
READY	0000010B-R	307 (3)	#-188 (3) #-201 (3) #-237 (3) #-263 (3)
			#-309 (3)
RL_BA	00000002		#-248 (3) #-278 (3)
RL_CS	00000000		#-187 (3) #-192 (3) #-200 (3) #-236 (3)
			#-262 (3)
RL_CS_M_DRDY	=00000001		#-192 (3)
RL_DA	00000004		#-186 (3) #-235 (3) #-247 (3) #-273 (3)
			#-274 (3)
RL_DA_M_MRK	=00000001		#-186 (3) #-234 (3)
RL_DA_M_RST	=00000008		#-184 (3)
RL_DA_M_STS	=00000002		#-185 (3)
RL_MP	00000006		#-190 (3) #-204 (3) #-257 (3)
RL_MP_M_BH	=00000008		#-190 (3)
RL_MP_M_HO	=00000010		#-189 (3)
RPB$W_UNIT	=00000064		#-183 (3)
SIZE	=00000008	173 (3)	#-285 (3) #-295 (3)
SS$_CTRLERR	=00000054		#-299 (3)
SS$_NORMAL	=00000001		#-288 (3)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.06	00:00:00.22
Command processing	934	00:00:00.32	00:00:01.15
Pass 1	614	00:00:02.34	00:00:03.46
Symbol table sort	0	00:00:00.33	00:00:00.32
Pass 2	64	00:00:00.58	00:00:01.05
Symbol table output	2	00:00:00.01	00:00:00.05
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	4	00:00:00.02	00:00:00.02
Assembler run totals	1647	00:00:03.66	00:00:06.27

The working set limit was 2400 pages.
118003 bytes (231 pages) of virtual memory were used to buffer the intermediate code.
There were 60 pages of symbol table space allocated to hold 1080 non-local and 13 local symbols.
316 source lines were read in Pass 1, producing 71 object records in Pass 2.
16 pages of virtual memory were used to define 15 macros.

```
                              +----------------------------+
                              ! Macro library statistics !
                              +----------------------------+

Macro library name                                Macros defined
------------------                                --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                        1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1                      0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1                     0
SYS$COMMON:[SYSLIB]LIB.MLB;2                                   4
SYS$COMMON:[SYSLIB]STARLET.MLB;2                               6
SYS$COMMON:[SYSLIB]STARLET.MLB;2                               0
TOTALS (all libraries)                                        11

1117 GETS were required to define 11 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(2) 49 DECLARATIONS
(3) 186 RK06/7 Bootstrap driver code
(4) 332 ECC - PERFORM ECC ERROR CORRECTION

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element DMBTDRIVR.MAR
0000     2 ; *1     6-FEB-1986 15:17:32 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element DMBTDRIVR.MAR
0000     4         .TITLE  DMBTDRIVR - RK06/7 BOOT DRIVER
0000     5         .IDENT  'V02-002'
0000     6
0000     7 ;
0000     8 ;*****************************************************************************
0000     9 ;*                                                                           *
0000    10 ;*  COPYRIGHT (c) 1979, 1980                                                 *
0000    11 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
0000    12 ;*                                                                           *
0000    13 ;*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND  COPIED   *
0000    14 ;*  ONLY  IN  ACCORDANCE  WITH  THE  TERMS  OF  SUCH  LICENSE AND WITH THE  *
0000    15 ;*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE OR  ANY  OTHER   *
0000    16 ;*  COPIES  THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY   *
0000    17 ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE  IS  HEREBY   *
0000    18 ;*  TRANSFERRED.                                                             *
0000    19 ;*                                                                           *
0000    20 ;*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE   *
0000    21 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT  *
0000    22 ;*  CORPORATION.                                                             *
0000    23 ;*                                                                           *
0000    24 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS   *
0000    25 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    26 ;*                                                                           *
0000    27 ;*****************************************************************************
0000    28 ;
0000    29
0000    30 ;++
0000    31 ; FACILITY:     BOOTS
0000    32 ;
0000    33 ; ABSTRACT:
0000    34 ;       This module contains the bootstrap device driver for the
0000    35 ;       RK06/7 disks.
0000    36 ;
0000    37 ; ENVIRONMENT:  IPL 31, kernel mode, code must be PIC
0000    38 ;
0000    39 ; AUTHOR:  Steve Beckhardt,     CREATION DATE:  1-Nov-1979
0000    40 ;  (Original author:  Carol Peters)
0000    41 ;
0000    42 ; MODIFIED BY:
0000    43 ;
0000    44 ;       02-02   CAS0001         C.A. Samuelson          30-Apr-1980
0000    45 ;                               Change interface to BOOTDRIVR for purge of UBA datapath
0000    46 ;
0000    47 ;--
```

```
                     0000     49          .SBTTL  DECLARATIONS
                     0000     50 ;
                     0000     51 ; INCLUDE FILES:
                     0000     52 ;
                     0000     53
                     0000     54          $BTDDEF                         ; Boot device types
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     55          $IODEF                          ; I/O function codes
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     56          $PRDEF                          ; Processor registers
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     57          $RPBDEF                         ; RPB offsets
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     58          $SSDEF                          ; Status codes
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     59          $UBADEF                         ; UBA definitions
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     60          $UBIDEF                         ; 11/750 UBA definitions
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     61
                     0000     62 ;
                     0000     63 ; MACROS:
                     0000     64 ;
                     0000     65
                     0000     66 ;
                     0000     67 ; EQUATED SYMBOLS:
                     0000     68 ;
                     0000     69 ;
                     0000     70 ; RK611/RK06 CONTROLLER REGISTER OFFSETS
                     0000     71 ;
                     0000     72
                     0000     73          $DEFINI RK
                     0000                 .SAVE   LOCAL_BLOCK
                     0000     74
                     0000     75 $DEF     RK_CS1              .BLKW   1       ;CONTROL STATUS REGISTER 1
                     0000                 .IIF    NB,RK_CS1,      RK_CS1:
                     0000                 .IIF    NB,.BLKW,       .BLKW   1
          00000002   0000     76          _VIELD  RK_CS1,0,<-                 ; CONTROL STATUS REGISTER 1 FIELD DEFINITION
                     0002     77                  <GO,,M>,-                  ; GO BIT
                     0002     78                  <FCODE,4>,-                ; FUNCTION CODE
                     0002     79                  <DPPE,,M>,-                ; DATA PATH PURGE ERROR
                     0002     80                  <IE,,M>,-                  ; INTERRUPT ENABLE
                     0002     81                  <RDY,,M>,-                 ; CONTROLLER READY
                     0002     82                  <MEX,2>,-                  ; MEMORY EXTENSION BITS
                     0002     83                  <CDT,,M>,-                 ; CONTROLLER DRIVE TYPE
                     0002     84                  <CTO,,M>,-                 ; CONTROLLER TIME OUT
                     0002     85                  <CFMT,,M>,-                ; CONTROLLER FORMAT ERROR
                     0002     86                  <SPAR,,M>,-                ; SERIAL BUS PARITY ERROR
                     0002     87                  <DI,,M>,-                  ; DRIVE INTERRUPT
                     0002     88                  <CERR,,M>-                 ; CONTROLLER ERROR
```

```
                 0002    89          >                                   ;
                 0002    90 $DEF     RK_WC            .BLKW   1         ;WORD COUNT REGISTER
                 0002                .IIF    NB,RK_WC,        RK_WC:
        00000004 0002                .IIF    NB,.BLKW,        .BLKW   1
                 0004    91 $DEF     RK_BA            .BLKW   1         ;BUFFER ADDRESS REGISTER
                 0004                .IIF    NB,RK_BA,        RK_BA:
        00000006 0004                .IIF    NB,.BLKW,        .BLKW   1
                 0006    92 $DEF     RK_DA            .BLKW   1         ;DESIRED SECTOR/TRACK ADDRESS REGISTER
                 0006                .IIF    NB,RK_DA,        RK_DA:
        00000008 0006                .IIF    NB,.BLKW,        .BLKW   1
                 0008    93          _VIELD  RK_DA,0,<-                 ; DESIRED ADDRESS FIELD DEFINITIONS
                 0008    94                  <SA,5>,-                   ; DESIRED SECTOR ADDRESS
                 0008    95                  <,3>,-                     ; RESERVED BITS
                 0008    96                  <TA,3>-                    ; DESIRED TRACK ADDRESS
                 0008    97          >                                   ;
                 0008    98 $DEF     RK_CS2           .BLKW   1         ;CONTROL STATUS REGISTER 2
                 0008                .IIF    NB,RK_CS2,       RK_CS2:
        0000000A 0008                .IIF    NB,.BLKW,        .BLKW   1
                 000A    99          _VIELD  RK_CS2,0,<-                ; CONTROL STATUS REGISTER 2 FIELD DEFINITION
                 000A   100                  <DS,3>,-                   ; DRIVE SELECT
                 000A   101                  <RLS,,M>,-                 ; RELEASE DRIVE
                 000A   102                  <BAI,,M>,-                 ; BUFFER ADDRESS INCREMENT INHIBIT
                 000A   103                  <SCLR,,M>,-                ; SUBSYSTEM CLEAR
                 000A   104                  <IR,,M>,-                  ; INPUT READY
                 000A   105                  <OR,,M>,-                  ; OUTPUT READY
                 000A   106                  <UFE,,M>,-                 ; UNIT FIELD ERROR
                 000A   107                  <MDS,,M>,-                 ; MULTIPLE DRIVE SELECT
                 000A   108                  <PGE,,M>,-                 ; PROGRAMMING ERROR
                 000A   109                  <NEM,,M>,-                 ; NONEXISTENT MEMORY
                 000A   110                  <NED,,M>,-                 ; NONEXISTENT DRIVE
                 000A   111                  <UPE,,M>,-                 ; UNIBUS PARITY ERROR
                 000A   112                  <WCE,,M>,-                 ; WRITE CHECK ERROR
                 000A   113                  <DLT,,M>-                  ; DATA LATE ERROR
                 000A   114          >                                   ;
                 000A   115 $DEF     RK_DS            .BLKW   1         ;DRIVE STATUS REGISTER
                 000A                .IIF    NB,RK_DS,        RK_DS:
        0000000C 000A                .IIF    NB,.BLKW,        .BLKW   1
                 000C   116          _VIELD  RK_DS,0,<-                 ; DRIVE STATUS REGISTER BIT DEFINTIONS
                 000C   117                  <DRA,,M>,-                 ; DRIVE AVAILABLE
                 000C   118                  <,1>,-                     ; RESERVED BIT
                 000C   119                  <OFST,,M>,-                ; DRIVE OFFSET
                 000C   120                  <ACLO,,M>,-                ; DRIVE AC LOW
                 000C   121                  <DCLO,,M>,-                ; DRIVE DC LOW
                 000C   122                  <DROT,,M>,-                ; DRIVE OFF TRACK
                 000C   123                  <VV,,M>,-                  ; VOLUME VALID
                 000C   124                  <DRDY,,M>,-                ; DRIVE READY
                 000C   125                  <DDT,,M>,-                 ; DRIVE DRIVE TYPE
                 000C   126                  <,2>,-                     ; RESERVED BITS
                 000C   127                  <WRL,,M>,-                 ; DRIVE WRITE LOCKED
                 000C   128                  <,1>,-                     ; RESERVED BIT
                 000C   129                  <PIP,,M>,-                 ; POSITIONING IN PROGRESS
                 000C   130                  <DSC,,M>,-                 ; DRIVE STATUS CHANGE
                 000C   131                  <SVAL,,M>-                 ; DRIVE STATUS VALID
                 000C   132          >                                   ;
                 000C   133 $DEF     RK_ER            .BLKW   1         ;ERROR REGISTER
                 000C                .IIF    NB,RK_ER,        RK_ER:
        0000000E 000C                .IIF    NB,.BLKW,        .BLKW   1
```

```
                     000E   134          _VIELD  RK_ER,0,<-                ; ERROR REGISTER BIT DEFINITIONS
                     000E   135                  <ILF,,M>,-                ; ILLEGAL FUNCTION
                     000E   136                  <SKI,,M>,-                ; SEEK INCOMPLETE
                     000E   137                  <NXF,,M>,-                ; NONEXECUTABLE FUNCTION
                     000E   138                  <DRPAR,,M>,-              ; DRIVE PARITY ERROR
                     000E   139                  <FMTE,,M>,-               ; FORMAT ERROR
                     000E   140                  <DTYE,,M>,-               ; DRIVE TYPE ERROR
                     000E   141                  <ECH,,M>,-                ; ECC HARD ERROR
                     000E   142                  <BSE,,M>,-                ; BAD SECTOR ERROR
                     000E   143                  <HVRC,,M>,-               ; HEADER VRC ERROR
                     000E   144                  <COE,,M>,-                ; CYLINDER OVERFLOW ERROR
                     000E   145                  <IDAE,,M>,-               ; INVALID DISK ADDRESS ERROR
                     000E   146                  <WLE,,M>,-                ; WRITE LOCK ERROR
                     000E   147                  <DTE,,M>,-                ; DRIVE TIMING ERROR
                     000E   148                  <OPI,,M>,-                ; OPERATION INCOMPLETE
                     000E   149                  <UNS,,M>,-                ; DRIVE UNSAFE
                     000E   150                  <DCK,,M>-                 ; DATA CHECK ERROR
                     000E   151          >                                 ;
                     000E   152 $DEF     RK_AS               .BLKW   1     ;ATTENTION SUMMARY/OFFSET REGISTER
                     000E               .IIF     NB,RK_AS,      RK_AS:
           00000010  000E               .IIF     NB,..BLKW,     .BLKW   1
                     0010   153          _VIELD  RK_AS,0,<-                ; ATTENTION SUMMARY/OFFSET REGISTER FIELDS
                     0010   154                  <OF,7>,-                  ; DRIVE OFFSET
                     0010   155                  <,1>,-                    ; RESERVED BIT
                     0010   156                  <ATTN,8,M>-               ; DRIVE ATTENTION SUMMARY
                     0010   157          >                                 ;
                     0010   158 $DEF     RK_DC               .BLKW   1     ;DESIRED CYLINDER ADDRESS
                     0010               .IIF     NB,RK_DC,      RK_DC:
           00000012  0010               .IIF     NB,..BLKW,     .BLKW   1
                     0012   159 $DEF     RK_SPR              .BLKW   1     ;UNUSED REGISTER
                     0012               .IIF     NB,RK_SPR,     RK_SPR:
           00000014  0012               .IIF     NB,..BLKW,     .BLKW   1
                     0014   160 $DEF     RK_DB               .BLKW   1     ;DATA BUFFER REGISTER
                     0014               .IIF     NB,RK_DB,      RK_DB:
           00000016  0014               .IIF     NB,..BLKW,     .BLKW   1
                     0016   161 $DEF     RK_MR1              .BLKW   1     ;MAINTENANCE REGISTER 1
                     0016               .IIF     NB,RK_MR1,     RK_MR1:
           00000018  0016               .IIF     NB,..BLKW,     .BLKW   1
                     0018   162          _VIELD  RK_MR1,0,<<MS,3>>         ; MAINTENANCE REGISTER 1 FIELD DEFINITION
                     0018   163 $DEF     RK_EC1              .BLKW   1     ;ECC POSITION REGISTER
                     0018               .IIF     NB,RK_EC1,     RK_EC1:
           0000001A  0018               .IIF     NB,..BLKW,     .BLKW   1
                     001A   164          _VIELD  RK_EC1,0,<<EPS,13>>       ; ECC POSITION FIELD
                     001A   165 $DEF     RK_EC2              .BLKW   1     ;ECC PATTERN REGISTER
                     001A               .IIF     NB,RK_EC2,     RK_EC2:
           0000001C  001A               .IIF     NB,..BLKW,     .BLKW   1
                     001C   166          _VIELD  RK_EC2,0,<<EPT,11>>       ; ECC PATTERN FIELD
                     001C   167 $DEF     RK_MR2              .BLKW   1     ;MAINTENANCE REGISTER 2
                     001C               .IIF     NB,RK_MR2,     RK_MR2:
           0000001E  001C               .IIF     NB,..BLKW,     .BLKW   1
                     001E   168 $DEF     RK_MR3              .BLKW   1     ;MAINTENANCE REGISTER 3
                     001E               .IIF     NB,RK_MR3,     RK_MR3:
           00000020  001E               .IIF     NB,..BLKW,     .BLKW   1
                     0020   169
                     0020   170          $DEFEND RK
                     0000               .RESTORE
                     0000   171
```

```
                        0000   172
                        0000   173 ;
                        0000   174 ; OWN STORAGE:
                        0000   175 ;
                        0000   176
                        0000   177 ;
                        0000   178 ; Boot driver table entry
                        0000   179 ;
                        0000   180
                        0000   181         $BOOT_DRIVER    DEVTYPE = BTD$K_DM,-     ; Device type (DM)
                        0000   182                         SIZE = DM_DRVSIZ,-       ; Driver size
                        0000   183                         ADDR = DM_DRIVER,-       ; Driver address
                        0000   184                         DRIVRNAME = DMNAME       ; Driver name
                  00000000                      .PSECT  BOOTDRIVR_4
                      FFFF  0000                .WORD   -1
                      0001  0002                .WORD   BTD$K_DM
                  00000000  0004                .LONG   0
                  00000123' 0008                .LONG   DM_DRVSIZ
                  00000000' 000C                .LONG   DM_DRIVER-$TABLE
                  00000000  0010                .LONG   0
                  00000116' 0014                .LONG   DMNAME-DM_DRIVER
                        00000000                .PSECT  BOOTDRIVR_2
```

```
                                        .SBTTL  RK06/7 Bootstrap driver code

                                ;++
                                ;
                                ; Inputs:
                                ;
                                ;       R3      - base address of adapter's register space
                                ;       R5      - LBN FOR CURRENT PIECE OF TRANSFER
                                ;       R6      - contains 0
                                ;       R7      - address of the device's CSR
                                ;       R8      - SIZE OF TRANSFER IN BYTES
                                ;       R9      - address of the RPB
                                ;       R10     - starting address of transfer (byte offset in first
                                ;                 page ORed with starting map register number)
                                ;       R11     - LBN at start of transfer
                                ;
                                ;       FUNC(AP)- I/O operation (IO$_READLBLK or IO$_WRITELBLK only)
                                ;       BUF(AP) - Buffer address
                                ;       SIZE(AP)- Size of transfer in bytes
                                ;       MODE(AP)- Address interpretation mode (0 = physical, 1 = virtual)
                                ;
                                ; Implicit inputs:
                                ;
                                ;       RPB$W_UNIT      - RPB field containing boot device unit number
                                ;
                                ; Outputs:
                                ;
                                ;       R0 - status code
                                ;
                                ;               SS$_NORMAL      - successful transfer
                                ;               SS$_NOSUCHDEV   - unsupported device
                                ;               SS$_CTRLERR     - fatal controller error
                                ;
                                ;       R3 - must be preserved
                                ;
                                ;       This routine destroys R1, R2, R4, R5, R6. Within the
                                ;       routine, register usage is as follows:
                                ;
                                ;               R0      - mapping enabled flag
                                ;                         device unit number
                                ;                         status code
                                ;               R1      - device function code
                                ;               R2      - drive type according to device register
                                ;               R4      - used in logical to physical calculation
                                ;               R5      - used in logical to physical calculation
                                ;               R6      - used in logical to physical calculation
                                ;                         transfer word count
                                ;
                                ;--
00000004                        BUF = 4
00000008                        SIZE = 8
0000000C                        LBN = 12
00000010                        FUNC = 16
00000014                        MODE = 20

                                DM_DRIVER:                              ; RK06/7 device driver.

```

```
                                  0000  ;
                                  0000  ; Translate the I/O function code into a device-dependent function
                                  0000  ; code for this disk.
                                  0000  ;
                                  0000
                 51    11    D0   0000  10$:    MOVL    #17,R1                    ; ASSUME READ
              20    10 AC    D1   0003          CMPL    FUNC(AP),#IO$_WRITELBLK   ; CHECK FOR WRITE FUNCTION
                       03    12   0007          BNEQ    20$                       ; NO, DO READ
                 51    13    D0   0009          MOVL    #19,R1                    ; SET WRITE FUNCTION CODE
                                  000C
                                  000C  ;
                                  000C  ; Clear controller and drive status. Confirm that the drive exists and
                                  000C  ; is ready for a transfer.
                                  000C  ;
                                  000C
              50    64 A9    3C   000C  20$:    MOVZWL  RPB$W_UNIT(R9),R0         ; GET UNIT NUMBER
              08 A7    20    B0   0010          MOVW    #RK_CS2_M_SCLR,RK_CS2(R7) ; CLEAR CONTROLLER AND ALL DRIVES
                     0092    30   0014          BSBW    READY                     ; WAIT FOR CONTROLLER READY
              08 A7    50    B0   0017          MOVW    R0,RK_CS2(R7)             ; SET DRIVE NUMBER
                                  001B
                                  001B  30$:                                      ; Clear drive and find type.
                 67    05    B0   001B          MOVW    #5,RK_CS1(R7)             ; Clear drive.
                     0088    30   001E          BSBW    READY                     ; Wait for controller ready.
                       52    D4   0021          CLRL    R2                        ; Assume RK06 drive.
        0A A7   0100 8F    B3   0023          BITW    #RK_DS_M_DDT,RK_DS(R7)    ; Is drive RK07?
                       05    13   0029          BEQL    33$                       ; No. Branch.
           52   0400 8F    3C   002B          MOVZWL  #RK_CS1_M_CDT,R2          ; Yes. Set drive code.
                                  0030
                                  0030  33$:                                      ; Check for existence of drive.
        08 A7   1000 8F    B3   0030          BITW    #RK_CS2_M_NED,RK_CS2(R7); Does drive exist?
                       06    13   0036          BEQL    35$                       ; Yes. Branch.
           50   0908 8F    3C   0038          MOVZWL  #SS$_NOSUCHDEV,R0         ; No.  Exit with error
                             05   003D          RSB
                                  003E
                                  003E  35$:                                      ; Clear drive and acknowledge.
                 8000 8F    B0   003E          MOVW    #RK_CS1_M_CERR,-          ; Clear controller error
                       67         0042                  RK_CS1(R7)                ; status.
              08 A7    50    B0   0043          MOVW    R0,RK_CS2(R7)             ; Set unit number code again.
           67    52    05    A9   0047          BISW3   #5,R2,RK_CS1(R7)          ; Clear drive.
                     005B    30   004B          BSBW    READY                     ; Wait for controller ready.
        0A A7   0080 8F    B3   004E          BITW    #RK_DS_M_DRDY,RK_DS(R7)   ; Is the drive ready?
                       E8    13   0054          BEQL    35$                       ; No. Clear drive again.
           67    52    03    A9   0056          BISW3   #3,R2,RK_CS1(R7)          ; Acknowledge pack and set
                                  005A                                            ; volume valid.
                       4D    10   005A          BSBB    READY                     ; Wait for controller ready.
                                  005C
                                  005C  ;
                                  005C  ; Compute the cylinder, track, and sector addresses. Load device
                                  005C  ; registers with transfer parameters and start transfer.
                                  005C  ;
                                  005C
                       56    D4   005C          CLRL    R6                        ; Clear register for EDIV.
 55    54    55   00000042 8F    7B   005E          EDIV    #22*3,R5,R4,R5            ; COMPUTE DESIRED CYLINDER
              10 A7    54    B0   0067          MOVW    R4,RK_DC(R7)              ; AND SET IN DEVICE
        56    55    55    16   7B   006B          EDIV    #22,R5,R5,R6              ; CALCULATE DESIRED TRACK/SECTOR
        56    08    08    55   F0   0070          INSV    R5,#8,#8,R6               ; MERGE TRACK AND SECTOR
              06 A7    56    B0   0075          MOVW    R6,RK_DA(R7)              ; SET DESIRED TRACK SECTOR
```

```
                04 A7   5A   B0  0079   300          MOVW    R10,RK_BA(R7)           ; SET STARTING BUFFER ADDRESS
             56   58   02   C7  007D   301          DIVL3   #2,R8,R6                ; COMPUTE WORD COUNT
               02 A7   56   AE  0081   302          MNEGW   R6,RK_WC(R7)            ; SET NUMBER OF WORDS TO TRANSFER
             67   52   51   A9  0085   303          BISW3   R1,R2,RK_CS1(R7)        ; Start disk function.
                       1E   10  0089   304          BSBB    READY                   ; WAIT FOR CONTROLLER READY
                            008B   305
                            008B   306 ;
                            008B   307 ; Transfer is complete. See whether the transfer completed without
                            008B   308 ; error. If not, prepare input registers for the ECC correction routine
                            008B   309 ; and branch to that routine.
                            008B   310 ;
                            008B   311
                   50   01   3C  008B   312          MOVZWL  #SS$_NORMAL,R0          ; ASSUME NORMAL COMPLETION
                        67   B5  008E   313          TSTW    RK_CS1(R7)              ; CHECK COMPOSITE ERROR
                        01   19  0090   314          BLSS    50$                     ; CONTINUE IF NO ERROR
                             05  0092   315          RSB                             ;
                50    0C A7   B0  0093   316 50$:    MOVW    RK_ER(R7),R0            ; GET ERROR STATUS
                51    02 A7   32  0097   317          CVTWL   RK_WC(R7),R1            ; GET NEGATED COUNT REMAINING
                   51   02   C4  009B   318          MULL    #2,R1                   ; CONVERT TO BYTES
                55    18 A7   3C  009E   319          MOVZWL  RK_EC1(R7),R5           ; GET POSITION OF ERROR
                56    1A A7   B0  00A2   320          MOVW    RK_EC2(R7),R6           ; GET PATTERN
                      0008    31  00A6   321          BRW     ECC                     ; AND ATTEMPT ECC CORRECTION
                              00A9   322
                              00A9   323 ;
                              00A9   324 ; SUBROUTINE TO WAIT FOR CONTROLLER READY OR ERROR
                              00A9   325 ;
                              00A9   326
                              00A9   327 READY:                                     ;
             67   8080 8F   B3  00A9   328          BITW    #^X8080,(R7)            ;CONTROLLER READY OR ERROR?
                       F9   13  00AE   329          BEQL    READY                   ;IF EQL NO
                            05  00B0   330          RSB                             ;
```

```
                     00B1   332          .SBTTL  ECC - PERFORM ECC ERROR CORRECTION
                     00B1   333
                     00B1   334 ;++
                     00B1   335 ;
                     00B1   336 ; Functional description:
                     00B1   337 ;
                     00B1   338 ;       ATTEMPT ECC ERROR CORRECTION
                     00B1   339 ;
                     00B1   340 ; INPUTS:
                     00B1   341 ;
                     00B1   342 ;       R0      - RK_ER/RP_ER1  ERROR STATUS REGISTER
                     00B1   343 ;       R1      - NEGATIVE BYTE COUNT REMAINING
                     00B1   344 ;       R5      - ECC POSITION
                     00B1   345 ;       R6      - ECC PATTERN
                     00B1   346 ;       R8      - BYTE COUNT REMAINING AT START OF LAST TRANSFER
                     00B1   347 ;       R10     - starting address of transfer
                     00B1   348 ;       R11     - BLOCK NUMBER AT START OF TRANSFER
                     00B1   349 ;
                     00B1   350 ; Outputs:
                     00B1   351 ;
                     00B1   352 ;--
                     00B1   353
                     00B1   354 ECC:                                    ; ATTEMPT ECC CORRECTION
                     00B1   355
                     00B1   356 ;
                     00B1   357 ; Don't attempt an ECC correction if any of the following conditions apply:
                     00B1   358 ;
                     00B1   359 ;       the error was not a data check
                     00B1   360 ;       the error was a hard ECC error
                     00B1   361 ;       the transfer mode does not match the map-enabled position, i.e.,
                     00B1   362 ;               transfer is virtual, and mapping is not enabled, or v.v.
                     00B1   363 ;       no bytes have been transferred yet
                     00B1   364 ;
                     00B1   365
        5B 50   0F   E1   00B1   366          BBC     #RK_ER_V_DCK,R0,RETRY   ; NOT DATA CHECK, RETRY
        57 50   06   E0   00B5   367          BBS     #RK_ER_V_ECH,R0,RETRY   ; HARD ECC ERROR, RETRY
           50   38   DB   00B9   368          MFPR    #PR$_MAPEN,R0           ; GET MAP ENABLE STATE
        14 AC   50   D1   00BC   369          CMPL    R0,MODE(AP)             ; SAME AS I/O MODE
               4E   12   00C0   370          BNEQ    RETRY                   ; NO, CANT DO SIMPLE ECC
           51   58   C0   00C2   371          ADDL    R8,R1                   ; COMPUTE BYTES TRANSFERRED
               49   13   00C5   372          BEQL    RETRY                   ; NONE, RETRY
                    00C7   373
                    00C7   374 ;
                    00C7   375 ; Appears to be a correctable data check. Attempt the correction.
                    00C7   376 ;
                    00C7   377
50      51     F7   8F   78   00C7   378          ASHL    #-9,R1,R0               ; CONVERT TO PAGE COUNT
           5B   50   C0   00CC   379          ADDL    R0,R11                  ; UPDATE BLOCK NUMBER
           5A   51   C0   00CF   380          ADDL    R1,R10                  ; UPDATE BYTE ADDRESS
           58   51   C2   00D2   381          SUBL    R1,R8                   ; DECREASE BYTES REMAINING
                55   D7   00D5   382          DECL    R5                      ; MAKE POSITION 1 ORIGIN
   50      0200 C8   9E   00D7   383          MOVAB   512(R8),R0              ; REMAINING BYTES AT START OF BAD SECTOR
52    08 AC   50   C3   00DC   384          SUBL3   R0,SIZE(AP),R2          ; BYTES TRANSFERRED AT START OF ERROR SECTOR
           50   08   C4   00E1   385          MULL    #8,R0                   ; CONVERT BYTE COUNT TO BIT COUNT
           50   55   C2   00E4   386          SUBL    R5,R0                   ; COMPUTE CORRECTION FIELD WIDTH
                19   15   00E7   387          BLEQ    20$                     ; BR IF NO CORRECTION NEEDED
           0D   50   D1   00E9   388          CMPL    R0,#RK_EC1_S_EPS        ; MINIMUM OF 13 AND BUFFER REMAINING
```

```
                        03   15  00EC          BLEQ    10$                     ; KEEP MINIMUM VALUE
                    50  0D   D0  00EE          MOVL    #RK_EC1_S_EPS,R0        ; LIMIT FIELD TO RK_EC1_S_EPS BITS
     51   04 BC42    50  55   EF  00F1  10$:    EXTZV   R5,R0,@BUF(AP)[R2],R1   ; GET FIELD TO BE CORRECTED
                    51  56   CC  00F8          XORL    R6,R1                   ; APPLY CORRECTION CODE
     04 BC42   50   55  51   F0  00FB          INSV    R1,R5,R0,@BUF(AP)[R2]   ; AND STORE IN BUFFER
                                0102
                                0102  ;
                                0102  ; If the transfer is not complete, branch back to retry it.
                                0102  ;
                                0102
                        58   D5  0102  20$:    TSTL    R8                      ; CHECK FOR COUNT REMAINING
                        06   15  0104          BLEQ    30$                     ; NONE, EXIT
                    55  5B   D0  0106          MOVL    R11,R5                  ; GET WORKING COPY OF LBN
                      FEF4   31  0109          BRW     DM_DRIVER               ; CONTINUE TRANSFER
                                010C
                                010C  ;
                                010C  ; Transfer is complete. Return with success status code.
                                010C  ;
                                010C
                    50  01   3C  010C  30$:    MOVZWL  #SS$_NORMAL,R0          ; SET COMPLETION CODE
                            05  010F          RSB                             ; AND RETURN
                                0110
                                0110  ;
                                0110  ; No ECC correction was possible.  Return and retry.
                                0110  ;
                                0110
                                0110  RETRY:
                50   0054 8F   3C  0110          MOVZWL  #SS$_CTRLERR,R0         ; Set failure status
                            05  0115          RSB                             ; Return to BOOTDRIVR
                                0116
58 45 2E 52 45 56 49 52 44 4D 44 00'  0116  DMNAME: .ASCIC  /DMDRIVER.EXE/          ; Driver filename
                            45  0122
                            0C  0116
                                0123
                      00000123  0123  DM_DRVSIZ=.-DM_DRIVER
                                0123
                                0123          .END
```

```
$TABLE                          = 00000000 R  D  02
BTD$K_DM                        = 00000001    D
BUF                             = 00000004    D
DMNAME                            00000116 R  D  03
DM_DRIVER                         00000000 R  D  03
DM_DRVSIZ                       = 00000123    D
ECC                               000000B1 R  D  03
FUNC                            = 00000010    D
IO$_WRITELBLK                   = 00000020    D
LBN                             = 0000000C    D
MODE                            = 00000014    D
PR$_MAPEN                       = 00000038    D
READY                             000000A9 R  D  03
RETRY                             00000110 R  D  03
RK_AS                             0000000E    D
RK_BA                             00000004    D
RK_CS1                            00000000    D
RK_CS1_M_CDT                    = 00000400    D
RK_CS1_M_CERR                   = 00008000    D
RK_CS2                            00000008    D
RK_CS2_M_NED                    = 00001000    D
RK_CS2_M_SCLR                   = 00000020    D
RK_DA                             00000006    D
RK_DB                             00000014    D
RK_DC                             00000010    D
RK_DS                             0000000A    D
RK_DS_M_DDT                     = 00000100    D
RK_DS_M_DRDY                    = 00000080    D
RK_EC1                            00000018    D
RK_EC1_S_EPS                    = 0000000D    D
RK_EC2                            0000001A    D
RK_ER                             0000000C    D
RK_ER_V_DCK                     = 0000000F    D
RK_ER_V_ECH                     = 00000006    D
RK_MR1                            00000016    D
RK_MR2                            0000001C    D
RK_MR3                            0000001E    D
RK_SPR                            00000012    D
RK_WC                             00000002    D
RPB$W_UNIT                      = 00000064    D
SIZ...                          = 0000000B    D
SIZE                            = 00000008    D
SS$_CTRLERR                     = 00000054    D
SS$_NORMAL                      = 00000001    D
SS$_NOSUCHDEV                   = 00000908    D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	00000020 (32.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
BOOTDRIVR_4	00000018 (24.)	02 (2.)	NOPIC USR CON REL LCL NOSHR EXE RD WRT NOVEC BYTE
BOOTDRIVR_2	00000123 (291.)	03 (3.)	NOPIC USR CON REL LCL NOSHR EXE RD WRT NOVEC BYTE

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$TABLE	=00000000-R	184 (2)	184 (2)
BTD$K_DM	=00000001		184 (2)
BUF	=00000004	235 (3)	391 (4) 393 (4)
DMNAME	00000116-R	419 (4)	184 (2)
DM_DRIVER	00000000-R	241 (3)	184 (2) #-402 (4) 421 (4)
DM_DRVSIZ	=00000123	421 (4)	184 (2)
ECC	000000B1-R	354 (4)	#-321 (3)
FUNC	=00000010	238 (3)	#-249 (3)
IO$_WRITELBLK	=00000020		#-249 (3)
LBN	=0000000C	237 (3)	
MODE	=00000014	239 (3)	#-369 (4)
PR$_MAPEN	=00000038		#-368 (4)
READY	000000A9-R	327 (3)	#-260 (3) #-265 (3) #-282 (3) #-287 (3)
			#-304 (3) #-329 (3)
RETRY	00000110-R	415 (4)	#-366 (4) #-367 (4) #-370 (4) #-372 (4)
RK_BA	00000004		#-300 (3)
RK_CS1	00000000		#-264 (3) #-279 (3) #-281 (3) #-285 (3)
			#-303 (3) #-313 (3)
RK_CS1_M_CDT	=00000400		#-269 (3)
RK_CS1_M_CERR	=00008000		#-278 (3)
RK_CS2	00000008		#-259 (3) #-261 (3) #-272 (3) #-280 (3)
RK_CS2_M_NED	=00001000		#-272 (3)
RK_CS2_M_SCLR	=00000020		#-259 (3)
RK_DA	00000006		#-299 (3)
RK_DC	00000010		#-296 (3)
RK_DS	0000000A		#-267 (3) #-283 (3)
RK_DS_M_DDT	=00000100		#-267 (3)
RK_DS_M_DRDY	=00000080		#-283 (3)
RK_EC1	00000018		#-319 (3)
RK_EC1_S_EPS	=0000000D		#-388 (4) #-390 (4)
RK_EC2	0000001A		#-320 (3)
RK_ER	0000000C		#-316 (3)
RK_ER_V_DCK	=0000000F		#-366 (4)
RK_ER_V_ECH	=00000006		#-367 (4)
RK_WC	00000002		#-302 (3) #-317 (3)
RPB$W_UNIT	=00000064		#-258 (3)
SIZE	=00000008	236 (3)	#-384 (4)
SS$_CTRLERR	=00000054		#-416 (4)
SS$_NORMAL	=00000001		#-312 (3) #-408 (4)
SS$_NOSUCHDEV	=00000908		#-274 (3)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.02	00:00:00.21
Command processing	931	00:00:00.31	00:00:01.04
Pass 1	677	00:00:02.43	00:00:03.64

Symbol table sort	0	00:00:00.35	00:00:00.36
Pass 2	67	00:00:00.68	00:00:01.23
Symbol table output	2	00:00:00.01	00:00:00.11
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	3	00:00:00.03	00:00:00.03
Assembler run totals	1709	00:00:03.84	00:00:06.63

The working set limit was 2400 pages.
143654 bytes (281 pages) of virtual memory were used to buffer the intermediate code.
There were 70 pages of symbol table space allocated to hold 1266 non-local and 9 local symbols.
423 source lines were read in Pass 1, producing 80 object records in Pass 2.
17 pages of virtual memory were used to define 16 macros.

+----------------------------+
! Macro library statistics !
+----------------------------+

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	4
SYS$COMMON:[SYSLIB]STARLET.MLB;2	7
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	12

1226 GETS were required to define 12 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(2)   43   DECLARATIONS
(3)   110   DR$INT - DR32 INTERRUPT HANDLER

```
                     0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element DRINT.MAR
                     0000     2 ; *1     6-FEB-1986 15:17:37 DS ""
                     0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element DRINT.MAR
                     0000     4         .TITLE  DRINT - DR32 interrupt handler
                     0000     5
                     0000     6         .IDENT  /V01/
                00000000     7         .PSECT  SEP, WRT, SHR, EXE, LONG
                     0000     8
                     0000     9 ;
                     0000    10 ;                                COPYRIGHT (c) 1978, 1980 BY
                     0000    11 ;                    DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.
                     0000    12 ;
                     0000    13 ; THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND  COPIED
                     0000    14 ; ONLY  IN  ACCORDANCE  WITH  THE  TERMS  OF  SUCH  LICENSE AND WITH THE
                     0000    15 ; INCLUSION OF THE ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE OR  ANY  OTHER
                     0000    16 ; COPIES  THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY
                     0000    17 ; OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE  IS  HEREBY
                     0000    18 ; TRANSFERRED.
                     0000    19 ;
                     0000    20 ; THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE
                     0000    21 ; AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT
                     0000    22 ; CORPORATION.
                     0000    23 ;
                     0000    24 ; DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS
                     0000    25 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.
                     0000    26 ;
                     0000    27
                     0000    28 ;++
                     0000    29 ; FACILITY:     EXECUTIVE
                     0000    30 ;
                     0000    31 ; ABSTRACT:
                     0000    32 ;       THIS IS A DUMMY DR32 INTERRUPT HANDLER WHICH IS USED UNTIL
                     0000    33 ;       THE REAL DR32 DRIVER IS LOADED.
                     0000    34 ;
                     0000    35 ; ENVIRONMENT:  KERNEL MODE, NON-PAGED
                     0000    36 ;
                     0000    37 ; AUTHOR:  STEVE BECKHARDT,     CREATION DATE:  7-MAR-1979
                     0000    38 ;
                     0000    39 ; MODIFIED BY:
                     0000    40 ;
                     0000    41 ;--
```

```
                        0000     43          .SBTTL  DECLARATIONS
                        0000     44 ;
                        0000     45 ; INCLUDE FILES:
                        0000     46 ;
                        0000     47
                        0000     48 ;
                        0000     49 ; MACROS:
                        0000     50 ;
                        0000     51
                        0000     52          $IDBDEF                             ; IDB OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .IIF    NB,IDB$L_CSR,   IDB$L_CSR:
                00000004 0000                        .BLKL   1
                        0004                 .IIF    NB,IDB$L_OWNER, IDB$L_OWNER:
                00000008 0004                        .BLKL   1
                        0008                 .IIF    NB,IDB$W_SIZE,  IDB$W_SIZE:
                0000000A 0008                        .BLKW   1
                        000A                 .IIF    NB,IDB$B_TYPE,  IDB$B_TYPE:
                0000000B 000A                        .BLKB   1
                0000000C 000B                        .BLKB   1
                        000C                 .IIF    NB,IDB$W_UNITS, IDB$W_UNITS:
                0000000E 000C                        .BLKW   1
                00000010 000E                        .BLKW   1
                        0010                 .IIF    NB,IDB$L_ADP,   IDB$L_ADP:
                00000014 0010                        .BLKL   1
                        0014                 .IIF    NB,IDB$L_UCBLST,        IDB$L_UCBLST:
                00000034 0014                        .BLKL   8
                        0034                 .IIF    NB,IDB$C_LENGTH,        IDB$C_LENGTH:
                        0034                 .IIF    NB,IDB$K_LENGTH,        IDB$K_LENGTH:
                00000000                     .RESTORE
                        0000     53
                        0000     54 ;
                        0000     55 ; EQUATED SYMBOLS:
                        0000     56 ;
                        0000     57
                        0000     58          ;
                        0000     59          ; DR32 DCR REGISTER DEFINITIONS
                        0000     60          ;
                        0000     61
                        0000     62          $DEFINI DR
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 0034                .=0
                        0000     63 $DEF     DR_DCR          .BLKL   1       ; DR32 CONTROL REGISTER
                        0000                 .IIF    NB,DR_DCR,      DR_DCR:
                00000004 0000                .IIF    NB,,BLKL,       .BLKL   1
                        0004     64          _VIELD  DR_DCR,0,<-
                        0004     65                  <ADPTYP,8>,-            ; ADAPTER TYPE
                        0004     66                  <ID2ERR,,M>,-           ; ID2 ERROR
                        0004     67                  <ID2TOS,2>,-            ; ID2 TIME-OUT STATUS
                        0004     68                  <,1>,-                  ; RESERVED
                        0004     69                  <ID1ERR,,M>,-           ; ID1 ERROR
                        0004     70                  <ID1TOS,2>,-            ; ID1 TIME-OUT STATUS
                        0004     71                  <RDS,,M>,-              ; READ DATA SUBSTITUTE
                        0004     72                  <CRD,,M>,-              ; CORRECTED READ DATA
                        0004     73                  <DCRHLT,,M>,-           ; DCR HALT
                        0004     74                  <DCRABT,,M>,-           ; DCR ABORT INTERRUPT
```

```
                     0004    75                 <PKTINT,,M>,-           ; PACKET INTERRUPT
                     0004    76                 <INTENB,,M>,-           ; INTERRUPT ENABLE
                     0004    77                 <,1>,-                  ; RESERVED
                     0004    78                 <PWR_UP,,M>,-           ; ADAPTER POWER UP
                     0004    79                 <PWR_DN,,M>,-           ; ADAPTER POWER DOWN
                     0004    80                 <EXTABT,,M>,-           ; EXTERNAL ABORT
                     0004    81                 <,1>,-                  ; RESERVED
                     0004    82                 <IMPDEP,6>,-            ; IMPLEMENTATION DEPENDENT BITS
                     0004    83             >
                     0004    84
                     0004    85 ; DCR CONTROL FIELD A CODES (USED WHEN WRITING TO DCR)
                     0004    86
            00000100 0004    87 DCR_K_CLRPWRUP=^X100
            00000200 0004    88 DCR_K_CLRPWRDN=^X200                    ; CLEAR POWER DOWN
            00000300 0004    89 DCR_K_CLREXTABT=^X300                   ; CLEAR EXTERNAL ABORT
            00000400 0004    90 DCR_K_CLRABTINT=^X400                   ; CLEAR ABORT INTERRUPT
            00000500 0004    91 DCR_K_CLRINTENB=^X500                   ; CLEAR INTERRUPT ENABLE
            00000600 0004    92 DCR_K_SETINTENB=^X600                   ; SET INTERRUPT ENABLE
            00000700 0004    93 DCR_K_CLRHLT=^X700                      ; CLEAR HALT
                     0004    94
                     0004    95 ; DCR CONTROL FIELD B CODES (USED WHEN WRITING TO DCR)
                     0004    96
            00001000 0004    97 DCR_K_CLRCRD=^X1000                     ; CLEAR CRD
            00002000 0004    98 DCR_K_SETEXTABT=^X2000                  ; SET EXTERNAL ABORT
            00003000 0004    99 DCR_K_CLRPKTINT=^X3000                  ; CLEAR PACKET INTERRUPT
            00004000 0004   100 DCR_K_RESET=^X4000                      ; RESET
            00005000 0004   101 DCR_K_SETOSQTST=^X5000                  ; SET OSEQ TEST
            00006000 0004   102 DCR_K_CLROSQTST=^X6000                  ; CLEAR OSEQ TEST
                     0004   103         $DEFEND DR
                 00000000           .RESTORE
                     0000   104
                     0000   105 ;
                     0000   106 ; OWN STORAGE:
                     0000   107 ;
                     0000   108
```

```
                        0000   110          .SBTTL  DR$INT - DR32 INTERRUPT HANDLER
                        0000   111 ;++
                        0000   112 ; FUNCTIONAL DESCRIPTION:
                        0000   113 ;
                        0000   114 ;       THIS MODULE IS A DUMMY DR32 INTERRUPT HANDLER WHICH IS USED
                        0000   115 ;       UNTIL THE REAL DR32 DRIVER IS LOADED.
                        0000   116 ;       THIS ROUTINE ALSO CONTAINS A DUMMY DR32 CONTROLLER INITIALIZATION
                        0000   117 ;       ENTRY POINT.
                        0000   118 ;
                        0000   119 ; CALLING SEQUENCE:
                        0000   120 ;
                        0000   121 ;       JSB FROM INTERRUPT VECTOR IN CRB
                        0000   122 ;
                        0000   123 ; INPUT PARAMETERS:
                        0000   124 ;
                        0000   125 ;       NONE
                        0000   126 ;
                        0000   127 ; IMPLICIT INPUTS:
                        0000   128 ;
                        0000   129 ;       THE STACK ON ENTRY IS AS FOLLOWS:
                        0000   130 ;
                        0000   131 ;                0(SP)           ADDRESS OF IDB ADDRESS
                        0000   132 ;           4(SP) - 16(SP)       SAVED R2 - R5
                        0000   133 ;               20(SP)           INTERRUPT PC
                        0000   134 ;               24(SP)           INTERRUPT PSL
                        0000   135 ;
                        0000   136 ; OUTPUT PARAMETERS:
                        0000   137 ;
                        0000   138 ;       NONE
                        0000   139 ;
                        0000   140 ; IMPLICIT OUTPUTS:
                        0000   141 ;
                        0000   142 ;       NONE
                        0000   143 ;
                        0000   144 ; COMPLETION CODES:
                        0000   145 ;
                        0000   146 ;       NONE
                        0000   147 ;
                        0000   148 ; SIDE EFFECTS:
                        0000   149 ;
                        0000   150 ;       INTERRUPTS ARE DISABLED ON THE DR32
                        0000   151 ;
                        0000   152 ;--
                        0000   153
                        0000   154 DR$INT::
     53    9E    D0     0000   155          MOVL    @(SP)+,R3                       ; GET ADDRESS OF IDB
     54    63    D0     0003   156          MOVL    IDB$L_CSR(R3),R4                ; GET ADDRESS OF FIRST CSR
64   0100  8F    3C     0006   157          MOVZWL  #DCR_K_CLRPWRUP,DR_DCR(R4)      ; CLEAR POWER UP
64   0200  8F    3C     000B   158          MOVZWL  #DCR_K_CLRPWRDN,DR_DCR(R4)      ; CLEAR POWER DOWN
     52    8E    7D     0010   159          MOVQ    (SP)+,R2                        ; RESTORE REGISTERS
     54    8E    7D     0013   160          MOVQ    (SP)+,R4
                02     0016   161          REI
                       0017   162
                       0017   163
                       0017   164 DR$INITIAL::                                     ; CONTROLLER INITIALIZATION
                       0017   165
                       0017   166
```

```
                64   4000 8F    3C  0017   167          MOVZWL  #DCR_K_RESET,(R4)              ; RESET DR (R4 POINTS TO FIRST CSR)
                                 05  001C   168          RSB
                                     001D   169
                                     001D   170
                                     001D   171
                                     001D   172          .END
```

```
DCR_K_CLRPWRDN = 00000200     D
DCR_K_CLRPWRUP = 00000100     D
DCR_K_RESET    = 00004000     D
DR$INITIAL       00000017 RG D  01
DR$INT           00000000 RG D  01
DR_DCR           00000000     D
IDB$B_TYPE       0000000A     D
IDB$C_LENGTH     00000034     D
IDB$K_LENGTH     00000034     D
IDB$L_ADP        00000010     D
IDB$L_CSR        00000000     D
IDB$L_OWNER      00000004     D
IDB$L_UCBLST     00000014     D
IDB$W_SIZE       00000008     D
IDB$W_UNITS      0000000C     D
SIZ...         = 00000006     D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
$EP	0000001D (29.)	01 (1.)	NOPIC USR CON REL LCL SHR EXE RD WRT NOVEC LONG
ABS	00000034 (52.)	02 (2.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE

Symbol Cross Reference

```
SYMBOL           VALUE        DEFINITION      REFERENCES...
------           -----        ----------      -------------
DCR_K_CLRPWRDN  =00000200                     #-158    (3)
DCR_K_CLRPWRUP  =00000100                     #-157    (3)
DCR_K_RESET     =00004000                     #-167    (3)
DR$INITIAL       00000017-R   164    (3)
DR$INT           00000000-R   154    (3)
DR_DCR           00000000                     #-157    (3)    #-158    (3)
IDB$L_CSR        00000000                     #-156    (3)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	41	00:00:00.02	00:00:00.31
Command processing	948	00:00:00.29	00:00:01.07
Pass 1	216	00:00:00.32	00:00:01.27
Symbol table sort	0	00:00:00.01	00:00:00.01
Pass 2	18	00:00:00.12	00:00:00.25
Symbol table output	2	00:00:00.00	00:00:00.00
Psect synopsis output	0	00:00:00.00	00:00:00.00
Cross-reference output	2	00:00:00.01	00:00:00.01
Assembler run totals	1229	00:00:00.77	00:00:02.92

```
The working set limit was 2400 pages.
13087 bytes (26 pages) of virtual memory were used to buffer the intermediate code.
There were 10 pages of symbol table space allocated to hold 57 non-local and 0 local symbols.
172 source lines were read in Pass 1, producing 17 object records in Pass 2.
10 pages of virtual memory were used to define 9 macros.
```

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	1
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	4
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	5

```
87 GETS were required to define 5 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element DSLOAD.B32
;    0002  0      ! *2    27-MAR-1987 16:53:36 BARANSKI "remove zero address argument check"
;    0003  0      ! *1     6-FEB-1986 15:17:49 DS ""
;    0004  0      ! DEC/CMS REPLACEMENT HISTORY, Element DSLOAD.B32
;    0005  0      %title '*** DSLOAD DS$LOAD routine'
;    0006  0      MODULE DSLOAD (                                 !Routines to handle DS$LOAD
;    0007  0                     IDENT = '10.8-12',                                          !G:2
;    0008  0                     ADDRESSING_MODE (EXTERNAL = LONG_RELATIVE)
;    0009  0                     ) =
;    0010  0      !
;    0011  0      ! COPYRIGHT (c) 1980, 1981,1984
;    0012  0      ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
;    0013  0      !
;    0014  0      ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
;    0015  0      ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
;    0016  0      ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
;    0017  0      ! MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
;    0018  0      ! EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
;    0019  0      ! TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
;    0020  0      ! REMAIN IN DEC.
;    0021  0      !
;    0022  0      ! THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
;    0023  0      ! AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
;    0024  0      ! CORPORATION.
;    0025  0      !
;    0026  0      ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
;    0027  0      ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
;    0028  0
;    0029  0      !++
;    0030  0      ! FACILITY: DIAGNOSTIC SUPERVISOR
;    0031  0      !
;    0032  0      ! ABSTRACT:
;    0033  0      !
;    0034  0      !       This module contains the routines necessary to handle
;    0035  0      !       the DS$LOAD routines.
;    0036  0      !
;    0037  0      ! AUTHOR:       Roger Riggs, CREATION DATE: 10-November-1979
;    0038  0      !                                                                           !G:2
;    0039  0      ! MODIFIED BY:
;    0040  0      !
;    0041  0      !               Dave Butenhof, 8-apr-1981, version 6.3
;    0042  0      !       01      In user mode, magtapes will only load one magtape block,
;    0043  0      !               irregardless of USZ field size, on $READ.  Therefore, loop
;    0044  0      !               on $READ until RMS$_EOF found, to make sure entire file is
;    0045  0      !               read.  Also, use $SPACE if VBN arg is specified, so it'll
;    0046  0      !               work on magtapes.
;    0047  0      !                                                                           !G:2
;    0048  0      !               Dave Butenhof, 02-Jun-1981, version 6.3                     !G:2
;    0049  0      !       02      Change directory specs of libraries for flexibility
;    0050  0      !
;    0051  0      !       03      Jack Stansbury, 28-Oct-1981, Version 6.5                    !G:2
;    0052  0      !               Changed PSECTs from SEP to WORK, CODE, and DATA.
;    0053  0      !
;    0054  0      !       04      Jack Stansbury, 10-Apr-1982, Version 6.7
;    0055  0      !               Changed the location of the following assignment statement:
;    0056  0      !                       addr = .address;
;    0057  0      !               in the routine, since if the return length is requested
```

```
;    0058  0      !                (ACTUALCOUNT() GEQ 5), the retlen is calculated to be the
;    0059  0      !                maximum of the actual loaded size (addr - address) or the
;    0060  0      !                XAB size. However, if the Length parameter is 0, the assignment
;    0061  0      !                statement above was not getting done, and the aboce calculation
;    0062  0      !                would have been wrong!
;    0063  0      !
;    0064  0      !        05      Richard Brown, 15-June-82,  Version 6.8
;    0065  0      !                Addition of code to differentiate between those diagnostics
;    0066  0      !                which have an image header and those which do not.  If the
;    0067  0      !                header is present, it is stored in a separate buffer area.
;    0068  0      !
;    0069  0      !        06      Richard Brown, 4-August-82, Version 6.9
;    0070  0      !                Change to allow loading files bigger than 64k.
;    0071  0      !
;    0072  0      !        07      Marion Baggett, 24-Sept-82,  Version 6.9
;    0073  0      !                Set addressing mode to fix trucation errors.
;    0074  0      !
;    0075  0      !        08      R.E.Muse, 15-Feb_84, version 6.14
;    0076  0      !                Added check of image header size for those diagnostics
;    0077  0      !                with new images headers created by VMS version 4.
;    0078  0      !
;    0079  0      !        09      Richard Brown, 25-Jun-84, Version 7.0
;    0080  0      !                Changed value of image header size checked for, since
;    0081  0      !                it changed between field test 1 and field test 2 of VMS V4.
;    0082  0      !
;    0083  0      !        10      Ted Salem, 14-Feb-85, Version 8.1
;    0084  0      !                Made changes in order to down-line load over the NI.
;    0085  0      !
;    0086  0      !        11      Jim Baranski, 24-May-85, Version 8.2
;    0087  0      !                Added check for address parameters equal to zero.
;    0088  0      !                                                                          !G:2
;    0089  0      !        12      Jim Baranski, 24-Mar-87, Version 10.8                     !G:2
;    0090  0      !                Remove check for address parameters equal to zero.        !G:2
;    0091  0      !                Incompatible with many diagnostics.                       !G:2
;    0092  0      !--
;    0093  0
;    0094  1      BEGIN
;    0095  1      !
;    0096  1      ! INCLUDE FILES:
;    0097  1      !
;    0098  1
;    0099  1      LIBRARY '$DIAG';                !
;    0100  1
;    0101  1      LIBRARY '$DS';                  !
;    0102  1
;    0103  1      LIBRARY 'SYS$LIBRARY:LIB';
;    0104  1
;    0105  1      $DS_DSADEF
;    0106  1
;    0107  1      !
;    0108  1      ! TABLE OF CONTENTS:
;    0109  1      !
;    0110  1
;    0111  1      FORWARD ROUTINE
;    0112  1          DSX$LOAD;
;    0113  1
;    0114  1      !
```

```
;    0115  1      ! EXTERNAL REFERENCES:
;    0116  1      !
;    0117  1
;    0118  1      EXTERNAL
;    0119  1
;    0120  1              DS$GL_FLAGS ;
;    0121  1
;    0122  1      !
;    0123  1      ! PSECT DEFINITIONS:
;    0124  1      !
;    0125  1
;    0126  1      PSECT                                                          !
;    0127  1          Plit    = Data (NoExecute, Share, NoWrite,                 !
;    0128  1                          Addressing_Mode (Long_Relative));          !
;    0129  1
;    0130  1      PSECT                                                          !
;    0131  1          Code    = Code (Execute, Share, NoWrite);                  !
;    0132  1
;    0133  1      PSECT                                                          !
;    0134  1          Own     = Work (NoExecute, NoShare, Write,                 !
;    0135  1                          Addressing_Mode (Long_Relative));          !
;    0136  1
;    0137  1      PSECT                                                          !
;    0138  1          Global  = Work (NoExecute, NoShare, Write,                 !
;    0139  1                          Addressing_Mode (Long_Relative));          !
;    0140  1
;    0141  1      BIND                                                                 ![05]
;    0142  1              FMT_BAD_HDR =                                                ![05]
;    0143  1       UPLIT (%ASCIC 'Routine DSX$LOAD has detected non-standard diag. or image header.!/Assuming no image header.!/');![0
;    0144  1
;    0145  1      EXTERNAL
;    0146  1              IMAGE_HEADER,                                                ![05]
;    0147  1              IMAGE_HEADER_END;                                            ![05]
;    0148  1
```

```
;    0150  1      %SBTTL 'DSX$LOAD routine'
;    0151  1
;    0152  1      global routine dsx$load (file, default, length, address, retlen, retrec, vbn) =
;    0153  1
;    0154  1      !++
;    0155  1      ! Functional description:
;    0156  1      !
;    0157  1      !       This routine opens and read portions of the specified file using RMS
;    0158  1      !       into the buffer specified.
;    0159  1      !
;    0160  1      ! Formal parameters:
;    0161  1      !
;    0162  1      !       file    Address of a quadword descriptor of the file name to be used
;    0163  1      !       default Address of a quadword descriptor of the file name defaults
;    0164  1      !       length  Length of the area to receive the file in bytes.
;    0165  1      !       address Address of the buffer to receive the file
;    0166  1      !       retlen  Address of a longword to receive the length of the file (bytes)
;    0167  1      !       retrec  Address of a longword to receive record attributes of the file
;    0168  1      !       vbn     Virtual block of the file to start reading.
;    0169  1      !
;    0170  1      ! Side effects:
;    0171  1      !
;    0172  1      !       The current load media is used to locate the file
;    0173  1      !
;    0174  1      ! Completion codes:
;    0175  1      !
;    0176  1      !       Any RMS or system service return
;    0177  1      !--
;    0178  1
;    0179  2          begin
;    0180  2
;    0181  2          local
;    0182  2              xab_size,                   ! size of the image loaded                  [10]
;    0183  2              addr,                       ! address at end of load                    [01]
;    0184  2              status,                     ! Status of RMS calls
;    0185  2              len ;
;    0186  2
;    0187  2          map
;    0188  2              file : ref vector [2, long];    ! Length and address of file name
;    0189  2
;    0190  2          builtin
;    0191  2              actualcount;
;    0192  2
;    0193  2          label
;    0194  2              read;
;    0195  2
;    0196  2
;    0197  2          addr = .address;                ! Initial address to load                   [04]
;    0198  2
;    0199  2          IF NOT .DS$V_NI THEN            ! If not over the NI                        [10]
;    0200  2
;    0201  3          BEGIN
;    0202  3
;    0203  3          local
;    0204  3              fab : $fab_decl,            ! FAB for file access
;    0205  3              rab : $rab_decl,            ! RAB for file access
;    0206  3              xab : $xabfhc_decl;         ! XAB for file access
```

```
;    0207  3
;    0208  3          map
;    0209  3              default : ref vector [2, long];          ! Length and address of default file name
;    0210  3
; P  0211  3          $fab_init (fab = fab, fna = .file [1], fns = .file [0], dna = .default [1], dns = .default [0],
;    0212  3              xab = xab, fac = (get, bio));
;    0213  3          $xabfhc_init (xab = xab);
;    0214  3          $rab_init (rab = rab, fab = fab, rac = seq);
;    0215  3
;    0216  3          if not (status = $open (fab = fab)) then return .status;
;    0217  3
;    0218  3          XAB_SIZE = .xab [xab$l_ebk]^9 + .xab [xab$w_ffb] - 512 ;                                    ![10]
;    0219  3
;    0220  3
;    0221  3          if actualcount () geq 6
;    0222  3           then
;    0223  4              begin
;    0224  4
;    0225  4              map
;    0226  4                  retrec : ref block [, byte];
;    0227  4
;    0228  4                  retrec [0, 0, 16, 0] = .fab [fab$w_mrs];
;    0229  4                  retrec [2, 0, 8, 0] = .fab [fab$b_rfm];
;    0230  4                  retrec [3, 0, 8, 0] = .fab [fab$b_fsz];
;    0231  3              end;
;    0232  3
;    0233  3
;    0234  3          if .length neq 0
;    0235  3          then
;    0236  3      read :
;    0237  4              begin
;    0238  4
;    0239  4              local                                   !                                              [01]
;    0240  4                  first;                              !                                              [01]
;    0241  4
;    0242  4              if not (status = $connect (rab = rab)) then leave read;
;    0243  4
;    0244  4              if actualcount () geq 7                 ! If VBN specified                             [01]
;    0245  4              then                                    !                                              [01]
;    0246  4                  if .dsa$v_user                      ! if in user mode                              [01]
;    0247  4                      and (.fab [fab$l_dev] and dev$m_sqd) neq 0      ! and magtape                  [01]
;    0248  4                  then                                !                                              [01]
;    0249  5                      begin                           ! space forward                                [01]
;    0250  5
;    0251  5                      local                           !                                              [01]
;    0252  5                          blsize;                     ! size of magtape block                        [01]
;    0253  5
;    0254  5                      blsize = .fab [fab$w_bls]/512;  ! Size of block in pages                       [01]
;    0255  5                      if ((.vbn - 1)/.blsize)*.blsize neq .vbn - 1    ! If can't access              [01]
;    0256  5                      then                            !                                              [01]
;    0257  5                          return ds$_error;           ! return fatal error                           [01]
;    0258  5
;    0259  5                      rab [rab$l_bkt] = (.vbn - 1)/.blsize;   ! Number of tape blocks to skip       [01]
;    0260  5                      status = $space (rab = rab);    ! do it                                        [01]
;    0261  5
;    0262  5                      if not .status then leave read  !                                              [01]
;    0263  5                      end                             !                                              [01]
```

```
;  0264  4                 else                                  !                                                  [01]
;  0265  4                     rab [rab$l_bkt] = .vbn;           !                                                  [01]
;  0266  4
;  0267  4             len = .length;                            ! Initial (max) length to load                     [01]
;  0268  4             first = 1;                                ! First time                                       [01]
;  0269  4
;  0270  4             while 1 do                                ! Loop on $READ until done                         [01]
;  0271  5                 begin                                 !                                                  [01]
;  0272  5                 rab [rab$l_ubf] = .addr;
;  0273  5                 if .len gtr %X'FE00'                  !                                                  [06]
;  0274  5                 then                                  !                                                  [06]
;  0275  5                     rab [rab$w_usz] = %X'FE00'        !                                                  [06]
;  0276  5                 else                                  !                                                  [06]
;  0277  5                     rab [rab$w_usz] = .len;
;  0278  5                 status = $read (rab = rab);
;  0279  5                 rab [rab$l_bkt] = 0;                  ! Use NBP for future reads (if any)                [01]
;  0280  5                 addr = .addr + .rab [rab$w_rsz];      ! Set to read next section (or EOF)                [01]
;  0281  5
;  0282  5                 if not .status then exitloop;         ! Leave if no good                                 [01]
;  0283  5
;  0284  5                 len = .len - .rab [rab$w_rsz];        !                                                  [01]
;  0285  5
;  0286  5                 first = 0;                            ! not first loop anymore                           [01]
;  0287  5
;  0288  5                 if .len eql 0                         ! If no more room,                                 [01]
;  0289  5                 then                                  !                                                  [01]
;  0290  6                     begin                             !                                                  [01]
;  0291  6                     status = rms$_normal;             !  that's OK                                       [01]
;  0292  6                     exitloop                          !                                                  [01]
;  0293  6                     end                               !                                                  [01]
;  0294  4                 end;                                  !                                                  [01]
;  0295  4
;  0296  4
;  0297  4             if not .first and .status eql rms$_eof    ! If end of file, but on loop                      [01]
;  0298  4             then                                      !                                                  [01]
;  0299  4                 status = rms$_normal;                 !                                                  [01]
;  0300  4
;  0301  4             $disconnect (rab = rab);
;  0302  4
;  0303  4
;  0304  3             END ;                     ! end if .length neq 0
;  0305  3
;  0306  3           $close (fab = fab);
;  0307  3
;  0308  3           END                         ! end if not NI, but continue else section
;  0309  3
;  0310  2         ELSE                          ! Load across the NI                                  ![10]
;  0311  2
;  0312  2     !       Load file across the network:                                                   ![10]
;  0313  2     !
;  0314  2     !       a) First determine if the filename has an extension, if it does not            ![10]
;  0315  2     !          then add the default extension.                                              ![10]
;  0316  2     !
;  0317  2     !       b) Copy the filename to another buffer called FILENAME.                        ![10]
;  0318  2     !
;  0319  2     !       c) Call the Load_self routine to invoke the network facilities.                ![10]
;  0320  2     !
```

```
;    0321  2
;    0322  3                    BEGIN                                                          ![10]
;    0323  3
;    0324  3                    OWN  PTR_BEG, PTR_COM, PTR_DIF, VER_LENGTH,                    ![10]
;    0325  3
;    0326  3                         FILE2     : VECTOR[2],          ! QUAD. of new string  ![10]
;    0327  3
;    0328  3                         FILE_NAME   : VECTOR[32,BYTE],  ! string of new file name  ![10]
;    0329  3                         EXTENSION : VECTOR[4,BYTE]  ;                             ![10]
;    0330  3
;    0331  3                    BIND LENGTH2  = FILE2[0] ,          ! length to pass to LOAD.  ![10]
;    0332  3                         ADDRESS2 = FILE2[1],           ! address to pass to LOAD. ![10]
;    0333  3
;    0334  3                         LENGTH1   = FILE[0],           ! length of original length ![10]
;    0335  3                         ADDRESS1  = FILE[1]  ;         ! address of original file name ![10]
;    0336  3
;    0337  3
;    0338  3                    EXTERNAL ROUTINE    LOAD_SELF : WEAK ;                                  ![10]
;    0339  3
;    0340  3                    LENGTH2 = .LENGTH1;                                            ![10]
;    0341  3                    ADDRESS2 = FILE_NAME ;                                         ![10]
;    0342  3
;    0343  3                    EXTENSION = %ASCII'.EXE' ;                                     ![10]
;    0344  3
;    0345  3                    IF CH$FAIL( CH$FIND_CH( .LENGTH1, CH$PTR(.ADDRESS1), %C'.' ) )  ![10]
;    0346  3
;    0347  3                    THEN                                                           ![10]
;    0348  3
;    0349  3     !                An extension does not exist so we have to add the default    ![10]
;    0350  3
;    0351  4                    BEGIN                                                          ![10]
;    0352  4
;    0353  4     !              First, search for a semi-colon                                 ![10]
;    0354  4
;    0355  4                    PTR_COM = CH$FIND_CH( .LENGTH1, CH$PTR(.ADDRESS1),%C';' ) ;    ![10]
;    0356  4
;    0357  4                    IF CH$FAIL( .PTR_COM )                                         ![10]
;    0358  4
;    0359  4                    THEN                                                           ![10]
;    0360  4
;    0361  4     !                no semi-colon therefore just add the extention               ![10]
;    0362  4
;    0363  4                    CH$COPY(.LENGTH1,CH$PTR(.ADDRESS1),4,CH$PTR(EXTENSION),0,      ![10]
;    0364  4                            .LENGTH1+4,CH$PTR(FILE_NAME) )                         ![10]
;    0365  4
;    0366  4                    ELSE                                                           ![10]
;    0367  4
;    0368  5                      BEGIN                                                        ![10]
;    0369  5
;    0370  5     !                semi-colon was found so add extention and version          ![10]
;    0371  5
;    0372  5                      PTR_BEG = CH$PTR(.ADDRESS1) ;                              ![10]
;    0373  5
;    0374  5                      PTR_DIF = .PTR_COM - .PTR_BEG ;                            ![10]
;    0375  5
;    0376  5                      VER_LENGTH =  .LENGTH1 - .PTR_DIF  ;                       ![10]
;    0377  5
```

```
;    0378  5                        CH$COPY(.PTR_DIF ,.PTR_BEG , 4,CH$PTR(EXTENSION),          ![10]
;    0379  5                                .VER_LENGTH, .PTR_COM   ,0,                        ![10]
;    0380  5                                .LENGTH1+4,CH$PTR(FILE_NAME) ) ;                   ![10]
;    0381  5
;    0382  4                        END ;                                                      ![10]
;    0383  4
;    0384  4                        ! update the length                                        ![10]
;    0385  4
;    0386  4                      LENGTH2 = .LENGTH1 + 4 ;                                     ![10]
;    0387  4
;    0388  4                      END                                                        ![10]
;    0389  4
;    0390  3                    ELSE                                                         ![10]
;    0391  3
;    0392  3                      CH$MOVE(.LENGTH1,CH$PTR(.ADDRESS1),CH$PTR(FILE_NAME) ) ;   ![10]
;    0393  3
;    0394  3                  LOAD_SELF( FILE2, .ADDRESS, XAB_SIZE ) ;                         ![10]
;    0395  3
;    0396  2                END;                                                           ![10]
;    0397  2
;    0398  2
;    0399  2                ! If we are loading  something at address 200                  ![05]
;    0400  2                ! -- i., e., a diagnostic program load, then see if there      ![05]
;    0401  2                ! is an image header.  (Do this by checking the first          ![05]
;    0402  2                ! longword loaded.) If the header exists, move                 ![05]
;    0403  2                ! it to its own buffer space and move the rest of what         ![05]
;    0404  2                ! was read in down one page, so that the actual image will     ![05]
;    0405  2                ! reside at 200.  If no header, the first record of the        ![05]
;    0406  2                ! image should be the "diagnostic header".  If the first       ![05]
;    0407  2                ! location of this header is not what the routine expects,     ![05]
;    0408  2                ! the operator is warned of the discrepancy.                   ![05]
;    0409  2                ! The reason for this is that if the image header or diagnostic ![05]
;    0410  2                ! header size is changed, this code will also have to be       ![05]
;    0411  2                ! changed, and the warning will be a reminder that the change  ![05]
;    0412  2                ! must be made.  Note that if either of the header sizes       ![05]
;    0413  2                ! is changed, the routine will assume there is no image header. ![05]
;    0414  2
;    0415  2                IF .ADDRESS EQL %X'200'                                        ![05]
;    0416  2                THEN                                                           ![05]
;    0417  3                   IF (..ADDRESS EQL %X'00300084')
;    0418  3                   or (..ADDRESS EQL %X'003000A8')                 ![08][09]
;    0419  2                      THEN                                                     ![05]
;    0420  3                              BEGIN                                            ![05]
;    0421  3                              LOCAL PTR1, PTR2;                                ![05]
;    0422  3
;    0423  3                              ! Move the image header to its                   ![05]
;    0424  3                              ! storage area for use by the                    ![05]
;    0425  3                              ! debugger.                                      ![05]
;    0426  3
;    0427  3                              PTR1 = IMAGE_HEADER;                             ![05]
;    0428  3                              PTR2 = .ADDRESS;                                 ![05]
;    0429  3                              WHILE .PTR1 LSSU IMAGE_HEADER_END                ![05]
;    0430  3                              DO                                               ![05]
;    0431  4                                      BEGIN                                    ![05]
;    0432  4                                      .PTR1 = ..PTR2;                          ![05]
;    0433  4                                      PTR1 = .PTR1 + 4;                        ![05]
;    0434  4                                      PTR2 = .PTR2 + 4;                        ![05]
```

```
;   0435  3                                 END;                                    ![05]
;   0436  3
;   0437  3                         ! Now everything already loaded                 ![05]
;   0438  3                         ! must be moved down one page,                  ![05]
;   0439  3                         ! so that the diag. header                      ![05]
;   0440  3                         ! starts at 200.                                ![05]
;   0441  3
;   0442  3                         PTR1 = .ADDRESS;                                ![05]
;   0443  3                         PTR2 = .ADDRESS + %X'200';                      ![05]
;   0444  3                         WHILE .PTR2 LSSU .ADDR DO                       ![05]
;   0445  4                                 BEGIN                                   ![05]
;   0446  4                                 .PTR1 = ..PTR2;                         ![05]
;   0447  4                                 PTR1 = .PTR1 + 4;                       ![05]
;   0448  4                                 PTR2 = .PTR2 + 4;                       ![05]
;   0449  3                                 END;                                    ![05]
;   0450  3                         ADDR = .ADDR - %X'200';                         ![05]
;   0451  3                         LEN = .LEN + %X'200';                           ![05]
;   0452  3                         END                                             ![05]
;   0453  2                 ELSE IF ..ADDRESS NEQ %X'00000058'
;   0454  2                  THEN
;   0455  2                         $DS_PRINTF (FMT_BAD_HDR);
;   0456  2
;   0457  2         if actualcount () geq 5 then .retlen = max ( .XAB_SIZE , .addr - .address);
;   0458  2                 ! Bigger of XAB size and actually loaded size           [01]
;   0459  2
;   0460  2         .status
;   0461  2
;   0462  1       end ;                         ! end routine


                                                                        .TITLE  DSLOAD *** DSLOAD DS$LOAD routine
                                                                        .IDENT  \10.8-12\

                                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

4F  4C  24  58  53  44  20  65  6E  69  74  75  6F  52  5E  00000 P.AAA:  .ASCII  \^Routine DSX$LOAD has detected non-stand\  ;
64  65  74  63  65  74  65  64  20  73  61  68  20  44  41  0000F                                                            ;
                    64  6E  61  74  73  2D  6E  6F  6E  20  0001E                                                            ;
6D  69  20  72  6F  20  2E  67  61  69  64  20  64  72  61  00028         .ASCII  \ard diag. or image header.!/Assuming no \  ;
73  41  2F  21  2E  72  65  64  61  65  68  20  65  67  61  00037                                                            ;
                    20  6F  6E  20  67  6E  69  6D  75  73  00046                                                            ;
2F  21  2E  72  65  64  61  65  68  20  65  67  61  6D  69  00050         .ASCII  \image header.!/\<0>                        ;
                                                        00  0005F                                                            ;

                                                                        .PSECT  WORK,NOEXE,2

                                                        00000 PTR_BEG:.BLKB   4
                                                        00004 PTR_COM:.BLKB   4
                                                        00008 PTR_DIF:.BLKB   4
                                                        0000C VER_LENGTH:
                                                                        .BLKB   4
                                                        00010 FILE2:  .BLKB   8
                                                        00018 FILE_NAME:
                                                                        .BLKB   32
                                                        00038 EXTENSION:
                                                                        .BLKB   4
```

```
                                                        DSA$AL_APTMAIL=     65024
                                                        DSA$GL_FLAGS=       65024
                                                        DSA$GL_APTCOM=      65028
                                                        DSA$GL_PASSES=      65032
                                                        DSA$GL_UNITS=       65036
                                                        DSA$GL_SECTNO=      65040
                                                        DSA$GL_SID=         65044
                                                        DSA$GL_MSGTYP=      65088
                                                        DSA$GL_ERRNO=       65092
                                                        DSA$GL_EVENT=       65096
                                                        DSA$GL_SUBTNO=      65100
                                                        DSA$GL_TESTNO=      65104
                                                        DSA$GL_PASSNO=      65108
                                                        DSA$GL_DEVLEN=      65112
                                                        DSA$GL_DEVNAM=      65116
                                                        DSA$GL_MSGPTR=      65128
                                                        FMT_BAD_HDR=        P.AAA
                                                        LENGTH2=            FILE2
                                                        ADDRESS2=           FILE2+4
                                                                .EXTRN  DS$GL_FLAGS, IMAGE_HEADER
                                                                .EXTRN  IMAGE_HEADER_END
                                                                .EXTRN  SYS$OPEN, SYS$CONNECT
                                                                .EXTRN  SYS$SPACE, SYS$READ
                                                                .EXTRN  SYS$DISCONNECT, SYS$CLOSE
                                                                .EXTRN  DS$PRINTF
                                                                .WEAK   LOAD_SELF

                                                                .PSECT  CODE,NOWRT,  SHR,2

                                                  0FFC 00000    .ENTRY  DSX$LOAD, Save R2,R3,R4,R5,R6,R7,R8,R9,R10,-; 0152
                                                                        R11                                         ;
                                  5E      FF3C   CE  9E 00002   MOVAB   -196(SP), SP                                ;
                                  56        10   AC  D0 00007   MOVL    ADDRESS, ADDR                               ; 0197
                                  57        04   AC  D0 0000B   MOVL    FILE, R7                                    ; 0212
                     03 00000000G  EF           02  E1 0000F   BBC     #2, DS$GL_FLAGS+3, 1$                       ; 0199
                                             016D  31 00017   BRW     14$                                         ;
0050   8F            00            6E           00  2C 0001A 1$: MOVC5   #0, (SP), #0, #80, $RMS_PTR                 ; 0212
                                          74   AE     00021                                                        ;
                            74    AE      5003   8F  B0 00023   MOVW    #20483, $RMS_PTR                            ;
                            C6    AD           22  90 00029   MOVB    #34, $RMS_PTR+22                            ;
                            CF    AD           02  90 0002D   MOVB    #2, $RMS_PTR+31                             ;
                            D4    AD        04   AE  9E 00031   MOVAB   XAB, $RMS_PTR+36                            ;
                            DC    AD        04   A7  D0 00036   MOVL    4(R7), $RMS_PTR+44                          ;
                                  50        08   AC  D0 0003B   MOVL    DEFAULT, R0                                 ;
                            E0    AD        04   A0  D0 0003F   MOVL    4(R0), $RMS_PTR+48                          ;
                            E4    AD           67  90 00044   MOVB    (R7), $RMS_PTR+52                           ;
                            E5    AD           60  90 00048   MOVB    (R0), $RMS_PTR+53                           ;
       2C            00            6E           00  2C 0004C   MOVC5   #0, (SP), #0, #44, $RMS_PTR                 ; 0213
                                          04   AE     00051                                                        ;
                            04    AE      2C1D   8F  B0 00053   MOVW    #11293, $RMS_PTR                            ;
0044   8F            00            6E           00  2C 00059   MOVC5   #0, (SP), #0, #68, $RMS_PTR                 ; 0214
                                          30   AE     00060                                                        ;
                            30    AE      4401   8F  B0 00062   MOVW    #17409, $RMS_PTR                            ;
                                          4E   AE  94 00068   CLRB    $RMS_PTR+30                                 ;
                            6C    AE        74   AE  9E 0006B   MOVAB   FAB, $RMS_PTR+60                            ;
                                          74   AE  9F 00070   PUSHAB  FAB                                         ; 0216
                        00000000G  00           01  FB 00073   CALLS   #1, SYS$OPEN                                ;
```

```
                    54          50  D0 0007A        MOVL    R0, STATUS                          ;
                    03          54  E8 0007D        BLBS    STATUS, 2$                          ;
                              028A  31 00080        BRW     31$                                 ;
      50       14   AE          09  78 00083 2$:    ASHL    #9, XAB+16, R0                      ; 0218
                    51      18   AE  3C 00088        MOVZWL  XAB+20, R1                          ;
                    6E    FE00 C140  9E 0008C        MOVAB   -512(R1)[R0], XAB_SIZE              ;
                    06          6C  91 00092        CMPB    (AP), #6                            ; 0221
                                12  1F 00095        BLSSU   3$                                  ;
                    50      18   AC  D0 00097        MOVL    RETREC, R0                          ; 0228
                    60      E6   AD  B0 0009B        MOVW    FAB+54, (R0)                        ;
                02  A0      CF   AD  90 0009F        MOVB    FAB+31, 2(R0)                       ; 0229
                03  A0      EF   AD  90 000A4        MOVB    FAB+63, 3(R0)                       ; 0230
                            0C   AC  D5 000A9 3$:    TSTL    LENGTH                              ; 0234
                                5A  13 000AC        BEQL    5$                                  ;
                            30   AE  9F 000AE        PUSHAB  RAB                                 ; 0242
         00000000G  00          01  FB 000B1        CALLS   #1, SYS$CONNECT                     ;
                    54          50  D0 000B8        MOVL    R0, STATUS                          ;
                    4A          54  E9 000BB        BLBC    STATUS, 5$                          ;
                    07          6C  91 000BE        CMPB    (AP), #7                            ; 0244
                                4C  1F 000C1        BLSSU   7$                                  ;
      3F 0000FE03   9F          04  E1 000C3        BBC     #4, a#^X0000FE03, 6$                ; 0247
      3A       F0   AD          05  E1 000CB        BBC     #5, FAB+64, 6$                      ;
                    52      EC   AD  3C 000D0        MOVZWL  FAB+60, BLSIZE                      ; 0254
                    52 00000200  8F  C6 000D4        DIVL2   #512, BLSIZE                        ;
      50       1C   AC          01  C3 000DB        SUBL3   #1, VBN, R0                         ; 0255
      51            50          52  C7 000E0        DIVL3   BLSIZE, R0, R1                      ;
                    52          51  C4 000E4        MULL2   R1, R2                              ;
                    50          52  D1 000E7        CMPL    R2, R0                              ;
                                08  13 000EA        BEQL    4$                                  ;
                    50 00660002  8F  D0 000EC        MOVL    #6684674, R0                        ; 0257
                                    04 000F3        RET                                         ;
                68  AE          51  D0 000F4 4$:    MOVL    R1, RAB+56                          ; 0259
                            30   AE  9F 000F8        PUSHAB  RAB                                 ; 0260
         00000000G  00          01  FB 000FB        CALLS   #1, SYS$SPACE                       ;
                    54          50  D0 00102        MOVL    R0, STATUS                          ;
                    07          54  E8 00105        BLBS    STATUS, 7$                          ; 0262
                                70  11 00108 5$:    BRB     13$                                 ;
                68  AE      1C   AC  D0 0010A 6$:    MOVL    VBN, RAB+56                         ; 0265
                    53      0C   AC  D0 0010F 7$:    MOVL    LENGTH, LEN                         ; 0267
                    52          01  D0 00113        MOVL    #1, FIRST                           ; 0268
                54  AE          56  D0 00116 8$:    MOVL    ADDR, RAB+36                        ; 0272
         0000FE00   8F          53  D1 0011A        CMPL    LEN, #65024                         ; 0273
                                08  15 00121        BLEQ    9$                                  ;
                50  AE    FE00   8F  B0 00123        MOVW    #-512, RAB+32                       ; 0275
                                04  11 00129        BRB     10$                                 ;
                50  AE          53  B0 0012B 9$:    MOVW    LEN, RAB+32                         ; 0277
                            30   AE  9F 0012F 10$:   PUSHAB  RAB                                 ; 0278
         00000000G  00          01  FB 00132        CALLS   #1, SYS$READ                        ;
                    54          50  D0 00139        MOVL    R0, STATUS                          ;
                            68   AE  D4 0013C        CLRL    RAB+56                              ; 0279
                    50      52   AE  3C 0013F        MOVZWL  RAB+34, R0                          ; 0280
                    56          50  C0 00143        ADDL2   R0, ADDR                            ;
                    14          54  E9 00146        BLBC    STATUS, 11$                         ; 0282
                    50      52   AE  3C 00149        MOVZWL  RAB+34, R0                          ; 0284
                    53          50  C2 0014D        SUBL2   R0, LEN                             ;
                                52  D4 00150        CLRL    FIRST                               ; 0286
                                53  D5 00152        TSTL    LEN                                 ; 0288
```

```
                                                C0  12 00154          BNEQ    8$                                                      ;
                                      54 00010001   8F  D0 00156          MOVL    #65537, STATUS                                          ; 0291
                                      10            52  E8 0015D 11$:     BLBS    FIRST, 12$                                              ; 0297
                                 0001827A   8F      54  D1 00160          CMPL    STATUS, #98938                                          ;
                                                    07  12 00167          BNEQ    12$                                                     ;
                                      54 00010001   8F  D0 00169          MOVL    #65537, STATUS                                          ; 0299
                                                30  AE  9F 00170 12$:     PUSHAB  RAB                                                     ; 0301
                                 00000000G  00      01  FB 00173          CALLS   #1, SYS$DISCONNECT                                      ;
                                                74  AE  9F 0017A 13$:     PUSHAB  FAB                                                     ; 0306
                                 00000000G  00      01  FB 0017D          CALLS   #1, SYS$CLOSE                                           ;
                                              00FA  31  00184          BRW     22$                                                     ;
                                 00000000'  EF      67  D0 00187 14$:     MOVL    (R7), LENGTH2                                           ; 0340
                                 00000000'  EF 00000000'  EF  9E 0018E     MOVAB   FILE_NAME, ADDRESS2                                     ; 0341
                                 00000000'  EF 4558452E   8F  D0 00199     MOVL    #1163412782, EXTENSION                                  ; 0343
                                      52        04  A7  D0 001A4          MOVL    4(R7), R2                                               ; 0345
                            62            67      2E  3A 001A8          LOCC    #46, (R7), (R2)                                         ;
                                                  02  12 001AC          BNEQ    15$                                                     ;
                                                  51  D4 001AE          CLRL    R1                                                      ;
                                                  51  D5 001B0 15$:     TSTL    R1                                                      ;
                                                  03  13 001B2          BEQL    16$                                                     ;
                                                00B0  31 001B4          BRW     20$                                                     ;
                            62            67      3B  3A 001B7 16$:     LOCC    #59, (R7), (R2)                                         ; 0355
                                                  02  12 001BB          BNEQ    17$                                                     ;
                                                  51  D4 001BD          CLRL    R1                                                      ;
                                 00000000'  EF      51  D0 001BF 17$:     MOVL    R1, PTR_COM                                             ;
                                      59 00000000'  EF  D0 001C6          MOVL    PTR_COM, R9                                             ; 0357
                                                  28  12 001CD          BNEQ    18$                                                     ;
                            58            67      04  C1 001CF          ADDL3   #4, (R7), R8                                            ; 0364
                                          5A      58  D0 001D3          MOVL    R8, R10                                                 ;
                                      5B 00000000'  EF  9E 001D6          MOVAB   FILE_NAME, R11                                          ;
                      5A            00      62      67  2C 001DD          MOVC5   (R7), (R2), #0, R10, (R11)                              ;
                                                    6B      001E2                                                                       ;
                                                    79  18 001E3          BGEQ    19$                                                     ;
                                          5B        67  C0 001E5          ADDL2   (R7), R11                                               ;
                                          5A        67  C2 001E8          SUBL2   (R7), R10                                               ;
                      5A            00 00000000'  EF      04  2C 001EB          MOVC5   #4, EXTENSION, #0, R10, (R11)                   ;
                                                    6B      001F4                                                                       ;
                                                    67  11  001F5          BRB     19$                                                     ;
                                 00000000'  EF      52  D0 001F7 18$:     MOVL    R2, PTR_BEG                                             ; 0372
                         00000000'  EF              59 00000000'  EF  C3 001FE          SUBL3   PTR_BEG, R9, PTR_DIF                    ; 0374
                         00000000'  EF              67 00000000'  EF  C3 0020A          SUBL3   PTR_DIF, (R7), VER_LENGTH               ; 0376
                                          58        67  04  C1 00216          ADDL3   #4, (R7), R8                                    ; 0380
                                          5A        58  D0 0021A          MOVL    R8, R10                                                 ;
                                      57 00000000'  EF  9E 0021D          MOVAB   FILE_NAME, R7                                           ;
                      5A            00 00000000'  FF 00000000'  EF  2C 00224          MOVC5   PTR_DIF, @PTR_BEG, #0, R10, (R7)        ;
                                                    67      00231                                                                       ;
                                                    2A  18  00232          BGEQ    19$                                                     ;
                                      57 00000000'  EF  C0 00234          ADDL2   PTR_DIF, R7                                             ;
                                      5A 00000000'  EF  C2 0023B          SUBL2   PTR_DIF, R10                                            ;
                      5A            00 00000000'  EF      04  2C 00242          MOVC5   #4, EXTENSION, #0, R10, (R7)                    ;
                                                    67      0024B                                                                       ;
                                                    10  18  0024C          BGEQ    19$                                                     ;
                                      57            04  C0 0024E          ADDL2   #4, R7                                                  ;
                                      5A            04  C2 00251          SUBL2   #4, R10                                                 ;
                      5A            00            69 00000000'  EF  2C 00254          MOVC5   VER_LENGTH, (R9), #0, R10, (R7)         ;
                                                    67      0025D                                                                       ;
                                 00000000'  EF      58  D0 0025E 19$:     MOVL    R8, LENGTH2                                             ; 0386
```

```
                                                08  11  00265                BRB     21$                                             ;
          00000000'  EF             62           67  28  00267  20$:        MOVC3   (R7), (R2), FILE_NAME                           ; 0392
                                                5E  DD  0026F  21$:        PUSHL   SP                                              ; 0394
                                      10        AC  DD  00271              PUSHL   ADDRESS                                         ;
                                00000000'       EF  9F  00274              PUSHAB  FILE2                                           ;
                    00000000G   EF              03  FB  0027A              CALLS   #3, LOAD_SELF                                   ;
                    00000200    8F        10    AC  D1  00281  22$:        CMPL    ADDRESS, #512                                   ; 0415
                                                6A  12  00289              BNEQ    29$                                             ;
                    00300084    8F        10    BC  D1  0028B              CMPL    @ADDRESS, #3145860                              ; 0417
                                                0A  13  00293              BEQL    23$                                             ;
                    003000A8    8F        10    BC  D1  00295              CMPL    @ADDRESS, #3145896                              ; 0418
                                                3F  12  0029D              BNEQ    28$                                             ;
                                51  00000000G   EF  9E  0029F  23$:        MOVAB   IMAGE_HEADER, PTR1                              ; 0427
                                50        10    AC  D0  002A6              MOVL    ADDRESS, PTR2                                   ; 0428
                                52  00000000G   EF  9E  002AA  24$:        MOVAB   IMAGE_HEADER_END, R2                            ; 0429
                                52              51  D1  002B1              CMPL    PTR1, R2                                        ;
                                                05  1E  002B4              BGEQU   25$                                             ;
                                81              80  D0  002B6              MOVL    (PTR2)+, (PTR1)+                                ; 0432
                                                EF  11  002B9              BRB     24$                                             ; 0434
                                51        10    AC  D0  002BB  25$:        MOVL    ADDRESS, PTR1                                   ; 0442
                    50          10    AC  00000200    8F  C1  002BF              ADDL3   #512, ADDRESS, PTR2                             ; 0443
                                56              50  D1  002C8  26$:        CMPL    PTR2, ADDR                                      ; 0444
                                                05  1E  002CB              BGEQU   27$                                             ;
                                81              80  D0  002CD              MOVL    (PTR2)+, (PTR1)+                                ; 0446
                                                F6  11  002D0              BRB     26$                                             ; 0448
                                56        FE00  C6  9E  002D2  27$:        MOVAB   -512(R6), ADDR                                  ; 0450
                                53        0200  C3  9E  002D7              MOVAB   512(R3), LEN                                    ; 0451
                                                17  11  002DC              BRB     29$                                             ;
                    00000058    8F        10    BC  D1  002DE  28$:        CMPL    @ADDRESS, #88                                   ; 0453
                                                0D  13  002E6              BEQL    29$                                             ;
                                      00000000' EF  9F  002E8              PUSHAB  FMT_BAD_HDR                                     ; 0455
                00000000G   9F              01  FB  002EE              CALLS   #1, @#DS$PRINTF                                 ;
                            05              6C  91  002F5  29$:        CMPB    (AP), #5                                        ; 0457
                                                13  1F  002F8              BLSSU   31$                                             ;
                            56        10    AC  C2  002FA              SUBL2   ADDRESS, R6                                     ;
                            50              6E  D0  002FE              MOVL    XAB_SIZE, R0                                    ;
                            56              50  D1  00301              CMPL    R0, R6                                          ;
                                            03  18  00304              BGEQ    30$                                             ;
                            50              56  D0  00306              MOVL    R6, R0                                          ;
                      14    BC              50  D0  00309  30$:        MOVL    R0, @RETLEN                                     ;
                            50              54  D0  0030D  31$:        MOVL    STATUS, R0                                      ; 0462
                                                04  00310              RET                                                     ;

; Routine Size:  785 bytes,    Routine Base:  CODE + 0000

;   0463  1
;   0464  1     END
;   0465  0     ELUDOM



;                                   PSECT SUMMARY
;
```

```
;       Name                          Bytes                              Attributes
;
;  DATA                                 96  NOVEC,NOWRT,  RD ,NOEXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  WORK                                 60  NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  CODE                                785  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
```

```
Symbol                Type  Defined  Referenced ...
--------------------- ------- ----- ----------------
$CLOSE                KeyWMacr Lib03   306
$CONNECT              KeyWMacr Lib03   242
$DISCONNECT           KeyWMacr Lib03   301
$DS_DSADEF            Macro    Lib01   105
$DS_PRINTF            Macro    Lib01   455
$FAB_DECL             Macro    Lib03   204
$FAB_INIT             KeyWMacr Lib03   211
$OPEN                 KeyWMacr Lib03   216
$RAB_DECL             Macro    Lib03   205
$RAB_INIT             KeyWMacr Lib03   214
$READ                 KeyWMacr Lib03   278
$RMS_BITFLD_INI       Macro    Lib03   212      214
$RMS_BITS             Macro    Lib03   212
$RMS_CODFLD_INI       Macro    Lib03   212      214
$RMS_OR               Macro    Lib03   212
$RMS_PTR              Unbound          214
                      Bind       212   212=
                      Bind       213   213=
                      Bind       214   214=
$RMS_VALFLD_INI       Unbound          214
                      Macro    Lib03   212      213      214
$SPACE                KeyWMacr Lib03   260
$XABFHC_DECL          Macro    Lib03   206
$XABFHC_INIT          KeyWMacr Lib03   213
ACTUALCOUNT           Builtin    191   221      244      457
ADDR                  Local      183   197=     272.     280=     280.     444.     450=     450.     457.
ADDRESS               RoutForm   152   197.     394.     415.     417a.    418a.    428.     442.     443.     453a.    457.
ADDRESS1              Bind       335   345a.    355a.    363a.    372.     392a.
ADDRESS2              Bind       332   341=
AP                    Builtin    221   221a.
                      Builtin    244   244a.
                      Builtin    457   457a.
BLSIZE                Local      252   254=     255.     259.
DEFAULT               RoutForm   152   209m     212a.
DEV$M_SQD             Literal  Lib03   247
DS$GL_FLAGS           External   120   199.
DS$PRINTF             ExtRout    455   455c
DS$V_NI               Macro    Lib02   199
DS$_ERROR             Literal  Lib01   257
DSA$AL_APTMAIL        Bind       105   105
DSA$GL_APTCOM         Bind       105
DSA$GL_DEVLEN         Bind       105
DSA$GL_DEVNAM         Bind       105
DSA$GL_ERRNO          Bind       105
DSA$GL_EVENT          Bind       105
```

Symbol	Type	Defined	Referenced ...
DSA$GL_FLAGS	Bind	105	246
DSA$GL_MSGPTR	Bind	105	
DSA$GL_MSGTYP	Bind	105	
DSA$GL_PASSES	Bind	105	
DSA$GL_PASSNO	Bind	105	
DSA$GL_SECTNO	Bind	105	
DSA$GL_SID	Bind	105	
DSA$GL_SUBTNO	Bind	105	
DSA$GL_TESTNO	Bind	105	
DSA$GL_UNITS	Bind	105	
DSA$V_USER	Macro	Lib01	246
DSX$LOAD	GlobRout	152	112f
EXTENSION	Own	329	343= 363. 378.
FAB	Local	204	212a 214a 216a 228. 229. 230. 247. 254. 306a
FAB$B_BID	Macro	Lib03	212
FAB$B_BKS	Macro	Lib03	212
FAB$B_BLN	Macro	Lib03	212
FAB$B_DNS	Macro	Lib03	212
FAB$B_FAC	Macro	Lib03	212
FAB$B_FNS	Macro	Lib03	212
FAB$B_FSZ	Macro	Lib03	212 230
FAB$B_JOURNAL	Macro	Lib03	212
FAB$B_ORG	Macro	Lib03	212
FAB$B_RAT	Macro	Lib03	212
FAB$B_RFM	Macro	Lib03	212 229
FAB$B_RTV	Macro	Lib03	212
FAB$B_RU_FACILITY	Macro	Lib03	212
FAB$B_SHR	Macro	Lib03	212
FAB$C_BID	Literal	Lib03	212
FAB$C_BLN	Literal	Lib03	204 212
FAB$C_VAR	Literal	Lib03	212
FAB$L_ALQ	Macro	Lib03	212
FAB$L_CTX	Macro	Lib03	212
FAB$L_DEV	Macro	Lib03	247
FAB$L_DNA	Macro	Lib03	212
FAB$L_FNA	Macro	Lib03	212
FAB$L_FOP	Macro	Lib03	212
FAB$L_MRN	Macro	Lib03	212
FAB$L_NAM	Macro	Lib03	212
FAB$L_XAB	Macro	Lib03	212
FAB$M_BIO	Literal	Lib03	212
FAB$M_GET	Literal	Lib03	212
FAB$V_CHAN_MODE	Macro	Lib03	212
FAB$V_FILE_MODE	Macro	Lib03	212
FAB$V_LNM_MODE	Macro	Lib03	212
FAB$W_BLS	Macro	Lib03	212 254
FAB$W_DEQ	Macro	Lib03	212
FAB$W_GBC	Macro	Lib03	212
FAB$W_MRS	Macro	Lib03	212 228
FILE	RoutForm	152	188m 212a. 334. 335aa
FILE2	Own	326	331a 332a 394a
FILE_NAME	Own	328	341a 364= 380= 392=
FIRST	Local	240	268= 286= 297.
FMT_BAD_HDR	Bind	142	455a
IMAGE_HEADER	External	146	427a

Symbol	Type	Defined	Referenced ...
IMAGE_HEADER_END	External	147	429
LEN	Local	185	267= 273. 277. 284= 284. 288. 451= 451.
LENGTH	RoutForm	152	234. 267.
LENGTH1	Bind	334	340. 345. 355. 363. 364. 376. 380. 386. 392.
LENGTH2	Bind	331	340= 386=
LOAD_SELF	ExtRout	338	394c
PTR1	Local	421	427= 429. 432a= 433= 433. 442= 446a= 447= 447.
PTR2	Local	421	428= 432a. 434= 434. 443= 444. 446a. 448= 448.
PTR_BEG	Own	324	372= 374. 378a.
PTR_COM	Own	324	355= 357. 374. 379a.
PTR_DIF	Own	324	374= 376. 378.
RAB	Local	205	214a 242a 259= 260a 265= 272= 275= 277= 278a 279= 280. 284. 301a
RAB$B_BID	Macro	Lib03	214
RAB$B_BLN	Macro	Lib03	214
RAB$B_KRF	Macro	Lib03	214
RAB$B_KSZ	Unbound		214
RAB$B_MBC	Macro	Lib03	214
RAB$B_MBF	Macro	Lib03	214
RAB$B_RAC	Macro	Lib03	214
RAB$B_TMO	Macro	Lib03	214
RAB$C_BID	Literal	Lib03	214
RAB$C_BLN	Literal	Lib03	205 214
RAB$C_SEQ	Literal	Lib03	214
RAB$L_BKT	Macro	Lib03	214 259 265 279
RAB$L_CTX	Macro	Lib03	214
RAB$L_FAB	Macro	Lib03	214
RAB$L_KBF	Unbound		214
RAB$L_RBF	Macro	Lib03	214
RAB$L_RHB	Macro	Lib03	214
RAB$L_ROP	Macro	Lib03	214
RAB$L_UBF	Macro	Lib03	214 272
RAB$L_XAB	Macro	Lib03	214
RAB$W_RSZ	Macro	Lib03	214 280 284
RAB$W_USZ	Macro	Lib03	214 275 277
READ	Label	194	236 242 262
RETLEN	RoutForm	152	457a=
RETREC	RoutForm	152	226m 228a= 229a= 230a=
RMS$_EOF	Literal	Lib03	297
RMS$_NORMAL	Literal	Lib03	291 299
SDL$STARLET_CONCAT	Macro	Lib03	216 242 260 278 301 306
SDL$STARLET_OPT	Macro	Lib03	216 242 260 278 301 306
SDL$STARLET_REQ	Macro	Lib03	216 242 260 278 301 306
STATUS	Local	184	216= 216. 242= 260= 262. 278= 282. 291= 297. 299= 460.
SYS$CLOSE	ExtRout	306	306c
SYS$CONNECT	ExtRout	242	242c
SYS$DISCONNECT	ExtRout	301	301c
SYS$OPEN	ExtRout	216	216c
SYS$READ	ExtRout	278	278c
SYS$SPACE	ExtRout	260	260c
VBN	RoutForm	152	255. 259. 265.
VER_LENGTH	Own	324	376= 379.
XAB	Local	206	212a 213a 218.
XAB$B_BLN	Macro	Lib03	213
XAB$B_COD	Macro	Lib03	213

```
Symbol                Type  Defined  Referenced ...
------------------ -------- ----- ----------------
XAB$C_FHC           Literal  Lib03   213
XAB$C_FHCLEN        Literal  Lib03   206     213
XAB$L_EBK           Macro    Lib03   218
XAB$L_NXT           Macro    Lib03   213
XAB$W_FFB           Macro    Lib03   218
XAB_SIZE            Local      182   218=    394a    457.


                CROSS REFERENCE MAP

Line #      Event          File ...
-----  ---------------  ---------
    1  Source (start)   DISK$DS:[DS.LOCAL.RELEASE.WORK]DSLOAD.B32;1
    6  Module DSLOAD
   99  Library #1       DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
  101  Library #2       DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
  103  Library #3       SYS$COMMON:[SYSLIB]LIB.L32;3
  465  Eludom DSLOAD


        KEY TO REFERENCE TYPE FLAGS

            .   Fetch
            =   Store
            c   Routine call
            a   Address use
            @   Indirect use
            e   External, external routine, or external literal declaration
            f   Forward or forward routine declaration
            h   Condition handler enabling
            m   Map declaration
            u   Undeclare declaration


;                              Library Statistics
;
;                                          -------- Symbols --------      Pages       Processing
;       File                               Total    Loaded   Percent      Mapped      Time
;
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
;                                            942         4         0        96          00:00.0
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
;                                            675         1         0        47          00:00.0
;  SYS$COMMON:[SYSLIB]LIB.L32;3             21522        85         0      1156          00:00.8




;                                      COMMAND QUALIFIERS

;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:DSLOAD.B32
```

```
;   0466  0
; Size:          785 code + 156 data bytes
; Run Time:        00:03.7
; Elapsed Time:    00:06.7
; Lines/CPU Min:    7536
; Lexemes/CPU-Min:105622
; Memory Used:  267 pages
; Compilation Complete
```

Table of contents

(1) 96 Libraries and Macros
(1) 102 The Dispatch Vectors

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element DSVECS.MAR
0000     2 ; *1     6-FEB-1986 15:17:55 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element DSVECS.MAR
0000     4         .Title  DSVECS  *** DSVECS Module
0000     5         .Ident  /01-10/
0000     6         .NoShow Conditionals
0000     7
0000     8 ;++
0000     9 ; COPYRIGHT (C) 1977,1980,1985
0000    10 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    11 ;
0000    12 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0000    13 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
0000    14 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
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0000    17 ; TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
0000    18 ; REMAIN IN DEC.
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0000    23 ;
0000    24 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0000    25 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    26 ;--
```

```
                     0000     28 ;++
                     0000     29 ; Facility:
                     0000     30 ;
                     0000     31 ;       VAX Diagnostic Supervisor (part of the Resident-DS image).
                     0000     32 ;
                     0000     33 ; Abstract:
                     0000     34 ;
                     0000     35 ;       This module contains the dispatch vectors that the CRD-Loadable
                     0000     36 ;       routines need to access certain Resident-DS locations and routines.
                     0000     37 ;
                     0000     38 ; Environment:
                     0000     39 ;
                     0000     40 ;       Not applicable
                     0000     41 ;
                     0000     42 ; Author:
                     0000     43 ;
                     0000     44 ;       Jack Stansbury
                     0000     45 ;
                     0000     46 ; Date Written:
                     0000     47 ;
                     0000     48 ;       March 30, 1982
                     0000     49 ;
                     0000     50 ; Modifications:
                     0000     51 ;
                     0000     52 ;       01      Jack Stansbury, Version 1.0, June 22, 1982
                     0000     53 ;               Added two more vectors.
                     0000     54 ;
                     0000     55 ;       02      Jack Stansbury, Version 1.1, July 24, 1982
                     0000     56 ;               Added the CRD$GB_Menu_OnLine_Debug byte. If == 1, then
                     0000     57 ;               on-line CRD command is allowed. If == 0, the CRD command
                     0000     58 ;               is disallowed. It is == 0 by default.
                     0000     59 ;
                     0000     60 ;       03      Jack Stansbury, Version 1.1, July 27, 1982
                     0000     61 ;               Added the DS$GA_DS_Ctrl_C_First (formerly DS$GA_DSCntrlC) and
                     0000     62 ;               the DS$GA_DS_Ctrl_C_Second longwords to the dispatch list.
                     0000     63 ;
                     0000     64 ;       04      Jack Stansbury, Version 1.1, August 19, 1982
                     0000     65 ;               Added the Begin and DS$GL_CRD_Debug vectors. Also changed the
                     0000     66 ;               version number bytes from 1 to 2.
                     0000     67 ;
                     0000     68 ;       05      Jack Stansbury, Version 1.1, September 10, 1982
                     0000     69 ;               Added the Boot$L_R5 address. This is used by Menu Test to allow
                     0000     70 ;               it to determine how CRD was invoked.
                     0000     71 ;
                     0000     72 ;       06      Jack Stansbury, Version 1.1, September 12, 1982
                     0000     73 ;               Took out the one added in 05 above, and added the
                     0000     74 ;               DSR$Check_MenuTest_Set and the DSR$Check_AutoTest_Set routine
                     0000     75 ;               addresses.
                     0000     76 ;
                     0000     77 ;       07      Jack Stansbury, Version 1.1, October 26, 1982
                     0000     78 ;               Added the DS$GL_CRD_Flags longword. This is set up now as a
                     0000     79 ;               'flags' longword. It is now used for CRD_Debug (bit 1) and
                     0000     80 ;               for disabling ^C echoing (bit 0).
                     0000     81 ;
                     0000     82 ;       08      Jack Stansbury, Version ?.?, March 3, 1983
                     0000     83 ;               Added a number of new (empty for now) dispatch vectors. These
                     0000     84 ;               empty ones are to allow the debug vectors (in CRD) to be big
```

```
                                0000     85 ;                  enough to pass enough useful information back to the
                                0000     86 ;                  DSR$Unload_CRD routine.
                                0000     87 ;
                                0000     88 ;          09      John Ciukaj     Version 6.11    4-April 1983
                                0000     89 ;                  - Changed name of CRD Online debug vector
                                0000     90 ;                  - Changed reference names to DSR$Check.. routines
                                0000     91 ;
                                0000     92 ;          10      Ron Parker      20-FEB-1985
                                0000     93 ;                  - Added address of Ptable descriptor table
                                0000     94 ;--
```

```
                        0000     96          .SubTitle       Libraries and Macros
                        0000     97
                        0000     98          .Library        /Sys$Library:Lib/       ; Use Lib last
                        0000     99          .Library        /$DS/                   ; Use DS.Mar second
                        0000    100          .Library        /$Diag/                 ; Use Diag.Mar first
```

```
                     0000   102          .SubTitle       The Dispatch Vectors
                 00000000   103          .Psect          Work, NoShr, NoExe, Wrt, Long
                     0000   104
                     0000   105 DS$GL_CRD_Flags::                              ; Analguous to the DS flags longword
            00000000 0000   106          .Long   0                              ; all bits = 0 by default       [07]
                     0004   107
                     0004   108          ;+
                     0004   109          ; This longword is used for special debug of CRD by CRD Command
                     0004   110          ;-
                     0004   111
                     0004   112 CRD$GL_CRD_Command_Debug::                      ;
            00000000 0004   113          .Long   0                              ; = 0 by default                [09]
                     0008   114
                     0008   115          ;+
                     0008   116          ; These four bytes are for verification purposes. See the
                     0008   117          ; Exchange_Dispat_Vectors routine in the CRDLoad.B32 module for more
                     0008   118          ; of an explanation of these bytes.
                     0008   119          ;-
                     0008   120
                     0008   121 DS$AL_DS_Dispatch_Vectors::
                  19 0008   122          .Byte   25                             ; The # of dispatch vectors     [08]
                  0A 0009   123          .Byte   10                             ; The positive version number   [10]
                  F6 000A   124          .Byte   -10                            ; The negative version number   [10]
                  00 000B   125          .Byte   0                              ; The null byte
                     000C   126
                     000C   127          ;+
                     000C   128          ; These are the actual dispatch vectors. The first vector is the one that
                     000C   129          ; will contain the address of the routine in the CRD-Loadable image that
                     000C   130          ; will be called by the Print routine. Thus, the global label. The dispatch
                     000C   131          ; vectors now contain those routines and locations internal to the
                     000C   132          ; Resident-DS that the CRD routines will have to access. These vectors
                     000C   133          ; will be exchanged with another like-set of vectors that are part of the
                     000C   134          ; CRD-Loadable image.
                     000C   135          ;-
                     000C   136
                     000C   137 DS$GA_CRD_DS_Interface::                       ; Talk to the CRD image
            00000000' 000C   138          .Address        DSV$Exit               ; To exit the Resident-DS
                     0010   139
            00000000' 0010   140          .Address        DSX$Print              ; The DS Print routine
                     0014   141
            00000000' 0014   142          .Address        DS$GL_Flags            ; The DS flags
                     0018   143
            00000000' 0018   144          .Address        DS$GA_DS_Ctrl_C_First  ; The DS's 1st Control-C        [03]
                     001C   145                                                 ; . . . handler                 [03]
                     001C   146
            00000000' 001C   147          .Address        DS$GA_PTable           ; The list of addresses of
                     0020   148                                                 ; ... PTables
                     0020   149
            00000000' 0020   150          .Address        Exe$AloNonPaged        ; Allocate a block of Non-Paged
                     0024   151                                                 ; ... pool
                     0024   152
                     0024   153 DS$GA_User_Error_Text::                        ; The address of the user's
            00000024' 0024   154          .Address        DS$GA_User_Error_Text  ; ... MsgAdr (from the ERRxxxx
                     0028   155                                                 ; ... macro) will be put here.
                     0028   156
            00000000' 0028   157          .Address        Scan$Numeric           ; The address of the            [01]
                     002C   158                                                 ; ... Scan$Numeric routine in   [01]
```

```
                 002C                                                  ; ... the PARSE module.          [01]
                 002C
        00000000' 002C          .Address        Exe$DeaNonPaged         ; The address of the Deallocate [01]
                 0030                                                  ; ... Non-Paged pool routine.    [01]
                 0030
        00000000' 0030          .Address        DS$GA_DS_Ctrl_C_Second  ; The DS's 2nd Control-C         [03]
                 0034                                                  ; . . . handler                  [03]
                 0034
        00000000' 0034          .Address        Begin                   ; The Begin label in KERNEL      [04]
                 0038
                 0038  DS$GL_CRD_Debug::                                ; Make it global to be in MAP    [04]
        00000000  0038          .Long           0                       ; If bit (1) = 1, CRD will print[07]
                 003C                                                  ; . . . debug statements. If     [07]
                 003C                                                  ; . . . bit (1) = 0, CRD won't   [07]
                 003C                                                  ; . . . print them.              [07]
                 003C                                                  ; Bit (0) is for disabling ^C    [07]
                 003C                                                  ; . . . echoing.                 [07]
                 003C
        00000000' 003C          .Address        DSR$Check_MenuTest_Off_Set
                 0040                                                  ; Return a 1 iff
                 0040                                                  ; CRD MENU Offline is active     [09]
                 0040
        00000000' 0040          .Address        DSR$Check_AutoTest_Off_Set
                 0044                                                  ; Return a 1 iff
                 0044                                                  ; CRD AUTO Offline is active     [09]
                 0044
        00000000' 0044          .Address        DS$GA_PTDESC
                 0048                                                  ; Address of Ptable descriptor
                 0048                                                  ; table                          [10]
                 0048
        00000000' 0048          .Address        DS$ATTACH
                 004C                                                  ; Address of attach routine
                 004C
                 004C          ;+
                 004C          ; The above vectors are the ones that actually contain the VDS           [08]
                 004C          ; addresses that CRD must know about. The ones below are unused except   [08]
                 004C          ; by the Debug_Vector. Note: the total number of these vectors must      [08]
                 004C          ; agree with the CRD$K_Total_Numb_Vectors constant in the CRD.R32        [08]
                 004C          ; library module.                                                        [08]
                 004C          ;-
                 004C
        00000070  004C          .BlkL   <25-16>                         ; CRD$K_Total_Numb_Vectors = 25 [10]
                 0070                                                  ; # of vectors above = 16 [10]
                 0070          .End
```

```
BEGIN                           ********   X   01
CRD$GL_CRD_COMMAND_DEBUG        00000004 RG  D  01
DS$AL_DS_DISPATCH_VECTORS       00000008 RG  D  01
DS$ATTACH                       ********   X   01
DS$GA_CRD_DS_INTERFACE          0000000C RG  D  01
DS$GA_DS_CTRL_C_FIRST           ********   X   01
DS$GA_DS_CTRL_C_SECOND          ********   X   01
DS$GA_PTABLE                    ********   X   01
DS$GA_PTDESC                    ********   X   01
DS$GA_USER_ERROR_TEXT           00000024 RG  D  01
DS$GL_CRD_DEBUG                 00000038 RG  D  01
DS$GL_CRD_FLAGS                 00000000 RG  D  01
DS$GL_FLAGS                     ********   X   01
DSR$CHECK_AUTOTEST_OFF_SET      ********   X   01
DSR$CHECK_MENUTEST_OFF_SET      ********   X   01
DSV$EXIT                        ********   X   01
DSX$PRINT                       ********   X   01
EXE$ALONONPAGED                 ********   X   01
EXE$DEANONPAGED                 ********   X   01
SCAN$NUMERIC                    ********   X   01
```

! Psect synopsis !

```
PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
. ABS  .                        00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
WORK                            00000070  (  112.)  01 (  1.)  NOPIC   USR   CON   REL   LCL NOSHR NOEXE   RD    WRT NOVEC LONG
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
BEGIN	00000000-XR		167 (1)
CRD$GL_CRD_COMMAND_DEBUG	00000004-R	112 (1)	
DS$AL_DS_DISPATCH_VECTORS	00000008-R	121 (1)	
DS$ATTACH	00000000-XR		189 (1)
DS$GA_CRD_DS_INTERFACE	0000000C-R	137 (1)	
DS$GA_DS_CTRL_C_FIRST	00000000-XR		144 (1)
DS$GA_DS_CTRL_C_SECOND	00000000-XR		164 (1)
DS$GA_PTABLE	00000000-XR		147 (1)
DS$GA_PTDESC	00000000-XR		185 (1)
DS$GA_USER_ERROR_TEXT	00000024-R	153 (1)	154 (1)
DS$GL_CRD_DEBUG	00000038-R	169 (1)	
DS$GL_CRD_FLAGS	00000000-R	105 (1)	
DS$GL_FLAGS	00000000-XR		142 (1)
DSR$CHECK_AUTOTEST_OFF_SET	00000000-XR		181 (1)
DSR$CHECK_MENUTEST_OFF_SET	00000000-XR		177 (1)
DSV$EXIT	00000000-XR		138 (1)
DSX$PRINT	00000000-XR		140 (1)
EXE$ALONONPAGED	00000000-XR		150 (1)
EXE$DEANONPAGED	00000000-XR		161 (1)
SCAN$NUMERIC	00000000-XR		157 (1)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.00	00:00:00.35
Command processing	912	00:00:00.26	00:00:00.93
Pass 1	120	00:00:00.14	00:00:00.60
Symbol table sort	0	00:00:00.00	00:00:00.00
Pass 2	6	00:00:00.09	00:00:00.22
Symbol table output	0	00:00:00.00	00:00:00.00
Psect synopsis output	0	00:00:00.00	00:00:00.00
Cross-reference output	1	00:00:00.02	00:00:00.08
Assembler run totals	1064	00:00:00.51	00:00:02.18

The working set limit was 1900 pages.
1888 bytes (4 pages) of virtual memory were used to buffer the intermediate code.
There were 10 pages of symbol table space allocated to hold 20 non-local and 0 local symbols.
202 source lines were read in Pass 1, producing 12 object records in Pass 2.
0 pages of virtual memory were used to define 0 macros.

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                 0

0 GETS were required to define 0 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 213 Libraries and Equated Symbols
(1) 241 Data Psect Declarations
(1) 253 DS Entry Points
(1) 1848 DS$SRVDISP_TABLE - Dispatch table for VDS services
(1) 1912 DSX$SERVICE_DISPATCHER - Service Dispatch Routine
(1) 1960 Resrvd_Entry Routine - For entry errors

```
                                0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element ENTRY.MAR
                                0000     2 ; *2    25-APR-1986 13:37:27 SHELHAMER "<no reason given>"
                                0000     3 ; *1     6-FEB-1986 15:18:04 DS ""
                                0000     4 ; DEC/CMS REPLACEMENT HISTORY, Element ENTRY.MAR
                                0000     5         .TITLE  ENTRY   *** ENTRY DS service entry vectors
                                0000     6         .IDENT  /10-43/                                          ;G:2
                                0000     7         .NoShow Conditionals    ;                                 [28]
                                0000     8
                                0000     9 ;++
                                0000    10 ; COPYRIGHT (c) 1977, 1982, 1983, 1984, 1985
                                0000    11 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
                                0000    12 ;
                                0000    13 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
                                0000    14 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
                                0000    15 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
                                0000    16 ; MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
                                0000    17 ; EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
                                0000    18 ; TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
                                0000    19 ; REMAIN IN DEC.
                                0000    20 ;
                                0000    21 ; THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
                                0000    22 ; AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
                                0000    23 ; CORPORATION.
                                0000    24 ;
                                0000    25 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
                                0000    26 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
                                0000    27
                                0000    28 ;++
                                0000    29 ; FACILITY:
                                0000    30 ;
                                0000    31 ;       VAX DIAGNOSTIC SUPERVISOR.
                                0000    32 ;
                                0000    33 ; ABSTRACT:
                                0000    34 ;
                                0000    35 ;       NONE
                                0000    36 ;
                                0000    37 ; ENVIRONMENT:
                                0000    38 ;
                                0000    39 ;       CEP AND SEP.
                                0000    40 ;
                                0000    41 ; AUTHOR:
                                0000    42 ;
                                0000    43 ;       KEN CHAPMAN     31-OCT-77       VERSION 01.
```

```
0000     45 ;
0000     46 ; MODIFIED BY:
0000     47 ;                    NICK HOWGATE    15-NOV-77       VERSION 02
0000     48 ;         01         CHANGE ENTRY VECTOR DISPATCH FROM 'BRW' TO 'JMP'
0000     49 ;
0000     50 ;                    KEN CHAPMAN     30-NOV-77       VERSION 03
0000     51 ;         02         ADDED SYS$WAKE VECTOR.  REMOVED SYS$CRETVA VECTOR.
0000     52 ;
0000     53 ;                    NICK HOWGATE    15-DEC-77       VERSION 04.
0000     54 ;         03         ADDED SYS$SETPRT ENTRY MASK.
0000     55 ;
0000     56 ;                    N. HOWGATE      21-FEB-78       VERSION 05 (ESSAA-4.00).
0000     57 ;         04         CHANGED ENTRY MASKS FOR SYS$ASSIGN, SYS$DASSGN, SYS$CANCEL,
0000     58 ;                    SYS$GTCHAN, SYS$ALLOC, SYS$DALLOC.
0000     59 ;
0000     60 ;                    KEN CHAPMAN     27-MAR-78       VERSION 06 (ESSAA-4.01).
0000     61 ;         05         CHANGED ENTRY MASKS FOR SYS$EXPREG, SYS$CNTREG, DS$GETBUF,
0000     62 ;                    AND DS$RELBUF.
0000     63 ;         06         ADDED NEW ENTRY NAMES: DS$SUMMARY, DS$CANWAIT, DS$ASKDATA,
0000     64 ;                    DS$ASKVLD, DS$ASKLGCL, DS$ASKSTR, DS$SHOCHAN.
0000     65 ;         07         ADDED '+2' TO SKIP OVER LOCAL ENTRY MASKS IN SOME CASES.
0000     66 ;
0000     67 ;                    Roger Riggs             12-Jun-1978
0000     68 ;         08         Changed GETMEM, RELMEM, MOVVRT, MOVPHY to be reserved.
0000     69 ;                    previously they were dummy routines in MEMMGT.
0000     70 ;                    Also changed EXPREG, CNTREG, MMOFF, MMON, and SETPRT to
0000     71 ;                    use .VECTOR pseudo op.
0000     72 ;         09         Changed names and entry vectors of:
0000     73 ;                    RGETDATA        DSX$GETDATA
0000     74 ;                    RGETADDRESS     DSX$GETADDRESS
0000     75 ;                    RGETVIELD       DSX$GETVIELD
0000     76 ;                    RGETLOGICAL     DSX$GETLOGICAL
0000     77 ;                    RGETSTRING      DSX$GETSTRING
0000     78 ;                    RGPHARD         DSX$GPHARD
0000     79 ;                    RBREAK
0000     80 ;         10         Added DS$PRINTSIG entry point
0000     81 ;
0000     82 ;                    Roger Riggs, 14-Jan-1979        Version 5.2
0000     83 ;         11         Activated DS$PROBE entry point at 101A0
0000     84 ;
0000     85 ;         12         David R. Butenhof  06-feb-80
0000     86 ;                    Add entry point for EXE$SETAST system call
0000     87 ;
0000     88 ;                    Roger Riggs, 24-MAR-1980
0000     89 ;         13         Added dummy entry points for SYS$LKWSET, SYS$SETPRI,
0000     90 ;                    SYS$SETRWM, SYS$SETSWM, SYS$ULWSET
0000     91 ;
0000     92 ;                    Roger Riggs, 27-May-1980, Version 5.4
0000     93 ;         14         Changed entry points for QIO routines to use .VECTOR
0000     94 ;                    and JMP +2
0000     95 ;
0000     96 ;                    Dave Butenhof   9-jun-1980, Version 5.4
0000     97 ;         15         Added entry vectors for VMS V2.0 driver support routines:
0000     98 ;                    IOC$LOADUBAMAPA, IOC$GETBUTE, IOC$PUTBYTE, IOC$INITBUFWIND,
0000     99 ;                    IOC$MOVFRUSER2, IOC$MOVFRUSER1, IOC$MOVTOUSER2, IOC$MOVTOUSER1.
0000    100 ;
0000    101 ;                    Dave Butenhof   18-jun-1980,    version 5.5
```

```
                        0000   102 ;        16      Add driver entry vectors for SCH$LOCKW and SCH$UNLOCK, for
                        0000   103 ;                use by drivers doing buffered I/O.
                        0000   104 ;
                        0000   105 ;                Roger Riggs, 22-July-1980, Version 5.5
                        0000   106 ;        17      Added entry points for ???
                        0000   107 ;                Moved RMS$GL_ABSTIM, RMS$GQ_SYSTIME here from clock.
                        0000   108 ;
                        0000   109 ;                Roger Riggs, 27-Aug-1980
                        0000   110 ;        18      Added SYS$GET, SYS$READ, SYS$OPEN, SYS$CLOSE, SYS$CONNECT,
                        0000   111 ;                SYS$DISCONNECT for subset of RMS services.
```

```
                        0000    113 ;
                        0000    114 ;               Dave Butenhof, 30-sep-1980, Version 6.1
                        0000    115 ;       19      Added entry point for DS$ATTACH--user-callable ATTACH
                        0000    116 ;               command processing
                        0000    117 ;       20      Added entry vectors for COM$DRVDEALMEM, EXE$INSIOQ,
                        0000    118 ;               IOC$PTETOPFN, and moved EXE$GQ_SYSTIME here from CLOCK to
                        0000    119 ;               make it accessible to drivers.
                        0000    120 ;       21      Added entry point for DS$HELP--user-callable HELP command
                        0000    121 ;               processing.
                        0000    122 ;       22      Add entry point for IOC$MOVFRUSER
                        0000    123 ;
                        0000    124 ;               Dave Butenhof, 22-apr-1981, version 6.4
                        0000    125 ;       23      Add entry points for IOC$ALLOSPT, EXE$MAXACMODE, and
                        0000    126 ;               EXE$READLOCK.  These were specified in release notes
                        0000    127 ;               of version 6.3, but somehow the updates were lost.
                        0000    128 ;               [also, define all libraries in source]
                        0000    129 ;
                        0000    130 ;       24      - dave butenhof, 11-Sep-1981, version 6.5
                        0000    131 ;               Fix entries for event flag services.  They are all done
                        0000    132 ;               as jumps directly to label: fix to allow for entry mask
                        0000    133 ;               on routine.
                        0000    134 ;
                        0000    135 ;       25      - Jack Stansbury, 23-Oct-1981, Version 6.-
                        0000    136 ;               Fixed a truncation error in the CODE Psect, and
                        0000    137 ;               another possibly future one in the same Psect.
                        0000    138 ;
                        0000    139 ;       26      - Jack Stansbury, 23-Oct-1981, Version 6.-
                        0000    140 ;               Added DS$BRANCH entry point, by putting it between
                        0000    141 ;               DS$SUMMARY and DS$BGNSUB, and by taking out the blank
                        0000    142 ;               one after DS$ASKSTR.
                        0000    143 ;
                        0000    144 ;       27      - Jack Stansbury, 16-Nov-1981, Version 6.-
                        0000    145 ;               Changed the code at the DS$BREAK entry point. Put in a
                        0000    146 ;               JMP to the label FAKE_JUMP, which is in the routine
                        0000    147 ;               RESRVD_ENTRY. This was necessitated by the code at
                        0000    148 ;               DS$BREAK occupying too many bytes for the entry point.
                        0000    149 ;
                        0000    150 ;       28      Marion Baggett, 12-Apr-1982,    Version 6.7
                        0000    151 ;               Added entry point DSX$ERRPREP
                        0000    152 ;
                        0000    153 ;       29      Richard Brown, 27-May-82, Version 6.8
                        0000    154 ;               Added entry point DS$SETPRIEXV.
                        0000    155 ;
                        0000    156 ;       30      Richard Brown, 24-June-82, Version 6.8
                        0000    157 ;               Added entry point DS$MAPDBGBLOCK.
                        0000    158 ;
                        0000    159 ;       31      Richard Brown, 4-August-82, Version 6.9
                        0000    160 ;               Added entry point DS$FREEDBGSYM.
                        0000    161 ;
                        0000    162 ;       32      Bob Bergazzi    23-Nov-82       Version 6.10
                        0000    163 ;               Added entry point DS$LOADPCS.
                        0000    164 ;
                        0000    165 ;       33      Bob Bergazzi    May 16,1983     Version 6.11
                        0000    166 ;               Changed the order of the .LIB statements.
                        0000    167 ;
                        0000    168 ;       34      Richard Brown   22-June-83      Version 6.12
                        0000    169 ;               Added entry point DS$GETTERM.
```

```
0000    170 ;
0000    171 ;       35      Richard Brown   12-July-84      Version 7.0
0000    172 ;               Added entry point DS$SERVICE_DISPATCHER, to handle
0000    173 ;               all future additional services, since empty spots
0000    174 ;               in the dispatch vector area are in short supply.
0000    175 ;               Added DS$SRVDISP_TABLE, used by DS$SERVICE_DISPATCHER.
0000    176 ;               Added DSX$MOUNT and DSX$DISMOUNT to DS$SRVDISP_TABLE.
0000    177 ;               Changed DATA psect alignment from Byte to Quad.
0000    178 ;
0000    179 ;       36      Jim Shelhamer   6-Aug-1984      Version 7.1
0000    180 ;               Added entry point DS$MEMSIZE, to return the physical
0000    181 ;               memory size.
0000    182 ;
0000    183 ;       37      Richard Brown   20-Sep-1984     Version 7.1
0000    184 ;               Removed DSX$MOUNT and DSX$DISMOUNT.
0000    185 ;
0000    186 ;       38      Domenic Andella 30-Nov-1984     Version 8.0
0000    187 ;               Added new VDS multiprocessing service dispatch
0000    188 ;               vectors to DS$SRVDISP_TABLE.
0000    189 ;
0000    190 ;       39      Domenic Andella 29-Jan-1985     Version 8.1
0000    191 ;               Added new service dispatch vectors for
0000    192 ;               $DS_GETSYSBUF and $DS_RELSYSBUF
0000    193 ;
0000    194 ;       40      Amy Iorio       15-Feb-1985     Version 8.1
0000    195 ;               Added new service dispath vector for
0000    196 ;               DS$_PRINTREV.
0000    197 ;
0000    198 ;       41      Domenic Andella 26-Feb-85       Version 8.1
0000    199 ;               Establish WEAK Externals for DSX$RELSYSBUF, and
0000    200 ;               DSX$GETSYSBUF pending replacement of BUFFER module.
0000    201 ;               Replace .vectors with .word for each.
0000    202 ;
0000    203 ;       42      Ted Salem       16-Dec-85       Version 9.2
0000    204 ;               Establish WEAK Externals for DSX$interlock_test, and
0000    205 ;               DSX$set and clear interlock. Added new service
0000    206 ;               dispatch vectors for each.
0000    207 ;
0000    208 ;       43      Jim Shelhamer   24-Apr-86       Version 10.0            ;G:2
0000    209 ;               Add new service, DS$PPSCB, which returns the base       ;G:2
0000    210 ;               address of the PP's SCB on 8200 AP systems.             ;G:2
0000    211 ;--
```

```
                        0000    213          .SBTTL  Libraries and Equated Symbols
                        0000    214 ;
                        0000    215 ; INCLUDE FILES:
                        0000    216 ;
                        0000    217          .LIBRARY        "SYS$LIBRARY:LIB"       ;                       [33]
                        0000    218          .LIBRARY        "$DS"                   ;                       [33]
                        0000    219          .LIBRARY        "$DIAG"                 ;                       [33]
                        0000    220
                        0000    221 ;
                        0000    222 ; MACROS:
                        0000    223 ;
                        0000    224
                        0000    225 ;
                        0000    226 ; Weak Externals
                        0000    227 ;
                        0000    228
                        0000    229          .WEAK   DSX$GETSYSBUF, DSX$RELSYSBUF
                        0000    230          .WEAK   DSX$_INTERLOCK_TEST     ; Entry for the Interlock test  [42]
                        0000    231          .WEAK   DSX$_SET_INTERLOCK      ; Entry for misc. interlocking  [42]
                        0000    232          .WEAK   DSX$_CLEAR_INTERLOCK    ; Entry for misc. interlocking  [42]
                        0000    233
                        0000    234
                        0000    235 ;
                        0000    236 ; EQUATED SYMBOLS:
                        0000    237 ;
            0000000D    0000    238          CR      = 13
            0000000A    0000    239          LF      = 10
```

```
ZZ-ECSAA-10.11  Data Psect Declarations                          3-MAY-1988       Fiche 7 Frame L12          Sequence 1390
ENTRY                          *** ENTRY DS service entry vectors      21-MAR-1988 18:03:32  VAX/VMS Macro V04-00          Page   7
10-43                          Data Psect Declarations                 24-APR-1986 14:23:56  ENTRY.MAR;1                   (1)

                                     0000   241          .SUBTITLE       Data Psect Declarations
                                     0000   242
                                     0000   243 ;
                                     0000   244 ; OWN STORAGE:
                                     0000   245 ;
                                 00000000   246          .PSECT  DATA, SHR, NOEXE, NOWRT, quad                    ; [35]
                                     0000   247
                                     0000   248          MODNAM  ENTRY
                        59 52 54 4E 45 00' 0000       $MODULE:          .ASCIC  \ENTRY\
                                     05    0000
                                     0006   249
                                     0006   250 T_RESRVD:
56 52 45 53 45 52 20 3F 3F 0A 0D 00' 0006   251          .ASCIC  <CR><LF>\?? RESERVED DIAGNOSTIC/SYSTEM SERVICE CALL.\
49 54 53 4F 4E 47 41 49 44 20 44 45  0012
52 45 53 20 4D 45 54 53 59 53 2F 43  001E
      2E 4C 4C 41 43 20 45 43 49 56  002A
                                     2D    0006
```

```
0034    253          .SBTTL  DS Entry Points
0034    254 ;++
0034    255 ; FUNCTIONAL DESCRIPTION:
0034    256 ;
0034    257 ;       THIS SECTION PROVIDES A WELL DEFINED LINK BETWEEN THE DIAGNOSTIC
0034    258 ;       SUPERVISOR AND THE DIAGNOSTIC PROGRAM.  EACH ROUTINE STARTS ON A
0034    259 ;       FIXED QUADWORD BOUNDRY WHICH CONTAINS THE APPROPRIATE LINK TO
0034    260 ;       THE BODY OF THE ROUTINE.  THERE ARE FOUR SETS OF LINK VECTORS,
0034    261 ;       ONE FOR EACH TYPE OF PROGRAM:  CEP FUNCTIONAL, CEP REPAIR,
0034    262 ;       SEP FUNCTIONAL, SEP REPAIR.
0034    263 ;
0034    264 ; CALLING SEQUENCE:
0034    265 ;
0034    266 ;       ALL ROUTINES ARE CALLED VIA THE STANDARD VAX CALL PROCEDURE,
0034    267 ;       I.E., CALLG AND CALLS INSTRUCTIONS.
0034    268 ;
0034    269 ; INPUT PARAMETERS:
0034    270 ;
0034    271 ;       SEE SPECIFIC ROUTINE.
0034    272 ;
0034    273 ; IMPLICIT INPUTS:
0034    274 ;
0034    275 ;       SEE SPECIFIC ROUTINE.
0034    276 ;
0034    277 ; OUTPUT PARAMETERS:
0034    278 ;
0034    279 ;       SEE SPECIFIC ROUTINE.
0034    280 ;
0034    281 ; IMPLICIT OUTPUTS:
0034    282 ;
0034    283 ;       SEE SPECIFIC ROUTINE.
0034    284 ;
0034    285 ; COMPLETION CODES:
0034    286 ;
0034    287 ;       SEE SPECIFIC ROUTINE.
0034    288 ;
0034    289 ; SIDE EFFECTS:
0034    290 ;
0034    291 ;       SEE SPECIFIC ROUTINE.
0034    292 ;
0034    293 ;--
```

```
                  00000000   295          .PSECT  $BASE, SHR, NOEXE, NOWRT, QUAD
                      0000   296
                      0000   297 DS$ENTRY:                                  ; Address 10000 (X)
          01E9   31   0000   298          BRW     LEAP_BOOT                 ; STAND ALONE ENTRY POINT.
                      0003   299
                      0003   300          .ALIGN  LONG
                      0004   301 DS$APT_ENTRY:
          01ED   31   0004   302          BRW     LEAP_APT                  ; APT ENTRY POINT
                      0007   303
                      0007   304          .ALIGN  QUAD
                      0008   305 ; RESERVED ENTRY POINT
                 0000 0008   306          .WORD   ^M<>                      ; ENTRY MASK.
   0000001D'EF   17   000A   307          JMP     RESRVD_ENTRY
```

```
                     0010   309 ;+
                     0010   310 ; 4.1.11        INITIALIZE CODE SERVICES.
                     0010   311 ;-
                     0010   312         .ALIGN  QUAD
                     0010   313 DS$ENDPASS::                          ; END OF PASS ENTRY POINT.
                0000' 0010   314         .VECTOR DSX$ENDPASS
    00000002'EF   17  0012   315         JMP     DSX$ENDPASS+2        ;
                     0018   316
                     0018   317         .ALIGN  QUAD
                     0018   318 DS$GPHARD::                           ; GET POINTER TO HARDWARE PARAMETER TABLE.
                0000' 0018   319         .VECTOR DSX$GPHARD
    00000002'EF   17  001A   320         JMP     DSX$GPHARD+2
                     0020   321
                     0020   322 ;+
                     0020   323 ; 4.1.12        CLEANUP CODE CALL.
                     0020   324 ;-
                     0020   325         .ALIGN  QUAD
                     0020   326 DS$ABORT::                            ; ABORT PROGRAM.
                0000' 0020   327         .VECTOR DSX$ABORT
    00000002'EF   17  0022   328         JMP     DSX$ABORT+2
                     0028   329
                     0028   330 ;+
                     0028   331 ; 4.1.13        SUMMARY REPORT CALL.
                     0028   332 ;-
                     0028   333         .ALIGN  QUAD
                     0028   334 DS$SUMMARY::
                     0028   335 DS$DOSUMMARY::                        ; EXECUTE SUMMARY REPORT ROUTINE.
                0000' 0028   336         .VECTOR DSX$DOSUMMARY
    00000002'EF   17  002A   337         JMP     DSX$DOSUMMARY+2
```

```
                     0030   339 ;+
                     0030   340 ; 4.2.1          PROGRAM CONTROL SERVICES.
                     0030   341 ;-
                     0030   342          .ALIGN  QUAD
                     0030   343 DS$BGNSUB::                                ; BEGIN SUBTEST ENTRY POINT.
                0000' 0030   344          .VECTOR DSX$BGNSUB
    00000002'EF   17 0032   345          JMP     DSX$BGNSUB+2
                     0038   346
                     0038   347          .ALIGN  QUAD
                     0038   348 DS$ENDSUB::                                ; END SUBTEST ENTRY POINT.
                0000' 0038   349          .VECTOR DSX$ENDSUB
    00000002'EF   17 003A   350          JMP     DSX$ENDSUB+2
                     0040   351
                     0040   352          .ALIGN  QUAD
                     0040   353 DS$CKLOOP::                                ; CHECK LOOP ENRTY POINT.
                0000' 0040   354          .VECTOR DSX$CKLOOP
    00000002'EF   17 0042   355          JMP     DSX$CKLOOP+2
                     0048   356
                     0048   357          .ALIGN  QUAD
                     0048   358 DS$INLOOP::                                ; IN LOOP ENTRY POINT.
                0000' 0048   359          .VECTOR DSX$INLOOP
    00000002'EF   17 004A   360          JMP     DSX$INLOOP+2
                     0050   361
                     0050   362          .ALIGN  QUAD
                     0050   363 DS$ESCAPE::                                ; ESCAPE ENTRY POINT.
                0000' 0050   364          .VECTOR DSX$ESCAPE
    00000002'EF   17 0052   365          JMP     DSX$ESCAPE+2
                     0058   366
                     0058   367          .ALIGN  QUAD
                     0058   368 DS$BREAK::                                ; BREAK FOR DYNAMIC SERVICES.
                0000 0058   369          .WORD   ^M<>                     ; ENTRY MASK.
    00000032'EF   17 005A   370          JMP     FAKE_JUMP                ; Go to Fake_Jump, which JSB's to KB_CHECK,
                     0060   371                                           ; and then RETurns.
                     0060   372
                     0060   373          .ALIGN  QUAD
                     0060   374 DS$WAITMS::                               ; WAIT MILLISECONDS ENTRY POINT.
                0000' 0060   375          .VECTOR DSX$WAITMS
    00000002'EF   17 0062   376          JMP     DSX$WAITMS+2
                     0068   377
                     0068   378          .ALIGN  QUAD
                     0068   379 DS$WAITUS::                               ; WAIT MICROSECONDS ENTRY POINT.
                0000' 0068   380          .VECTOR DSX$WAITUS
    00000002'EF   17 006A   381          JMP     DSX$WAITUS+2
                     0070   382
                     0070   383          .ALIGN  QUAD
                     0070   384 DS$CANWAIT::
                     0070   385 DS$ABORTWAIT::                            ; CANCEL WAIT ENTRY POINT.
                0000' 0070   386          .VECTOR DSX$CANWAIT
    00000002'EF   17 0072   387          JMP     DSX$CANWAIT+2
                     0078   388
                     0078   389          .ALIGN  QUAD
                     0078   390 DS$CNTRLC::
                0000' 0078   391          .VECTOR DSX$CNTRLC
    00000002'EF   17 007A   392          JMP     DSX$CNTRLC+2
```

```
                     0080   394 ;+
                     0080   395 ; 4.2.2          MESSAGE HANDLER SERVICES.
                     0080   396 ;-
                     0080   397          .ALIGN  QUAD
                     0080   398 DS$ASKDATA::
                     0080   399 DS$GETDATA::                              ; GET DATA ENTRY POINT.
                0000' 0080   400          .VECTOR DSX$GETDATA
    00000002'EF   17 0082   401          JMP     DSX$GETDATA+2
                     0088   402
                     0088   403          .ALIGN  QUAD
                     0088   404 DS$ASKVLD::
                     0088   405 DS$GETVIELD::                             ; GET A VIELD ENTRY POINT.
                0000' 0088   406          .VECTOR DSX$GETVIELD
    00000002'EF   17 008A   407          JMP     DSX$GETVIELD+2
                     0090   408
                     0090   409          .ALIGN  QUAD
                     0090   410 DS$ASKADR::
                     0090   411 DS$GETADDRESS::                           ; GET AN ADDRESS ENTRY POINT.
                0000' 0090   412          .VECTOR DSX$GETADDRESS
    00000002'EF   17 0092   413          JMP     DSX$GETADDRESS+2
                     0098   414
                     0098   415          .ALIGN  QUAD
                     0098   416 DS$ASKLGCL::
                     0098   417 DS$GETLOGICAL::                          ; GET A LOGICAL DECISION ENTRY POINT.
                0000' 0098   418          .VECTOR DSX$GETLOGICAL
    00000002'EF   17 009A   419          JMP     DSX$GETLOGICAL+2
                     00A0   420
                     00A0   421          .ALIGN  QUAD
                     00A0   422 DS$ASKSTR::
                     00A0   423 DS$GETSTRING::                           ; GET AN ASCII STRING ENTRY POINT.
                0000' 00A0   424          .VECTOR DSX$GETSTRING
    00000002'EF   17 00A2   425          JMP     DSX$GETSTRING+2
                     00A8   426
                     00A8   427
                     00A8   428          .ALIGN  QUAD                    ;                                  [26]
                     00A8   429 DS$BRANCH::                              ;                                  [26]
                0000' 00A8   430          .VECTOR DSX$BRANCH             ; QA branch routine                [26]
    00000002'EF   17 00AA   431          JMP     DSX$BRANCH+2           ;                                  [26]
                     00B0   432                                         ;                                  [26]
                     00B0   433                                         ;                                  [26]
                     00B0   434
                     00B0   435          .ALIGN  QUAD
                     00B0   436 DS$CVTREG::                              ; CONVERT REGISTER BITS TO ASCII.
                0000' 00B0   437          .VECTOR DSX$CVTREG,^M<>
    00000002'EF   17 00B2   438          JMP     DSX$CVTREG+2
                     00B8   439
                     00B8   440          .ALIGN  QUAD
                     00B8   441 DS$PARSE::                               ; PARSE AN ASCII STRING.
                0000' 00B8   442          .VECTOR DSX$PARSE
    00000002'EF   17 00BA   443          JMP     DSX$PARSE+2
```

```
                        00C0   445          .ALIGN  QUAD
                        00C0   446 DS$ERRSYS::                          ; SYSTEM FATAL ERROR ENTRY POINT.
                0000'   00C0   447          .VECTOR DSX$ERRSYS
    00000002'EF   17    00C2   448          JMP     DSX$ERRSYS+2
                        00C8   449
                        00C8   450          .ALIGN  QUAD
                        00C8   451 DS$ERRDEV::                          ; DEVICE FATAL ERROR ENTRY POINT.
                0000'   00C8   452          .VECTOR DSX$ERRDEV
    00000002'EF   17    00CA   453          JMP     DSX$ERRDEV+2
                        00D0   454
                        00D0   455          .ALIGN  QUAD
                        00D0   456 DS$ERRHARD::                         ; HARD ERROR ENTRY POINT.
                0000'   00D0   457          .VECTOR DSX$ERRHARD
    00000002'EF   17    00D2   458          JMP     DSX$ERRHARD+2
                        00D8   459
                        00D8   460          .ALIGN  QUAD
                        00D8   461 DS$ERRSOFT::                         ; SOFT ERROR ENTRY POINT.
                0000'   00D8   462          .VECTOR DSX$ERRSOFT
    00000002'EF   17    00DA   463          JMP     DSX$ERRSOFT+2
                        00E0   464
                        00E0   465          .ALIGN  QUAD
                        00E0   466 DS$PRINTB::                          ; PRINT BASIC MESSAGE ENTRY POINT.
                0000'   00E0   467          .VECTOR DSX$PRINTB,^M<>
    00000002'EF   17    00E2   468          JMP     DSX$PRINTB+2
                        00E8   469
                        00E8   470          .ALIGN  QUAD
                        00E8   471 DS$PRINTX::                          ; PRINT EXTENDED MESSAGE ENTRY POINT.
                0000'   00E8   472          .VECTOR DSX$PRINTX,^M<>
    00000002'EF   17    00EA   473          JMP     DSX$PRINTX+2
                        00F0   474
                        00F0   475          .ALIGN  QUAD
                        00F0   476 DS$PRINTF::                          ; PRINT FORCED MESSAGE ENTRY POINT.
                0000'   00F0   477          .VECTOR DSX$PRINTF,^M<>
    00000002'EF   17    00F2   478          JMP     DSX$PRINTF+2
                        00F8   479
                        00F8   480          .ALIGN  QUAD
                        00F8   481 DS$PRINTS::                          ; PRINT STATISTICAL MESSAGE ENTRY POINT.
                0000'   00F8   482          .VECTOR DSX$PRINTS,^M<>
    00000002'EF   17    00FA   483          JMP     DSX$PRINTS+2
```

```
                        0100   485          .ALIGN  QUAD
                        0100   486 DS$PRINTSIG::                          ; Print signal array routine
                0000'   0100   487          .VECTOR DSX$PRINTSIG,^M<>
    00000002'EF   17    0102   488          JMP     DSX$PRINTSIG+2
                        0108   489
                        0108   490          .ALIGN  QUAD
                        0108   491 DS$ERRPREP::                           ; ERROR IN DEVICE PREPARATION.          [28]
                0000'   0108   492          .VECTOR DSX$ERRPREP           ;                                       [28]
    00000002'EF   17    010A   493          JMP     DSX$ERRPREP+2         ;                                       [28]
                        0110   494
                        0110   495          .ALIGN  QUAD
                        0110   496 DS$SETPRIEXV::                          ; SET PRIMARY EXCEPTION VECTOR  [29]
                0000'   0110   497          .VECTOR DSX$SETPRIEXV,^M<>    ;                               [29]
    00000002'EF   17    0112   498          JMP     DSX$SETPRIEXV+2       ;                               [29]
                        0118   499
                        0118   500          .ALIGN  QUAD
                        0118   501 DS$MAPDBGBLOCK::                        ; MAP BLOCK OF MEMORY FOR DEBUGGER[30]
                0000'   0118   502          .VECTOR DSX$MAPDBGBLOCK,^M<>  ;                                 [30]
    00000002'EF   17    011A   503          JMP     DSX$MAPDBGBLOCK+2     ;                                 [30]
                        0120   504
```

```
                     0120   506 ;+
                     0120   507 ; 4.2.3          MEMORY MANAGEMENT SERVICES.
                     0120   508 ;-
                     0120   509          .ALIGN  QUAD
                     0120   510 DS$GETBUF::                          ; GET BUFFER ENTRY POINT.
                0000' 0120   511          .VECTOR DSX$GETBUF
    00000002'EF   17  0122   512          JMP     DSX$GETBUF+2        ;
                     0128   513
                     0128   514          .ALIGN  QUAD
                     0128   515 DS$RELBUF::                          ; RELEASE BUFFER ENTRY POINT.
                0000' 0128   516          .VECTOR DSX$RELBUF
    00000002'EF   17  012A   517          JMP     DSX$RELBUF+2        ;
                     0130   518
                     0130   519          .ALIGN  QUAD
                     0130   520 ; RESERVED ENTRY POINT                ; GET PHYSICAL MEMORY ENTRY POINT.
                0000  0130   521          .WORD   ^M<>                ; ENTRY MASK
    0000001D'EF   17  0132   522          JMP     RESRVD_ENTRY        ;
                     0138   523
                     0138   524          .ALIGN  QUAD
                     0138   525 ; RESERVED ENTRY POINT                ; RELEASE PHYSICAL MEMORY ENTRY POINT.
                0000  0138   526          .WORD   ^M<>                ; ENTRY MASK
    0000001D'EF   17  013A   527          JMP     RESRVD_ENTRY        ;
                     0140   528
                     0140   529          .ALIGN  QUAD
                     0140   530 ; RESERVED ENTRY POINT                ; RELOCATE PROGRAM ENTRY POINT.
                0000  0140   531          .WORD   ^M<>                ; ENTRY MASK
    0000001D'EF   17  0142   532          JMP     RESRVD_ENTRY        ;
                     0148   533
                     0148   534          .ALIGN  QUAD
                     0148   535 ; RESERVED ENTRY POINT                ; PHYSICAL RELOCATE ENTRY POINT.
                0000  0148   536          .WORD   ^M<>                ; ENTRY MASK
    0000001D'EF   17  014A   537          JMP     RESRVD_ENTRY        ;
                     0150   538
                     0150   539          .ALIGN  QUAD
                     0150   540 DS$MMON::                            ; MEMORY MANAGEMENT ON ENTRY POINT.
                0000' 0150   541          .VECTOR DSX$MMON,^M<>
    00000002'EF   17  0152   542          JMP     DSX$MMON+2          ;
                     0158   543
                     0158   544          .ALIGN  QUAD
                     0158   545 DS$MMOFF::                           ; MEMORY MANAGEMENT OFF ENTRY POINT.
                0000' 0158   546          .VECTOR DSX$MMOFF,^M<>
    00000002'EF   17  015A   547          JMP     DSX$MMOFF+2         ;
```

```
                     0160   549 ;+
                     0160   550 ; 4.2.4          I/O SERVICES.
                     0160   551 ;-
                     0160   552          .ALIGN  QUAD
                     0160   553 DS$SETVEC::                          ; SET VECTOR ENTRY POINT.
               0000' 0160   554          .VECTOR DSX$SETVEC
00000002'EF    17    0162   555          JMP     DSX$SETVEC+2
                     0168   556
                     0168   557          .ALIGN  QUAD
                     0168   558 DS$CLRVEC::                          ; CLEAR VECTOR ENTRY POINT.
               0000' 0168   559          .VECTOR DSX$CLRVEC
00000002'EF    17    016A   560          JMP     DSX$CLRVEC+2
                     0170   561
                     0170   562          .ALIGN  QUAD
                     0170   563 DS$INITSCB::                         ; INITIALIZE SYSTEM CONTROL BLOCK ENTRY POIN
               0000' 0170   564          .VECTOR DSX$INITSCB
00000002'EF    17    0172   565          JMP     DSX$INITSCB+2
                     0178   566
                     0178   567          .ALIGN  QUAD
                     0178   568 DS$SETIPL::                          ; SET INTERRUPT PRIORITY LEVEL ENTRY POINT.
               0000' 0178   569          .VECTOR DSX$SETIPL
00000002'EF    17    017A   570          JMP     DSX$SETIPL+2
                     0180   571
                     0180   572          .ALIGN  QUAD
                     0180   573 DS$CHANNEL::                         ; CHANNEL SERVICES ENTRY POINT.
               0000' 0180   574          .VECTOR DSX$CHANNEL
00000002'EF    17    0182   575          JMP     DSX$CHANNEL+2
                     0188   576
                     0188   577          .ALIGN  QUAD
                     0188   578 DS$SETMAP::                          ; SET CHANNEL MAPPING ENTRY POINT.
               0000' 0188   579          .VECTOR DSX$SETMAP
00000002'EF    17    018A   580          JMP     DSX$SETMAP+2
                     0190   581
                     0190   582          .ALIGN  QUAD
                     0190   583 DS$SHOCHAN::
                     0190   584 DS$SHOWCHAN::                        ; SHOW CHANNEL STATUS ENTRY POINT.
               0000' 0190   585          .VECTOR DSX$SHOWCHAN
00000002'EF    17    0192   586          JMP     DSX$SHOWCHAN+2
                     0198   587
                     0198   588          .ALIGN  QUAD
                     0198   589 DS$LOAD::                           ; ^X10198
               0000' 0198   590          .VECTOR DSX$LOAD
00000002'EF    17    019A   591          JMP     DSX$LOAD+2
                     01A0   592
                     01A0   593          .ALIGN  QUAD
                     01A0   594 DS$PROBE::                          ; Probe accessibility
               0000' 01A0   595          .VECTOR DSX$PROBE
00000002'EF    17    01A2   596          JMP     DSX$PROBE+2
                     01A8   597
                     01A8   598          .ALIGN  QUAD
                     01A8   599 DS$ATTACH::                         ; Process ATTACH command line
               0000' 01A8   600          .VECTOR DSX$ATTACH
00000002'EF    17    01AA   601          JMP     DSX$ATTACH+2
                     01B0   602          .ALIGN  QUAD
                     01B0   603 DS$HELP::                           ; Process HELP command line
               0000' 01B0   604          .VECTOR DSX$HELP
00000002'EF    17    01B2   605          JMP     DSX$HELP+2
```

```
                        01B8   607          .ALIGN  QUAD
                        01B8   608 DS$FREEDBGSYM::                          ; FREE MEMORY ASSIGNED TO SYMBOL TABLES[31]
                0000'   01B8   609          .VECTOR DSX$FREEDBGSYM,^M<>     ;                                         [31]
    00000002'EF   17    01BA   610          JMP     DSX$FREEDBGSYM+2        ;                                         [31]
                        01C0   611
                        01C0   612          .ALIGN  QUAD
                        01C0   613 DS$LOADPCS::                             ; LOAD THE PCS INTO THE COMET             [32]
                0000'   01C0   614          .VECTOR DSX$LOADPCS,^M<>        ;                                         [32]
    00000002'EF   17    01C2   615          JMP     DSX$LOADPCS+2           ;                                         [32]
                        01C8   616
                        01C8   617          .ALIGN  QUAD
                        01C8   618 DS$GETTERM::                             ; Get terminal characteristics            [34]
                0000'   01C8   619          .VECTOR DSX$GETTERM,^M<>        ;                                         [34]
    00000002'EF   17    01CA   620          JMP     DSX$GETTERM+2           ;                                         [34]
                        01D0   621
                        01D0   622          .ALIGN  QUAD
                        01D0   623 DS$SERVICE_DISPATCHER::                  ;                                         [35]
                0000'   01D0   624          .VECTOR DSX$SERVICE_DISPATCHER  ;                                         [35]
    00000002'EF   17    01D2   625          JMP     DSX$SERVICE_DISPATCHER+2; Common dispatcher for all               [35]
                        01D8   626                                          ; future additional services.             [35]
                        01D8   627          .ALIGN  QUAD
                        01D8   628 DS$MEMSIZE::                             ; Get memory size                         [36]
                0000'   01D8   629          .VECTOR DSX$MEMSIZE,^M<>        ;                                         [36]
    00000002'EF   17    01DA   630          JMP     DSX$MEMSIZE+2           ;                                         [36]
                        01E0   631
                        01E0   632
                        01E0   633          .ALIGN  QUAD
                        01E0   634 ; RESERVED ENTRY POINT.
                0000    01E0   635          .WORD   ^M<>                            ; ENTRY MASK.
    0000001D'EF   17    01E2   636          JMP     RESRVD_ENTRY
                        01E8   637
                        01E8   638          .ALIGN  QUAD
                        01E8   639 ; RESERVED ENTRY POINT.
                0000    01E8   640          .WORD   ^M<>                            ; ENTRY MASK.
              0E   11   01EA   641          BRB     RESRVD                          ; LEAPFROG TO RESERVED ENTRY
                        01EC   642 LEAP_BOOT:
    00000000'EF   17    01EC   643          JMP     BOOT                            ; LEAPFROG TO BOOT
                        01F2   644
                        01F2   645 ; RESERVED ENTRY+2       (SAVE MASK IS HIGH ORDER BITS OF BOOT RELATIVE ADDRESS)
              06   11    01F2   646          BRB     RESRVD                          ; LEAPFROG TO RESERVED_ENTRY
                        01F4   647
                        01F4   648 LEAP_APT:
    00000000'EF   17    01F4   649          JMP     APT                             ; LEAPFROG TO APT ENTRY POINT
                        01FA   650 ; RESERVED ENTRY+2       (SAVE MASK IS HIGH ORDER BITS OF APT RELATIVE ADDRESS)
    0000001D'EF   17    01FA   651 RESRVD: JMP     RESRVD_ENTRY
```

```
                        0200   653 ;
                        0200   654 ; STARLET SYSTEM SERVICE VECTORS.
                        0200   655 ;
                        0200   656         .ALIGN  QUAD
                        0200   657 DS$AQ_SYSSRV::
                        0200   658 SYS$QIOW::                              ; ^X80000000
                0000'   0200   659         .VECTOR EXE$QIO
00000002'9F     16      0202   660         JSB     @#EXE$QIO+2
            00000204    0208   661 EXE$QIO2=.-4                            ; FUDGE ADDRESS OF EXE$QIO+2, SEE SYS$QIO
          03 50   E9    0208   662         BLBC    R0, 10$                 ; SKIP WAIT IF QIO ERROR.
           026C'  31    020B   663         BRW     SYS$WAITFR+2            ; WAIT FOR EVENT FLAG.
                  04    020E   664 10$:     RET
                        020F   665
                        020F   666         .ALIGN  QUAD
                        0210   667 SYS$CALL_HANDL::
 61   04 AE     FA      0210   668         CALLG   4(SP),(R1)              ; CALL EXCEPTION HANDLER
                  05    0214   669         RSB
                        0215   670
                        0215   671         .ALIGN  QUAD
                        0218   672 ; RESERVED ENTRY POINT.
                0000    0218   673         .WORD   ^M<>                    ; ENTRY MASK.
0000001D'EF     17      021A   674         JMP     RESRVD_ENTRY
                        0220   675
                        0220   676         .ALIGN  QUAD
                        0220   677 ; RESERVED ENTRY POINT.
                0000    0220   678         .WORD   ^M<>                    ; ENTRY MASK.
0000001D'EF     17      0222   679         JMP     RESRVD_ENTRY
                        0228   680
                        0228   681         .ALIGN  QUAD
                        0228   682 ; RESERVED ENTRY POINT.
                0000    0228   683         .WORD   ^M<>                    ; ENTRY MASK.
0000001D'EF     17      022A   684         JMP     RESRVD_ENTRY
                        0230   685
                        0230   686         .ALIGN  QUAD
                        0230   687 ; RESERVED ENTRY POINT.
                0000    0230   688         .WORD   ^M<>                    ; ENTRY MASK.
0000001D'EF     17      0232   689         JMP     RESRVD_ENTRY
                        0238   690
                        0238   691         .ALIGN  QUAD
                        0238   692 SYS$ALLOC::                             ; ^X80000038
                0000'   0238   693         .VECTOR EXE$ALLOC
00000002'EF     17      023A   694         JMP     EXE$ALLOC+2
```

```
                        0240   696          .ALIGN  QUAD
                        0240   697 ; RESERVED ENTRY POINT.                    ; ^X80000040
                0000    0240   698          .WORD   ^M<>                     ; ENTRY MASK.
    0000001D'EF   17    0242   699          JMP     RESRVD_ENTRY
                        0248   700
                        0248   701          .ALIGN  QUAD
                        0248   702 SYS$ASCTIM::                              ; ^X80000048
                007C    0248   703          .WORD   ^M<R2,R3,R4,R5,R6>       ; ENTRY MASK.
    00000002'EF   17    024A   704          JMP     EXE$ASCTIM+2
                        0250   705
                        0250   706          .ALIGN  QUAD
                        0250   707 SYS$ASSIGN::                              ; ^X80000050
                0000'   0250   708          .VECTOR EXE$ASSIGN
    00000002'EF   17    0252   709          JMP     EXE$ASSIGN+2
                        0258   710
                        0258   711          .ALIGN  QUAD
                        0258   712 SYS$BINTIM::                              ; ^X80000058
                01FC    0258   713          .WORD   ^M<R2,R3,R4,R5,R6,R7,R8>; ENTRY MASK.
    00000002'EF   17    025A   714          JMP     EXE$BINTIM+2
                        0260   715
                        0260   716          .ALIGN  QUAD
                        0260   717 SYS$CANCEL::                              ; ^X80000060
                0000'   0260   718          .VECTOR EXE$CANCEL
    00000002'EF   17    0262   719          JMP     EXE$CANCEL+2
                        0268   720
                        0268   721          .ALIGN  QUAD
                        0268   722 SYS$CANTIM::                              ; ^X80000068
                0000'   0268   723          .VECTOR EXE$CANTIM
    00000002'EF   17    026A   724          JMP     EXE$CANTIM+2
                        0270   725
                        0270   726          .ALIGN  QUAD
                        0270   727 ; RESERVED ENTRY POINT.
                0000    0270   728          .WORD   ^M<>                     ; ENTRY MASK.
    0000001D'EF   17    0272   729          JMP     RESRVD_ENTRY
                        0278   730
                        0278   731          .ALIGN  QUAD
                        0278   732 ; RESERVED ENTRY POINT.
                0000    0278   733          .WORD   ^M<>                     ; ENTRY MASK.
    0000001D'EF   17    027A   734          JMP     RESRVD_ENTRY
```

```
                     0280   736          .ALIGN  QUAD
                     0280   737 ; RESERVED ENTRY POINT.                    ; ^X80000080
                0000 0280   738          .WORD   ^M<>                      ; ENTRY MASK.
    0000001D'EF   17 0282   739          JMP     RESRVD_ENTRY
                     0288   740
                     0288   741          .ALIGN  QUAD
                     0288   742 ; RESERVED ENTRY POINT.
                0000 0288   743          .WORD   ^M<>                      ; ENTRY MASK.
    0000001D'EF   17 028A   744          JMP     RESRVD_ENTRY
                     0290   745
                     0290   746          .ALIGN  QUAD
                     0290   747 ; RESERVED ENTRY POINT.
                0000 0290   748          .WORD   ^M<>                      ; ENTRY MASK.
    0000001D'EF   17 0292   749          JMP     RESRVD_ENTRY
                     0298   750
                     0298   751          .ALIGN  QUAD
                     0298   752 SYS$CLREF::                                ; ^X80000098
                0000' 0298  753          .vector exe$clref
    00000002'EF   17 029A   754          jmp     exe$clref+2
                     02A0   755
                     02A0   756          .ALIGN  QUAD
                     02A0   757 SYS$CNTREG::                               ; ^X800000A0
                0000' 02A0  758          .VECTOR EXE$CNTREG,^M<>
    00000002'EF   17 02A2   759          JMP     EXE$CNTREG+2
                     02A8   760
                     02A8   761          .ALIGN  QUAD
                     02A8   762 ; RESERVED ENTRY POINT.
                0000 02A8   763          .WORD   ^M<>                      ; ENTRY MASK.
    0000001D'EF   17 02AA   764          JMP     RESRVD_ENTRY
                     02B0   765
                     02B0   766          .ALIGN  QUAD
                     02B0   767 ; RESERVED ENTRY POINT.
                0000 02B0   768          .WORD   ^M<>                      ; ENTRY MASK.
    0000001D'EF   17 02B2   769          JMP     RESRVD_ENTRY
                     02B8   770
                     02B8   771          .ALIGN  QUAD
                     02B8   772 ; RESERVED ENTRY POINT.
                0000 02B8   773          .WORD   ^M<>                      ; ENTRY MASK.
    0000001D'EF   17 02BA   774          JMP     RESRVD_ENTRY
```

```
                        02C0   776          .ALIGN  QUAD
                        02C0   777 ; RESERVED ENTRY POINT.                  ; ^X800000C0
                  0000  02C0   778          .WORD   ^M<>                    ; ENTRY MASK.
      0000001D'EF   17  02C2   779          JMP     RESRVD_ENTRY
                        02C8   780
                        02C8   781          .ALIGN  QUAD
                        02C8   782 ; RESERVED ENTRY POINT
                  0000  02C8   783          .WORD   ^M<>                    ; ENTRY MASK.
      0000001D'EF   17  02CA   784          JMP     RESRVD_ENTRY
                        02D0   785
                        02D0   786          .ALIGN  QUAD
                        02D0   787 ; RESERVED ENTRY POINT.
                  0000  02D0   788          .WORD   ^M<>                    ; ENTRY MASK.
      0000001D'EF   17  02D2   789          JMP     RESRVD_ENTRY
                        02D8   790
                        02D8   791          .ALIGN  QUAD
                        02D8   792 SYS$DALLOC::                             ; ^X800000D8
                  0000' 02D8   793          .VECTOR EXE$DALLOC
      00000002'EF   17  02DA   794          JMP     EXE$CANCEL+2
                        02E0   795
                        02E0   796          .ALIGN  QUAD
                        02E0   797 SYS$DASSGN::                             ; ^X800000E0
                  0000' 02E0   798          .VECTOR EXE$DASSGN
      00000002'EF   17  02E2   799          JMP     EXE$DASSGN+2
                        02E8   800
                        02E8   801          .ALIGN  QUAD
                        02E8   802 ; RESERVED ENTRY POINT.
                  0000  02E8   803          .WORD   ^M<>                    ; ENTRY MASK.
      0000001D'EF   17  02EA   804          JMP     RESRVD_ENTRY
                        02F0   805
                        02F0   806          .ALIGN  QUAD
                        02F0   807 ; RESERVED ENTRY POINT.
                  0000  02F0   808          .WORD   ^M<>                    ; ENTRY MASK.
      0000001D'EF   17  02F2   809          JMP     RESRVD_ENTRY
                        02F8   810
                        02F8   811          .ALIGN  QUAD
                        02F8   812 ; RESERVED ENTRY POINT.
                  0000  02F8   813          .WORD   ^M<>                    ; ENTRY MASK.
      0000001D'EF   17  02FA   814          JMP     RESRVD_ENTRY
```

```
                     0300   816          .ALIGN  QUAD
                     0300   817 ; RESERVED ENTRY POINT.                  ; ^X80001000
                0000 0300   818          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17 0302   819          JMP     RESRVD_ENTRY
                     0308   820
                     0308   821          .ALIGN  QUAD
                     0308   822 ; RESERVED ENTRY POINT.
                0000 0308   823          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17 030A   824          JMP     RESRVD_ENTRY
                     0310   825
                     0310   826          .ALIGN  QUAD
                     0310   827 ; RESERVED ENTRY POINT
                0000 0310   828          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17 0312   829          JMP     RESRVD_ENTRY
                     0318   830
                     0318   831          .ALIGN  QUAD
                     0318   832 ; RESERVED ENTRY POINT.
                0000 0318   833          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17 031A   834          JMP     RESRVD_ENTRY
                     0320   835
                     0320   836          .ALIGN  QUAD
                     0320   837 ; RESERVED ENTRY POINT.
                0000 0320   838          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17 0322   839          JMP     RESRVD_ENTRY
                     0328   840
                     0328   841          .ALIGN  QUAD
                     0328   842 ; RESERVED ENTRY POINT.
                0000 0328   843          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17 032A   844          JMP     RESRVD_ENTRY
                     0330   845
                     0330   846          .ALIGN  QUAD
                     0330   847 ; RESERVED ENTRY POINT.
                0000 0330   848          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17 0332   849          JMP     RESRVD_ENTRY
                     0338   850
                     0338   851          .ALIGN  QUAD
                     0338   852 ; RESERVED ENTRY POINT.
                0000 0338   853          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17 033A   854          JMP     RESRVD_ENTRY
```

```
                        0340   856          .ALIGN  QUAD
                        0340   857 SYS$EXIT::                              ; ^X80000140
                   0000 0340   858          .WORD   ^M<>                   ; ENTRY MASK.
                     04 0342   859          RET
                        0343   860
                        0343   861          .ALIGN  QUAD
                        0348   862 SYS$EXPREG::                            ; ^X80000148
                   0000'0348   863          .VECTOR EXE$EXPREG,^M<>
          00000002'EF  17 034A   864          JMP     EXE$EXPREG+2
                        0350   865
                        0350   866          .ALIGN  QUAD
                        0350   867 SYS$FAO::                               ; ^X80000150
                   0FFC 0350   868          .WORD   ^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ; ENTRY MASK.
          00000002'EF  17 0352   869          JMP     EXE$FAO+2
                        0358   870
                        0358   871          .ALIGN  QUAD
                        0358   872 SYS$FAOL::                              ; ^X80000158
                   0FFC 0358   873          .WORD   ^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ; ENTRY MASK.
          00000002'EF  17 035A   874          JMP     EXE$FAOL+2
                        0360   875
                        0360   876          .ALIGN  QUAD
                        0360   877 ; RESERVED ENTRY POINT.
                   0000 0360   878          .WORD   ^M<>                   ; ENTRY MASK.
          0000001D'EF  17 0362   879          JMP     RESRVD_ENTRY
                        0368   880
                        0368   881          .ALIGN  QUAD
                        0368   882 ; RESERVED ENTRY POINT.
                   0000 0368   883          .WORD   ^M<>                   ; ENTRY MASK.
          0000001D'EF  17 036A   884          JMP     RESRVD_ENTRY
                        0370   885
                        0370   886          .ALIGN  QUAD
                        0370   887 ; RESERVED ENTRY POINT.
                   0000 0370   888          .WORD   ^M<>                   ; ENTRY MASK.
          0000001D'EF  17 0372   889          JMP     RESRVD_ENTRY
                        0378   890
                        0378   891          .ALIGN  QUAD
                        0378   892 SYS$GETTIM::                            ; ^X80000178
                   0000 0378   893          .WORD   ^M<>                   ; ENTRY MASK.
          00000002'EF  17 037A   894          JMP     EXE$GETTIM+2
```

```
                     0380   896          .ALIGN  QUAD
                     0380   897 SYS$GTCHAN::                        ; ^X80000180
                0000' 0380   898          .VECTOR EXE$GTCHAN
    00000002'EF   17 0382   899          JMP     EXE$GTCHAN+2
                     0388   900
                     0388   901          .ALIGN  QUAD
                     0388   902 SYS$HIBER::                         ; ^X80000188
                0000' 0388   903          .VECTOR EXE$HIBER
    00000002'EF   17 038A   904          JMP     EXE$HIBER+2
                     0390   905
                     0390   906          .ALIGN  QUAD
                     0390   907 ; RESERVED ENTRY POINT.
                0000 0390   908          .WORD   ^M<>                ; ENTRY MASK.
    0000001D'EF   17 0392   909          JMP     RESRVD_ENTRY
                     0398   910
                     0398   911          .ALIGN  QUAD
                     0398   912 ; RESERVED ENTRY POINT.
                0000 0398   913          .WORD   ^M<>                ; ENTRY MASK.
    0000001D'EF   17 039A   914          JMP     RESRVD_ENTRY
                     03A0   915
                     03A0   916          .ALIGN  QUAD
                     03A0   917 SYS$LKWSET::                        ; ^X800001A0
                0000 03A0   918          .WORD   0                   ; Entry mask
          50    01   D0 03A2   919          MOVL    #1,R0               ; Indicate success
                     04 03A5   920          RET                         ; Return
                     03A6   921
                     03A6   922          .ALIGN  QUAD
                     03A8   923 ; RESERVED ENTRY POINT.
                0000 03A8   924          .WORD   ^M<>                ; ENTRY MASK.
    0000001D'EF   17 03AA   925          JMP     RESRVD_ENTRY
                     03B0   926
                     03B0   927          .ALIGN  QUAD
                     03B0   928 ; RESERVED ENTRY POINT.
                0000 03B0   929          .WORD   ^M<>                ; ENTRY MASK.
    0000001D'EF   17 03B2   930          JMP     RESRVD_ENTRY
                     03B8   931
                     03B8   932          .ALIGN  QUAD
                     03B8   933 SYS$NUMTIM::                        ; ^X800001B8
                00FC 03B8   934          .WORD   ^M<R2,R3,R4,R5,R6,R7>   ; ENTRY MASK.
    00000002'EF   17 03BA   935          JMP     EXE$NUMTIM+2
```

```
                        03C0   937          .ALIGN  QUAD
                        03C0   938 ; RESERVED ENTRY POINT.                  ; ^X800001C0
                  0000  03C0   939          .WORD   ^M<>                     ; ENTRY MASK.
      0000001D'EF   17  03C2   940          JMP     RESRVD_ENTRY
                        03C8   941
                        03C8   942          .ALIGN  QUAD
                        03C8   943 SYS$QIO::                               ; ^X800001C8
                  0000' 03C8   944          .VECTOR EXE$QIO
          FE36 DF   16  03CA   945          JSB     @EXE$QIO2
                    04  03CE   946          RET
                        03CF   947
                        03CF   948          .ALIGN  QUAD
                        03D0   949 SYS$READEF::                            ; ^X800001D0
                  0000' 03D0   950          .vector exe$readef
      00000002'EF   17  03D2   951          jmp     exe$readef+2
                        03D8   952
                        03D8   953          .ALIGN  QUAD
                        03D8   954 ; RESERVED ENTRY POINT.
                  0000  03D8   955          .WORD   ^M<>                     ; ENTRY MASK.
      0000001D'EF   17  03DA   956          JMP     RESRVD_ENTRY
                        03E0   957
                        03E0   958          .ALIGN  QUAD
                        03E0   959 ; RESERVED ENTRY POINT.
                  0000  03E0   960          .WORD   ^M<>                     ; ENTRY MASK.
      0000001D'EF   17  03E2   961          JMP     RESRVD_ENTRY
                        03E8   962
                        03E8   963          .ALIGN  QUAD
                        03E8   964 ; RESERVED ENTRY POINT.
                  0000  03E8   965          .WORD   ^M<>                     ; ENTRY MASK.
      0000001D'EF   17  03EA   966          JMP     RESRVD_ENTRY
                        03F0   967
                        03F0   968          .ALIGN  QUAD
                        03F0   969 ; RESERVED ENTRY POINT.
                  0000  03F0   970          .WORD   ^M<>                     ; ENTRY MASK.
      0000001D'EF   17  03F2   971          JMP     RESRVD_ENTRY
                        03F8   972
                        03F8   973          .ALIGN  QUAD
                        03F8   974 SYS$SETAST::                            ; ^X800001F8
                  0000' 03F8   975          .VECTOR EXE$SETAST               ; Entry mask
      00000002'EF   17  03FA   976          JMP     EXE$SETAST+2
```

```
                        0400   978          .ALIGN  QUAD
                        0400   979 SYS$SETEF::                          ; ^X80000200
                0000'   0400   980          .vector exe$setef
    00000002'EF   17    0402   981          jmp     exe$setef+2
                        0408   982
                        0408   983          .ALIGN  QUAD
                        0408   984 ; RESERVED ENTRY POINT.
                0000    0408   985          .WORD   ^M<>                 ; ENTRY MASK.
    0000001D'EF   17    040A   986          JMP     RESRVD_ENTRY
                        0410   987
                        0410   988          .ALIGN  QUAD
                        0410   989 ; RESERVED ENTRY POINT.
                0000    0410   990          .WORD   ^M<>                 ; ENTRY MASK.
    0000001D'EF   17    0412   991          JMP     RESRVD_ENTRY
                        0418   992
                        0418   993          .ALIGN  QUAD
                        0418   994 ; RESERVED ENTRY POINT.
                0000    0418   995          .WORD   ^M<>                 ; ENTRY MASK.
    0000001D'EF   17    041A   996          JMP     RESRVD_ENTRY
                        0420   997
                        0420   998          .ALIGN  QUAD
                        0420   999 SYS$SETIMR::                          ; ^X80000220
                0000'   0420  1000          .VECTOR EXE$SETIMR
    00000002'EF   17    0422  1001          JMP     EXE$SETIMR+2
                        0428  1002
                        0428  1003          .ALIGN  QUAD
                        0428  1004 SYS$SETPRI::                          ; ^X80000228
                0000    0428  1005          .WORD   0                    ; Entry mask
          50    01      D0    042A  1006          MOVL    #1,R0          ; Indicate success
                        04    042D  1007          RET                    ; Return
                        042E  1008
                        042E  1009          .ALIGN  QUAD
                        0430  1010 SYS$SETPRT::                          ; ^X80000230
                0000'   0430  1011          .VECTOR EXE$SETPRT,^M<>      ; ENTRY MASK.
    00000002'EF   17    0432  1012          JMP     EXE$SETPRT+2
                        0438  1013
                        0438  1014          .ALIGN  QUAD
                        0438  1015 SYS$SETRWM::                          ; ^X80000238
                0000    0438  1016          .WORD   0                    ; Entry mask
          50    01      D0    043A  1017          MOVL    #1,R0          ; Indicate success
                        04    043D  1018          RET                    ; Return
```

```
                        043E  1020          .ALIGN  QUAD
                        0440  1021 ; RESERVED ENTRY POINT.                  ; ^X80000240
                  0000  0440  1022          .WORD   ^M<>                    ; ENTRY MASK.
      0000001D'EF   17  0442  1023          JMP     RESRVD_ENTRY
                        0448  1024
                        0448  1025          .ALIGN  QUAD
                        0448  1026 ; RESERVED ENTRY POINT.
                  0000  0448  1027          .WORD   ^M<>                    ; ENTRY MASK.
      0000001D'EF   17  044A  1028          JMP     RESRVD_ENTRY
                        0450  1029
                        0450  1030          .ALIGN  QUAD
                        0450  1031 ; RESERVED ENTRY POINT.
                  0000  0450  1032          .WORD   ^M<>                    ; ENTRY MASK.
      0000001D'EF   17  0452  1033          JMP     RESRVD_ENTRY
                        0458  1034
                        0458  1035          .ALIGN  QUAD
                        0458  1036 SYS$TRNLOG::                             ; ^X80000258
                  0000  0458  1037          .WORD   ^M<>                    ; ENTRY MASK.
      0000001D'EF   17  045A  1038          JMP     RESRVD_ENTRY
                        0460  1039
                        0460  1040          .ALIGN  QUAD
                        0460  1041 SYS$ULKPAG::                             ; ^X80000260
                  0000  0460  1042          .WORD   0                       ; Entry mask
          50  01    D0  0462  1043          MOVL    #1,R0                   ; Indicate success
                    04  0465  1044          RET                             ; Return
                        0466  1045
                        0466  1046          .ALIGN  QUAD
                        0468  1047 SYS$ULWSET::                             ; ^X80000268
                  0000  0468  1048          .WORD   0                       ; Entry mask
          50  01    D0  046A  1049          MOVL    #1,R0                   ; Indicate success
                    04  046D  1050          RET                             ; Return
                        046E  1051
                        046E  1052          .ALIGN  QUAD
                        0470  1053 SYS$UNWIND::
                  0000' 0470  1054          .VECTOR EXE$UNWIND
      00000002'EF   17  0472  1055          JMP     EXE$UNWIND+2
                        0478  1056
                        0478  1057          .ALIGN  QUAD
                        0478  1058 SYS$WAITFR::                             ; ^X80000278
                  0000' 0478  1059          .vector exe$waitfr
      00000002'EF   17  047A  1060          jmp     exe$waitfr+2
```

```
                        0480  1062          .ALIGN  QUAD
                        0480  1063 SYS$WAKE::                              ; ^X80000280
                0000'   0480  1064          .VECTOR EXE$WAKE
    00000002'EF   17    0482  1065          JMP     EXE$WAKE+2
                        0488  1066
                        0488  1067          .ALIGN  QUAD
                        0488  1068 SYS$WFLAND::                            ; ^X80000288
                0000'   0488  1069          .vector exe$wfland
    00000002'EF   17    048A  1070          jmp     exe$wfland+2
                        0490  1071
                        0490  1072          .ALIGN  QUAD
                        0490  1073 SYS$WFLOR::                             ; ^X80000290
                0000'   0490  1074          .vector exe$wflor
    00000002'EF   17    0492  1075          jmp     exe$wflor+2
                        0498  1076
                        0498  1077          .ALIGN  QUAD
                        0498  1078 ; RESERVED ENTRY POINT.
                0000    0498  1079          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    049A  1080          JMP     RESRVD_ENTRY
                        04A0  1081
                        04A0  1082          .ALIGN  QUAD
                        04A0  1083 ; RESERVED ENTRY POINT.
                0000    04A0  1084          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    04A2  1085          JMP     RESRVD_ENTRY
                        04A8  1086
                        04A8  1087          .ALIGN  QUAD
                        04A8  1088 ; RESERVED ENTRY POINT.
                0000    04A8  1089          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    04AA  1090          JMP     RESRVD_ENTRY
                        04B0  1091
                        04B0  1092          .ALIGN  QUAD
                        04B0  1093 ; RESERVED ENTRY POINT.
                0000    04B0  1094          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    04B2  1095          JMP     RESRVD_ENTRY
                        04B8  1096
                        04B8  1097          .ALIGN  QUAD
                        04B8  1098 ; RESERVED ENTRY POINT.
                0000    04B8  1099          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    04BA  1100          JMP     RESRVD_ENTRY
```

```
                        04C0  1102          .ALIGN  QUAD
                        04C0  1103 ; RESERVED ENTRY POINT.                  ; ^X800002C0
                0000    04C0  1104          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    04C2  1105          JMP     RESRVD_ENTRY
                        04C8  1106
                        04C8  1107          .ALIGN  QUAD
                        04C8  1108 SYS$GETCHN::                             ; ^X800002C8
                0000'   04C8  1109          .VECTOR EXE$GTCHAN
    00000002'EF   17    04CA  1110          JMP     EXE$GTCHAN+2
                        04D0  1111
                        04D0  1112          .ALIGN  QUAD
                        04D0  1113 ; RESERVED ENTRY POINT.
                0000    04D0  1114          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    04D2  1115          JMP     RESRVD_ENTRY
                        04D8  1116
                        04D8  1117          .ALIGN  QUAD
                        04D8  1118 ; RESERVED ENTRY POINT.
                0000    04D8  1119          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    04DA  1120          JMP     RESRVD_ENTRY
                        04E0  1121
                        04E0  1122          .ALIGN  QUAD
                        04E0  1123 ; RESERVED ENTRY POINT.
                0000    04E0  1124          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    04E2  1125          JMP     RESRVD_ENTRY
                        04E8  1126
                        04E8  1127          .ALIGN  QUAD
                        04E8  1128 ; RESERVED ENTRY POINT.
                0000    04E8  1129          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    04EA  1130          JMP     RESRVD_ENTRY
                        04F0  1131
                        04F0  1132          .ALIGN  QUAD
                        04F0  1133 ; RESERVED ENTRY POINT.
                0000    04F0  1134          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    04F2  1135          JMP     RESRVD_ENTRY
                        04F8  1136
                        04F8  1137          .ALIGN  QUAD
                        04F8  1138 ; RESERVED ENTRY POINT.
                0000    04F8  1139          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    04FA  1140          JMP     RESRVD_ENTRY
```

```
                        0500  1142          .ALIGN  QUAD
                        0500  1143 ; RESERVED ENTRY POINT.                ; ^X80000300
                0000    0500  1144          .WORD   ^M<>                  ; ENTRY MASK.
    0000001D'EF   17    0502  1145          JMP     RESRVD_ENTRY
                        0508  1146
                        0508  1147          .ALIGN  QUAD
                        0508  1148 ; RESERVED ENTRY POINT.
                0000    0508  1149          .WORD   ^M<>                  ; ENTRY MASK.
    0000001D'EF   17    050A  1150          JMP     RESRVD_ENTRY
                        0510  1151
                        0510  1152          .ALIGN  QUAD
                        0510  1153 ; RESERVED ENTRY POINT.
                0000    0510  1154          .WORD   ^M<>                  ; ENTRY MASK.
    0000001D'EF   17    0512  1155          JMP     RESRVD_ENTRY
                        0518  1156
                        0518  1157          .ALIGN  QUAD
                        0518  1158 ; RESERVED ENTRY POINT.
                0000    0518  1159          .WORD   ^M<>                  ; ENTRY MASK.
    0000001D'EF   17    051A  1160          JMP     RESRVD_ENTRY
                        0520  1161
                        0520  1162          .ALIGN  QUAD
                        0520  1163 ; RESERVED ENTRY POINT.
                0000    0520  1164          .WORD   ^M<>                  ; ENTRY MASK.
    0000001D'EF   17    0522  1165          JMP     RESRVD_ENTRY
                        0528  1166
                        0528  1167          .ALIGN  QUAD
                        0528  1168 ; RESERVED ENTRY POINT.
                0000    0528  1169          .WORD   ^M<>                  ; ENTRY MASK.
    0000001D'EF   17    052A  1170          JMP     RESRVD_ENTRY
                        0530  1171
                        0530  1172          .ALIGN  QUAD
                        0530  1173 ; RESERVED ENTRY POINT.
                0000    0530  1174          .WORD   ^M<>                  ; ENTRY MASK.
    0000001D'EF   17    0532  1175          JMP     RESRVD_ENTRY
                        0538  1176
                        0538  1177          .ALIGN  QUAD
                        0538  1178 ; RESERVED ENTRY POINT.
                0000    0538  1179          .WORD   ^M<>                  ; ENTRY MASK.
    0000001D'EF   17    053A  1180          JMP     RESRVD_ENTRY
```

```
                     0540  1182          .ALIGN  QUAD
                     0540  1183 ; RESERVED ENTRY POINT                    ; ^X80000340
                0000 0540  1184          .WORD   ^M<>                     ; ENTRY MASK.
    0000001D'EF   17 0542  1185          JMP     RESRVD_ENTRY
                     0548  1186
                     0548  1187          .ALIGN  QUAD
                     0548  1188 ; RESERVED ENTRY POINT.
                0000 0548  1189          .WORD   ^M<>                     ; ENTRY MASK.
    0000001D'EF   17 054A  1190          JMP     RESRVD_ENTRY
                     0550  1191
                     0550  1192          .ALIGN  QUAD
                     0550  1193 ; RESERVED ENTRY POINT.
                0000 0550  1194          .WORD   ^M<>                     ; ENTRY MASK.
    0000001D'EF   17 0552  1195          JMP     RESRVD_ENTRY
                     0558  1196
                     0558  1197          .ALIGN  QUAD
                     0558  1198 ; RESERVED ENTRY POINT.
                0000 0558  1199          .WORD   ^M<>                     ; ENTRY MASK.
    0000001D'EF   17 055A  1200          JMP     RESRVD_ENTRY
                     0560  1201
                     0560  1202          .ALIGN  QUAD
                     0560  1203 ; RESERVED ENTRY POINT.
                0000 0560  1204          .WORD   ^M<>                     ; ENTRY MASK.
    0000001D'EF   17 0562  1205          JMP     RESRVD_ENTRY
                     0568  1206
                     0568  1207          .ALIGN  QUAD
                     0568  1208 ; RESERVED ENTRY POINT.
                0000 0568  1209          .WORD   ^M<>                     ; ENTRY MASK.
    0000001D'EF   17 056A  1210          JMP     RESRVD_ENTRY
                     0570  1211
                     0570  1212          .ALIGN  QUAD
                     0570  1213 ; RESERVED ENTRY POINT.
                0000 0570  1214          .WORD   ^M<>                     ; ENTRY MASK.
    0000001D'EF   17 0572  1215          JMP     RESRVD_ENTRY
                     0578  1216
                     0578  1217          .ALIGN  QUAD
                     0578  1218 ; RESERVED ENTRY POINT.
                0000 0578  1219          .WORD   ^M<>                     ; ENTRY MASK.
    0000001D'EF   17 057A  1220          JMP     RESRVD_ENTRY
```

```
                        0580  1222          .ALIGN  QUAD
                        0580  1223 SYS$GET::                                  ; ^X80000380
                0000'   0580  1224          .VECTOR RMS$GET
    00000002'EF   17    0582  1225          JMP     RMS$GET+2
                        0588  1226
                        0588  1227          .ALIGN  QUAD
                        0588  1228 ; RESERVED ENTRY POINT.
                0000    0588  1229          .WORD   ^M<>                        ; ENTRY MASK.
    0000001D'EF   17    058A  1230          JMP     RESRVD_ENTRY
                        0590  1231
                        0590  1232          .ALIGN  QUAD
                        0590  1233 SYS$READ::
                0000'   0590  1234          .VECTOR RMS$READ
    00000002'EF   17    0592  1235          JMP     RMS$READ+2                  ; ^X80000390
                        0598  1236
                        0598  1237          .ALIGN  QUAD
                        0598  1238 ; RESERVED ENTRY POINT.
                0000    0598  1239          .WORD   ^M<>                        ; ENTRY MASK.
    0000001D'EF   17    059A  1240          JMP     RESRVD_ENTRY
                        05A0  1241
                        05A0  1242          .ALIGN  QUAD
                        05A0  1243 ; RESERVED ENTRY POINT.
                0000    05A0  1244          .WORD   ^M<>                        ; ENTRY MASK.
    0000001D'EF   17    05A2  1245          JMP     RESRVD_ENTRY
                        05A8  1246
                        05A8  1247          .ALIGN  QUAD
                        05A8  1248 ; RESERVED ENTRY POINT.
                0000    05A8  1249          .WORD   ^M<>                        ; ENTRY MASK.
    0000001D'EF   17    05AA  1250          JMP     RESRVD_ENTRY
                        05B0  1251
                        05B0  1252          .ALIGN  QUAD
                        05B0  1253 ; RESERVED ENTRY POINT.
                0000    05B0  1254          .WORD   ^M<>                        ; ENTRY MASK.
    0000001D'EF   17    05B2  1255          JMP     RESRVD_ENTRY
                        05B8  1256
                        05B8  1257          .ALIGN  QUAD
                        05B8  1258 SYS$CLOSE::
                0000'   05B8  1259          .VECTOR RMS$CLOSE
    00000002'EF   17    05BA  1260          JMP     RMS$CLOSE+2
```

```
                        05C0  1262          .ALIGN  QUAD
                        05C0  1263 SYS$CONNECT::                            ; ^X800003C0
                0000'   05C0  1264          .VECTOR RMS$CONNECT
    00000002'EF   17    05C2  1265          JMP     RMS$CONNECT+2
                        05C8  1266
                        05C8  1267          .ALIGN  QUAD
                        05C8  1268 ; RESERVED ENTRY POINT.
                0000    05C8  1269          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    05CA  1270          JMP     RESRVD_ENTRY
                        05D0  1271
                        05D0  1272          .ALIGN  QUAD
                        05D0  1273 SYS$DISCONNECT::                                 ; ^X800003D0
                0000'   05D0  1274          .VECTOR RMS$DISCONNECT
    00000002'EF   17    05D2  1275          JMP     RMS$DISCONNECT+2
                        05D8  1276
                        05D8  1277          .ALIGN  QUAD
                        05D8  1278 ; RESERVED ENTRY POINT.
                0000    05D8  1279          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    05DA  1280          JMP     RESRVD_ENTRY
                        05E0  1281
                        05E0  1282          .ALIGN  QUAD
                        05E0  1283 ; RESERVED ENTRY POINT.
                0000    05E0  1284          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    05E2  1285          JMP     RESRVD_ENTRY
                        05E8  1286
                        05E8  1287          .ALIGN  QUAD
                        05E8  1288 ; RESERVED ENTRY POINT.
                0000    05E8  1289          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    05EA  1290          JMP     RESRVD_ENTRY
                        05F0  1291
                        05F0  1292          .ALIGN  QUAD
                        05F0  1293 ; RESERVED ENTRY POINT.
                0000    05F0  1294          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    05F2  1295          JMP     RESRVD_ENTRY
                        05F8  1296
                        05F8  1297          .ALIGN  QUAD
                        05F8  1298 ; RESERVED ENTRY POINT.
                0000    05F8  1299          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    05FA  1300          JMP     RESRVD_ENTRY
```

```
                        0600  1302          .ALIGN  QUAD
                        0600  1303 ; RESERVED ENTRY POINT.                    ; ^X80000400
                  0000  0600  1304          .WORD   ^M<>                      ; ENTRY MASK.
      00000001D'EF  17  0602  1305          JMP     RESRVD_ENTRY
                        0608  1306
                        0608  1307          .ALIGN  QUAD
                        0608  1308 SYS$OPEN::                                 ; ^X80000408
                  0000' 0608  1309          .VECTOR RMS$OPEN
      00000002'EF  17   060A  1310          JMP     RMS$OPEN+2
                        0610  1311
                        0610  1312
                        0610  1313          .ALIGN  QUAD
                        0610  1314 ; RESERVED ENTRY POINT.
                  0000  0610  1315          .WORD   ^M<>                      ; ENTRY MASK.
      0000001D'EF  17   0612  1316          JMP     RESRVD_ENTRY
                        0618  1317
                        0618  1318          .ALIGN  QUAD
                        0618  1319 ; RESERVED ENTRY POINT.
                  0000  0618  1320          .WORD   ^M<>                      ; ENTRY MASK.
      0000001D'EF  17   061A  1321          JMP     RESRVD_ENTRY
                        0620  1322
                        0620  1323          .ALIGN  QUAD
                        0620  1324 ; RESERVED ENTRY POINT.
                  0000  0620  1325          .WORD   ^M<>                      ; ENTRY MASK.
      0000001D'EF  17   0622  1326          JMP     RESRVD_ENTRY
                        0628  1327
                        0628  1328          .ALIGN  QUAD
                        0628  1329 ; RESERVED ENTRY POINT.
                  0000  0628  1330          .WORD   ^M<>                      ; ENTRY MASK.
      0000001D'EF  17   062A  1331          JMP     RESRVD_ENTRY
                        0630  1332
                        0630  1333          .ALIGN  QUAD
                        0630  1334 ; RESERVED ENTRY POINT.
                  0000  0630  1335          .WORD   ^M<>                      ; ENTRY MASK.
      0000001D'EF  17   0632  1336          JMP     RESRVD_ENTRY
                        0638  1337
                        0638  1338          .ALIGN  QUAD
                        0638  1339 ; RESERVED ENTRY POINT.
                  0000  0638  1340          .WORD   ^M<>                      ; ENTRY MASK.
      0000001D'EF  17   063A  1341          JMP     RESRVD_ENTRY
```

```
                     0640  1343          .ALIGN  QUAD
                     0640  1344 ; RESERVED ENTRY POINT.                    ; ^X80000440
                0000 0640  1345          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17  0642  1346          JMP     RESRVD_ENTRY
                     0648  1347
                     0648  1348          .ALIGN  QUAD
                     0648  1349 ; RESERVED ENTRY POINT.
                0000 0648  1350          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17  064A  1351          JMP     RESRVD_ENTRY
                     0650  1352
                     0650  1353          .ALIGN  QUAD
                     0650  1354 ; RESERVED ENTRY POINT.
                0000 0650  1355          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17  0652  1356          JMP     RESRVD_ENTRY
                     0658  1357
                     0658  1358          .ALIGN  QUAD
                     0658  1359 ; RESERVED ENTRY POINT.
                0000 0658  1360          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17  065A  1361          JMP     RESRVD_ENTRY
                     0660  1362
                     0660  1363          .ALIGN  QUAD
                     0660  1364 ; RESERVED ENTRY POINT.
                0000 0660  1365          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17  0662  1366          JMP     RESRVD_ENTRY
                     0668  1367
                     0668  1368          .ALIGN  QUAD
                     0668  1369 ; RESERVED ENTRY POINT.
                0000 0668  1370          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17  066A  1371          JMP     RESRVD_ENTRY
                     0670  1372
                     0670  1373          .ALIGN  QUAD
                     0670  1374 ; RESERVED ENTRY POINT.
                0000 0670  1375          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17  0672  1376          JMP     RESRVD_ENTRY
                     0678  1377
                     0678  1378          .ALIGN  QUAD
                     0678  1379 ; RESERVED ENTRY POINT.
                0000 0678  1380          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17  067A  1381          JMP     RESRVD_ENTRY
```

```
                        0680  1383          .ALIGN  QUAD
                        0680  1384 ; RESERVED ENTRY POINT.                  ; ^X80000480
                0000    0680  1385          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    0682  1386          JMP     RESRVD_ENTRY
                        0688  1387
                        0688  1388          .ALIGN  QUAD
                        0688  1389 ; RESERVED ENTRY POINT.
                0000    0688  1390          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    068A  1391          JMP     RESRVD_ENTRY
                        0690  1392
                        0690  1393          .ALIGN  QUAD
                        0690  1394 ; RESERVED ENTRY POINT.
                0000    0690  1395          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    0692  1396          JMP     RESRVD_ENTRY
                        0698  1397
                        0698  1398          .ALIGN  QUAD
                        0698  1399 ; RESERVED ENTRY POINT.
                0000    0698  1400          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    069A  1401          JMP     RESRVD_ENTRY
                        06A0  1402
                        06A0  1403          .ALIGN  QUAD
                        06A0  1404 ; RESERVED ENTRY POINT.
                0000    06A0  1405          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    06A2  1406          JMP     RESRVD_ENTRY
                        06A8  1407
                        06A8  1408          .ALIGN  QUAD
                        06A8  1409 ; RESERVED ENTRY POINT.
                0000    06A8  1410          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    06AA  1411          JMP     RESRVD_ENTRY
                        06B0  1412
                        06B0  1413          .ALIGN  QUAD
                        06B0  1414 ; RESERVED ENTRY POINT.
                0000    06B0  1415          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    06B2  1416          JMP     RESRVD_ENTRY
                        06B8  1417
                        06B8  1418          .ALIGN  QUAD
                        06B8  1419 ; RESERVED ENTRY POINT.
                0000    06B8  1420          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    06BA  1421          JMP     RESRVD_ENTRY
```

```
                        06C0  1423          .ALIGN  QUAD
                        06C0  1424 ; RESERVED ENTRY POINT.                  ; ^X800004C0
                0000    06C0  1425          .WORD   ^M<>                    ; ENTRY MASK.
0000001D'EF      17     06C2  1426          JMP     RESRVD_ENTRY
                        06C8  1427
                        06C8  1428          .ALIGN  QUAD
                        06C8  1429 ; RESERVED ENTRY POINT.
                0000    06C8  1430          .WORD   ^M<>                    ; ENTRY MASK.
0000001D'EF      17     06CA  1431          JMP     RESRVD_ENTRY
                        06D0  1432
                        06D0  1433          .ALIGN  QUAD
                        06D0  1434 ; RESERVED ENTRY POINT.
                0000    06D0  1435          .WORD   ^M<>                    ; ENTRY MASK.
0000001D'EF      17     06D2  1436          JMP     RESRVD_ENTRY
                        06D8  1437
                        06D8  1438          .ALIGN  QUAD
                        06D8  1439 ; RESERVED ENTRY POINT.
                0000    06D8  1440          .WORD   ^M<>                    ; ENTRY MASK.
0000001D'EF      17     06DA  1441          JMP     RESRVD_ENTRY
                        06E0  1442
                        06E0  1443          .ALIGN  QUAD
                        06E0  1444 ; RESERVED ENTRY POINT.
                0000    06E0  1445          .WORD   ^M<>                    ; ENTRY MASK.
0000001D'EF      17     06E2  1446          JMP     RESRVD_ENTRY
                        06E8  1447
                        06E8  1448          .ALIGN  QUAD
                        06E8  1449 ; RESERVED ENTRY POINT.
                0000    06E8  1450          .WORD   ^M<>                    ; ENTRY MASK.
0000001D'EF      17     06EA  1451          JMP     RESRVD_ENTRY
                        06F0  1452
                        06F0  1453          .ALIGN  QUAD
                        06F0  1454 ; RESERVED ENTRY POINT.
                0000    06F0  1455          .WORD   ^M<>                    ; ENTRY MASK.
0000001D'EF      17     06F2  1456          JMP     RESRVD_ENTRY
                        06F8  1457
                        06F8  1458          .ALIGN  QUAD
                        06F8  1459 ; RESERVED ENTRY POINT.
                0000    06F8  1460          .WORD   ^M<>                    ; ENTRY MASK.
0000001D'EF      17     06FA  1461          JMP     RESRVD_ENTRY
```

```
                        0700  1463          .ALIGN  QUAD
                        0700  1464 ; RESERVED ENTRY POINT.                    ; ^X80000500
                0000    0700  1465          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17     0702  1466          JMP     RESRVD_ENTRY
                        0708  1467
                        0708  1468          .ALIGN  QUAD
                        0708  1469 ; RESERVED ENTRY POINT.
                0000    0708  1470          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17     070A  1471          JMP     RESRVD_ENTRY
                        0710  1472
                        0710  1473          .ALIGN  QUAD
                        0710  1474 ; RESERVED ENTRY POINT.
                0000    0710  1475          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17     0712  1476          JMP     RESRVD_ENTRY
                        0718  1477
                        0718  1478          .ALIGN  QUAD
                        0718  1479 ; RESERVED ENTRY POINT.
                0000    0718  1480          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17     071A  1481          JMP     RESRVD_ENTRY
                        0720  1482
                        0720  1483          .ALIGN  QUAD
                        0720  1484 ; RESERVED ENTRY POINT.
                0000    0720  1485          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17     0722  1486          JMP     RESRVD_ENTRY
                        0728  1487
                        0728  1488          .ALIGN  QUAD
                        0728  1489 ; RESERVED ENTRY POINT.
                0000    0728  1490          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17     072A  1491          JMP     RESRVD_ENTRY
                        0730  1492
                        0730  1493          .ALIGN  QUAD
                        0730  1494 ; RESERVED ENTRY POINT.
                0000    0730  1495          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17     0732  1496          JMP     RESRVD_ENTRY
                        0738  1497
                        0738  1498          .ALIGN  QUAD
                        0738  1499 ; RESERVED ENTRY POINT.
                0000    0738  1500          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17     073A  1501          JMP     RESRVD_ENTRY
```

```
                        0740  1503          .ALIGN  QUAD
                        0740  1504 ; RESERVED ENTRY POINT.                    ; ^X80000540
                0000    0740  1505          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17     0742  1506          JMP     RESRVD_ENTRY
                        0748  1507
                        0748  1508          .ALIGN  QUAD
                        0748  1509 ; RESERVED ENTRY POINT.
                0000    0748  1510          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17     074A  1511          JMP     RESRVD_ENTRY
                        0750  1512
                        0750  1513          .ALIGN  QUAD
                        0750  1514 ; RESERVED ENTRY POINT.
                0000    0750  1515          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17     0752  1516          JMP     RESRVD_ENTRY
                        0758  1517
                        0758  1518          .ALIGN  QUAD
                        0758  1519 ; RESERVED ENTRY POINT.
                0000    0758  1520          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17     075A  1521          JMP     RESRVD_ENTRY
                        0760  1522
                        0760  1523          .ALIGN  QUAD
                        0760  1524 ; RESERVED ENTRY POINT.
                0000    0760  1525          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17     0762  1526          JMP     RESRVD_ENTRY
                        0768  1527
                        0768  1528          .ALIGN  QUAD
                        0768  1529 ; RESERVED ENTRY POINT.
                0000    0768  1530          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17     076A  1531          JMP     RESRVD_ENTRY
                        0770  1532
                        0770  1533          .ALIGN  QUAD
                        0770  1534 ; RESERVED ENTRY POINT.
                0000    0770  1535          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17     0772  1536          JMP     RESRVD_ENTRY
                        0778  1537
                        0778  1538          .ALIGN  QUAD
                        0778  1539 ; RESERVED ENTRY POINT.
                0000    0778  1540          .WORD   ^M<>                      ; ENTRY MASK.
0000001D'EF      17     077A  1541          JMP     RESRVD_ENTRY
```

```
                        0780  1543          .ALIGN  QUAD
                        0780  1544 ; RESERVED ENTRY POINT.                    ; ^X80000580
                0000    0780  1545          .WORD   ^M<>                      ; ENTRY MASK.
    0000001D'EF   17    0782  1546          JMP     RESRVD_ENTRY
                        0788  1547
                        0788  1548          .ALIGN  QUAD
                        0788  1549 ; RESERVED ENTRY POINT.
                0000    0788  1550          .WORD   ^M<>                      ; ENTRY MASK.
    0000001D'EF   17    078A  1551          JMP     RESRVD_ENTRY
                        0790  1552
                        0790  1553          .ALIGN  QUAD
                        0790  1554 ; RESERVED ENTRY POINT.
                0000    0790  1555          .WORD   ^M<>                      ; ENTRY MASK.
    0000001D'EF   17    0792  1556          JMP     RESRVD_ENTRY
                        0798  1557
                        0798  1558          .ALIGN  QUAD
                        0798  1559 ; RESERVED ENTRY POINT.
                0000    0798  1560          .WORD   ^M<>                      ; ENTRY MASK.
    0000001D'EF   17    079A  1561          JMP     RESRVD_ENTRY
                        07A0  1562
                        07A0  1563          .ALIGN  QUAD
                        07A0  1564 ; RESERVED ENTRY POINT.
                0000    07A0  1565          .WORD   ^M<>                      ; ENTRY MASK.
    0000001D'EF   17    07A2  1566          JMP     RESRVD_ENTRY
                        07A8  1567
                        07A8  1568          .ALIGN  QUAD
                        07A8  1569 ; RESERVED ENTRY POINT.
                0000    07A8  1570          .WORD   ^M<>                      ; ENTRY MASK.
    0000001D'EF   17    07AA  1571          JMP     RESRVD_ENTRY
                        07B0  1572
                        07B0  1573          .ALIGN  QUAD
                        07B0  1574 ; RESERVED ENTRY POINT.
                0000    07B0  1575          .WORD   ^M<>                      ; ENTRY MASK.
    0000001D'EF   17    07B2  1576          JMP     RESRVD_ENTRY
                        07B8  1577
                        07B8  1578          .ALIGN  QUAD
                        07B8  1579 ; RESERVED ENTRY POINT.
                0000    07B8  1580          .WORD   ^M<>                      ; ENTRY MASK.
    0000001D'EF   17    07BA  1581          JMP     RESRVD_ENTRY
```

```
                        07C0  1583          .ALIGN  QUAD
                        07C0  1584 ; RESERVED ENTRY POINT.                  ; ^X80005C0
                0000    07C0  1585          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    07C2  1586          JMP     RESRVD_ENTRY
                        07C8  1587
                        07C8  1588          .ALIGN  QUAD
                        07C8  1589 ; RESERVED ENTRY POINT.
                0000    07C8  1590          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    07CA  1591          JMP     RESRVD_ENTRY
                        07D0  1592
                        07D0  1593          .ALIGN  QUAD
                        07D0  1594 ; RESERVED ENTRY POINT.
                0000    07D0  1595          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    07D2  1596          JMP     RESRVD_ENTRY
                        07D8  1597
                        07D8  1598          .ALIGN  QUAD
                        07D8  1599 ; RESERVED ENTRY POINT.
                0000    07D8  1600          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    07DA  1601          JMP     RESRVD_ENTRY
                        07E0  1602
                        07E0  1603          .ALIGN  QUAD
                        07E0  1604 ; RESERVED ENTRY POINT.
                0000    07E0  1605          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    07E2  1606          JMP     RESRVD_ENTRY
                        07E8  1607
                        07E8  1608          .ALIGN  QUAD
                        07E8  1609 ; RESERVED ENTRY POINT.
                0000    07E8  1610          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    07EA  1611          JMP     RESRVD_ENTRY
                        07F0  1612
                        07F0  1613          .ALIGN  QUAD
                        07F0  1614 ; RESERVED ENTRY POINT.
                0000    07F0  1615          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    07F2  1616          JMP     RESRVD_ENTRY
                        07F8  1617
                        07F8  1618          .ALIGN  QUAD
                        07F8  1619 ; RESERVED ENTRY POINT.
                0000    07F8  1620          .WORD   ^M<>                    ; ENTRY MASK.
    0000001D'EF   17    07FA  1621          JMP     RESRVD_ENTRY
                        0800  1622
                        0800  1623          .ALIGN  QUAD
            000007FF    0800  1624 DS$AQ_SSEND      == . - 1
            00000600    0800  1625 DS$K_SSSIZE      == . - DS$AQ_SYSSRV
```

```
                        0800  1627 ;++
                        0800  1628 ; FUNCTIONAL DESCRIPTION:
                        0800  1629 ;
                        0800  1630 ;       These entry points are fixed to allow VMS device drivers
                        0800  1631 ;       a static program interface to the common utility and
                        0800  1632 ;       support routines.  Note that the absolute addresses
                        0800  1633 ;       of these entry points are defined only in $QIOVEC_DEF in
                        0800  1634 ;       DS.MLB.
                        0800  1635 ;
                        0800  1636 ;--
                        0800  1637 SYS$GL_OPRMBX::
                00000000  0800  1638         .LONG   0                       ; ^X10800
                        0804  1639 MMG$GL_SPTBASE::
                00000000  0804  1640         .LONG   0                       ; ^X10804
                        0808  1641 MMG$GL_P0BASE::
                00000000' 0808  1642         .LONG   P0PT_BASE               ; ^X10808
                        080C  1643 SCH$GL_PCBVEC::
                00000000' 080C  1644         .ADDRESS        DS$GL_PCBVEC    ; Address of PCB vector
                00000000  0810  1645 EXE$GL_ABSTIM:: .LONG   0                       ; EXE$GL_ABSTIM, time in secs
                00000000  0814  1646                .LONG   0                       ; Unused
                00000818' 0818  1647 IOC$GL_PSFL::   .LONG   IOC$GL_PSFL
                00000818' 081C  1648 IOC$GL_PSBL::   .LONG   IOC$GL_PSFL
                        0820  1649         .ALIGN  QUAD
      00000000'9F   17  0820  1650         JMP     a#ACP$ACCESS
                        0826  1651         .ALIGN  QUAD
      00000000'9F   17  0828  1652         JMP     a#ACP$DEACCESS
                        082E  1653         .ALIGN  QUAD
      00000000'9F   17  0830  1654         JMP     a#ACP$MODIFY
                        0836  1655         .ALIGN  QUAD
      00000000'9F   17  0838  1656         JMP     a#ACP$MOUNT
                        083E  1657         .ALIGN  QUAD
      00000000'9F   17  0840  1658         JMP     a#ACP$READBLK
                        0846  1659         .ALIGN  QUAD
      00000000'9F   17  0848  1660         JMP     a#ACP$WRITEBLK
                        084E  1661         .ALIGN  QUAD
      00000000'9F   17  0850  1662         JMP     a#ERL$DEVICERR
                        0856  1663         .ALIGN  QUAD
      00000000'9F   17  0858  1664         JMP     a#ERL$DEVICTMO
                        085E  1665         .ALIGN  QUAD
      00000000'9F   17  0860  1666         JMP     a#EXE$ABORTIO
                        0866  1667         .ALIGN  QUAD
      00000000'9F   17  0868  1668         JMP     a#EXE$IOFORK
                        086E  1669         .ALIGN  QUAD
      00000000'9F   17  0870  1670         JMP     a#EXE$ONEPARM
                        0876  1671         .ALIGN  QUAD
      00000000'9F   17  0878  1672         JMP     a#EXE$PWRTIMCHK
                        087E  1673         .ALIGN  QUAD
      00000000'9F   17  0880  1674         JMP     a#EXE$SENSEMODE
                        0886  1675         .ALIGN  QUAD
      00000000'9F   17  0888  1676         JMP     a#EXE$SETCHAR
                        088E  1677         .ALIGN  QUAD
      00000000'9F   17  0890  1678         JMP     a#EXE$SETMODE
                        0896  1679         .ALIGN  QUAD
      00000000'9F   17  0898  1680         JMP     a#EXE$SNDEVMSG
                        089E  1681         .ALIGN  QUAD
      00000000'9F   17  08A0  1682         JMP     a#EXE$ZEROPARM
                        08A6  1683         .ALIGN  QUAD
```

```
00000000'9F   17  08A8  1684          JMP     a#IOC$APPLYECC
                  08AE  1685          .ALIGN  QUAD
00000000'9F   17  08B0  1686          JMP     a#IOC$CANCELIO
                  08B6  1687          .ALIGN  QUAD
00000000'9F   17  08B8  1688          JMP     a#IOC$DIAGBUFILL
                  08BE  1689          .ALIGN  QUAD
00000000'9F   17  08C0  1690          JMP     a#IOC$LOADMBAMAP
                  08C6  1691          .ALIGN  QUAD
00000000'9F   17  08C8  1692          JMP     a#IOC$LOADUBAMAP
                  08CE  1693          .ALIGN  QUAD
00000000'9F   17  08D0  1694          JMP     a#IOC$MOVTOUSER
                  08D6  1695          .ALIGN  QUAD
00000000'9F   17  08D8  1696          JMP     a#IOC$PURGDATAP
                  08DE  1697          .ALIGN  QUAD
00000000'9F   17  08E0  1698          JMP     a#IOC$RELCHAN
                  08E6  1699          .ALIGN  QUAD
00000000'9F   17  08E8  1700          JMP     a#IOC$RELDATAP
                  08EE  1701          .ALIGN  QUAD
00000000'9F   17  08F0  1702          JMP     a#IOC$RELMAPREG
                  08F6  1703          .ALIGN  QUAD
00000000'9F   17  08F8  1704          JMP     a#IOC$RELSCHAN
                  08FE  1705          .ALIGN  QUAD
00000000'9F   17  0900  1706          JMP     a#IOC$REQCOM
                  0906  1707          .ALIGN  QUAD
00000000'9F   17  0908  1708          JMP     a#IOC$REQDATAP
                  090E  1709          .ALIGN  QUAD
00000000'9F   17  0910  1710          JMP     a#IOC$REQMAPREG
                  0916  1711          .ALIGN  QUAD
00000000'9F   17  0918  1712          JMP     a#IOC$REQPCHANH
                  091E  1713          .ALIGN  QUAD
00000000'9F   17  0920  1714          JMP     a#IOC$REQPCHANL
                  0926  1715          .ALIGN  QUAD
00000000'9F   17  0928  1716          JMP     a#IOC$REQSCHANL
                  092E  1717          .ALIGN  QUAD
00000000'9F   17  0930  1718 IOC$RTN::JMP     a#IOC$RETURN          ; Defined external for QIO
                  0936  1719          .ALIGN  QUAD
00000000'9F   17  0938  1720          JMP     a#IOC$SENSEDISK
                  093E  1721          .ALIGN  QUAD
00000000'9F   17  0940  1722          JMP     a#IOC$UPDATRANSP
                  0946  1723          .ALIGN  QUAD
00000000'9F   17  0948  1724          JMP     a#IOC$WFIKPCH
                  094E  1725          .ALIGN  QUAD
00000000'9F   17  0950  1726          JMP     a#IOC$WFIRLCH
                  0956  1727          .ALIGN  QUAD
00000000'9F   17  0958  1728          JMP     a#MT$CHECK_ACCESS
                  095E  1729          .ALIGN  QUAD
00000000'9F   17  0960  1730          JMP     a#EXE$ALLOCIRP
                  0966  1731          .ALIGN  QUAD
00000000'9F   17  0968  1732          JMP     a#EXE$ALONONPAGED
                  096E  1733          .ALIGN  QUAD
00000000'9F   17  0970  1734          JMP     a#EXE$DEANONPAGED
                  0976  1735          .ALIGN  QUAD
00000000'9F   17  0978  1736          JMP     a#EXE$FINISHIOC
                  097E  1737          .ALIGN  QUAD
00000000'9F   17  0980  1738          JMP     a#EXE$FORK
                  0986  1739          .ALIGN  QUAD
00000000'9F   17  0988  1740          JMP     a#EXE$MODIFYLOCKR
```

```
                    098E  1741          .ALIGN  QUAD
00000000'9F   17    0990  1742          JMP     a#EXE$QIODRVPKT
                    0996  1743          .ALIGN  QUAD
00000000'9F   17    0998  1744          JMP     a#EXE$WRITELOCK
                    099E  1745          .ALIGN  QUAD
00000000'9F   17    09A0  1746          JMP     a#SCH$POSTEF
                    09A6  1747          .ALIGN  QUAD
00000000'9F   17    09A8  1748          JMP     a#SCH$QAST
                    09AE  1749          .ALIGN  QUAD
00000000'9F   17    09B0  1750          JMP     a#EXE$WRITECHK
                    09B6  1751          .ALIGN  QUAD
00000000'9F   17    09B8  1752          JMP     a#EXE$READLOCKR
                    09BE  1753          .ALIGN  QUAD
00000000'9F   17    09C0  1754          JMP     a#EXE$WRITELOCKR
                    09C6  1755          .ALIGN QUAD
00000000'9F   17    09C8  1756          JMP     a#IOC$INITIATE
                    09CE  1757          .ALIGN  QUAD
00000000'9F   17    09D0  1758          JMP     a#EXE$INSERTIRP
                    09D6  1759          .ALIGN QUAD
00000000'9F   17    09D8  1760          JMP     a#EXE$QIORETURN
                    09DE  1761          .ALIGN   QUAD
00000000'9F   17    09E0  1762          JMP     a#IOC$REQDATAPNW
                    09E6  1763          .ALIGN  QUAD
00000000'9F   17    09E8  1764          JMP     a#COM$POST
                    09EE  1765          .ALIGN  QUAD
00000000'9F   17    09F0  1766          JMP     a#IOC$ALOUBAMAP
                    09F6  1767          .ALIGN  QUAD
00000000'9F   17    09F8  1768          JMP     a#IOC$ALTUBAMAP
                    09FE  1769          .ALIGN  QUAD
00000000'9F   17    0A00  1770          JMP     a#ERL$RELEASEMB
                    0A06  1771          .ALIGN  QUAD
00000000'9F   17    0A08  1772          JMP     a#IOC$ALOUBAMAPN
                    0A0E  1773          .ALIGN  QUAD
00000000'9F   17    0A10  1774          JMP     a#EXE$ALLOCBUF
                    0A16  1775          .ALIGN  QUAD
00000000'9F   17    0A18  1776          JMP     a#EXE$BUFQUOPRC
                    0A1E  1777          .ALIGN  QUAD
00000000'9F   17    0A20  1778          JMP     a#EXE$BUFFRQUOTA
                    0A26  1779          .ALIGN  QUAD
00000000'9F   17    0A28  1780          JMP     a#EXE$FINISHIO
                    0A2E  1781          .ALIGN  QUAD
00000000'9F   17    0A30  1782          JMP     a#EXE$READ
                    0A36  1783          .ALIGN  QUAD
00000000'9F   17    0A38  1784          JMP     a#EXE$READCHK
                    0A3E  1785          .ALIGN  QUAD
00000000'9F   17    0A40  1786          JMP     a#EXE$READCHKR
                    0A46  1787          .ALIGN  QUAD
00000000'9F   17    0A48  1788          JMP     a#EXE$WRITE
                    0A4E  1789          .ALIGN  QUAD
00000000'9F   17    0A50  1790          JMP     a#EXE$WRITECHKR
                    0A56  1791          .ALIGN  QUAD
00000000'9F   17    0A58  1792          JMP     a#EXE$MODIFY
                    0A5E  1793          .ALIGN  QUAD
00000000'9F   17    0A60  1794          JMP     a#EXE$MODIFYLOCK
                    0A66  1795          .ALIGN  QUAD
00000000'9F   17    0A68  1796          JMP     a#EXE$CARRIAGE
                    0A6E  1797          .ALIGN  QUAD
```

```
                00000000'9F   17  0A70  1798          JMP     a#IOC$REQSCHANH
                                  0A76  1799          .ALIGN QUAD
                00000000'9F   17  0A78  1800          JMP     a#IOC$LOADUBAMAPA
                                  0A7E  1801          .ALIGN QUAD
                00000000'9F   17  0A80  1802          JMP     a#IOC$GETBYTE
                                  0A86  1803          .ALIGN QUAD
                00000000'9F   17  0A88  1804          JMP     a#IOC$PUTBYTE
                                  0A8E  1805          .ALIGN QUAD
                00000000'9F   17  0A90  1806          JMP     a#IOC$INITBUFWIND
                                  0A96  1807          .ALIGN QUAD
                00000000'9F   17  0A98  1808          JMP     a#IOC$MOVFRUSER2
                                  0A9E  1809          .ALIGN QUAD
                00000000'9F   17  0AA0  1810          JMP     a#IOC$MOVFRUSER1
                                  0AA6  1811          .ALIGN QUAD
                00000000'9F   17  0AA8  1812          JMP     a#IOC$MOVTOUSER2
                                  0AAE  1813          .ALIGN QUAD
                00000000'9F   17  0AB0  1814          JMP     a#IOC$MOVTOUSER1
                                  0AB6  1815          .ALIGN  QUAD
                00000000'9F   17  0AB8  1816          JMP     a#SCH$LOCKW                     ; Lock "MUTEX" for write access
                                  0ABE  1817          .ALIGN  QUAD
                00000000'9F   17  0AC0  1818          JMP     a#SCH$UNLOCK                    ; Unlock "MUTEX"
                                  0AC6  1819          .ALIGN  QUAD
                00000000'9F   17  0AC8  1820          JMP     a#EXE$ALTQUEPKT
                                  0ACE  1821          .ALIGN  QUAD
                00000000'9F   17  0AD0  1822          JMP     a#COM$SETATTNAST
                                  0AD6  1823          .ALIGN  QUAD
                00000000'9F   17  0AD8  1824          JMP     a#COM$DELATTNAST
                                  0ADE  1825          .ALIGN  QUAD
                00000000'9F   17  0AE0  1826          JMP     a#COM$FLUSHATTNS
                                  0AE6  1827          .ALIGN  QUAD
                00000000'9F   17  0AE8  1828          JMP     a#COM$DRVDEALMEM
                                  0AEE  1829          .ALIGN  QUAD
                00000000'9F   17  0AF0  1830          JMP     a#EXE$INSIOQ
                                  0AF6  1831          .ALIGN  QUAD
                00000000'9F   17  0AF8  1832          JMP     a#IOC$PTETOPFN
                                  0AFE  1833          .ALIGN  QUAD
                                  0B00  1834 EXE$GQ_SYSTIME::
            00000000 00000000     0B00  1835          .QUAD   0                       ; **DATA** System time quadword
                                  0B08  1836          .ALIGN  QUAD
                00000000'9F   17  0B08  1837          JMP     a#IOC$MOVFRUSER
                                  0B0E  1838          .ALIGN  QUAD
                00000000'9F   17  0B10  1839          JMP     a#IOC$ALLOSPT                   ;                       [23]
                                  0B16  1840          .ALIGN  QUAD                    ;                       [23]
                00000000'9F   17  0B18  1841          JMP     a#EXE$MAXACMODE         ;                       [23]
                                  0B1E  1842          .ALIGN  QUAD                    ;                       [23]
                00000000'9F   17  0B20  1843          JMP     a#EXE$READLOCK          ;                       [23]
                                  0B26  1844          .ALIGN  QUAD                    ;                       [23]
                                  0B28  1845
                                  0B28  1846
```

```
                     0B28  1848 .sbttl DS$SRVDISP_TABLE - Dispatch table for VDS services
                 00000034  1849 .psect DATA, SHR, NOEXE, NOWRT, QUAD
                     0034  1850
                     0034  1851 ; This is the dispatch table for all future additional VDS services.    [35]
                     0034  1852
                     0034  1853                    .ALIGN QUAD                 ;                       [35]
                     0038  1854 DS$SRVDISP_TABLE::                            ;                       [35]
                     0038  1855
                     0038  1856 ;[37]    .VECTOR DSX$MOUNT                   ;                       [35]
                     0038  1857 ;[37]    JMP     DSX$MOUNT+2                 ;                       [35]
                     0038  1858
                     0038  1859 ;[37]    .VECTOR DSX$DISMOUNT                ;                       [35]
                     0038  1860 ;[37]    JMP     DSX$DISMOUNT+2              ;                       [35]
                     0038  1861
                     0038  1862 ;                                                                      [38]
                     0038  1863 ; The following four dispatch vectors jump to module MPCOMMON.B32 to    [38]
                     0038  1864 ; perform multi-processing services                                     [38]
                     0038  1865 ;                                                                      [38]
                     0038  1866
              0000'  0038  1867          .VECTOR DSX$BOOTATTACHED            ;                       [38]
00000002'EF    17    003A  1868          JMP     DSX$BOOTATTACHED+2          ;                       [38]
                     0040  1869
              0000'  0040  1870          .VECTOR DSX$STARTATTACHED           ;                       [38]
00000002'EF    17    0042  1871          JMP     DSX$STARTATTACHED+2         ;                       [38]
                     0048  1872
              0000'  0048  1873          .VECTOR DSX$HALTATTACHED            ;                       [38]
00000002'EF    17    004A  1874          JMP     DSX$HALTATTACHED+2          ;                       [38]
                     0050  1875
              0000'  0050  1876          .VECTOR DSX$SHOWIDLE                ;                       [38]
00000002'EF    17    0052  1877          JMP     DSX$SHOWIDLE+2              ;                       [38]
                     0058  1878
                     0058  1879 ;
                     0058  1880 ; Add dispatch vectors for new VDS internal GETSYSBUF and RELSYSBUF     begin [39]
                     0058  1881 ; services
                     0058  1882 ;
                     0058  1883
              001C   0058  1884          .WORD   ^M<R2,R3,R4>                ; Entry mask            [41]
00000002'EF    17    005A  1885          JMP     DSX$GETSYSBUF+2
                     0060  1886
              000C   0060  1887          .WORD   ^M<R2,R3>                   ; Entry mask            [41]
00000002'EF    17    0062  1888          JMP     DSX$RELSYSBUF+2                                     ;end [39]
                     0068  1889
              0000'  0068  1890          .VECTOR DSX$PRINTREV                ; Vector for PRINTREV macro [40]
00000002'EF    17    006A  1891          JMP     DSX$PRINTREV+2
                     0070  1892
                     0070  1893          .ALIGN  QUAD
              0000'  0070  1894          .VECTOR DSX$_INTERLOCK_TEST         ; Entry for the Interlock test  [42]
00000002'EF    17    0072  1895          JMP     DSX$_INTERLOCK_TEST+2
                     0078  1896
                     0078  1897          .ALIGN  QUAD
              0000'  0078  1898          .VECTOR DSX$_SET_INTERLOCK          ; Entry for misc. interlocking  [42]
00000002'EF    17    007A  1899          JMP     DSX$_SET_INTERLOCK+2
                     0080  1900
                     0080  1901          .ALIGN  QUAD
              0000'  0080  1902          .VECTOR DSX$_CLEAR_INTERLOCK        ; Entry for misc. interlocking  [42]
00000002'EF    17    0082  1903          JMP     DSX$_CLEAR_INTERLOCK+2
                     0088  1904
```

```
                          0088  1905          .ALIGN  QUAD                  ;                          [43]  ;G:2
                    0000' 0088  1906          .VECTOR DSX$PPSCB             ;                          [43]  ;G:2
        00000002'EF   17  008A  1907          JMP     DSX$PPSCB+2           ;                          [43]  ;G:2
                          0090  1908                                                                          ;G:2
                          0090  1909 DS$SRVDISP_TABLE_END:                  ;                          [35]
                          0090  1910
```

```
                     0090  1912 .SBTTL DSX$SERVICE_DISPATCHER - Service Dispatch Routine
                 00000000  1913 .psect code, shr, exe, nowrt, byte
                     0000  1914
                     0000  1915 ;++                                                                    [35]
                     0000  1916 ; Functional Description:                                             [35]
                     0000  1917 ;                                                                     [35]
                     0000  1918 ;       Calls the proper service via the service dispatch table.      [35]
                     0000  1919 ;                                                                     [35]
                     0000  1920 ; Inputs:                                                            [35]
                     0000  1921 ;                                                                     [35]
                     0000  1922 ;       .................................                             [35]
                     0000  1923 ;       :       No. of args.            :<=AP                       [35]
                     0000  1924 ;       :.............................:                               [35]
                     0000  1925 ;       :Code indicating type of service:                           [35]
                     0000  1926 ;       :.............................:                               [35]
                     0000  1927 ;       :       Service routine arg1    :                           [35]
                     0000  1928 ;       :.............................:                               [35]
                     0000  1929 ;       /                             /                             [35]
                     0000  1930 ;       /                             /                             [35]
                     0000  1931 ;       :.............................:                               [35]
                     0000  1932 ;       :       Service routine argN    :                           [35]
                     0000  1933 ;       :.............................:                               [35]
                     0000  1934 ;                                                                     [35]
                     0000  1935 ;                                                                     [35]
                     0000  1936 ; Implicit Inputs:                                                   [35]
                     0000  1937 ;                                                                     [35]
                     0000  1938 ; Outputs:                                                           [35]
                     0000  1939 ;                                                                     [35]
                     0000  1940 ; Implicit Outputs:                                                  [35]
                     0000  1941 ;                                                                     [35]
                     0000  1942 ; Side Effects:                                                      [35]
                     0000  1943 ;                                                                     [35]
                     0000  1944 ; Return Status:                                                     [35]
                     0000  1945 ;                                                                     [35]
                     0000  1946 ;--                                                                  [35]
                     0000  1947
                0000 0000  1948 .ENTRY DSX$SERVICE_DISPATCHER, ^M<>     ;                           [35]
                     0002  1949
 7E   04 AC    08   C5  0002  1950         MULL3   #8,4(AP),-(SP)          ; Calc. offset into table.  [35]
7E  00000038'EF   9E  0007  1951         MOVAB   DS$SRVDISP_TABLE,-(SP)  ; Get dispatch table address. [35]
     04 AE    6E   C0  000E  1952         ADDL    (SP),4(SP)              ; Add offset.               [35]
 04 AC    6C   01   C3  0012  1953         SUBL3   #1,(AP),4(AP)           ; Create true arg. list for [35]
                     0017  1954                                         ;   service routine by getting [35]
                     0017  1955                                         ;   rid of service code arg.  [35]
   04 BE   04 AC    FA  0017  1956         CALLG   4(AP),a4(SP)            ; Call the proper service.  [35]
                     04  001C  1957         RET                             ; Return.                   [35]
                         001D  1958
```

```
                     001D  1960          .SBTTL  Resrvd_Entry Routine - For entry errors
                0000001D   1961          .PSECT  CODE, SHR, EXE, NOWRT, BYTE
                     001D  1962 ;++
                     001D  1963 ; FUNCTIONAL DESCRIPTION:
                     001D  1964 ;
                     001D  1965 ;
                     001D  1966 ; CALLING SEQUENCE:
                     001D  1967 ;
                     001D  1968 ;       NONE
                     001D  1969 ;
                     001D  1970 ; INPUT PARAMETERS:
                     001D  1971 ;
                     001D  1972 ;       NONE
                     001D  1973 ;
                     001D  1974 ; IMPLICIT INPUTS:
                     001D  1975 ;
                     001D  1976 ;       NONE
                     001D  1977 ;
                     001D  1978 ; OUTPUT PARAMETERS:
                     001D  1979 ;
                     001D  1980 ;       NONE
                     001D  1981 ;
                     001D  1982 ; IMPLICIT OUTPUTS:
                     001D  1983 ;
                     001D  1984 ;       NONE
                     001D  1985 ;
                     001D  1986 ; COMPLETION CODES:
                     001D  1987 ;
                     001D  1988 ;       NONE
                     001D  1989 ;
                     001D  1990 ; SIDE EFFECTS:
                     001D  1991 ;
                     001D  1992 ;       NONE
                     001D  1993 ;
                     001D  1994 ;--
```

```
                        001D  1996 RESRVD_ENTRY:
                        001D  1997          ERRSUP_S        MSGADR=L^T_RESRVD       ;                               [25]
          00000000'EF   DF  001D                      PUSHAL  $MODULE
          00000006'EF   DF  0023                      PUSHAL  L^T_RESRVD
                  01    DD  0029                      PUSHL   #$ERR
      00000000'EF   03    FB  002B                    CALLS   #3, DS_ERRSUP
                        0032  1998
                        0032  1999 FAKE_JUMP:                                        ;                               [27]
          00000000'EF   16  0032  2000          JSB     KB_CHECK                    ; Check keyboard status         [25]
                        04  0038  2001          RET
                        0039  2002
                        0039  2003          .END
```

```
$ER                             = 00000002     D
$MODULE                           00000000 R   D   01
ACP$ACCESS                        ********     X   02
ACP$DEACCESS                      ********     X   02
ACP$MODIFY                        ********     X   02
ACP$MOUNT                         ********     X   02
ACP$READBLK                       ********     X   02
ACP$WRITEBLK                      ********     X   02
APT                               ********     X   02
BOOT                              ********     X   02
COM$DELATTNAST                    ********     X   02
COM$DRVDEALMEM                    ********     X   02
COM$FLUSHATTNS                    ********     X   02
COM$POST                          ********     X   02
COM$SETATTNAST                    ********     X   02
CR                              = 0000000D     D
DS$ABORT                          00000020 RG  D   02
DS$ABORTWAIT                      00000070 RG  D   02
DS$APT_ENTRY                      00000004 R   D   02
DS$AQ_SSEND                     = 000007FF RG  D   02
DS$AQ_SYSSRV                      00000200 RG  D   02
DS$ASKADR                         00000090 RG  D   02
DS$ASKDATA                        00000080 RG  D   02
DS$ASKLGCL                        00000098 RG  D   02
DS$ASKSTR                         000000A0 RG  D   02
DS$ASKVLD                         00000088 RG  D   02
DS$ATTACH                         000001A8 RG  D   02
DS$BGNSUB                         00000030 RG  D   02
DS$BRANCH                         000000A8 RG  D   02
DS$BREAK                          00000058 RG  D   02
DS$CANWAIT                        00000070 RG  D   02
DS$CHANNEL                        00000180 RG  D   02
DS$CKLOOP                         00000040 RG  D   02
DS$CLRVEC                         00000168 RG  D   02
DS$CNTRLC                         00000078 RG  D   02
DS$CVTREG                         000000B0 RG  D   02
DS$DOSUMMARY                      00000028 RG  D   02
DS$ENDPASS                        00000010 RG  D   02
DS$ENDSUB                         00000038 RG  D   02
DS$ENTRY                          00000000 R   D   02
DS$ERRDEV                         000000C8 RG  D   02
DS$ERRHARD                        000000D0 RG  D   02
DS$ERRPREP                        00000108 RG  D   02
DS$ERRSOFT                        000000D8 RG  D   02
DS$ERRSYS                         000000C0 RG  D   02
DS$ESCAPE                         00000050 RG  D   02
DS$FREEDBGSYM                     000001B8 RG  D   02
DS$GETADDRESS                     00000090 RG  D   02
DS$GETBUF                         00000120 RG  D   02
DS$GETDATA                        00000080 RG  D   02
DS$GETLOGICAL                     00000098 RG  D   02
DS$GETSTRING                      000000A0 RG  D   02
DS$GETTERM                        000001C8 RG  D   02
DS$GETVIELD                       00000088 RG  D   02
DS$GL_PCBVEC                      ********     X   02
DS$GPHARD                         00000018 RG  D   02
DS$HELP                           000001B0 RG  D   02
DS$INITSCB                        00000170 RG  D   02
DS$INLOOP                         00000048 RG  D   02
DS$K_SSSIZE                     = 00000600     G   D
DS$LOAD                           00000198 RG  D   02
DS$LOADPCS                        000001C0 RG  D   02
DS$MAPDBGBLOCK                    00000118 RG  D   02
DS$MEMSIZE                        000001D8 RG  D   02
DS$MMOFF                          00000158 RG  D   02
DS$MMON                           00000150 RG  D   02
DS$PARSE                          000000B8 RG  D   02
DS$PRINTB                         000000E0 RG  D   02
DS$PRINTF                         000000F0 RG  D   02
DS$PRINTS                         000000F8 RG  D   02
DS$PRINTSIG                       00000100 RG  D   02
DS$PRINTX                         000000E8 RG  D   02
DS$PROBE                          000001A0 RG  D   02
DS$RELBUF                         00000128 RG  D   02
DS$SERVICE_DISPATCHER             000001D0 RG  D   02
DS$SETIPL                         00000178 RG  D   02
DS$SETMAP                         00000188 RG  D   02
DS$SETPRIEXV                      00000110 RG  D   02
DS$SETVEC                         00000160 RG  D   02
DS$SHOCHAN                        00000190 RG  D   02
DS$SHOWCHAN                       00000190 RG  D   02
DS$SRVDISP_TABLE                  00000038 RG  D   01
DS$SRVDISP_TABLE_END              00000090 R   D   01
DS$SUMMARY                        00000028 RG  D   02
DS$WAITMS                         00000060 RG  D   02
DS$WAITUS                         00000068 RG  D   02
DSX$ABORT                         ********     X   02
DSX$ATTACH                        ********     X   02
DSX$BGNSUB                        ********     X   02
DSX$BOOTATTACHED                  ********     X   01
DSX$BRANCH                        ********     X   02
DSX$CANWAIT                       ********     X   02
DSX$CHANNEL                       ********     X   02
DSX$CKLOOP                        ********     X   02
DSX$CLRVEC                        ********     X   02
DSX$CNTRLC                        ********     X   02
DSX$CVTREG                        ********     X   02
DSX$DOSUMMARY                     ********     X   02
DSX$ENDPASS                       ********     X   02
DSX$ENDSUB                        ********     X   02
DSX$ERRDEV                        ********     X   02
DSX$ERRHARD                       ********     X   02
DSX$ERRPREP                       ********     X   02
DSX$ERRSOFT                       ********     X   02
DSX$ERRSYS                        ********     X   02
DSX$ESCAPE                        ********     X   02
DSX$FREEDBGSYM                    ********     X   02
DSX$GETADDRESS                    ********     X   02
DSX$GETBUF                        ********     X   02
DSX$GETDATA                       ********     X   02
DSX$GETLOGICAL                    ********     X   02
DSX$GETSTRING                     ********     X   02
DSX$GETSYSBUF                     ********W GX   00
DSX$GETTERM                       ********     X   02
```

```
DSX$GETVIELD                    ********   X   02      EXE$DEANONPAGED                 ********   X   02
DSX$GPHARD                      ********   X   02      EXE$EXPREG                      ********   X   02
DSX$HALTATTACHED                ********   X   01      EXE$FAO                         ********   X   02
DSX$HELP                        ********   X   02      EXE$FAOL                        ********   X   02
DSX$INITSCB                     ********   X   02      EXE$FINISHIO                    ********   X   02
DSX$INLOOP                      ********   X   02      EXE$FINISHIOC                   ********   X   02
DSX$LOAD                        ********   X   02      EXE$FORK                        ********   X   02
DSX$LOADPCS                     ********   X   02      EXE$GETTIM                      ********   X   02
DSX$MAPDBGBLOCK                 ********   X   02      EXE$GL_ABSTIM                   00000810 RG  D  02
DSX$MEMSIZE                     ********   X   02      EXE$GQ_SYSTIME                  00000B00 RG  D  02
DSX$MMOFF                       ********   X   02      EXE$GTCHAN                      ********   X   02
DSX$MMON                        ********   X   02      EXE$HIBER                       ********   X   02
DSX$PARSE                       ********   X   02      EXE$INSERTIRP                   ********   X   02
DSX$PPSCB                       ********   X   01      EXE$INSIOQ                      ********   X   02
DSX$PRINTB                      ********   X   02      EXE$IOFORK                      ********   X   02
DSX$PRINTF                      ********   X   02      EXE$MAXACMODE                   ********   X   02
DSX$PRINTREV                    ********   X   01      EXE$MODIFY                      ********   X   02
DSX$PRINTS                      ********   X   02      EXE$MODIFYLOCK                  ********   X   02
DSX$PRINTSIG                    ********   X   02      EXE$MODIFYLOCKR                 ********   X   02
DSX$PRINTX                      ********   X   02      EXE$NUMTIM                      ********   X   02
DSX$PROBE                       ********   X   02      EXE$ONEPARM                     ********   X   02
DSX$RELBUF                      ********   X   02      EXE$PWRTIMCHK                   ********   X   02
DSX$RELSYSBUF                   ********W  GX  00      EXE$QIO                         ********   X   02
DSX$SERVICE_DISPATCHER          00000000 RG  D  03      EXE$QIO2                      = 00000204 R   D  02
DSX$SETIPL                      ********   X   02      EXE$QIODRVPKT                   ********   X   02
DSX$SETMAP                      ********   X   02      EXE$QIORETURN                   ********   X   02
DSX$SETPRIEXV                   ********   X   02      EXE$READ                        ********   X   02
DSX$SETVEC                      ********   X   02      EXE$READCHK                     ********   X   02
DSX$SHOWCHAN                    ********   X   02      EXE$READCHKR                    ********   X   02
DSX$SHOWIDLE                    ********   X   01      EXE$READEF                      ********   X   02
DSX$STARTATTACHED               ********   X   01      EXE$READLOCK                    ********   X   02
DSX$WAITMS                      ********   X   02      EXE$READLOCKR                   ********   X   02
DSX$WAITUS                      ********   X   02      EXE$SENSEMODE                   ********   X   02
DSX$_CLEAR_INTERLOCK            ********W  GX  00      EXE$SETAST                      ********   X   02
DSX$_INTERLOCK_TEST             ********W  GX  00      EXE$SETCHAR                     ********   X   02
DSX$_SET_INTERLOCK              ********W  GX  00      EXE$SETEF                       ********   X   02
DS_ERRSUP                       ********   X   03      EXE$SETIMR                      ********   X   02
ERL$DEVICERR                    ********   X   02      EXE$SETMODE                     ********   X   02
ERL$DEVICTMO                    ********   X   02      EXE$SETPRT                      ********   X   02
ERL$RELEASEMB                   ********   X   02      EXE$SNDEVMSG                    ********   X   02
EXE$ABORTIO                     ********   X   02      EXE$UNWIND                      ********   X   02
EXE$ALLOC                       ********   X   02      EXE$WAITFR                      ********   X   02
EXE$ALLOCBUF                    ********   X   02      EXE$WAKE                        ********   X   02
EXE$ALLOCIRP                    ********   X   02      EXE$WFLAND                      ********   X   02
EXE$ALONONPAGED                 ********   X   02      EXE$WFLOR                       ********   X   02
EXE$ALTQUEPKT                   ********   X   02      EXE$WRITE                       ********   X   02
EXE$ASCTIM                      ********   X   02      EXE$WRITECHK                    ********   X   02
EXE$ASSIGN                      ********   X   02      EXE$WRITECHKR                   ********   X   02
EXE$BINTIM                      ********   X   02      EXE$WRITELOCK                   ********   X   02
EXE$BUFFRQUOTA                  ********   X   02      EXE$WRITELOCKR                  ********   X   02
EXE$BUFQUOPRC                   ********   X   02      EXE$ZEROPARM                    ********   X   02
EXE$CANCEL                      ********   X   02      FAKE_JUMP                       00000032 R   D  03
EXE$CANTIM                      ********   X   02      IOC$ALLOSPT                     ********   X   02
EXE$CARRIAGE                    ********   X   02      IOC$ALOUBAMAP                   ********   X   02
EXE$CLREF                       ********   X   02      IOC$ALOUBAMAPN                  ********   X   02
EXE$CNTREG                      ********   X   02      IOC$ALTUBAMAP                   ********   X   02
EXE$DASSGN                      ********   X   02      IOC$APPLYECC                    ********   X   02
```

IOC$CANCELIO	********	X	02	SCH$UNLOCK			********	X	02		
IOC$DIAGBUFILL	********	X	02	SYS$ALLOC			00000238	RG	D	02	
IOC$GETBYTE	********	X	02	SYS$ASCTIM			00000248	RG	D	02	
IOC$GL_PSBL	0000081C	RG	D	02	SYS$ASSIGN			00000250	RG	D	02
IOC$GL_PSFL	00000818	RG	D	02	SYS$BINTIM			00000258	RG	D	02
IOC$INITBUFWIND	********	X	02	SYS$CALL_HANDL			00000210	RG	D	02	
IOC$INITIATE	********	X	02	SYS$CANCEL			00000260	RG	D	02	
IOC$LOADMBAMAP	********	X	02	SYS$CANTIM			00000268	RG	D	02	
IOC$LOADUBAMAP	********	X	02	SYS$CLOSE			000005B8	RG	D	02	
IOC$LOADUBAMAPA	********	X	02	SYS$CLREF			00000298	RG	D	02	
IOC$MOVFRUSER	********	X	02	SYS$CNTREG			000002A0	RG	D	02	
IOC$MOVFRUSER1	********	X	02	SYS$CONNECT			000005C0	RG	D	02	
IOC$MOVFRUSER2	********	X	02	SYS$DALLOC			000002D8	RG	D	02	
IOC$MOVTOUSER	********	X	02	SYS$DASSGN			000002E0	RG	D	02	
IOC$MOVTOUSER1	********	X	02	SYS$DISCONNECT			000005D0	RG	D	02	
IOC$MOVTOUSER2	********	X	02	SYS$EXIT			00000340	RG	D	02	
IOC$PTETOPFN	********	X	02	SYS$EXPREG			00000348	RG	D	02	
IOC$PURGDATAP	********	X	02	SYS$FAO			00000350	RG	D	02	
IOC$PUTBYTE	********	X	02	SYS$FAOL			00000358	RG	D	02	
IOC$RELCHAN	********	X	02	SYS$GET			00000580	RG	D	02	
IOC$RELDATAP	********	X	02	SYS$GETCHN			000004C8	RG	D	02	
IOC$RELMAPREG	********	X	02	SYS$GETTIM			00000378	RG	D	02	
IOC$RELSCHAN	********	X	02	SYS$GL_OPRMBX			00000800	RG	D	02	
IOC$REQCOM	********	X	02	SYS$GTCHAN			00000380	RG	D	02	
IOC$REQDATAP	********	X	02	SYS$HIBER			00000388	RG	D	02	
IOC$REQDATAPNW	********	X	02	SYS$LKWSET			000003A0	RG	D	02	
IOC$REQMAPREG	********	X	02	SYS$NUMTIM			000003B8	RG	D	02	
IOC$REQPCHANH	********	X	02	SYS$OPEN			00000608	RG	D	02	
IOC$REQPCHANL	********	X	02	SYS$QIO			000003C8	RG	D	02	
IOC$REQSCHANH	********	X	02	SYS$QIOW			00000200	RG	D	02	
IOC$REQSCHANL	********	X	02	SYS$READ			00000590	RG	D	02	
IOC$RETURN	********	X	02	SYS$READEF			000003D0	RG	D	02	
IOC$RTN	00000930	RG	D	02	SYS$SETAST			000003F8	RG	D	02
IOC$SENSEDISK	********	X	02	SYS$SETEF			00000400	RG	D	02	
IOC$UPDATRANSP	********	X	02	SYS$SETIMR			00000420	RG	D	02	
IOC$WFIKPCH	********	X	02	SYS$SETPRI			00000428	RG	D	02	
IOC$WFIRLCH	********	X	02	SYS$SETPRT			00000430	RG	D	02	
KB_CHECK	********	X	03	SYS$SETRWM			00000438	RG	D	02	
LEAP_APT	000001F4	R	D	02	SYS$TRNLOG			00000458	RG	D	02
LEAP_BOOT	000001EC	R	D	02	SYS$ULKPAG			00000460	RG	D	02
LF	= 0000000A		D		SYS$ULWSET			00000468	RG	D	02
MMG$GL_P0BASE	00000808	RG	D	02	SYS$UNWIND			00000470	RG	D	02
MMG$GL_SPTBASE	00000804	RG	D	02	SYS$WAITFR			00000478	RG	D	02
MT$CHECK_ACCESS	********	X	02	SYS$WAKE			00000480	RG	D	02	
P0PT_BASE	********	X	02	SYS$WFLAND			00000488	RG	D	02	
RESRVD	000001FA	R	D	02	SYS$WFLOR			00000490	RG	D	02
RESRVD_ENTRY	0000001D	R	D	03	T_RESRVD			00000006	R	D	01
RMS$CLOSE	********	X	02								
RMS$CONNECT	********	X	02								
RMS$DISCONNECT	********	X	02								
RMS$GET	********	X	02								
RMS$OPEN	********	X	02								
RMS$READ	********	X	02								
SCH$GL_PCBVEC	0000080C	RG	D	02							
SCH$LOCKW	********	X	02								
SCH$POSTEF	********	X	02								
SCH$QAST	********	X	02								

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
DATA	00000090 (144.)	01 (1.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC QUAD
$BASE	00000B28 (2856.)	02 (2.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC QUAD
CODE	00000039 (57.)	03 (3.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC BYTE

! Symbol Cross Reference !

SYMBOL	VALUE	DEFINITION	REFERENCES...
$ER	=00000002	1997 (1)	#-1997 (1)
$MODULE	00000000-R	248 (1)	1997 (1)
ACP$ACCESS	00000000-XR		1650 (1)
ACP$DEACCESS	00000000-XR		1652 (1)
ACP$MODIFY	00000000-XR		1654 (1)
ACP$MOUNT	00000000-XR		1656 (1)
ACP$READBLK	00000000-XR		1658 (1)
ACP$WRITEBLK	00000000-XR		1660 (1)
APT	00000000-XR		649 (1)
BOOT	00000000-XR		643 (1)
COM$DELATTNAST	00000000-XR		1824 (1)
COM$DRVDEALMEM	00000000-XR		1828 (1)
COM$FLUSHATTNS	00000000-XR		1826 (1)
COM$POST	00000000-XR		1764 (1)
COM$SETATTNAST	00000000-XR		1822 (1)
CR	=0000000D	238 (1)	251 (1)
DS$ABORT	00000020-R	326 (1)	
DS$ABORTWAIT	00000070-R	385 (1)	
DS$APT_ENTRY	00000004-R	301 (1)	
DS$AQ_SSEND	=000007FF-R	1624 (1)	
DS$AQ_SYSSRV	00000200-R	657 (1)	1625 (1)
DS$ASKADR	00000090-R	410 (1)	
DS$ASKDATA	00000080-R	398 (1)	
DS$ASKLGCL	00000098-R	416 (1)	
DS$ASKSTR	000000A0-R	422 (1)	
DS$ASKVLD	00000088-R	404 (1)	
DS$ATTACH	000001A8-R	599 (1)	
DS$BGNSUB	00000030-R	343 (1)	
DS$BRANCH	000000A8-R	429 (1)	
DS$BREAK	00000058-R	368 (1)	
DS$CANWAIT	00000070-R	384 (1)	
DS$CHANNEL	00000180-R	573 (1)	
DS$CKLOOP	00000040-R	353 (1)	
DS$CLRVEC	00000168-R	558 (1)	
DS$CNTRLC	00000078-R	390 (1)	
DS$CVTREG	000000B0-R	436 (1)	
DS$DOSUMMARY	00000028-R	335 (1)	
DS$ENDPASS	00000010-R	313 (1)	
DS$ENDSUB	00000038-R	348 (1)	
DS$ENTRY	00000000-R	297 (1)	
DS$ERRDEV	000000C8-R	451 (1)	
DS$ERRHARD	000000D0-R	456 (1)	
DS$ERRPREP	00000108-R	491 (1)	
DS$ERRSOFT	000000D8-R	461 (1)	
DS$ERRSYS	000000C0-R	446 (1)	
DS$ESCAPE	00000050-R	363 (1)	
DS$FREEDBGSYM	000001B8-R	608 (1)	
DS$GETADDRESS	00000090-R	411 (1)	
DS$GETBUF	00000120-R	510 (1)	
DS$GETDATA	00000080-R	399 (1)	

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DS$GETLOGICAL                   00000098-R   417    (1)
DS$GETSTRING                    000000A0-R   423    (1)
DS$GETTERM                      000001C8-R   618    (1)
DS$GETVIELD                     00000088-R   405    (1)
DS$GL_PCBVEC                    00000000-XR                1644   (1)
DS$GPHARD                       00000018-R   318    (1)
DS$HELP                         000001B0-R   603    (1)
DS$INITSCB                      00000170-R   563    (1)
DS$INLOOP                       00000048-R   358    (1)
DS$K_SSIZE                     =00000600     1625   (1)
DS$LOAD                         00000198-R   589    (1)
DS$LOADPCS                      000001C0-R   613    (1)
DS$MAPDBGBLOCK                  00000118-R   501    (1)
DS$MEMSIZE                      000001D8-R   628    (1)
DS$MMOFF                        00000158-R   545    (1)
DS$MMON                         00000150-R   540    (1)
DS$PARSE                        000000B8-R   441    (1)
DS$PRINTB                       000000E0-R   466    (1)
DS$PRINTF                       000000F0-R   476    (1)
DS$PRINTS                       000000F8-R   481    (1)
DS$PRINTSIG                     00000100-R   486    (1)
DS$PRINTX                       000000E8-R   471    (1)
DS$PROBE                        000001A0-R   594    (1)
DS$RELBUF                       00000128-R   515    (1)
DS$SERVICE_DISPATCHER           000001D0-R   623    (1)
DS$SETIPL                       00000178-R   568    (1)
DS$SETMAP                       00000188-R   578    (1)
DS$SETPRIEXV                    00000110-R   496    (1)
DS$SETVEC                       00000160-R   553    (1)
DS$SHOCHAN                      00000190-R   583    (1)
DS$SHOWCHAN                     00000190-R   584    (1)
DS$SRVDISP_TABLE                00000038-R   1854   (1)        1951   (1)
DS$SRVDISP_TABLE_END            00000090-R   1909   (1)
DS$SUMMARY                      00000028-R   334    (1)
DS$WAITMS                       00000060-R   374    (1)
DS$WAITUS                       00000068-R   379    (1)
DSX$ABORT                       00000000-XR                328    (1)
DSX$ATTACH                      00000000-XR                601    (1)
DSX$BGNSUB                      00000000-XR                345    (1)
DSX$BOOTATTACHED                00000000-XR                1868   (1)
DSX$BRANCH                      00000000-XR                431    (1)
DSX$CANWAIT                     00000000-XR                387    (1)
DSX$CHANNEL                     00000000-XR                575    (1)
DSX$CKLOOP                      00000000-XR                355    (1)
DSX$CLRVEC                      00000000-XR                560    (1)
DSX$CNTRLC                      00000000-XR                392    (1)
DSX$CVTREG                      00000000-XR                438    (1)
DSX$DOSUMMARY                   00000000-XR                337    (1)
DSX$ENDPASS                     00000000-XR                315    (1)
DSX$ENDSUB                      00000000-XR                350    (1)
DSX$ERRDEV                      00000000-XR                453    (1)
DSX$ERRHARD                     00000000-XR                458    (1)
DSX$ERRPREP                     00000000-XR                493    (1)
DSX$ERRSOFT                     00000000-XR                463    (1)
DSX$ERRSYS                      00000000-XR                448    (1)
DSX$ESCAPE                      00000000-XR                365    (1)
DSX$FREEDBGSYM                  00000000-XR                610    (1)
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DSX$GETADDRESS                  00000000-XR                     413    (1)
DSX$GETBUF                      00000000-XR                     512    (1)
DSX$GETDATA                     00000000-XR                     401    (1)
DSX$GETLOGICAL                  00000000-XR                     419    (1)
DSX$GETSTRING                   00000000-XR                     425    (1)
DSX$GETSYSBUF                   00000000-XR                     1885   (1)       229     (1)
DSX$GETTERM                     00000000-XR                     620    (1)
DSX$GETVIELD                    00000000-XR                     407    (1)
DSX$GPHARD                      00000000-XR                     320    (1)
DSX$HALTATTACHED                00000000-XR                     1874   (1)
DSX$HELP                        00000000-XR                     605    (1)
DSX$INITSCB                     00000000-XR                     565    (1)
DSX$INLOOP                      00000000-XR                     360    (1)
DSX$LOAD                        00000000-XR                     591    (1)
DSX$LOADPCS                     00000000-XR                     615    (1)
DSX$MAPDBGBLOCK                 00000000-XR                     503    (1)
DSX$MEMSIZE                     00000000-XR                     630    (1)
DSX$MMOFF                       00000000-XR                     547    (1)
DSX$MMON                        00000000-XR                     542    (1)
DSX$PARSE                       00000000-XR                     443    (1)
DSX$PPSCB                       00000000-XR                     1907   (1)
DSX$PRINTB                      00000000-XR                     468    (1)
DSX$PRINTF                      00000000-XR                     478    (1)
DSX$PRINTREV                    00000000-XR                     1891   (1)
DSX$PRINTS                      00000000-XR                     483    (1)
DSX$PRINTSIG                    00000000-XR                     488    (1)
DSX$PRINTX                      00000000-XR                     473    (1)
DSX$PROBE                       00000000-XR                     596    (1)
DSX$RELBUF                      00000000-XR                     517    (1)
DSX$RELSYSBUF                   00000000-XR                     1888   (1)       229     (1)
DSX$SERVICE_DISPATCHER          00000000-R      1948    (1)     625    (1)
DSX$SETIPL                      00000000-XR                     570    (1)
DSX$SETMAP                      00000000-XR                     580    (1)
DSX$SETPRIEXV                   00000000-XR                     498    (1)
DSX$SETVEC                      00000000-XR                     555    (1)
DSX$SHOWCHAN                    00000000-XR                     586    (1)
DSX$SHOWIDLE                    00000000-XR                     1877   (1)
DSX$STARTATTACHED               00000000-XR                     1871   (1)
DSX$WAITMS                      00000000-XR                     376    (1)
DSX$WAITUS                      00000000-XR                     381    (1)
DSX$_CLEAR_INTERLOCK            00000000-XR                     1903   (1)       232     (1)
DSX$_INTERLOCK_TEST             00000000-XR                     1895   (1)       230     (1)
DSX$_SET_INTERLOCK              00000000-XR                     1899   (1)       231     (1)
DS_ERRSUP                       00000000-XR                     1997   (1)
ERL$DEVICERR                    00000000-XR                     1662   (1)
ERL$DEVICTMO                    00000000-XR                     1664   (1)
ERL$RELEASEMB                   00000000-XR                     1770   (1)
EXE$ABORTIO                     00000000-XR                     1666   (1)
EXE$ALLOC                       00000000-XR                     694    (1)
EXE$ALLOCBUF                    00000000-XR                     1774   (1)
EXE$ALLOCIRP                    00000000-XR                     1730   (1)
EXE$ALONONPAGED                 00000000-XR                     1732   (1)
EXE$ALTQUEPKT                   00000000-XR                     1820   (1)
EXE$ASCTIM                      00000000-XR                     704    (1)
EXE$ASSIGN                      00000000-XR                     709    (1)
EXE$BINTIM                      00000000-XR                     714    (1)
EXE$BUFFRQUOTA                  00000000-XR                     1778   (1)
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EXE$BUFQUOPRC                   00000000-XR                     1776    (1)
EXE$CANCEL                      00000000-XR                     719     (1)     794     (1)
EXE$CANTIM                      00000000-XR                     724     (1)
EXE$CARRIAGE                    00000000-XR                     1796    (1)
EXE$CLREF                       00000000-XR                     754     (1)
EXE$CNTREG                      00000000-XR                     759     (1)
EXE$DASSGN                      00000000-XR                     799     (1)
EXE$DEANONPAGED                 00000000-XR                     1734    (1)
EXE$EXPREG                      00000000-XR                     864     (1)
EXE$FAO                         00000000-XR                     869     (1)
EXE$FAOL                        00000000-XR                     874     (1)
EXE$FINISHIO                    00000000-XR                     1780    (1)
EXE$FINISHIOC                   00000000-XR                     1736    (1)
EXE$FORK                        00000000-XR                     1738    (1)
EXE$GETTIM                      00000000-XR                     894     (1)
EXE$GL_ABSTIM                   00000810-R      1645    (1)
EXE$GQ_SYSTIME                  00000B00-R      1834    (1)
EXE$GTCHAN                      00000000-XR                     1110    (1)     899     (1)
EXE$HIBER                       00000000-XR                     904     (1)
EXE$INSERTIRP                   00000000-XR                     1758    (1)
EXE$INSIOQ                      00000000-XR                     1830    (1)
EXE$IOFORK                      00000000-XR                     1668    (1)
EXE$MAXACMODE                   00000000-XR                     1841    (1)
EXE$MODIFY                      00000000-XR                     1792    (1)
EXE$MODIFYLOCK                  00000000-XR                     1794    (1)
EXE$MODIFYLOCKR                 00000000-XR                     1740    (1)
EXE$NUMTIM                      00000000-XR                     935     (1)
EXE$ONEPARM                     00000000-XR                     1670    (1)
EXE$PWRTIMCHK                   00000000-XR                     1672    (1)
EXE$QIO                         00000000-XR                     660     (1)
EXE$QIO2                        =00000204-R     661     (1)     945     (1)
EXE$QIODRVPKT                   00000000-XR                     1742    (1)
EXE$QIORETURN                   00000000-XR                     1760    (1)
EXE$READ                        00000000-XR                     1782    (1)
EXE$READCHK                     00000000-XR                     1784    (1)
EXE$READCHKR                    00000000-XR                     1786    (1)
EXE$READEF                      00000000-XR                     951     (1)
EXE$READLOCK                    00000000-XR                     1843    (1)
EXE$READLOCKR                   00000000-XR                     1752    (1)
EXE$SENSEMODE                   00000000-XR                     1674    (1)
EXE$SETAST                      00000000-XR                     976     (1)
EXE$SETCHAR                     00000000-XR                     1676    (1)
EXE$SETEF                       00000000-XR                     981     (1)
EXE$SETIMR                      00000000-XR                     1001    (1)
EXE$SETMODE                     00000000-XR                     1678    (1)
EXE$SETPRT                      00000000-XR                     1012    (1)
EXE$SNDEVMSG                    00000000-XR                     1680    (1)
EXE$UNWIND                      00000000-XR                     1055    (1)
EXE$WAITFR                      00000000-XR                     1060    (1)
EXE$WAKE                        00000000-XR                     1065    (1)
EXE$WFLAND                      00000000-XR                     1070    (1)
EXE$WFLOR                       00000000-XR                     1075    (1)
EXE$WRITE                       00000000-XR                     1788    (1)
EXE$WRITECHK                    00000000-XR                     1750    (1)
EXE$WRITECHKR                   00000000-XR                     1790    (1)
EXE$WRITELOCK                   00000000-XR                     1744    (1)
EXE$WRITELOCKR                  00000000-XR                     1754    (1)
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EXE$ZEROPARM                    00000000-XR                     1682    (1)
FAKE_JUMP                       00000032-R    1999    (1)       370     (1)
IOC$ALLOSPT                     00000000-XR                     1839    (1)
IOC$ALOUBAMAP                   00000000-XR                     1766    (1)
IOC$ALOUBAMAPN                  00000000-XR                     1772    (1)
IOC$ALTUBAMAP                   00000000-XR                     1768    (1)
IOC$APPLYECC                    00000000-XR                     1684    (1)
IOC$CANCELIO                    00000000-XR                     1686    (1)
IOC$DIAGBUFILL                  00000000-XR                     1688    (1)
IOC$GETBYTE                     00000000-XR                     1802    (1)
IOC$GL_PSBL                     0000081C-R    1648    (1)
IOC$GL_PSFL                     00000818-R    1647    (1)       1647    (1)       1648    (1)
IOC$INITBUFWIND                 00000000-XR                     1806    (1)
IOC$INITIATE                    00000000-XR                     1756    (1)
IOC$LOADMBAMAP                  00000000-XR                     1690    (1)
IOC$LOADUBAMAP                  00000000-XR                     1692    (1)
IOC$LOADUBAMAPA                 00000000-XR                     1800    (1)
IOC$MOVFRUSER                   00000000-XR                     1837    (1)
IOC$MOVFRUSER1                  00000000-XR                     1810    (1)
IOC$MOVFRUSER2                  00000000-XR                     1808    (1)
IOC$MOVTOUSER                   00000000-XR                     1694    (1)
IOC$MOVTOUSER1                  00000000-XR                     1814    (1)
IOC$MOVTOUSER2                  00000000-XR                     1812    (1)
IOC$PTETOPFN                    00000000-XR                     1832    (1)
IOC$PURGDATAP                   00000000-XR                     1696    (1)
IOC$PUTBYTE                     00000000-XR                     1804    (1)
IOC$RELCHAN                     00000000-XR                     1698    (1)
IOC$RELDATAP                    00000000-XR                     1700    (1)
IOC$RELMAPREG                   00000000-XR                     1702    (1)
IOC$RELSCHAN                    00000000-XR                     1704    (1)
IOC$REQCOM                      00000000-XR                     1706    (1)
IOC$REQDATAP                    00000000-XR                     1708    (1)
IOC$REQDATAPNW                  00000000-XR                     1762    (1)
IOC$REQMAPREG                   00000000-XR                     1710    (1)
IOC$REQPCHANH                   00000000-XR                     1712    (1)
IOC$REQPCHANL                   00000000-XR                     1714    (1)
IOC$REQSCHANH                   00000000-XR                     1798    (1)
IOC$REQSCHANL                   00000000-XR                     1716    (1)
IOC$RETURN                      00000000-XR                     1718    (1)
IOC$RTN                         00000930-R    1718    (1)
IOC$SENSEDISK                   00000000-XR                     1720    (1)
IOC$UPDATRANSP                  00000000-XR                     1722    (1)
IOC$WFIKPCH                     00000000-XR                     1724    (1)
IOC$WFIRLCH                     00000000-XR                     1726    (1)
KB_CHECK                        00000000-XR                     2000    (1)
LEAP_APT                        000001F4-R    648     (1)     #-302    (1)
LEAP_BOOT                       000001EC-R    642     (1)     #-298    (1)
LF                             =0000000A      239     (1)       251    (1)
MMG$GL_POBASE                   00000808-R    1641    (1)
MMG$GL_SPTBASE                  00000804-R    1639    (1)
MT$CHECK_ACCESS                 00000000-XR                     1728    (1)
POPT_BASE                       00000000-XR                     1642    (1)
RESRVD                          000001FA-R    651     (1)     #-641    (1)     #-646    (1)
RESRVD_ENTRY                    0000001D-R    1996    (1)       1023    (1)       1028    (1)       1033    (1)       1038    (1)
                                                                1080    (1)       1085    (1)       1090    (1)       1095    (1)
                                                                1100    (1)       1105    (1)       1115    (1)       1120    (1)
                                                                1125    (1)       1130    (1)       1135    (1)       1140    (1)
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				1145	(1)	1150	(1)	1155	(1)	1160	(1)
				1165	(1)	1170	(1)	1175	(1)	1180	(1)
				1185	(1)	1190	(1)	1195	(1)	1200	(1)
				1205	(1)	1210	(1)	1215	(1)	1220	(1)
				1230	(1)	1240	(1)	1245	(1)	1250	(1)
				1255	(1)	1270	(1)	1280	(1)	1285	(1)
				1290	(1)	1295	(1)	1300	(1)	1305	(1)
				1316	(1)	1321	(1)	1326	(1)	1331	(1)
				1336	(1)	1341	(1)	1346	(1)	1351	(1)
				1356	(1)	1361	(1)	1366	(1)	1371	(1)
				1376	(1)	1381	(1)	1386	(1)	1391	(1)
				1396	(1)	1401	(1)	1406	(1)	1411	(1)
				1416	(1)	1421	(1)	1426	(1)	1431	(1)
				1436	(1)	1441	(1)	1446	(1)	1451	(1)
				1456	(1)	1461	(1)	1466	(1)	1471	(1)
				1476	(1)	1481	(1)	1486	(1)	1491	(1)
				1496	(1)	1501	(1)	1506	(1)	1511	(1)
				1516	(1)	1521	(1)	1526	(1)	1531	(1)
				1536	(1)	1541	(1)	1546	(1)	1551	(1)
				1556	(1)	1561	(1)	1566	(1)	1571	(1)
				1576	(1)	1581	(1)	1586	(1)	1591	(1)
				1596	(1)	1601	(1)	1606	(1)	1611	(1)
				1616	(1)	1621	(1)	307	(1)	522	(1)
				527	(1)	532	(1)	537	(1)	636	(1)
				651	(1)	674	(1)	679	(1)	684	(1)
				689	(1)	699	(1)	729	(1)	734	(1)
				739	(1)	744	(1)	749	(1)	764	(1)
				769	(1)	774	(1)	779	(1)	784	(1)
				789	(1)	804	(1)	809	(1)	814	(1)
				819	(1)	824	(1)	829	(1)	834	(1)
				839	(1)	844	(1)	849	(1)	854	(1)
				879	(1)	884	(1)	889	(1)	909	(1)
				914	(1)	925	(1)	930	(1)	940	(1)
				956	(1)	961	(1)	966	(1)	971	(1)
				986	(1)	991	(1)	996	(1)		
RMS$CLOSE	00000000-XR			1260	(1)						
RMS$CONNECT	00000000-XR			1265	(1)						
RMS$DISCONNECT	00000000-XR			1275	(1)						
RMS$GET	00000000-XR			1225	(1)						
RMS$OPEN	00000000-XR			1310	(1)						
RMS$READ	00000000-XR			1235	(1)						
SCH$GL_PCBVEC	0000080C-R	1643	(1)								
SCH$LOCKW	00000000-XR			1816	(1)						
SCH$POSTEF	00000000-XR			1746	(1)						
SCH$QAST	00000000-XR			1748	(1)						
SCH$UNLOCK	00000000-XR			1818	(1)						
SYS$ALLOC	00000238-R	692	(1)								
SYS$ASCTIM	00000248-R	702	(1)								
SYS$ASSIGN	00000250-R	707	(1)								
SYS$BINTIM	00000258-R	712	(1)								
SYS$CALL_HANDL	00000210-R	667	(1)								
SYS$CANCEL	00000260-R	717	(1)								
SYS$CANTIM	00000268-R	722	(1)								
SYS$CLOSE	000005B8-R	1258	(1)								
SYS$CLREF	00000298-R	752	(1)								
SYS$CNTREG	000002A0-R	757	(1)								
SYS$CONNECT	000005C0-R	1263	(1)								

```
SYS$DALLOC                  000002D8-R   792    (1)
SYS$DASSGN                  000002E0-R   797    (1)
SYS$DISCONNECT              000005D0-R   1273   (1)
SYS$EXIT                    00000340-R   857    (1)
SYS$EXPREG                  00000348-R   862    (1)
SYS$FAO                     00000350-R   867    (1)
SYS$FAOL                    00000358-R   872    (1)
SYS$GET                     00000580-R   1223   (1)
SYS$GETCHN                  000004C8-R   1108   (1)
SYS$GETTIM                  00000378-R   892    (1)
SYS$GL_OPRMBX               00000800-R   1637   (1)
SYS$GTCHAN                  00000380-R   897    (1)
SYS$HIBER                   00000388-R   902    (1)
SYS$LKWSET                  000003A0-R   917    (1)
SYS$NUMTIM                  000003B8-R   933    (1)
SYS$OPEN                    00000608-R   1308   (1)
SYS$QIO                     000003C8-R   943    (1)
SYS$QIOW                    00000200-R   658    (1)
SYS$READ                    00000590-R   1233   (1)
SYS$READEF                  000003D0-R   949    (1)
SYS$SETAST                  000003F8-R   974    (1)
SYS$SETEF                   00000400-R   979    (1)
SYS$SETIMR                  00000420-R   999    (1)
SYS$SETPRI                  00000428-R   1004   (1)
SYS$SETPRT                  00000430-R   1010   (1)
SYS$SETRWM                  00000438-R   1015   (1)
SYS$TRNLOG                  00000458-R   1036   (1)
SYS$ULKPAG                  00000460-R   1041   (1)
SYS$ULWSET                  00000468-R   1047   (1)
SYS$UNWIND                  00000470-R   1053   (1)
SYS$WAITFR                  00000478-R   1058   (1)     #-663    (1)
SYS$WAKE                    00000480-R   1063   (1)
SYS$WFLAND                  00000488-R   1068   (1)
SYS$WFLOR                   00000490-R   1073   (1)
T_RESRVD                    00000006-R   250    (1)       1997   (1)

                                         +-------------------------+
                                         ! Performance indicators !
                                         +-------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    41    00:00:00.04    00:00:00.22
Command processing               927    00:00:00.27    00:00:00.95
Pass 1                           351    00:00:01.07    00:00:02.13
Symbol table sort                  0    00:00:00.07    00:00:00.07
Pass 2                            25    00:00:00.64    00:00:01.67
Symbol table output                2    00:00:00.05    00:00:00.14
Psect synopsis output              0    00:00:00.00    00:00:00.00
Cross-reference output             4    00:00:00.20    00:00:00.37
Assembler run totals            1352    00:00:02.34    00:00:05.55

The working set limit was 2900 pages.
26937 bytes (53 pages) of virtual memory were used to buffer the intermediate code.
There were 20 pages of symbol table space allocated to hold 332 non-local and 1 local symbols.
2003 source lines were read in Pass 1, producing 52 object records in Pass 2.
3 pages of virtual memory were used to define 3 macros.
```

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                2
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       1
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                 3

18 GETS were required to define 3 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 223 Libraries, Macros, Equated Symbols
(1) 250 Work Psect Declarations
(1) 272 Data Psect Declarations
(1) 506 DSX$ErrSoft Routine
(1) 558 DSX$ErrHard Routine
(1) 610 DSX$ErrPrep Routine
(1) 662 DSX$ErrDev Routine
(1) 717 DSX$ErrSys Routine
(1) 772 RRptError Routine
(1) 1025 DS_TestID Routine
(1) 1051 DS_ErrSup Routine
(1) 1177 DSR$Completion Routine

[17]

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element ERROR.MAR
0000     2 ; *8    26-FEB-1988 14:20:07 MCCARRON "fixed bug found during QA"
0000     3 ; *7    11-FEB-1988 13:40:11 MCCARRON "Changed copyright date"
0000     4 ; *6     8-FEB-1988 16:47:43 MCCARRON "Changed according to printrev changes"
0000     5 ; *5     1-SEP-1987 13:31:10 MEIER "CHANGES TO DS"
0000     6 ; *4    30-MAR-1987 16:19:00 MARTIN "FIXED A COMMENT"
0000     7 ; *3    26-JAN-1987 08:06:00 GEARIN "PRV ADDED TO insufficient privilege ERROR MESSA
0000     8 ; *2    23-JAN-1987 15:47:05 GEARIN "CHANGED ERROR CODE MESSAGES"
0000     9 ; *1     6-FEB-1986 15:18:15 DS ""
0000    10 ; DEC/CMS REPLACEMENT HISTORY, Element ERROR.MAR
0000    11         .Title  ERROR   *** ERROR Error routines
0000    12         .Ident  /10.11-8/                                                ;G:8
0000    13         .NoShow Conditionals
0000    14
0000    15 ;++
0000    16 ; Copyright (c) 1977, 1983, 1984, 1985, 1986, 1987, 1988                 ;G:7
0000    17 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    18 ;
0000    19 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0000    20 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
0000    21 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
0000    22 ; MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
0000    23 ; EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
0000    24 ; TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
0000    25 ; REMAIN IN DEC.
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0000    27 ; THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
0000    28 ; AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
0000    29 ; CORPORATION.
0000    30 ;
0000    31 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0000    32 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    33 ;--
```

```
0000     35 ;**
0000     36 ; FACILITY:
0000     37 ;
0000     38 ;       VAX Diagnostic Supervisor
0000     39 ;
0000     40 ; ABSTRACT:
0000     41 ;
0000     42 ; ENVIRONMENT:
0000     43 ;
0000     44 ; AUTHOR:
0000     45 ;
0000     46 ;       Tom Soutter     16-NOV-77       VERSION 01
0000     47 ;
0000     48 ; MODIFIED BY:
0000     49 ;                       TOM SOUTTER     08-DEC-77       VERSION 02 (ESSAA-3.05)
0000     50 ;       01              DSPR #20:  "ERROR HALT AT ..." MESSAGE INSERTED.
0000     51 ;
0000     52 ;                       KEN CHAPMAN     30-DEC-77       VERSION 03 (ESSAA-3.06)
0000     53 ;       02              PASS AP TO USER'S ERROR ROUTINE.
0000     54 ;                       NICK HOWGATE    06-DEC-78       VERSION 04 (ESSAA-5.01)
0000     55 ;       03              EMULATE CHARACTER STRING INSTRUCTIONS
0000     56 ;       04              Removed DSA$V_ERR_LOOP, use DS$INLOOP instead
0000     57 ;
0000     58 ;                       Dave Butenhof, 10-sep-1980, Version 6.0
0000     59 ;       05              Add error text to support RMS error codes used within
0000     60 ;                       supervisor.
0000     61 ;
0000     62 ;                       Dave Butenhof, 30-sep-1980, Version 6.1
0000     63 ;       06              Change forced word-relative references to longword-relative,
0000     64 ;                       since supervisor has grown.
0000     65 ;
0000     66 ;       07              - Jack Stansbury, 21-Oct-1981, Version 6.-
0000     67 ;                       Added calls to QA$MAIN for the QA enhancement.
0000     68 ;                       Also added .LIBRARY statements for $DS and $DIAG.
0000     69 ;                       Also changed some of the error messages to lower case.
0000     70 ;
0000     71 ;       08              - Jack Stansbury, 22-Oct-1981, Version 6.-
0000     72 ;                       Fixed truncation errors.
0000     73 ;                                                                       ;G:8
0000     74 ;       09              - Jack Stansbury, 12-Nov-1981, Version 6.-
0000     75 ;                       Took out references to HALTD and HALTI. Changed them to HALT.
0000     76 ;
0000     77 ;       10              - Dave Butenhof, 17-Nov-1981, Version 6.5
0000     78 ;                       Add 'end of error' message, and typecodes
0000     79 ;
0000     80 ;       11              - Jack Stansbury, 21-Nov-1981, Version 6.5
0000     81 ;                       Commented out several of the calls to QA_MAIN because it
0000     82 ;                       appears as though they will not be needed for the 6.5 DS version.
0000     83 ;
0000     84 ;       12              - Dave Butenhof, 25-Nov-1981, version 6.5
0000     85 ;                       Added error text for error '54', 'Fatal controller error',
0000     86 ;                       as it is appallingly common.
0000     87 ;
0000     88 ;       13              - Dave Butenhof, 15-Dec-1981, Version 6.6
0000     89 ;                       Fix error trailer message to only type out if IE1 isn't
0000     90 ;                       set.
0000     91 ;
```

```
0000     92 ;        14      - Jack Stansbury, 17-Dec-1981, Version ?.?
0000     93 ;                Added all the registers to the register masks on each of the
0000     94 ;                error routines. These are for the QA routines.
0000     95 ;
0000     96 ;        15      - Dave Butenhof, 29-Dec-1981, Version 6.6
0000     97 ;                Use new error counters for each class of error (hard,
0000     98 ;                soft, etc.).
0000     99 ;
0000    100 ;        16      - Jack Stansbury, 25-Jan-1982, Version 6.6
0000    101 ;                Discovered that the error number is truncated to a word in the
0000    102 ;                RRprError error reporting routine even though the error number
0000    103 ;                that is passed to the routine is a longword in length. This is
0000    104 ;                most likely because of APT running on PDP-11's, which operate
0000    105 ;                on word lengths. So, I changed one instruction to zero out the
0000    106 ;                top word in DSA$GL_ERRNO when the error number is moved to this
0000    107 ;                longword.
0000    108 ;
0000    109 ;        17      Marion Baggett, 2-apr-1982, Version 6.7
0000    110 ;                added the PREPERR error routine for reporting errors caused by a
0000    111 ;                testing starting and the hardware not being properly set up.
0000    112 ;
0000    113 ;        18      Marion Baggett, 9-Apr-1982, Version 6.7
0000    114 ;                Change DS$PRINTF to DSX$PRINT for type coding
0000    115 ;
0000    116 ;        19      Jack Stansbury, 10-Apr-1982, Version 6.7
0000    117 ;                Changed some of the BBC instructions to the new DS macros such
0000    118 ;                as Br_If_ ....
0000    119 ;
0000    120 ;        20      Jack Stansbury, 11-May-1982, Version 6.8
0000    121 ;                Added code to store the MsgAdr parameter from the $DS_ERRxxx
0000    122 ;                macros into a location for use by the CRD routines.
0000    123 ;
0000    124 ;        21      Jack Stansbury, 21-Dec-1982, Version 6.11
0000    125 ;                Printed out some more flags, locations, etc. in the ErrSup
0000    126 ;                routine.
0000    127 ;
0000    128 ;        22      Jack Stansbury, 03-Mar-1983, Version 6.11
0000    129 ;                Changed the code that sets the DS$GA_User_Error_Text so that
0000    130 ;                this location is set ONLY when CRD is running. This MUST be
0000    131 ;                true or else the CRD dispatch vectors will get scrwed up.
0000    132 ;                The condition was this: if a diagnostic was run that issued
0000    133 ;                an error (prep, sys, dev, hard, or soft), then if CRD was run,
0000    134 ;                and one of the diags run by CRD encountered a prep error, the
0000    135 ;                path from the MEN$Preparation_Error_Text routine to the address
0000    136 ;                of the user's error text would be lost, and an exception would
0000    137 ;                result.
0000    138 ;
0000    139 ;        23      John Ciukaj     4-Apr-1983      Version 6.11
0000    140 ;                - Changed all references to CRD Bits in DSA Flags
0000    141 ;                  distinguishing between Online and Offline.
0000    142 ;
0000    143 ;        24      Bob Bergazzi    24-Apr-1984     Version 7.0
0000    144 ;                Fixed edit # 21, FMTERRSUP1, which pushed contents instead of the
0000    145 ;                address of DS$GT_VDS_VERSION on the stack.
0000    146 ;
0000    147 ;        25      Amy Iorio       18-Mar-1985     Version 8.2
0000    148 ;                Put in hardware/firmware error reporting.
```

```
                        0000   149 ;
                        0000   150 ;       26      Ted Salem       8-April-1985    Version 8.2
                        0000   151 ;               Added interlocks to RRPTERROR and DS_ERRSUP routines
                        0000   152 ;
                        0000   153 ;       27      Ted Salem       10-April-1985   Version 8.2
                        0000   154 ;               Fixed bug in DS_ERRSUP routine.
                        0000   155 ;
                        0000   156 ;       28      Amy Iorio       17-May-1985     Version 8.2
                        0000   157 ;               Enhancement to Printrev; Patch revision level.
                        0000   158 ;
                        0000   159 ;       29      Amy Iorio       18-June-1985    Version 8.3
                        0000   160 ;               Fix to Printrev; actual revision level zero recognized.
                        0000   161 ;
                        0000   162 ;       30      Domenic Andella 12-July-1985    Version 8.3
                        0000   163 ;               Modified routine RRPTERROR to solve mp interlocking
                        0000   164 ;               code problem where the saved_FP's pc must be used
                        0000   165 ;               instead of the currect FP to compensate for additional
                        0000   166 ;               call frame generation.
                        0000   167 ;
                        0000   168 ;       31      Amy Iorio       15-July-1985    Version 8.3
                        0000   169 ;               Branch around revision levels if no prlink given
                        0000   170 ;               deleted so that revision levels print with or with out
                        0000   171 ;               prlink address.
                        0000   172 ;
                        0000   173 ;       32      Domenic Andella 7-August-1985   Version 8.3
                        0000   174 ;               Comment out modification 30 until interlocking
                        0000   175 ;               code is reinstated.
                        0000   176 ;
                        0000   177 ;       33      Ted Salem       9-Oct-1985      Version 9.0
                        0000   178 ;               Changed the format for the print service if the
                        0000   179 ;               revision level refers to harware.
                        0000   180 ;
                        0000   181 ;       34      Ted Salem       18_Nov_1985     Version 9.0
                        0000   182 ;               Fixed problem in RRPTERROR. Wrong log unit
                        0000   183 ;               number was being used to get device name .
                        0000   184 ;               Also, fixed incorrect checking of rev. type.
                        0000   185 ;
                        0000   186 ;       35      Domenic Andella 17-Dec-1985     Version 9.1
                        0000   187 ;               Modify routine RRPTERROR such that if cpu
                        0000   188 ;               is a Scorpio or Nautilus, frame pointer will be
                        0000   189 ;               altered to accomodate interlocking. See edit 30
                        0000   190 ;
                        0000   191 ;       36      M. Baggett      16-Jan-1986     Version 9.1
                        0000   192 ;               Added error message for invalid load for cpu specific
                        0000   193 ;               supervisor.
                        0000   194 ;
                        0000   195 ;       37      M. Baggett      17-Jan-1986     Version 9.1
                        0000   196 ;               Change error code from DS$_NOSUPPORT to DS$_UNSUPPDEV
                        0000   197 ;                                                                       ;G:2
                        0000   198 ;       3       David Gearin    23-Jan-1987     Version 10.6            ;G:5
                        0000   199 ;               Change error message for RMS$PRV from "Unknown error" to ;G:2
                        0000   200 ;               "PRV, Insufficient privilege or file protection violation". ;G:2
                        0000   201 ;                                                                       ;G:4
                        0000   202 ;       4       Ingrid Martin   30-March-1987   Version 10.7            ;G:5
                        0000   203 ;               Just updated a comment:  BR_IF_MP checks if the machine ;G:4
                        0000   204 ;               is Scorpio, Nautilus, RRR or LLL.                       ;G:4
                        0000   205 ;                                                                       ;G:6
```

```
0000   ;       5    Stephen Meier   1-Sept-1987     Version 10.10                  ;G:6
0000   ;            Recompiled to include changes to BR_IF_MP                       ;G:5
0000   ;                                                                           ;G:6
0000   ;            Paul McCarron   4-Feb-1988      Version 10.11                  ;G:6
0000   ;            Changed code so that the information dealing with              ;G:6
0000   ;            DSX$PRINTREV would be read correctly.                           ;G:6
0000   ;                                                                           ;G:6
0000   ;            Paul McCarron   11-Feb-1988     Version 10.11                  ;G:7
0000   ;            Changed copyright date to 1988                                 ;G:7
0000   ;                                                                           ;G:8
0000   ;            Paul McCarron   25-Feb-1988     Version 10.11                  ;G:8
0000   ;            Fixed bug found during QA, concerning the logical unit         ;G:8
0000   ;            number. Obtained it from err$_unit(ap) instead of from         ;G:8
0000   ;            the global lognum in DSX$PRINTREV.                             ;G:8
0000   ;                                                                           ;G:8
0000   ;--
```

```
                        0000    223          .SBTTL  Libraries, Macros, Equated Symbols
                        0000    224 ;
                        0000    225 ; INCLUDE FILES:
                        0000    226 ;
                        0000    227          .LIBRARY        /SYS$LIBRARY:LIB/       ;                       [17]
                        0000    228          .LIBRARY        /$DS/                   ;                       [07]
                        0000    229          .LIBRARY        /$DIAG/                 ;                       [07]
                        0000    230
                        0000    231 ;
                        0000    232 ; EQUATED SYMBOLS:
                        0000    233 ;
                        0000    234
                00000003 0000   235          BPTCODE     = 03                    ; BREAKPOINT OPCODE
                00000020 0000   236          TESTID_LEN = 32                     ; TEXT BUFFER FOR TEST/SUBTEST MESSAGE
                        0000    237
                        0000    238          APTDEF                              ; APT MESSAGE CODE DEFINITIONS
                        0000    239          DSFDEF                              ; CONTROL FLAG DEFINITIONS
                        0000    240          DSQA                                ; QA routine name constants             [07]
                        0000    241          $DS_CFDEF
                        0000    242          $DS_DSDEF
                        0000    243          $DS_DSADEF                          ; CONTROL FLAG DEFINITIONS
                        0000    244          $DS_ERRDEF
                        0000    245          $DS_HDRDEF                          ; DIAGNOSTIC PROGRAM HEADER SYMBOLS
                        0000    246          $DS_HPODEF                          ; P-TABLE OFFSET DEFINITIONS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 FE70                .=0
                        0000                 .IIF    NB,HP$Q_DEVICE, HP$Q_DEVICE:
                00000008 0000                .IIF    NB,..BLKQ,      .BLKQ   1
                        0008                 .IIF    NB,HP$W_SIZE,   HP$W_SIZE:
                0000000A 0008                .IIF    NB,..BLKW,      .BLKW   1
                        000A                 .IIF    NB,HP$B_FLAGS,  HP$B_FLAGS:
                0000000B 000A                .IIF    NB,..BLKB,      .BLKB   1
                        000B                 .IIF    NB,HP$B_DRIVE,  HP$B_DRIVE:
                0000000C 000B                .IIF    NB,..BLKB,      .BLKB   1
                        000C                 .IIF    NB,HP$T_DEVICE, HP$T_DEVICE:
                00000018 000C                .IIF    NB,..BLKB,      .BLKB   12
                        0018                 .IIF    NB,HP$A_DEVICE, HP$A_DEVICE:
                0000001C 0018                .IIF    NB,..BLKL,      .BLKL   1
                        001C                 .IIF    NB,HP$A_DVA,    HP$A_DVA:
                00000020 001C                .IIF    NB,..BLKL,      .BLKL   1
                        0020                 .IIF    NB,HP$A_LINK,   HP$A_LINK:
                00000024 0020                .IIF    NB,..BLKL,      .BLKL   1
                        0024                 .IIF    NB,HP$W_VECTOR, HP$W_VECTOR:
                00000026 0024                .IIF    NB,..BLKW,      .BLKW   1
                        0026                 .IIF    NB,HP$T_TYPE,   HP$T_TYPE:
                00000032 0026                .IIF    NB,..BLKB,      .BLKB   12
                        0032                 .IIF    NB,HP$A_DEPENDENT,      HP$A_DEPENDENT:
                        0000                 .RESTORE
                        0000    247          $RMSDEF                             ; RMS return code definitions
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 FE70                .=0
                        0000                 .RESTORE
                        0000    248          $ds_typedef                         ; Define error typecodes                [10]
```

```
                     0000   250          .Subtitle       Work Psect Declarations
                     0000   251 ;
                     0000   252 ; OWN STORAGE:
                     0000   253 ;
                     0000   254
                 00000000   255          .Psect  Work, Noshr, Noexe, Wrt, Long
                     0000   256
                     0000   257 Q_BUFQWD:                                ; QUADWORD DESCRIPTOR
            00000008 0000   258          .BLKQ   1                      ;  FOR MISC. STRINGS
                     0008   259 DS$GQ_TESTID::
            00000010 0008   260          .BLKQ   1                      ; STRING LENGTH & POINTER
                     0010   261 L_OFFSET:                               ; OFFSET INTO LOGICAL UNIT DATA [25]
            00000014 0010   262          .BLKL   1
                     0014   263 REVERROR:                               ; HOLDS REVISION TYPE [25]
            00000018 0014   264          .BLKL   1
                     0018   265 PRINT:                                  ; FLAG TO PRINT MESSAGE [28]
            0000001C 0018   266          .BLKL   1
                     001C   267 MODULE:                                 ; HOLDS MODULE NUMBER TO PRINT[ATI]
            00000020 001C   268          .BLKL   1
                     0020   269 T_TESTID:
            00000040 0020   270          .BLKB   TESTID_LEN             ; BUFFER FOR TEST/SUBTEST MESSAGE
```

```
                                    0040   272          .Subtitle       Data Psect Declarations
                                00000000   273          .Psect  Data, Shr, Noexe, Nowrt, Byte
                                    0000   274
                                    0000   275 MSGBELL:
                                      07   0000   276          .ASCII  <7>                     ; ASCII "BELL"
                                    0001   277 HARDER:
                                      06   0001   278          .byte   ds$k_type_errhard       ; Type code byte                [10]
   72 6F 72 72 65 20 64 72 61 48      00'  0002   279          .ASCIC  .Hard error.
                                      0A   0002
                                    000D   280 SOFTER:
                                      07   000D   281          .byte   ds$k_type_errsoft       ; Type code byte                [10]
   72 6F 72 72 65 20 74 66 6F 53      00'  000E   282          .ASCIC  .Soft error.
                                      0A   000E
                                    0019   283 DEVFER:
                                      08   0019   284          .byte   ds$k_type_errdev        ; Type code byte                [10]
61 74 61 66 20 65 63 69 76 65 44    00'  001A   285          .ASCIC  .Device fatal error.    ;               [10]
                72 6F 72 72 65 20 6C    0026
                                      12   001A
                                    002D   286 PREPER:
                                      1B   002D   287          .byte   ds$K_type_errprep       ; Type code byte                [17]
20 74 6F 6E 20 65 63 69 76 65 44    00'  002E   288          .ASCIC  .Device not prepared error.     ;       [17]
72 72 65 20 64 65 72 61 70 65 72 70     003A
                            72 6F       0046
                                      19   002E
                                    0048   289 SYSFER:
                                      05   0048   290          .byte   ds$k_type_errsys        ; Type code byte                [10]
61 74 61 66 20 6D 65 74 73 79 53    00'  0049   291          .ASCIC  .System fatal error.    ;               [10]
                72 6F 72 72 65 20 6C    0055
                                      12   0049
                                    005C   292 ersuper:                                    ; Supervisor error text         [10]
65 64 20 65 72 61 77 74 66 6F 53    00'  005C   293          .ascic  .Software detected error.       ;       [10]
72 6F 72 72 65 20 64 65 74 63 65 74     0068
                                      17   005C
                                    0074   294 ANULL:
                                      00'  0074   295          .ASCIC  ..                      .
                                      00   0074
                                    0075   296 QUNKDEV:
77 6F 6E 6B 6E 55 0000007D'010E0000'    0075   297          .ASCID  .Unknown device.
                65 63 69 76 65 64 20 6E 0083
                                    008B   298 QINITSEC:
61 69 74 69 6E 49 00000093'010E0000'    008B   299          .ASCID  .Initialization section.
63 65 73 20 6E 6F 69 74 61 7A 69 6C     0099
                            6E 6F 69 74 00A5
                                    00A9   300 QCLEANSEC:
75 6E 61 65 6C 43 000000B1'010E0000'    00A9   301          .ASCID  .Cleanup section.
                6E 6F 69 74 63 65 73 20 70  00B7
                                    00C0   302 HARDREV:                                    ;                       [25][33]
20 3D 65 72 61 77 64 72 61 48 20    00'  00C0   303          .ASCIC " Hardware= !AC;"
                            3B 43 41 21     00CC
                                      0F   00C0
                                    00D0   304 FIRMREV:                                    ;                       [25]
20 3D 65 72 61 77 6D 72 69 46 20    00'  00D0   305          .ASCIC " Firmware= !ZL;"
                            3B 4C 5A 21     00DC
                                      0F   00D0
                                    00E0   306 PATCHREV:                                   ;                       [28]
4C 5A 21 20 3D 68 63 74 61 50 20    00'  00E0   307          .ASCIC " Patch= !ZL;"
                                      3B   00EC
```

```
                                    0C  00E0
                                        00ED   308 QFMTTESTID:
21 20 74 73 65 74 000000F5'010E0000'    00ED   309          .ASCID  .test !UL, subtest !UL.
20 74 73 65 74 62 75 73 20 2C 4C 55     00FB
                        4C 55 21        0107
```

```
                                        010A   311 FMTERRHLT:
6F 20 74 6C 61 48 20 2E 2E 2F 21 00'    010A   312          .ASCIC  "!/.. Halt on error at PC !XL(X)!/"     ;                [07]
50 20 74 61 20 72 6F 72 72 65 20 6E     0116
      2F 21 29 58 28 4C 58 21 20 43     0122
                                  21    010A
                                        012C   313 FMTERRHDR:
20 2A 2A 2A 2A 2A 2A 2A 2A 2F 21 00'    012C   314          .ASCIC  \!/********  !AC - !UL.!UL  ********\ -
21 2E 4C 55 21 20 2D 20 43 41 21 20     0138
2A 2A 2A 2A 2A 2A 2A 2A 20 20 4C 55     0144
2C 4C 55 21 20 73 73 61 50 20 2F 21     0150   315                  "!/ Pass !UL, !AS, error !UL, !%D"-     ;                [07]
20 72 6F 72 72 65 20 2C 53 41 21 20     015C
            44 25 21 20 2C 4C 55 21     0168
65 6C 69 68 77 20 43 41 21 20 2F 21     0170   316                  "!/ !AC while testing !AS: !AC !/"              ;
53 41 21 20 67 6E 69 74 73 65 74 20     017C
            2F 21 20 43 41 21 20 3A     0188
                                  63    012C
                                        0190   317 linefeed:                                                          ;        [28]
                              2F 21 00' 0190   318          .ASCIC  \!/\
                                    02  0190
                                        0193   319 FMTREVERROR:                                                      ;        [25]
20 6E 6F 69 73 69 76 65 52 2F 21 00'    0193   320          .ASCIC  \!/Revision level(s) of !AS:!/\
20 66 6F 20 29 73 28 6C 65 76 65 6C     019F
               2F 21 3A 53 41 21        01AB
                                  1D    0193
                                        01B1   321 FMTMODULE:
   3A 29 43 41 21 28 09 09 2F 21 00'    01B1   322          .ASCIC  \!/             (!AC):\
                                    0A  01B1
                                        01BC   323 FMTNO_MOD:
20 20 20 20 20 20 20 09 09 2F 21 00'    01BC   324          .ASCIC  \!/                     \
                                    20  01C8
                                    0C  01BC
                                        01C9   325 fmtenderror:
20 2A 2A 2A 2A 2A 2A 2A 2A 2F 21 00'    01C9   326          .ascic  \!/********  End of !AC number !UL ********!/!/\        ;       [10]
20 43 41 21 20 66 6F 20 64 6E 45 20     01D5
2A 20 4C 55 21 20 72 65 62 6D 75 6E     01E1
   2F 21 2F 21 2A 2A 2A 2A 2A 2A 2A     01ED
                                  2E    01C9
                                        01F8   327 FMTERRSUP:
61 77 74 66 6F 53 20 3F 3F 2F 21 00'    01F8   328          .ASCIC  '!/?? Software detected error in "!AC", error #!UL, !%D'-  ;    [07]
20 64 65 74 63 65 74 65 64 20 65 72     0204
41 21 22 20 6E 69 20 72 6F 72 72 65     0210
21 23 20 72 6F 72 72 65 20 2C 22 43     021C
               44 25 21 20 2C 4C 55     0228
            2F 21 43 41 21 20 2F 21     022F   329                  "!/ !AC!/"
                                  3E    01F8
                                        0237   330 FmtErrSup1:                                                        ;        [21]
67 61 6C 46 5F 4C 47 24 41 53 44 00'    0237   331          .Ascic  'DSA$GL_Flags: !XL(X)  DS$GL_Flags: !XL(X)  Version: !AC!/' ;   [21]
44 20 20 29 58 28 4C 58 21 20 3A 73     0243
20 3A 73 67 61 6C 46 5F 4C 47 24 53     024F
73 72 65 56 20 20 29 58 28 4C 58 21     025B
      2F 21 43 41 21 20 3A 6E 6F 69     0267
                                  39    0237
                                        0271   332
                                        0271   333 FMTERRSUP2:
20 20 4C 58 21 20 3A 43 50 5F 21 00'    0271   334          .ASCIC  "!_PC: !XL  PSL: !XL!/"-
      2F 21 4C 58 21 20 3A 4C 53 50     027D
52 20 20 4C 58 21 20 3A 30 52 5F 21     0287   335                  "!_R0: !XL  R1:  !XL  R2:  !XL  R3:  !XL!/"-
```

```
3A 32 52 20 20 4C 58 21 20 20 3A 31   0293
20 20 3A 33 52 20 20 4C 58 21 20 20   029F
                  2F 21 4C 58 21      02AB
52 20 20 4C 58 21 20 3A 34 52 5F 21   02B0    336                 "!_R4: !XL  R5:  !XL  R6:  !XL  R7:  !XL!/"-
3A 36 52 20 20 4C 58 21 20 20 3A 35   02BC
20 20 3A 37 52 20 20 4C 58 21 20 20   02C8
                  2F 21 4C 58 21      02D4
52 20 20 4C 58 21 20 3A 38 52 5F 21   02D9    337                 "!_R8: !XL  R9:  !XL  R10: !XL  R11: !XL!/"
30 31 52 20 20 4C 58 21 20 20 3A 39   02E5
20 3A 31 31 52 20 20 4C 58 21 20 3A   02F1
                  2F 21 4C 58 21      02FD
                              90      0271
                                      0302    338 FMTERRSUP3:
39 28 37 21 4C 58 21 3A 4C 58 21 00'  0302    339         .ASCIC  "!XL:!XL!7(9XL)!/"
                  2F 21 29 4C 58      030E
                              10      0302
```

```
                                0313   341 T_ERROR_MASK:
21 2D 44 41 21 2D 43 41 21 2F 21 00' 0313   342          .ASCIC  "!/!AC-!AD-!AC (R0=!XL)!/"
21 29 4C 58 21 3D 30 52 28 20 43 41  031F
                                2F   032B
                                18   0313
                                     032C   343 UTILITY_CODES:
                          00000004' 032C   344          .LONG   <10$-.>/4
                          00000000  0330   345          .LONG   0
                          00000001  0334   346          .LONG   1
                          00000066  0338   347          .LONG   ^X66
                                     033C   348 10$:
                                     033C   349 UTILITY_TEXT:
                               0000  033C   350          .WORD   0
                               0006' 033E   351          .WORD   10$-.
                               000C' 0340   352          .WORD   20$-.
                               000F' 0342   353          .WORD   30$-.
                     4D 45 54 53 59 53 25 00' 0344   354 10$:    .ASCIC  "%SYSTEM"
                                07   0344
                        53 4D 52 25 00' 034C   355 20$:    .ASCIC  "%RMS"
                                04   034C
                     47 41 49 44 25 00' 0351   356 30$:    .ASCIC  "%DIAG"
                                05   0351
                                     0357   357
                                     0357   358 ERROR_CODES:
                          0000002F' 0357   359          .LONG   <10$-.>/4
                          00000000' 035B   360          .LONG   SS$_ACCVIO          ; Access violation
                          00000000' 035F   361          .LONG   SS$_NOSUCHDEV       ; No such device
                          00000000' 0363   362          .LONG   SS$_NOSUCHFILE      ; No such file
                          00000000' 0367   363          .long   ss$_ctrlerr         ; Fatal controller error          [12]
                          00018298  036B   364          .LONG   RMS$_PRV&^XFFFFFFF8 ; RMS insufficient privilege       [38]
                          00018290  036F   365          .LONG   RMS$_FNF&^XFFFFFFF8 ; RMS no such file
                          000184C0  0373   366          .LONG   RMS$_DEV&^XFFFFFFF8 ; RMS bad device
                          0001C048  0377   367          .LONG   RMS$_DNF&^XFFFFFFF8 ; RMS directory not found
                          0001C000  037B   368          .LONG   RMS$_ACC&^XFFFFFFF8 ; RMS file access error
                          00018490  037F   369          .LONG   RMS$_CCR&^XFFFFFFF8 ; RMS connect error
                          000184D0  0383   370          .LONG   RMS$_DME&^XFFFFFFF8 ; RMS pool allocation error
                          00018278  0387   371          .LONG   RMS$_EOF&^XFFFFFFF8 ; RMS end of file
                          00018508  038B   372          .LONG   RMS$_FAB&^XFFFFFFF8 ; RMS invalid FAB
                          00018560  038F   373          .LONG   RMS$_IFI&^XFFFFFFF8 ; RMS invalid internal file index
                          00018570  0393   374          .LONG   RMS$_IOP&^XFFFFFFF8 ; RMS illegal operation
                          00018580  0397   375          .LONG   RMS$_ISI&^XFFFFFFF8 ; RMS invalid RAB/FAB pair
                          00018638  039B   376          .LONG   RMS$_RAB&^XFFFFFFF8 ; RMS invalid RAB
                          0001C0F0  039F   377          .LONG   RMS$_RER&^XFFFFFFF8 ; RMS file read error
                          000181A8  03A3   378          .LONG   RMS$_RTB&^XFFFFFFF8 ; RMS record truncation warning
                          00018658  03A7   379          .LONG   RMS$_RFA&^XFFFFFFF8 ; RMS invalid RFA
                          00018578  03AB   380          .LONG   RMS$_IRC&^XFFFFFFF8 ; RMS invalid record
                          00018528  03AF   381          .LONG   RMS$_FNM&^XFFFFFFF8 ; FNM error in filename
                          00660008  03B3   382          .LONG   DS$_OVERFLOW        ; Field overflow
                          00660010  03B7   383          .LONG   DS$_NULLSTR         ; Null input string
                          00660018  03BB   384          .LONG   DS$_ILLCHAR         ; Illegal character
                          00660020  03BF   385          .LONG   DS$_PROGERR         ; Programmer error
                          00660028  03C3   386          .LONG   DS$_TRUNCATE        ; Data truncated
                          00660038  03C7   387          .LONG   DS$_IVVECT          ; Invalid vector
                          00660040  03CB   388          .LONG   DS$_IVADDR          ; Invalid vector address
                          00660048  03CF   389          .LONG   DS$_VASFULL         ; virtural address space full
                          00660050  03D3   390          .LONG   DS$_INSFMEM         ; Insufficient memory
                          00660060  03D7   391          .LONG   DS$_IHWE            ; Initial channel hardware error
```

```
                00660068  03DB   392          .LONG   DS$_FHWE                ; Final channel hardware error
                00660070  03DF   393          .LONG   DS$_LOGIC               ; Program logic error
                00660078  03E3   394          .LONG   DS$_ILLPAGCNT           ; Illegal page count
                00660080  03E7   395          .LONG   DS$_FRAGBUF             ; Buffer is fragmented
                00660088  03EB   396          .LONG   DS$_MCHK                ; Machine check
                00660090  03EF   397          .LONG   DS$_KRNLSTK             ; Kernel stack not valid
                00660098  03F3   398          .LONG   DS$_POWER               ; Power fail interrupt
                006600A0  03F7   399          .LONG   DS$_TRANSL              ; Translation not valid
                006600B0  03FB   400          .LONG   DS$_NOTIMP              ; Not implemented
                006600B8  03FF   401          .LONG   DS$_IPL2HI              ; IPL too high
                006600C0  0403   402          .LONG   DS$_ICERR               ; Interval clock error
                006600D0  0407   403          .LONG   DS$_ARITH               ; Arithmetic trap
                006600D8  040B   404          .LONG   DS$_UNEXPINT            ; Unexpected interrupt
                00660158  040F   405          .LONG   DS$_UNSUPPDEV           ; load device not support under this cpu[27]
                          0413   406 10$:
                          0413   407 ERROR_TEXT:
                    005E' 0413   408          .WORD   0$-.                    ; Unknown error
                    00F8' 0415   409          .WORD   60$-.                   ; ^X0C Access violation
                    0068' 0417   410          .WORD   10$-.
                    0080' 0419   411          .WORD   20$-.
                    04CC' 041B   412          .word   440$-.                  ; Fatal controller error                [12]
                    051E' 041D   413          .WORD   510$-.                  ;                                       [38]
                    0093' 041F   414          .WORD   30$-.
                    00A5' 0421   415          .WORD   40$-.
                    00D1' 0423   416          .WORD   50$-.
                    02C6' 0425   417          .WORD   300$-.
                    02E0' 0427   418          .WORD   310$-.
                    02F6' 0429   419          .WORD   320$-.
                    0312' 042B   420          .WORD   330$-.
                    032A' 042D   421          .WORD   340$-.
                    034F' 042F   422          .WORD   350$-.
                    037F' 0431   423          .WORD   360$-.
                    03B4' 0433   424          .WORD   370$-.
                    03E6' 0435   425          .WORD   380$-.
                    040B' 0437   426          .WORD   390$-.
                    041E' 0439   427          .WORD   400$-.
                    0444' 043B   428          .WORD   410$-.
                    046B' 043D   429          .WORD   420$-.
                    0491' 043F   430          .WORD   430$-.
                    00E2' 0441   431          .WORD   70$-.
                    00EF' 0443   432          .WORD   80$-.
                    00FF' 0445   433          .WORD   90$-.
                    010F' 0447   434          .WORD   100$-.
                    011E' 0449   435          .WORD   110$-.
                    012B' 044B   436          .WORD   120$-.
                    0138' 044D   437          .WORD   130$-.
                    014D' 044F   438          .WORD   140$-.
                    0167' 0451   439          .WORD   150$-.
                    0179' 0453   440          .WORD   160$-.
                    0196' 0455   441          .WORD   170$-.
                    01B1' 0457   442          .WORD   180$-.
                    01C3' 0459   443          .WORD   190$-.
                    01D4' 045B   444          .WORD   200$-.
                    01E7' 045D   445          .WORD   210$-.
                    01F3' 045F   446          .WORD   220$-.
                    0208' 0461   447          .WORD   230$-.
                    021B' 0463   448          .WORD   240$-.
```

```
                                022F' 0465    449          .WORD   250$-.
                                023D' 0467    450          .WORD   260$-.
                                0248' 0469    451          .WORD   270$-.
                                025B' 046B    452          .WORD   280$-.
                                0269' 046D    453          .WORD   290$-.
                                0498' 046F    454          .WORD   500$-.
72 72 65 20 6E 77 6F 6E 6B 6E 55 00' 0471    455 0$:      .ASCIC  "Unknown error"
                                72 6F 047D
                                   0D 0471
20 2C 56 45 44 48 43 55 53 4F 4E 00' 047F    456 10$:     .ASCIC  "NOSUCHDEV, No such device"
69 76 65 64 20 68 63 75 73 20 6F 4E  048B
                                65 63 0497
                                   19 047F
2C 45 4C 49 46 48 43 55 53 4F 4E 00' 0499    457 20$:     .ASCIC  "NOSUCHFILE, No such file"
6C 69 66 20 68 63 75 73 20 6F 4E 20  04A5
                                   65 04B1
                                   18 0499
6E 20 65 6C 69 66 20 2C 46 4E 46 00' 04B2    458 30$:     .ASCIC  "FNF, file not found"
            64 6E 75 6F 66 20 74 6F  04BE
                                   13 04B2
65 64 20 64 61 62 20 2C 56 45 44 00' 04C6    459 40$:     .ASCIC  "DEV, bad device, or inappropriate device type"
61 6E 69 20 72 6F 20 2C 65 63 69 76  04D2
64 20 65 74 61 69 72 70 6F 72 70 70  04DE
   65 70 79 74 20 65 63 69 76 65     04EA
                                2D 04C6
74 63 65 72 69 64 20 2C 46 4E 44 00' 04F4    460 50$:     .ASCIC  "DNF, directory not found"
6E 75 6F 66 20 74 6F 6E 20 79 72 6F  0500
                                64 050C
                                   18 04F4
73 73 65 63 63 61 20 2C 43 43 41 00' 050D    461 60$:     .ASCIC  "ACC, access violation"
   6E 6F 69 74 61 6C 6F 69 76 20     0519
                                   15 050D
66 72 65 76 6F 20 64 6C 65 69 46 00' 0523    462 70$:     .ASCIC  "Field overflow"
                                77 6F 6C 052F
                                   0E 0523
20 74 75 70 6E 69 20 6C 6C 75 4E 00' 0532    463 80$:     .ASCIC  "Null input string"
                  67 6E 69 72 74 73  053E
                                   11 0532
61 68 63 20 6C 61 67 65 6C 6C 49 00' 0544    464 90$:     .ASCIC  "Illegal character"
                  72 65 74 63 61 72  0550
                                   11 0544
20 72 65 6D 6D 61 72 67 6F 72 50 00' 0556    465 100$:    .ASCIC  "Programmer error"
                     72 6F 72 72 65  0562
                                   10 0556
61 63 6E 75 72 74 20 61 74 61 44 00' 0567    466 110$:    .ASCIC  "Data truncated"
                                64 65 74 0573
                                   0E 0567
63 65 76 20 64 69 6C 61 76 6E 49 00' 0576    467 120$:    .ASCIC  "Invalid vector"
                                72 6F 74 0582
                                   0E 0576
63 65 76 20 64 69 6C 61 76 6E 49 00' 0585    468 130$:    .ASCIC  "Invalid vector address"
   73 73 65 72 64 64 61 20 72 6F 74  0591
                                   16 0585
64 61 20 6C 61 72 75 74 72 69 56 00' 059C    469 140$:    .ASCIC  "Virtural address space full"
20 65 63 61 70 73 20 73 73 65 72 64  05A8
                     6C 6C 75 66     05B4
                                   1B 059C
```

```
6E 65 69 63 69 66 66 75 73 6E 49 00' 05B8    470 150$:   .ASCIC  "Insufficient memory"
                79 72 6F 6D 65 6D 20 74  05C4
                                   13    05B8
61 68 63 20 6C 61 69 74 69 6E 49 00' 05CC    471 160$:   .ASCIC  "Initial channel hardware error"
72 61 77 64 72 61 68 20 6C 65 6E 6E  05D8
                72 6F 72 72 65 20 65  05E4
                                   1E    05CC
6E 6E 61 68 63 20 6C 61 6E 69 46 00' 05EB    472 170$:   .ASCIC  "Final channel hardware error"
20 65 72 61 77 64 72 61 68 20 6C 65  05F7
                      72 6F 72 72 65  0603
                                   1C    05EB
67 6F 6C 20 6D 61 72 67 6F 72 50 00' 0608    473 180$:   .ASCIC  "Program logic error"
                72 6F 72 72 65 20 63 69  0614
                                   13    0608
67 61 70 20 6C 61 67 65 6C 6C 49 00' 061C    474 190$:   .ASCIC  "Illegal page count"
                74 6E 75 6F 63 20 65  0628
                                   12    061C
66 20 73 69 20 72 65 66 66 75 42 00' 062F    475 200$:   .ASCIC  "Buffer is fragmented"
                64 65 74 6E 65 6D 67 61  063B
                                   14    062F
65 68 63 20 65 6E 69 68 63 61 4D 00' 0644    476 210$:   .ASCIC  "Machine check"
                                6B 63  0650
                                   0D    0644
63 61 74 73 20 6C 65 6E 72 65 4B 00' 0652    477 220$:   .ASCIC  "Kernel stack not valid"
   64 69 6C 61 76 20 74 6F 6E 20 6B  065E
                                   16    0652
20 6C 69 61 66 20 72 65 77 6F 50 00' 0669    478 230$:   .ASCIC  "Power fail interrupt"
                74 70 75 72 72 65 74 6E 69  0675
                                   14    0669
6E 6F 69 74 61 6C 73 6E 61 72 54 00' 067E    479 240$:   .ASCIC  "Translation not valid"
      64 69 6C 61 76 20 74 6F 6E 20  068A
                                   15    067E
65 6D 65 6C 70 6D 69 20 74 6F 4E 00' 0694    480 250$:   .ASCIC  "Not implemented"
                                64 65 74 6E  06A0
                                   0F    0694
67 69 68 20 6F 6F 74 20 4C 50 49 00' 06A4    481 260$:   .ASCIC  "IPL too high"
                                      68  06B0
                                   0C    06A4
6C 63 20 6C 61 76 72 65 74 6E 49 00' 06B1    482 270$:   .ASCIC  "Interval clock error"
                72 6F 72 72 65 20 6B 63 6F  06BD
                                   14    06B1
20 63 69 74 65 6D 68 74 69 72 41 00' 06C6    483 280$:   .ASCIC  "Arithmetic trap"
                                70 61 72 74  06D2
                                   0F    06C6
20 64 65 74 63 65 70 78 65 6E 55 00' 06D6    484 290$:   .ASCIC  "Unexpected interrupt"
                74 70 75 72 72 65 74 6E 69  06E2
                                   14    06D6
69 66 20 50 43 41 20 2C 43 43 41 00' 06EB    485 300$:   .ASCIC  "ACC, ACP file access failed"
61 66 20 73 73 65 63 63 61 20 65 6C  06F7
                                64 65 6C 69  0703
                                   1B    06EB
74 6F 6E 6E 61 63 20 2C 52 43 43 00' 0707    486 310$:   .ASCIC  "CCR, cannot connect RAB"
42 41 52 20 74 63 65 6E 6E 6F 63 20  0713
                                   17    0707
69 6D 61 6E 79 64 20 2C 45 4D 44 00' 071F    487 320$:   .ASCIC  "DME, dynamic memory exhausted"
68 78 65 20 79 72 6F 6D 65 6D 20 63  072B
                   64 65 74 73 75 61  0737
```

```
                                                  1D  071F
66 6F 20 64 6E 65 20 2C 46 4F 45 00' 073D   488 330$:   .ASCIC  "EOF, end of file detected"
74 63 65 74 65 64 20 65 6C 69 66 20  0749
                                 64 65  0755
                                 19  073D
69 6C 61 76 6E 69 20 2C 42 41 46 00' 0757   489 340$:   .ASCIC  "FAB, invalid FAB or FAB not accessible"
42 41 46 20 72 6F 20 42 41 46 20 64  0763
69 73 73 65 63 63 61 20 74 6F 6E 20  076F
                           65 6C 62  077B
                                 26  0757
69 6C 61 76 6E 69 20 2C 49 46 49 00' 077E   490 350$:   .ASCIC  "IFI, invalid internal file identifier (IFI) value"
66 20 6C 61 6E 72 65 74 6E 69 20 64  078A
69 66 69 74 6E 65 64 69 20 65 6C 69  0796
6C 61 76 20 29 49 46 49 28 20 72 65  07A2
                           65 75 6C  07AE
                                 31  077E
74 61 72 65 70 6F 20 2C 50 4F 49 00' 07B0   491 360$:   .ASCIC  "IOP, operation invalid for file organization or device"
20 64 69 6C 61 76 6E 69 20 6E 6F 69  07BC
67 72 6F 20 65 6C 69 66 20 72 6F 66  07C8
72 6F 20 6E 6F 69 74 61 7A 69 6E 61  07D4
                 65 63 69 76 65 64 20  07E0
                                 36  07B0
69 6C 61 76 6E 69 20 2C 49 53 49 00' 07E7   492 370$:   .ASCIC  "ISI, invalid internal stream identifier (ISI) value"
73 20 6C 61 6E 72 65 74 6E 69 20 64  07F3
69 74 6E 65 64 69 20 6D 61 65 72 74  07FF
76 20 29 49 53 49 28 20 72 65 69 66  080B
                           65 75 6C 61  0817
                                 33  07E7
69 6C 61 76 6E 69 20 2C 42 41 52 00' 081B   493 380$:   .ASCIC  "RAB, invalid RAB or RAB not accessible"
42 41 52 20 72 6F 20 42 41 52 20 64  0827
69 73 73 65 63 63 61 20 74 6F 6E 20  0833
                           65 6C 62  083F
                                 26  081B
72 20 65 6C 69 66 20 2C 52 45 52 00' 0842   494 390$:   .ASCIC  "RER, file read error"
         72 6F 72 72 65 20 64 61 65  084E
                                 14  0842
64 72 6F 63 65 72 20 2C 42 54 52 00' 0857   495 400$:   .ASCIC  "RTB, record too large for user's buffer"
66 20 65 67 72 61 6C 20 6F 6F 74 20  0863
75 62 20 73 27 72 65 73 75 20 72 6F  086F
                           72 65 66 66  087B
                                 27  0857
69 6C 61 76 6E 69 20 2C 41 46 52 00' 087F   496 410$:   .ASCIC  "RFA, invalid record's file address (RFA)"
66 20 73 27 64 72 6F 63 65 72 20 64  088B
20 73 73 65 72 64 64 61 20 65 6C 69  0897
                        29 41 46 52 28  08A3
                                 28  087F
61 67 65 6C 6C 69 20 2C 43 52 49 00' 08A8   497 420$:   .ASCIC  "IRC, illegal record encountered in file"
63 6E 65 20 64 72 6F 63 65 72 20 6C  08B4
20 6E 69 20 64 65 72 65 74 6E 75 6F  08C0
                           65 6C 69 66  08CC
                                 27  08A8
20 72 6F 72 72 65 20 2C 4D 4E 46 00' 08D0   498 430$:   .ASCIC  "FNM, error in filename"
   65 6D 61 6E 65 6C 69 66 20 6E 69  08DC
                                 16  08D0
61 66 20 2C 52 52 45 4C 52 54 43 00' 08E7   499 440$:   .ascic  "CTRLERR, fatal controller error"       ;                    [12]
6C 6C 6F 72 74 6E 6F 63 20 6C 61 74  08F3
         72 6F 72 72 65 20 72 65  08FF
```

```
                                                 1F  08E7
65 64 20 64 61 6F 6C 20 65 68 54 00'  0907    500 500$:   .ASCIC  "The load device is not supported in this Supervisor"   ;       [37]
20 74 6F 6E 20 73 69 20 65 63 69 76   0913
6E 69 20 64 65 74 72 6F 70 70 75 73   091F
76 72 65 70 75 53 20 73 69 68 74 20   092B
                  72 6F 73 69 63 65   0937
                                 33   0907
66 66 75 73 6E 49 20 2C 56 52 50 00'  093B    501 510$:   .ASCIC  "PRV, Insufficient privilege or file protection violation"  ;   [38]
69 76 69 72 70 20 74 6E 65 69 63 69   0947
65 6C 69 66 20 72 6F 20 65 67 65 6C   0953
20 6E 6F 69 74 63 65 74 6F 72 70 20   095F
      6E 6F 69 74 61 6C 6F 69 76 63   096B
                                 38   093B
                                      0974    502
                                      0974    503 SEVERITY:
                     3F 46 45 57      0974    504         .ASCII  "WEF?"
```

```
                     0978   506          .SBTTL  DSX$ErrSoft Routine
                 00000000   507          .PSECT  CODE, SHR, EXE, NOWRT, BYTE
                     0000   508 ;++
                     0000   509 ; FUNCTIONAL DESCRIPTION:
                     0000   510 ;
                     0000   511 ;       THIS ROUTINE LOGS AND REPORTS THE OCCURENCE OF AN
                     0000   512 ;       "ERRSOFT" CALL TO THE OPERATOR AND A.P.T..
                     0000   513 ;
                     0000   514 ; CALLING SEQUENCE:
                     0000   515 ;
                     0000   516 ;       NONE
                     0000   517 ;
                     0000   518 ; INPUT PARAMETERS:
                     0000   519 ;
                     0000   520 ;       ERR$_NUM(AP)     = ERROR NUMBER
                     0000   521 ;       ERR$_UNIT(AP)    = LOGICAL UNIT NUMBER
                     0000   522 ;       ERR$_MSGADR(AP)  = POINTER TO ASCII STRING
                     0000   523 ;       ERR$_POINTER(AP)= LINK TO PRINT ROUTINE
                     0000   524 ;
                     0000   525 ; IMPLICIT INPUTS:
                     0000   526 ;
                     0000   527 ;       NONE
                     0000   528 ;
                     0000   529 ; OUTPUT PARAMETERS:
                     0000   530 ;
                     0000   531 ;       NONE
                     0000   532 ;
                     0000   533 ; IMPLICIT OUTPUTS:
                     0000   534 ;
                     0000   535 ;       NONE
                     0000   536 ;
                     0000   537 ; COMPLETION CODES:
                     0000   538 ;
                     0000   539 ;       NONE
                     0000   540 ;
                     0000   541 ; SIDE EFFECTS:
                     0000   542 ;
                     0000   543 ;       NONE
                     0000   544 ;
                     0000   545 ;--
```

```
                    0FFC  0000   .ENTRY  DSX$ERRSOFT,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ;                    [14]
                          0002
        00000000'EF   D6  0002           Incl    L^Ds$GL_SoftErr_Count   ; Count this soft error              [15]
        0000000D'EF   DF  0008           PUSHAL  L^SOFTER                ; INDICATE ERROR TYPE                [08]
              00C0    30  000E           BSBW    RRPTERROR               ; CALL ERROR REPORTING SUBRTN
  0000FE40'EF   04    D0  0011           MOVL    #APM$_SOFTERR, -        ; Indicate error type in mailbox
                          0018                     L^DSA$GL_MSGTYP
                          0018           Br_If_Not_APT   10$             ; If not running from APT, branch    [19]
  0000FE00'EF   1F    E1  0018           BBC     #DSA$V_Apt, -                   ; If bit not set, branch
                06        001F                     L^DSA$GL_Flags, 10$             ;
        00000000'EF   16  0020           JSB     L^APT_MSG               ; Else, transfer control to APT      [08]
                          0026
                      04  0026   10$:    RET
                          0027           .SBTTL  DSX$ErrHard Routine
                          0027   ;++
                          0027   ; FUNCTIONAL DESCRIPTION:
                          0027   ;
                          0027   ;       THIS ROUTINE LOGS AND REPORTS THE OCCURENCE OF AN
                          0027   ;       "ERRHARD" CALL TO THE OPERATOR AND A.P.T..
                          0027   ;
                          0027   ; CALLING SEQUENCE:
                          0027   ;
                          0027   ;       NONE
                          0027   ;
                          0027   ; INPUT PARAMETERS:
                          0027   ;
                          0027   ;       ERR$_NUM(AP)     = ERROR NUMBER
                          0027   ;       ERR$_UNIT(AP)    = LOGICAL UNIT NUMBER
                          0027   ;       ERR$_MSGADR(AP)  = POINTER TO ASCII STRING
                          0027   ;       ERR$_POINTER(AP)= LINK TO PRINT ROUTINE
                          0027   ;
                          0027   ; IMPLICIT INPUTS:
                          0027   ;
                          0027   ;       NONE
                          0027   ;
                          0027   ; OUTPUT PARAMETERS:
                          0027   ;
                          0027   ;       NONE
                          0027   ;
                          0027   ; IMPLICIT OUTPUTS:
                          0027   ;
                          0027   ;       NONE
                          0027   ;
                          0027   ; COMPLETION CODES:
                          0027   ;
                          0027   ;       NONE
                          0027   ;
                          0027   ; SIDE EFFECTS:
                          0027   ;
                          0027   ;       NONE
                          0027   ;
                          0027   ;--
```

```
                    0FFC  0027   598 .ENTRY  DSX$ERRHARD,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ;                    [14]
                          0029   599
        00000000'EF   D6  0029   600         Incl    L^Ds$GL_HardErr_Count   ; Count this hard error              [15]
        00000001'EF   DF  002F   601         PUSHAL  L^HARDER                ; INDICATE ERROR TYPE                [08]
                0099  30  0035   602         BSBW    RRPTERROR               ; CALL ERROR REPORTING SUBRTN
   0000FE40'EF   03   D0  0038   603         MOVL    #APM$_HARDERR, -        ; Indicate error type in mailbox
                          003F   604                   L^DSA$GL_MSGTYP
                          003F   605         Br_If_Not_APT   10$             ; If not running from APT, branch    [19]
   0000FE00'EF   1F   E1  003F               BBC     #DSA$V_Apt, -                   ; If bit not set, branch
                 06       0046                         L^DSA$GL_Flags, 10$           ;
        00000000'EF   16  0047   606         JSB     L^APT_MSG               ; Else, transfer control to APT      [08]
                          004D   607
                      04  004D   608 10$:    RET
```

```
004E        .SBTTL  DSX$ErrPrep Routine                                    [17]
004E   ;++                                                                 [17]
004E   ; FUNCTIONAL DESCRIPTION:                                           [17]
004E   ;                                                                   [17]
004E   ;       THIS ROUTINE LOGS AND REPORTS THE OCCURENCE OF AN           [17]
004E   ;       "ERRPREP" CALL TO THE OPERATOR AND A.P.T..                  [17]
004E   ;                                                                   [17]
004E   ; CALLING SEQUENCE:                                                 [17]
004E   ;                                                                   [17]
004E   ;       NONE                                                        [17]
004E   ;                                                                   [17]
004E   ; INPUT PARAMETERS:                                                 [17]
004E   ;                                                                   [17]
004E   ;       ERR$_NUM(AP)    = ERROR NUMBER                              [17]
004E   ;       ERR$_UNIT(AP)   = LOGICAL UNIT NUMBER                       [17]
004E   ;       ERR$_MSGADR(AP) = POINTER TO ASCII STRING                   [17]
004E   ;       ERR$_POINTER(AP)= LINK TO PRINT ROUTINE                     [17]
004E   ;                                                                   [17]
004E   ; IMPLICIT INPUTS:                                                  [17]
004E   ;                                                                   [17]
004E   ;       NONE                                                        [17]
004E   ;                                                                   [17]
004E   ; OUTPUT PARAMETERS:                                                [17]
004E   ;                                                                   [17]
004E   ;       NONE                                                        [17]
004E   ;                                                                   [17]
004E   ; IMPLICIT OUTPUTS:                                                 [17]
004E   ;                                                                   [17]
004E   ;       NONE                                                        [17]
004E   ;                                                                   [17]
004E   ; COMPLETION CODES:                                                 [17]
004E   ;                                                                   [17]
004E   ;       NONE                                                        [17]
004E   ;                                                                   [17]
004E   ; SIDE EFFECTS:                                                     [17]
004E   ;                                                                   [17]
004E   ;       NONE                                                        [17]
004E   ;                                                                   [17]
004E   ;--                                                                 [17]
```

```
                        0FFC  004E    650 .ENTRY  DSX$ERRPREP,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ;                    [17]
                              0050    651
          00000000'EF    D6   0050    652         Incl    L^Ds$GL_PrepErr_Count   ; Count this device preparation  error  [17]
          0000002D'EF    DF   0056    653         PUSHAL  L^PREPERR               ; INDICATE ERROR TYPE                  [17]
                0072     30   005C    654         BSBW    RRPTERROR               ; CALL ERROR REPORTING SUBRTN          [17]
     0000FE40'EF   0C    D0   005F    655         MOVL    #APM$_PREPERR, -        ; Indicate error type in mailbox       [17]
                              0066    656                   L^DSA$GL_MSGTYP
                              0066    657         Br_If_Not_APT   10$             ; If not running from APT, branch      [19]
     0000FE00'EF   1F    E1   0066                BBC     #DSA$V_Apt, -           ; If bit not set, branch
                         06   006D                          L^DSA$GL_Flags, 10$   ;
          00000000'EF    16   006E    658         JSB     L^APT_MSG               ; Else, transfer control to APT        [17]
                              0074    659
                         04   0074    660 10$:    RET
```

```
0075   662          .SBTTL  DSX$ErrDev Routine
0075   663 ;++
0075   664 ; FUNCTIONAL DESCRIPTION:
0075   665 ;
0075   666 ;       THIS ROUTINE LOGS AND REPORTS THE OCCURENCE OF AN
0075   667 ;       "ERRDEV" CALL TO THE OPERATOR AND A.P.T..
0075   668 ;
0075   669 ; CALLING SEQUENCE:
0075   670 ;
0075   671 ;       NONE
0075   672 ;
0075   673 ; INPUT PARAMETERS:
0075   674 ;
0075   675 ;       ERR$_NUM(AP)     = ERROR NUMBER
0075   676 ;       ERR$_UNIT(AP)    = LOGICAL UNIT NUMBER
0075   677 ;       ERR$_MSGADR(AP) = POINTER TO ASCII STRING
0075   678 ;       ERR$_POINTER(AP)= LINK TO PRINT ROUTINE
0075   679 ;
0075   680 ; IMPLICIT INPUTS:
0075   681 ;
0075   682 ;       NONE
0075   683 ;
0075   684 ; OUTPUT PARAMETERS:
0075   685 ;
0075   686 ;       NONE
0075   687 ;
0075   688 ; IMPLICIT OUTPUTS:
0075   689 ;
0075   690 ;       NONE
0075   691 ;
0075   692 ; COMPLETION CODES:
0075   693 ;
0075   694 ;       NONE
0075   695 ;
0075   696 ; SIDE EFFECTS:
0075   697 ;
0075   698 ;       NONE
0075   699 ;
0075   700 ;--
```

```
                    0FFC  0075   702 .ENTRY  DSX$ERRDEV,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>  ;                          [14]
                          0077   703
        00000000'EF   D6  0077   704         Incl    L^Ds$GL_DevErr_Count    ; Count this device error                  [15]
        00000019'EF   DF  007D   705         PUSHAL  L^DEVFER                ; INDICATE ERROR TYPE                      [08]
  00000000'EF    09   E2  0083   706         BBSS    #DS$V_DEVFLG, -         ; FLAG DEVICE-FATAL                        [08]
                 00       008A   707                   L^DS$GL_FLAGS,10$
                          008B   708
                 44   10  008B   709 10$:    BSBB    RRPTERROR               ; CALL ERROR REPORTING SUBRTN              [10]
  0000FE40'EF    02   D0  008D   710         MOVL    #APM$_DEVERR, -         ; Indicate error type in mailbox
                          0094   711                   L^DSA$GL_MSGTYP
                          0094   712         Br_If_Not_APT   20$             ; If not running from APT, branch          [19]
  0000FE00'EF    1F   E1  0094               BBC     #DSA$V_Apt, -                   ; If bit not set, branch
                 06       009B                         L^DSA$GL_Flags, 20$            ;
        00000000'EF   16  009C   713         JSB     L^APT_MSG               ; Else, transfer control to APT            [08]
                          00A2   714
                      04  00A2   715 20$:    RET
```

```
00A3    717          .SBTTL  DSX$ErrSys Routine
00A3    718 ;++
00A3    719 ; FUNCTIONAL DESCRIPTION:
00A3    720 ;
00A3    721 ;       THIS ROUTINE LOGS AND REPORTS THE OCCURENCE OF AN
00A3    722 ;       "ERRSYS" CALL TO THE OPERATOR AND A.P.T..
00A3    723 ;
00A3    724 ; CALLING SEQUENCE:
00A3    725 ;
00A3    726 ;       NONE
00A3    727 ;
00A3    728 ; INPUT PARAMETERS:
00A3    729 ;
00A3    730 ;       ERR$_NUM(AP)     = ERROR NUMBER
00A3    731 ;       ERR$_UNIT(AP)    = LOGICAL UNIT NUMBER
00A3    732 ;       ERR$_MSGADR(AP) = POINTER TO ASCII STRING
00A3    733 ;       ERR$_POINTER(AP)= LINK TO PRINT ROUTINE
00A3    734 ;
00A3    735 ; IMPLICIT INPUTS:
00A3    736 ;
00A3    737 ;       NONE
00A3    738 ;
00A3    739 ; OUTPUT PARAMETERS:
00A3    740 ;
00A3    741 ;       NONE
00A3    742 ;
00A3    743 ; IMPLICIT OUTPUTS:
00A3    744 ;
00A3    745 ;       NONE
00A3    746 ;
00A3    747 ; COMPLETION CODES:
00A3    748 ;
00A3    749 ;       NONE
00A3    750 ;
00A3    751 ; SIDE EFFECTS:
00A3    752 ;
00A3    753 ;       NONE
00A3    754 ;
00A3    755 ;--                                                    ;G:7
```

```
                    0FFC  00A3   757 .ENTRY  DSX$ERRSYS,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>  ;                    [14]
                          00A5   758
        00000000'EF   D6  00A5   759         Incl    L^Ds$GL_SysErr_Count    ; Count this system error            [15]
        00000048'EF   DF  00AB   760         PUSHAL  L^SYSFER                ; INDICATE ERROR TYPE                [08]
  00000000'EF    0A   E2  00B1   761         BBSS    #DS$V_SYSFLG, -         ; FLAG SYSTEM-FATAL                  [08]
                 00        00B8   762                   L^DS$GL_FLAGS, 10$
                           00B9   763
                 16   10  00B9   764 10$:    BSBB    RRPTERROR               ; CALL ERROR REPORTING SUBRTN        [10]
  0000FE40'EF    01   D0  00BB   765         MOVL    #APM$_SYSERR, -         ; Indicate error type in mailbox
                           00C2   766                   L^DSA$GL_MSGTYP
                           00C2   767         Br_If_Not_APT   20$             ; If not running from APT, branch    [19]
  0000FE00'EF    1F   E1  00C2               BBC     #DSA$V_Apt, -                   ; If bit not set, branch
                 06        00C9                         L^DSA$GL_Flags, 20$           ;
        00000000'EF   16  00CA   768         JSB     L^APT_MSG               ; Else, transfer control to APT      [08]
                           00D0   769
                      04  00D0   770 20$:    RET
```

```
00D1    772          .SBTTL  RRptError Routine
00D1    773 ;++
00D1    774 ; FUNCTIONAL DESCRIPTION:
00D1    775 ;
00D1    776 ;       THIS ROUTINE REPORTS THE ERROR MESSAGE TO THE OPERATOR,
00D1    777 ;       IT IS REACHED VIA "BSBW" FROM A SUPERVISOR ROUTINE.
00D1    778 ;
00D1    779 ; CALLING SEQUENCE:
00D1    780 ;
00D1    781 ;       NONE
00D1    782 ;
00D1    783 ; INPUT PARAMETERS:
00D1    784 ;
00D1    785 ;       4(SP)             = POINTER TO ERROR TYPE STRING
00D1    786 ;       ERR$_NUM(AP)      = ERROR NUMBER
00D1    787 ;       ERR$_UNIT(AP)     = LOGICAL UNIT NUMBER
00D1    788 ;       ERR$_MSGADR(AP)   = POINTER TO ASCII STRING
00D1    789 ;       ERR$_POINTER(AP)= LINK TO PRINT ROUTINE
00D1    790 ;
00D1    791 ; IMPLICIT INPUTS:
00D1    792 ;
00D1    793 ;       NONE
00D1    794 ;
00D1    795 ; OUTPUT PARAMETERS:
00D1    796 ;
00D1    797 ;       NONE
00D1    798 ;
00D1    799 ; IMPLICIT OUTPUTS:
00D1    800 ;
00D1    801 ;       NONE
00D1    802 ;
00D1    803 ; COMPLETION CODES:
00D1    804 ;
00D1    805 ;       NORMAL RETURN IF "HALT" ON ERROR IS NOT SET
00D1    806 ;       GO TO COMMAND MODE IF "HALT" IS SET (IMMEDIATELY AFTER RETURN)
00D1    807 ;
00D1    808 ; SIDE EFFECTS:
00D1    809 ;
00D1    810 ;       NONE
00D1    811 ;
00D1    812 ;--
```

```
                                  00D1   814 RRPTERROR:                                          ;
          00000018'EF    D4       00D1   815          CLRL    PRINT                            ; Make sure flag is clear
          00000000'EF    D6       00D7   816          INCL    L^DS$GL_ERRCNT                   ; KEEP TOTAL OF ERRORS
                                  00DD   817          Set_ErrFlg                               ; Set the error flag
     00000000'EF    04    E2       00DD               BBSS    #DS$V_ErrFlg, -          ; Branch if ERRFLG bit is set to        [29]
                    00             00E4                         L^DS$GL_Flags, 30000$ ; ...                                  [29]
                                  00E5        30000$:                                  ; ... here. Set bit regardless.         [29]
          00000000'EF    D4       00E5   818          CLRL    L^DS$GA_CHKLPPC                  ; CLEAR THE CHECK_LOOP P.C.
          0000FE68'EF    7C       00EB   819          CLRQ    L^DSA$GQ_MSGPTR                  ; Clear message descriptor
  0000FE44'EF    04 AC    3C       00F1   820          MOVZWL  ERR$_NUM(AP), L^DSA$GL_ERRNO     ; Save error number-only a word
                                  00F9   821          Br_If_Not_Bell  20$                      ; Skip if "BELL" flag not set
     0000FE00'EF    03    E1       00F9               BBC     #DSA$V_Bell, -                   ; If bit not set, branch        [29]
                    25             0100                         L^DSA$GL_Flags, 20$            ;                                [29]
                                  0101   822          $QIOW_S ,L^DS$GW_TTOUT, -                ; "DING"
                                  0101   823                       #IO$_WRITEVBLK,,,, -
                                  0101   824                       L^MSGBELL, #1
                    7E    7C       0101                       CLRQ    -(SP)
                    7E    7C       0103                       CLRQ    -(SP)
                    01    DD       0105                       PUSHL   #1
          00000000'EF    DF       0107                       PUSHAL  L^MSGBELL
                    7E    7C       010D                       CLRQ    -(SP)
                    00    DD       010F                       PUSHL   #0
        7E    0000'8F    3C       0111                       MOVZWL  #IO$_WRITEVBLK,-(SP)
     7E   00000000'EF    3C       0116                       MOVZWL  L^DS$GW_TTOUT,-(SP)
                    00    DD       011D                       PUSHL   #0
     00000000'GF    0C    FB       011F                       CALLS   #12,G^SYS$QIOW
                                  0126   825
                                  0126   826 20$:     $DS_GPHARD_S  ERR$_UNIT(AP), -(SP)       ; GET ADDRESS OF UUT'S P-TABLE
                    7E    DF       0126                       PUSHAL  -(SP)
                 08 AC    DD       0128                       PUSHL   ERR$_UNIT(AP)
     00000000'9F    02    FB       012B                       CALLS   #2, @#DS$GPHARD
                51    8E    D0       0132   827          MOVL    (SP)+, R1                        ;  INTO R1
                 13 50    E9       0135   828          BLBC    R0, 30$                          ; IF NON-EXISTENT, FAKE IT
   00000000'EF    61    01    C3       0138   829          SUBL3   #1, HP$Q_DEVICE(R1), L^Q_BUFQWD ; REDUCE COUNT BY ONE
 00000004'EF    04 A1    01    C1       0140   830          ADDL3   #1, HP$Q_DEVICE+4(R1), -         ; ADJUST POINTER (SKIP "_")
                                  0149   831                       L^Q_BUFQWD+4                   ;
                    0B    11       0149   832          BRB     40$                              ; AND PROCEED
                                  014B   833
00000000'EF    00000075'EF    7D       014B   834 30$:     MOVQ    L^QUNKDEV, L^Q_BUFQWD            ; ELSE USE "UNK" MSG
                                  0156   835
0000FE58'EF    00000000'EF    3C       0156   836 40$:     MOVZWL  L^Q_BUFQWD,L^DSA$GL_DEVLEN       ; Dev name string len to mailbox
                    07    BB       0161   837          PUSHR   #^M<R0,R1,R2>                    ; CLOBBERED BY "MOVC3"
     50   00000000'EF    7D       0163   838          MOVQ    Q_BUFQWD,R0                      ; Get length/address of name
                50    50    3C       016A   839          movzwl  r0, r0                           ; Zero extend length
     52   0000FE5C'EF    9E       016D   840          MOVAB   L^DSA$GT_DEVNAM,R2
                                  0174   841
                82    81    90       0174   842 45$:     MOVB    (R1)+,(R2)+
                 FA 50    F5       0177   843          SOBGTR  R0,45$
                    07    BA       017A   844          POPR    #^M<R0,R1,R2>                    ; RESTORE CLOBBERED REGISTERS
```

```
                                017C          Br_If_IE1       97$                 ; Inhibit level-1 flag set?
0000FE00'EF     04      E0      017C          BBS     #DSA$V_IE1, -                       ; If bit set, branch          [29]
                7C              0183                    L^DSA$GL_Flags, 97$                 ;                             [29]
                                0184                                                ;
            0284        30      0184  50$:    BSBW    DS_TESTID                   ; GET TEST/SUBTEST MESSAGE.
      50    0C BC       DE      0187          MOVAL   @ERR$_MSGADR(AP),R0         ; GET ADDRESS OF CALLER'S MSG
                07      12      018B          BNEQ    90$                         ; PROCEED IF SPECIFIED
50    00000074'EF       DE      018D          MOVAL   L^ANULL,R0                  ; Else, use a null string
                                0194
      51    FC BD       9A      0194  90$:    movzbl  @-4(fp), r1                 ; Get error type code
            FC AD       D6      0198          incl    -4(fp)                      ; And increment address past type
                                019B
                                019B          ;+
                                019B          ; Now, check to see if CRD is running. If so, load the address of the
                                019B          ; user's error text into the User_Error_Text location for use by CRD.
                                019B          ;-
                                019B
                01      BB      019B          PushR   #^M<R0>                     ; Save R0 because it's clobbered
      00000000'EF       16      019D          Jsb     L^DSR$Check_MenuTest_Off_Set; Check if Menu Test  Offline bit is set
                                01A3                                                ;
            09 50       E8      01A3          Blbs    R0, 93$                     ; If Menu Test running, branch
      00000000'EF       16      01A6          Jsb     L^DSR$Check_AutoTest_Off_Set; Check if Auto Test Offlinebit is set
                                01AC                                                ;
            0B 50       E9      01AC          Blbc    R0, 95$                     ; No Auto Test, no Menu Test => branch
                                01AF
                01      BA      01AF  93$:    PopR    #^M<R0>                     ; Restore R0 - MsgAdr parameter
00000000'EF     50      D0      01B1          MovL    R0, -                       ; Move the MsgAdr parameter into a
                                01B8                    L^DS$GA_User_Error_Text ; ... location for CRD.
                02      11      01B8          Brb     96$                         ; Go print it
                                01BA
                01      BA      01BA  95$:    PopR    #^M<R0>                     ; Restore R0
                                01BC
                                01BC  96$:    $PRINT  r1, -                       ; Print the error message:
                                01BC                    #DS$K_PrintF, -             ; ... printf
                                01BC                    L^FMTERRHDR, -              ; ... format string
                                01BC                    @#L$A_NAME, -               ; ... diag name
                                01BC                    @#L$L_REV, -                ; ... diag rev level
                                01BC                    @#L$L_UPDATE, -             ; ... diag update level
                                01BC                    L^DSA$GL_PASSNO, -          ; ... pass number of the diagnostic
                                01BC                    #DS$GQ_TESTID, -            ; ... ???
                                01BC                    L^DSA$GL_ERRNO, -           ; ... error number
                                01BC                    #0, -                       ; LINE 2
                                01BC                    -4(FP), -                   ;
                                01BC                    #Q_BUFQWD, -                ; LINE 3
                                01BC                    R0                          ; ... MsgAdr - user's error text
                50      DD      01BC                  PUSHL   R0
      00000000'8F       DD      01BE                  PUSHL   #Q_BUFQWD
            FC AD       DD      01C4                  PUSHL   -4(FP)
                00      DD      01C7                  PUSHL   #0
      0000FE44'EF       DD      01C9                  PUSHL   L^DSA$GL_ERRNO
      00000008'8F       DD      01CF                  PUSHL   #DS$GQ_TESTID
      0000FE54'EF       DD      01D5                  PUSHL   L^DSA$GL_PASSNO
      00000210 9F       DD      01DB                  PUSHL   @#L$L_UPDATE
      0000020C 9F       DD      01E1                  PUSHL   @#L$L_REV
      00000208 9F       DD      01E7                  PUSHL   @#L$A_NAME
      0000012C'EF       9F      01ED                  PUSHAB  L^FMTERRHDR
          7E    01      9A      01F3                  movzbl  #DS$K_PrintF, -(sp)
```

```
                7E   51   98  01F6                        cvtbl   r1, -(sp)
      00000000'GF    0D   FB  01F9                        CALLS   #$$N+2, G^DSX$PRINT
                                0200  889
                10 AC    D5  0200  890 97$:    TSTL    ERR$_POINTER(AP)        ; IS THERE A PRINT LINK ?
                   03    12  0203  891          BNEQ    98$                     ; NO, SKIP
                 001E    31  0205  892          BRW     100$                    ; Print revision levels w/ or w/out prlink
      00000000'EF    09    90  0208  893 98$:    movb    #ds$k_type_error_body, -; Set type code to error body
                                020F  894                    L^ds$gb_typecode    ;
              10 BC    6C    FA  020F  895          CALLG   (AP), @ERR$_POINTER(AP) ; CALL USER'S PRINT ROUTINE
                                0213  896          $print  #ds$k_type_command_out,-
                                0213  897                  #ds$k_printf,-
                                0213  898                  linefeed
           00000190'EF    9F    0213                        PUSHAB  linefeed
                   7E    01    9A  0219                    movzbl  #ds$k_printf, -(sp)
                   7E    16    98  021C                    cvtbl   #ds$k_type_command_out, -(sp)
      00000000'GF    03    FB  021F                        CALLS   #$$N+2, G^DSX$PRINT
                                0226  899 100$:   Br_If_IE1       101$            ; Don't print revision level if IE1
      0000FE00'EF    04    E0  0226                        BBS     #DSA$V_IE1, -           ; If bit set, branch            [29]
                       04        022D                          L^DSA$GL_Flags, 101$      ;                               [29]
                       04    BB  022E  900          PUSHR           #^M<R2>         ; USED FOR ADDR_128                     ;G:6
                       03    11  0230  901          BRB             102$                                                    ;G:8
                     0127    31  0232  902 101$:    BRW             119$            ; Extend Br_If_IE1                      ;G:8
                                0235  903                                                                                  ;G:8
                08 AC    D0  0235  904 102$:    MOVL            ERR$_UNIT(AP),R3                ; Logical unit #        ;G:8
      00000000'EF43    D0  0239  905          MOVL            ADDR_128[R3],R2                 ; Address of static block ;G
                   52    D5  0241  906          TSTL            R2                              ; Test if it exists     ;G:8
                   03    12  0243  907          BNEQ            103$                            ; It does exist         ;G:8
                 00EE    31  0245  908          BRW             115$                            ; If it doesn't don't print
                   52    C0  0248  909 103$:    ADDL2           #4,R2                           ; R2 now at module #    ;G:8
      00000010'EF    04    D0  024B  910          MOVL            #4,L_OFFSET                     ; Counter of module numbers
                                0252  911                                                                              ;G:7
                   62    D5  0252  912 104$:    TSTL            (R2)                            ; Does Module # exist?
                   12    12  0254  913          BNEQ            105$                            ; Yes, than print
                04 A2    D5  0256  914          TSTL            4(R2)                           ; Does Hard rev exist?
                   0D    12  0259  915          BNEQ            105$                            ; Yes, than print
                08 A2    D5  025B  916          TSTL            8(R2)                           ; Does Firm rev exist?
                   08    12  025E  917          BNEQ            105$                            ; Yes, than print
                0C A2    D5  0260  918          TSTL            12(R2)                          ; Does Patch rev exist?
                   03    12  0263  919          BNEQ            105$                            ; Yes, than print
                 00CE    31  0265  920          BRW             115$                            ; Else, do not print    ;G:6
                                0268  921
           00000018'EF    D5  0268  922 105$:    TSTL    PRINT
                   20    12  026E  923          BNEQ    106$
                                0270  924          $print          #ds$k_type_command_out,-        ; Print message
                                0270  925                          #ds$k_printf,-                  ; ...use printf to type it
                                0270  926                          fatreverror,-                   ; ...error message
                                0270  927                          #q_bufqwd                       ; ...device name
           00000000'8F    DD  0270                        PUSHL   #q_bufqwd
           00000193'EF    9F  0276                        PUSHAB  fatreverror
                   7E    01    9A  027C                    movzbl  #ds$k_printf, -(sp)
                   7E    16    98  027F                    cvtbl   #ds$k_type_command_out, -(sp)
      00000000'GF    04    FB  0282                        CALLS   #$$N+2, G^DSX$PRINT
           00000018'EF    01    D0  0289  928          MOVL    #1,PRINT                                                    ;G:7
           0000001C'EF    62    D0  0290  929 106$:    MOVL    (R2),MODULE             ; to print module name
                0000001C'EF    D5  0297  930          TSTL    module
                   1B    13    BD  029D  931          BEQL    107$
                                029F  932          $print  #ds$k_type_command_out,-        ; Print message
```

```
                                029F   933                          #ds$k_printf,-                  ; ...use printf to type it
                                029F   934                          fmtmodule,-                     ; ...error message
                                029F   935                          module                          ; ...module name
          0000001C'EF    DD     029F                       PUSHL    module
          000001B1'EF    9F     02A5                       PUSHAB   fmtmodule
                7E   01   9A     02AB                       movzbl   #ds$k_printf, -(sp)
                7E   16   98     02AE                       cvtbl    #ds$k_type_command_out, -(sp)
      00000000'GF    04   FB     02B1                       CALLS    #$$N+2, G^DSX$PRINT
                     13   11     02B8   936         BRB              110$                            ; Next chekc
                                02BA   937 107$:   $print           #ds$k_type_command_out,-
                                02BA   938                          #ds$k_printf,-
                                02BA   939                          fmtno_mod
          000001BC'EF    9F     02BA                       PUSHAB   fmtno_mod
                7E   01   9A     02C0                       movzbl   #ds$k_printf, -(sp)
                7E   16   98     02C3                       cvtbl    #ds$k_type_command_out, -(sp)
      00000000'GF    03   FB     02C6                       CALLS    #$$N+2, G^DSX$PRINT
                52   04   C0     02CD   940 110$:   ADDL2            #4,R2
                     62   D5     02D0   941         TSTL             (R2)
                     15   13     02D2   942         BEQL             108$
                                02D4   943
                                02D4   944
                                02D4   945         $print           #ds$k_type_command_out,-        ; print "hardware"
                                02D4   946                          #ds$k_printf,-
                                02D4   947                          hardrev,-
                                02D4   948                          R2                              ; address of ascic string
                     52   DD     02D4                       PUSHL    R2
          000000C0'EF    9F     02D6                       PUSHAB   hardrev
                7E   01   9A     02DC                       movzbl   #ds$k_printf, -(sp)
                7E   16   98     02DF                       cvtbl    #ds$k_type_command_out, -(sp)
      00000000'GF    04   FB     02E2                       CALLS    #$$N+2, G^DSX$PRINT
                                02E9   949
                52   04   C0     02E9   950 108$:   ADDL2            #4,R2
                     62   D5     02EC   951         TSTL             (R2)
                     15   13     02EE   952         BEQL             111$
                                02F0   953
                                02F0   954
                                02F0   955
                                02F0   956 109$:   $print           #ds$k_type_command_out,-        ; print "firmware"
                                02F0   957                          #ds$k_printf,-
                                02F0   958                          firmrev,-
                                02F0   959                          (R2)
                     62   DD     02F0                       PUSHL    (R2)
          000000D0'EF    9F     02F2                       PUSHAB   firmrev
                7E   01   9A     02F8                       movzbl   #ds$k_printf, -(sp)
                7E   16   98     02FB                       cvtbl    #ds$k_type_command_out, -(sp)
      00000000'GF    04   FB     02FE                       CALLS    #$$N+2, G^DSX$PRINT
                                0305   960
                52   04   C0     0305   961 111$:   ADDL2            #4,R2
                     62   D5     0308   962         TSTL             (R2)
                     15   13     030A   963         BEQL             114$                            ; Don't print message
                                030C   964
                                030C   965
                                030C   966 113$:   $print           #ds$k_type_command_out,-        ; print "patch"
                                030C   967                          #ds$k_printf,-
                                030C   968                          patchrev,-
                                030C   969                          (R2)
                     62   DD     030C                       PUSHL    (R2)
```

```
          000000E0'EF   9F  030E                        PUSHAB  patchrev
               7E   01  9A  0314                        movzbl  #ds$k_printf, -(sp)
               7E   16  98  0317                        cvtbl   #ds$k_type_command_out, -(sp)
      00000000'GF   04  FB  031A                        CALLS   #$$N+2, G^DSX$PRINT
                            0321   970
               52   04  C0  0321   971 114$:   ADDL2           #4,R2                          ; Point to next module
      00000010'EF   01  C2  0324   972         SUBL2           #1,L_OFFSET                    ; Check for four module numb
          00000010'EF   D5  032B   973         TSTL            L_OFFSET
                   03  13  0331   974         BEQL            115$
                 FF1C  31  0333   975         BRW             104$
                   04  BA  0336   976 115$:   POPR            #^M<R2>                        ; DELETED BY ADDR_128 ;G:6
                            0338   977
                            0338   978 117$:   Br_If_IE1       119$                           ; Don't print trailer if IE1
      0000FE00'EF   04  E0  0338               BBS     #DSA$V_IE1, -                  ; If bit set, branch          [29]
                   1C       033F                          L^DSA$GL_Flags, 119$         ;                             [29]
                            0340   979         $print  #ds$k_type_error_end, -                ; Print out end-of-error mes
                            0340   980                   #ds$k_printf, -                      ; .. use PRINTF to type it
                            0340   981                   fmtenderror, -                       ; .. 'end-of-error' format
                            0340   982                   -4(fp), -                            ; .. Type of error
                            0340   983                   L^dsa$gl_errno                       ; .. and error number
          0000FE44'EF   DD  0340                        PUSHL   L^dsa$gl_errno
                FC AD   DD  0346                        PUSHL   -4(fp)
          000001C9'EF   9F  0349                        PUSHAB  fmtenderror
               7E   01  9A  034F                        movzbl  #ds$k_printf, -(sp)
               7E   0A  98  0352                        cvtbl   #ds$k_type_error_end, -(sp)
      00000000'GF   05  FB  0355                        CALLS   #$$N+2, G^DSX$PRINT
                            035C   984
                            035C   985 119$:   Br_If_Halt      120$                           ; Halt on error detection?
      0000FE00'EF   00  E0  035C               BBS     #DSA$V_Halt, -                 ; If bit set, branch          [29]
                   03       0363                          L^DSA$GL_Flags, 120$         ;                             [29]
                 009A  31  0364   986         BRW     RRPTERRORX                             ; NO HALT(S), RETURN
                            0367   987                                                        ;
                            0367   988 120$:   Set_Halt                                       ; YES HALT, SET INTERNAL FLA
      0000FE00'EF   00  E2  0367               BBSS    #DSA$V_Halt, -           ; Branch if Halt bit is set to        [29]
                   00       036E                          L^DSA$GL_Flags, 30001$       ; ...
                            036F       30001$:                                  ; ... here. Set bit regardless.       [29]
                            036F   989
                            036F   990         BR_IF_MP 130$                                  ; Check if Scorpio, Nautilus
05000000 8F   00000000'8F   D1  036F               CMPL    #DS$GK_SID,#^X05000000         ; Branch if Scorpio [61]
                   2A  13  037A               BEQL    130$                           ; Yes, branch
06000000 8F   00000000'8F   D1  037C               CMPL    #DS$GK_SID,#^X06000000         ; Branch if Nautilus [61]
                   1D  13  0387               BEQL    130$                           ; Yes, branch
11000000 8F   00000000'8F   D1  0389               CMPL    #DS$GK_SID,#^X11000000         ; Branch if RRR [69]          ;G:20
                   10  13  0394               BEQL    130$                                                         ;G:18
0A000000 8F   00000000'8F   D1  0396               CMPL    #DS$GK_SID,#^X0A000000         ; Branch if LLL [69]          ;G:20
                   03  13  03A1               BEQL    130$                                                         ;G:22
                 0031  31  03A3   991         BRW     140$                                   ; Handle for non-mp systems
                            03A6   992
                            03A6   993 ;++
                            03A6   994 ; NOTE: For mp systems,
                            03A6   995 ;       the saved_FP must be used to get the return pc since the current call frame
                            03A6   996 ;       built as a result of mp interlocking features.
                            03A6   997 ;--
                            03A6   998
               5A   0C AD   D0  03A6   999 130$:   MOVL    12(FP),R10                             ; Get saved Frame Pointer.
               5B   10 AA   D0  03AA  1000         MOVL    16(R10),R11                            ; Get return pc
      00000000'EF   5B  D0  03AE  1001         MOVL    R11,L^DS$AA_BPTADDR                    ; Save Return 'PC'
```

```
                00000000'EF   6B   90  03B5  1002          MOVB    (R11),L^DS$AB_BPTINST                   ; SAVE THE OPCODE LOCATED TH
                        6B   03   90  03BC  1003          MOVB    #BPTCODE,(R11)                          ; CAUSE A BREAK TO THE "CLI"
                                      03BF  1004          $print  #ds$k_type_err_halt, -                   ; Print out HALT ON ERROR me
                                      03BF  1005                    #ds$k_printf, -                       ; .. Use Printf to type it
                                      03BF  1006                    I^fmterrhlt, -                        ; .. 'Halt on error' message
                                      03BF  1007                    R11                                   ; .. display "halt pc"
                                5B    DD  03BF                      PUSHL   R11
                      0000010A'EF     9F  03C1                      PUSHAB  I^fmterrhlt
                            7E    01    9A  03C7                      movzbl  #ds$k_printf, -(sp)
                            7E    0D    98  03CA                      cvtbl   #ds$k_type_err_halt, -(sp)
                00000000'GF     04    FB  03CD                      CALLS   #$$N+2, G^DSX$PRINT
                                      03D4  1008
                          002A  31    03D4  1009          BRW     RRPTERRORX                              ; [35]
                                      03D7  1010
                                      03D7  1011 ; The following code will be executed for non mpsystems [35]
                                      03D7  1012
        00000000'EF     10 BD   DE    03D7  1013 140$:    MOVAL   @CF$L_PC(FP),L^DS$AA_BPTADDR            ; Save Return 'PC'
        00000000'EF     10 BD   90    03DF  1014          MOVB    @CF$L_PC(FP),L^DS$AB_BPTINST            ; SAVE THE OPCODE LOCATED TH
                  10 BD     03    90  03E7  1015          MOVB    #BPTCODE,@CF$L_PC(FP)                   ; CAUSE A BREAK TO THE "CLI"
                                      03EB  1016          $print  #ds$k_type_err_halt, -                   ; Print out HALT ON ERROR me
                                      03EB  1017                    #ds$k_printf, -                       ; .. Use Printf to type it
                                      03EB  1018                    I^fmterrhlt, -                        ; .. 'Halt on error' message
                                      03EB  1019                    @CF$L_PC(FP)                          ; .. display "halt pc"
                      10 AD     DD    03EB                        PUSHL   @CF$L_PC(FP)
                      0000010A'EF     9F  03EE                      PUSHAB  I^fmterrhlt
                            7E    01    9A  03F4                      movzbl  #ds$k_printf, -(sp)
                            7E    0D    98  03F7                      cvtbl   #ds$k_type_err_halt, -(sp)
                00000000'GF     04    FB  03FA                      CALLS   #$$N+2, G^DSX$PRINT
                                      0401  1020
                                      0401  1021 RRPTERRORX:
                                      0401  1022          QA_MAIN Error_Error_End                         ;
                          05    DD    0401                PUSHL   #DSQA$K_Error_Error_End
                00000000'9F     01    FB  0403            CALLS   #1, @#QA$MAIN
                                      05  040A  1023       RSB                                           ; RETURN TO THE DIAGNOSTIC
```

```
                                040B  1025          .SBTTL  DS_TestID Routine
                                040B  1026 ;+
                                040B  1027 ; FUNCTIONAL DESCRIPTION:
                                040B  1028 ;
                                040B  1029 ;       DETERMINES IF IN INIT OR CLEANUP CODE AND FORMS THE PROPER MESSAGE.
                                040B  1030 ;
                                040B  1031 ;--
                                040B  1032 DS_TESTID::
            0000FE50'EF   D5    040B  1033          TSTL    L^DSA$GL_TESTNO                 ; Test 0 ?
                          2C    12  0411  1034          BNEQ    70$                     ; NO, PROCEED WITH STANDARD MSG
                                0413  1035                                              ;
         01 0000FE4C'EF   D1    0413  1036          CMPL    L^DSA$GL_SUBTNO,#1              ; Test 0 & subtest 1 ?
                          0D    12  041A  1037          BNEQ    60$                     ; NO, TRY NEXT
00000008'EF 0000008B'EF   7D    041C  1038          MOVQ    L^QINITSEC,L^DS$GQ_TESTID       ; Yes, use init section msg     [08]
                          4D    11  0427  1039          BRB     80$                     ;  AND PROCEED
         02 0000FE4C'EF   D1    0429  1040 60$:     CMPL    L^DSA$GL_SUBTNO,#2              ; Test 0 & subtest 2 ?
                          0D    12  0430  1041          BNEQ    70$                     ; NO, TRY NEXT
00000008'EF 000000A9'EF   7D    0432  1042          MOVQ    L^QCLEANSEC,L^DS$GQ_TESTID      ; Yes, use clean section msg    [08]
                          37    11  043D  1043          BRB     80$                     ;  AND PROCEED
      00000008'EF   20    3C    043F  1044 70$:     MOVZWL  #TESTID_LEN,L^DS$GQ_TESTID      ; SET UP QUADWORD DESCRIPTOR    [08]
0000000C'EF 00000020'EF   DE    0446  1045          MOVAL   L^T_TESTID,L^DS$GQ_TESTID+4     ;  FOR "TEST/SUBTEST" STRING    [08]
                                0451  1046          $FAO_S  L^QFMTTESTID,L^DS$GQ_TESTID,-   ; Convert test and subtest     [08]
                                0451  1047                  L^DS$GQ_TESTID,-                ;   numbers                     [08]
                                0451  1048                  L^DSA$GL_TESTNO,L^DSA$GL_SUBTNO ;  into ascii for output
            0000FE4C'EF   DD    0451                  PUSHL   L^DSA$GL_SUBTNO
            0000FE50'EF   DD    0457                  PUSHL   L^DSA$GL_TESTNO
            00000008'EF   7F    045D                  PUSHAQ  L^DS$GQ_TESTID
            00000008'EF   3F    0463                  PUSHAW  L^DS$GQ_TESTID
            000000ED'EF   7F    0469                  PUSHAQ  L^QFMTTESTID
      00000000'GF   05    FB    046F                  CALLS   #$$T2,G^SYS$FAO
                          05    0476  1049 80$:     RSB                             ; RETURN.
```

```
0477  1051          .SBTTL  DS_ErrSup Routine
0477  1052 ;++
0477  1053 ; FUNCTIONAL DESCRIPTION:
0477  1054 ;
0477  1055 ;       THIS ROUTINE LOGS AND REPORTS THE OCCURENCE OF AN
0477  1056 ;       "ERRSUP" CALL TO THE OPERATOR AND A.P.T..
0477  1057 ;
0477  1058 ; CALLING SEQUENCE:
0477  1059 ;
0477  1060 ;       CALLG   ARGLIST, a#DS_ERRSUP
0477  1061 ;         OR
0477  1062 ;       CALLS   #3, a#DS_ERRSUP
0477  1063 ;
0477  1064 ; INPUT PARAMETERS:
0477  1065 ;
0477  1066 ;        4(AP) ERROR NUMBER
0477  1067 ;        8(AP) POINTER TO COUNTED ASCII ERROR MESSAGE STRING
0477  1068 ;       12(AP) POINTER TO COUNTED ASCII MODULE NAME STRING
0477  1069 ;
0477  1070 ; IMPLICIT INPUTS:
0477  1071 ;
0477  1072 ;       NONE
0477  1073 ;
0477  1074 ; OUTPUT PARAMETERS:
0477  1075 ;
0477  1076 ;       NONE
0477  1077 ;
0477  1078 ; IMPLICIT OUTPUTS:
0477  1079 ;
0477  1080 ;       NONE
0477  1081 ;
0477  1082 ; COMPLETION CODES:
0477  1083 ;
0477  1084 ;       NONE
0477  1085 ;
0477  1086 ; SIDE EFFECTS:
0477  1087 ;
0477  1088 ;       NONE
0477  1089 ;
0477  1090 ;--
```

```
                        0FFC  0477  1092 .ENTRY  DS_ERRSUP,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>   ;                          [14]
                              0479  1093
                 0FFF 8F   BB  0479  1094         PUSHR   #^M<R0,R1,R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>
                      7E   DC  047D  1095         MOVPSL  -(SP)                    ; Save PSL for error typeout
                   10 AD   DD  047F  1096         PUSHL   16(FP)                   ; Push return address for typeout
                              0482  1097
     0000FE44'EF   04 AC   D0  0482  1098         MOVL    4(AP),L^DSA$GL_ERRNO     ; Error number to mailbox
              50   0C AC   D0  048A  1099         MOVL    12(AP),R0                ; Get address of ASCIC module name
                 51   80   9A  048E  1100         MOVZBL  (R0)+,R1                 ; Get length of string
        0000FE58'EF   51   D0  0491  1101         MOVL    R1,L^DSA$GL_DEVLEN       ; Move string length to mailbox
        52   0000FE5C'EF   9E  0498  1102         MOVAB   L^DSA$GT_DEVNAM,R2
                              049F  1103
                 82   80   90  049F  1104 15$:    MOVB    (R0)+,(R2)+
                   FA 51   F5  04A2  1105         SOBGTR  R1,15$
                              04A5  1106
              52   08 BC   DE  04A5  1107         MOVAL   @8(AP),R2                ; GET OPTIONAL MSG ADDRESS
                      07   12  04A9  1108         BNEQ    10$                      ; SKIP IF VALID
        52   00000074'EF   DE  04AB  1109         MOVAL   ANULL,R2                 ; ELSE FAKE A MESSAGE
                              04B2  1110
                              04B2  1111 10$:    $print  #ds$k_type_errsup, -     ; Print Supervisor error                [10]
                              04B2  1112                   #ds$k_printf, -         ; .. use PRINTF                         [10]
                              04B2  1113                   L^FMTERRSUP, -          ; .. Format                             [10]
                              04B2  1114                   12(AP), -               ; .. force the message out              [08]
                              04B2  1115                   4(AP), -                ; .. number                             [10]
                              04B2  1116                   #0, -                   ; .. current time                       [10]
                              04B2  1117                   R2                      ;                                       [08]
                      52   DD  04B2                       PUSHL   R2
                      00   DD  04B4                       PUSHL   #0
                   04 AC   DD  04B6                       PUSHL   4(AP)
                   0C AC   DD  04B9                       PUSHL   12(AP)
           000001F8'EF     9F  04BC                       PUSHAB  L^FMTERRSUP
                 7E   01   9A  04C2                       movzbl  #ds$k_printf, -(sp)
                 7E   04   98  04C5                       cvtbl   #ds$k_type_errsup, -(sp)
        00000000'GF   07   FB  04C8                       CALLS   #$$N+2, G^DSX$PRINT
                              04CF  1118
           00000271'EF     9F  04CF  1119         PUSHAB  L^FMTERRSUP2             ; Push address of register text         [08]
                 7E   01   9A  04D5  1120         movzbl  #ds$k_printf, -(sp)      ; .. push PRINTF code                   [10]
           FFFFFFF7 8F     DD  04D8  1121         pushl   #-ds$k_type_error_body   ; .. and type code (sticky)             [10]
        00000000'EF   11   FB  04DE  1122         CALLS   #17,DSX$PRINT            ; Print the error                       [10]
                              04E5  1123
           00000000'EF     DF  04E5  1124         PUSHAL  L^DS$GT_VDS_Version      ; ... version                           [24]
           00000000'EF     DD  04EB  1125         PUSHL   L^DS$GL_Flags            ; ... DS flags                          [24]
           0000FE00'EF     DD  04F1  1126         PUSHL   L^DSA$GL_Flags           ; ... DSA flags                         [24]
           00000237'EF     DF  04F7  1127         PUSHAL  L^FmtErrSup1             ; ... format string                     [24]
                 7E   01   9A  04FD  1128         MOVZBL  #DS$K_PrintF, -(SP)      ; ... use PRINTF                        [24]
                 7E   04   98  0500  1129         CVTBL   #DS$K_Type_ErrSup, -(SP); Print Supervisor error                [24]
        00000000'GF   06   FB  0503  1130         CALLS   #6,G^DSX$PRINT           ;                                       [24]
                              050A  1131
                 52   5E   D0  050A  1132         MOVL    SP,R2                    ; Copy current stack pointer
                 53   08   D0  050D  1133         MOVL    #8,R3                    ; Print several lines                   [21]
                              0510  1134
              52   20 A2   DE  0510  1135 16$:    MOVAL   32(R2),R2                ; Point past
                 51   52   D0  0514  1136         MOVL    R2,R1                    ; Copy
                              0517  1137
                 7E   71   7D  0517  1138         MOVQ    -(R1),-(SP)              ; Push quad
                 7E   71   7D  051A  1139         MOVQ    -(R1),-(SP)
                 7E   71   7D  051D  1140         MOVQ    -(R1),-(SP)
```

```
                      7E   71    7D  0520  1141          MOVQ    -(R1),-(SP)
                           51    DD  0523  1142          PUSHL   R1                      ; Address of stack
                00000302'EF      9F  0525  1143          PUSHAB  L^FMTERRSUP3            ; Edit text                     [08]
                      7E   01    9A  052B  1144          movzbl  #ds$k_printf,-(sp)      ; Use PRINTF                    [18]
                      7E   09    98  052E  1145          cvtbl   #ds$k_type_error_body,-(sp)     ;                       [18]
           00000000'GF     0C    FB  0531  1146          CALLS   #12, G^DSX$PRINT        ; print it                      [18]
                        D5 53    F5  0538  1147          SOBGTR  R3,16$                  ; Count and continue
                                     053B  1148
                        04 AC    DD  053B  1149          pushl   4(ap)                   ; Set up for PRINT error number [10]
                0000005C'EF      9F  053E  1150          pushab  L^ersuper               ; .. 'Supervisor detected error' [10]
                000001C9'EF      9F  0544  1151          pushab  L^fmtenderror           ; .. use end of error format    [10]
                           01    DD  054A  1152          pushl   #ds$k_printf            ; .. use PRINTF                 [10]
                           0A    DD  054C  1153          pushl   #ds$k_type_error_end    ; .. print end of error         [10]
           00000000'GF     05    FB  054E  1154          calls   #5, G^dsx$print         ; .. print it                   [10]
           0000FE00'EF     01    D3  0555  1155          BITL    #DSA$M_HALT, -          ;                               [09]
                                     055C  1156           L^DSA$GL_FLAGS                 ; Halt on detection or isolation?
                           2A    13  055C  1157          BEQL    DSERRSUPX               ; Branch if not
                                     055E  1158
        00000000'EF     10 BD    DE  055E  1159          MOVAL   a16(FP),L^DS$AA_BPTADDR ; SAVE RETURN 'PC'              [08]
        00000000'EF     10 BD    90  0566  1160          MOVB    a16(FP),L^DS$AB_BPTINST ; SAVE THE OPCODE LOCATED THERE [08]
                10 BD    03    90  056E  1161          MOVB    #BPTCODE,a16(FP)        ; CAUSE A BREAK TO THE "CLI"
                                     0572  1162          $PRINT  #ds$k_type_err_halt, -  ; Print error halt message      [10]
                                     0572  1163                    #ds$k_printf, -      ; .. use PRINTF                 [10]
                                     0572  1164                    L^FMTERRHLT, -       ; .. error halt format          [10]
                                     0572  1165                    16(FP)               ; .. display halt PC            [08]
                           10 AD    DD  0572                    PUSHL   16(FP)
                0000010A'EF      9F  0575                    PUSHAB  L^FMTERRHLT
                      7E   01    9A  057B                    movzbl  #ds$k_printf, -(sp)
                      7E   0D    98  057E                    cvtbl   #ds$k_type_err_halt, -(sp)
           00000000'GF     04    FB  0581                    CALLS   #$$N+2, G^DSX$PRINT
                                     0588  1166                                    ;
                                     0588  1167 DSERRSUPX:
           0000FE40'EF     05    D0  0588  1168          MOVL    #APM$_PRGERR,L^DSA$GL_MSGTYP    ; Indicate error type in mailbox
                00000000'EF     D6  058F  1169          Incl    L^Ds$GL_ErrSup_Count    ; Count this error                      [15]
                                     0595  1170          Br_If_Not_APT   10$             ; If not running from APT, branch       [19]
           0000FE00'EF     1F    E1  0595                BBC     #DSA$V_Apt, -           ; If bit not set, branch
                           06        059C                  L^DSA$GL_Flags, 10$           ;
                00000000'EF     16  059D  1171          JSB     L^APT_MSG               ; Else, transfer control to APT         [08]
                                     05A3  1172
                                     05A3  1173 10$:
                                     05A3  1174
                                 04  05A3  1175          RET
```

```
05A4  1177          .SBTTL  DSR$Completion Routine
05A4  1178 ;++
05A4  1179 ; FUNCTIONAL DESCRIPTION:
05A4  1180 ;
05A4  1181 ;       This routine can be called unconditionally to print
05A4  1182 ;       the text for a given error code.  It returns immediately
05A4  1183 ;       if R0 does not indicate an error
05A4  1184 ;
05A4  1185 ; CALLING SEQUENCE:
05A4  1186 ;
05A4  1187 ;       BSBB    DSR$COMPLETION
05A4  1188 ;
05A4  1189 ; INPUT PARAMETERS:     NONE
05A4  1190 ;
05A4  1191 ; IMPLICIT INPUTS:
05A4  1192 ;
05A4  1193 ;       R0      Contains the Completion code to be translated and typed
05A4  1194 ;
05A4  1195 ; OUTPUT PARAMETERS:    NONE
05A4  1196 ;
05A4  1197 ; IMPLICIT OUTPUTS:     NONE
05A4  1198 ;
05A4  1199 ; COMPLETION CODES:     NONE
05A4  1200 ;
05A4  1201 ; SIDE EFFECTS:         NONE... ALL REGISTERS ARE LEFT INTACT
05A4  1202 ;
05A4  1203 ;--
```

```
                        05A4  1205 DSR$COMPLETION::
                01 50   E9  05A4  1206          BLBC    R0,10$                          ; Continue only if error
                        05  05A7  1207          RSB                                     ; Return since not in error
                        05A8  1208 10$:
                   1F   BB  05A8  1209          PUSHR   #^M<R0,R1,R2,R3,R4>             ; Save working registers
                54 5E   D0  05AA  1210          MOVL    SP,R4                           ; Copy current stack pointer
                        05AD  1211
                   50   DD  05AD  1212          PUSHL   R0                              ; Last arg is actual return
                52 50   D0  05AF  1213          MOVL    R0,R2                           ; Save uncut code
                        05B2  1214
                50 07   CA  05B2  1215          BICL    #7,R0                           ; Clear level bits
          53 00000357'EF    9E  05B5  1216          MOVAB   L^ERROR_CODES,R3                ; Point to table of error codes         [08]
                   61   10  05BC  1217          BSBB    80$                             ; Locate error text
       51 00000413'EF41     3E  05BE  1218          MOVAW   L^ERROR_TEXT[R1],R1             ; Get offset to error text              [08]
                7E 61   3C  05C6  1219          MOVZWL  (R1),-(SP)                      ; Push offset to error text
                6E 51   C0  05C9  1220          ADDL    R1,(SP)                         ; And make it absolute
                        05CC  1221
          51 52 02 01   EF  05CC  1222          EXTZV   #1,#2,R2,R1                     ; Get severity
             00000974'EF41  9F  05D1  1223          PUSHAB  L^SEVERITY[R1]                  ; Push address of severity              [08]
                   01   DD  05D8  1224          PUSHL   #1                              ; String length=1
                        05DA  1225
          50 52 0C  10  EF  05DA  1226          EXTZV   #16,#12,R2,R0                   ; Get facility code
           53 0000032C'EF   9E  05DF  1227          MOVAB   L^UTILITY_CODES,R3              ; Point to table of utilities           [08]
                   2A   10  05E6  1228          BSBB    50$                             ; Locate name of utility
       51 0000033C'EF41     3E  05E8  1229          MOVAW   L^UTILITY_TEXT[R1],R1           ; Get offset to error text              [08]
                7E 61   3C  05F0  1230          MOVZWL  (R1),-(SP)                      ; Push offset to error text
                6E 51   C0  05F3  1231          ADDL    R1,(SP)                         ; And make it absolute
                        05F6  1232
             00000313'EF    9F  05F6  1233          PUSHAB  L^T_ERROR_MASK                  ; Push address for edit string          [08]
                7E 01   9A  05FC  1234          movzbl  #ds$k_printf, -(sp)             ; Use PRINTF                            [10]
                7E 03   9A  05FF  1235          movzbl  #ds$k_type_general_error, -(sp) ; And general error code                [10]
                54 5E   C2  0602  1236          SUBL    SP,R4                           ; Bytes used by args
                54 04   C6  0605  1237          DIVL2   #4,R4                           ; Longwords
    00000000'GF 54      FB  0608  1238          CALLS   R4, G^DSX$PRINT                 ; Type the error text                   [10]
                        060F  1239                                                                                          ;G:5
                   1F   BA  060F  1240          POPR    #^M<R0,R1,R2,R3,R4>             ; Restore
                        05  0611  1241          RSB                                     ; Return
                        0612  1242 50$:
                51 63   D0  0612  1243          MOVL    (R3),R1                         ; Get length of table
              6341 50   D1  0615  1244 60$:     CMPL    R0, (R3)[R1]                    ; Is this it?                           [12]
                   03   13  0619  1245          BEQL    70$                             ; Copy text address and return
                F7 51   F5  061B  1246          SOBGTR  R1,60$                          ; Count and continue
                        05  061E  1247 70$:     RSB                                     ; Return
                        061F  1248
                        061F  1249
                        061F  1250 80$:
                51 63   D0  061F  1251          MOVL    (R3),R1                         ; Get length of table
          7E    6341 07   CB  0622  1252 90$:     bicl3   #7, (r3)[r1], -(sp)             ; Clear out low bits                    [12]
                8E 50   D1  0627  1253          CMPL    R0, (sp)+                       ; Is this it?                           [12]
                   03   13  062A  1254          BEQL    100$                            ; Copy text address and return
                F3 51   F5  062C  1255          SOBGTR  R1,90$                          ; Count and continue
                        05  062F  1256 100$:    RSB                                     ; Return
                        0630  1257          .END
```

```
$$ARGS                          = 0000000A     D
$$N                             = 00000002     D
$$T1                            = 00000001     D
$$T2                            = 00000005     D
ADDR_128                          ********   X   04
ANULL                             00000074 R   D   03
APC$_ABORT                      = 00000006     D
APC$_CONTINUE                   = 00000009     D
APC$_DUMP                       = 00000003     D
APC$_NOP                        = 00000000     D
APC$_START                      = 00000005     D
APC$_ZERO                       = 00000004     D
APM$_ABTDON                     = 00000006     D
APM$_DEVERR                     = 00000002     D
APM$_DONE                       = 0000000A     D
APM$_EXCEPT                     = 0000000B     D
APM$_HARDERR                    = 00000003     D
APM$_MORE                       = 00000008     D
APM$_NOMES                      = 00000000     D
APM$_PREPERR                    = 0000000C     D
APM$_PRGERR                     = 00000005     D
APM$_SOFTERR                    = 00000004     D
APM$_SPOOL                      = 00000009     D
APM$_SYSERR                     = 00000001     D
APT_MSG                           ********   X   04
BIT...                          = 00000004     D
BPTCODE                         = 00000003     D
CF$L_AP                           00000008     D
CF$L_FP                           0000000C     D
CF$L_ONCOND                       00000000     D
CF$L_PC                           00000010     D
CF$L_REG                          00000014     D
CF$W_MASK                         00000006     D
CF$W_PSW                          00000004     D
DEVFER                            00000019 R   D   03
DS$AA_BPTADDR                     ********     X   04
DS$AB_BPTINST                     ********     X   04
DS$GA_CHKLPPC                     ********     X   04
DS$GA_USER_ERROR_TEXT             ********     X   04
DS$GB_TYPECODE                    ********     X   04
DS$GK_SID                         ********     X   04
DS$GL_DEVERR_COUNT                ********     X   04
DS$GL_ERRCNT                      ********     X   04
DS$GL_ERRSUP_COUNT                ********     X   04
DS$GL_FLAGS                       ********     X   04
DS$GL_HARDERR_COUNT               ********     X   04
DS$GL_PREPERR_COUNT               ********     X   04
DS$GL_SOFTERR_COUNT               ********     X   04
DS$GL_SYSERR_COUNT                ********     X   04
DS$GPHARD                         ********     X   04
DS$GQ_TESTID                      00000008 RG  D   02
DS$GT_VDS_VERSION                 ********     X   04
DS$GW_TTOUT                       ********     X   04
DS$K_ERROR                      = 00000002       D
DS$K_NORMAL                     = 00000001       D
DS$K_PRINTB                     = 00000002       D
DS$K_PRINTF                     = 00000001       D
DS$K_PRINTI                     = 00000000       D
DS$K_PRINTX                     = 00000003       D
DS$K_SEVERE                     = 00000004       D
DS$K_SUBSYS                     = 00000066       D
DS$K_TYPE_ABORT_PROGRAM         = 00000014       D
DS$K_TYPE_ABORT_TEST            = 00000013       D
DS$K_TYPE_COMMAND_ERR           = 00000015       D
DS$K_TYPE_COMMAND_OUT           = 00000016       D
DS$K_TYPE_CRD_AUTOTEST          = 0000001A       D
DS$K_TYPE_DS_PROMPT             = 00000001       D
DS$K_TYPE_DS_START              = 0000001D       D
DS$K_TYPE_ERRDEV                = 00000008       D
DS$K_TYPE_ERRHARD               = 00000006       D
DS$K_TYPE_ERROR_BODY            = 00000009       D
DS$K_TYPE_ERROR_END             = 0000000A       D
DS$K_TYPE_ERRPREP               = 0000001B       D
DS$K_TYPE_ERRSOFT               = 00000007       D
DS$K_TYPE_ERRSUP                = 00000004       D
DS$K_TYPE_ERRSYS                = 00000005       D
DS$K_TYPE_ERR_HALT              = 0000000D       D
DS$K_TYPE_EXCEPTION             = 0000000C       D
DS$K_TYPE_EXCEPTION_HEAD        = 0000000B       D
DS$K_TYPE_FIRST_PASS            = 00000011       D
DS$K_TYPE_GENERAL               = 00000000       D
DS$K_TYPE_GENERAL_ERROR         = 00000003       D
DS$K_TYPE_NO_TESTS              = 00000012       D
DS$K_TYPE_PARAM_ERROR           = 0000001C       D
DS$K_TYPE_PROGRAM_END           = 00000010       D
DS$K_TYPE_PROGRAM_INFO          = 00000017       D
DS$K_TYPE_PROGRAM_START         = 0000000F       D
DS$K_TYPE_QIO_INVADP            = 00000024       D
DS$K_TYPE_QIO_NODRIVER          = 00000022       D
DS$K_TYPE_QIO_WRONGVER          = 00000023       D
DS$K_TYPE_SCRIPT_ECHO           = 00000021       D
DS$K_TYPE_SCRIPT_PNF            = 0000001E       D
DS$K_TYPE_SCRIPT_PROMPT         = 00000020       D
DS$K_TYPE_SCRIPT_SKIP           = 0000001F       D
DS$K_TYPE_SEQUENCE_ERROR        = 00000019       D
DS$K_TYPE_START_ERR             = 00000018       D
DS$K_TYPE_START_LIST            = 00000025       D
DS$K_TYPE_SUMMARY               = 0000000E       D
DS$K_TYPE_USER_PROMPT           = 00000002       D
DS$K_WARNING                    = 00000000       D
DS$M_ABRTFLG                    = 00000040       D
DS$M_BADTIME                    = 00100000       D
DS$M_BATCH                      = 00400000       D
DS$M_BRKCLR                     = 00001000       D
DS$M_BRKPT                      = 00000800       D
DS$M_CHARFLG                    = 00000100       D
DS$M_CMDFLG                     = 00000080       D
DS$M_CTRLC                      = 00000001       D
DS$M_CTRLO                      = 00010000       D
DS$M_DEVFLG                     = 00000200       D
DS$M_DISABLCC                   = 01000000       D
DS$M_DONFLG                     = 00002000       D
DS$M_ERRFLG                     = 00000010       D
DS$M_EXCEPT                     = 00080000       D
```

```
DS$M_EXETST                     = 00040000     D        DS$_ICERR                       = 006600C0     D
DS$M_HLTFLG                     = 00000008     D        DS$_IHWE                        = 00660060     D
DS$M_LODFLG                     = 00000002     D        DS$_ILLCHAR                     = 00660018     D
DS$M_MEMMGT                     = 00008000     D        DS$_ILLPAGCNT                   = 00660078     D
DS$M_NI                         = 04000000     D        DS$_ILLUNIT                     = 00660100     D
DS$M_OUTPUT                     = 00800000     D        DS$_INIT_FAIL                   = 00660140     D
DS$M_RUBFLG                     = 00000020     D        DS$_INSFMEM                     = 00660050     D
DS$M_SCRIPT                     = 00200000     D        DS$_INVCPU                      = 00660130     D
DS$M_SETIMR                     = 02000000     D        DS$_IPL2HI                      = 006600B8     D
DS$M_STRFLG                     = 00000004     D        DS$_IVADDR                      = 00660040     D
DS$M_SUBT                       = 00004000     D        DS$_IVVECT                      = 00660038     D
DS$M_SYSFLG                     = 00000400     D        DS$_KRNLSTK                     = 00660090     D
DS$M_TIMED                      = 02000000     D        DS$_LOGIC                       = 00660070     D
DS$M_TIMED_OUT                  = 08000000     D        DS$_MCHK                        = 00660088     D
DS$M_TIMRON                     = 00020000     D        DS$_MEM_ALLOC_ERR               = 00660138     D
DS$V_ABRTFLG                    = 00000006     D        DS$_MMOFF                       = 00660058     D
DS$V_BADTIME                    = 00000014     D        DS$_NEEDUNIT                    = 006600F8     D
DS$V_BATCH                      = 00000016     D        DS$_NODE                        = 00660128     D
DS$V_BRKCLR                     = 0000000C     D        DS$_NOPCS                       = 00660110     D
DS$V_BRKPT                      = 0000000B     D        DS$_NORMAL                      = 00660001     D
DS$V_CHARFLG                    = 00000008     D        DS$_NOSUPPORT                   = 006600B1     D
DS$V_CMDFLG                     = 00000007     D        DS$_NOTALLOWMP                  = 00660148     D
DS$V_CTRLC                      = 00000000     D        DS$_NOTDON                      = 00660030     D
DS$V_CTRLO                      = 00000010     D        DS$_NOTIMP                      = 006600B0     D
DS$V_DEVFLG                     = 00000009     D        DS$_NULLSTR                     = 00660010     D
DS$V_DISABLCC                   = 00000018     D        DS$_OVERFLOW                    = 00660008     D
DS$V_DONFLG                     = 0000000D     D        DS$_POWER                       = 00660098     D
DS$V_ERRFLG                     = 00000004     D        DS$_PROGERR                     = 00660020     D
DS$V_EXCEPT                     = 00000013     D        DS$_SEVERE                      = 00660004     D
DS$V_EXETST                     = 00000012     D        DS$_TRANSL                      = 006600A0     D
DS$V_HLTFLG                     = 00000003     D        DS$_TRUNCATE                    = 00660028     D
DS$V_LODFLG                     = 00000001     D        DS$_UNEXPINT                    = 006600D8     D
DS$V_MEMMGT                     = 0000000F     D        DS$_UNSUPPDEV                   = 00660158     D
DS$V_NI                         = 0000001A     D        DS$_VASFULL                     = 00660048     D
DS$V_OUTPUT                     = 00000017     D        DS$_WARNING                     = 00660000     D
DS$V_RUBFLG                     = 00000005     D        DSA$AL_APTMAIL                    0000FE00     D
DS$V_SCRIPT                     = 00000015     D        DSA$AT_APTTXT                     0000FA00     D
DS$V_SETIMR                     = 00000019     D        DSA$GL_APTCOM                     0000FE04     D
DS$V_STRFLG                     = 00000002     D        DSA$GL_DEVLEN                     0000FE58     D
DS$V_SUBT                       = 0000000E     D        DSA$GL_ERRNO                      0000FE44     D
DS$V_SYSFLG                     = 0000000A     D        DSA$GL_EVENT                      0000FE48     D
DS$V_TIMED                      = 00000019     D        DSA$GL_FLAGS                      0000FE00     D
DS$V_TIMED_OUT                  = 0000001B     D        DSA$GL_MSGTYP                     0000FE40     D
DS$V_TIMRON                     = 00000011     D        DSA$GL_PASSES                     0000FE08     D
DS$_AP_NORMAL_BREAK             = 00660150     D        DSA$GL_PASSNO                     0000FE54     D
DS$_ARITH                       = 006600D0     D        DSA$GL_SECTNO                     0000FE10     D
DS$_ASBE                        = 00660118     D        DSA$GL_SID                        0000FE14     D
DS$_BADLINK                     = 006600F0     D        DSA$GL_SUBTNO                     0000FE4C     D
DS$_BADTYPE                     = 006600E8     D        DSA$GL_TESTNO                     0000FE50     D
DS$_BIIC                        = 00660120     D        DSA$GL_UNITS                      0000FE0C     D
DS$_CHME                        = 006600A8     D        DSA$GQ_MSGPTR                     0000FE68     D
DS$_CHMK                        = 006600E0     D        DSA$GT_DEVNAM                     0000FE5C     D
DS$_DEVNAME                     = 00660108     D        DSA$M_HALT                      = 00000001     D
DS$_ERROR                       = 00660002     D        DSA$V_APT                       = 0000001F     D
DS$_FHWE                        = 00660068     D        DSA$V_BELL                      = 00000003     D
DS$_FRAGBUF                     = 00660080     D        DSA$V_HALT                      = 00000000     D
DS$_ICBUSY                      = 006600C8     D        DSA$V_IE1                       = 00000004     D
```

```
DSERRSUPX                       00000588 R   D  04
DSQA$K_DISPAT_AFTER_INIT      = 00000014     D
DSQA$K_DISPAT_BEFORE_INIT     = 00000013     D
DSQA$K_DISPAT_CALLTEST        = 00000015     D
DSQA$K_DISPAT_DONE_TESTS      = 00000018     D
DSQA$K_DISPAT_DSX$ENDPASS_BGN = 00000001     D
DSQA$K_DISPAT_DSX$ENDPASS_END = 00000002     D
DSQA$K_DISPAT_DSX$ENDPASS_MID = 00000000     D
DSQA$K_DISPAT_DS_CLEANUP_BGN  = 00000003     D
DSQA$K_DISPAT_DS_CLEANUP_END  = 00000004     D
DSQA$K_DUMMY_1                = 00000007     D
DSQA$K_ERROR_ERROR_BGN        = 00000006     D
DSQA$K_ERROR_ERROR_END        = 00000005     D
DSQA$K_KERNEL_INIT_CONTEXT    = 00000008     D
DSQA$K_LOOP_DSX$BGNSUB        = 00000009     D
DSQA$K_LOOP_DSX$CKLOOP        = 0000000B     D
DSQA$K_LOOP_DSX$ENDSUB        = 0000000A     D
DSQA$K_PARAM_DSX$GETADDRESS   = 0000000E     D
DSQA$K_PARAM_DSX$GETDATA      = 0000000C     D
DSQA$K_PARAM_DSX$GETLOGICAL   = 0000000F     D
DSQA$K_PARAM_DSX$GETSTRING    = 00000010     D
DSQA$K_PARAM_DSX$GETVIELD     = 0000000D     D
DSQA$K_QA_DSX$BRANCH          = 00000011     D
DSQA$K_START_BEFORE_HEADER    = 00000017     D
DSQA$K_START_VRRESTART        = 00000012     D
DSQA$K_START_VRSTART          = 00000016     D
DSR$CHECK_AUTOTEST_OFF_SET      ********   X   04
DSR$CHECK_MENUTEST_OFF_SET      ********   X   04
DSR$COMPLETION                  000005A4 RG  D  04
DSX$ERRDEV                      00000075 RG  D  04
DSX$ERRHARD                     00000027 RG  D  04
DSX$ERRPREP                     0000004E RG  D  04
DSX$ERRSOFT                     00000000 RG  D  04
DSX$ERRSYS                      000000A3 RG  D  04
DSX$PRINT                       ********   X   04
DS_ERRSUP                       00000477 RG  D  04
DS_TESTID                       0000040B RG  D  04
ERR$_MSGADR                   = 0000000C     D
ERR$_NARGS                    = 0000000A     D
ERR$_NUM                      = 00000004     D
ERR$_P1                       = 00000014     D
ERR$_P2                       = 00000018     D
ERR$_P3                       = 0000001C     D
ERR$_P4                       = 00000020     D
ERR$_P5                       = 00000024     D
ERR$_P6                       = 00000028     D
ERR$_POINTER                  = 00000010     D
ERR$_UNIT                     = 00000008     D
ERROR_CODES                     00000357 R   D  03
ERROR_TEXT                      00000413 R   D  03
ERSUPER                         000005C R   D  03
FIRMREV                         000000D0 R   D  03
FMTENDERROR                     000001C9 R   D  03
FMTERRHDR                       0000012C R   D  03
FMTERRHLT                       0000010A R   D  03
FMTERRSUP                       000001F8 R   D  03
FMTERRSUP1                      00000237 R   D  03
FMTERRSUP2                      00000271 R   D  03
FMTERRSUP3                      00000302 R   D  03
FMTMODULE                       000001B1 R   D  03
FMTNO_MOD                       000001BC R   D  03
FMTREVERROR                     00000193 R   D  03
HARDER                          00000001 R   D  03
HARDREV                         000000C0 R   D  03
HP$A_DEPENDENT                  00000032     D
HP$A_DEVICE                     00000018     D
HP$A_DVA                        0000001C     D
HP$A_LINK                       00000020     D
HP$B_DRIVE                      0000000B     D
HP$B_FLAGS                      0000000A     D
HP$Q_DEVICE                     00000000     D
HP$T_DEVICE                     0000000C     D
HP$T_TYPE                       00000026     D
HP$W_SIZE                       00000008     D
HP$W_VECTOR                     00000024     D
IO$_WRITEVBLK                   ********   X   04
L$A_CCP                         00000240     D
L$A_DEVP                        0000021C     D
L$A_DREG                        00000224     D
L$A_DTP                         00000218     D
L$A_ICP                         0000023C     D
L$A_LASTADR                     00000214     D
L$A_NAME                        00000208     D
L$A_REPP                        00000244     D
L$A_SECNAM                      00000250     D
L$A_STATAB                      00000248     D
L$A_TSTCNT                      00000254     D
L$L_ENVIRON                     00000204     D
L$L_ERRTYP                      0000024C     D
L$L_HEADLENGTH                  00000200     D
L$L_REV                         0000020C     D
L$L_UNIT                        00000220     D
L$L_UNUSED                      00000228     D
L$L_UPDATE                      00000210     D
LINEFEED                        00000190 R   D  03
L_OFFSET                        00000010 R   D  02
MODULE                          0000001C R   D  02
MSGBELL                         00000000 R   D  03
PATCHREV                        000000E0 R   D  03
PREPER                          0000002D R   D  03
PRINT                           00000018 R   D  02
QA$MAIN                         ********   X   04
QCLEANSEC                       000000A9 R   D  03
QFMTTESTID                      000000ED R   D  03
QINITSEC                        0000008B R   D  03
QUNKDEV                         00000075 R   D  03
Q_BUFQWD                        00000000 R   D  02
REVERROR                        00000014 R   D  02
RMS$_ACC                      = 0001C002     D
RMS$_CCR                      = 00018494     D
RMS$_DEV                      = 000184C4     D
RMS$_DME                      = 000184D4     D
RMS$_DNF                      = 0001C04A     D
RMS$_EOF                      = 0001827A     D
```

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RMS$_FAB                        =  0001850C     D
RMS$_FNF                        =  00018292     D
RMS$_FNM                        =  0001852C     D
RMS$_IFI                        =  00018564     D
RMS$_IOP                        =  00018574     D
RMS$_IRC                        =  0001857C     D
RMS$_ISI                        =  00018584     D
RMS$_PRV                        =  0001829A     D
RMS$_RAB                        =  0001863C     D
RMS$_RER                        =  0001C0F4     D
RMS$_RFA                        =  0001865C     D
RMS$_RTB                        =  000181A8     D
RRPTERROR                          000000D1 R   D   04
RRPTERRORX                         00000401 R   D   04
SEVERITY                           00000974 R   D   03
SIZ...                          =  00000001     D
SOFTER                             0000000D R   D   03
SS$_ACCVIO                         ********     X   03
SS$_CTRLERR                        ********     X   03
SS$_NOSUCHDEV                      ********     X   03
SS$_NOSUCHFILE                     ********     X   03
SYS$FAO                            ********     X   04
SYS$QIOW                           ********    GX   04
SYSFER                             00000048 R   D   03
TESTID_LEN                      =  00000020     D
T_ERROR_MASK                       00000313 R   D   03
T_TESTID                           00000020 R   D   02
UTILITY_CODES                      0000032C R   D   03
UTILITY_TEXT                       0000033C R   D   03
```

! Psect synopsis !

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000FE70 (65136.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
WORK	00000040 (64.)	02 (2.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC LONG
DATA	00000978 (2424.)	03 (3.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC BYTE
CODE	00000630 (1584.)	04 (4.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC BYTE

```
                                  +-------------------------+
                                  ! Symbol Cross Reference !
                                  +-------------------------+

SYMBOL                      VALUE        DEFINITION      REFERENCES...
------                      -----        ----------      -------------
$$ARGS                     =0000000A     244    (1)      244    (1)
$$N                        =00000002     1165   (1)      1007   (1)      1019   (1)      1117   (1)      1165   (1)
                                                         888    (1)    #-898    (1)      927    (1)      935    (1)
                                                       #-939    (1)      948    (1)      959    (1)      969    (1)
                                                         983    (1)
$$T1                       =00000001     824    (1)      244    (1)      824    (1)
$$T2                       =00000005     1048   (1)      1048   (1)
ADDR_128                    00000000-XR                #-905    (1)
ANULL                       00000074-R   294    (1)      1109   (1)      851    (1)
APC$_ABORT                 =00000006     238    (1)
APC$_CONTINUE              =00000009     238    (1)
APC$_DUMP                  =00000003     238    (1)
APC$_NOP                   =00000000     238    (1)
APC$_START                 =00000005     238    (1)
APC$_ZERO                  =00000004     238    (1)
APM$_ABTDON                =00000006     238    (1)
APM$_DEVERR                =00000002     238    (1)    #-710    (1)
APM$_DONE                  =0000000A     238    (1)
APM$_EXCEPT                =0000000B     238    (1)
APM$_HARDERR               =00000003     238    (1)    #-603    (1)
APM$_MORE                  =00000008     238    (1)
APM$_NOMES                 =00000000     238    (1)
APM$_PREPERR               =0000000C     238    (1)    #-655    (1)
APM$_PRGERR                =00000005     238    (1)    #-1168   (1)
APM$_SOFTERR               =00000004     238    (1)    #-552    (1)
APM$_SPOOL                 =00000009     238    (1)
APM$_SYSERR                =00000001     238    (1)    #-765    (1)
APT_MSG                     00000000-XR                1171   (1)      555    (1)      606    (1)      658    (1)
                                                         713    (1)      768    (1)
BIT...                     =00000004     248    (1)      239    (1)      240    (1)      242    (1)      248    (1)
BPTCODE                    =00000003     235    (1)    #-1003   (1)    #-1015   (1)    #-1161   (1)
CF$L_PC                     00000010                    1013   (1)    #-1014   (1)    #-1015   (1)    #-1019   (1)
DEVFER                      00000019-R   283    (1)      705    (1)
DS$AA_BPTADDR               00000000-XR                #-1001   (1)    #-1013   (1)    #-1159   (1)
DS$AB_BPTINST               00000000-XR                #-1002   (1)    #-1014   (1)    #-1160   (1)
DS$GA_CHKLPPC               00000000-XR                #-818    (1)
DS$GA_USER_ERROR_TEXT       00000000-XR                #-871    (1)
DS$GB_TYPECODE              00000000-XR                #-894    (1)
DS$GK_SID                   00000000-XR                #-990    (1)
DS$GL_DEVERR_COUNT          00000000-XR                #-704    (1)
DS$GL_ERRCNT                00000000-XR                #-816    (1)
DS$GL_ERRSUP_COUNT          00000000-XR                #-1169   (1)
DS$GL_FLAGS                 00000000-XR                #-1125   (1)      707    (1)      762    (1)      817    (1)
DS$GL_HARDERR_COUNT         00000000-XR                #-600    (1)
DS$GL_PREPERR_COUNT         00000000-XR                #-652    (1)
DS$GL_SOFTERR_COUNT         00000000-XR                #-549    (1)
DS$GL_SYSERR_COUNT          00000000-XR                #-759    (1)
DS$GPHARD                   00000000-XR                 826    (1)
DS$GQ_TESTID                00000008-R   259    (1)    #-1038   (1)    #-1042   (1)    #-1044   (1)    #-1045   (1)
                                                         1048   (1)    #-888    (1)
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DS$GT_VDS_VERSION                00000000-XR                    1124    (1)
DS$GW_TTOUT                      00000000-XR                  #-824     (1)
DS$K_ERROR                       =00000002      242     (1)
DS$K_NORMAL                      =00000001      242     (1)
DS$K_PRINTB                      =00000002      248     (1)
DS$K_PRINTF                      =00000001      248     (1)    #-1007    (1)    #-1019    (1)    #-1117    (1)    #-1120    (1)
                                                               #-1128    (1)    #-1144    (1)    #-1152    (1)    #-1165    (1)
                                                               #-1234    (1)    #-888     (1)    #-898     (1)    #-927     (1)
                                                               #-935     (1)    #-939     (1)    #-948     (1)    #-959     (1)
                                                               #-969     (1)    #-983     (1)
DS$K_PRINTI                      =00000000      248     (1)
DS$K_PRINTX                      =00000003      248     (1)
DS$K_SEVERE                      =00000004      242     (1)
DS$K_SUBSYS                      =00000066      242     (1)      242     (1)
DS$K_TYPE_ABORT_PROGRAM          =00000014      248     (1)
DS$K_TYPE_ABORT_TEST             =00000013      248     (1)
DS$K_TYPE_COMMAND_ERR            =00000015      248     (1)
DS$K_TYPE_COMMAND_OUT            =00000016      248     (1)    #-898     (1)    #-927     (1)    #-935     (1)    #-939     (1)
                                                               #-948     (1)    #-959     (1)    #-969     (1)
DS$K_TYPE_CRD_AUTOTEST           =0000001A      248     (1)
DS$K_TYPE_DS_PROMPT              =00000001      248     (1)
DS$K_TYPE_DS_START               =0000001D      248     (1)
DS$K_TYPE_ERRDEV                 =00000008      248     (1)      284     (1)
DS$K_TYPE_ERRHARD                =00000006      248     (1)      278     (1)
DS$K_TYPE_ERROR_BODY             =00000009      248     (1)    #-1121    (1)    #-1145    (1)    #-893     (1)
DS$K_TYPE_ERROR_END              =0000000A      248     (1)    #-1153    (1)    #-983     (1)
DS$K_TYPE_ERRPREP                =0000001B      248     (1)      287     (1)
DS$K_TYPE_ERRSOFT                =00000007      248     (1)      281     (1)
DS$K_TYPE_ERRSUP                 =00000004      248     (1)    #-1117    (1)    #-1129    (1)
DS$K_TYPE_ERRSYS                 =00000005      248     (1)      290     (1)
DS$K_TYPE_ERR_HALT               =0000000D      248     (1)    #-1007    (1)    #-1019    (1)    #-1165    (1)
DS$K_TYPE_EXCEPTION              =0000000C      248     (1)
DS$K_TYPE_EXCEPTION_HEAD         =0000000B      248     (1)
DS$K_TYPE_FIRST_PASS             =00000011      248     (1)
DS$K_TYPE_GENERAL                =00000000      248     (1)
DS$K_TYPE_GENERAL_ERROR          =00000003      248     (1)    #-1235    (1)
DS$K_TYPE_NO_TESTS               =00000012      248     (1)
DS$K_TYPE_PARAM_ERROR            =0000001C      248     (1)
DS$K_TYPE_PROGRAM_END            =00000010      248     (1)
DS$K_TYPE_PROGRAM_INFO           =00000017      248     (1)
DS$K_TYPE_PROGRAM_START          =0000000F      248     (1)
DS$K_TYPE_QIO_INVADP             =00000024      248     (1)
DS$K_TYPE_QIO_NODRIVER           =00000022      248     (1)
DS$K_TYPE_QIO_WRONGVER           =00000023      248     (1)
DS$K_TYPE_SCRIPT_ECHO            =00000021      248     (1)
DS$K_TYPE_SCRIPT_PNF             =0000001E      248     (1)
DS$K_TYPE_SCRIPT_PROMPT          =00000020      248     (1)
DS$K_TYPE_SCRIPT_SKIP            =0000001F      248     (1)
DS$K_TYPE_SEQUENCE_ERROR         =00000019      248     (1)
DS$K_TYPE_START_ERR              =00000018      248     (1)
DS$K_TYPE_START_LIST             =00000025      248     (1)
DS$K_TYPE_SUMMARY                =0000000E      248     (1)
DS$K_TYPE_USER_PROMPT            =00000002      248     (1)
DS$K_WARNING                     =00000000      242     (1)
DS$M_ABRTFLG                     =00000040      239     (1)
DS$M_BADTIME                     =00100000      239     (1)
DS$M_BATCH                       =00400000      239     (1)
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DS$M_BRKCLR                     =00001000     239     (1)
DS$M_BRKPT                      =00000800     239     (1)
DS$M_CHARFLG                    =00000100     239     (1)
DS$M_CMDFLG                     =00000080     239     (1)
DS$M_CTRLC                      =00000001     239     (1)
DS$M_CTRLO                      =00010000     239     (1)
DS$M_DEVFLG                     =00000200     239     (1)
DS$M_DISABLCC                   =01000000     239     (1)
DS$M_DONFLG                     =00002000     239     (1)
DS$M_ERRFLG                     =00000010     239     (1)
DS$M_EXCEPT                     =00080000     239     (1)
DS$M_EXETST                     =00040000     239     (1)
DS$M_HLTFLG                     =00000008     239     (1)
DS$M_LODFLG                     =00000002     239     (1)
DS$M_MEMMGT                     =00008000     239     (1)
DS$M_NI                         =04000000     239     (1)
DS$M_OUTPUT                     =00800000     239     (1)
DS$M_RUBFLG                     =00000020     239     (1)
DS$M_SCRIPT                     =00200000     239     (1)
DS$M_SETIMR                     =02000000     239     (1)
DS$M_STRFLG                     =00000004     239     (1)
DS$M_SUBT                       =00004000     239     (1)
DS$M_SYSFLG                     =00000400     239     (1)
DS$M_TIMED                      =02000000     239     (1)
DS$M_TIMED_OUT                  =08000000     239     (1)
DS$M_TIMRON                     =00020000     239     (1)
DS$V_ABRTFLG                    =00000006     239     (1)
DS$V_BADTIME                    =00000014     239     (1)
DS$V_BATCH                      =00000016     239     (1)
DS$V_BRKCLR                     =0000000C     239     (1)
DS$V_BRKPT                      =0000000B     239     (1)
DS$V_CHARFLG                    =00000008     239     (1)
DS$V_CMDFLG                     =00000007     239     (1)
DS$V_CTRLC                      =00000000     239     (1)
DS$V_CTRLO                      =00000010     239     (1)
DS$V_DEVFLG                     =00000009     239     (1)     #-706     (1)
DS$V_DISABLCC                   =00000018     239     (1)
DS$V_DONFLG                     =0000000D     239     (1)
DS$V_ERRFLG                     =00000004     239     (1)     #-817     (1)
DS$V_EXCEPT                     =00000013     239     (1)
DS$V_EXETST                     =00000012     239     (1)
DS$V_HLTFLG                     =00000003     239     (1)
DS$V_LODFLG                     =00000001     239     (1)
DS$V_MEMMGT                     =0000000F     239     (1)
DS$V_NI                         =0000001A     239     (1)
DS$V_OUTPUT                     =00000017     239     (1)
DS$V_RUBFLG                     =00000005     239     (1)
DS$V_SCRIPT                     =00000015     239     (1)
DS$V_SETIMR                     =00000019     239     (1)
DS$V_STRFLG                     =00000002     239     (1)
DS$V_SUBT                       =0000000E     239     (1)
DS$V_SYSFLG                     =0000000A     239     (1)     #-761     (1)
DS$V_TIMED                      =00000019     239     (1)
DS$V_TIMED_OUT                  =0000001B     239     (1)
DS$V_TIMRON                     =00000011     239     (1)
DS$_AP_NORMAL_BREAK             =00660150     242     (1)
DS$_ARITH                       =006600D0     242     (1)       403     (1)
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DS$_ASBE                        =00660118     242     (1)
DS$_BADLINK                     =006600F0     242     (1)
DS$_BADTYPE                     =006600E8     242     (1)
DS$_BIIC                        =00660120     242     (1)
DS$_CHME                        =006600A8     242     (1)
DS$_CHMK                        =006600E0     242     (1)
DS$_DEVNAME                     =00660108     242     (1)
DS$_ERROR                       =00660002     242     (1)
DS$_FHWE                        =00660068     242     (1)     392     (1)
DS$_FRAGBUF                     =00660080     242     (1)     395     (1)
DS$_ICBUSY                      =006600C8     242     (1)
DS$_ICERR                       =006600C0     242     (1)     402     (1)
DS$_IHWE                        =00660060     242     (1)     391     (1)
DS$_ILLCHAR                     =00660018     242     (1)     384     (1)
DS$_ILLPAGCNT                   =00660078     242     (1)     394     (1)
DS$_ILLUNIT                     =00660100     242     (1)
DS$_INIT_FAIL                   =00660140     242     (1)
DS$_INSFMEM                     =00660050     242     (1)     390     (1)
DS$_INVCPU                      =00660130     242     (1)
DS$_IPL2HI                      =006600B8     242     (1)     401     (1)
DS$_IVADDR                      =00660040     242     (1)     388     (1)
DS$_IVVECT                      =00660038     242     (1)     387     (1)
DS$_KRNLSTK                     =00660090     242     (1)     397     (1)
DS$_LOGIC                       =00660070     242     (1)     393     (1)
DS$_MCHK                        =00660088     242     (1)     396     (1)
DS$_MEM_ALLOC_ERR               =00660138     242     (1)
DS$_MMOFF                       =00660058     242     (1)
DS$_NEEDUNIT                    =006600F8     242     (1)
DS$_NODE                        =00660128     242     (1)
DS$_NOPCS                       =00660110     242     (1)
DS$_NORMAL                      =00660001     242     (1)
DS$_NOSUPPORT                   =006600B1     242     (1)
DS$_NOTALLOWMP                  =00660148     242     (1)
DS$_NOTDON                      =00660030     242     (1)
DS$_NOTIMP                      =006600B0     242     (1)     242     (1)     400     (1)
DS$_NULLSTR                     =00660010     242     (1)     383     (1)
DS$_OVERFLOW                    =00660008     242     (1)     382     (1)
DS$_POWER                       =00660098     242     (1)     398     (1)
DS$_PROGERR                     =00660020     242     (1)     385     (1)
DS$_SEVERE                      =00660004     242     (1)
DS$_TRANSL                      =006600A0     242     (1)     399     (1)
DS$_TRUNCATE                    =00660028     242     (1)     386     (1)
DS$_UNEXPINT                    =006600D8     242     (1)     404     (1)
DS$_UNSUPPDEV                   =00660158     242     (1)     405     (1)
DS$_VASFULL                     =00660048     242     (1)     389     (1)
DS$_WARNING                     =00660000     242     (1)     242     (1)
DSA$GL_DEVLEN                    0000FE58                     #-1101  (1)     #-836   (1)
DSA$GL_ERRNO                     0000FE44                     #-1098  (1)     #-820   (1)     #-888   (1)     #-983   (1)
DSA$GL_FLAGS                     0000FE00                     #-1126  (1)     #-1156  (1)      1170   (1)      554   (1)
                                                               605   (1)       657   (1)      712   (1)      767   (1)
                                                               821   (1)       846   (1)      899   (1)      978   (1)
                                                               985   (1)       988   (1)
DSA$GL_MSGTYP                    0000FE40                     #-1168  (1)     #-553   (1)     #-604   (1)     #-656   (1)
                                                             #-711   (1)     #-766   (1)
DSA$GL_PASSNO                    0000FE54                     #-888   (1)
DSA$GL_SUBTNO                    0000FE4C                     #-1036  (1)     #-1040  (1)     #-1048  (1)
DSA$GL_TESTNO                    0000FE50                     #-1033  (1)     #-1048  (1)
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DSA$GQ_MSGPTR                    0000FE68                        #-819    (1)
DSA$GT_DEVNAM                    0000FE5C                          1102    (1)      840    (1)
DSA$M_HALT                      =00000001                        #-1155    (1)
DSA$V_APT                       =0000001F                        #-1170    (1)    #-554    (1)    #-605    (1)    #-657    (1)
                                                                 #-712     (1)    #-767    (1)
DSA$V_BELL                      =00000003                        #-821     (1)
DSA$V_HALT                      =00000000                        #-985     (1)    #-988    (1)
DSA$V_IE1                       =00000004                        #-846     (1)    #-899    (1)    #-978    (1)
DSERRSUPX                        00000588-R   1167    (1)       #-1157    (1)
DSQA$K_DISPAT_AFTER_INIT        =00000014     240     (1)
DSQA$K_DISPAT_BEFORE_INIT       =00000013     240     (1)
DSQA$K_DISPAT_CALLTEST          =00000015     240     (1)
DSQA$K_DISPAT_DONE_TESTS        =00000018     240     (1)
DSQA$K_DISPAT_DSX$ENDPASS_BGN   =00000001     240     (1)
DSQA$K_DISPAT_DSX$ENDPASS_END   =00000002     240     (1)
DSQA$K_DISPAT_DSX$ENDPASS_MID   =00000000     240     (1)
DSQA$K_DISPAT_DS_CLEANUP_BGN    =00000003     240     (1)
DSQA$K_DISPAT_DS_CLEANUP_END    =00000004     240     (1)
DSQA$K_DUMMY_1                  =00000007     240     (1)
DSQA$K_ERROR_ERROR_BGN          =00000006     240     (1)
DSQA$K_ERROR_ERROR_END          =00000005     240     (1)    #-1022    (1)
DSQA$K_KERNEL_INIT_CONTEXT      =00000008     240     (1)
DSQA$K_LOOP_DSX$BGNSUB          =00000009     240     (1)
DSQA$K_LOOP_DSX$CKLOOP          =0000000B     240     (1)
DSQA$K_LOOP_DSX$ENDSUB          =0000000A     240     (1)
DSQA$K_PARAM_DSX$GETADDRESS     =0000000E     240     (1)
DSQA$K_PARAM_DSX$GETDATA        =0000000C     240     (1)
DSQA$K_PARAM_DSX$GETLOGICAL     =0000000F     240     (1)
DSQA$K_PARAM_DSX$GETSTRING      =00000010     240     (1)
DSQA$K_PARAM_DSX$GETVIELD       =0000000D     240     (1)
DSQA$K_QA_DSX$BRANCH            =00000011     240     (1)
DSQA$K_START_BEFORE_HEADER      =00000017     240     (1)
DSQA$K_START_VRRESTART          =00000012     240     (1)
DSQA$K_START_VRSTART            =00000016     240     (1)
DSR$CHECK_AUTOTEST_OFF_SET       00000000-XR                     865     (1)
DSR$CHECK_MENUTEST_OFF_SET       00000000-XR                     862     (1)
DSR$COMPLETION                   000005A4-R   1205    (1)
DSX$ERRDEV                       00000075-R   702     (1)
DSX$ERRHARD                      00000027-R   598     (1)
DSX$ERRPREP                      0000004E-R   650     (1)
DSX$ERRSOFT                      00000000-R   547     (1)
DSX$ERRSYS                       000000A3-R   757     (1)
DSX$PRINT                        00000000-XR                     1007    (1)    1019    (1)    1117    (1)    1122    (1)
                                                                 1130    (1)    1146    (1)    1154    (1)    1165    (1)
                                                                 1238    (1)    888     (1)    898     (1)    927     (1)
                                                                 935     (1)    939     (1)    948     (1)    959     (1)
                                                                 969     (1)    983     (1)
DS_ERRSUP                        00000477-R   1092    (1)
DS_TESTID                        0000040B-R   1032    (1)    #-848     (1)
ERR$_MSGADR                     =0000000C     244     (1)      849     (1)
ERR$_NARGS                      =0000000A     244     (1)
ERR$_NUM                        =00000004     244     (1)    #-820     (1)
ERR$_P1                         =00000014     244     (1)
ERR$_P2                         =00000018     244     (1)
ERR$_P3                         =0000001C     244     (1)
ERR$_P4                         =00000020     244     (1)
ERR$_P5                         =00000024     244     (1)
```

```
ERR$_P6                         =00000028      244     (1)
ERR$_POINTER                    =00000010      244     (1)     #-890     (1)       895     (1)
ERR$_UNIT                       =00000008      244     (1)     #-826     (1)    #-904      (1)
ERROR_CODES                      00000357-R    358     (1)       1216    (1)
ERROR_TEXT                       00000413-R    407     (1)       1218    (1)
ERSUPER                          0000005C-R    292     (1)       1150    (1)
FIRMREV                          000000D0-R    304     (1)       959     (1)
FMTENDERROR                      000001C9-R    325     (1)       1151    (1)       983     (1)
FMTERRHDR                        0000012C-R    313     (1)       888     (1)
FMTERRHLT                        0000010A-R    311     (1)       1007    (1)       1019    (1)       1165    (1)
FMTERRSUP                        000001F8-R    327     (1)       1117    (1)
FMTERRSUP1                       00000237-R    330     (1)       1127    (1)
FMTERRSUP2                       00000271-R    333     (1)       1119    (1)
FMTERRSUP3                       00000302-R    338     (1)       1143    (1)
FMTMODULE                        000001B1-R    321     (1)       935     (1)
FMTNO_MOD                        000001BC-R    323     (1)       939     (1)
FMTREVERROR                      00000193-R    319     (1)       927     (1)
HARDER                           00000001-R    277     (1)       601     (1)
HARDREV                          000000C0-R    302     (1)       948     (1)
HP$Q_DEVICE                      00000000                        #-829     (1)    #-830      (1)
IO$_WRITEVBLK                    00000000-XR                     #-824     (1)
L$A_NAME                         00000208                        #-888     (1)
L$L_REV                          0000020C                        #-888     (1)
L$L_UPDATE                       00000210                        #-888     (1)
LINEFEED                         00000190-R    317     (1)       898     (1)
L_OFFSET                         00000010-R    261     (1)     #-910     (1)    #-972      (1)    #-973     (1)
MODULE                           0000001C-R    267     (1)     #-929     (1)    #-930      (1)    #-935     (1)
MSGBELL                          00000000-R    275     (1)       824     (1)
PATCHREV                         000000E0-R    306     (1)       969     (1)
PREPER                           0000002D-R    286     (1)       653     (1)
PRINT                            00000018-R    265     (1)     #-815     (1)    #-922      (1)    #-928     (1)
QA$MAIN                          00000000-XR                     1022    (1)
QCLEANSEC                        000000A9-R    300     (1)     #-1042    (1)
QFMTTESTID                       000000ED-R    308     (1)       1048    (1)
QINITSEC                         0000008B-R    298     (1)     #-1038    (1)
QUNKDEV                          00000075-R    296     (1)     #-834     (1)
Q_BUFQWD                         00000000-R    257     (1)     #-829     (1)    #-831      (1)    #-834     (1)    #-836     (1)
                                                               #-838     (1)    #-888      (1)    #-927     (1)
REVERROR                         00000014-R    263     (1)
RMS$_ACC                        =0001C002                        368     (1)
RMS$_CCR                        =00018494                        369     (1)
RMS$_DEV                        =000184C4                        366     (1)
RMS$_DME                        =000184D4                        370     (1)
RMS$_DNF                        =0001C04A                        367     (1)
RMS$_EOF                        =0001827A                        371     (1)
RMS$_FAB                        =0001850C                        372     (1)
RMS$_FNF                        =00018292                        365     (1)
RMS$_FNM                        =0001852C                        381     (1)
RMS$_IFI                        =00018564                        373     (1)
RMS$_IOP                        =00018574                        374     (1)
RMS$_IRC                        =0001857C                        380     (1)
RMS$_ISI                        =00018584                        375     (1)
RMS$_PRV                        =0001829A                        364     (1)
RMS$_RAB                        =0001863C                        376     (1)
RMS$_RER                        =0001C0F4                        377     (1)
RMS$_RFA                        =0001865C                        379     (1)
RMS$_RTB                        =000181A8                        378     (1)
```

```
RRPTERROR                    000000D1-R   814    (1)    #-551    (1)    #-602    (1)    #-654    (1)    #-709    (1)
                                                        #-764    (1)
RRPTERRORX                   00000401-R   1021   (1)    #-1009   (1)    #-986    (1)
SEVERITY                     00000974-R   503    (1)      1223   (1)
SIZ...                       =00000001    239    (1)      239    (1)
SOFTER                       0000000D-R   280    (1)      550    (1)
SS$_ACCVIO                   00000000-XR                  360    (1)
SS$_CTRLERR                  00000000-XR                  363    (1)
SS$_NOSUCHDEV                00000000-XR                  361    (1)
SS$_NOSUCHFILE               00000000-XR                  362    (1)
SYS$FAO                      00000000-XR                  1048   (1)
SYS$QIOW                     00000000-XR                  824    (1)
SYSFER                       00000048-R   289    (1)      760    (1)
TESTID_LEN                   =00000020    236    (1)    #-1044   (1)      270    (1)
T_ERROR_MASK                 00000313-R   341    (1)      1233   (1)
T_TESTID                     00000020-R   269    (1)      1045   (1)
UTILITY_CODES                0000032C-R   343    (1)      1227   (1)
UTILITY_TEXT                 0000033C-R   349    (1)      1229   (1)

                                          +-------------------------+
                                          ! Performance indicators !
                                          +-------------------------+

Phase                     Page faults    CPU Time       Elapsed Time
-----                     -----------    --------       ------------
Initialization                     41    00:00:00.05    00:00:00.20
Command processing                955    00:00:00.27    00:00:00.89
Pass 1                            740    00:00:03.59    00:00:06.27
Symbol table sort                   0    00:00:00.19    00:00:00.19
Pass 2                             17    00:00:01.04    00:00:01.99
Symbol table output                 2    00:00:00.05    00:00:00.25
Psect synopsis output               2    00:00:00.01    00:00:00.01
Cross-reference output              7    00:00:00.26    00:00:00.41
Assembler run totals             1766    00:00:05.46    00:00:10.21

The working set limit was 3400 pages.
190222 bytes (372 pages) of virtual memory were used to buffer the intermediate code.
There were 40 pages of symbol table space allocated to hold 664 non-local and 106 local symbols.
1257 source lines were read in Pass 1, producing 81 object records in Pass 2.
48 pages of virtual memory were used to define 38 macros.
```

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              9
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1               12
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                      12
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                33

813 GETS were required to define 33 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element EVENT.B32
;    0002  0      ! *1     6-FEB-1986 15:18:20 DS ""
;    0003  0      ! DEC/CMS REPLACEMENT HISTORY, Element EVENT.B32
;    0004  0      %title '*** EVENT flag system services'
;    0005  0      module event (ident = '06-01',
;    0006  0                    addressing_mode (external = long_relative),
;    0007  0                    optlevel = 3,
;    0008  0                    optimize) =
;    0009  1      begin
;    0010  1
;    0011  1      !
;    0012  1      ! Copyright (c) 1977, 1981, 1983
;    0013  1      ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
;    0014  1      !
;    0015  1      ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
;    0016  1      ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
;    0017  1      ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
;    0018  1      ! MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
;    0019  1      ! EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
;    0020  1      ! TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
;    0021  1      ! REMAIN IN DEC.
;    0022  1      !
;    0023  1      ! THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
;    0024  1      ! AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
;    0025  1      ! CORPORATION.
;    0026  1      !
;    0027  1      ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
;    0028  1      ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
;    0029  1
;    0030  1      !++
;    0031  1      ! FACILITY:     VAX Diagnostic Supervisor
;    0032  1      !
;    0033  1      ! ABSTRACT:
;    0034  1      !
;    0035  1      ! ENVIRONMENT:
;    0036  1      !
;    0037  1      ! AUTHOR:       Dave Butenhof, 11-Sep-1981 [DS version 6.5]
;    0038  1      !
;    0039  1      ! MODIFIED BY:
;    0040  1      !
;    0041  1      !       00      - dave butenhof, 11-Sep-1981.  Converted module from Macro-32
;    0042  1      !                 to Bliss-32.  Primary purpose was to add SS$_WASSET and
;    0043  1      !                 SS$_WASCLR status returns to READEF, SETEF and CLREF.  Also,
;    0044  1      !                 routines were poorly structured and did not have entry masks.
;    0045  1      !
;    0046  1      !       01      Bob Bergazzi    May 17, 1983    Version 6.11
;    0047  1      !               Changed the order of searching libraries.
;    0048  1      !--
```

```
;    0050  1     %sbttl 'Declarations'
;    0051  1
;    0052  1     !
;    0053  1     ! Include Files:
;    0054  1     !
;    0055  1     library '$diag';                !                                   [01]
;    0056  1
;    0057  1     library '$ds';                  ! DS-specific library               [01]
;    0058  1
;    0059  1     library 'sys$library:lib';      ! Common VMS library                [01]
;    0060  1
;    0061  1     !
;    0062  1     ! Macros:
;    0063  1     !
;    0064  1
;    0065  1     builtin
;    0066  1         testbitss,
;    0067  1         testbitsc;
;    0068  1
;    0069  1     !
;    0070  1     ! Equated Symbols:
;    0071  1     !
;    0072  1
;    0073  1     !
;    0074  1     ! Own Storage:
;    0075  1     !
;    0076  1
;    0077  1     !
;    0078  1     ! Externals:
;    0079  1     !
;    0080  1
;    0081  1     external
;    0082  1         ds$ax_softpcb,
;    0083  1         ds$gq_efl : bitvector [64]; ! The event flags
;    0084  1
;    0085  1     external routine
;    0086  1         kb_check : jsb_none;        ! Check for console input
;    0087  1
;    0088  1     !
;    0089  1     ! Psect definition
;    0090  1     !
;    0091  1
;    0092  1     psect code = code (share);
```

```
;   0094  1     %sbttl 'check for legal event flag number'
;   0095  1
;   0096  1     routine check_efn : jsb_none =
;   0097  2         begin
;   0098  2
;   0099  2         builtin
;   0100  2             ap;
;   0101  2
;   0102  2         bind
;   0103  2             efn = .ap + 4;
;   0104  2
;   0105  2         if .efn gtr 127 then return ss$_illefc;
;   0106  2
;   0107  2         if .efn gtr 63 then return ss$_unasefc;
;   0108  2
;   0109  2         ss$_normal
;   0110  1         end;


                                                                .TITLE  EVENT *** EVENT flag system services
                                                                .IDENT  \06-01\

                                                                .EXTRN  DS$AX_SOFTPCB, DS$GQ_EFL
                                                                .EXTRN  KB_CHECK

                                                                .PSECT  CODE,NOWRT,  SHR,2

                0000007F   8F       04   AC  D1 00000 CHECK_EFN:
                                                                CMPL    4(AP), #127                          ; 0105
                                         05  15 00008           BLEQ    1$                                   ;
                           50       EC   8F  9A 0000A           MOVZBL  #236, R0                             ;
                                         05  0000E              RSB                                          ;
                           3F       04   AC  D1 0000F 1$:       CMPL    4(AP), #63                           ; 0107
                                         06  15 00013           BLEQ    2$                                   ;
                           50     0234   8F  3C 00015           MOVZWL  #564, R0                             ;
                                         05  0001A              RSB                                          ;
                           50           01  D0 0001B 2$:       MOVL    #1, R0                               ; 0110
                                         05  0001E              RSB                                          ;

; Routine Size:  31 bytes,    Routine Base:  CODE + 0000
```

```
;    0112  1      %sbttl 'set event flag routine'
;    0113  1
;    0114  1      !++
;    0115  1      ! Functional Description:
;    0116  1      !
;    0117  1      !       Sets a single event flag specified by the caller
;    0118  1      !
;    0119  1      ! Calling Sequence:
;    0120  1      !
;    0121  1      !       status = $setef (efn)
;    0122  1      !
;    0123  1      ! Input Parameters:
;    0124  1      !
;    0125  1      !       efn =>  event flag number
;    0126  1      !
;    0127  1      ! Implicit Inputs:
;    0128  1      !
;    0129  1      !       None
;    0130  1      !
;    0131  1      ! Output Parameters:
;    0132  1      !
;    0133  1      !       None
;    0134  1      !
;    0135  1      ! Implicit Outputs:
;    0136  1      !
;    0137  1      !       None
;    0138  1      !
;    0139  1      ! Completion Codes:
;    0140  1      !
;    0141  1      !       SS$_WASCLR
;    0142  1      !       SS$_WASSET
;    0143  1      !       SS$_UNASEFC                     ; 128 > EFN > 63
;    0144  1      !       SS$_ILLEFC                      ; EFN > 127
;    0145  1      !
;    0146  1      ! Side Effects:
;    0147  1      !
;    0148  1      !       None
;    0149  1      !
;    0150  1      !--
```

```
;   0152  1     global routine exe$setef (efn) =
;   0153  2         begin
;   0154  2
;   0155  2         (local s; if not (s = check_efn ()) then return .s);
;   0156  2
;   0157  2         testbitss (ds$gq_efl [.efn])^3 + 1
;   0158  1         end;


                                        0FFC 00000          .ENTRY  EXE$SETEF, Save R2,R3,R4,R5,R6,R7,R8,R9,-    ; 0152
                                                                    R10,R11                                          ;
                                    DD  10 00002            BSBB    CHECK_EFN                                    ; 0155
                              12    50  E9 00004            BLBC    S, 2$                                        ;
                                    50  D4 00007            CLRL    R0                                           ; 0157
                    02 00000000G  EF      04    AC  E3 00009          BBCS    EFN, DS$GQ_EFL, 1$                   ;
                                    50  D6 00012            INCL    R0                                           ;
                              50    08  C4 00014 1$:        MULL2   #8, R0                                       ;
                                    50  D6 00017            INCL    R0                                           ;
                                        04 00019 2$:        RET                                                  ; 0158

; Routine Size:  26 bytes,    Routine Base:  CODE + 001F
```

```
;    0160  1      %sbttl 'Clear event flag routine'
;    0161  1      !++
;    0162  1      ! Functional Description:
;    0163  1      !
;    0164  1      !       Clears a single event flag specified by the caller
;    0165  1      !
;    0166  1      ! Calling Sequence:
;    0167  1      !
;    0168  1      !       status = $clref (efn)
;    0169  1      !
;    0170  1      ! Input Parameters:
;    0171  1      !
;    0172  1      !       efn =>  event flag number
;    0173  1      !
;    0174  1      ! Implicit Inputs:
;    0175  1      !
;    0176  1      !       None
;    0177  1      !
;    0178  1      ! Output Parameters:
;    0179  1      !
;    0180  1      !       None
;    0181  1      !
;    0182  1      ! Implicit Outputs:
;    0183  1      !
;    0184  1      !       None
;    0185  1      !
;    0186  1      ! Completion Codes:
;    0187  1      !
;    0188  1      !       SS$_WASSET
;    0189  1      !       SS$_WASCLR
;    0190  1      !       SS$_UNASEFC                     ; 128 > EFN > 63
;    0191  1      !       SS$_ILLEFC                      ; EFN > 127
;    0192  1      !
;    0193  1      ! Side Effects:
;    0194  1      !
;    0195  1      !       None
;    0196  1      !
;    0197  1      !--
;    0198  1
;    0199  1      global routine exe$clref (efn) =
;    0200  2          begin
;    0201  2
;    0202  2          (local s; if not (s = check_efn ()) then return .s);
;    0203  2
;    0204  2          testbitsc (ds$gq_efl [.efn])^3 + 1
;    0205  1          end;


                                        0FFC 00000          .ENTRY  EXE$CLREF, Save R2,R3,R4,R5,R6,R7,R8,R9,-    ; 0199
                                                                    R10,R11                                      ;
                                        C3  10 00002        BSBB    CHECK_EFN                                    ; 0202
                                    12  50  E9 00004        BLBC    S, 2$                                        ;
                                        50  D4 00007        CLRL    R0                                           ; 0204
                         02 00000000G   EF  04  AC  E5 00009        BBCC    EFN, DS$GQ_EFL, 1$                   ;
```

```
                                    50  D6 00012          INCL    R0                                  ;
                          50        08  C4 00014 1$:      MULL2   #8, R0                              ;
                                    50  D6 00017          INCL    R0                                  ;
                                        04 00019 2$:      RET                                         ; 0205

; Routine Size:  26 bytes,    Routine Base:  CODE + 0039
```

```
1       %sbttl 'post event flag'
1       !++
1       ! Functional Description:
1       !       Post event flag will set an event flag specified by number
1       !       for a process specified by process ID (PID) and cause any
1       !       necessary rescheduling if this event satisfies a wait
1       !       condition for the process.
1       !
1       !       In the supervisor, this routine merely sets the flag and returns the
1       !       PCB address as a side effect.
1       !
1       ! Calling Sequence:
1       !
1       !       JSB     SCH$POSTEF
1       !
1       ! Input Parameters:
1       !       r1 - process identification (pid)
1       !       r2 - priority increment class number
1       !       r3 - event flag number
1       !
1       ! Implicit Inputs:
1       !       None
1       !
1       ! Output Parameters:
1       !       r0 - completion status code
1       !       r4 - pcb address of process specified by pid
1       !
1       ! Implicit Outputs:
1       !       event flag bit selected by pid and event flag number
1       !       is set.
1       !
1       ! Completion Codes:
1       !       SS$_NORMAL  -  normal successful completion
1       !       SS$_NONEXPR -  non-existent process
1       !
1       ! Side Effects:
1       !
1       !       None
1       !--
1
1       global routine sch$postef (pid, pri_inc, efn; pcb) : jsb_postef =
2           begin
2           pcb = ds$ax_softpcb;        ! Set PCB value for return
2           ds$gq_efl [.efn] = 1;       ! Set flag
2           ss$_normal
1           end;



                                54 00000000G  EF  9E 00000 SCH$POSTEF::
                                                           MOVAB   DS$AX_SOFTPCB, PCB                  ; 0249
                 00 00000000G   EF            53  E2 00007  BBSS    EFN, DS$GQ_EFL, 1$                  ; 0250
                                50            01  D0 0000F 1$:  MOVL    #1, R0                              ; 0252
                                                  05 00012  RSB                                         ;
```

```
; Routine Size:  19 bytes,    Routine Base:  CODE + 0053
```

```
;    0254  1      %sbttl 'read event flags routine'
;    0255  1
;    0256  1      !++
;    0257  1      ! Functional Description:
;    0258  1      !
;    0259  1      !       Returns a specified event flag cluster to a longword
;    0260  1      !       in the caller's area
;    0261  1      !
;    0262  1      ! Calling Sequence:
;    0263  1      !
;    0264  1      !       status = $readef (efn, state)
;    0265  1      !
;    0266  1      ! Input Parameters:
;    0267  1      !
;    0268  1      !       efn =>   any event flag number within desired cluster
;    0269  1      !       state => longword address for returned cluster
;    0270  1      !
;    0271  1      ! Implicit Inputs:
;    0272  1      !
;    0273  1      !       None
;    0274  1      !
;    0275  1      ! Output Parameters:
;    0276  1      !
;    0277  1      !       state => longword pointed to receives all flags in cluseter
;    0278  1      !
;    0279  1      ! Implicit Outputs:
;    0280  1      !
;    0281  1      !       None
;    0282  1      !
;    0283  1      ! Completion Codes:
;    0284  1      !
;    0285  1      !       SS$_UNASEFC                     ; 128 > EFN > 63
;    0286  1      !       SS$_ILLEFC                      ; EFN > 127
;    0287  1      !       SS$_WASSET                      ; Success, specified flag was set
;    0288  1      !       SS$_WASCLR                      ; Success, specified flag was clear
;    0289  1      !
;    0290  1      ! Side Effects:
;    0291  1      !
;    0292  1      !       None
;    0293  1      !
;    0294  1      !--
```

```
;   0296  1     global routine exe$readef (efn, state) =
;   0297  2         begin
;   0298  2
;   0299  2         (local s; if not (s = check_efn ()) then return .s);
;   0300  2
;   0301  3         (map ds$gq_efl : vector [2];        ! Access flags by longword
;   0302  3         .state = .ds$gq_efl [.efn/32]       ! Read correct longword
;   0303  2         );
;   0304  2
;   0305  2         .ds$gq_efl [.efn]^3 + 1     ! Return SS$_WASSET or SS_$WASCLR
;   0306  1         end;



                                                  0FFC 00000          .ENTRY  EXE$READEF, Save R2,R3,R4,R5,R6,R7,R8,R9,-   ; 0296
                                                                              R10,R11                                      ;
                                  52 00000000G  EF   9E 00002          MOVAB   DS$GQ_EFL, R2                                ;
                                                8F   10 00009          BSBB    CHECK_EFN                                    ; 0299
                                  15            50   E9 0000B          BLBC    S, 1$                                        ;
                    50        04  AC            20   C7 0000E          DIVL3   #32, EFN, R0                                 ; 0302
                              08  BC          6240   D0 00013          MOVL    DS$GQ_EFL[R0], @STATE                        ;
          50        62            01        04  AC   EF 00018          EXTZV   EFN, #1, DS$GQ_EFL, R0                       ; 0305
                                  50            08   C4 0001E          MULL2   #8, R0                                       ;
                                                50   D6 00021          INCL    R0                                           ;
                                                     04 00023 1$:      RET                                                  ; 0306

; Routine Size:  36 bytes,    Routine Base:  CODE + 0066
```

```
;    0308  1     %sbttl 'wait for single event flag routine'
;    0309  1
;    0310  1     !++
;    0311  1     ! Functional Description:
;    0312  1     !
;    0313  1     !       Suspends program execution until a single specified
;    0314  1     !       event flag sets
;    0315  1     !
;    0316  1     ! Calling Sequence:
;    0317  1     !
;    0318  1     !       state = $waitfr (efn)
;    0319  1     !
;    0320  1     ! Input Parameters:
;    0321  1     !
;    0322  1     !       efn => event flag number
;    0323  1     !
;    0324  1     ! Implicit Inputs:
;    0325  1     !
;    0326  1     !       None
;    0327  1     !
;    0328  1     ! Output Parameters:
;    0329  1     !
;    0330  1     !       None
;    0331  1     !
;    0332  1     ! Implicit Outputs:
;    0333  1     !
;    0334  1     !       None
;    0335  1     !
;    0336  1     ! Completion Codes:
;    0337  1     !
;    0338  1     !       SS$_NORMAL
;    0339  1     !       SS$_UNASEFC                     ; 128 > EFN > 63
;    0340  1     !       SS$_ILLEFC                      ; EFN > 127
;    0341  1     !
;    0342  1     ! Side Effects:
;    0343  1     !
;    0344  1     !       None
;    0345  1     !
;    0346  1     !--
;    0347  1
;    0348  1     global routine exe$waitfr (efn) =
;    0349  2         begin
;    0350  2
;    0351  2         (local s; if not (s = check_efn ()) then return .s);
;    0352  2
;    0353  2         while not .ds$gq_efl [.efn] do kb_check ();
;    0354  2         ss$_normal
;    0355  1         end;


                                    0FFC 00000          .ENTRY  EXE$WAITFR, Save R2,R3,R4,R5,R6,R7,R8,R9,-  ; 0348
                                                                R10,R11                                         ;
                                FF71  30 00002          BSBW    CHECK_EFN                                       ; 0351
                          14      50  E9 00005          BLBC    S, 3$                                           ;
```

```
                08 00000000G  EF        04   AC  E0 00008 1$:     BBS     EFN, DS$GQ_EFL, 2$                    ; 0353
                                   00000000G  EF  16 00011         JSB     KB_CHECK                              ;
                                              EF  11 00017         BRB     1$                                    ;
                                50            01  D0 00019 2$:     MOVL    #1, R0                                ; 0355
                                                  04 0001C 3$:     RET                                           ;

; Routine Size:  29 bytes,    Routine Base:  CODE + 008A
```

```
;    0357  1      %sbttl 'wait for logical or of event flags routine'
;    0358  1
;    0359  1      !++
;    0360  1      ! Functional Description:
;    0361  1      !
;    0362  1      !       Suspends program execution until any one of a set of
;    0363  1      !       specified event flags sets
;    0364  1      !
;    0365  1      ! Calling Sequence:
;    0366  1      !
;    0367  1      !       status = $wflor (efn, mask)
;    0368  1      !
;    0369  1      ! Input Parameters:
;    0370  1      !
;    0371  1      !       efn =>  any event flag number within desired cluster
;    0372  1      !       mask => mask of desired flags within the specified cluster
;    0373  1      !
;    0374  1      ! Implicit Inputs:
;    0375  1      !
;    0376  1      !       None
;    0377  1      !
;    0378  1      ! Output Parameters:
;    0379  1      !
;    0380  1      !       None
;    0381  1      !
;    0382  1      ! Implicit Outputs:
;    0383  1      !
;    0384  1      !       None
;    0385  1      !
;    0386  1      ! Completion Codes:
;    0387  1      !
;    0388  1      !       SS$_NORMAL
;    0389  1      !       SS$_UNASEFC                     ; 128 > EFN > 63
;    0390  1      !       SS$_ILLEFC                      ; EFN > 127
;    0391  1      !
;    0392  1      ! Side Effects:
;    0393  1      !
;    0394  1      !       None
;    0395  1      !
;    0396  1      !--
;    0397  1
;    0398  1      global routine exe$wflor (efn, mask) =
;    0399  2          begin
;    0400  2
;    0401  2          while 1 do
;    0402  3              begin
;    0403  3
;    0404  3              local
;    0405  3                  cluster;
;    0406  3
;    0407  3              kb_check ();
;    0408  3
;    0409  3              (local s; if not (s = exe$readef (.efn, cluster)) then return .s);
;    0410  3
;    0411  3              if (.cluster and .mask) neq 0 then exitloop
;    0412  2              end;
;    0413  2
```

```
;   0414  2          ss$_normal
;   0415  1          end;



                                        0FFC 00000          .ENTRY  EXE$WFLOR, Save R2,R3,R4,R5,R6,R7,R8,R9,-    ; 0398
                                                                    R10,R11                                          ;
                     5E                 04  C2 00002          SUBL2   #4, SP                                           ;
                        00000000G       EF  16 00005 1$:      JSB     KB_CHECK                                         ; 0407
                                        5E  DD 0000B          PUSHL   SP                                               ; 0409
                              04        AC  DD 0000D          PUSHL   EFN                                              ;
                AB   AF                 02  FB 00010          CALLS   #2, EXE$READEF                                   ;
                     09                 50  E9 00014          BLBC    S, 2$                                            ;
                08   AC                 6E  D3 00017          BITL    CLUSTER, MASK                                    ; 0411
                                        E8  13 0001B          BEQL    1$                                               ;
                     50                 01  D0 0001D          MOVL    #1, R0                                           ; 0415
                                            04 00020 2$:      RET                                                      ;

; Routine Size:  33 bytes,    Routine Base:  CODE + 00A7
```

```
;    0417  1     %sbttl 'wait for logical and of event flags routine'
;    0418  1
;    0419  1     !++
;    0420  1     ! Functional Description:
;    0421  1     !
;    0422  1     !       Suspends program execution until all specified
;    0423  1     !       event flags are set
;    0424  1     !
;    0425  1     ! Calling Sequence:
;    0426  1     !
;    0427  1     !       status = $wfland (efn, mask)
;    0428  1     !
;    0429  1     ! Input Parameters:
;    0430  1     !
;    0431  1     !       efn =>  any event flag number within desired cluster
;    0432  1     !       mask => mask of desired flags within the specified cluster
;    0433  1     !
;    0434  1     ! Implicit Inputs:
;    0435  1     !
;    0436  1     !       None
;    0437  1     !
;    0438  1     ! Output Parameters:
;    0439  1     !
;    0440  1     !       None
;    0441  1     !
;    0442  1     ! Implicit Outputs:
;    0443  1     !
;    0444  1     !       None
;    0445  1     !
;    0446  1     ! Completion Codes:
;    0447  1     !
;    0448  1     !       SS$_NORMAL
;    0449  1     !       SS$_UNASEFC                     ; 128 > EFN > 63
;    0450  1     !       SS$_ILLEFC                      ; EFN > 127
;    0451  1     !
;    0452  1     ! Side Effects:
;    0453  1     !
;    0454  1     !       None
;    0455  1     !
;    0456  1     !--
;    0457  1
;    0458  1     global routine exe$wfland (efn, mask) =
;    0459  2         begin
;    0460  2
;    0461  2         while 1 do
;    0462  3             begin
;    0463  3
;    0464  3             local
;    0465  3                 cluster;
;    0466  3
;    0467  3             kb_check ();
;    0468  3
;    0469  3             (local s; if not (s = exe$readef (.efn, cluster)) then return .s);
;    0470  3
;    0471  3             if (.cluster and .mask) eql .mask then exitloop
;    0472  3
;    0473  2             end;
```

```
;   0474  2
;   0475  2         ss$_normal
;   0476  1         end;



                                                  0FFC 00000          .ENTRY  EXE$WFLAND, Save R2,R3,R4,R5,R6,R7,R8,R9,-   ; 0458
                                                                              R10,R11                                      ;
                                  5E                 04  C2 00002          SUBL2   #4, SP                                       ;
                                     00000000G       EF  16 00005 1$:      JSB     KB_CHECK                                     ; 0467
                                                     5E  DD 0000B          PUSHL   SP                                           ; 0469
                                           04        AC  DD 0000D          PUSHL   EFN                                          ;
                            8A    AF                 02  FB 00010          CALLS   #2, EXE$READEF                               ;
                                  11                 50  E9 00014          BLBC    S, 2$                                        ;
                                  50         08      AC  D2 00017          MCOML   MASK, R0                                     ; 0471
                     50           6E                 50  CB 0001B          BICL3   R0, CLUSTER, R0                              ;
                            08    AC                 50  D1 0001F          CMPL    R0, MASK                                     ;
                                                     E0  12 00023          BNEQ    1$                                           ;
                                  50                 01  D0 00025          MOVL    #1, R0                                       ; 0476
                                                         04 00028 2$:      RET                                                  ;

; Routine Size:  41 bytes,    Routine Base:  CODE + 00C8


;   0477  1
;   0478  1     end
;   0479  0     eludom



;                                   PSECT SUMMARY
;
;       Name                    Bytes                          Attributes
;
;  CODE                             241  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
```

Symbol	Type	Defined	Referenced ...							
AP	Builtin	100	103.							
CHECK_EFN	Routine	96	155c	202c	299c	351c				
CLUSTER	Local	405	409a	411.						
	Local	465	469a	471.						
DS$AX_SOFTPCB	External	82	249a							
DS$GQ_EFL	External	83	157.	157=	204.	204=	250=	301m	302.	305.	353.
EFN	Bind	103	105.	107.						
	RoutForm	152	157.							
	RoutForm	199	204.							
	RoutForm	247	250.							
	RoutForm	296	302.	305.						
	RoutForm	348	353.							
	RoutForm	398	409.							
	RoutForm	458	469.							
EXE$CLREF	GlobRout	199								
EXE$READEF	GlobRout	296	409c	469c						
EXE$SETEF	GlobRout	152								
EXE$WAITFR	GlobRout	348								
EXE$WFLAND	GlobRout	458								
EXE$WFLOR	GlobRout	398								
JSB_NONE	Linkage	Lib02	86	96						
JSB_POSTEF	Linkage	Lib02	247							
KB_CHECK	ExtRout	86	353c	407c	467c					
MASK	RoutForm	398	411.							
	RoutForm	458	471.							
PCB	RoutForm	247	249=							
PID	RoutForm	247								
PRI_INC	RoutForm	247								
S	Local	155	155=	155.						
	Local	202	202=	202.						
	Local	299	299=	299.						
	Local	351	351=	351.						
	Local	409	409=	409.						
	Local	469	469=	469.						
SCH$POSTEF	GlobRout	247								
SS$_ILLEFC	Literal	Lib03	105							
SS$_NORMAL	Literal	Lib03	109	251	354	414	475			
SS$_UNASEFC	Literal	Lib03	107							
STATE	RoutForm	296	302a=							
TESTBITSC	Builtin	67	204							
TESTBITSS	Builtin	66	157							

CROSS REFERENCE MAP

Line #	Event	File ...
1	Source (start)	DISK$DS:[DS.LOCAL.RELEASE.WORK]EVENT.B32;1
5	Module EVENT	
55	Library #1	DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
57	Library #2	DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
59	Library #3	SYS$COMMON:[SYSLIB]LIB.L32;3
479	Eludom EVENT	

```
        KEY TO REFERENCE TYPE FLAGS

            .   Fetch
            =   Store
            c   Routine call
            a   Address use
            @   Indirect use
            e   External, external routine, or external literal declaration
            f   Forward or forward routine declaration
            h   Condition handler enabling
            m   Map declaration
            u   Undeclare declaration


;                              Library Statistics
;
;                                          -------- Symbols --------      Pages       Processing
;       File                               Total    Loaded   Percent      Mapped      Time
;
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
;                                            942         0         0        96         00:00.0
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
;                                            675         2         0        47         00:00.0
;  SYS$COMMON:[SYSLIB]LIB.L32;3             21522         3         0      1156         00:00.8




;                                      COMMAND QUALIFIERS

;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:EVENT.B32

; Size:          241 code + 0 data bytes
; Run Time:         00:02.0
; Elapsed Time:     00:04.6
; Lines/CPU Min:    14157
; Lexemes/CPU-Min: 21428
; Memory Used:  66 pages
; Compilation Complete
```

Table of contents

(1)   176   Libraries, External & Equated Symbols, Macros
(1)   232   Work Psect Declarations
(1)   243   Data Psect Declarations
(1)   374   COND_HANDLR ROUTINE - HANDLE UNWANTED EXCEPTIONS
(1)   504   DSX$PrintSig Routine - Format Signal Array
(1)   917   FIND_USERPC   Find USER PC on stack
(1)   970   TST$MChk Routine - Machine Check Handler   ;   [14]
(1)   1026   HARDWARE EXCEPTION ENTRY POINTS
(1)   1406   SEARCH FOR CONDITION HANDLER
(1)   1532   DSX$SETPRIEXV - ESTABLISH PRIMARY EXCEPTION VECTOR   [19]

```
                                1 ; DEC/CMS REPLACEMENT HISTORY, Element EXCEPT.MAR
                                2 ; *2     5-MAY-1986 11:34:56 SALEM "DONE"
                                3 ; *1     6-FEB-1986 15:18:23 DS ""
                                4 ; DEC/CMS REPLACEMENT HISTORY, Element EXCEPT.MAR
                                5         .TITLE  EXCEPT  *** EXCEPT Machine Exception handling
                                6         .IDENT  /07-34/
                                7         .NoShow Conditionals            ;                       [18]
                                8         .DSABL  GBL
                                9
                               10 ;**
                               11 ; Copyright (c) 1977, 1982, 1983, 1984, 1985
                               12 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
                               13 ;
                               14 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
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                               24 ; CORPORATION.
                               25 ;
                               26 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
                               27 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
                               28 ;--
```

```
                     30 ;++
                     31 ; FACILITY:
                     32 ;
                     33 ; ABSTRACT:
                     34 ;
                     35 ; ENVIRONMENT:
                     36 ;
                     37 ; AUTHOR:        ROGER RIGGS     15-AUG-78       VERSION 01.
                     38 ;
                     39 ; MODIFICATIONS:
                     40 ;                 Roger Riggs     07-FEB-79       VERSION 01. (EVSAA 5.00)
                     41 ;       01        Added conversion of T-bit trap in compatability mode
                     42 ;                 to compatability mode trap with code=7.
                     43 ;       02        Fixed lower limit of user stack in SEARCH routine
                     44 ;       03        Removed ISTK/KSTK Switching stuff.  Interrupts occur on
                     45 ;                 the correct stack as indicated by the SCB
                     46 ;       04        Fixed up position of carriage prior to calling CLI.
                     47 ;                 Make sure its on a new line at the left margin
                     48 ;
                     49 ;                 Roger Riggs     11-Sept-1979
                     50 ;       05        Added TST$MCHK Machine check entry point for
                     51 ;                 testing the existence of a memory location
                     52 ;
                     53 ;                 Roger Riggs     29-OCT-1979
                     54 ;       06        More cleanup and added DS$PRINTSIG, which can
                     55 ;                 be used by the program to print the signal array of an
                     56 ;                 exception
                     57 ;
                     58 ;                 Roger Riggs, 14-Feb-1980
                     59 ;       07        Added QIO to cancel Control O before printing exception info
                     60 ;
                     61 ;                 Roger Riggs, 21-Feb-1980
                     62 ;       08        Added duplicate defs for entry points to satisify internal debugger
                     63 ;                 Also added code to revert to old handler for arithmetic traps
                     64 ;                 and faults.
                     65 ;
                     66 ;                 Roger Riggs, 16-Apr-1980
                     67 ;       09        Corrected bug that reports the incorrect value in R3 during
                     68 ;                 exception call to CLI
                     69 ;
                     70 ;                 Roger Riggs, 21-Jun-1980, Version 5.5
                     71 ;       10        Changed DSX$PRINTSIG to use PRINTB for First line
                     72 ;                 and PRINTX for info lines.  Added new entry point
                     73 ;                 DSX$PRINTSIGI that uses PRINTI for all output.
                     74 ;
                     75 ;                 Dave Butenhof, 11-sep-1980, Version 6.0
                     76 ;       11        Fixed link-time truncation errors in module (change
                     77 ;                 word-relative to long-relative)
                     78 ;
                     79 ;                 Roger Riggs, 17-Sep-1980
                     80 ;       12        Added Type and VA to error typeout for translation not
                     81 ;
                     82 ;                 Dave Butenhof, 23-apr-1981, version 6.4
                     83 ;       13        Correct spelling in some messages, change to mixed case.
                     84 ;
                     85 ;       14        - Jack Stansbury, 22-Oct-1981, Version 6.-
                     86 ;                 Changed SEP Psect to CODE. Fixed truncation errors.
```

```
0000     87 ;                Also added .LIBRARY statements for $DS and $DIAG.
0000     88 ;
0000     89 ;        15      - Dave Butenhof, 16-Nov-1981, Version 6.5
0000     90 ;                Split the FIND_USERPC routine into two--one will actually
0000     91 ;                find the last user PC and return the address (FIND_USER_PC),
0000     92 ;                while the other (FIND_USERPC) will call the first, then
0000     93 ;                format and type the response.
0000     94 ;
0000     95 ;        16      - Dave Butenhof, 17-Dec-1981, Version 6.6
0000     96 ;                Correct a bug in TST$MCHK which seems to have been here all
0000     97 ;                along--it clears off machine check logout incorrectly.
0000     98 ;
0000     99 ;        17      - Dave Butenhof, 09-Mar-1982, version 6.6
0000    100 ;                Fix PRINTSIG to know about SS$_MCHECK code...new for V3a.
0000    101 ;
0000    102 ;        18      - Jack Stansbury, 23-Mar-1982, Version 6.8
0000    103 ;                Added typecoding to all the messages. Also made a few minor
0000    104 ;                enhancements (e.g., taking out the .LIST statements, changing
0000    105 ;                the text in the .SBTTL's, etc.).
0000    106 ;
0000    107 ;        19      - Richard Brown, 27-May-82, Version 6.8
0000    108 ;                Addition of routine DSX$SETPRIEXV, which is used to establish
0000    109 ;                a primary exception vector.
0000    110 ;
0000    111 ;        20      Jack Stansbury, 8-Mar-1983, Version 6.11
0000    112 ;                Took out the Find_User_PC routine and put it into the new
0000    113 ;                CallFrame.B32 module.
0000    114 ;
0000    115 ;        21      Bob Bergazzi    5-May-1983      Version 6.11
0000    116 ;                Added array single bit error interrupt (vector 064) reporting for
0000    117 ;                VENUS processor.
0000    118 ;
0000    119 ;        22      Bob Bergazzi    Feb. 3, 1984    Version 6.14
0000    120 ;                Changed FMT_EXCEPT and FMT_UNEXPINT to say ..."SCB vector"
0000    121 ;                instead of ..."vector". This makes it clearer to some people.
0000    122 ;
0000    123 ;        23      Domenic Andella 8-Mar-1984      Version 6.14
0000    124 ;                Remove ASBE handler from DSX$PRINTSIG routine to
0000    125 ;                MCHK8600 module, routine ASBE_WORK.
0000    126 ;
0000    127 ;        24      Domenic Andella 1-May-1984      Version 7.0
0000    128 ;                Include FAULTCLEAR selection macro, and push/pop
0000    129 ;                of selection code to each call to DSR$FAULT_CLEAR in
0000    130 ;                routines EXE_MCHK, and TST$MCHK. This allows cpu
0000    131 ;                and routine dependent action to occur.
0000    132 ;
0000    133 ;        25      M. Baggett      31-1-1985       Version 8.1
0000    134 ;                Added call to do pre-processing to signal/mechanism arrays
0000    135 ;                for AURORA trap/interrupt/fault/exception.
0000    136 ;
0000    137 ;        26      M. Baggett      7-MAR-1985      Version 8.1
0000    138 ;                Fixed truncation error.
0000    139 ;
0000    140 ;        27      M. Baggett      12-Mar-1985     Version 8.1
0000    141 ;                Added label for Aurora exceptions.
0000    142 ;
0000    143 ;        28      Domenic Andella 4-Apr-1985      Version 8.2
```

```
                                0000    144 ;               Mods to COND_HANDL to call
                                0000    145 ;               MP$_STOP_EVERYTHING if mp system.
                                0000    146 ;               *** have commented out this code until able
                                0000    147 ;               *** to debug.
                                0000    148 ;
                                0000    149 ;       29      Bob Bergazzi    18-Apr-1985     Version 8.2
                                0000    150 ;               Print out node # and Bus Error register for
                                0000    151 ;               SCORPIO systems on unexpected interrupts.
                                0000    152 ;
                                0000    153 ;       30      Bob Bergazzi    18-Apr-1985     Version 8.2
                                0000    154 ;               CHange CLRL DS$GB_TYPECODE to CLRB DS$GB_TYPECODE.
                                0000    155 ;               No symptom connected with this bug.
                                0000    156 ;
                                0000    157 ;       31      Bob Bergazzi    22-Apr-1985     Version 8.2
                                0000    158 ;               Fix edit 29 to check for vectors 100-1FC.
                                0000    159 ;
                                0000    160 ;       32      Ted Salem       23-April-1985   Version 8.2
                                0000    161 ;               Interlocked COND_HANDLER.
                                0000    162 ;
                                0000    163 ;       33      Bob Bergazzi    25-Apr-1985     Version 8.2
                                0000    164 ;               Clear BER for edit 29.
                                0000    165 ;
                                0000    166 ;       34      Domenic Andella 22-May-1985     Version 8.2
                                0000    167 ;               Add mods to COND_HANDLR to support multi-
                                0000    168 ;               processing. Note, mod 28 is changed as a
                                0000    169 ;               result of this mod.
                                0000    170 ;                                                               ;G:2
                                0000    171 ;       35      Ted Salem       4-May-1986      Version 10.0    ;G:2
                                0000    172 ;               Changed to check to MicroVax SID instead of     ;G:2
                                0000    173 ;               just Aurora                                     ;G:2
                                0000    174 ;--
```

```
                     0000   176          .SBTTL  Libraries, External & Equated Symbols, Macros
                     0000   177 ;
                     0000   178 ;       INCLUDE FILES:
                     0000   179 ;
                     0000   180
                     0000   181          .Library        /Sys$Library:Lib/        ;                                       [15]
                     0000   182          .Library        /$DS/                   ;                                       [14]
                     0000   183          .Library        /$Diag/                 ;                                       [14]
                     0000   184
                     0000   185 ;
                     0000   186 ; EXTERNAL SYMBOLS
                     0000   187 ;
                     0000   188
                     0000   189          .WEAK   MP$R_ACTIVE_ROUTINES,MP$R_ROUTINE_COUNT_TABLE                   ;[32]
                     0000   190          .WEAK   MP$R_ROUTINE_ID_TABLE,MP$R_GET_PROCESSOR_ID                     ;[32]
                     0000   191          .WEAK   VAX$MODIFY_EXCEPTION, FMT_BER, BI_BER_BIT                       ;[29]
                     0000   192          .WEAK   MP$GL_AP_SIGNAL_ARRAY,MP$_COND_HANDLR                           ;[34]
                     0000   193          .WEAK   MP$GR_SAVED_GPRS, MP$GL_SAVED_PSL                               ;[34]
                     0000   194
                     0000   195          .EXTRN  DSX$PRINTI,     DS_ERRSUP,      DS$ABORT,       BPTMAX
                     0000   196          .EXTRN  DS$AA_BPTADDR,  DS$GA_BREAKVEC, DS$GA_TBITVEC,  DEBUG$GB_FLAGS
                     0000   197          .EXTRN  CHR$MCHK,       DS$CLI,         COND_DEBUG,     SYS$UNWIND
                     0000   198          .EXTRN  MODELST,        APSLMNE,        DS$CVTREG,      USTKPTR
                     0000   199          .EXTRN  PCB_BASE,       DS$GL_FLAGS,    STACK_BASE,     DSX$PRINTB
                     0000   200          .EXTRN  SYS$CALL_HANDL, DSR$FAULT_CLEAR,SCRIPT$STOP,    DSX$PRINTX
                     0000   201          .EXTRN  ISTKPTR,        ESTKPTR,        SSTKPTR,        IO$M_CANCTRLO
                     0000   202          .EXTRN  IO$_WRITEVBLK,  DS$GW_TTOUT,    DS$GB_TypeCode                  ;[18
                     0000   203          .EXTRN  SCB_IMAGE,      DSR$Find_User_PC,VAX$MODIFY_EXCEPTION, EXE$GB_CPUTYP
                     0000   204          .EXTRN DS$SERVICE_DISPATCHER
                     0000   205          .EXTRN  MP$GR_BOOTED_PROCESSORS, DS$GB_PRIMARY_CPU_IDENTIFIER ;[34]
                     0000   206          .EXTRN  MP$_RESUME_ATTACHED_PROCESSORS, MP$_GET_PROCESSOR_ID  ;[34]
                     0000   207
                     0000   208 ;       EQUATED SYMBOLS:
                     0000   209 ;
                     0000   210
                     0000   211          $DS_TypeDef                             ; Define typecodes              [18]
                     0000   212          $DS_CVTREG_DEF
                     0000   213          $DS_DSDEF
                     0000   214          $PRDEF
                     0000               .SAVE   LOCAL_BLOCK
                     0000               .RESTORE
                     0000   215          $PSLDEF
                     0000               .SAVE   LOCAL_BLOCK
                     0000               .RESTORE
                     0000   216          $DS_SCBDEF
                     0000   217          $SSDEF
                     0000               .SAVE   LOCAL_BLOCK
                     0000               .PSECT  $ABS$,ABS
                00000000    0200               .=0
                     0000               .RESTORE
                     0000   218          CLIDEF
                     0000   219          CMKDEF
                     0000   220          DSFDEF
                     0000   221          APTDEF
                     0000   222          $MP_ILDEFS                              ; interlock literal defs.
                     0000   223          $DS_DSADEF
                     0000   224          $CHFDEF
```

```
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000  FE70                .=0
                        0000                .RESTORE
                        0000    225         $SSDEF
                        0000    226         $BIICDEF                                        ; BIIC DEFINITIONS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000  FE70                .=0
                        0000                .RESTORE
                        0000    227         FLTCLR_SEL
                00000001  0000    228         IS      = 1
                00000100  0000    229         BUFSIZ  = 256                                   ;
                        0000    230
```

```
                 0000          .SBTTL  Work Psect Declarations
              00000000          .PSECT  Work, NoExe, NoShr, Wrt, Long                    ;                [14]
                 0000
        00000004 0000  NEW_SP:          .BLKL   1
                 0004
        0000000C 0004  NEW_AP_FP:       .BLKQ   1
                 000C
        00000014 000C  NEW_PC_PSL:      .BLKQ   1
                 0014
        00000000 0014  ID_TEMP:         .LONG   0                                        ; Storage for cpu id
```

```
                                0018   243          .SBTTL  Data Psect Declarations
                            00000000   244          .PSECT  Data, NoExe, Shr, NoWrt, Long                    ;              [14]
                                0000   245
                                0000   246          MODNAM  EXCEPT
                  54 50 45 43 58 45 00' 0000      $MODULE:        .ASCIC  \EXCEPT\
                                06    0000
                                0007   247
                                0007   248 CTL$AQ_EXCVEC:  ; PRIMARY,SECONDARY EXCEPTION VECTORS FOR EXCEPTION HANDLERS
                   00000000'00000000' 0007   249          .ADDRESS        0,COND_DEBUG    ; KERNEL EXCEPTION HANDLER
                   00000000'00000000' 000F   250          .ADDRESS        0,COND_DEBUG    ; EXEC   EXCEPTION HANDLER
                   00000000'00000000' 0017   251          .ADDRESS        0,COND_DEBUG    ; SUPER  EXCEPTION HANDLER
                   00000000'00000000' 001F   252          .ADDRESS        0,COND_DEBUG    ; USER   EXCEPTION HANDLER
                                0027   253
                                0027   254 CTL$AL_STACK:   ; ADDRESS OF TOP OF EACH MODE STACK INDEX BY LONGWORD MODE
00000000'00000000'00000000'00000000' 0027   255          .ADDRESS        ISTKPTR,ESTKPTR,SSTKPTR,USTKPTR
```

```
                     0037   257 ;+
                     0037   258 ; These are the messages output by the exception printing routines. These do    [18]
                     0037   259 ; not need to contain typecodes since the typecode will be set explicitly by    [18]
                     0037   260 ; the routines, and the appropriate print routine will be called (rather than   [18]
                     0037   261 ; calling Print).                                                               [18]
                     0037   262 ;-
                     0037   263
                     0037   264 Msg_UMchk:      $PrintI_L       Fmt_UMchk               ;                      [17]
00000001             0037                       .LONG   $$N
00000383'            003B                       .LONG   Fmt_UMchk
                     003F   265 MSG_KRNLSTK:    $PRINTI_L       FMT_EXCEPT, T_KRNLSTK, T_ABORT, <<^X08>>
00000004             003F                       .LONG   $$N
000003BD'            0043                       .LONG   FMT_EXCEPT
00000581'            0047                       .LONG   T_KRNLSTK
000006D0'            004B                       .LONG   T_ABORT
00000008             004F                       .LONG   ^X08
                     0053   266 MSG_POWER:      $PRINTI_L       FMT_EXCEPT, T_POWER, T_INTRPT, <<^X0C>>
00000004             0053                       .LONG   $$N
000003BD'            0057                       .LONG   FMT_EXCEPT
00000598'            005B                       .LONG   T_POWER
000006D6'            005F                       .LONG   T_INTRPT
0000000C             0063                       .LONG   ^X0C
                     0067   267 MSG_OPCDEC:     $PRINTI_L       FMT_EXCEPT, T_OPCDEC, T_FAULT, <<^X10>>
00000004             0067                       .LONG   $$N
000003BD'            006B                       .LONG   FMT_EXCEPT
000005A3'            006F                       .LONG   T_OPCDEC
000006CA'            0073                       .LONG   T_FAULT
00000010             0077                       .LONG   ^X10
                     007B   268 MSG_OPCCUS:     $PRINTI_L       FMT_EXCEPT, T_OPCCUS, T_FAULT, <<^X14>>
00000004             007B                       .LONG   $$N
000003BD'            007F                       .LONG   FMT_EXCEPT
000005C3'            0083                       .LONG   T_OPCCUS
000006CA'            0087                       .LONG   T_FAULT
00000014             008B                       .LONG   ^X14
                     008F   269 MSG_ROPRAND:    $PRINTI_L       FMT_EXCEPT, T_ROPRAND, T_FLT_ABO, <<^X18>>
00000004             008F                       .LONG   $$N
000003BD'            0093                       .LONG   FMT_EXCEPT
000005E1'            0097                       .LONG   T_ROPRAND
000006E0'            009B                       .LONG   T_FLT_ABO
00000018             009F                       .LONG   ^X18
                     00A3   270 MSG_RADRMOD:    $PRINTI_L       FMT_EXCEPT, T_RADRMOD, T_FAULT, <<^X1C>>
00000004             00A3                       .LONG   $$N
000003BD'            00A7                       .LONG   FMT_EXCEPT
000005F2'            00AB                       .LONG   T_RADRMOD
000006CA'            00AF                       .LONG   T_FAULT
0000001C             00B3                       .LONG   ^X1C
                     00B7   271 MSG_ACCVIO:     $PRINTI_L       FMT_EXCEPT, T_ACCVIO, T_FAULT, <<^X20>>
00000004             00B7                       .LONG   $$N
000003BD'            00BB                       .LONG   FMT_EXCEPT
0000060B'            00BF                       .LONG   T_ACCVIO
000006CA'            00C3                       .LONG   T_FAULT
00000020             00C7                       .LONG   ^X20
                     00CB   272 MSG_TRANSL:     $PRINTI_L       FMT_EXCEPT, T_TRANSL, T_FAULT, <<^X24>>
00000004             00CB                       .LONG   $$N
000003BD'            00CF                       .LONG   FMT_EXCEPT
00000624'            00D3                       .LONG   T_TRANSL
000006CA'            00D7                       .LONG   T_FAULT
```

```
00000024  00DB                    .LONG   ^X24
          00DF   273 MSG_TBIT:    $PRINTI_L       FMT_EXCEPT, T_TBIT, T_TRAP, <<^X28>>
00000004  00DF                    .LONG   $$N
000003BD' 00E3                    .LONG   FMT_EXCEPT
0000063A' 00E7                    .LONG   T_TBIT
000006C5' 00EB                    .LONG   T_TRAP
00000028  00EF                    .LONG   ^X28
          00F3   274 MSG_BREAK:   $PRINTI_L       FMT_EXCEPT, T_BREAK, T_FAULT, <<^X2C>>
00000004  00F3                    .LONG   $$N
000003BD' 00F7                    .LONG   FMT_EXCEPT
00000640' 00FB                    .LONG   T_BREAK
000006CA' 00FF                    .LONG   T_FAULT
0000002C  0103                    .LONG   ^X2C
          0107   275 MSG_COMPAT:  $PRINTI_L       FMT_EXCEPT, T_COMPAT, T_FLT_ABO, <<^X30>>
00000004  0107                    .LONG   $$N
000003BD' 010B                    .LONG   FMT_EXCEPT
000006EC' 010F                    .LONG   T_COMPAT
000006E0' 0113                    .LONG   T_FLT_ABO
00000030  0117                    .LONG   ^X30
          011B   276 MSG_CHMK:    $PRINTI_L       FMT_EXCEPT, T_CHMK, T_TRAP, <<^X40>>
00000004  011B                    .LONG   $$N
000003BD' 011F                    .LONG   FMT_EXCEPT
0000064B' 0123                    .LONG   T_CHMK
000006C5' 0127                    .LONG   T_TRAP
00000040  012B                    .LONG   ^X40
          012F   277 MSG_CHME:    $PRINTI_L       FMT_EXCEPT, T_CHME, T_TRAP, <<^X44>>
00000004  012F                    .LONG   $$N
000003BD' 0133                    .LONG   FMT_EXCEPT
0000065E' 0137                    .LONG   T_CHME
000006C5' 013B                    .LONG   T_TRAP
00000044  013F                    .LONG   ^X44
          0143   278 MSG_CHMS:    $PRINTI_L       FMT_EXCEPT, T_CHMS, T_TRAP, <<^X48>>
00000004  0143                    .LONG   $$N
000003BD' 0147                    .LONG   FMT_EXCEPT
00000674' 014B                    .LONG   T_CHMS
000006C5' 014F                    .LONG   T_TRAP
00000048  0153                    .LONG   ^X48
          0157   279 MSG_CHMU:    $PRINTI_L       FMT_EXCEPT, T_CHMU, T_TRAP, <<^X4C>>
00000004  0157                    .LONG   $$N
000003BD' 015B                    .LONG   FMT_EXCEPT
0000068B' 015F                    .LONG   T_CHMU
000006C5' 0163                    .LONG   T_TRAP
0000004C  0167                    .LONG   ^X4C
          016B   280
```

```
                                0000018B' 016B   282 AAT_ARITH::      .ADDRESS        0$
                                0000019B' 016F   283                  .ADDRESS        1$
                                000001AC' 0173   284                  .ADDRESS        2$
                                000001C3' 0177   285                  .ADDRESS        3$
                                000001D5' 017B   286                  .ADDRESS        4$
                                000001ED' 017F   287                  .ADDRESS        5$
                                00000200' 0183   288                  .ADDRESS        6$
                                00000211' 0187   289                  .ADDRESS        7$
                                          018B   290
6E 65 70 20 50 41 52 54 20 6F 4E 00' 018B   291 0$:      .ASCIC  .No TRAP pending.              ;                    [13]
                         67 6E 69 64  0197
                                   0F  018B
65 76 6F 20 72 65 67 65 74 6E 49 00' 019B   292 1$:      .ASCIC  .Integer overflow.             ;                    [13]
                      77 6F 6C 66 72  01A7
                                   10  019B
76 69 64 20 72 65 67 65 74 6E 49 00' 01AC   293 2$:      .ASCIC  .Integer divide by zero.       ;                    [13]
   6F 72 65 7A 20 79 62 20 65 64 69  01B8
                                   16  01AC
76 6F 20 67 6E 69 74 61 6F 6C 46 00' 01C3   294 3$:      .ASCIC  .Floating overflow.            ;                    [13]
                   77 6F 6C 66 72 65  01CF
                                   11  01C3
69 64 20 67 6E 69 74 61 6F 6C 46 00' 01D5   295 4$:      .ASCIC  .Floating divide by zero.      ;                    [13]
6F 72 65 7A 20 79 62 20 65 64 69 76  01E1
                                   17  01D5
6E 75 20 67 6E 69 74 61 6F 6C 46 00' 01ED   296 5$:      .ASCIC  .Floating underflow.           ;                    [13]
                77 6F 6C 66 72 65 64  01F9
                                   12  01ED
65 76 6F 20 6C 61 6D 69 63 65 44 00' 0200   297 6$:      .ASCIC  .Decimal overflow.             ;                    [13]
                      77 6F 6C 66 72  020C
                                   10  0200
76 69 64 20 6C 61 6D 69 63 65 44 00' 0211   298 7$:      .ASCIC  .Decimal divide by zero.       ;                    [13]
   6F 72 65 7A 20 79 62 20 65 64 69  021D
                                   16  0211
```

```
                    0228   300 MSG_INTOVF:     $PRINTI_L       FMT_EXCEPT, T_INTOVF, T_TRAP, <<^X34>>
00000004  0228                                  .LONG   $$N
000003BD' 022C                                  .LONG   FMT_EXCEPT
0000071F' 0230                                  .LONG   T_INTOVF
000006C5' 0234                                  .LONG   T_TRAP
00000034  0238                                  .LONG   ^X34
                    023C   301 MSG_INTDIV:     $PRINTI_L       FMT_EXCEPT, T_INTDIV, T_TRAP, <<^X34>>
00000004  023C                                  .LONG   $$N
000003BD' 0240                                  .LONG   FMT_EXCEPT
00000730' 0244                                  .LONG   T_INTDIV
000006C5' 0248                                  .LONG   T_TRAP
00000034  024C                                  .LONG   ^X34
                    0250   302 MSG_FLTOVF:     $PRINTI_L       FMT_EXCEPT, T_FLTOVF, T_TRAP, <<^X34>>
00000004  0250                                  .LONG   $$N
000003BD' 0254                                  .LONG   FMT_EXCEPT
00000747' 0258                                  .LONG   T_FLTOVF
000006C5' 025C                                  .LONG   T_TRAP
00000034  0260                                  .LONG   ^X34
                    0264   303 MSG_FLTDIV:     $PRINTI_L       FMT_EXCEPT, T_FLTDIV, T_TRAP, <<^X34>>
00000004  0264                                  .LONG   $$N
000003BD' 0268                                  .LONG   FMT_EXCEPT
00000759' 026C                                  .LONG   T_FLTDIV
000006C5' 0270                                  .LONG   T_TRAP
00000034  0274                                  .LONG   ^X34
                    0278   304 MSG_FLTUND:     $PRINTI_L       FMT_EXCEPT, T_FLTUND, T_TRAP, <<^X34>>
00000004  0278                                  .LONG   $$N
000003BD' 027C                                  .LONG   FMT_EXCEPT
00000779' 0280                                  .LONG   T_FLTUND
000006C5' 0284                                  .LONG   T_TRAP
00000034  0288                                  .LONG   ^X34
                    028C   305 MSG_DECOVF:     $PRINTI_L       FMT_EXCEPT, T_DECOVF, T_TRAP, <<^X34>>
00000004  028C                                  .LONG   $$N
000003BD' 0290                                  .LONG   FMT_EXCEPT
0000078C' 0294                                  .LONG   T_DECOVF
000006C5' 0298                                  .LONG   T_TRAP
00000034  029C                                  .LONG   ^X34
                    02A0   306 MSG_SUBRNG:     $PRINTI_L       FMT_EXCEPT, T_SUBRNG, T_TRAP, <<^X34>>
00000004  02A0                                  .LONG   $$N
000003BD' 02A4                                  .LONG   FMT_EXCEPT
0000079D' 02A8                                  .LONG   T_SUBRNG
000006C5' 02AC                                  .LONG   T_TRAP
00000034  02B0                                  .LONG   ^X34
                    02B4   307 MSG_FLTOVF_F:   $PRINTI_L       FMT_EXCEPT, T_FLTOVF, T_FAULT, <<^X34>>
00000004  02B4                                  .LONG   $$N
000003BD' 02B8                                  .LONG   FMT_EXCEPT
00000747' 02BC                                  .LONG   T_FLTOVF
000006CA' 02C0                                  .LONG   T_FAULT
00000034  02C4                                  .LONG   ^X34
                    02C8   308 MSG_FLTDIV_F:   $PRINTI_L       FMT_EXCEPT, T_FLTDIV, T_FAULT, <<^X34>>
00000004  02C8                                  .LONG   $$N
000003BD' 02CC                                  .LONG   FMT_EXCEPT
00000759' 02D0                                  .LONG   T_FLTDIV
000006CA' 02D4                                  .LONG   T_FAULT
00000034  02D8                                  .LONG   ^X34
                    02DC   309 MSG_FLTUND_F:   $PRINTI_L       FMT_EXCEPT, T_FLTUND, T_FAULT, <<^X34>>
00000004  02DC                                  .LONG   $$N
000003BD' 02E0                                  .LONG   FMT_EXCEPT
```

```
                        00000779' 02E4          .LONG   T_FLTUND
                        000006CA' 02E8          .LONG   T_FAULT
                        00000034  02EC          .LONG   ^X34
```

```
                                00000310' 02F0   311 AAT_COMPAT:     .ADDRESS        0$              ; RESERVED OPCODE FAULT
                                00000326' 02F4   312                 .ADDRESS        1$              ; BPT FAULT
                                00000330' 02F8   313                 .ADDRESS        2$              ; IOT FAULT
                                0000033A' 02FC   314                 .ADDRESS        3$              ; EMT FAULT
                                00000344' 0300   315                 .ADDRESS        4$              ; TRAP FAULT
                                0000034F' 0304   316                 .ADDRESS        5$              ; ILLEGAL INSTRUCTION FAULT
                                00000369' 0308   317                 .ADDRESS        6$              ; ODD ADDRESS ABORT
                                0000037B' 030C   318                 .ADDRESS        7$              ; UNUSED
70 6F 20 64 65 76 72 65 73 65 52 00' 0310   319 0$:                 .ASCIC  .Reserved opcode fault. ;                       [13]
      74 6C 75 61 66 20 65 64 6F 63  031C
                                  15  0310
      74 6C 75 61 66 20 54 50 42 00' 0326   320 1$:                 .ASCIC  .BPT fault.             ;                       [13]
                                  09  0326
      74 6C 75 61 66 20 54 4F 49 00' 0330   321 2$:                 .ASCIC  .IOT fault.             ;                       [13]
                                  09  0330
      74 6C 75 61 66 20 54 4D 45 00' 033A   322 3$:                 .ASCIC  .EMT fault.             ;                       [13]
                                  09  033A
   74 6C 75 61 66 20 50 41 52 54 00' 0344   323 4$:                 .ASCIC  .TRAP fault.            ;                       [13]
                                  0A  0344
73 6E 69 20 6C 61 67 65 6C 6C 49 00' 034F   324 5$:                 .ASCIC  .Illegal instruction fault.     ;               [13]
75 61 66 20 6E 6F 69 74 63 75 72 74  035B
                                  74 6C  0367
                                  19  034F
73 73 65 72 64 64 61 20 64 64 4F 00' 0369   325 6$:                 .ASCIC  .Odd address abort.     ;                       [13]
                  74 72 6F 62 61 20  0375
                                  11  0369
            6E 77 6F 6E 6B 6E 55 00' 037B   326 7$:                 .ASCIC  .Unknown.               ;                       [13]
                                  07  037B
```

```
61 6D 20 53 4D 56 20 3F 3F 2F 21 00' 0383   328 Fmt_UMchk:       .AsciC  '!/?? VMS machine check (hardware' -    ;                [17]
20 6B 63 65 68 63 20 65 6E 69 68 63  038F
6F 6C 20 65 72 61 77 64 72 61 68 28  039B
61 76 61 20 74 6F 6E 20 74 75 6F 67  03A7
       2F 21 3A 29 65 6C 62 61 6C 69  03B3
                                 39  0383
                                     03BD   329                             ' logout not available):!/'              ;                [17]
41 21 20 43 41 21 20 3F 3F 2F 21 00' 03BD   330 FMT_EXCEPT:      .ASCIC  '!/?? !AC !AC through SCB vector: !XB(X)!/'     ;        [22]
43 53 20 68 67 75 6F 72 68 74 20 43  03C9
58 21 20 3A 72 6F 74 63 65 76 20 42  03D5
                 2F 21 29 58 28 42  03E1
                                 29  03BD
65 70 78 65 6E 55 20 3F 3F 2F 21 00' 03E7   331 FMT_UNEXPINT:    .ASCIC  '!/?? Unexpected trap or interrupt thru SCB vector !XW!/' ;[
72 6F 20 70 61 72 74 20 64 65 74 63  03F3
74 20 74 70 75 72 72 65 74 6E 69 20  03FF
74 63 65 76 20 42 43 53 20 75 72 68  040B
           2F 21 57 58 21 20 72 6F  0417
                                 37  03E7
65 70 78 65 6E 55 20 3F 3F 2F 21 00' 041F   332 FMT_BI_UNEXPINT: .ASCIC '!/?? Unexpected trap or interrupt thru SCB vector !XW from
72 6F 20 70 61 72 74 20 64 65 74 63  042B
74 20 74 70 75 72 72 65 74 6E 69 20  0437
74 63 65 76 20 42 43 53 20 75 72 68  0443
20 6D 6F 72 66 20 57 58 21 20 72 6F  044F
       2F 21 42 58 21 20 65 64 6F 6E  045B
                                 45  041F
72 6F 72 72 65 20 74 61 20 43 50 00' 0465   333 FMT_ERRPC:       .ASCIC  'PC at error:!_!_!XL(X)!/'               ;                [13]
21 29 58 28 4C 58 21 5F 21 5F 21 3A  0471
                                 2F  047D
                                 18  0465
6E 72 75 74 65 72 20 72 65 73 55 00' 047E   334 FMT_USRPC:       .ASCIC  'User return PC:!_!_!XL(X)!/'            ;                [13]
28 4C 58 21 5F 21 5F 21 3A 43 50 20  048A
                       2F 21 29 58  0496
                                 1B  047E
6E 72 75 74 65 72 20 72 65 73 55 00' 049A   335 Fmt_User_PC_NF: .Ascic  'User return PC: none found!!!/'          ;                [20]
6F 66 20 65 6E 6F 6E 20 3A 43 50 20  04A6
              2F 21 21 21 64 6E 75  04B2
                                 1E  049A
6F 72 72 65 20 74 61 20 4C 53 50 00' 04B9   336 FMT_ERRPSL:      .ASCIC  'PSL at error:!_!_!XL(X)!_; !AC!/'       ;                [13]
29 58 28 4C 58 21 5F 21 5F 21 3A 72  04C5
           2F 21 43 41 21 20 3B 5F 21  04D1
                                 20  04B9
64 64 61 20 6C 61 75 74 72 69 56 00' 04DA   337 FMT_VIRT:        .ASCIC  'Virtual address:!_!XL(X)!/Fault type:!_!_!XL(X)!/' ;    [13]
58 28 4C 58 21 5F 21 3A 73 73 65 72  04E6
70 79 74 20 74 6C 75 61 46 2F 21 29  04F2
29 58 28 4C 58 21 5F 21 5F 21 3A 65  04FE
                                 2F 21  050A
                                 31  04DA
63 20 43 41 21 20 43 41 21 5F 21 00' 050C   338 FMT_EXCEP_CODE: .ASCIC  '!_!AC !AC code:!_!AC!/'                 ;                [13]
   2F 21 43 41 21 5F 21 3A 65 64 6F  0518
                                 16  050C
21 5F 21 5F 21 5F 21 3A 67 72 41 00' 0523   339 FMT_CHMX_ARG:    .ASCIC  'Arg:!_!_!_!XL(X)!/'                     ;                [13]
              2F 21 29 58 28 4C 58  052F
                                 12  0523
20 6E 77 6F 6E 6B 6E 55 20 3F 3F 00' 0536   340 FMT_UNK_ARG:     .ASCIC  '?? Unknown exception/condition:!/'       ;                [13]
6F 63 2F 6E 6F 69 74 70 65 63 78 65  0542
       2F 21 3A 6E 6F 69 74 69 64 6E  054E
                                 21  0536
```

```
21 5F 21 5F 21 3A 74 6E 75 6F 43 00' 0558    341 FMT_UNK_CNT:    .ASCIC  'Count:!_!_!_!XL(X)!/'                ;              [13]
         2F 21 29 58 28 4C 58 21 5F   0564
                                 14   0558
5F 21 5F 21 5F 21 3A 4C 55 21 50 00' 056D    342 FMT_PXXX:       .ASCIC  'P!UL:!_!_!_!XL(X)!/'
            2F 21 29 58 28 4C 58 21   0579
                                 13   056D
```

```
63 61 74 73 20 4C 45 4E 52 45 4B 00' 0581    344 T_KRNLSTK:      .ASCIC  'KERNEL stack not valid'        ;                    [13]
   64 69 6C 61 76 20 74 6F 6E 20 6B  058D
                                  16  0581
   6C 69 61 66 20 72 65 77 6F 50 00' 0598    345 T_POWER:        .ASCIC  'Power fail'            ;                    [13]
                                  0A  0598
72 70 2F 64 65 76 72 65 73 65 52 00' 05A3    346 T_OPCDEC:       .ASCIC  'Reserved/privileged instruction'       ;    [13]
73 6E 69 20 64 65 67 65 6C 69 76 69  05AF
            6E 6F 69 74 63 75 72 74  05BB
                                  1F  05A3
65 72 20 72 65 6D 6F 74 73 75 43 00' 05C3    347 T_OPCCUS:       .ASCIC  'Customer reserved instruction' ;            [13]
72 74 73 6E 69 20 64 65 76 72 65 73  05CF
               6E 6F 69 74 63 75 72  05DB
                                  1D  05C3
70 6F 20 64 65 76 72 65 73 65 52 00' 05E1    348 T_ROPRAND:      .ASCIC  'Reserved operand'      ;                    [13]
                  64 6E 61 72 65 00  05ED
                                  10  05E1
64 61 20 64 65 76 72 65 73 65 52 00' 05F2    349 T_RADRMOD:      .ASCIC  'Reserved addressing mode'      ;            [13]
64 6F 6D 20 67 6E 69 73 73 65 72 64  05FE
                                  65  060A
                                  18  05F2
74 6E 6F 63 20 73 73 65 63 63 41 00' 060B    350 T_ACCVIO:       .ASCIC  'Access control violation'      ;            [13]
6F 69 74 61 6C 6F 69 76 20 6C 6F 72  0617
                                  6E  0623
                                  18  060B
6E 6F 69 74 61 6C 73 6E 61 72 54 00' 0624    351 T_TRANSL:       .ASCIC  'Translation not valid' ;                    [13]
      64 69 6C 61 76 20 74 6F 6E 20  0630
                                  15  0624
               65 63 61 72 54 00' 063A    352 T_TBIT:         .ASCIC  'Trace'                 ;                    [13]
                                  05  063A
   74 6E 69 6F 70 6B 61 65 72 42 00' 0640    353 T_BREAK:        .ASCIC  'Breakpoint'            ;                    [13]
                                  0A  0640
65 64 6F 6D 20 65 67 6E 61 68 43 00' 064B    354 T_CHMK:         .ASCIC  'Change mode KERNEL'    ;                    [13]
               4C 45 4E 52 45 4B 20  0657
                                  12  064B
65 64 6F 6D 20 65 67 6E 61 68 43 00' 065E    355 T_CHME:         .ASCIC  'Change mode EXECUTIVE' ;                    [13]
      45 56 49 54 55 43 45 58 45 20  066A
                                  15  065E
65 64 6F 6D 20 65 67 6E 61 68 43 00' 0674    356 T_CHMS:         .ASCIC  'Change mode SUPERVISOR'        ;            [13]
   52 4F 53 49 56 52 45 50 55 53 20  0680
                                  16  0674
65 64 6F 6D 20 65 67 6E 61 68 43 00' 068B    357 T_CHMU:         .ASCIC  'Change mode USER'      ;                    [13]
               52 45 53 55 20  0697
                                  10  068B
20 64 65 74 63 65 70 78 65 6E 55 00' 069C    358 T_XCHFAILURE:   .ASCIC  'Unexpected status from condition handler'      ;  [13]
20 6D 6F 72 66 20 73 75 74 61 74 73  06A8
61 68 20 6E 6F 69 74 69 64 6E 6F 63  06B4
               72 65 6C 64 6E 00  06C0
                                  28  069C
               70 61 72 54 00' 06C5    359 T_TRAP:         .ASCIC  'Trap'                  ;                    [13]
                                  04  06C5
            74 6C 75 61 46 00' 06CA    360 T_FAULT:        .ASCIC  'Fault'                 ;                    [13]
                                  05  06CA
            74 72 6F 62 41 00' 06D0    361 T_ABORT:        .ASCIC  'Abort'                 ;                    [13]
                                  05  06D0
      74 70 75 72 72 65 74 6E 49 00' 06D6    362 T_INTRPT:       .ASCIC  'Interrupt'             ;                    [13]
                                  09  06D6
74 72 6F 62 61 2F 74 6C 75 61 46 00' 06E0    363 T_FLT_ABO:      .ASCIC  'Fault/abort'           ;                    [13]
```

```
                                                  0B  06E0
69 6C 69 62 61 74 61 70 6D 6F 43  00' 06EC    364 T_COMPAT:       .ASCIC  'Compatability mode'    ;                          [13]
                  65 64 6F 6D 20 79 74  06F8
                                        12  06EC
74 73 20 73 75 6F 69 76 65 72 50  00' 06FF    365 T_STKVIO:       .ASCIC  'Previous stack access violation'       ;          [13]
76 20 73 73 65 63 63 61 20 6B 63  61  070B
                  6E 6F 69 74 61 6C 6F 69  0717
                                        1F  06FF
65 76 6F 20 72 65 67 65 74 6E 49  00' 071F    366 T_INTOVF:       .ASCIC  'Integer overflow'      ;                          [13]
                        77 6F 6C 66 72  072B
                                        10  071F
76 69 64 20 72 65 67 65 74 6E 49  00' 0730    367 T_INTDIV:       .ASCIC  'Integer divide by zero'        ;                  [13]
   6F 72 65 7A 20 79 62 20 65 64  69  073C
                                        16  0730
76 6F 20 67 6E 69 74 61 6F 6C 46  00' 0747    368 T_FLTOVF:       .ASCIC  'Floating overflow'     ;                          [13]
                     77 6F 6C 66 72 65  0753
                                        11  0747
65 64 2F 67 6E 69 74 61 6F 6C 46  00' 0759    369 T_FLTDIV:       .ASCIC  'Floating/decimal divide by zero'       ;          [13]
65 64 69 76 69 64 20 6C 61 6D 69  63  0765
                  6F 72 65 7A 20 79 62 20  0771
                                        1F  0759
6E 75 20 67 6E 69 74 61 6F 6C 46  00' 0779    370 T_FLTUND:       .ASCIC  'Floating underflow'    ;                          [13]
                     77 6F 6C 66 72 65 64  0785
                                        12  0779
65 76 6F 20 6C 61 6D 69 63 65 44  00' 078C    371 T_DECOVF:       .ASCIC  'Decimal overflow'      ;                          [13]
                        77 6F 6C 66 72  0798
                                        10  078C
72 20 74 70 69 72 63 73 62 75 53  00' 079D    372 T_SUBRNG:       .ASCIC  'Subscript range'       ;                          [13]
                           65 67 6E 61  07A9
                                        0F  079D
```

```
                     07AD   374          .SBTTL  COND_HANDLR ROUTINE - HANDLE UNWANTED EXCEPTIONS
                 00000000   375          .PSECT  CODE, EXE, SHR, NOWRT, LONG
                     0000   376 ;++
                     0000   377 ; FUNCTIONAL DESCRIPTION:
                     0000   378 ;
                     0000   379 ;       This routine handles all exceptions not wanted by other handlers.
                     0000   380 ;       It could be considered a last chance exception handler and is setup
                     0000   381 ;       as such in user mode.
                     0000   382 ;
                     0000   383 ; CALLING SEQUENCE:
                     0000   384 ;
                     0000   385 ;       PROCEEDURE CALL
                     0000   386 ;
                     0000   387 ; INPUT PARAMETERS:
                     0000   388 ;
                     0000   389 ;       STANDARD MECHANISM AND SIGNAL ARRAY ARGS
                     0000   390 ;
                     0000   391 ; IMPLICIT INPUTS:
                     0000   392 ;
                     0000   393 ;       NONE
                     0000   394 ;
                     0000   395 ; OUTPUT PARAMETERS:
                     0000   396 ;
                     0000   397 ;       NONE
                     0000   398 ;
                     0000   399 ; IMPLICIT OUTPUTS:
                     0000   400 ;
                     0000   401 ;       NONE
                     0000   402 ;
                     0000   403 ; COMPLETION CODES:
                     0000   404 ;
                     0000   405 ;       SS$_CONTINUE -or-
                     0000   406 ;       SS$_RESIGNAL
                     0000   407 ;
                     0000   408 ; SIDE EFFECTS:
                     0000   409 ;
                     0000   410 ;       NONE
                     0000   411 ;--
```

```
                     000C  0000   413 .ENTRY  COND_HANDLR,^M<R2,R3>           ; Entry point to handle exceptions
                           0002   414         $MP_SET_INTERLOCK  #MP$V_IL_CNHN ; Interlock routine                    [32]
                       06   DD  0002                 PUSHL   #MP$V_IL_CNHN
                       08   DD  0004                 PUSHL   #$SRVCODE_SET_INTERLOCK
          00000000'9F  02   FB  0006                 CALLS   #2, a#DS$SERVICE_DISPATCHER
                           000D   415
               00000000'EF  D5  000D   416         TSTL    MP$GR_BOOTED_PROCESSORS ; Are we an mp system?          [34]
                         0E  13  0013   417         BEQL    3$                      ; Not mp, therefore branch      [34]
        00000000'EF   04 BC  DE  0015   418         MOVAL   a4(AP),MP$GL_AP_SIGNAL_ARRAY    ; Store address of Ap's signal array
               00000000'EF  16  001D   419         JSB     MP$_COND_HANDLR                 ; Go to mp handler      [34]
                           0023   420                                                 ; Note Ap will not RSB [34]
                           0023   421
                           0023   422 3$:      $QIO_S  FUNC=#IO$_WRITEVBLK!IO$M_CANCTRLO, -
                           0023   423                 CHAN=DS$GW_TTOUT        ; Cancel Control-O
                       7E  7C  0023                 CLRQ    -(SP)
                       7E  7C  0025                 CLRQ    -(SP)
                       00  DD  0027                 PUSHL   #0
                       00  DD  0029                 PUSHL   #0
                       7E  7C  002B                 CLRQ    -(SP)
                       00  DD  002D                 PUSHL   #0
             7E   0000'8F  3C  002F                 MOVZWL  #IO$_WRITEVBLK!IO$M_CANCTRLO,-(SP)
          7E   00000000'EF  3C  0034                 MOVZWL  DS$GW_TTOUT,-(SP)
                       00  DD  003B                 PUSHL   #0
          00000000'GF  0C   FB  003D                 CALLS   #12,G^SYS$QIO
        0000015A'EF   04 BC  FA  0044   424         CALLG   a4(AP),DSX$PRINTSIGI    ; Format signal array
                     03 50   E8  004C   425         BLBS    R0,COND_HANDLR_CLI      ; Branch if known condition
                           004F   426
                     00D4  31  004F   427         BRW     COND_HANDLR_EXIT        ; Jump to clear interlock and exit      [32]
                           0052   428
                           0052   429 COND_HANDLR_CLI:
                           0052   430         Br_If_User      5$                  ; Branch if in user mode                [18]
        0000FE00'EF   1C  E0  0052                 BBS     #DSA$V_User, -              ; If bit set, branch            [28]
                       07       0059                   L^DSA$GL_Flags, 5$          ;                               [28]
        0000FE40'EF   0B  D0  005A   431         MOVL    #APM$_EXCEPT, -         ; Tell APT about the error
                           0061   432                   DSA$GL_MSGTYP
                           0061   433
        00000000'EF   0C  90  0061   434 5$:     MovB    #DS$K_Type_Exception, - ; Set typecode                  [18]
                           0068   435                   L^DS$GB_TypeCode        ;                               [18]
            04A0'CF   6C  FA  0068   436         CALLG   (AP),W^FIND_USERPC      ; Locate and print PC<10000
             00000000'EF  94  006D   437         ClrB    L^DS$GB_TypeCode        ; Clear typecode                [30]
                           0073   438
                           0073   439 ;+
                           0073   440 ; INFORMATION ABOUT THE UNEXPECTED CONDITION HAS BEEN PRINTED.
                           0073   441 ; CALL CLI TO ALLOW THE OPERATOR TO EXAMINE THE SITUATION.
                           0073   442 ; DETERMINE THE STACK POINTER AT THE TIME OF THE INTERRUPT
                           0073   443 ;-
                           0073   444
              50   04 BC  DE  0073   445         MOVAL   a4(AP),R0               ; ADDRESS OF SIGNAL ARRAY
                 51   60  D0  0077   446         MOVL    (R0),R1                 ; GET COUNT OF ARGS
              50   FC A041  DE  007A   447         MOVAL   -4(R0)[R1],R0           ; POINT AT PC/PSL PAIR
                53   08 A0  DE  007F   448         MOVAL   8(R0),R3                ; Stack pointer before exception
             22 04 A0   1A  E0  0083   449         BBS     #PSL$V_IS,4(R0), 10$    ; IF IS WAS SET THAT WAS CORRECT
                           0088   450         Br_If_User      10$                 ; Branch if in user mode                [18]
        0000FE00'EF   1C  E0  0088                 BBS     #DSA$V_User, -              ; If bit set, branch            [28]
                       1A       008F                   L^DSA$GL_Flags, 10$         ;                               [28]
                           0090   451
    51   04 A0   02   18  EF  0090   452         EXTZV   #PSL$V_CURMOD, #PSL$S_CURMOD, -
```

```
                                0096   453                      4(R0),R1                        ; GET PREVIOUS MODE
                          52    DC   0096   454          MOVPSL  R2                              ; Get current PSL
                    52    02    18   ED   0098   455          CMPZV   #PSL$V_CURMOD,#PSL$S_CURMOD, -
                          51         009C   456                    R2,R1                         ; Same mode as previous?
                          0B    13   009D   457          BEQL    10$                             ; Use stack pointer in R3 if so
               53   00000000'EF41    D0   009F   458          MOVL    PCB_BASE[R1],R3               ; Get SP from PCB
                          53    51   DB   00A7   459          MFPR    R1,R3                         ; Get implementation dependent SP
                                00AA   460
                          7E    60   7D   00AA   461 10$:     MOVQ    (R0),-(SP)                    ; STACK PC/PSL
                          08    BB   00AD   462          PUSHR   #^M<R3>                       ; Push exception SP
                    7E    08    AD   7D   00AF   463          MOVQ    8(FP),-(SP)                   ; PUSH AP/FP
                    0FF0  8F    BB   00B3   464          PUSHR   #^M<R4,R5,R6,R7,R8,R9,R10,R11>; SAVE R4-R11
                    7E    14    AD   7D   00B7   465          MOVQ    20(FP),-(SP)                  ; Push R2 and R3
                    50    08    BC   DE   00BB   466          MOVAL   @8(AP),R0                     ; POINT TO MECHANISM ARGS
                    7E    0C    A0   7D   00BF   467          MOVQ    12(R0),-(SP)                  ; SAVE R0-R1
                                00C3   468
                                00C3   469          Set_CmdFlg                            ; Set command mode                      [18]
          00000000'EF   07    E2   00C3              BBSS    #DS$V_CmdFlg, -               ; Branch if CMDFLG bit is set to        [29]
                          00         00CA                     L^DS$GL_Flags, 30000$ ; ...                                   [29]
                                00CB         30000$:                                     ; ... here. Set bit regardless.         [29]
                                00CB   470          Set_Except                            ; Set Exception bit                     [18]
          00000000'EF   13    E2   00CB              BBSS    #DS$V_Except, -               ; Branch if EXCEPT bit is set to        [29]
                          00         00D2                     L^DS$GL_Flags, 30001$ ; ...                                   [29]
                                00D3         30001$:                                     ; ... here. Set bit regardless.         [29]
                                00D3   471
          0000FE40'EF   01    D0   00D3   472          MOVL    #APM$_SYSERR, -
                                00DA   473                    L^DS$A$GL_MSGTYP              ; Inform APT of error
               00000000'EF    16   00DA   474          JSB     SCRIPT$STOP                   ; GET OUT OF SCRIPT MODE
                                00E0   475
          00000000'EF   6E    FA   00E0   476 15$:     CALLG   (SP),L^DS$CLI                 ; PAUSE FOR OPERATOR                    [14]
                                00E7   477
               00000000'EF    D5   00E7   478          TSTL    MP$GR_BOOTED_PROCESSORS       ; Are we an mp system?                  [34]
                          07    13   00ED   479          BEQL    17$                           ; Not mp, therefore branch              [34]
          00000000'EF   00    FB   00EF   480          CALLS   #0,MP$_RESUME_ATTACHED_PROCESSORS ; Call mp code                   [34]
                                00F6   481
                    50    04    AC   7D   00F6   482 17$:     MOVQ    4(AP),R0                      ; POINT TO SIGNAL/MECHANISM ARRAY       [34]
                    0C    A1    8E   7D   00FA   483          MOVQ    (SP)+,12(R1)                  ; PUT MODIFIED R0/R1 BACK IN MECHANISM
                          0FFC  8F   BA   00FE   484          POPR    #^XFFC                        ; RESTORE R2-R11
                                0102   485
          00000004'EF   8E    7D   0102   486          MOVQ    (SP)+,L^NEW_AP_FP             ; AP - FP                               [14]
          00000000'EF   8E    D0   0109   487          MOVL    (SP)+,L^NEW_SP                ; PUT SP, PC, PSL                       [14]
          0000000C'EF   8E    7D   0110   488          MOVQ    (SP)+,L^NEW_PC_PSL            ; IN A SAFE PLACE                       [14]
                    51    60    D0   0117   489          MOVL    (R0),R1                       ; SIGNAL ARRAY SIZE
                          6041  DC   011A   490          MOVPSL  (R0)[R1]                      ; REPLACE ORIGINAL PSL WITH CURRENT
                FC A041   32'AF   DE   011D   491          MOVAL   @B^EXCPT,-4(R0)[R1]           ; LOCAL PC REPLACES ORIGINAL
                    50    01    D0   0123   492          MOVL    #SS$_CONTINUE,R0              ; INDICATE SUCCESS
                                0126   493
                                0126   494 COND_HANDLR_EXIT:
                                0126   495          $MP_CLEAR_INTERLOCK  #MP$V_IL_CNHN ; Clear Interlock                          [32]
                          06    DD   0126                    PUSHL   #MP$V_IL_CNHN
                          09    DD   0128                    PUSHL   #$SRVCODE_CLEAR_INTERLOCK
          00000000'9F   02    FB   012A                    CALLS   #2, @#DS$SERVICE_DISPATCHER
                                0131   496
                          04    0131   497          RET                                   ; RETURN TO DISPATCHER
                                0132   498
          5C  00000004'EF   7D   0132   499 EXCPT:  MOVQ    L^NEW_AP_FP,AP                ; SET AP AND FP                         [14]
          5E  00000000'EF   D0   0139   500          MOVL    L^NEW_SP,SP                   ; SWITCH "SP'S"                         [14]
```

```
                7E   0000000C'EF   7D  0140   501          MOVQ    L^NEW_PC_PSL,-(SP)      ; SETUP FOR REI  PC/PSL PAIR          [14]
                                    02  0147   502          REI                             ; RETURN TO PROGRAM CAUSING EXCEPTION
```

```
                     0148    504          .SBTTL  DSX$PrintSig Routine - Format Signal Array
                     0148    505 ;++
                     0148    506 ; FUNCTIONAL DESCRIPTION:
                     0148    507 ;
                     0148    508 ;       This routine can be called to format the signal array
                     0148    509 ;       created by the condition/exception handler.
                     0148    510 ;
                     0148    511 ; CALLING SEQUENCE:
                     0148    512 ;
                     0148    513 ;       DSX$PRINTSIG(signal_array)      Print using DS$PRINTB/DS$PRINTX
                     0148    514 ;       DSX$PRINTSIGI(signal_array)     Print using DS$PRINTI
                     0148    515 ;
                     0148    516 ; INPUT PARAMETERS:
                     0148    517 ;
                     0148    518 ;       AP -> Signal array, Specific contents dependent on the condition
                     0148    519 ;
                     0148    520 ; IMPLICIT INPUTS:
                     0148    521 ;
                     0148    522 ;       NONE
                     0148    523 ;
                     0148    524 ; OUTPUT PARAMETERS:
                     0148    525 ;
                     0148    526 ;       NONE
                     0148    527 ;
                     0148    528 ; IMPLICIT OUTPUTS:
                     0148    529 ;
                     0148    530 ;       NONE
                     0148    531 ;
                     0148    532 ; SIDE EFFECTS:
                     0148    533 ;
                     0148    534 ;       An error message is typed
                     0148    535 ;
                     0148    536 ; REGISTER USAGE:
                     0148    537 ;
                     0148    538 ;       R5      Print routine for message header
                     0148    539 ;       R6      Print routine for information text
                     0148    540 ;
                     0148    541 ; COMPLETION CODES:
                     0148    542 ;
                     0148    543 ;       SS$_NORMAL      If condition recoginzed
                     0148    544 ;       SS$_RESIGNAL    If condition unknown
                     0148    545 ;--
                     0148    546
                     0148    547          $OFFSET 0,NEGATIVE, < -
                     0148    548                  <BUFFER,BUFSIZ> -       ; Length of buffer for conversion
                     0148    549                  <LOCAL,0>>              ; Length of local storage
                     0148                 .SAVE   LOCAL_BLOCK
                     0148                 .PSECT $ABS$ ABS
00000000  FE70                            .=0
FFFFFF00  0000                            .BLKB   -BUFSIZ
          FF00       BUFFER:
          FF00       LOCAL:
00000148                                  .RESTORE
```

```
                     006C  0148    551 .ENTRY  DSX$PRINTSIG,^M<R2,R3,R5,R6>    ; Save registers
55   00000000'9F       9E  014A    552         MOVAB   a#DSX$PRINTB,R5         ; Use PRINTB for first message
56   00000000'9F       9E  0151    553         MOVAB   a#DSX$PRINTX,R6         ; Use PRINTX for information message
                 0C    11  0158    554         BRB     COMMON                  ; Join common code
                           015A    555
                     006C  015A    556 .ENTRY  DSX$PRINTSIGI,^M<R2,R3,R5,R6>; Save registers
55   00000000'9F       9E  015C    557         MOVAB   a#DSX$PRINTI,R5         ; Use PRINTI for first message
        56   65       9E  0163    558         MOVAB   (R5),R6                 ; Use PRINTI for information message
                           0166    559
                           0166    560 COMMON:
00000000'EF   0B       90  0166    561         MovB    #DS$K_Type_Exception_Head, - ; Set typecode                    [18]
                           016D    562                   L^DS$GB_TypeCode      ;                                      [18]
                           016D    563
   5E    FF00 CD       9E  016D    564         MOVAB   LOCAL(FP),SP            ; Allocate space for local storage
 50    04 AC   08       C7  0172    565         DIVL3   #8,4(AP),R0             ; Get index from condition code
                           0177    566
     00000433'EF       9F  0177    567         PUSHAB  L^PRINT_PC_PSL          ; Fake JSB to handler:                 [18]
                           017D    568                                         ; ... set return address to print PC/PSL[14]
                           017D    569         CASE    R0,LIMIT=#SS$_BREAKa-3,TYPE=L,DISPLIST=<-
                           017D    570                   X_BREAK, -            ; SS$_BREAK
                           017D    571                   X_CHMS, -             ; SS$_CHMS
                           017D    572                   X_CHMU, -             ; SS$_CHMU
                           017D    573                   X_COMPAT, -           ; SS$_COMPAT
                           017D    574                   X_OPCCUS, -           ; SS$_OPCCUS
                           017D    575                   X_OPCDEC, -           ; SS$_OPCDEC
                           017D    576                   RESIGNAL, -           ; SS$_PAGRDERR, not handled
                           017D    577                   X_RADRMOD, -          ; SS$_RADRMOD
                           017D    578                   X_ROPRAND, -          ; SS$_ROPRAND
                           017D    579                   RESIGNAL, -           ; SS$_FAIL, not handled
                           017D    580                   X_TBIT, -             ; SS$_TBIT
                           017D    581                   RESIGNAL, -           ; SS$_DEBUG, not handled
                           017D    582                   RESIGNAL, -           ; SS$_ARTRES, not handled
                           017D    583                   X_INTOVF, -           ; SS$_INTOVF
                           017D    584                   X_INTDIV, -           ; SS$_INTDIV
                           017D    585                   X_FLTOVF, -           ; SS$_FLTOVF
                           017D    586                   X_FLTDIV, -           ; SS$_FLTDIV
                           017D    587                   X_FLTUND, -           ; SS$_FLTUND
                           017D    588                   X_DECOVF, -           ; SS$_DECOVF
                           017D    589                   X_SUBRNG, -           ; SS$_SUBRNG
                           017D    590                   X_FLTOVF_F, -         ; SS$_?????? Floating overflow fault
                           017D    591                   X_FLTDIV_F, -         ; SS$_?????? Floating divide fault
                           017D    592                   X_FLTUND_F -          ; SS$_?????? Floating underflow fault
                           017D    593                   >
16'  00000082 8F   50   CF  017D                CASEL   R0,#SS$_BREAKa-3,S^#<<30003$-30002$>/2>-1
                           0185            30002$:
                     01C8' 0185                .SIGNED_WORD    X_BREAK-30002$
                     01D0' 0187                .SIGNED_WORD    X_CHMS-30002$
                     01D8' 0189                .SIGNED_WORD    X_CHMU-30002$
                     01E0' 018B                .SIGNED_WORD    X_COMPAT-30002$
                     020A' 018D                .SIGNED_WORD    X_OPCCUS-30002$
                     0212' 018F                .SIGNED_WORD    X_OPCDEC-30002$
                     030F' 0191                .SIGNED_WORD    RESIGNAL-30002$
                     021A' 0193                .SIGNED_WORD    X_RADRMOD-30002$
                     0222' 0195                .SIGNED_WORD    X_ROPRAND-30002$
                     030F' 0197                .SIGNED_WORD    RESIGNAL-30002$
                     022A' 0199                .SIGNED_WORD    X_TBIT-30002$
                     030F' 019B                .SIGNED_WORD    RESIGNAL-30002$
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                    030F' 019D                .SIGNED_WORD    RESIGNAL-30002$
                    0232' 019F                .SIGNED_WORD    X_INTOVF-30002$
                    023A' 01A1                .SIGNED_WORD    X_INTDIV-30002$
                    0242' 01A3                .SIGNED_WORD    X_FLTOVF-30002$
                    024A' 01A5                .SIGNED_WORD    X_FLTDIV-30002$
                    0252' 01A7                .SIGNED_WORD    X_FLTUND-30002$
                    025A' 01A9                .SIGNED_WORD    X_DECOVF-30002$
                    0262' 01AB                .SIGNED_WORD    X_SUBRNG-30002$
                    026A' 01AD                .SIGNED_WORD    X_FLTOVF_F-30002$
                    0272' 01AF                .SIGNED_WORD    X_FLTDIV_F-30002$
                    027A' 01B1                .SIGNED_WORD    X_FLTUND_F-30002$
                          01B3        30003$:
                          01B3   594
          04 AC   0C   B1 01B3   595          CMPW    #SS$_ACCVIO,4(AP)       ; Access violation?
                  0A   12 01B7   596          BNEQ    200$                    ; Branch if not
     65   000000B7'EF  FA 01B9   597          CALLG   L^MSG_ACCVIO,(R5)       ; Print header                          [14]
                0244   31 01C0   598          BRW     PRINT_TYPE_VA           ; Format access type and address
                          01C3   599
  04 AC   000002BC 8F  D1 01C3   600 200$:    CmpL    #SS$_MCHECK, 4(Ap)      ; User mode machine check?              [17]
                  08   12 01CB   601          BNeq    205$                    ; Branch if not                         [17]
     65   00000037'EF  FA 01CD   602          CallG   L^Msg_UMChk, (R5)       ; Print header                          [17]
                      05 01D4   603          Rsb                             ; Print PC/PSL                          [17]
                          01D5   604
  04 AC   00660088 8F  D1 01D5   605 205$:    CMPL    #DS$_MCHK,4(AP)         ; Standalone Machine check?             [17]
                  0E   12 01DD   606          BNEQ    210$                    ; Branch if not
            0060 8F    BB 01DF   607          PUSHR   #^M<R5,R6>              ; Use Separate print routines for hdr/txt
                  5C   DD 01E3   608          PUSHL   AP                      ; Address of signal array
     00000000'EF  03   FB 01E5   609          CALLS   #3,CHR$MCHK             ; Format Machine check information
                      05 01EC   610          RSB                             ; All done
                          01ED   611
  04 AC   00660090 8F  D1 01ED   612 210$:    CMPL    #DS$_KRNLSTK,4(AP)      ; Kernel stack not valid?
                  08   12 01F5   613          BNEQ    220$                    ; Branch if not
     65   0000003F'EF  FA 01F7   614          CALLG   L^MSG_KRNLSTK,(R5)      ; Print header                          [14]
                      05 01FE   615          RSB                             ; All done
                          01FF   616
  04 AC   006600A0 8F  D1 01FF   617 220$:    CMPL    #DS$_TRANSL,4(AP)       ; Translation not valid?
                  0A   12 0207   618          BNEQ    240$                    ; Branch if not                         [23]
     65   000000CB'EF  FA 0209   619          CALLG   L^MSG_TRANSL,(R5)       ; Print header                          [14]
                01F4   31 0210   620          BRW     PRINT_TYPE_VA           ; Format access type and address
                          0213   621
  04 AC   006600A8 8F  D1 0213   622 240$:    CMPL    #DS$_CHME,4(AP)         ; Change mode to EXEC?
                  09   12 021B   623          BNEQ    250$                    ; Branch if not
     65   0000012F'EF  FA 021D   624          CALLG   L^MSG_CHME,(R5)         ; Print header                          [14]
                  11   11 0224   625          BRB     255$                    ; Branch to print argument
                          0226   626
  04 AC   006600E0 8F  D1 0226   627 250$:    CMPL    #DS$_CHMK,4(AP)         ; Change mode to KERNEL?
                  0A   12 022E   628          BNEQ    260$                    ; Branch if not
     65   0000011B'EF  FA 0230   629          CALLG   L^MSG_CHMK,(R5)         ; Print header                          [14]
                01E4   31 0237   630 255$:    BRW     PRINT_CHMX_ARG          ; Print argument
                          023A   631
  04 AC   006600D8 8F  D1 023A   632 260$:    CMPL    #DS$_UNEXPINT,4(AP)     ; Unexpected trap or interrupt?
                  03   13 0242   633          BEQL    263$                    ; Yes,
                009D   31 0244   634          BRW     270$                    ; Branch if not
                          0247   635 263$:    BR_IF_NOT_USER  264$            ;                                       [31]
     0000FE00'EF  1C   E1 0247                BBC     #DSA$V_User, -                  ; If bit not set, branch
                  03      024E                          L^DSA$GL_Flags, 264$          ;
                0085   31 024F   636          BRW     265$                    ; User mode, branch                     [31]
```

```
                05   0000FE17'EF   91   0252    637 264$:   CMPB    DSA$GL_SID+3,#PR$_SID_TYP8SS ; Print node # and BER if ZZZ      [29]
                                   7C   12   0259    638         BNEQ    265$                         ; Branch if not ZZZ             [29]
             00000100 8F    08 AC   D1   025B    639         CMPL    8(AP),#^X100                 ; Only want adapter vectors     [31]
                                   72   19   0263    640         BLSS    265$                         ; Branch if vector < 100        [31]
             000001FC 8F    08 AC   D1   0265    641         CMPL    8(AP),#^X1FC                 ;                               [31]
                                   68   14   026D    642         BGTR    265$                         ; Branch if vector > 1FC        [31]
          52    08 AC    04    02   EF   026F    643         EXTZV   #2,#4,8(AP),R2               ; Extract node # from vector    [29]
                                   52   DD   0275    644         PUSHL   R2                           ; Node #                        [29]
                      08 AC      DD   0277    645         PUSHL   8(AP)                        ; Vector offset                 [29]
                 0000041F'EF     9F   027A    646         PUSHAB  L^FMT_BI_UNEXPINT            ; Edit string                   [29]
                       65    03   FB   0280    647         CALLS   #3,(R5)                      ; Print it                      [29]
             00000000'EF     0B   90   0283    648         MOVB    #DS$K_TYPE_EXCEPTION_HEAD, - ; Set typecode for header      [29]
                                        028A    649                 L^DS$GB_TYPECODE             ;                               [29]
                52    52     0D   78   028A    650         ASHL    #13,R2,R2                    ; Build BI address              [29]
             52    60000000  8F   C8   028E    651         BISL2   #^X60000000,R2               ; Make it virtual and in IO space [29]
                   53    08 A2   D0   0295    652         MOVL    BIIC$L_BER(R2),R3            ; Fetch Bus Error Register      [29]
                   08 A2   53    D0   0299    653         MOVL    R3,BIIC$L_BER(R2)            ; Clear Bus Error Register      [31]
                                        029D    654         $DS_CVTREG_S    #31,R3, -            ; MSB and value to be converted [29]
                                        029D    655                 BI_BER_BIT,BUFFER(FP), - ; control string and buffer address [29]
                                        029D    656                 #BUFSIZ                      ; buffer size                   [29]
                          00    DD    029D                        PUSHL   #0
                          00    DD    029F                        PUSHL   #0
                          00    DD    02A1                        PUSHL   #0
                          00    DD    02A3                        PUSHL   #0
                          00    DD    02A5                        PUSHL   #0
                          00    DD    02A7                        PUSHL   #0
                00000100  8F    DD    02A9                        PUSHL   #BUFSIZ
                    FF00  CD    9F    02AF                        PUSHAB  BUFFER(FP)
                00000000'EF     9F    02B3                        PUSHAB  BI_BER_BIT
                          53    DD    02B9                        PUSHL   R3
                          1F    DD    02BB                        PUSHL   #31
          00000000'9F     0B    FB    02BD                        CALLS   #11, a#DS$CVTREG
             50   FF00  CD    9E    02C4    657         MOVAB   BUFFER(FP),R0                ; Get address of buffer         [29]
                          50    DD    02C9    658         PUSHL   R0                           ; Address of mnemonic string    [29]
                          53    DD    02CB    659         PUSHL   R3                           ; Contents of BER               [29]
                00000000'EF     9F    02CD    660         PUSHAB  FMT_BER                      ; Address of format string      [29]
                    66    03    FB    02D3    661         CALLS   #3,(R6)                      ; Output message of lesser importance [29]
                                   05   02D6    662         RSB                                  ; All done                      [29]
                                        02D7    663
                      08 AC       DD   02D7    664 265$:   PUSHL   8(AP)                        ; Vector offset                 [29]
                 000003E7'EF      9F   02DA    665         PUSHAB  L^FMT_UNEXPINT               ; Edit string                   [14]
                       65    02    FB   02E0    666         CALLS   #2,(R5)                      ; Print it
                                   05   02E3    667         RSB                                  ; All done
                                        02E4    668
          04 AC    006600D0  8F    D1   02E4    669 270$:   CMPL    #DS$_ARITH,4(AP)             ; Arithmetic fault or trap?
                                   1F   12   02EC    670         BNEQ    280$                         ; Branch if this not it
                    0433'CF     9F   02EE    671         PUSHAB  W^PRINT_PC_PSL               ; Set return address to print PC/PSL
                                        02F2    672         CASE    8(AP),TYPE=W,LIMIT=#1,DISPLIST=<-    ; Case on Trap/Fault type
                                        02F2    673                   X_INTOVF, -                ; SS$_INTOVF
                                        02F2    674                   X_INTDIV, -                ; SS$_INTDIV
                                        02F2    675                   X_FLTOVF, -                ; SS$_FLTOVF
                                        02F2    676                   X_FLTDIV, -                ; SS$_FLTDIV
                                        02F2    677                   X_FLTUND, -                ; SS$_FLTUND
                                        02F2    678                   X_DECOVF, -                ; SS$_DECOVF
                                        02F2    679                   X_SUBRNG, -                ; SS$_SUBRNG
                                        02F2    680                   X_FLTOVF_F, -              ; SS$_?????? Floating overflow fault
                                        02F2    681                   X_FLTDIV_F, -              ; SS$_?????? Floating divide fault
```

```
                                02F2                    X_FLTUND_F -          ; SS$_?????? Floating underflow fault
                                02F2                    >
        09'  01   08 AC    AF   02F2            CASEW   8(AP),#1,S^#<<30005$-30004$>/2>-1
                                02F7        30004$:
                          00C0' 02F7            .SIGNED_WORD    X_INTOVF-30004$
                          00C8' 02F9            .SIGNED_WORD    X_INTDIV-30004$
                          00D0' 02FB            .SIGNED_WORD    X_FLTOVF-30004$
                          00D8' 02FD            .SIGNED_WORD    X_FLTDIV-30004$
                          00E0' 02FF            .SIGNED_WORD    X_FLTUND-30004$
                          00E8' 0301            .SIGNED_WORD    X_DECOVF-30004$
                          00F0' 0303            .SIGNED_WORD    X_SUBRNG-30004$
                          00F8' 0305            .SIGNED_WORD    X_FLTOVF_F-30004$
                          0100' 0307            .SIGNED_WORD    X_FLTDIV_F-30004$
                          0108' 0309            .SIGNED_WORD    X_FLTUND_F-30004$
                                030B        30005$:
                     00    11   030B            BRB     PRINT_UNK_EXC         ; Bad value of trap code, fake it.
                                030D
                                030D        ;+
                                030D        ; Unknown exception code, Print the arglist and PC/PSL
                                030D        ;-
                                030D
                                030D        280$:
                                030D        PRINT_UNK_EXC:
  00000000'EF    0B    90   030D            MovB    #DS$K_Type_Exception_Head, - ; Set typecode for header          [18]
                                0314                    L^DS$GB_TypeCode      ;                                     [18]
                                0314
      00000536'EF    9F   0314            PUSHAB  L^FMT_UNK_ARG         ; Edit string for count                [14]
          65    02    FB   031A            CALLS   #2,(R5)               ; Print header
                                031D
  00000000'EF    0C    90   031D            MovB    #DS$K_Type_Exception, - ; Set typecode for text                [18]
                                0324                    L^DS$GB_TypeCode      ;                                     [18]
                     6C    DD   0324            PUSHL   (AP)                  ; Count of args
      00000558'EF    9F   0326            PUSHAB  L^FMT_UNK_CNT         ; format for count of args             [14]
          66    02    FB   032C            CALLS   #2,(R6)               ; Print count of args
                                032F
     53   6C    02    C3   032F            SUBL3   #2,(AP),R3            ; Count less PC/PSL
                     15    15   0333            BLEQ    20$                   ; None, Print PC/PSL
          52    01    D0   0335            MOVL    #1,R2                 ; Start with first arg
                                0338
                  6C42    DD   0338        10$:    PUSHL   (AP)[R2]              ; Value of arg
                     52    DD   033B            PUSHL   R2                    ; arg number
      0000056D'EF    9F   033D            PUSHAB  L^FMT_PXXX            ; Address of edit string               [14]
          66    03    FB   0343            CALLS   #3,(R6)               ; Print arg
       EE 52    53    F2   0346            AOBLSS  R3,R2,10$             ; Print all args
                                034A
                  00E6    31   034A        20$:    BRW     PRINT_PC_PSL          ; Now format and print PC/PSL
```

```
                        034D    716 ;+
                        034D    717 ; SS$_BREAK             Breakpoint exception
                        034D    718 ;-
                        034D    719
                        034D    720 X_BREAK:
      65  000000F3'EF   FA  034D    721         CALLG   L^MSG_BREAK,(R5)        ; Print header                          [14]
                        05  0354    722         RSB                             ; All done
                            0355    723
                            0355    724 ;+
                            0355    725 ; SS$_CHMS              Change mode to SUPERVISOR
                            0355    726 ;-
                            0355    727
                            0355    728 X_CHMS:
      65  00000143'EF   FA  0355    729         CALLG   L^MSG_CHMS,(R5)         ; Print header                          [14]
                        05  035C    730         RSB                             ; All done
                            035D    731
                            035D    732 ;+
                            035D    733 ; SS$_CHMU              Change mode to USER
                            035D    734 ;-
                            035D    735
                            035D    736 X_CHMU:
      65  00000157'EF   FA  035D    737         CALLG   L^MSG_CHMU,(R5)         ; Print header                          [14]
                        05  0364    738         RSB                             ; All done
                            0365    739
                            0365    740 ;+
                            0365    741 ; SS$_COMPAT            Compatability mode trap
                            0365    742 ;-
                            0365    743
                            0365    744 X_COMPAT:
    65  00000107'EF   FA  0365    745         CALLG   L^MSG_COMPAT,(R5)       ; Print Compatability mode fault header [14]
50   08 AC   03   00  EF  036C    746         EXTZV   #0,#3,8(AP),R0          ; Get fault type
      000002F0'EF40   DD  0372    747         PUSHL   L^AAT_COMPAT[R0]        ; Address of insert                     [14]
        000006E0'EF   9F  0379    748         PUSHAB  L^T_FLT_ABO             ; Address of FAULT/ABORT                [14]
        000006EC'EF   9F  037F    749         PUSHAB  L^T_COMPAT              ; Address of Compatability mode ...     [14]
        0000050C'EF   9F  0385    750         PUSHAB  L^FMT_EXCEP_CODE        ; Format for exception code             [14]
            66   04   FB  038B    751         CALLS   #4,(R6)                 ; Print type code
                        05  038E    752         RSB                             ; All done
                            038F    753
                            038F    754 ;+
                            038F    755 ; SS$_OPCCUS            Opcode reserved to customer
                            038F    756 ;-
                            038F    757
                            038F    758 X_OPCCUS:
    65  0000007B'EF   FA  038F    759         CALLG   L^MSG_OPCCUS,(R5)       ; Print header                          [14]
                        05  0396    760         RSB                             ; All done
                            0397    761
                            0397    762 ;+
                            0397    763 ; SS$_OPCDEC            Opcode reserved to DIGITAL
                            0397    764 ;-
                            0397    765
                            0397    766 X_OPCDEC:
    65  00000067'EF   FA  0397    767         CALLG   L^MSG_OPCDEC,(R5)       ; Print header                          [14]
                        05  039E    768         RSB                             ; All done
                            039F    769
                            039F    770 ;+
                            039F    771 ; SS$_RADRMOD           Reserved addressing mode
                            039F    772 ;-
```

```
                          039F
                          039F  X_RADRMOD:
65   000000A3'EF   FA     039F          CALLG   L^MSG_RADRMOD,(R5)      ; Print header                    [14]
                   05     03A6          RSB                             ; All done
                          03A7
                          03A7  ;+
                          03A7  ; SS$_ROPRAND           Reserved operand
                          03A7  ;-
                          03A7
                          03A7  X_ROPRAND:
65   0000008F'EF   FA     03A7          CALLG   L^MSG_ROPRAND,(R5)      ; Print header                    [14]
                   05     03AE          RSB                             ; All done
                          03AF
                          03AF  ;+
                          03AF  ; SS$_TBIT              T-bit exception
                          03AF  ;-
                          03AF
                          03AF  X_TBIT:
65   000000DF'EF   FA     03AF          CALLG   L^MSG_TBIT,(R5)         ; Print header                    [14]
                   05     03B6          RSB                             ; All done
                          03B7
                          03B7  ;+
                          03B7  ; SS$_INTOVF            Integer overflow
                          03B7  ;-
                          03B7
                          03B7  X_INTOVF:
65   00000228'EF   FA     03B7          CALLG   L^MSG_INTOVF,(R5)       ; Print header                    [14]
                   05     03BE          RSB                             ; All done
                          03BF  ;+
                          03BF  ; SS$_INTDIV            Integer division by zero
                          03BF  ;-
                          03BF
                          03BF  X_INTDIV:
65   0000023C'EF   FA     03BF          CALLG   L^MSG_INTDIV,(R5)       ; Print header                    [14]
                   05     03C6          RSB                             ; All done
                          03C7
                          03C7  ;+
                          03C7  ; SS$_FLTOVF            Floating overflow
                          03C7  ;-
                          03C7
                          03C7  X_FLTOVF:
65   00000250'EF   FA     03C7          CALLG   L^MSG_FLTOVF,(R5)       ; Print header                    [14]
                   05     03CE          RSB                             ; All done
                          03CF
                          03CF  ;+
                          03CF  ; SS$_FLTDIV            Floating division by zero
                          03CF  ;-
                          03CF
                          03CF  X_FLTDIV:
65   00000264'EF   FA     03CF  170$:   CALLG   L^MSG_FLTDIV,(R5)       ; Print header                    [14]
                   05     03D6          RSB                             ; All done
                          03D7
                          03D7  ;+
                          03D7  ; SS$_FLTUND            Floating underflow trap
                          03D7  ;-
                          03D7
                          03D7  X_FLTUND:
```

```
                65   00000278'EF   FA  03D7   830          CALLG   L^MSG_FLTUND,(R5)       ; Print header                  [14]
                                   05  03DE   831          RSB                             ; All done
                                       03DF   832
                                       03DF   833 ;+
                                       03DF   834 ; SS$_DECOVF          Decimal overflow trap
                                       03DF   835 ;-
                                       03DF   836
                                       03DF   837 X_DECOVF:
                65   0000028C'EF   FA  03DF   838          CALLG   L^MSG_DECOVF,(R5)       ; Print header                  [14]
                                   05  03E6   839          RSB                             ; All done
                                       03E7   840
                                       03E7   841 ;+
                                       03E7   842 ; SS$_SUBRNG          Subscript range trap
                                       03E7   843 ;-
                                       03E7   844
                                       03E7   845 X_SUBRNG:
                65   000002A0'EF   FA  03E7   846          CALLG   L^MSG_SUBRNG,(R5)       ; Print header                  [14]
                                   05  03EE   847          RSB                             ; All done
                                       03EF   848
                                       03EF   849 ;+
                                       03EF   850 ; SS$_??????          Floating overflow fault
                                       03EF   851 ;-
                                       03EF   852
                                       03EF   853 X_FLTOVF_F:
                65   000002B4'EF   FA  03EF   854          CALLG   L^MSG_FLTOVF_F,(R5)     ; Print header                  [14]
                                   05  03F6   855          RSB                             ; All done
                                       03F7   856
                                       03F7   857 ;+
                                       03F7   858 ; SS$_??????          Floating division by zero fault
                                       03F7   859 ;-
                                       03F7   860
                                       03F7   861 X_FLTDIV_F:
                65   000002C8'EF   FA  03F7   862          CALLG   L^MSG_FLTDIV_F,(R5)     ; Print header                  [14]
                                       03FE   863
                                   05  03FE   864          RSB                             ; All done
                                       03FF   865
                                       03FF   866 ;+
                                       03FF   867 ; SS$_??????          Floating underflow fault
                                       03FF   868 ;-
                                       03FF   869
                                       03FF   870 X_FLTUND_F:
                65   000002DC'EF   FA  03FF   871          CALLG   L^MSG_FLTUND_F,(R5)     ; Print header                  [14]
                                   05  0406   872          RSB                             ; All done
                                       0407   873
                                       0407   874 Print_Type_VA:                           ;                               [18]
00000000'EF       0C   90  0407   875          MovB    #DS$K_Type_Exception, -  ; Set typecode                  [18]
                                       040E   876            L^DS$GB_TypeCode       ;                               [18]
                                       040E   877
                    08 AC   DD  040E   878          PushL   8(AP)                   ; Reference type                [18]
                    0C AC   DD  0411   879          PUSHL   12(AP)                  ; Virtual address
            000004DA'EF     9F  0414   880          PUSHAB  L^FMT_VIRT              ; Format string                 [14]
                  66   03   FB  041A   881          CALLS   #3,(R6)                 ; Print message of lesser importance
                                   05  041D   882          RSB                             ; Now format and print PC/PSL
                                       041E   883
                                       041E   884 PRINT_CHMX_ARG:
00000000'EF       0C   90  041E   885          MovB    #DS$K_Type_Exception, -  ; Set typecode                  [18]
                                       0425   886            L^DS$GB_TypeCode       ;                               [18]
```

```
                                0425
                08 AC     DD    0425          PUSHL   8(AP)                    ; Output CHMx ARG
        00000523'EF       9F    0428          PUSHAB  L^FMT_CHMX_ARG           ; Format CHMx ARG                    [14]
            66    02      FB    042E          CALLS   #2,(R6)                  ; Output message of lesser importance
                  00      11    0431          BRB     PRINT_PC_PSL             ; Now format and print PC/PSL
                                0433
                                0433  PRINT_PC_PSL:
  00000000'EF     0C      90    0433          MovB    #DS$K_Type_Exception, -  ; Set typecode                       [18]
                                043A                    L^DS$GB_TypeCode       ;                                    [18]
                                043A
            52    6C      D0    043A          MOVL    (AP),R2                  ; Get count of args
            FC AC42       DD    043D          PUSHL   -4(AP)[R2]               ; PC to print
        00000465'EF       9F    0441          PUSHAB  L^FMT_ERRPC              ; Address of format string           [14]
            66    02      FB    0447          CALLS   #2,(R6)                  ; Output message of lesser importance
                                044A          $DS_CVTREG_S    #31,(AP)[R2], -  ; MSB and value to be converted
                                044A                  APSLMNE, BUFFER(FP), -   ; Control string and buffer address
                                044A                  #BUFSIZ, MODELST,MODELST; Buffer size and mode list twice
                  00      DD    044A                  PUSHL   #0
                  00      DD    044C                  PUSHL   #0
                  00      DD    044E                  PUSHL   #0
                  00      DD    0450                  PUSHL   #0
        00000000'EF       DF    0452                  PUSHAL  MODELST
        00000000'EF       DF    0458                  PUSHAL  MODELST
        00000100 8F       DD    045E                  PUSHL   #BUFSIZ
            FF00 CD       9F    0464                  PUSHAB  BUFFER(FP)
        00000000'EF       9F    0468                  PUSHAB  APSLMNE
              6C42        DD    046E                  PUSHL   (AP)[R2]
                  1F      DD    0471                  PUSHL   #31
  00000000'9F     0B      FB    0473                  CALLS   #11, a#DS$CVTREG
      50    FF00 CD       9E    047A          MOVAB   BUFFER(FP),R0            ; Get address of buffer
                  50      DD    047F          PUSHL   R0                       ; Address of mneumonic string
              6C42        DD    0481          PUSHL   (AP)[R2]                 ; Push PSL
        000004B9'EF       9F    0484          PUSHAB  L^FMT_ERRPSL             ; Address of format string           [14]
            66    03      FB    048A          CALLS   #3,(R6)                  ; output message of lesser importance
        00000000'EF       94    048D          ClrB    L^DS$GB_TypeCode         ; Clear typecode                     [30]
                  04      0493          RET                                    ; Return all done
                                0494
                                0494  RESIGNAL:
      50    0918 8F       3C    0494          MOVZWL  #SS$_RESIGNAL,R0         ; Unknown signal
        00000000'EF       94    0499          ClrB    L^DS$GB_TypeCode         ; Clear typecode                     [30]
                  04      049F          RET                                    ; Return
```

```
04A0    917          .SBTTL  FIND_USERPC     Find USER PC on stack
04A0    918 ;++
04A0    919 ; FUNCTIONAL DESCRIPTION:
04A0    920 ;
04A0    921 ;       This routine is used to find and print a user program PC
04A0    922 ;       in the event of an error, exception, abort or fault.
04A0    923 ;
04A0    924 ; CALLING SEQUENCE:
04A0    925 ;
04A0    926 ;       CALLG   (AP),FIND_USERPC
04A0    927 ;
04A0    928 ; INPUT PARAMETERS:
04A0    929 ;
04A0    930 ;       R0 = ADDRESS OF FAILURE
04A0    931 ;
04A0    932 ; IMPLICIT INPUTS:
04A0    933 ;
04A0    934 ;       NONE
04A0    935 ;
04A0    936 ; OUTPUT PARAMETERS:
04A0    937 ;
04A0    938 ;       NONE
04A0    939 ;
04A0    940 ; IMPLICIT OUTPUTS:
04A0    941 ;
04A0    942 ;       NONE
04A0    943 ;
04A0    944 ; COMPLETION CODES:
04A0    945 ;
04A0    946 ;       NONE
04A0    947 ;
04A0    948 ; SIDE EFFECTS:
04A0    949 ;
04A0    950 ;       NONE
04A0    951 ;--
```

```
                     0000  04A0    953 .ENTRY FIND_USERPC,^M<>
                           04A2    954
          50    04 BC     DE  04A2  955         MOVAL   a4(AP),R0                ; GET ADDRESS OF SIGNAL ARRAY
             51    60     9A  04A6  956         MOVZBL  (R0),R1                  ; GET COUNT OF SIGNAL ARGS
       50    FC A041     D0  04A9  957         MOVL    -4(R0)[R1],R0            ; Get PC of failure
 00010000 8F    50     D1  04AE  958         cmpl    r0, #^X10000             ; Less than 10000?                    [15]
                0C     1F  04B5  959         blssu   10$                      ; If so, don't search                 [15]
 00000000'EF    00     FB  04B7  960         CallS   #0, L^DSR$Find_User_PC   ; Search for it                       [20]
          50    00     D1  04BE  961         CmpL    #0, R0                   ; Return a zero?                      [20]
                10     13  04C1  962         Beql    20$                      ; Yes, so no user PC was found        [20]
                           04C3  963
                           04C3  964 10$:     $PRINTI_S  L^FMT_USRPC, R0       ; Print the real User PC              [20]
                50     DD  04C3                       PUSHL   R0
      0000047E'EF     9F  04C5                       PUSHAB  L^FMT_USRPC
 00000000'EF    02     FB  04CB                       CALLS   #$$N, DSX$PRINTI
                04     04  04D2  965         RET                              ; Return to caller
                           04D3  966
                           04D3  967 20$:     $PrintI_S  L^Fmt_User_PC_NF      ; Print "none found"                  [20]
      0000049A'EF     9F  04D3                       PUSHAB  L^Fmt_User_PC_NF
 00000000'EF    01     FB  04D9                       CALLS   #$$N, DSX$PRINTI
                04     04  04E0  968         RET                              ; Return to caller                    [20]
```

```
                     04E1   970          .SBTTL  TST$MChk Routine - Machine Check Handler        ;               [14]
                000004E1    971          .PSECT  Code, Exe, Shr, NoWrt, Long                     ;               [14]
                     04E1   972 ;++
                     04E1   973 ; FUNCTIONAL DESCRIPTION:
                     04E1   974 ;
                     04E1   975 ;       This routine is entered from SCB offset 4.
                     04E1   976 ;       It removes the machine check info from the stack and adds 2
                     04E1   977 ;       to the PC, sets the "C" bit in the PSL and returns
                     04E1   978 ;
                     04E1   979 ; CALLING SEQUENCE:
                     04E1   980 ;
                     04E1   981 ;       Vectored from SCB offset 4
                     04E1   982 ;       FOR EXAMPLE:
                     04E1   983 ;               PUSHL   4(scb)          ; Save old machine check
                     04E1   984 ;               MOVAL   TST$MCHK,4(SCB) ; Set new machine check handler
                     04E1   985 ;               TSTW    (R0)            ; Instruction expected to get mchk
                     04E1   986 ;               POPL    4(SCB)          ; Restore old machine check handler
                     04E1   987 ;               BCS     ...             ; Branch if machine check occured
                     04E1   988 ;
                     04E1   989 ; INPUT PARAMETERS:
                     04E1   990 ;
                     04E1   991 ;       NONE
                     04E1   992 ;
                     04E1   993 ; IMPLICIT INPUTS:
                     04E1   994 ;
                     04E1   995 ;       (SP)    number of bytes of machine check info
                     04E1   996 ;       (SP)+SP PC and PSL of fault inst which MUST be 2 bytes long
                     04E1   997 ;
                     04E1   998 ; OUTPUT PARAMETERS:
                     04E1   999 ;
                     04E1  1000 ;       NONE
                     04E1  1001 ;
                     04E1  1002 ; IMPLICIT OUTPUTS:
                     04E1  1003 ;
                     04E1  1004 ;       C-bit is set and interrupt PC updated by 2
                     04E1  1005 ;
                     04E1  1006 ; SIDE EFFECTS:
                     04E1  1007 ;
                     04E1  1008 ;       NONE
                     04E1  1009 ;
                     04E1  1010 ; COMPLETION CODES:
                     04E1  1011 ;
                     04E1  1012 ;       N/A
                     04E1  1013 ;--
```

```
                                04E1  1015          .ALIGN  LONG
                                04E4  1016 TST$MCHK::
                          5E    DD  04E4  1017          PUSHL   SP                      ; Store stack frame address
                          01    DD  04E6  1018          PUSHL   #DS$_GK_TST$MCHK                ; Pass fault clear selection code
                00000000'EF     16  04E8  1019          JSB     L^DSR$FAULT_CLEAR       ; Clear fault status
                    5E    08    C0  04EE  1020          ADDL2   #8,SP                   ; Reset the stack                       ;[24
                    5E    8E    C0  04F1  1021          ADDL    (SP)+, SP               ; Remove specific machine check info    [16]
                    6E    02    C0  04F4  1022          ADDL    #2,(SP)                 ; Update PC
                 04 AE    01    C8  04F7  1023          BISL    #1,4(SP)                ; Set C-bit in condition codes
                                02  04FB  1024          REI                             ; Return after faulting instruction
```

```
                     04FC  1026          .SBTTL  HARDWARE EXCEPTION ENTRY POINTS
                000004FC  1027          .PSECT  Code, Exe, Shr, NoWrt, Long                     ;                [14]
                     04FC  1028 ;++
                     04FC  1029 ; FUNCTIONAL DESCRIPTION:
                     04FC  1030 ;
                     04FC  1031 ;       THESE ROUTINES EMULATE THE STARLET EXCEPTION HANDLER MECHANISM.
                     04FC  1032 ;       SEE THE STARLET WORKING DESIGN DOCUMENT FOR FURTHER DETAILS.
                     04FC  1033 ;
                     04FC  1034 ; CALLING SEQUENCE:
                     04FC  1035 ;
                     04FC  1036 ;       EXCEPTION OR INTERRUPT.
                     04FC  1037 ;
                     04FC  1038 ; INPUT PARAMETERS:
                     04FC  1039 ;
                     04FC  1040 ;       EXCEPTION FRAME ON THE STACK.
                     04FC  1041 ;
                     04FC  1042 ; IMPLICIT INPUTS:
                     04FC  1043 ;
                     04FC  1044 ;       NONE
                     04FC  1045 ;
                     04FC  1046 ; OUTPUT PARAMETERS:
                     04FC  1047 ;
                     04FC  1048 ;       NONE
                     04FC  1049 ;
                     04FC  1050 ; IMPLICIT OUTPUTS:
                     04FC  1051 ;
                     04FC  1052 ;       NONE
                     04FC  1053 ;
                     04FC  1054 ; COMPLETION CODES:
                     04FC  1055 ;
                     04FC  1056 ;       NONE
                     04FC  1057 ;
                     04FC  1058 ; SIDE EFFECTS:
                     04FC  1059 ;
                     04FC  1060 ;       NONE
                     04FC  1061 ;
                     04FC  1062 ;--
```

```
                        04FC  1064 ;+
                        04FC  1065 ; ENTER HERE FOR MACHINE CHECK ABORTS, FAULTS AND TRAPS
                        04FC  1066 ;-
                        04FC  1067
                        04FC  1068          .ALIGN  LONG                    ; REQUIRED FOR EXCEPTION VECTOR
                        04FC  1069 EXE_MCHK::                               ; HERE FROM MCHK VECTOR
    00660088 8F    DD   04FC  1070          PUSHL   #DS$_MCHK               ; INDICATE MACHINE CHECK CONDITION
 7E   04 AE    04    C7  0502  1071          DIVL3   #4,4(SP),-(SP)          ; CONVERT BYTES TO LONGWORD COUNT
       6E    04    C0  0507  1072          ADDL2   #4,(SP)                 ; INCLUDE PSL/PC/COND NAME & BYTE COUNT
             5E    DD  050A  1073          PUSHL   SP                      ; Store stack frame address             ;[24
             00    DD  050C  1074          PUSHL   #DS$_GK_EXE_MCHK        ; PUSH THE FAULT CLEAR SELECTION CODE   ;[24
    00000000'EF    16  050E  1075          JSB     L^DSR$FAULT_CLEAR       ; CLEAR ERROR FIRST PASS AND RE-INIT
       5E    08    C0  0514  1076          ADDL2   #8,SP                   ; Reset the stack                       ;[24
           014D    31  0517  1077          BRW     EXE_EXCEPTION           ; PROCEED
                       051A  1078
                       051A  1079 ;+
                       051A  1080 ; ENTER HERE FOR KERNEL STACK NOT VALID ABORT
                       051A  1081 ;-
                       051A  1082
                       051A  1083          .ALIGN  LONG                    ; REQUIRED FOR EXCEPTION VECTOR
                       051C  1084 EXE_KRNLSTK::                            ; HERE FROM KRNLSTK VECTOR
    00660090 8F    DD   051C  1085          PUSHL   #DS$_KRNLSTK            ; INDICATE KERNEL STACK CONDITION
           013E    31  0522  1086          BRW     EXE_3ARG                ; SETUP 3 ARGS, AND PROCESS
                       0525  1087
                       0525  1088 ;+
                       0525  1089 ; ENTER HERE FOR POWER INTERRUPT
                       0525  1090 ;-
                       0525  1091
                       0525  1092          .ALIGN  LONG                    ; REQUIRED FOR EXCEPTION VECTOR
                       0528  1093 EXE_POWER::                              ; HERE FROM POWER FAIL VECTOR
    00660098 8F    DD   0528  1094          PUSHL   #DS$_POWER              ; INDICATE POWER FAIL CONDITION
             00    DD  052E  1095          HALT                            ; NOT GRACEFUL, BUT EFFECTIVE
           0131    31  052F  1096          BRW     EXE_3ARG                ; SETUP 3 ARGS, AND PROCESS
                       0532  1097
                       0532  1098 ;+
                       0532  1099 ; ENTER HERE FOR RESERVED OR PRIVILEGED INSTRUCTION FAULT
                       0532  1100 ;-
                       0532  1101
                       0532  1102          .ALIGN  LONG                    ; REQUIRED FOR EXCEPTION VECTOR
                       0534  1103 EXE_OPCDEC::                             ; HERE FROM OPCDEC VECTOR
 7E    043C 8F    3C   0534  1104          MOVZWL  #SS$_OPCDEC, -(SP)      ; INDICATE RESERVED OPCODE CONDITION
           0127    31  0539  1105          BRW     EXE_3ARG                ; SETUP 3 ARGS
                       053C  1106
                       053C  1107 ;+
                       053C  1108 ; ENTER HERE FOR CUSTOMER RESERVED INSTRUCTION FAULT
                       053C  1109 ;-
                       053C  1110
                       053C  1111          .ALIGN  LONG                    ; REQUIRED FOR EXCEPTION VECTOR
                       053C  1112 EXE_OPCCUS::                             ; HERE FROM OPCCUS VECTOR
 7E    0434 8F    3C   053C  1113          MOVZWL  #SS$_OPCCUS, -(SP)      ; INDICATE CUSTOMER OPCODE CONDITION
           011F    31  0541  1114          BRW     EXE_3ARG                ; SETUP 3 ARGS
```

```
                        0544  1116 ;+
                        0544  1117 ; ENTER HERE FOR RESERVED OPERAND FAULT OR ABORT
                        0544  1118 ;-
                        0544  1119
                        0544  1120          .ALIGN  LONG                    ; REQUIRED FOR EXCEPTION VECTOR
                        0544  1121 EXE_ROPRAND::                            ; HERE FROM ROPRAND VECTOR
                        0544  1122 EXE$ROPRAND::                            ; Used by XDELTA only
              7E  0454 8F   3C  0544  1123          MOVZWL  #SS$_ROPRAND, -(SP)     ; INDICATE RESERVED OPERAND CONDITION
                  0117    31  0549  1124          BRW     EXE_3ARG                ; SETUP 3 ARGS
                        054C  1125
                        054C  1126 ;+
                        054C  1127 ; ENTER HERE FOR RESERVED ADDRESSING MODE FAULT
                        054C  1128 ;-
                        054C  1129
                        054C  1130          .ALIGN  LONG                    ; REQUIRED FOR EXCEPTION VECTOR
                        054C  1131 EXE_RADRMOD::                            ; HERE FROM RADRMOD VECTOR
              7E  044C 8F   3C  054C  1132          MOVZWL  #SS$_RADRMOD, -(SP)     ; INDICATE ADDRESSING MODE CONDITION
                  010F    31  0551  1133          BRW     EXE_3ARG                ; SETUP 3 ARGS
                        0554  1134
                        0554  1135 ;+
                        0554  1136 ; ENTER HERE FOR ACCESS CONTROL VIOLATION FAULT
                        0554  1137 ;-
                        0554  1138
                        0554  1139          .ALIGN  LONG                    ; REQUIRED FOR EXCEPTION VECTOR
                        0554  1140 EXE_ACCVIO::                             ; HERE FROM ACCVIO VECTOR
                        0554  1141 EXE$ACVIOLAT::                           ; Used by XDELTA only
              7E    0C  3C  0554  1142          MOVZWL  #SS$_ACCVIO, -(SP)      ; INDICATE ACCESS VIOLATION CONDITION
                    05  DD  0557  1143          PUSHL   #5                      ; INDICATE SIGNAL ARRAY SIZE
                  010B  31  0559  1144          BRW     EXE_EXCEPTION           ; PROCEED
                        055C  1145
                        055C  1146 ;+
                        055C  1147 ; ENTER HERE FOR TRANSLATION NOT VALID FAULT
                        055C  1148 ;-
                        055C  1149
                        055C  1150          .ALIGN  LONG                    ; REQUIRED FOR EXCEPTION VECTOR
                        055C  1151 EXE_TRANSL::                             ; HERE FROM TRANSL VECTOR
                        055C  1152 MMG$PAGEFAULT::                          ; Used by XDELTA only
          006600A0 8F   DD  055C  1153          PUSHL   #DS$_TRANSL             ; INDICATE TRANSLATION CONDITION
                    05  DD  0562  1154          PUSHL   #5                      ; INDICATE SIGNAL ARRAY SIZE
                  0100  31  0564  1155          BRW     EXE_EXCEPTION           ; PROCEED
                        0567  1156
                        0567  1157 ;+
                        0567  1158 ; ENTER HERE FOR COMPATIBILITY FAULT OR ABORT
                        0567  1159 ;-
                        0567  1160
                        0567  1161          .ALIGN  LONG                    ; REQUIRED FOR EXCEPTION VECTOR
                        0568  1162 EXE_COMPAT::                             ; HERE FROM COMPAT VECTOR
            7E  042C 8F   3C  0568  1163          MOVZWL  #SS$_COMPAT, -(SP)      ; INDICATE COMPATIBILITY CONDITION
                  00EF    31  056D  1164          BRW     EXE_4ARG                ; SETUP 4 ARGS
```

```
                        0570  1166 ;+
                        0570  1167 ; ENTER HERE FOR ARITHMETIC TRAP
                        0570  1168 ;-
                        0570  1169
                        0570  1170          .ALIGN  LONG                    ; REQUIRED FOR EXCEPTION VECTOR
                        0570  1171 EXE_ARITH::                              ; HERE FROM ARITH VECTOR
          006600D0 8F   DD  0570  1172          PUSHL   #DS$_ARITH            ; Indicate Arithmetic fault
                00E6    31  0576  1173          BRW     EXE_4ARG              ; Form 4 argument list
                        0579  1174
                        0579  1175 ;+
                        0579  1176 ; ENTER HERE FOR "ALL" BREAKPOINT FAULTS (I.E., DIAGNOSTIC PROGRAM
                        0579  1177 ; WILL ALWAYS GET SECOND CHANCE AT THIS VECTOR)
                        0579  1178 ;-
                        0579  1179
                        0579  1180          .ALIGN  LONG                    ; REQUIRED FOR EXCEPTION VECTOR
                        057C  1181 EXE_BREAK::                              ; HERE FROM BREAKPOINT VECTOR
                        057C  1182 EXE$BREAK::                              ; Used by XDELTA only
                        057C  1183
    00000000'EF         D5  057C  1184          TSTL    MP$GR_BOOTED_PROCESSORS         ; Are we an mp system?   [34]
                  62    13  0582  1185          BEQL    5$                              ; Not mp, therefore branch [34]
              5E  04    C2  0584  1186          SUBL2   #4,SP                           ; Reserve storage
                  5E    DD  0587  1187          PUSHL   SP                              ; Storage for CPU identifier [34]
 00000000'EF      01    FB  0589  1188          CALLS   #1, MP$_GET_PROCESSOR_ID        ; Get current CPU identifier
6E   00000000'EF      91  0590  1189          CMPB    DS$GB_PRIMARY_CPU_IDENTIFIER,(SP); Are we the primary? [34]
                  4A  13  0597  1190          BEQL    4$                              ; Branch if Pp          [34]
              5E  04    C0  0599  1191          ADDL2   #4,SP                           ; Reset the stack       [34]
                        059C  1192 ;++
                        059C  1193 ; The following code is used to save the GPR context of an Ap in       [34]
                        059C  1194 ; the event the user wished to do EXAMINES and DEPOSITS after setting
                        059C  1195 ; a Breakpoint in the Ap code.
                        059C  1196 ;--
                        059C  1197
        00000000'EF     DC  059C  1198          MOVPSL  MP$GL_SAVED_PSL                 ; Store the Ap PSL          [34]
    00000000'EF     50  7D  05A2  1199          MOVQ    R0,MP$GR_SAVED_GPRS             ; Store Ap GPR's            [34]
    00000008'EF     52  7D  05A9  1200          MOVQ    R2,MP$GR_SAVED_GPRS+8           ; ...
    00000010'EF     54  7D  05B0  1201          MOVQ    R4,MP$GR_SAVED_GPRS+16          ; ...
    00000018'EF     56  7D  05B7  1202          MOVQ    R6,MP$GR_SAVED_GPRS+24          ; ...
    00000020'EF     58  7D  05BE  1203          MOVQ    R8,MP$GR_SAVED_GPRS+32          ; ...
    00000028'EF     5A  7D  05C5  1204          MOVQ    R10,MP$GR_SAVED_GPRS+40         ; ...
    00000030'EF     5C  7D  05CC  1205          MOVQ    AP,MP$GR_SAVED_GPRS+48          ; ...
    00000038'EF     5E  D0  05D3  1206          MOVL    SP,MP$GR_SAVED_GPRS+56          ; ...
    0000003C'EF     6E  D0  05DA  1207          MOVL    (SP),MP$GR_SAVED_GPRS+60        ; ...                       [34]
                    03  11  05E1  1208          BRB     5$                              ; Continue                  [34]
                        05E3  1209
                  5E  04    C0  05E3  1210 4$:      ADDL2   #4,SP                           ; Reset stack       [34]
7E  00000000'EF     03    CB  05E6  1211 5$:      BICL3   #3,DS$GA_BREAKVEC,-(SP); USE SOFT VECTOR
                    18  13  05EE  1212          BEQL    30$                     ; BRANCH IF NO SOFT VECTOR
                        05F0  1213
                    01  BB  05F0  1214          PUSHR   #^M<R0>                 ; NEED A LITTLE WORKING ROOM
                50  00'    D0  05F2  1215          MOVL    S^#BPTMAX,R0            ; INIT AN INDEX
00000000'EF40     08  AE    D1  05F5  1216 10$:     CMPL    8(SP),DS$AA_BPTADDR[R0] ; LOOK AT A SUPERVISOR'S KNOWN BPT'S
                    06  13  05FE  1217          BEQL    20$                     ; IT MATCHES, SO GO CALL HANDLER
                  F2 50    F4  0600  1218          SOBGEQ  R0,10$                  ; LOOP THRU ENTIRE LIST (INCL. [0])
                    01  BA  0603  1219          POPR    #^M<R0>                 ; RESTORE R0
                        05  0605  1220          RSB                             ; ENTER USER I.S.R
                        0606  1221
                    01  BA  0606  1222 20$:    POPR    #^M<R0>                 ; RESTORE REG
```

```
                6E   0414 8F   3C   0608  1223 30$:    MOVZWL  #SS$_BREAK, (SP)        ; INDICATE BREAKPOINT CONDITION
                          54   11   060D  1224         BRB     EXE_3ARG                ; SETUP 3 ARGS AND DISPATCH
                                    060F  1225
                                    060F  1226
                                    060F  1227 ;+
                                    060F  1228 ; ENTER HERE FOR "ALL" TBIT TRAPS (I.E., DIAGNOSTIC PROGRAM WILL ALWAYS
                                    060F  1229 ; GET SECOND CHANCE AT THIS VECTOR)
                                    060F  1230 ;-
                                    060F  1231
                                    060F  1232         .ALIGN  LONG                    ; REQUIRED FOR EXCEPTION VECTOR
                                    0610  1233 EXE_TBIT::                              ; HERE FROM TBIT VECTOR
                                    0610  1234 EXE$TBIT::                              ; Used by XDELTA only
          7E   00000000'EF   03   CB   0610  1235         BICL3   #3,DS$GA_TBITVEC,-(SP)  ; Set secondary vector
                          08   13   0618  1236         BEQL    10$                     ; Branch if not set vec'ed
                01 00000000'EF   E8   061A  1237         BLBS    DEBUG$GB_FLAGS,10$      ; Branch if supervisor expects this
                          05   0621  1238         RSB                             ; Dispatch to user ISR
                                    0622  1239
                      6E   07   D0   0622  1240 10$:    MOVL    #7,(SP)                 ; Assume compatability mode T-bit
                02 08 AE   1F   E0   0625  1241         BBS     #PSL$V_CM,8(SP), -
                                    062A  1242                 15$                     ; BRANCH TO COMPATABILITY MODE HANDLER
                          03   11   062A  1243         BRB     16$                     ;
                       FF39   31   062C  1244 15$:     BRW     EXE_COMPAT              ;
                6E   0464 8F   3C   062F  1245 16$:     MOVZWL  #SS$_TBIT, (SP)         ; INDICATE T-BIT CONDITION
                          2D   11   0634  1246         BRB     EXE_3ARG                ; SETUP 3 ARGS, AND DISPATCH
```

```
                     0636  1248 ;+
                     0636  1249 ; HERE FOR UNEXPECTED INTERRUPT FROM SCB
                     0636  1250 ;-
                     0636  1251 EXE_UNEXPINT::
006600D8 8F    DD    0636  1252          PUSHL   #DS$_UNEXPINT           ; CODE FOR EXCEPTION ARGLIST
         0020  31    063C  1253          BRW     EXE_4ARG                ; USE COMMON CODE FOR REST
                     063F  1254
                     063F  1255 ;+
                     063F  1256 ; ENTER HERE FOR CHMK TRAP
                     063F  1257 ;-
                     063F  1258
                     063F  1259          .ALIGN  LONG
                     0640  1260 EXE_CHMK::
006600E0 8F    DD    0640  1261          PUSHL   #DS$_CHMK               ; Indicate extraneous CHMK TRAP
         17    11    0646  1262          BRB     EXE_4ARG                ; And build rest of 4 ARG list
                     0648  1263 ;+
                     0648  1264 ; ENTER HERE FOR CHME TRAP
                     0648  1265 ;-
                     0648  1266
                     0648  1267          .ALIGN  LONG                    ; REQUIRED FOR EXCEPTION VECTOR
                     0648  1268 EXE_CHME::                               ; HERE FROM CHME VECTOR
006600A8 8F    DD    0648  1269          PUSHL   #DS$_CHME               ; INDICATE CHANGE MODE CONDITION
         0F    11    064E  1270          BRB     EXE_4ARG                ; SETUP 4 ARGS, NO SECONDARY VECTOR
                     0650  1271
                     0650  1272 ;+
                     0650  1273 ; ENTER HERE FOR CHMS TRAP
                     0650  1274 ;-
                     0650  1275
                     0650  1276          .ALIGN  LONG                    ; REQUIRED FOR EXCEPTION VECTOR
                     0650  1277 EXE_CHMS::                               ; HERE FROM CHMS VECTOR
7E   041C 8F    3C   0650  1278          MOVZWL  #SS$_CMODSUPR, -(SP)    ; INDICATE CHANGE MODE CONDITION
         08    11    0655  1279          BRB     EXE_4ARG                ; SETUP 4 ARGS, NO SECONDARY VECTOR
                     0657  1280
                     0657  1281 ;+
                     0657  1282 ; ENTER HERE FOR CHMU TRAP
                     0657  1283 ;-
                     0657  1284
                     0657  1285          .ALIGN  LONG                    ; REQUIRED FOR EXCEPTION VECTOR
                     0658  1286 EXE_CHMU::                               ; HERE FROM CHMU VECTOR
7E   0424 8F    3C   0658  1287          MOVZWL  #SS$_CMODUSER, -(SP)    ; INDICATE CHANGE MODE CONDITION
         00    11    065D  1288          BRB     EXE_4ARG                ; SETUP 4 ARGS, NO SECONDARY VECTOR
                     065F  1289
                     065F  1290 EXE_4ARG:
         04    DD    065F  1291          PUSHL   #4                      ; 4 ARGS
         04    11    0661  1292          BRB     EXE_EXCEPTION           ; JOIN COMMON CODE
                     0663  1293
                     0663  1294 EXE_3ARG:
         03    DD    0663  1295          PUSHL   #3                      ; 3 ARGS
         00    11    0665  1296          BRB     EXE_EXCEPTION
```

```
                                0667  ;+
                                0667  ; COMMON CODE FOR ALL EXCEPTIONS.
                                0667  ; STACK CONTAINS SIGNAL ARRAY, BUILD MECHANISM ARRARY
                                0667  ; THEN SWITCH TO PREVIOUS MODE STACK UNLESS 'IS' IS SET OR PREVMODE WAS KERNEL
                                0667  ;-
                                0667
                                0667  EXE$REFLECT::                                  ;                                [27]
                                0667  EXE_EXCEPTION:
                   03   BB      0667          PUSHR   #^M<R0,R1>                     ; SAVE VOLATILE REGISTERS
             7E    03   CE      0669          MNEGL   #3,-(SP)                       ; INITIAL FRAME DEPTH   [34]
                   5D   DD      066C          PUSHL   FP                             ; INITIAL HANDLER ESTABLISHER FRAME
                   04   DD      066E          PUSHL   #4                             ; MECHANISM ARRAY SIZE
                                0670
        00000000'EF     D5      0670          TSTL    MP$GR_BOOTED_PROCESSORS                ; Are we an mp system?   [34]
                   1E   13      0676          BEQL    35$                                    ; Not mp, therefore branch [34]
             5E    04   C2      0678          SUBL2   #4,SP                                  ; Reserve storage       [34]
                   5E   DD      067B          PUSHL   SP                                     ; Storage for CPU identifier [34]
   00000000'EF     01   FB      067D          CALLS   #1, MP$_GET_PROCESSOR_ID               ; Get current CPU identifier
   6E   00000000'EF     91      0684          CMPB    DS$GB_PRIMARY_CPU_IDENTIFIER,(SP); Are we the primary? [34]
                   06   13      068B          BEQL    30$                                    ; Branch if Pp          [34]
             5E    04   C0      068D          ADDL2   #4,SP                                  ; Reset the stack       [34]
                 0077   31      0690          BRW     NORMAL                          ; Skip stack switch code   [34]
                                0693
             5E    04   C0      0693  30$:    ADDL2   #4,SP                          ; Reset the stack       [34]
                   51   DC      0696  35$:    MOVPSL  R1                             ; GET CURRENT PSL
          6E 51    1A   E0      0698          BBS     #PSL$V_IS,R1,NORMAL            ; INTERRUPT ON INTERRUPT STACK, PROCESS
   50   51   02    16   EF      069C          EXTZV   #PSL$V_PRVMOD, -
                                06A1                  #PSL$S_PRVMOD,R1,R0            ; GET PREVIOUS MODE
                   67   13      06A1          BEQL    NORMAL                         ; BRANCH IF WAS IN KERNEL MODE, PROCESS
                                06A3
                   0C   BB      06A3          PUSHR   #^M<R2,R3>                     ; SAVE WORKING REGISTERS
             52    50   D0      06A5          MOVL    R0,R2                          ; SAVE PREVIOUS MODE STACK POINTER
   53   1C AE       06   C1      06A8          ADDL3   #6,28(SP),R3                   ; CALCULATE NUMBER OF LONGWORDS TO MOVE
                                06AD
   51   00000000'EF42   D0      06AD          MOVL    PCB_BASE[R2],R1                ; GET SAVED SP FROM 'PCB'
             51    52   DB      06B5          MFPR    R2,R1                          ; GET HARDWARE SAVED PREV MODE SP
        50   53    02   78      06B8          ASHL    #2,R3,R0                       ; CALCULATE NUMBER OF BYTES TO MOVE
             51    50   C2      06BC          SUBL2   R0,R1                          ; SET UP A NEW STACK POINTER
        61   50    52   0D      06BF          PROBEW  R2,R0,(R1)                     ; CAN IT BE DONE ?
                   1C   12      06C3          BNEQ    50$                            ; "NO PROBLEM", PROCEED
                                06C5                                                 ;
                                06C5          ERRSUP_S  ,T_STKVIO                    ; CANNOT COPY STACK !
        00000000'EF     DF      06C5                  PUSHAL  $MODULE
        000006FF'EF     DF      06CB                  PUSHAL  T_STKVIO
                   01   DD      06D1                  PUSHL   #$ER
   00000000'EF     03   FB      06D3                  CALLS   #3, DS_ERRSUP
                                06DA          $DS_ABORT                              ; SO GO AHEAD & DO THE UGLY DEED
   00000000'9F     6C   FA      06DA                  CALLG   (AP), @#DS$ABORT
                                06E1                                                 ;
   00000000'EF40   51   D0      06E1  50$:    MOVL    R1,PCB_BASE[R0]                ; STORE NEW SP INTO 'PCB'
             52    51   DA      06E9          MTPR    R1,R2                          ; STORE NEW HARDWARE SP
        50   08 AE       9E      06EC          MOVAB   8(SP),R0                       ; ADDRESS OF ARGS TO COPY
             81    80   D0      06F0  60$:    MOVL    (R0)+,(R1)+                    ; COPY CURR STACK TO NEW ONE
                FA 53   F5      06F3          SOBGTR  R3,60$                         ; UNTIL DONE
                                06F6
                                06F6  ;+
                                06F6  ; NOW MAKE THE SWITCH TO THE NEW STACK
```

```
                                06F6  1350 ;-
                                06F6  1351
        70   C8000010 8F   CA   06F6  1352          BICL    #PSL$M_CM!PSL$M_TBIT! -
                                06FD  1353                  PSL$M_FPD!PSL$M_TP,-(R0); CLEAR CM,T,TP,FPD
        70   0000070A'EF   9E   06FD  1354          MOVAB   L^NORMAL,-(R0)           ; PUSH ADDRESS TO RESUME AT IN PREV MODE[14]
                     0C   BA   0704  1355          POPR    #^M<R2,R3>               ; RESTORE WORKING REGISTERS
                  5E   50   D0   0706  1356          MOVL    R0,SP                    ; POINT TO PC/PSL PAIR
                           02   0709  1357          REI                              ; RETURN IN PREVIOUS MODE AT 'NORMAL'
```

```
                                070A  1359 ;+
                                070A  1360 ; HERE TO BUILD THE CONDITION ARGLIST AND CALL THE HANDLER
                                070A  1361 ;-
                                070A  1362
                                070A  1363 NORMAL:
                          6E    DF  070A  1364         PUSHAL  (SP)                        ; POINT TO MECHANISM ARRAY
                       18 AE    DF  070C  1365         PUSHAL  24(SP)                      ; POINT TO SIGNAL ARRAY
                          02    DD  070F  1366         PUSHL   #2                          ; INDICATE ARGLIST LENGTH
               00000000'EF    08    D1  0711  1367         CMPL    #PR$_SID_TYPUV2, EXE$GB_CPUTYPE ; TEST CPU FOR MICROVAX [25][35] ;G:
                          06    12  0718  1368         BNEQ    10$                         ; SKIP IF NOT MICROVAX          [25][35] ;G:
                    00000000'EF    16  071A  1369         JSB     VAX$MODIFY_EXCEPTION        ; GO DO PRE-PROCESSING                   [26]
                                0720  1370 10$:
                                0720  1371
                                0720  1372 ;
                                0720  1373 ; SEARCH FOR CONDITION HANDLER
                                0720  1374 ;
                                0720  1375
               0000076B'EF    6E    FA  0720  1376 120$:   CALLG   (SP),L^SEARCH               ;SEARCH FOR CONDITION HANDLER           [14]
                       0B 50    E9  0727  1377         BLBC    R0,130$                     ;IF LBC TRY LAST CHANCE
                                072A  1378
                                072A  1379 ;
                                072A  1380 ; CALL CONDITION HANDLER
                                072A  1381 ;
                    00000000'9F    16  072A  1382         JSB     a#SYS$CALL_HANDL            ;CALL HANDLER VIA SYSTEM VECTOR
                          ED 50    E9  0730  1383         BLBC    R0,120$                     ;IF LBS TRY AGAIN
                             26    11  0733  1384         BRB     140$                        ;CONTINUE
                                0735  1385
                                0735  1386 ;+
                                0735  1387 ; HERE WHEN "RESIGNALLED"  (I.E., CONDITION HANDLER DIDN'T WANT IT)
                                0735  1388 ;-
                                0735  1389
          FFFFF8C4 EF    6E    FA  0735  1390 130$:   CALLG   (SP), L^COND_HANDLR         ; Call last chance condition handler    [14]
                             1C 50    E8  073C  1391         BLBS    R0,140$                     ; HANDLED, CONTINUE                     [34]
                                073F  1392
                                073F  1393         ERRSUP_S   ,T_XCHFAILURE            ; UNRECOVERABLE SITUATION !
                    00000000'EF    DF  073F                PUSHAL  $MODULE
                    0000069C'EF    DF  0745                PUSHAL  T_XCHFAILURE
                             02    DD  074B                PUSHL   #$ER
                00000000'EF    03    FB  074D                CALLS   #3, DS_ERRSUP
                                0754  1394         $DS_ABORT                           ; NO OTHER WAY AT THIS POINT
                00000000'9F    6C    FA  0754                CALLG   (AP), a#DS$ABORT
                                075B  1395
                                075B  1396 ;+
                                075B  1397 ; HERE TO CLEAN THE STACK AND RETURN
                                075B  1398 ;-
                                075B  1399
             6E    20 AE    07    C1  075B  1400 140$:   ADDL3   #7,32(SP),(SP)              ; CALCULATE LONGWORD OFFSET TO SAVED PC
                   6E    04    C4  0760  1401         MULL2   #4,(SP)                     ; CALCULATE NUMBER OF BYTES TO REMOVE
                50    18 AE    7D  0763  1402         MOVQ    24(SP),R0                   ; RESTORE R0,R1
                   5E    6E    C0  0767  1403         ADDL2   (SP),SP                     ; REMOVE ARGUMENT LIST FROM STACK
                                02  076A  1404         REI
```

```
                     076B  1406          .SBTTL  SEARCH FOR CONDITION HANDLER
                     076B  1407 ;
                     076B  1408 ; SEARCH - SEARCH FOR CONDITION HANDLER
                     076B  1409 ;
                     076B  1410 ; THIS IS A SPECIAL INTERNAL ROUTINE THAT IS CALLED IN THE INITIAL SEARCH
                     076B  1411 ; FOR A CONDITION HANDLER AND ON RESIGNAL FROM A PREVIOUSLY SIGNALLED
                     076B  1412 ; CONDITION.
                     076B  1413 ;
                     076B  1414 ; INPUTS:
                     076B  1415 ;
                     076B  1416 ;       00(AP) = NUMBER OF CONDITION ARGUMENTS.
                     076B  1417 ;       04(AP) = ADDRESS OF SIGNAL ARGUMENT LIST.
                     076B  1418 ;       08(AP) = ADDRESS OF MECHANISM ARGUMENT LIST.
                     076B  1419 ;       12(AP) = NUMBER OF MECHANISM ARGUMENTS.
                     076B  1420 ;       16(AP) = FP OF HANDLER ESTABLISHER FRAME.
                     076B  1421 ;       20(AP) = FRAME DEPTH.
                     076B  1422 ;       24(AP) = SAVED R0.
                     076B  1423 ;       28(AP) = SAVED R1.
                     076B  1424 ;       32(AP) = NUMBER OF SIGNAL ARGUMENTS.
                     076B  1425 ;       36(AP) = EXCEPTION NAME (INTEGER VALUE).
                     076B  1426 ;       40(AP) = FIRST EXCEPTION PARAMETER (IF ANY).
                     076B  1427 ;       44(AP) = SECOND EXCEPTION PARAMETER (IF ANY).
                     076B  1428 ;              .
                     076B  1429 ;              .
                     076B  1430 ;              .
                     076B  1431 ;       36+N*4(AP) = N'TH EXCEPTION PARAMETER (IF ANY).
                     076B  1432 ;       36+N*4+4(AP) = EXCEPTION PC.
                     076B  1433 ;       36+N*4+8(AP) = EXCEPTION PSL.
                     076B  1434 ;
                     076B  1435 ; OUTPUTS:
                     076B  1436 ;
                     076B  1437 ;       R0 LOW BIT CLEAR INDICATES FAILURE TO LOCATE CONDITION HANDLER.
                     076B  1438 ;
                     076B  1439 ;              R0 = SS$_ACCVIO - STACK CANNOT BE READ FROM CURRENT MODE.
                     076B  1440 ;
                     076B  1441 ;              R0 = SS$_NOHANDLER - NO CONDITION HANDLER COULD BE FOUND.
                     076B  1442 ;
                     076B  1443 ;       R0 LOW BIT SET INDICATES SUCCESSFUL COMPLETION.
                     076B  1444 ;
                     076B  1445 ;              R1 = ADDRESS OF CONDITION HANDLER.
                     076B  1446 ;
                     076B  1447
00000000             076B  1448          HANDLER = 0                     ; CONDITION HANDLER ADDRESS
00000004             076B  1449          SAVPSW  = 4                     ; SAVED PSW FROM CALL
00000006             076B  1450          SAVMSK  = 6                     ; REGISTER SAVE MASK
00000008             076B  1451          SAVAP   = 8                     ; SAVED AP REGISTER IMAGE
0000000C             076B  1452          SAVFP   = 12                    ; SAVED FP REGISTER IMAGE
00000010             076B  1453          SAVPC   = 16                    ; SAVED PC REGISTER IMAGE
00000014             076B  1454          SAVRG   = 20                    ; OTHER SAVED REGISTER IMAGES
```

```
                                076B  1456 SEARCH:                                    ;SEARCH FOR CONDITION HANDLER
                           0000 076B  1457          .WORD   0                       ;ENTRY MASK
      6D   00000811'EF      DE   076D  1458          MOVAL   L^CHANDL,(FP)           ;SET ADDRESS OF CONDITION HANDLER       [14]
                                0774  1459
           50   10 AC       D0   0774  1460 10$:     MOVL    16(AP),R0               ;GET PREVIOUS FRAME ADDRESS
                                0778  1461
                  51        DC   0778  1462 20$:     MOVPSL  R1                      ;READ CURRENT PSL
     51   51   02   18       EF   077A  1463          EXTZV   #PSL$V_CURMOD,#PSL$S_CURMOD,R1,R1 ;EXTRACT CURRENT MODE
                  14 AC       D6   077F  1464          INCL    20(AP)                  ;INCREMENT FRAME DEPTH
                  28          13   0782  1465          BEQL    50$                     ;IF EQL FIRST STACK FRAME
                  18          14   0784  1466          BGTR    40$                     ;IF GTR OTHER STACK FRAME
     50   00000007'9F41       7E   0786  1467          MOVAQ   @#CTL$AQ_EXCVEC[R1],R0  ;GET ADDRESS OF EXCEPTION VECTOR QUADWORD
          14 AC   FE 8F       91   078E  1468          CMPB    #-2,20(AP)              ;EXAMINE PRIMARY VECTOR?
                  02          13   0793  1469          BEQL    30$                     ;IF EQL YES
                  80          D5   0795  1470          TSTL    (R0)+                   ;ADJUST TO SECONDARY VECTOR
                                0797  1471
                  51   60     D0   0797  1472 30$:     MOVL    (R0),R1                 ;GET ADDRESS OF CONDITION HANDLER
                  37          12   079A  1473          BNEQ    60$                     ;IF NEQ CONDITION HANDLER FOUND
                  D6          11   079C  1474          BRB     10$                     ;
                                079E  1475
                69 16 AC      E8   079E  1476 40$:     BLBS    22(AP),100$             ;IF LBS SEARCH COUNT OVERFLOW
                50   0C A0     D0   07A2  1477          MOVL    SAVFP(R0),R0            ;GET ADDRESS OF PREVIOUS FRAME
                  63          13   07A6  1478          BEQL    100$                    ;IF EQL NONE
                10 AC   50      D0   07A8  1479          MOVL    R0,16(AP)               ;SAVE ADDRESS OF ESTABLISHER FRAME
                                07AC  1480
     00000027'EF41   50        D1   07AC  1481 50$:     CMPL    R0,CTL$AL_STACK[R1]     ;FRAME POINTER WITHIN STACK RANGE?
                  55          1A   07B4  1482          BGTRU   100$                    ;IF GTRU NO
           00000000'EF        9F   07B6  1483          PUSHAB  STACK_BASE              ;SET LOWER LIMIT OF USER STACK
                51   03       D1   07BC  1484          CMPL    #PSL$C_USER,R1          ;CURRENT MODE USER?
                  08          13   07BF  1485          BEQL    55$                     ;IF EQL YES
      6E   00000023'EF41       D0   07C1  1486          MOVL    CTL$AL_STACK-4[R1],(SP) ;SET CURRENT MODE STACK LIMIT
                                07C9  1487
                8E   50        D1   07C9  1488 55$:     CMPL    R0,(SP)+                ;FRAME POINTER WITHIN STACK RANGE?
                  3D          1F   07CC  1489          BLSSU   100$                    ;IF LSSU NO
                51   60        D0   07CE  1490          MOVL    (R0),R1                 ;GET ADDRESS OF CONDITION HANDLER
                  04          13   07D1  1491          BEQL    70$                     ;IF EQL NONE
                                07D3  1492
                50   01        C8   07D3  1493 60$:     BISL    #1,R0                   ;INDICATE SUCCESSFUL COMPLETION
                  04          04   07D6  1494          RET                             ;
                                07D7  1495
      10 A0   00000004'8F       D1   07D7  1496 70$:     CMPL    #SYS$CALL_HANDL+4,SAVPC(R0) ;CALL FROM CONDITION DISPATCHER?
                  93          12   07DF  1497          BNEQ    10$                     ;IF NEQ NO
51    06 A0   0C   00           EF   07E1  1498          EXTZV   #0,#12,SAVMSK(R0),R1    ;GET REGISTER SAVE MASK
7E    06 A0   02   0E           EF   07E7  1499          EXTZV   #14,#2,SAVMSK(R0),-(SP) ;GET STACK ALIGNMENT BIAS
                50   14        C0   07ED  1500          ADDL    #SAVRG,R0               ;ADD OFFSET TO REGISTER SAVE AREA
                50   8E        C0   07F0  1501          ADDL    (SP)+,R0                ;ADD STACK ALIGNMENT BIAS
                                07F3  1502
                  03 51       E9   07F3  1503 80$:     BLBC    R1,90$                  ;IF LBC CORRESPONDING REGISTER NOT SAVED
                50   04        C0   07F6  1504          ADDL    #4,R0                   ;ADJUST FOR SAVED REGISTER
                                07F9  1505
     51   51   FF 8F           78   07F9  1506 90$:     ASHL    #-1,R1,R1               ;ANY MORE REGISTERS SAVED?
                  F3          12   07FE  1507          BNEQ    80$                     ;IF NEQ YES
           50   0C A0         D0   0800  1508          MOVL    CHF$L_MCHARGLST+4(R0),R0 ;GET ADDRESS OF MECHANISM ARGUMENTS
           50   04 A0         D0   0804  1509          MOVL    CHF$L_MCH_FRAME(R0),R0  ;GET ADDRESS OF ESTABLISHER FRAME
                  FF6D        31   0808  1510          BRW     20$                     ;
                                080B  1511
           50   08F8 8F       3C   080B  1512 100$:    MOVZWL  #SS$_NOHANDLER,R0       ;SET NO HANDLER FOUND
```

```
                        04  0810  1513          RET                                  ;
                            0811  1514
                            0811  1515 ;
                            0811  1516 ; CONDITION HANDLER FOR SEARCH ROUTINE EXCEPTIONS
                            0811  1517 ;
                            0811  1518
                            0811  1519 CHANDL:                                       ;SEARCH ROUTINE CONDITION HANDLER
                      0000  0811  1520          .WORD   0                            ;ENTRY MASK
          50    04 AC   D0  0813  1521          MOVL    CHF$L_SIGARGLST(AP),R0       ;GET ADDRESS OF SIGNAL ARGUMENTS
     04 A0    0920 8F   B1  0817  1522          CMPW    #SS$_UNWIND, -               ;UNWINDING?
                            081D  1523                    CHF$L_SIG_NAME(R0)         ;
                  12   13  081D  1524          BEQL    10$                          ;IF EQL YES
          51    08 AC   D0  081F  1525          MOVL    CHF$L_MCHARGLST(AP),R1       ;GET ADDRESS OF MECHANISM ARGUMENTS
       0C A1    04 A0   D0  0823  1526          MOVL    CHF$L_SIG_NAME(R0),CHF$L_MCH_SAVR0(R1) ;SET FINAL STATUS
                  7E   7C  0828  1527          CLRQ    -(SP)                        ;CLEAR DEPTH AND NEW PC ARGUMENTS
   00000000'EF    02   FB  082A  1528          CALLS   #2,SYS$UNWIND                ;UNWIND TO ESTABLISHER'S CALLER
                            0831  1529
                        04  0831  1530 10$:     RET                                  ;
```

```
                                0832  1532 .SBTTL DSX$SETPRIEXV - ESTABLISH PRIMARY EXCEPTION VECTOR                [19]
                                0832  1533
                                0832  1534 ;FUNCTIONAL DESCRIPTION                                                  [19]
                                0832  1535 ;       This routine services the DS$SETPRIEXV macro call, used by a     [19]
                                0832  1536 ;       program running under the DS when the progam wishes to establish[19]
                                0832  1537 ;       a primary exception vector to field exception conditions before [19]
                                0832  1538 ;       the supervisor's condition handler takes over.                  [19]
                                0832  1539 ;                                                                        [19]
                                0832  1540 ;INPUTS                                                                  [19]
                                0832  1541 ;       4(AP) = Address of the condition handler                         [19]
                                0832  1542 ;OUTPUTS                                                                 [19]
                                0832  1543 ;       None                                                             [19]
                                0832  1544 ;                                                                        [19]
                                0832  1545
                          0004  0832  1546 .ENTRY  DSX$SETPRIEXV, ^M<R2>          ;                                [19]
                                0834  1547
                      1C    E1  0834  1548         BBC     #DSA$V_USER,-          ;IF USER MODE                    [19]
          12 0000FE00'EF        0836  1549                 DSA$GL_FLAGS,100$      ;THEN                            [19]
                                083C  1550         $SETEXV_S       #0,@4(AP)      ;   CALL SYSTEM SERVICE          [19]
                      00    DD  083C                       PUSHL   #0
                      00    DD  083E                       PUSHL   #0
                   04 BC    DF  0840                       PUSHAL  @4(AP)
                      00    DD  0843                       PUSHL   #0
      00000000'GF     04    FB  0845                       CALLS   #4,G^SYS$SETEXV
                      20    11  084C  1551         BRB     200$                   ;ELSE                            [19]
  00000007'EF     04 AC    D0  084E  1552 100$:   MOVL    4(AP),CTL$AQ_EXCVEC    ;   SET KERNEL PRIMARY VECTOR    [19]
  0000000F'EF     04 AC    D0  0856  1553         MOVL    4(AP),CTL$AQ_EXCVEC+8  ;   SET EXEC   PRIMARY VECTOR    [19]
  00000017'EF     04 AC    D0  085E  1554         MOVL    4(AP),CTL$AQ_EXCVEC+16 ;   SET SUPER  PRIMARY VECTOR    [19]
  0000001F'EF     04 AC    D0  0866  1555         MOVL    4(AP),CTL$AQ_EXCVEC+24 ;   SET USER   PRIMARY VECTOR    [19]
                          04  086E  1556 200$:   RET                            ;RETURN                          [19]
                                086F  1557
                                086F  1558         .END
```

```
$$ARGS                          = 0000000B     D
$$N                             = 00000001     D
$$T1                            = 00000000     D
$ER                             = 00000003     D
$MODULE                           00000000 R   D  03
$SRVCODE_BOOTATTACHED           = 00000000     D
$SRVCODE_CLEAR_INTERLOCK        = 00000009     D
$SRVCODE_GETSYSBUF              = 00000004     D
$SRVCODE_HALTATTACHED           = 00000002     D
$SRVCODE_INTERLOCK_TEST         = 00000007     D
$SRVCODE_PPSCB                  = 0000000A     D
$SRVCODE_PRINTREV               = 00000006     D
$SRVCODE_RELSYSBUF              = 00000005     D
$SRVCODE_SET_INTERLOCK          = 00000008     D
$SRVCODE_SHOWIDLE               = 00000003     D
$SRVCODE_STARTATTACHED          = 00000001     D
AAT_ARITH                         0000016B RG  D  03
AAT_COMPAT                        000002F0 R   D  03
APC$_ABORT                      = 00000006     D
APC$_CONTINUE                   = 00000009     D
APC$_DUMP                       = 00000003     D
APC$_NOP                        = 00000000     D
APC$_START                      = 00000005     D
APC$_ZERO                       = 00000004     D
APM$_ABTDON                     = 00000006     D
APM$_DEVERR                     = 00000002     D
APM$_DONE                       = 0000000A     D
APM$_EXCEPT                     = 0000000B     D
APM$_HARDERR                    = 00000003     D
APM$_MORE                       = 00000008     D
APM$_NOMES                      = 00000000     D
APM$_PREPERR                    = 0000000C     D
APM$_PRGERR                     = 00000005     D
APM$_SOFTERR                    = 00000004     D
APM$_SPOOL                      = 00000009     D
APM$_SYSERR                     = 00000001     D
APSLMNE                           ********     X   00
BIIC$L_BER                      = 00000008       D
BIT...                          = 00000004       D
BI_BER_BIT                        ********W G        00
BPTMAX                            ********     X   00
BUFFER                            FFFFFF00       D
BUFSIZ                          = 00000100       D
CHANDL                            00000811 R   D  04
CHF$L_MCHARGLST                 = 00000008     D
CHF$L_MCH_FRAME                 = 00000004     D
CHF$L_MCH_SAVR0                 = 0000000C     D
CHF$L_SIGARGLST                 = 00000004     D
CHF$L_SIG_NAME                  = 00000004     D
CHR$MCHK                          ********     X   00
CLI$K_BUFSIZ                    = 00000100       D
CLI$K_SIZE                        0000044C       D
CLI$L_ADDRESS                     00000018       D
CLI$L_COMMAND                     00000004       D
CLI$L_DATA                        0000001C       D
CLI$L_FLAGS                       00000000       D
CLI$L_FLAGS2                      00000444       D
CLI$L_LAST                        00000024       D
CLI$L_NEXT                        00000030       D
CLI$L_PASS                        0000002C       D
CLI$L_SUBT                        00000028       D
CLI$L_TEMP_BASE                   00000448       D
CLI$L_TEST                        00000020       D
CLI$M_START_OR_RUN              = 00000008       D
CLI$Q_BUFQWD                      00000034       D
CLI$Q_FILE                        00000008       D
CLI$Q_SECTION                     00000010       D
CLI$Q_TIME                        0000043C       D
CLI$T_BUFFER                      0000003C       D
CLI$V_ADAPTER                   = 00000018       D
CLI$V_ADR                       = 0000000B       D
CLI$V_ASCII                     = 00000013       D
CLI$V_BASE_QUAL                 = 00000002       D
CLI$V_BREAK                     = 0000000A       D
CLI$V_BRIEF                     = 0000001B       D
CLI$V_BYTE                      = 0000000D       D
CLI$V_CLEAR                     = 00000002       D
CLI$V_DEC                       = 00000010       D
CLI$V_DEFAULT                   = 0000000C       D
CLI$V_DEPOSIT                   = 00000019       D
CLI$V_EVENT                     = 00000008       D
CLI$V_EXAM                      = 00000005       D
CLI$V_FLAGS                     = 00000009       D
CLI$V_HEX                       = 00000012       D
CLI$V_KERNEL                    = 00000017       D
CLI$V_LOAD                      = 00000006       D
CLI$V_LONG                      = 0000000F       D
CLI$V_NEXT                      = 00000001       D
CLI$V_NOALLOC                   = 00000000       D
CLI$V_NOTNUF                    = 00000001       D
CLI$V_OCT                       = 00000011       D
CLI$V_PREG                      = 0000001A       D
CLI$V_QA                        = 00000007       D
CLI$V_QACKLOOPLOOPS             = 0000001C       D
CLI$V_QAERRORPRINTS             = 0000001B       D
CLI$V_QAMULTIPLEPASS            = 0000001F       D
CLI$V_QASUBTESTLOOPS            = 0000001E       D
CLI$V_QATESTLOOPS               = 0000001D       D
CLI$V_REG                       = 00000014       D
CLI$V_REQUIRED                  = 00000000       D
CLI$V_RUN                       = 00000015       D
CLI$V_SET                       = 00000003       D
CLI$V_SHOW                      = 00000004       D
CLI$V_START_OR_RUN              = 00000003       D
CLI$V_VALSEC                    = 00000016       D
CLI$V_WORD                      = 0000000E       D
CMK$_APBOOT                     = 00000004       D
CMK$_ASTEXIT                    = 00000000       D
CMK$_CANTIM                     = 0000000B       D
CMK$_HIBER                      = 00000007       D
CMK$_INITSCB                    = 00000008       D
CMK$_LAST                       = 0000000E       D
CMK$_MMENABLE                   = 00000003       D
CMK$_RCONSOLE                   = 00000001       D
```

```
CMK$_REFRESH                    = 00000005     D
CMK$_SCHDWK                     = 00000006     D
CMK$_SETIMR                     = 0000000C     D
CMK$_SETIPL                     = 00000009     D
CMK$_SETPRT                     = 0000000D     D
CMK$_SGIPR                      = 0000000A     D
CMK$_TCONSOLE                   = 00000002     D
COMMON                            00000166 R   D  04
COND_DEBUG                        ********     X  00
COND_HANDLR                       00000000 RG  D  04
COND_HANDLR_CLI                   00000052 R   D  04
COND_HANDLR_EXIT                  00000126 R   D  04
CTL$AL_STACK                      00000027 R   D  03
CTL$AQ_EXCVEC                     00000007 R   D  03
CVTREG$_DATA                    = 00000008     D
CVTREG$_MAXLEN                  = 00000014     D
CVTREG$_MNEADR                  = 0000000C     D
CVTREG$_MSB                     = 00000004     D
CVTREG$_NARGS                   = 0000000B     D
CVTREG$_STRBUF                  = 00000010     D
CVTREG$_V1                      = 00000018     D
CVTREG$_V2                      = 0000001C     D
CVTREG$_V3                      = 00000020     D
CVTREG$_V4                      = 00000024     D
CVTREG$_V5                      = 00000028     D
CVTREG$_V6                      = 0000002C     D
DEBUG$GB_FLAGS                    ********     X  00
DIR...                          = FFFFFFFF     D
DS$AA_BPTADDR                     ********     X  00
DS$ABORT                          ********     X  00
DS$CLI                            ********     X  00
DS$CVTREG                         ********     X  00
DS$GA_BREAKVEC                    ********     X  00
DS$GA_TBITVEC                     ********     X  00
DS$GB_PRIMARY_CPU_IDENTIFIER      ********     X  00
DS$GB_TYPECODE                    ********     X  00
DS$GL_FLAGS                       ********     X  00
DS$GW_TTOUT                       ********     X  00
DS$K_ERROR                      = 00000002     D
DS$K_NORMAL                     = 00000001     D
DS$K_PRINTB                     = 00000002     D
DS$K_PRINTF                     = 00000001     D
DS$K_PRINTI                     = 00000000     D
DS$K_PRINTX                     = 00000003     D
DS$K_SEVERE                     = 00000004     D
DS$K_SUBSYS                     = 00000066     D
DS$K_TYPE_ABORT_PROGRAM         = 00000014     D
DS$K_TYPE_ABORT_TEST            = 00000013     D
DS$K_TYPE_COMMAND_ERR           = 00000015     D
DS$K_TYPE_COMMAND_OUT           = 00000016     D
DS$K_TYPE_CRD_AUTOTEST          = 0000001A     D
DS$K_TYPE_DS_PROMPT             = 00000001     D
DS$K_TYPE_DS_START              = 0000001D     D
DS$K_TYPE_ERRDEV                = 00000008     D
DS$K_TYPE_ERRHARD               = 00000006     D
DS$K_TYPE_ERROR_BODY            = 00000009     D
DS$K_TYPE_ERROR_END             = 0000000A     D
DS$K_TYPE_ERRPREP               = 0000001B     D
DS$K_TYPE_ERRSOFT               = 00000007     D
DS$K_TYPE_ERRSUP                = 00000004     D
DS$K_TYPE_ERRSYS                = 00000005     D
DS$K_TYPE_ERR_HALT              = 0000000D     D
DS$K_TYPE_EXCEPTION             = 0000000C     D
DS$K_TYPE_EXCEPTION_HEAD        = 0000000B     D
DS$K_TYPE_FIRST_PASS            = 00000011     D
DS$K_TYPE_GENERAL               = 00000000     D
DS$K_TYPE_GENERAL_ERROR         = 00000003     D
DS$K_TYPE_NO_TESTS              = 00000012     D
DS$K_TYPE_PARAM_ERROR           = 0000001C     D
DS$K_TYPE_PROGRAM_END           = 00000010     D
DS$K_TYPE_PROGRAM_INFO          = 00000017     D
DS$K_TYPE_PROGRAM_START         = 0000000F     D
DS$K_TYPE_QIO_INVADP            = 00000024     D
DS$K_TYPE_QIO_NODRIVER          = 00000022     D
DS$K_TYPE_QIO_WRONGVER          = 00000023     D
DS$K_TYPE_SCRIPT_ECHO           = 00000021     D
DS$K_TYPE_SCRIPT_PNF            = 0000001E     D
DS$K_TYPE_SCRIPT_PROMPT         = 00000020     D
DS$K_TYPE_SCRIPT_SKIP           = 0000001F     D
DS$K_TYPE_SEQUENCE_ERROR        = 00000019     D
DS$K_TYPE_START_ERR             = 00000018     D
DS$K_TYPE_START_LIST            = 00000025     D
DS$K_TYPE_SUMMARY               = 0000000E     D
DS$K_TYPE_USER_PROMPT           = 00000002     D
DS$K_WARNING                    = 00000000     D
DS$M_ABRTFLG                    = 00000040     D
DS$M_BADTIME                    = 00100000     D
DS$M_BATCH                      = 00400000     D
DS$M_BRKCLR                     = 00001000     D
DS$M_BRKPT                      = 00000800     D
DS$M_CHARFLG                    = 00000100     D
DS$M_CMDFLG                     = 00000080     D
DS$M_CTRLC                      = 00000001     D
DS$M_CTRLO                      = 00010000     D
DS$M_DEVFLG                     = 00000200     D
DS$M_DISABLCC                   = 01000000     D
DS$M_DONFLG                     = 00002000     D
DS$M_ERRFLG                     = 00000010     D
DS$M_EXCEPT                     = 00080000     D
DS$M_EXETST                     = 00040000     D
DS$M_HLTFLG                     = 00000008     D
DS$M_LODFLG                     = 00000002     D
DS$M_MEMMGT                     = 00008000     D
DS$M_NI                         = 04000000     D
DS$M_OUTPUT                     = 00800000     D
DS$M_RUBFLG                     = 00000020     D
DS$M_SCRIPT                     = 00200000     D
DS$M_SETIMR                     = 02000000     D
DS$M_STRFLG                     = 00000004     D
DS$M_SUBT                       = 00004000     D
DS$M_SYSFLG                     = 00000400     D
DS$M_TIMED                      = 02000000     D
DS$M_TIMED_OUT                  = 08000000     D
DS$M_TIMRON                     = 00020000     D
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DS$SERVICE_DISPATCHER           ********  X   00
DS$V_ABRTFLG                =  00000006    D
DS$V_BADTIME                =  00000014    D
DS$V_BATCH                  =  00000016    D
DS$V_BRKCLR                 =  0000000C    D
DS$V_BRKPT                  =  0000000B    D
DS$V_CHARFLG                =  00000008    D
DS$V_CMDFLG                 =  00000007    D
DS$V_CTRLC                  =  00000000    D
DS$V_CTRLO                  =  00000010    D
DS$V_DEVFLG                 =  00000009    D
DS$V_DISABLCC               =  00000018    D
DS$V_DONFLG                 =  0000000D    D
DS$V_ERRFLG                 =  00000004    D
DS$V_EXCEPT                 =  00000013    D
DS$V_EXETST                 =  00000012    D
DS$V_HLTFLG                 =  00000003    D
DS$V_LODFLG                 =  00000001    D
DS$V_MEMMGT                 =  0000000F    D
DS$V_NI                     =  0000001A    D
DS$V_OUTPUT                 =  00000017    D
DS$V_RUBFLG                 =  00000005    D
DS$V_SCRIPT                 =  00000015    D
DS$V_SETIMR                 =  00000019    D
DS$V_STRFLG                 =  00000002    D
DS$V_SUBT                   =  0000000E    D
DS$V_SYSFLG                 =  0000000A    D
DS$V_TIMED                  =  00000019    D
DS$V_TIMED_OUT              =  0000001B    D
DS$V_TIMRON                 =  00000011    D
DS$_AP_NORMAL_BREAK         =  00660150    D
DS$_ARITH                   =  006600D0    D
DS$_ASBE                    =  00660118    D
DS$_BADLINK                 =  006600F0    D
DS$_BADTYPE                 =  006600E8    D
DS$_BIIC                    =  00660120    D
DS$_CHME                    =  006600A8    D
DS$_CHMK                    =  006600E0    D
DS$_DEVNAME                 =  00660108    D
DS$_ERROR                   =  00660002    D
DS$_FHWE                    =  00660068    D
DS$_FRAGBUF                 =  00660080    D
DS$_GK_EXE_MCHK             =  00000000    D
DS$_GK_INITSCB              =  00000002    D
DS$_GK_INT_WORK             =  00000003    D
DS$_GK_TST$MCHK             =  00000001    D
DS$_ICBUSY                  =  006600C8    D
DS$_ICERR                   =  006600C0    D
DS$_IHWE                    =  00660060    D
DS$_ILLCHAR                 =  00660018    D
DS$_ILLPAGCNT               =  00660078    D
DS$_ILLUNIT                 =  00660100    D
DS$_INIT_FAIL               =  00660140    D
DS$_INSFMEM                 =  00660050    D
DS$_INVCPU                  =  00660130    D
DS$_IPL2HI                  =  006600B8    D
DS$_IVADDR                  =  00660040    D
DS$_IVVECT                  =  00660038    D
DS$_KRNLSTK                 =  00660090    D
DS$_LOGIC                   =  00660070    D
DS$_MCHK                    =  00660088    D
DS$_MEM_ALLOC_ERR           =  00660138    D
DS$_MMOFF                   =  00660058    D
DS$_NEEDUNIT                =  006600F8    D
DS$_NODE                    =  00660128    D
DS$_NOPCS                   =  00660110    D
DS$_NORMAL                  =  00660001    D
DS$_NOSUPPORT               =  006600B1    D
DS$_NOTALLOWMP              =  00660148    D
DS$_NOTDON                  =  00660030    D
DS$_NOTIMP                  =  006600B0    D
DS$_NULLSTR                 =  00660010    D
DS$_OVERFLOW                =  00660008    D
DS$_POWER                   =  00660098    D
DS$_PROGERR                 =  00660020    D
DS$_SEVERE                  =  00660004    D
DS$_TRANSL                  =  006600A0    D
DS$_TRUNCATE                =  00660028    D
DS$_UNEXPINT                =  006600D8    D
DS$_UNSUPPDEV               =  00660158    D
DS$_VASFULL                 =  00660048    D
DS$_WARNING                 =  00660000    D
DSA$AL_APTMAIL                 0000FE00    D
DSA$AT_APTTXT                  0000FA00    D
DSA$GL_APTCOM                  0000FE04    D
DSA$GL_DEVLEN                  0000FE58    D
DSA$GL_ERRNO                   0000FE44    D
DSA$GL_EVENT                   0000FE48    D
DSA$GL_FLAGS                   0000FE00    D
DSA$GL_MSGTYP                  0000FE40    D
DSA$GL_PASSES                  0000FE08    D
DSA$GL_PASSNO                  0000FE54    D
DSA$GL_SECTNO                  0000FE10    D
DSA$GL_SID                     0000FE14    D
DSA$GL_SUBTNO                  0000FE4C    D
DSA$GL_TESTNO                  0000FE50    D
DSA$GL_UNITS                   0000FE0C    D
DSA$GQ_MSGPTR                  0000FE68    D
DSA$GT_DEVNAM                  0000FE5C    D
DSA$V_USER                  =  0000001C    D
DSR$FAULT_CLEAR                ********    X   00
DSR$FIND_USER_PC               ********    X   00
DSX$PRINTB                     ********    X   00
DSX$PRINTI                     ********    X   00
DSX$PRINTSIG                   00000148 RG  D   04
DSX$PRINTSIGI                  0000015A RG  D   04
DSX$PRINTX                     ********      X   00
DSX$SETPRIEXV                  00000832 RG  D   04
DS_ERRSUP                      ********      X   00
ESTKPTR                        ********      X   00
EXCPT                          00000132 R   D   04
EXE$ACVIOLAT                   00000554 RG  D   04
EXE$BREAK                      0000057C RG  D   04
EXE$GB_CPUTYPE                 ********      X   00
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EXE$REFLECT                     00000667 RG D  04
EXE$ROPRAND                     00000544 RG D  04
EXE$TBIT                        00000610 RG D  04
EXE_3ARG                        00000663 R  D  04
EXE_4ARG                        0000065F R  D  04
EXE_ACCVIO                      00000554 RG D  04
EXE_ARITH                       00000570 RG D  04
EXE_BREAK                       0000057C RG D  04
EXE_CHME                        00000648 RG D  04
EXE_CHMK                        00000640 RG D  04
EXE_CHMS                        00000650 RG D  04
EXE_CHMU                        00000658 RG D  04
EXE_COMPAT                      00000568 RG D  04
EXE_EXCEPTION                   00000667 R  D  04
EXE_KRNLSTK                     0000051C RG D  04
EXE_MCHK                        000004FC RG D  04
EXE_OPCCUS                      0000053C RG D  04
EXE_OPCDEC                      00000534 RG D  04
EXE_POWER                       00000528 RG D  04
EXE_RADRMOD                     0000054C RG D  04
EXE_ROPRAND                     00000544 RG D  04
EXE_TBIT                        00000610 RG D  04
EXE_TRANSL                      0000055C RG D  04
EXE_UNEXPINT                    00000636 RG D  04
FIND_USERPC                     000004A0 RG D  04
FMT_BER                         ********W G    00
FMT_BI_UNEXPINT                 0000041F R  D  03
FMT_CHMX_ARG                    00000523 R  D  03
FMT_ERRPC                       00000465 R  D  03
FMT_ERRPSL                      000004B9 R  D  03
FMT_EXCEPT                      000003BD R  D  03
FMT_EXCEP_CODE                  0000050C R  D  03
FMT_PXXX                        0000056D R  D  03
FMT_UMCHK                       00000383 R  D  03
FMT_UNEXPINT                    000003E7 R  D  03
FMT_UNK_ARG                     00000536 R  D  03
FMT_UNK_CNT                     00000558 R  D  03
FMT_USER_PC_NF                  0000049A R  D  03
FMT_USRPC                       0000047E R  D  03
FMT_VIRT                        000004DA R  D  03
HANDLER                   =     00000000    D
ID_TEMP                         00000014 R  D  02
IO$M_CANCTRLO                   ********   X   00
IO$_WRITEVBLK                   ********   X   00
IS                        =     00000001     D
ISTKPTR                         ********   X   00
LOCAL                           FFFFFF00     D
MMG$PAGEFAULT                   0000055C RG D  04
MODELST                         ********   X   00
MP$GL_AP_SIGNAL_ARRAY           ********W G    00
MP$GL_SAVED_PSL                 ********W G    00
MP$GR_BOOTED_PROCESSORS         ********   X   00
MP$GR_SAVED_GPRS                ********W G    00
MP$V_IL_ALLN              =     00000004     D
MP$V_IL_CNDB              =     00000007     D
MP$V_IL_CNHN              =     00000006     D
MP$V_IL_DELN              =     00000005     D
MP$V_IL_DSBK              =     00000008     D
MP$V_IL_ERSP              =     00000003     D
MP$V_IL_GTLN              =     00000009     D
MP$V_IL_NUMT              =     00000000     D
MP$V_IL_PRNT              =     00000001     D
MP$V_IL_RRPT              =     00000002     D
MP$_COND_HANDLR                 ********W G    00
MP$_GET_PROCESSOR_ID            ********   X   00
MP$_RESUME_ATTACHED_PROCESSORS  ********   X   00
MSG_ACCVIO                      000000B7 R  D  03
MSG_BREAK                       000000F3 R  D  03
MSG_CHME                        0000012F R  D  03
MSG_CHMK                        0000011B R  D  03
MSG_CHMS                        00000143 R  D  03
MSG_CHMU                        00000157 R  D  03
MSG_COMPAT                      00000107 R  D  03
MSG_DECOVF                      0000028C R  D  03
MSG_FLTDIV                      00000264 R  D  03
MSG_FLTDIV_F                    000002C8 R  D  03
MSG_FLTOVF                      00000250 R  D  03
MSG_FLTOVF_F                    000002B4 R  D  03
MSG_FLTUND                      00000278 R  D  03
MSG_FLTUND_F                    000002DC R  D  03
MSG_INTDIV                      0000023C R  D  03
MSG_INTOVF                      00000228 R  D  03
MSG_KRNLSTK                     0000003F R  D  03
MSG_OPCCUS                      0000007B R  D  03
MSG_OPCDEC                      00000067 R  D  03
MSG_POWER                       00000053 R  D  03
MSG_RADRMOD                     000000A3 R  D  03
MSG_ROPRAND                     0000008F R  D  03
MSG_SUBRNG                      000002A0 R  D  03
MSG_TBIT                        000000DF R  D  03
MSG_TRANSL                      000000CB R  D  03
MSG_UMCHK                       00000037 R  D  03
NEW_AP_FP                       00000004 R  D  02
NEW_PC_PSL                      0000000C R  D  02
NEW_SP                          00000000 R  D  02
NORMAL                          0000070A R  D  04
PCB_BASE                        ********    X  00
PR$_SID_TYP8SS            =     00000005     D
PR$_SID_TYPUV2            =     00000008     D
PRINT_CHMX_ARG                  0000041E R  D  04
PRINT_PC_PSL                    00000433 R  D  04
PRINT_TYPE_VA                   00000407 R  D  04
PRINT_UNK_EXC                   0000030D R  D  04
PSL$C_USER                =     00000003     D
PSL$M_CM                  =     80000000     D
PSL$M_FPD                 =     08000000     D
PSL$M_TBIT                =     00000010     D
PSL$M_TP                  =     40000000     D
PSL$S_CURMOD              =     00000002     D
PSL$S_PRVMOD              =     00000002     D
PSL$V_CM                  =     0000001F     D
PSL$V_CURMOD              =     00000018     D
PSL$V_IS                  =     0000001A     D
PSL$V_PRVMOD              =     00000016     D
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RESIGNAL                        00000494 R  D  04
SAVABS...                     = FFFFFF00    D
SAVAP                         = 00000008    D
SAVFP                         = 0000000C    D
SAVMSK                        = 00000006    D
SAVPC                         = 00000010    D
SAVPSW                        = 00000004    D
SAVRG                         = 00000014    D
SCB$L_ACCESS                    00000020    D
SCB$L_ARITH                     00000034    D
SCB$L_BREAK                     0000002C    D
SCB$L_CHME                      00000044    D
SCB$L_CHMK                      00000040    D
SCB$L_CHMS                      00000048    D
SCB$L_CHMU                      0000004C    D
SCB$L_COMPAT                    00000030    D
SCB$L_KNLSTK                    00000008    D
SCB$L_MACHCHK                   00000004    D
SCB$L_OPCCUS                    00000014    D
SCB$L_OPCDEC                    00000010    D
SCB$L_POWER                     0000000C    D
SCB$L_RADRMOD                   0000001C    D
SCB$L_ROPRAND                   00000018    D
SCB$L_RXDB                      000000F8    D
SCB$L_SFTLVL1                   00000084    D
SCB$L_SFTLVL10                  000000A8    D
SCB$L_SFTLVL11                  000000AC    D
SCB$L_SFTLVL12                  000000B0    D
SCB$L_SFTLVL13                  000000B4    D
SCB$L_SFTLVL14                  000000B8    D
SCB$L_SFTLVL15                  000000BC    D
SCB$L_SFTLVL2                   00000088    D
SCB$L_SFTLVL3                   0000008C    D
SCB$L_SFTLVL4                   00000090    D
SCB$L_SFTLVL5                   00000094    D
SCB$L_SFTLVL6                   00000098    D
SCB$L_SFTLVL7                   0000009C    D
SCB$L_SFTLVL8                   000000A0    D
SCB$L_SFTLVL9                   000000A4    D
SCB$L_TBIT                      00000028    D
SCB$L_TIMER                     000000C0    D
SCB$L_TRANSL                    00000024    D
SCB$L_TXDB                      000000FC    D
SCB$L_VM                        00000038    D
SCB$L_ZERO                      00000000    D
SCB_IMAGE                       ********  X   00
SCRIPT$STOP                     ********  X   00
SEARCH                          0000076B R  D  04
SIZ...                        = 00000001    D
SS$_ACCVIO                    = 0000000C    D
SS$_BREAK                     = 00000414    D
SS$_CMODSUPR                  = 0000041C    D
SS$_CMODUSER                  = 00000424    D
SS$_COMPAT                    = 0000042C    D
SS$_CONTINUE                  = 00000001    D
SS$_MCHECK                    = 000002BC    D
SS$_NOHANDLER                 = 000008F8    D
SS$_OPCCUS                    = 00000434    D
SS$_OPCDEC                    = 0000043C    D
SS$_RADRMOD                   = 0000044C    D
SS$_RESIGNAL                  = 00000918    D
SS$_ROPRAND                   = 00000454    D
SS$_TBIT                      = 00000464    D
SS$_UNWIND                    = 00000920    D
SSTKPTR                         ********  X   00
STACK_BASE                      ********  X   00
SYS$CALL_HANDL                  ********  X   00
SYS$QIO                         ********  G   04
SYS$SETEXV                      ********  G   04
SYS$UNWIND                      ********  X   00
TST$MCHK                        000004E4 RG D  04
T_ABORT                         000006D0 R  D  03
T_ACCVIO                        0000060B R  D  03
T_BREAK                         00000640 R  D  03
T_CHME                          0000065E R  D  03
T_CHMK                          0000064B R  D  03
T_CHMS                          00000674 R  D  03
T_CHMU                          0000068B R  D  03
T_COMPAT                        000006EC R  D  03
T_DECOVF                        0000078C R  D  03
T_FAULT                         000006CA R  D  03
T_FLTDIV                        00000759 R  D  03
T_FLTOVF                        00000747 R  D  03
T_FLTUND                        00000779 R  D  03
T_FLT_ABO                       000006E0 R  D  03
T_INTDIV                        00000730 R  D  03
T_INTOVF                        0000071F R  D  03
T_INTRPT                        000006D6 R  D  03
T_KRNLSTK                       00000581 R  D  03
T_OPCCUS                        000005C3 R  D  03
T_OPCDEC                        000005A3 R  D  03
T_POWER                         00000598 R  D  03
T_RADRMOD                       000005F2 R  D  03
T_ROPRAND                       000005E1 R  D  03
T_STKVIO                        000006FF R  D  03
T_SUBRNG                        0000079D R  D  03
T_TBIT                          0000063A R  D  03
T_TRANSL                        00000624 R  D  03
T_TRAP                          000006C5 R  D  03
T_XCHFAILURE                    0000069C R  D  03
USTKPTR                         ********    X   00
VAX$MODIFY_EXCEPTION            ********W GX   00
X_BREAK                         0000034D R  D  04
X_CHMS                          00000355 R  D  04
X_CHMU                          0000035D R  D  04
X_COMPAT                        00000365 R  D  04
X_DECOVF                        000003DF R  D  04
X_FLTDIV                        000003CF R  D  04
X_FLTDIV_F                      000003F7 R  D  04
X_FLTOVF                        000003C7 R  D  04
X_FLTOVF_F                      000003EF R  D  04
X_FLTUND                        000003D7 R  D  04
X_FLTUND_F                      000003FF R  D  04
X_INTDIV                        000003BF R  D  04
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X_INTOVF                    000003B7 R  D  04
X_OPCCUS                    0000038F R  D  04
X_OPCDEC                    00000397 R  D  04
X_RADRMOD                   0000039F R  D  04
X_ROPRAND                   000003A7 R  D  04
X_SUBRNG                    000003E7 R  D  04
X_TBIT                      000003AF R  D  04

                                  +----------------+
                                  ! Psect synopsis !
                                  +----------------+

PSECT name                  Allocation          PSECT No.  Attributes
----------                  ----------          ---------  ----------
.  ABS  .                   00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                       FFFFFF00  (    0.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
WORK                        00000018  (   24.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR NOEXE   RD    WRT NOVEC LONG
DATA                        000007AD  ( 1965.)  03 (  3.)  NOPIC   USR   CON   REL   LCL   SHR NOEXE   RD  NOWRT NOVEC LONG
CODE                        0000086F  ( 2159.)  04 (  4.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD  NOWRT NOVEC LONG
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Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$ARGS	=0000000B	212 (1)	212 (1)
$$N	=00000001	967 (1)	264 (1) 265 (1) 266 (1) 267 (1) 268 (1) 269 (1) 270 (1) 271 (1) 272 (1) 273 (1) 274 (1) 275 (1) 276 (1) 277 (1) 278 (1) 279 (1) 300 (1) 301 (1) 302 (1) 303 (1) 304 (1) 305 (1) 306 (1) 307 (1) 308 (1) 309 (1) 964 (1) #-967 (1)
$$T1	=00000000	1550 (1)	1550 (1) 212 (1) 423 (1)
$ER	=00000003	1393 (1)	#-1339 (1) #-1393 (1)
$MODULE	00000000-R	246 (1)	1339 (1) 1393 (1)
$SRVCODE_BOOTATTACHED	=00000000	495 (1)	
$SRVCODE_CLEAR_INTERLOCK	=00000009	495 (1)	#-495 (1)
$SRVCODE_GETSYSBUF	=00000004	495 (1)	
$SRVCODE_HALTATTACHED	=00000002	495 (1)	
$SRVCODE_INTERLOCK_TEST	=00000007	495 (1)	
$SRVCODE_PPSCB	=0000000A	495 (1)	
$SRVCODE_PRINTREV	=00000006	495 (1)	
$SRVCODE_RELSYSBUF	=00000005	495 (1)	
$SRVCODE_SET_INTERLOCK	=00000008	495 (1)	#-414 (1)
$SRVCODE_SHOWIDLE	=00000003	495 (1)	
$SRVCODE_STARTATTACHED	=00000001	495 (1)	
AAT_ARITH	0000016B-R	282 (1)	
AAT_COMPAT	000002F0-R	311 (1)	#-747 (1)
APC$_ABORT	=00000006	221 (1)	
APC$_CONTINUE	=00000009	221 (1)	
APC$_DUMP	=00000003	221 (1)	
APC$_NOP	=00000000	221 (1)	
APC$_START	=00000005	221 (1)	
APC$_ZERO	=00000004	221 (1)	
APM$_ABTDON	=00000006	221 (1)	
APM$_DEVERR	=00000002	221 (1)	
APM$_DONE	=0000000A	221 (1)	
APM$_EXCEPT	=0000000B	221 (1)	#-431 (1)
APM$_HARDERR	=00000003	221 (1)	
APM$_MORE	=00000008	221 (1)	
APM$_NOMES	=00000000	221 (1)	
APM$_PREPERR	=0000000C	221 (1)	
APM$_PRGERR	=00000005	221 (1)	
APM$_SOFTERR	=00000004	221 (1)	
APM$_SPOOL	=00000009	221 (1)	
APM$_SYSERR	=00000001	221 (1)	#-472 (1)
APSLMNE	00000000-XR		198 (1) 903 (1)
BIIC$L_BER	=00000008		#-652 (1) #-653 (1)
BIT...	=00000004	227 (1)	211 (1) 213 (1) 219 (1) 220 (1) 227 (1)
BI_BER_BIT	00000000-XR		191 (1) 656 (1)
BPTMAX	00000000-XR		#-1215 (1) 195 (1)
BUFFER	FFFFFF00	549 (1)	656 (1) 657 (1) 903 (1) 904 (1)
BUFSIZ	=00000100	229 (1)	549 (1) #-656 (1) #-903 (1)

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CHANDL                          00000811-R   1519   (1)      1458   (1)
CHF$L_MCHARGLST                 =00000008                  #-1508   (1)    #-1525   (1)
CHF$L_MCH_FRAME                 =00000004                  #-1509   (1)
CHF$L_MCH_SAVR0                 =0000000C                  #-1526   (1)
CHF$L_SIGARGLST                 =00000004                  #-1521   (1)
CHF$L_SIG_NAME                  =00000004                  #-1523   (1)    #-1526   (1)
CHR$MCHK                        00000000-XR                  197    (1)      609    (1)
CLI$K_BUFSIZ                    =00000100      218   (1)     218    (1)
CLI$K_SIZE                      0000044C       218   (1)
CLI$L_ADDRESS                   00000018       218   (1)
CLI$L_COMMAND                   00000004       218   (1)
CLI$L_DATA                      0000001C       218   (1)
CLI$L_FLAGS                     00000000       218   (1)
CLI$L_FLAGS2                    00000444       218   (1)
CLI$L_LAST                      00000024       218   (1)
CLI$L_NEXT                      00000030       218   (1)
CLI$L_PASS                      0000002C       218   (1)
CLI$L_SUBT                      00000028       218   (1)
CLI$L_TEMP_BASE                 00000448       218   (1)
CLI$L_TEST                      00000020       218   (1)
CLI$M_START_OR_RUN              =00000008      218   (1)
CLI$Q_BUFQWD                    00000034       218   (1)
CLI$Q_FILE                      00000008       218   (1)
CLI$Q_SECTION                   00000010       218   (1)
CLI$Q_TIME                      0000043C       218   (1)
CLI$T_BUFFER                    0000003C       218   (1)
CLI$V_ADAPTER                   =00000018      218   (1)
CLI$V_ADR                       =0000000B      218   (1)
CLI$V_ASCII                     =00000013      218   (1)
CLI$V_BASE_QUAL                 =00000002      218   (1)
CLI$V_BREAK                     =0000000A      218   (1)
CLI$V_BRIEF                     =0000001B      218   (1)
CLI$V_BYTE                      =0000000D      218   (1)
CLI$V_CLEAR                     =00000002      218   (1)
CLI$V_DEC                       =00000010      218   (1)
CLI$V_DEFAULT                   =0000000C      218   (1)
CLI$V_DEPOSIT                   =00000019      218   (1)
CLI$V_EVENT                     =00000008      218   (1)
CLI$V_EXAM                      =00000005      218   (1)
CLI$V_FLAGS                     =00000009      218   (1)
CLI$V_HEX                       =00000012      218   (1)
CLI$V_KERNEL                    =00000017      218   (1)
CLI$V_LOAD                      =00000006      218   (1)
CLI$V_LONG                      =0000000F      218   (1)
CLI$V_NEXT                      =00000001      218   (1)
CLI$V_NOALLOC                   =00000000      218   (1)
CLI$V_NOTNUF                    =00000001      218   (1)
CLI$V_OCT                       =00000011      218   (1)
CLI$V_PREG                      =0000001A      218   (1)
CLI$V_QA                        =00000007      218   (1)
CLI$V_QACKLOOPLOOPS             =0000001C      218   (1)
CLI$V_QAERRORPRINTS             =0000001B      218   (1)
CLI$V_QAMULTIPLEPASS            =0000001F      218   (1)
CLI$V_QASUBTESTLOOPS            =0000001E      218   (1)
CLI$V_QATESTLOOPS               =0000001D      218   (1)
CLI$V_REG                       =00000014      218   (1)
CLI$V_REQUIRED                  =00000000      218   (1)
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CLI$V_RUN                       =00000015     218    (1)
CLI$V_SET                       =00000003     218    (1)
CLI$V_SHOW                      =00000004     218    (1)
CLI$V_START_OR_RUN              =00000003     218    (1)       218    (1)
CLI$V_VALSEC                    =00000016     218    (1)
CLI$V_WORD                      =0000000E     218    (1)
CMK$_APBOOT                     =00000004     219    (1)
CMK$_ASTEXIT                    =00000000     219    (1)
CMK$_CANTIM                     =0000000B     219    (1)
CMK$_HIBER                      =00000007     219    (1)
CMK$_INITSCB                    =00000008     219    (1)
CMK$_LAST                       =0000000E     219    (1)
CMK$_MMENABLE                   =00000003     219    (1)
CMK$_RCONSOLE                   =00000001     219    (1)
CMK$_REFRESH                    =00000005     219    (1)
CMK$_SCHDWK                     =00000006     219    (1)
CMK$_SETIMR                     =0000000C     219    (1)
CMK$_SETIPL                     =00000009     219    (1)
CMK$_SETPRT                     =0000000D     219    (1)
CMK$_SGIPR                      =0000000A     219    (1)
CMK$_TCONSOLE                   =00000002     219    (1)
COMMON                           00000166-R   560    (1)    #-554    (1)
COND_DEBUG                       00000000-XR           197    (1)      249    (1)      250    (1)      251    (1)
                                                       252    (1)
COND_HANDLR                      00000000-R   413    (1)    1390    (1)
COND_HANDLR_CLI                  00000052-R   429    (1)    #-425    (1)
COND_HANDLR_EXIT                 00000126-R   494    (1)    #-427    (1)
CTL$AL_STACK                     00000027-R   254    (1)    #-1481   (1)    #-1486   (1)
CTL$AQ_EXCVEC                    00000007-R   248    (1)    1467     (1)    #-1552   (1)    #-1553   (1)    #-1554   (1)
                                                       #-1555   (1)
CVTREG$_DATA                    =00000008     212    (1)
CVTREG$_MAXLEN                  =00000014     212    (1)
CVTREG$_MNEADR                  =0000000C     212    (1)
CVTREG$_MSB                     =00000004     212    (1)
CVTREG$_NARGS                   =0000000B     212    (1)
CVTREG$_STRBUF                  =00000010     212    (1)
CVTREG$_V1                      =00000018     212    (1)
CVTREG$_V2                      =0000001C     212    (1)
CVTREG$_V3                      =00000020     212    (1)
CVTREG$_V4                      =00000024     212    (1)
CVTREG$_V5                      =00000028     212    (1)
CVTREG$_V6                      =0000002C     212    (1)
DEBUG$GB_FLAGS                   00000000-XR           #-1237   (1)      196    (1)
DIR...                          =FFFFFFFF     549    (1)    549    (1)
DS$AA_BPTADDR                    00000000-XR           #-1216   (1)      196    (1)
DS$ABORT                         00000000-XR           1340     (1)    1394     (1)      195    (1)
DS$CLI                           00000000-XR           197      (1)    476      (1)
DS$CVTREG                        00000000-XR           198      (1)    656      (1)      903    (1)
DS$GA_BREAKVEC                   00000000-XR           #-1211   (1)      196    (1)
DS$GA_TBITVEC                    00000000-XR           #-1235   (1)      196    (1)
DS$GB_PRIMARY_CPU_IDENTIFIER     00000000-XR           #-1189   (1)    #-1316   (1)      205    (1)
DS$GB_TYPECODE                   00000000-XR           202      (1)    #-435    (1)    #-437    (1)    #-562    (1)
                                                       #-649    (1)    #-693    (1)    #-699    (1)    #-876    (1)
                                                       #-886    (1)    #-895    (1)    #-909    (1)    #-914    (1)
DS$GL_FLAGS                      00000000-XR           199      (1)    469      (1)      470    (1)
DS$GW_TTOUT                      00000000-XR           202      (1)    #-423    (1)
DS$K_ERROR                      =00000002     213    (1)
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DS$K_NORMAL                     =00000001     213    (1)
DS$K_PRINTB                     =00000002     211    (1)
DS$K_PRINTF                     =00000001     211    (1)
DS$K_PRINTI                     =00000000     211    (1)
DS$K_PRINTX                     =00000003     211    (1)
DS$K_SEVERE                     =00000004     213    (1)
DS$K_SUBSYS                     =00000066     213    (1)      213    (1)
DS$K_TYPE_ABORT_PROGRAM         =00000014     211    (1)
DS$K_TYPE_ABORT_TEST            =00000013     211    (1)
DS$K_TYPE_COMMAND_ERR           =00000015     211    (1)
DS$K_TYPE_COMMAND_OUT           =00000016     211    (1)
DS$K_TYPE_CRD_AUTOTEST          =0000001A     211    (1)
DS$K_TYPE_DS_PROMPT             =00000001     211    (1)
DS$K_TYPE_DS_START              =0000001D     211    (1)
DS$K_TYPE_ERRDEV                =00000008     211    (1)
DS$K_TYPE_ERRHARD               =00000006     211    (1)
DS$K_TYPE_ERROR_BODY            =00000009     211    (1)
DS$K_TYPE_ERROR_END             =0000000A     211    (1)
DS$K_TYPE_ERRPREP               =0000001B     211    (1)
DS$K_TYPE_ERRSOFT               =00000007     211    (1)
DS$K_TYPE_ERRSUP                =00000004     211    (1)
DS$K_TYPE_ERRSYS                =00000005     211    (1)
DS$K_TYPE_ERR_HALT              =0000000D     211    (1)
DS$K_TYPE_EXCEPTION             =0000000C     211    (1)      #-434    (1)    #-698    (1)    #-875    (1)    #-885    (1)
                                                              #-894    (1)
DS$K_TYPE_EXCEPTION_HEAD        =0000000B     211    (1)      #-561    (1)    #-648    (1)    #-692    (1)
DS$K_TYPE_FIRST_PASS            =00000011     211    (1)
DS$K_TYPE_GENERAL               =00000000     211    (1)
DS$K_TYPE_GENERAL_ERROR         =00000003     211    (1)
DS$K_TYPE_NO_TESTS              =00000012     211    (1)
DS$K_TYPE_PARAM_ERROR           =0000001C     211    (1)
DS$K_TYPE_PROGRAM_END           =00000010     211    (1)
DS$K_TYPE_PROGRAM_INFO          =00000017     211    (1)
DS$K_TYPE_PROGRAM_START         =0000000F     211    (1)
DS$K_TYPE_QIO_INVADP            =00000024     211    (1)
DS$K_TYPE_QIO_NODRIVER          =00000022     211    (1)
DS$K_TYPE_QIO_WRONGVER          =00000023     211    (1)
DS$K_TYPE_SCRIPT_ECHO           =00000021     211    (1)
DS$K_TYPE_SCRIPT_PNF            =0000001E     211    (1)
DS$K_TYPE_SCRIPT_PROMPT         =00000020     211    (1)
DS$K_TYPE_SCRIPT_SKIP           =0000001F     211    (1)
DS$K_TYPE_SEQUENCE_ERROR        =00000019     211    (1)
DS$K_TYPE_START_ERR             =00000018     211    (1)
DS$K_TYPE_START_LIST            =00000025     211    (1)
DS$K_TYPE_SUMMARY               =0000000E     211    (1)
DS$K_TYPE_USER_PROMPT           =00000002     211    (1)
DS$K_WARNING                    =00000000     213    (1)
DS$M_ABRTFLG                    =00000040     220    (1)
DS$M_BADTIME                    =00100000     220    (1)
DS$M_BATCH                      =00400000     220    (1)
DS$M_BRKCLR                     =00001000     220    (1)
DS$M_BRKPT                      =00000800     220    (1)
DS$M_CHARFLG                    =00000100     220    (1)
DS$M_CMDFLG                     =00000080     220    (1)
DS$M_CTRLC                      =00000001     220    (1)
DS$M_CTRLO                      =00010000     220    (1)
DS$M_DEVFLG                     =00000200     220    (1)
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DS$M_DISABLCC                   =01000000     220    (1)
DS$M_DONFLG                     =00002000     220    (1)
DS$M_ERRFLG                     =00000010     220    (1)
DS$M_EXCEPT                     =00080000     220    (1)
DS$M_EXETST                     =00040000     220    (1)
DS$M_HLTFLG                     =00000008     220    (1)
DS$M_LODFLG                     =00000002     220    (1)
DS$M_MEMMGT                     =00008000     220    (1)
DS$M_NI                         =04000000     220    (1)
DS$M_OUTPUT                     =00800000     220    (1)
DS$M_RUBFLG                     =00000020     220    (1)
DS$M_SCRIPT                     =00200000     220    (1)
DS$M_SETIMR                     =02000000     220    (1)
DS$M_STRFLG                     =00000004     220    (1)
DS$M_SUBT                       =00004000     220    (1)
DS$M_SYSFLG                     =00000400     220    (1)
DS$M_TIMED                      =02000000     220    (1)
DS$M_TIMED_OUT                  =08000000     220    (1)
DS$M_TIMRON                     =00020000     220    (1)
DS$SERVICE_DISPATCHER            00000000-XR                204    (1)      414    (1)      495    (1)
DS$V_ABRTFLG                    =00000006     220    (1)
DS$V_BADTIME                    =00000014     220    (1)
DS$V_BATCH                      =00000016     220    (1)
DS$V_BRKCLR                     =0000000C     220    (1)
DS$V_BRKPT                      =0000000B     220    (1)
DS$V_CHARFLG                    =00000008     220    (1)
DS$V_CMDFLG                     =00000007     220    (1)    #-469    (1)
DS$V_CTRLC                      =00000000     220    (1)
DS$V_CTRLO                      =00000010     220    (1)
DS$V_DEVFLG                     =00000009     220    (1)
DS$V_DISABLCC                   =00000018     220    (1)
DS$V_DONFLG                     =0000000D     220    (1)
DS$V_ERRFLG                     =00000004     220    (1)
DS$V_EXCEPT                     =00000013     220    (1)    #-470    (1)
DS$V_EXETST                     =00000012     220    (1)
DS$V_HLTFLG                     =00000003     220    (1)
DS$V_LODFLG                     =00000001     220    (1)
DS$V_MEMMGT                     =0000000F     220    (1)
DS$V_NI                         =0000001A     220    (1)
DS$V_OUTPUT                     =00000017     220    (1)
DS$V_RUBFLG                     =00000005     220    (1)
DS$V_SCRIPT                     =00000015     220    (1)
DS$V_SETIMR                     =00000019     220    (1)
DS$V_STRFLG                     =00000002     220    (1)
DS$V_SUBT                       =0000000E     220    (1)
DS$V_SYSFLG                     =0000000A     220    (1)
DS$V_TIMED                      =00000019     220    (1)
DS$V_TIMED_OUT                  =0000001B     220    (1)
DS$V_TIMRON                     =00000011     220    (1)
DS$_AP_NORMAL_BREAK             =00660150     213    (1)
DS$_ARITH                       =006600D0     213    (1)    #-1172   (1)    #-669    (1)
DS$_ASBE                        =00660118     213    (1)
DS$_BADLINK                     =006600F0     213    (1)
DS$_BADTYPE                     =006600E8     213    (1)
DS$_BIIC                        =00660120     213    (1)
DS$_CHME                        =006600A8     213    (1)    #-1269   (1)    #-622    (1)
DS$_CHMK                        =006600E0     213    (1)    #-1261   (1)    #-627    (1)
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DS$_DEVNAME                     =00660108       213     (1)
DS$_ERROR                       =00660002       213     (1)
DS$_FHWE                        =00660068       213     (1)
DS$_FRAGBUF                     =00660080       213     (1)
DS$_GK_EXE_MCHK                 =00000000       227     (1)     #-1074    (1)
DS$_GK_INITSCB                  =00000002       227     (1)
DS$_GK_INT_WORK                 =00000003       227     (1)
DS$_GK_TST$MCHK                 =00000001       227     (1)     #-1018    (1)
DS$_ICBUSY                      =006600C8       213     (1)
DS$_ICERR                       =006600C0       213     (1)
DS$_IHWE                        =00660060       213     (1)
DS$_ILLCHAR                     =00660018       213     (1)
DS$_ILLPAGCNT                   =00660078       213     (1)
DS$_ILLUNIT                     =00660100       213     (1)
DS$_INIT_FAIL                   =00660140       213     (1)
DS$_INSFMEM                     =00660050       213     (1)
DS$_INVCPU                      =00660130       213     (1)
DS$_IPL2HI                      =006600B8       213     (1)
DS$_IVADDR                      =00660040       213     (1)
DS$_IVVECT                      =00660038       213     (1)
DS$_KRNLSTK                     =00660090       213     (1)     #-1085    (1)     #-612     (1)
DS$_LOGIC                       =00660070       213     (1)
DS$_MCHK                        =00660088       213     (1)     #-1070    (1)     #-605     (1)
DS$_MEM_ALLOC_ERR               =00660138       213     (1)
DS$_MMOFF                       =00660058       213     (1)
DS$_NEEDUNIT                    =006600F8       213     (1)
DS$_NODE                        =00660128       213     (1)
DS$_NOPCS                       =00660110       213     (1)
DS$_NORMAL                      =00660001       213     (1)
DS$_NOSUPPORT                   =006600B1       213     (1)
DS$_NOTALLOWMP                  =00660148       213     (1)
DS$_NOTDON                      =00660030       213     (1)
DS$_NOTIMP                      =006600B0       213     (1)       213     (1)
DS$_NULLSTR                     =00660010       213     (1)
DS$_OVERFLOW                    =00660008       213     (1)
DS$_POWER                       =00660098       213     (1)     #-1094    (1)
DS$_PROGERR                     =00660020       213     (1)
DS$_SEVERE                      =00660004       213     (1)
DS$_TRANSL                      =006600A0       213     (1)     #-1153    (1)     #-617     (1)
DS$_TRUNCATE                    =00660028       213     (1)
DS$_UNEXPINT                    =006600D8       213     (1)     #-1252    (1)     #-632     (1)
DS$_UNSUPPDEV                   =00660158       213     (1)
DS$_VASFULL                     =00660048       213     (1)
DS$_WARNING                     =00660000       213     (1)       213     (1)
DSA$GL_FLAGS                     0000FE00                         1549    (1)       430     (1)       450     (1)       635     (1)
DSA$GL_MSGTYP                    0000FE40                       #-432     (1)     #-473     (1)
DSA$GL_SID                       0000FE14                       #-637     (1)
DSA$V_USER                      =0000001C                       #-1548    (1)     #-430     (1)     #-450     (1)     #-635     (1)
DSR$FAULT_CLEAR                  00000000-XR                      1019    (1)       1075    (1)       200     (1)
DSR$FIND_USER_PC                 00000000-XR                      203     (1)       960     (1)
DSX$PRINTB                       00000000-XR                      199     (1)       552     (1)
DSX$PRINTI                       00000000-XR                      195     (1)       557     (1)       964     (1)       967     (1)
DSX$PRINTSIG                     00000148-R      551     (1)
DSX$PRINTSIGI                    0000015A-R      556     (1)       424     (1)
DSX$PRINTX                       00000000-XR                      200     (1)       553     (1)
DSX$SETPRIEXV                    00000832-R      1546    (1)
DS_ERRSUP                        00000000-XR                      1339    (1)       1393    (1)       195     (1)
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ESTKPTR                         00000000-XR                    201    (1)      255    (1)
EXCPT                           00000132-R    499     (1)      491    (1)
EXE$ACVIOLAT                    00000554-R    1141    (1)
EXE$BREAK                       0000057C-R    1182    (1)
EXE$GB_CPUTYPE                  00000000-XR                   #-1367  (1)      203    (1)
EXE$REFLECT                     00000667-R    1304    (1)
EXE$ROPRAND                     00000544-R    1122    (1)
EXE$TBIT                        00000610-R    1234    (1)
EXE_3ARG                        00000663-R    1294    (1)    #-1086  (1)    #-1096  (1)    #-1105  (1)    #-1114  (1)
                                                             #-1124  (1)    #-1133  (1)    #-1224  (1)    #-1246  (1)
EXE_4ARG                        0000065F-R    1290    (1)    #-1164  (1)    #-1173  (1)    #-1253  (1)    #-1262  (1)
                                                             #-1270  (1)    #-1279  (1)    #-1288  (1)
EXE_ACCVIO                      00000554-R    1140    (1)
EXE_ARITH                       00000570-R    1171    (1)
EXE_BREAK                       0000057C-R    1181    (1)
EXE_CHME                        00000648-R    1268    (1)
EXE_CHMK                        00000640-R    1260    (1)
EXE_CHMS                        00000650-R    1277    (1)
EXE_CHMU                        00000658-R    1286    (1)
EXE_COMPAT                      00000568-R    1162    (1)    #-1244  (1)
EXE_EXCEPTION                   00000667-R    1305    (1)    #-1077  (1)    #-1144  (1)    #-1155  (1)    #-1292  (1)
                                                             #-1296  (1)
EXE_KRNLSTK                     0000051C-R    1084    (1)
EXE_MCHK                        000004FC-R    1069    (1)
EXE_OPCCUS                      0000053C-R    1112    (1)
EXE_OPCDEC                      00000534-R    1103    (1)
EXE_POWER                       00000528-R    1093    (1)
EXE_RADRMOD                     0000054C-R    1131    (1)
EXE_ROPRAND                     00000544-R    1121    (1)
EXE_TBIT                        00000610-R    1233    (1)
EXE_TRANSL                      0000055C-R    1151    (1)
EXE_UNEXPINT                    00000636-R    1251    (1)
FIND_USERPC                     000004A0-R    953     (1)    436     (1)
FMT_BER                         00000000-XR                    191     (1)      660    (1)
FMT_BI_UNEXPINT                 0000041F-R    332     (1)    646     (1)
FMT_CHMX_ARG                    00000523-R    339     (1)    889     (1)
FMT_ERRPC                       00000465-R    333     (1)    899     (1)
FMT_ERRPSL                      000004B9-R    336     (1)    907     (1)
FMT_EXCEPT                      000003BD-R    330     (1)    265     (1)    266     (1)    267     (1)    268     (1)
                                                             269     (1)    270     (1)    271     (1)    272     (1)
                                                             273     (1)    274     (1)    275     (1)    276     (1)
                                                             277     (1)    278     (1)    279     (1)    300     (1)
                                                             301     (1)    302     (1)    303     (1)    304     (1)
                                                             305     (1)    306     (1)    307     (1)    308     (1)
                                                             309     (1)
FMT_EXCEP_CODE                  0000050C-R    338     (1)    750     (1)
FMT_PXXX                        0000056D-R    342     (1)    710     (1)
FMT_UMCHK                       00000383-R    328     (1)    264     (1)
FMT_UNEXPINT                    000003E7-R    331     (1)    665     (1)
FMT_UNK_ARG                     00000536-R    340     (1)    695     (1)
FMT_UNK_CNT                     0000055C-R    341     (1)    701     (1)
FMT_USER_PC_NF                  0000049A-R    335     (1)    967     (1)
FMT_USRPC                       0000047E-R    334     (1)    964     (1)
FMT_VIRT                        000004DA-R    337     (1)    880     (1)
HANDLER                        =00000000      1448    (1)
ID_TEMP                         00000014-R    241     (1)
IO$M_CANCTRLO                   00000000-XR                    201     (1)    #-423   (1)
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IO$_WRITEVBLK                  00000000-XR                  202    (1)    #-423    (1)
IS                            =00000001     228    (1)
ISTKPTR                        00000000-XR                  201    (1)      255    (1)
LOCAL                          FFFFFF00     549    (1)      564    (1)
MMG$PAGEFAULT                  0000055C-R   1152   (1)
MODELST                        00000000-XR                  198    (1)      903    (1)
MP$GL_AP_SIGNAL_ARRAY          00000000-XR                  192    (1)    #-418    (1)
MP$GL_SAVED_PSL                00000000-XR                #-1198   (1)      193    (1)
MP$GR_BOOTED_PROCESSORS        00000000-XR                #-1184   (1)    #-1311   (1)      205    (1)    #-416    (1)
                                                          #-478    (1)
MP$GR_SAVED_GPRS               00000000-XR                #-1199   (1)    #-1200   (1)    #-1201   (1)    #-1202   (1)
                                                          #-1203   (1)    #-1204   (1)    #-1205   (1)    #-1206   (1)
                                                          #-1207   (1)      193    (1)
MP$R_ACTIVE_ROUTINES           00000000-XR                  189    (1)
MP$R_GET_PROCESSOR_ID          00000000-XR                  190    (1)
MP$R_ROUTINE_COUNT_TABLE       00000000-XR                  189    (1)
MP$R_ROUTINE_ID_TABLE          00000000-XR                  190    (1)
MP$V_IL_ALLN                  =00000004     222    (1)
MP$V_IL_CNDB                  =00000007     222    (1)
MP$V_IL_CNHN                  =00000006     222    (1)    #-414    (1)    #-495    (1)
MP$V_IL_DELN                  =00000005     222    (1)
MP$V_IL_DSBK                  =00000008     222    (1)
MP$V_IL_ERSP                  =00000003     222    (1)
MP$V_IL_GTLN                  =00000009     222    (1)
MP$V_IL_NUMT                  =00000000     222    (1)
MP$V_IL_PRNT                  =00000001     222    (1)
MP$V_IL_RRPT                  =00000002     222    (1)
MP$_COND_HANDLR                00000000-XR                  192    (1)      419    (1)
MP$_GET_PROCESSOR_ID           00000000-XR                  1188   (1)      1315   (1)      206    (1)
MP$_RESUME_ATTACHED_PROCESSORS 00000000-XR                  206    (1)      480    (1)
MSG_ACCVIO                     000000B7-R   271    (1)      597    (1)
MSG_BREAK                      000000F3-R   274    (1)      721    (1)
MSG_CHME                       0000012F-R   277    (1)      624    (1)
MSG_CHMK                       0000011B-R   276    (1)      629    (1)
MSG_CHMS                       00000143-R   278    (1)      729    (1)
MSG_CHMU                       00000157-R   279    (1)      737    (1)
MSG_COMPAT                     00000107-R   275    (1)      745    (1)
MSG_DECOVF                     0000028C-R   305    (1)      838    (1)
MSG_FLTDIV                     00000264-R   303    (1)      822    (1)
MSG_FLTDIV_F                   000002C8-R   308    (1)      862    (1)
MSG_FLTOVF                     00000250-R   302    (1)      814    (1)
MSG_FLTOVF_F                   000002B4-R   307    (1)      854    (1)
MSG_FLTUND                     00000278-R   304    (1)      830    (1)
MSG_FLTUND_F                   000002DC-R   309    (1)      871    (1)
MSG_INTDIV                     0000023C-R   301    (1)      806    (1)
MSG_INTOVF                     00000228-R   300    (1)      799    (1)
MSG_KRNLSTK                    0000003F-R   265    (1)      614    (1)
MSG_OPCCUS                     0000007B-R   268    (1)      759    (1)
MSG_OPCDEC                     00000067-R   267    (1)      767    (1)
MSG_POWER                      00000053-R   266    (1)
MSG_RADRMOD                    000000A3-R   270    (1)      775    (1)
MSG_ROPRAND                    0000008F-R   269    (1)      783    (1)
MSG_SUBRNG                     000002A0-R   306    (1)      846    (1)
MSG_TBIT                       000000DF-R   273    (1)      791    (1)
MSG_TRANSL                     000000CB-R   272    (1)      619    (1)
MSG_UMCHK                      00000037-R   264    (1)      602    (1)
NEW_AP_FP                      00000004-R   237    (1)    #-486    (1)    #-499    (1)
```

```
NEW_PC_PSL                      0000000C-R   239   (1)     #-488    (1)     #-501    (1)
NEW_SP                          00000000-R   235   (1)     #-487    (1)     #-500    (1)
NORMAL                          0000070A-R  1363   (1)     #-1319   (1)     #-1323   (1)     #-1326   (1)      1354   (1)
PCB_BASE                        00000000-XR                  #-1332   (1)     #-1342   (1)      199   (1)    #-458    (1)
PR$_SID_TYP8SS                  =00000005                    #-637    (1)
PR$_SID_TYPUV2                  =00000008                    #-1367   (1)
PRINT_CHMX_ARG                   0000041E-R  884   (1)     #-630    (1)
PRINT_PC_PSL                    00000433-R  893   (1)      567     (1)      671     (1)     #-714    (1)     #-891    (1)
PRINT_TYPE_VA                   00000407-R  874   (1)     #-598    (1)     #-620    (1)
PRINT_UNK_EXC                   0000030D-R  691   (1)     #-684    (1)
PSL$C_USER                      =00000003                    #-1484   (1)
PSL$M_CM                        =80000000                    #-1352   (1)
PSL$M_FPD                       =08000000                    #-1353   (1)
PSL$M_TBIT                      =00000010                    #-1352   (1)
PSL$M_TP                        =40000000                    #-1353   (1)
PSL$S_CURMOD                    =00000002                    #-1463   (1)     #-452    (1)     #-455    (1)
PSL$S_PRVMOD                    =00000002                    #-1325   (1)
PSL$V_CM                        =0000001F                    #-1241   (1)
PSL$V_CURMOD                    =00000018                    #-1463   (1)     #-452    (1)     #-455    (1)
PSL$V_IS                        =0000001A   219   (1)     #-1323   (1)     #-449    (1)
PSL$V_PRVMOD                    =00000016                    #-1324   (1)
RESIGNAL                         00000494-R  912   (1)      593     (1)
SAVABS...                       =FFFFFF00   549   (1)
SAVAP                           =00000008  1451   (1)
SAVFP                           =0000000C  1452   (1)     #-1477   (1)
SAVMSK                          =00000006  1450   (1)      1498    (1)      1499    (1)
SAVPC                           =00000010  1453   (1)     #-1496   (1)
SAVPSW                          =00000004  1449   (1)
SAVRG                           =00000014  1454   (1)     #-1500   (1)
SCB_IMAGE                        00000000-XR                  203     (1)
SCRIPT$STOP                      00000000-XR                  200     (1)      474     (1)
SEARCH                           0000076B-R 1456   (1)      1376    (1)
SIZ...                          =00000001   220   (1)      220     (1)
SS$_ACCVIO                      =0000000C                    #-1142   (1)     #-595    (1)
SS$_BREAK                       =00000414                    #-1223   (1)     #-593    (1)
SS$_CMODSUPR                    =0000041C                    #-1278   (1)
SS$_CMODUSER                    =00000424                    #-1287   (1)
SS$_COMPAT                      =0000042C                    #-1163   (1)
SS$_CONTINUE                    =00000001                    #-492    (1)
SS$_MCHECK                      =000002BC                    #-600    (1)
SS$_NOHANDLER                   =000008F8                    #-1512   (1)
SS$_OPCCUS                      =00000434                    #-1113   (1)
SS$_OPCDEC                      =0000043C                    #-1104   (1)
SS$_RADRMOD                     =0000044C                    #-1132   (1)
SS$_RESIGNAL                    =00000918                    #-913    (1)
SS$_ROPRAND                     =00000454                    #-1123   (1)
SS$_TBIT                        =00000464                    #-1245   (1)
SS$_UNWIND                      =00000920                    #-1522   (1)
SSTKPTR                          00000000-XR                  201     (1)      255     (1)
STACK_BASE                       00000000-XR                  1483    (1)      199     (1)
SYS$CALL_HANDL                   00000000-XR                  1382    (1)     #-1496   (1)      200    (1)
SYS$QIO                          00000000-XR                  423     (1)
SYS$SETEXV                       00000000-XR                  1550    (1)
SYS$UNWIND                       00000000-XR                  1528    (1)      197     (1)
TST$MCHK                         000004E4-R 1016   (1)
T_ABORT                          000006D0-R  361   (1)      265     (1)
T_ACCVIO                         0000060B-R  350   (1)      271     (1)
```

```
T_BREAK                         00000640-R   353   (1)      274   (1)
T_CHME                          0000065E-R   355   (1)      277   (1)
T_CHMK                          0000064B-R   354   (1)      276   (1)
T_CHMS                          00000674-R   356   (1)      278   (1)
T_CHMU                          0000068B-R   357   (1)      279   (1)
T_COMPAT                        000006EC-R   364   (1)      275   (1)      749   (1)
T_DECOVF                        0000078C-R   371   (1)      305   (1)
T_FAULT                         000006CA-R   360   (1)      267   (1)      268   (1)      270   (1)      271   (1)
                                                            272   (1)      274   (1)      307   (1)      308   (1)
                                                            309   (1)
T_FLTDIV                        00000759-R   369   (1)      303   (1)      308   (1)
T_FLTOVF                        00000747-R   368   (1)      302   (1)      307   (1)
T_FLTUND                        00000779-R   370   (1)      304   (1)      309   (1)
T_FLT_ABO                       000006E0-R   363   (1)      269   (1)      275   (1)      748   (1)
T_INTDIV                        00000730-R   367   (1)      301   (1)
T_INTOVF                        0000071F-R   366   (1)      300   (1)
T_INTRPT                        000006D6-R   362   (1)      266   (1)
T_KRNLSTK                       00000581-R   344   (1)      265   (1)
T_OPCCUS                        000005C3-R   347   (1)      268   (1)
T_OPCDEC                        000005A3-R   346   (1)      267   (1)
T_POWER                         00000598-R   345   (1)      266   (1)
T_RADRMOD                       000005F2-R   349   (1)      270   (1)
T_ROPRAND                       000005E1-R   348   (1)      269   (1)
T_STKVIO                        000006FF-R   365   (1)      1339  (1)
T_SUBRNG                        0000079D-R   372   (1)      306   (1)
T_TBIT                          0000063A-R   352   (1)      273   (1)
T_TRANSL                        00000624-R   351   (1)      272   (1)
T_TRAP                          000006C5-R   359   (1)      273   (1)      276   (1)      277   (1)      278   (1)
                                                            279   (1)      300   (1)      301   (1)      302   (1)
                                                            303   (1)      304   (1)      305   (1)      306   (1)
T_XCHFAILURE                    0000069C-R   358   (1)      1393  (1)
USTKPTR                         00000000-XR                 198   (1)      255   (1)
VAX$MODIFY_EXCEPTION            00000000-XR                 1369  (1)      191   (1)      203   (1)
X_BREAK                         0000034D-R   720   (1)      593   (1)
X_CHMS                          00000355-R   728   (1)      593   (1)
X_CHMU                          0000035D-R   736   (1)      593   (1)
X_COMPAT                        00000365-R   744   (1)      593   (1)
X_DECOVF                        000003DF-R   837   (1)      593   (1)      683   (1)
X_FLTDIV                        000003CF-R   821   (1)      593   (1)      683   (1)
X_FLTDIV_F                      000003F7-R   861   (1)      593   (1)      683   (1)
X_FLTOVF                        000003C7-R   813   (1)      593   (1)      683   (1)
X_FLTOVF_F                      000003EF-R   853   (1)      593   (1)      683   (1)
X_FLTUND                        000003D7-R   829   (1)      593   (1)      683   (1)
X_FLTUND_F                      000003FF-R   870   (1)      593   (1)      683   (1)
X_INTDIV                        000003BF-R   805   (1)      593   (1)      683   (1)
X_INTOVF                        000003B7-R   798   (1)      593   (1)      683   (1)
X_OPCCUS                        0000038F-R   758   (1)      593   (1)
X_OPCDEC                        00000397-R   766   (1)      593   (1)
X_RADRMOD                       0000039F-R   774   (1)      593   (1)
X_ROPRAND                       000003A7-R   782   (1)      593   (1)
X_SUBRNG                        000003E7-R   845   (1)      593   (1)      683   (1)
X_TBIT                          000003AF-R   790   (1)      593   (1)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	24	00:00:00.03	00:00:00.22
Command processing	901	00:00:00.22	00:00:01.14
Pass 1	1168	00:00:04.88	00:00:08.18
Symbol table sort	0	00:00:00.38	00:00:00.38
Pass 2	136	00:00:01.44	00:00:02.83
Symbol table output	2	00:00:00.08	00:00:00.26
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	7	00:00:00.40	00:00:00.74
Assembler run totals	2241	00:00:07.44	00:00:13.76

The working set limit was 3400 pages.
314051 bytes (614 pages) of virtual memory were used to buffer the intermediate code.
There were 70 pages of symbol table space allocated to hold 1322 non-local and 75 local symbols.
1558 source lines were read in Pass 1, producing 113 object records in Pass 2.
58 pages of virtual memory were used to define 47 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	13
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	16
SYS$COMMON:[SYSLIB]LIB.MLB;2	1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	17
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	47

1486 GETS were required to define 47 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1)   88   Libraries, Equated Symbols
(1)   197   FAO - Main program
(1)   410   GETCHAR - Routine to get next char from input string
(1)   458   GETCOUNT - Routine to get repeat-count or field-width
(1)   528   CVTASC - Insert ASCII string
(1)   666   CVTNUM - Convert numeric parameter to ASCII
(1)   877   QUICKSERVE - Small service routines
(1)   1015   PERCENT - Time directives and plural 'S'
(1)   1114   HANDLER - Condition handler

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element FAO.MAR
0000     2 ; *1     6-FEB-1986 15:18:28 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element FAO.MAR
0000     4         .TITLE  FAO     *** - FORMATTED ASCII OUTPUT
0000     5         .IDENT  '03-02'
0000     6
0000     7 ;
0000     8 ;*****************************************************************************
0000     9 ;*                                                                           *
0000    10 ;*  COPYRIGHT (c) 1978, 1980, 1982 BY                                        *
0000    11 ;*  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.                   *
0000    12 ;*  ALL RIGHTS RESERVED.                                                     *
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0000    17 ;*  COPIES THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY    *
0000    18 ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE IS  HEREBY    *
0000    19 ;*  TRANSFERRED.                                                             *
0000    20 ;*                                                                           *
0000    21 ;*  THE INFORMATION IN THIS SOFTWARE IS  SUBJECT TO CHANGE WITHOUT NOTICE    *
0000    22 ;*  AND  SHOULD  NOT  BE  CONSTRUED AS  A COMMITMENT BY DIGITAL EQUIPMENT   *
0000    23 ;*  CORPORATION.                                                             *
0000    24 ;*                                                                           *
0000    25 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE  OR  RELIABILITY OF ITS    *
0000    26 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    27 ;*                                                                           *
0000    28 ;*                                                                           *
0000    29 ;*****************************************************************************
0000    30
0000    31 ;++
0000    32 ; FACILITY: SYSTEM SERVICE
0000    33 ;
0000    34 ; ABSTRACT:
0000    35 ;
0000    36 ;       This module provides general formatting services.  It converts
0000    37 ;       binary values to octal, hexadecimal, and decimal ASCII
0000    38 ;       representations, and also inserts ASCII strings and converts
0000    39 ;       date and time to ASCII.
0000    40 ;
0000    41 ; ENVIRONMENT:
0000    42 ;
0000    43 ;       VAX Diagnostic Supervisor.
0000    44 ;
0000    45 ; AUTHOR:
0000    46 ;
0000    47 ;       Henry M. Levy
0000    48 ;
0000    49 ; CREATION DATE:
0000    50 ;
0000    51 ;       29-JAN-1977
0000    52 ;
0000    53 ; MODIFIED BY:
0000    54 ;
0000    55 ;       03-02   Jack Stansbury, Version 6.11?, January 6, 1983
0000    56 ;               Change the IvSSRq error return code to BadParam. This is
0000    57 ;               to make it consistent with the Design Guide.
```

```
                0000     58 ;
                0000     59 ;       03-01   Jack Stansbury, Version 6.9, July 25, 1982
                0000     60 ;               Changed the real SYSFAO module to work in the Diagnostic
                0000     61 ;               Supervisor environment. This includes changing the PSECT names,
                0000     62 ;               changing a return error code, and changing the Handler routine
                0000     63 ;               code.
                0000     64 ;
                0000     65 ;       V03-005 MSH0001         Maryann S. Hinden       20-NOV-1981
                0000     66 ;               Use longword displacement to reference EXE$SIGTORET.
                0000     67 ;
                0000     68 ;       V03-004 DWT0001         David W. Thiel          06-Nov-1981
                0000     69 ;               Fixed condition handler.  Check argument to $ASCTIM to
                0000     70 ;               prevent exception in $ASCTIM.
                0000     71 ;
                0000     72 ;       V03-003 PCA0001         Paul C. Anagnostopoulos         22-Jul-1981
                0000     73 ;               Fixed a bug wherein !AF did not replace unprintable
                0000     74 ;               characters if it encountered result string overflow.
                0000     75 ;               Now it replaces those characters that it does copy.
                0000     76 ;
                0000     77 ;       V03-002 TCM0001         Trudy C. Matthews       10-Mar-1981
                0000     78 ;               Change CALLS with word displacement to CALLS with longword
                0000     79 ;               displacement.
                0000     80 ;
                0000     81 ;       V03-001 TMH0001         Tim Halvorsen   24-Feb-1981
                0000     82 ;               Add condition handler to catch access violations
                0000     83 ;               and the like, so that services like $PUTMSG do
                0000     84 ;               not cause an access violation in programs like DCL
                0000     85 ;               simply because not enough arguments were supplied.
                0000     86 ;--
```

```
                        0000     88          .SBTTL  Libraries, Equated Symbols
                        0000     89
                        0000     90 ;
                        0000     91 ; MACROS:
                        0000     92 ;
                        0000     93
                        0000     94          $SSDEF                          ; define system status codes
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .RESTORE
                        0000     95 ;        $CHFDEF                         ; Condition handling facility          [01]
                        0000     96 ;        $SFDEF                          ; Call frame definitions               [01]
                        0000     97
                        0000     98 ;
                        0000     99 ; EQUATED SYMBOLS:
                        0000    100 ;
                        0000    101
00000000                0000    102          ARGCOUNT = 0                    ; offset to argument count
00000004                0000    103          INDSC    = 4                    ; offset to input string descriptor
00000008                0000    104          OUTLEN   = 8                    ; offset to output length
0000000C                0000    105          OUTDSC   = 12                   ; offset to output buffer descriptor
00000010                0000    106          FIRSTARG = 16                   ; offset to first conversion param
                        0000    107
FFFFFFF0                0000    108          INLEN    = -16                  ; local offset to input length remaining
FFFFFFF4                0000    109          INPTR    = -12                  ; local offset to input string pointer
FFFFFFF8                0000    110          LASTVAL  = -8                   ; local offset to last value converted
FFFFFFFC                0000    111          FIELDEND = -4                   ; local offset to end of defined field
                        0000    112
0000000D                0000    113          CR       = 13                   ; carriage return
0000000A                0000    114          LF       = 10                   ; line feed
00000021                0000    115          EXCL     = 33                   ; exclamation ('!')
00000009                0000    116          TAB      = 9                    ; horizontal tab
0000000C                0000    117          FF       = 12                   ; form feed
```

```
                                    0000   119
                                    0000   120 ;
                                    0000   121 ; OWN STORAGE:
                                    0000   122 ;
                                    0000   123
                                00000000   124         .PSect  Data    NoExe, Shr, NoWrt, Long ;                       [01]
                                    0000   125
                                    0000   126 ASC_NAMES:
42 41 39 38 37 36 35 34 33 32 31 30 0000   127         .ASCII  /0123456789ABCDEF/      ; ASCII digits
                        46 45 44 43 000C
                                    0010   128
                                    0010   129 ;
                                    0010   130 ;       The following table contains the first character for all
                                    0010   131 ;       FAO conversion directives.  The first part of the table
                                    0010   132 ;       contains the first character for two-character directives,
                                    0010   133 ;       while the second half of the table contains the one-character
                                    0010   134 ;       directives.
                                    0010   135 ;
                                    0010   136 ;       NOTE -- The ordering of this table must be preserved.  The index
                                    0010   137 ;               of the directives found in this table is used to dispatch
                                    0010   138 ;               via a CASE statement in the main program (FAO).
                                    0010   139 ;               Routine CVTNUM also uses the index to dispatch and to
                                    0010   140 ;               compute the proper radix for the conversion.
                                    0010   141 ;
                                    0010   142
                                    0010   143 CNTRL_TABLE:
                                    0010   144 TWO_CHAR_CNTRLS:
                                 4F 0010   145         .ASCII  /O/                     ; octal conversions
                                 58 0011   146         .ASCII  /X/                     ; hex conversions
                                 55 0012   147         .ASCII  /U/                     ; unsigned decimal
                                 53 0013   148         .ASCII  /S/                     ; signed decimal
                                 5A 0014   149         .ASCII  /Z/                     ; unsigned decimal zero filled
                                 41 0015   150         .ASCII  /A/                     ; ascii insertion directives
                                 25 0016   151         .ASCII  /%/                     ; time conversion, or plural indication
                                 2A 0017   152         .ASCII  /*/                     ; character repeater
                                    0018   153
                                    0018   154 ONE_CHAR_CNTRLS:
                                 2B 0018   155         .ASCII  /+/                     ; skip argument
                                 2D 0019   156         .ASCII  /-/                     ; backup argument
                                 3C 001A   157         .ASCII  /</                     ; begin field definition
                                 3E 001B   158         .ASCII  />/                     ; end of field definition
                                    001C   159
                                    001C   160 REPLACE_CHRS:                           ; these are one or two char replacements
                                 2F 001C   161         .ASCII  ./.                     ; newline
                                 5F 001D   162         .ASCII  /_/                     ; tab
                                 5E 001E   163         .ASCII  /^/                     ; form feed
                                 21 001F   164         .ASCII  /!/                     ; insert exclamation
                                    0020   165
                           00000010 0020   166 CNTRL_LENGTH = .-CNTRL_TABLE           ; length of table
                                    0020   167
                           00000008 0020   168 ONECHAR_INDEX = CNTRL_LENGTH - <ONE_CHAR_CNTRLS - CNTRL_TABLE>
                                    0020   169
                           0000000C 0020   170 REPL_OFFSET = REPLACE_CHRS - CNTRL_TABLE ; offset of replacement chars
                                    0020   171
                                    0020   172 STRING_TYPES:
                        46 44 53 43 0020   173         .ASCII  /CSDF/                  ; ascii string types
                                    0024   174 DATA_TYPES:
```

```
                     4C 57 42  0024   175          .ASCII  /BWL/                   ; byte, word , or long
                               0027   176 PERCENT_STR:
                     54 44 53  0027   177          .ASCII  /SDT/                   ; subtypes for % directive
                               002A   178 FIELDS:
                     20 10 08  002A   179          .BYTE   8,16,32                 ; field size for B,W,and L
                               002D   180 REPLACEMENT:
                  21 0C 09 0A  002D   181          .BYTE   LF,TAB,FF,EXCL          ; simple replacement table
                               0031   182
                               0031   183 ;
                               0031   184 ; The following array contains the number of Octal and Hex digits in
                               0031   185 ; byte , word, and longword fields.  The byte digits are first, the
                               0031   186 ; hex digits starting at the 4'th entry so that the array may be
                               0031   187 ; context indexed.
                               0031   188 ;
                               0031   189
                               0031   190 OCT_HEX_DIGITS:
                  00 0B 06 03  0031   191          .BYTE   3,6,11,0
                     08 04 02  0035   192          .BYTE   2,4,8
                               0038   193
                               0038   194 RADIX:
               0A 0A 0A 10 08  0038   195          .BYTE   8,16,10,10,10           ; radix for numeric conversisons
```

```
                     003D   197          .SBTTL  FAO - Main program
                 00000000   198          .PSect  Code    Exe, Shr, NoWrt, Long   ;                                [01]
                     0000   199 ;++
                     0000   200 ; FUNCTIONAL DESCRIPTION:
                     0000   201 ;
                     0000   202 ;       This routine is the entry point for the FAO and FAOL system
                     0000   203 ;       services.   The caller's control string is scanned for control
                     0000   204 ;       characters ('!').  All other information is simply passed to
                     0000   205 ;       the output buffer.  If a control directive is found, it is parsed
                     0000   206 ;       and an action routine is dispatched.
                     0000   207 ;
                     0000   208 ; CALLING SEQUENCE:
                     0000   209 ;
                     0000   210 ;       CALLS or CALLG  to SYS$FAO or SYS$FAOL
                     0000   211 ;
                     0000   212 ; INPUT PARAMETERS:
                     0000   213 ;
                     0000   214 ;       INDSC   - The address of a string descriptor for the input
                     0000   215 ;                 control string.
                     0000   216 ;       OUTLEN  - The address of a word to receive the length of
                     0000   217 ;                 the output string
                     0000   218 ;       OUTDSC  - The address of a string descriptor for the output
                     0000   219 ;                 buffer.
                     0000   220 ;       FIRSTARG - For FAOL , this is the address of a list of longword
                     0000   221 ;                  parameters.  For FAO , this is the first of a
                     0000   222 ;                  variable number of parameters which
                     0000   223 ;                  may have been passed on the call argument list.
                     0000   224 ;
                     0000   225 ; IMPLICIT INPUTS:
                     0000   226 ;
                     0000   227 ;       none
                     0000   228 ;
                     0000   229 ; OUTPUT PARAMETERS:
                     0000   230 ;
                     0000   231 ;       OUTLEN  - Word pointed to will receive length of output buffer.
                     0000   232 ;
                     0000   233 ; IMPLICIT OUTPUTS:
                     0000   234 ;
                     0000   235 ;       none
                     0000   236 ;
                     0000   237 ; COMPLETION CODES:
                     0000   238 ;
                     0000   239 ;       SS$_NORMAL      - success code, normal return
                     0000   240 ;       SS$_BUFFEROVF   - output buffer overflow, attempt to write past end
                     0000   241 ;                         of output buffer
                     0000   242 ;       SS$_BadParam    - Invalid directive specified or unable to read        [02]
                     0000   243 ;                         argument list or address arguments                  [02]
                     0000   244 ;
                     0000   245 ; SIDE EFFECTS:
                     0000   246 ;
                     0000   247 ;       none
                     0000   248 ;
                     0000   249 ;--
```

```
                                0000   251
                                0000   252 ;+
                                0000   253 ; Global register usage:
                                0000   254 ;
                                0000   255 ;       R7,R8 - scratch registers
                                0000   256 ;       R9  - number of characters remaining in output buffer
                                0000   257 ;       R10 - current position in output buffer
                                0000   258 ;       R11 - pointer to next conversion parameter
                                0000   259 ;
                                0000   260 ; Locals
                                0000   261 ;
                                0000   262 ;       INLEN(FP) - (word) length of input control string
                                0000   263 ;       INPTR(FP) - address of position in input control string
                                0000   264 ;-
                                0000   265
                                0000   266 ;
                                0000   267 ; Entry point for call with multiple arguments on stack
                                0000   268 ;
                                0000   269
                                0000   270 EXE$FAO::
                                0000   271
                          0FFC  0000   272            .WORD   ^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>     ; save all registers
                                0002   273 ;          MOVAB   W^HANDLER,(FP)          ; Establish condition handler          [01]
                   5B   10 AC   DE   0002   274            MOVAL   FIRSTARG(AP),R11        ; get address of first argument
                        06   11   0006   275            BRB     FAO                     ; go to main routine
                                0008   276
                                0008   277 ;
                                0008   278 ; Entry point for FAOL call.
                                0008   279 ;
                                0008   280
                                0008   281 EXE$FAOL::
                                0008   282
                          0FFC  0008   283            .WORD   ^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>
                                000A   284 ;          MOVAB   W^HANDLER,(FP)          ; Establish condition handler          [01]
                   5B   10 AC   D0   000A   285            MOVL    FIRSTARG(AP),R11        ; address of first argument
```

```
                                000E
                                000E  FAO:
                      7E   7C   000E          CLRQ    -(SP)                      ; save space for LASTVAL and FIELDEND
            7E   04 BC   7D   0010          MOVQ    @INDSC(AP),-(SP)           ; save locals on stack
            59   0C BC   7D   0014          MOVQ    @OUTDSC(AP),R9             ; load output descriptor into R9,R10
               59   59   3C   0018          MOVZWL  R9,R9                      ; ensure word length
                                001B
                                001B  ;
                                001B  ; Look for a control character in the input string.  Copy text
                                001B  ; up to the control, if any , to the output buffer.
                                001B  ;
                                001B
                                001B  MAIN_SCAN:
                      7E   D4   001B          CLRL    -(SP)                      ; indicate control not found
      F4 BD   F0 AD   21   3A   001D          LOCC    #EXCL,INLEN(FP),@INPTR(FP) ; search for control char
                      02   13   0023          BEQL    10$                        ; branch if not found
                      6E   D6   0025          INCL    (SP)                       ; set indicator to show char. found
                                0027  10$:
         56   F0 AD   50   A3   0027          SUBW3   R0,INLEN(FP),R6            ; calculate bytes to move
              F0 AD   50   D0   002C          MOVL    R0,INLEN(FP)               ; update input length remaining
                 59   56   A2   0030          SUBW    R6,R9                      ; update and test output length
                      75   19   0033          BLSS    OVERFLOW                   ; not enough room, error exit
         6A   F4 BD   56   28   0035          MOVC3   R6,@INPTR(FP),(R10)        ; move text part of input string
                   76 8E   E9   003A          BLBC    (SP)+,DONE                 ; leave if no controls left
              F4 AD   51   D0   003D          MOVL    R1,INPTR(FP)               ; update input address pointer
                 5A   53   D0   0041          MOVL    R3,R10                     ; update output address pointer
                      7C   10   0044          BSBB    GETCHAR                    ; skip control char
```

```
                                0046  ;
                                0046  ; Parse the directive which has been found in the input string.  Set
                                0046  ; up: R0 = remaining count in CNTRL_TABLE
                                0046  ;     R4 = second char if two-char directive
                                0046  ;     R5 = repeat count
                                0046  ;     R6 = field width
                                0046  ;
                                0046
                                0046  PARSE_DIRECTIVE:
                                0046
                 55   01   D0   0046          MOVL    #1,R5                   ; default repeat count is 1
                      52   D4   0049          CLRL    R2                      ; paren indicator ( not found yet )
                    0081   30   004B          BSBW    GETCOUNT                ; pull off count, if any
                      72   10   004E          BSBB    GETCHAR                 ; get next char from input string
                 53   28   91   0050          CMPB    #^A/(/,R3               ; was next char a paren?
                      0D   12   0053          BNEQ    20$                     ; branch if not
                      52   D6   0055          INCL    R2                      ; set paren found indicator
                      56   D5   0057          TSTL    R6                      ; was there a repeat count?
                      03   19   0059          BLSS    10$                     ; no..use default
                 55   56   D0   005B          MOVL    R6,R5                   ; else get repeat count
                                005E  10$:
                      6F   10   005E          BSBB    GETCOUNT                ; look for field width
                      60   10   0060          BSBB    GETCHAR                 ; get next char
                                0062  20$:
  00000010'EF    10   53   3A   0062          LOCC    R3,#CNTRL_LENGTH,CNTRL_TABLE ; check character in table
                      39   13   006A          BEQL    ILLEGAL                 ; illegal directive exit
                 08   50   D1   006C          CMPL    R0,#ONECHAR_INDEX       ; is this a one char directive?
                      05   15   006F          BLEQ    30$                     ; yes, don't need any more
                      4F   10   0071          BSBB    GETCHAR                 ; get second control char
                 54   53   D0   0073          MOVL    R3,R4                   ; move to R4 for return
                                0076  30$:
                   02 52   E9   0076          BLBC    R2,40$                  ; skip if no paren found
                      47   10   0079          BSBB    GETCHAR                 ; else skip paren char
                                007B  40$:
                                007B
            53   10   50   C3   007B          SUBL3   R0,#CNTRL_LENGTH,R3     ; compute offset for case table
                                007F
                                007F  ;
                                007F  ; The following  does a BSBB to the case dispatch
                                007F  ; table.  The service routines do an RSB and return into CASE_LOOP.
                                007F  ;
                                007F
                      02   11   007F          BRB     CASE_LOOP               ; start processing loop
                                0081  CASE_BSB:
                      05   10   0081          BSBB    FAO_CASE                ; dispatch next directive
                                0083  CASE_LOOP:
                   FB 55   F4   0083          SOBGEQ  R5,CASE_BSB             ; repeat as specified
                      93   11   0086          BRB     MAIN_SCAN               ; else continue string processing
```

```
                     0088   364 ;
                     0088   365 ; Here is the main dispatch table for dispatching FAO service
                     0088   366 ; routines.  The case is entered via BSBB from CASE_BSB. The routines
                     0088   367 ; RSB to CASE_LOOP.  Since the 5 numeric conversion directives all
                     0088   368 ; dispatch to the same routine, the case has a base of 5 and the
                     0088   369 ; numeric directives fall through to the statement following the CASE.
                     0088   370 ;
                     0088   371 ; Registers R0, R1, and R2 may be scratched by service routines.
                     0088   372 ;
                     0088   373
                     0088   374 FAO_CASE:
                     0088   375         CASE    R3,<-                   ; dispatch to service routine
                     0088   376                 CVTASC,-                ; ascii string insertion
                     0088   377                 PERCENT,-               ; insert ascii time or plural 'S'
                     0088   378                 REPEATIT,-              ; repeat character 'n' times
                     0088   379                 INCR_ARGPTR,-           ; skip next parameter
                     0088   380                 DECR_ARGPTR,-           ; backup to previous parameter
                     0088   381                 STARTFIELD,-            ; define fixed length field
                     0088   382                 ENDFIELD,-              ; terminate fixed length field
                     0088   383                 NEWLINE,-               ; insert CR/LF
                     0088   384                 INSERT_CHAR,-           ; insert TAB
                     0088   385                 INSERT_CHAR,-           ; insert form feed
                     0088   386                 INSERT_CHAR,-           ; insert '!'
                     0088   387         >,B,#5                          ; offset start by 5
 0A'  05   53   8F   0088                CASEB   R3,#5,S^#<<30001$-30000$>/2>-1
                     008C       30000$:
              0078'  008C                .SIGNED_WORD    CVTASC-30000$
              022F'  008E                .SIGNED_WORD    PERCENT-30000$
              01F4'  0090                .SIGNED_WORD    REPEATIT-30000$
              01D7'  0092                .SIGNED_WORD    INCR_ARGPTR-30000$
              01DA'  0094                .SIGNED_WORD    DECR_ARGPTR-30000$
              020B'  0096                .SIGNED_WORD    STARTFIELD-30000$
              021D'  0098                .SIGNED_WORD    ENDFIELD-30000$
              01DD'  009A                .SIGNED_WORD    NEWLINE-30000$
              01E5'  009C                .SIGNED_WORD    INSERT_CHAR-30000$
              01E5'  009E                .SIGNED_WORD    INSERT_CHAR-30000$
              01E5'  00A0                .SIGNED_WORD    INSERT_CHAR-30000$
                     00A2       30001$:
                     00A2   388
   00D3   31  00A2   389         BRW     CVTNUM                          ; dispatch to numeric conversion
                     00A5   390
                     00A5   391
                     00A5   392 ILLEGAL:
   50  14  3C  00A5   393         MOVZWL  #SS$_BadParam,R0                ; Error return code                     [02]
       0C  11  00A8   394         BRB     FAO_EXIT
                     00AA   395
                     00AA   396 OVERFLOW:
50 0601 8F  3C  00AA   397         MOVZWL  #SS$_BUFFEROVF,R0               ; error return code
       59  D4  00AF   398         CLRL    R9                              ; ensure correct return length
       03  11  00B1   399         BRB     FAO_EXIT
                     00B3   400
                     00B3   401 DONE:
   50  01  3C  00B3   402         MOVZWL  #SS$_NORMAL,R0                  ; no errors
                     00B6   403
                     00B6   404 FAO_EXIT:
   08 AC  D5  00B6   405         TSTL    OUTLEN(AP)                      ; was a return length required?
       06  13  00B9   406         BEQL    10$                             ; branch if not
```

```
          08 BC   0C BC   59   A3  00BB   407          SUBW3   R9,aOUTDSC(AP),aOUTLEN(AP) ; compute and return output buffer length
                                04  00C1   408 10$:    RET
```

```
                     00C2   410          .SBTTL  GETCHAR - Routine to get next char from input string
                     00C2   411
                     00C2   412 ;++
                     00C2   413 ;
                     00C2   414 ; FUNCTIONAL DESCRIPTION:
                     00C2   415 ;
                     00C2   416 ;       This routine gets the next character from the input control
                     00C2   417 ;       string, updating the length and address pointers.  If the length
                     00C2   418 ;       goes negative, an error exit is called.
                     00C2   419 ;
                     00C2   420 ; CALLING SEQUENCE:
                     00C2   421 ;
                     00C2   422 ;       JSB (R8)
                     00C2   423 ;
                     00C2   424 ; INPUT PARAMETERS:
                     00C2   425 ;
                     00C2   426 ;       none
                     00C2   427 ;
                     00C2   428 ; IMPLICIT INPUTS:
                     00C2   429 ;
                     00C2   430 ;       INLEN(FP) -  lower word has remaining length of input string
                     00C2   431 ;       INPTR(FP) -  is pointer to current string position
                     00C2   432 ;
                     00C2   433 ; OUTPUTS:
                     00C2   434 ;
                     00C2   435 ;       R3 - next character in input string
                     00C2   436 ;
                     00C2   437 ; IMPLICIT OUTPUTS:
                     00C2   438 ;
                     00C2   439 ;       none
                     00C2   440 ;
                     00C2   441 ; COMPLETION CODES:
                     00C2   442 ;
                     00C2   443 ;       none
                     00C2   444 ;
                     00C2   445 ; SIDE EFFECTS:
                     00C2   446 ;
                     00C2   447 ;       input pointers on stack are updated
                     00C2   448 ;       error may cause jump to ILLEGAL
                     00C2   449 ;--
```

```
                        00C2    451 GETCHAR:
            F0 AD   B7  00C2    452         DECW    INLEN(FP)                   ; decr input length remaining
               DE   19  00C5    453         BLSS    ILLEGAL                     ; error if no more left
         53    F4 BD   9A  00C7    454         MOVZBL  @INPTR(FP),R3               ; get next character
            F4 AD   D6  00CB    455         INCL    INPTR(FP)                   ; update pointer
                    05  00CE    456         RSB                                 ; return
```

```
00CF    458          .SBTTL  GETCOUNT - Routine to get repeat-count or field-width
00CF    459
00CF    460 ;++
00CF    461 ;
00CF    462 ; FUNCTIONAL DESCRIPTION:
00CF    463 ;
00CF    464 ;       This subroutine to PARSE_DIRECTIVE scans for a repeat-count or
00CF    465 ;       field-width in the directive in the input stream.  If a numeric
00CF    466 ;       count is found, it is converted to binary.  If a '#' character
00CF    467 ;       is found, the count is taken from the next parameter
00CF    468 ;       in the parameter list.
00CF    469 ;
00CF    470 ; CALLING SEQUENCE:
00CF    471 ;
00CF    472 ;       JSB or BSB
00CF    473 ;
00CF    474 ; INPUTS:
00CF    475 ;
00CF    476 ;       R11     - parameter pointer
00CF    477 ;
00CF    478 ; IMPLICIT INPUTS:
00CF    479 ;
00CF    480 ;       none
00CF    481 ;
00CF    482 ; OUTPUTS:
00CF    483 ;
00CF    484 ;       R6      - value of count, if # or number found, else -1
00CF    485 ;
00CF    486 ; IMPLICIT OUTPUTS:
00CF    487 ;
00CF    488 ;       R11 may be modified if a parameter is taken from the stack
00CF    489 ;
00CF    490 ; COMPLETION CODES:
00CF    491 ;
00CF    492 ;       none
00CF    493 ;
00CF    494 ; SIDE EFFECTS:
00CF    495 ;
00CF    496 ;       R1, R3, and R4 are destroyed
00CF    497 ;--
```

```
                                00CF
                                00CF  GETCOUNT:
            56    01    CE    00CF          MNEGL   #1,R6                      ; not found indicator
        F4 BD     23    91    00D2          CMPB    #^A/#/,@INPTR(FP)          ; is this a param. count?
                  26    13    00D6          BEQL    40$                        ; yes .. pull next param
                  53    7C    00D8          CLRQ    R3                         ; zero buffer for digit (R3)
                                00DA                                           ; ... and accumulator for sum (R4)
        51    F4 AD    D0    00DA          MOVL    INPTR(FP),R1               ; remember where we were
                                00DE  10$:
    53  F4 BD     30    83    00DE          SUBB3   #^A/0/,@INPTR(FP),R3       ; subtract ascii 0 from char
                  0F    19    00E3          BLSS    20$                        ; branch if not numeric
            53    09    91    00E5          CMPB    #^A/9/-^A/0/,R3            ; still numeric?
                  0A    19    00E8          BLSS    20$                        ; no, branch
            54    0A    C4    00EA          MULL2   #10,R4                     ; shift for next digit
            54    53    C0    00ED          ADDL    R3,R4                      ; add in next digit
                  D0    10    00F0          BSBB    GETCHAR                    ; skip digit we took
                  EA    11    00F2          BRB     10$                        ; continue while numeric
                                00F4  20$:
        F4 AD     51    D1    00F4          CMPL    R1,INPTR(FP)               ; did we get any chars?
                  03    13    00F8          BEQL    30$                        ; no, leave
            56    54    D0    00FA          MOVL    R4,R6                      ; yes, return value
                                00FD  30$:
                        05    00FD          RSB                                ; return
                                00FE
                                00FE  40$:
            56    8B    D0    00FE          MOVL    (R11)+,R6                  ; get value from next parameter
                  BF    10    0101          BSBB    GETCHAR                    ; skip '#'
                        05    0103          RSB                                ; return
```

```
0104          .SBTTL  CVTASC  - Insert ASCII string
0104          .LIST MEB
0104
0104  ;++
0104  ;
0104  ; FUNCTIONAL DESCRIPTION:
0104  ;
0104  ;       Service routine to handle ASCII string insertions.
0104  ;       Strings are specified by several different methods.  For
0104  ;       filled strings (AF) , non-printing characters are output
0104  ;       as dots ('.').
0104  ;
0104  ; CALLING SEQUENCE:
0104  ;
0104  ;       JSB or BSB
0104  ;
0104  ; INPUTS:
0104  ;
0104  ;       R3      - index of first control char in CNTRL_TABLE
0104  ;       R4      - second control character
0104  ;       R6      - output field width
0104  ;       R9      - output buffer length remaining
0104  ;       R10     - output buffer pointer
0104  ;       R11     - parameter pointer
0104  ;
0104  ; IMPLICIT INPUTS:
0104  ;
0104  ;       none
0104  ;
0104  ; OUTPUTS:
0104  ;
0104  ;       none
0104  ;
0104  ; IMPLICIT OUTPUTS:
0104  ;
0104  ;       R9 and R10 are update to point to current position in output buffer
0104  ;       R11 is updated as parameters are taken from the stack
0104  ;
0104  ; ROUTINE VALUE:
0104  ;
0104  ;       none
0104  ;
0104  ; SIDE EFFECTS:
0104  ;
0104  ;       R7 and R8 are destroyed
0104  ;--
```

```
                                  0104
                                  0104  CVTASC:
                  0078 8F   BB    0104          PUSHR   #^M<R3,R4,R5,R6>          ; save registers
                       57   D4    0108          CLRL    R7                         ; set filled indicator to not filled
     00000020'EF  04   54   3A    010A          LOCC    R4,#4,STRING_TYPES        ; search for string subtype
                       61   13    0112          BEQL    110$                       ; error if not found
                                  0114
                                  0114  ;
                                  0114  ;       R0 = 1 - filled , 2 - 2 arg desc. , 3 - str. desc. , 4 - cstring
                                  0114  ;
                                  0114          CASE    R0,<10$,20$,30$>,B,#2     ; case on descriptor type, base = 2
            02'  02   50   8F    0114          CASEB   R0,#2,S^#<<30003$-30002$>/2>-1
                                  0118      30002$:
                            0008' 0118          .SIGNED_WORD    10$-30002$
                            000D' 011A          .SIGNED_WORD    20$-30002$
                            0015' 011C          .SIGNED_WORD    30$-30002$
                                  011E      30003$:
                                  011E
                                  011E  ;
                                  011E  ; Case falls through here for filled ascii strings. Two argument
                                  011E  ; descriptor is used.
                                  011E  ;
                                  011E
                       57   D6    011E          INCL    R7                         ; set filled indicator for filled ascii
                                  0120  10$:
                  51   8B   7D    0120          MOVQ    (R11)+,R1                  ; get length and address
                       0E   11    0123          BRB     40$                        ; continue
                                  0125
                                  0125  ;
                                  0125  ; Standard system string descriptor
                                  0125  ;
                                  0125
                                  0125  20$:
                  51   9B   7D    0125          MOVQ    @(R11)+,R1                 ; move descriptor to R1,R2
                  51   51   3C    0128          MOVZWL  R1,R1                      ; make sure length is word
                       06   11    012B          BRB     40$                        ; continue
                                  012D
                                  012D  ;
                                  012D  ; Ascii counted string, first byte contains length
                                  012D  ;
                                  012D
                                  012D  30$:
                  52   8B   D0    012D          MOVL    (R11)+,R2                  ; address of counted string
                  51   82   9A    0130          MOVZBL  (R2)+,R1                   ; get length and skip byte count
                                  0133
                                  0133  40$:
                                  0133
                                  0133  ;
                                  0133  ; Here, R1 has string length, R2 has string address. Check length against
                                  0133  ; specified field width to decide how much string to move.
                                  0133  ;
                                  0133
                  58   56   D0    0133          MOVL    R6,R8                      ; was a width specified?
                       03   18    0136          BGEQ    50$                        ; branch if so
                  58   51   D0    0138          MOVL    R1,R8                      ; if not, use string length instead
                                  013B  50$:
                                  013B
```

```
                                013B   626 ;
                                013B   627 ; The string is moved to the output buffer with blank fill at the
                                013B   628 ; end.  The output pointers are then updated by the field width, so
                                013B   629 ; that the string will be truncated if it was longer than the field
                                013B   630 ; width.  If the string is filled, a second pass is made to change
                                013B   631 ; non-printing characters to dots.
                                013B   632 ;
                                013B   633
                  56    59    D0  013B   634          MOVL    R9,R6                       ; copy remaining char count
                                014E   635                                              ; NOTE we have to use R6 here.
                  59    58    C2  014E   636          SUBL    R8,R9                       ; update length remaining
                        03    19  0141   637          BLSS    55$                         ; Overflow, use remaining length.
                  56    58    D0  0143   638          MOVL    R8,R6                       ; else move only required length
        6A  56  20    62    51  2C  0146   639 55$:    MOVC5   R1,(R2),#^A/ /,R6,(R10) ; move string, fill at end
                                014C   640
                  52    5A    D0  014C   641          MOVL    R10,R2                      ; save output address
                  5A    56    C0  014F   642          ADDL    R6,R10                      ; update output pointer
                     14 57    E9  0152   643          BLBC    R7,90$                      ; all done if not filled ASCII
                                0155   644 60$:                                          ; R7 will now become loop counter.
                  20    62    91  0155   645          CMPB    (R2),#^040                  ; printing character?
                        06    19  0158   646          BLSS    70$                         ; no, fill with dot
                  7E 8F 62    91  015A   647          CMPB    (R2),#^0176                 ; still printing?
                        03    15  015E   648          BLEQ    80$                         ; yes, skip this one
                                0160   649 70$:
                  62    2E    90  0160   650          MOVB    #^A/./,(R2)                 ; insert dot in place of char
                                0163   651 80$:
                        52    D6  0163   652          INCL    R2                          ; point to next character
                  EC 57 56    F3  0165   653          AOBLEQ  R6,R7,60$                   ; continue until done
                                0169   654
                                0169   655 90$:
                        59    D5  0169   656          TSTL    R9                          ; Did we get result overflow above?
                        05    19  016B   657          BLSS    100$                        ; Yes, branch to tell user.
                  0078 8F BA    016D   658          POPR    #^M<R3,R4,R5,R6>
                        05    0171   659          RSB                                 ; return
                              0172   660
                              0172   661 100$:
                     FF35 31    0172   662          BRW     OVERFLOW
                              0175   663 110$:
                     FF2D 31    0175   664          BRW     ILLEGAL
```

```
0178   666          .SBTTL  CVTNUM - Convert numeric parameter to ASCII
0178   667
0178   668 ;++
0178   669 ;
0178   670 ; FUNCTIONAL DESCRIPTION:
0178   671 ;
0178   672 ;       This routine handles the various HEX, OCTAL, and DECIMAL
0178   673 ;       conversions. The proper field is extracted from the
0178   674 ;       parameter (byte, word , or long) and the needed output
0178   675 ;       width is determined.  This is compared with the user
0178   676 ;       specified field width to determine if padding of filling
0178   677 ;       is needed.  The entire field with fill is built on the
0178   678 ;       stack and then moved so that the result will be correct
0178   679 ;       on buffer overflow.
0178   680 ;
0178   681 ; CALLING SEQUENCE:
0178   682 ;
0178   683 ;       JSB or BSB
0178   684 ;
0178   685 ; INPUTS:
0178   686 ;
0178   687 ;       R3      - index of directive in CNTRL_TABLE.
0178   688 ;                         0 = Octal
0178   689 ;                         1 = heX
0178   690 ;                         2 = Unsigned decimal
0178   691 ;                         3 = Signed decimal
0178   692 ;                         4 = Zero filled unsigned decimal
0178   693 ;       R4      - second char of directive (B,W, or L)
0178   694 ;       R6      - field width, or -1 if none
0178   695 ;       R9      - output length remaining
0178   696 ;       R10     - output position pointer
0178   697 ;       R11     - next parameter pointer
0178   698 ;
0178   699 ; IMPLICIT INPUTS:
0178   700 ;
0178   701 ;       none
0178   702 ;
0178   703 ; OUTPUTS:
0178   704 ;
0178   705 ;       none
0178   706 ;
0178   707 ; IMPLICIT OUTPUTS:
0178   708 ;
0178   709 ;       none
0178   710 ;
0178   711 ; ROUTINE VALUE:
0178   712 ;
0178   713 ;       none
0178   714 ;
0178   715 ; SIDE EFFECTS:
0178   716 ;
0178   717 ;       none
0178   718 ;--
```

```
                                0178   720 ;
                                0178   721 ; The registers will be set up as follows
                                0178   722 ;
                                0178   723 ;       R0  - max digits to be output
                                0178   724 ;       R1  - 0 -> byte, 1 -> word , 2 -> long
                                0178   725 ;       R2  - value to be converted
                                0178   726 ;       R4  - conversion radix
                                0178   727 ;       R5  - sign indicator, 1 -> sign to be output, 0 otherwise
                                0178   728 ;       R7  - fill character, (blank, zero for !Z, or * on width too small
                                0178   729 ;                 for decimal conversions)
                                0178   730 ;       R8  - total width of field to be output
                                0178   731 ;
                                0178   732
                                0178   733 CVTNUM:
                          38    BB    0178   734         PUSHR   #^M<R3,R4,R5>
                                017A   735
        00000024'EF     03    54    3A    017A   736         LOCC    R4,#3,DATA_TYPES        ; determine data type
                              03    12    0182   737         BNEQ    10$                     ; continue if legal directive
                           FF1E     31    0184   738         BRW     ILLEGAL                 ; else take error condition
                                0187   739 10$:
                  51    03    50    C3    0187   740         SUBL3   R0,#3,R1                ; convert to index
                        52    8B    D0    018B   741         MOVL    (R11)+,R2               ; get next longword parameter
  52    52    0000002A'EF41    00    EF    018E   742         EXTZV   #0,FIELDS[R1],R2,R2     ; select proper field
                        55    D4    0198   743         CLRL    R5                      ; note unsigned
                     57   20    90    019A   744         MOVB    #^A/ /,R7               ; default fill char is blank
           54   00000038'EF43    9A    019D   745         MOVZBL  RADIX[R3],R4            ; get conversion radix
                                01A5   746
                                01A5   747 ;
                                01A5   748 ; Case on the type of conversion.  Note that base is set
                                01A5   749 ; so that octal and hex conversions fall through case table.
                                01A5   750 ;
                                01A5   751
                                01A5   752         CASE    R3,<40$,30$,20$>,,#2    ; base index of 2
        02'  02    53    AF    01A5           CASEW   R3,#2,S^#<<30005$-30004$>/2>-1
                                01A9       30004$:
                     003C'      01A9           .SIGNED_WORD    40$-30004$
                     0029'      01AB           .SIGNED_WORD    30$-30004$
                     0024'      01AD           .SIGNED_WORD    20$-30004$
                                01AF       30005$:
                                01AF   753
                                01AF   754 ;
                                01AF   755 ; Octal and Hex fall through here
                                01AF   756 ;
                                01AF   757
           50    6143    DE    01AF   758         MOVAL   (R1)[R3],R0             ; compute index in OCT_HEX_DIGITS
  50    00000031'EF40    9A    01B3   759         MOVZBL  OCT_HEX_DIGITS[R0],R0   ; get number of digits to output
              58    56    D0    01BB   760         MOVL    R6,R8                   ; user specified width?
                    03    18    01BE   761         BGEQ    15$                     ; yes, use it as width
              58    50    D0    01C0   762         MOVL    R0,R8                   ; else take needed space
                                01C3   763 15$:
              50    58    D1    01C3   764         CMPL    R8,R0                   ; width lss default digits?
                    47    18    01C6   765         BGEQ    60$                     ; no, fill to user specified width
              50    58    D0    01C8   766         MOVL    R8,R0                   ; else output only specified width
                    42    11    01CB   767         BRB     60$
                                01CD   768
                                01CD   769 ;
                                01CD   770 ; Unsigned decimal with zero fill
```

```
                                01CD    771 ;
                                01CD    772
                                01CD    773 20$:
                     57  30  90  01CD    774         MOVB    #^A/0/,R7               ; insert new fill char
                         13  11  01D0    775         BRB     40$                     ; continue with normal dec. code
                                01D2    776
                                01D2    777 ;
                                01D2    778 ; Signed decimal conversion
                                01D2    779 ;
                                01D2    780
                                01D2    781 30$:
 52  52  0000002A'EF41  00  EE  01D2    782         EXTV    #0,FIELDS[R1],R2,R2     ; sign extend the field
                   05 52  1F  E1  01DC    783         BBC     #31,R2,40$              ; not negative, continue
                          55  D6  01E0    784         INCL    R5                      ; else note that value negative
                      52  52  CE  01E2    785         MNEGL   R2,R2                   ; and make it positive
                                01E5    786
                                01E5    787 40$:                                    ; common decimal processing
                                01E5    788
                                01E5    789 ;
                                01E5    790 ; Determine the number of digits needed to print number in ASCII
                                01E5    791 ; decimal representation.
                                01E5    792 ;
                                01E5    793
                      50  01  D0  01E5    794         MOVL    #1,R0                   ; init digit counter
                      53  54  D0  01E8    795         MOVL    R4,R3                   ; copy first power of 10
                                01EB    796 44$:
                      53  52  D1  01EB    797         CMPL    R2,R3                   ; does it fit?
                          07  1F  01EE    798         BLSSU   48$                     ; yes, R0 has count if so
                      53  54  C4  01F0    799         MULL    R4,R3                   ; else compute next power of ten
                  F4  50  54  F2  01F3    800         AOBLSS  R4,R0,44$               ; continue (10 digits is largest possible)
                                01F7    801 48$:
              53      55  50  C1  01F7    802         ADDL3   R0,R5,R3                ; add in sign, if one exists
                      58  56  D0  01FB    803         MOVL    R6,R8                   ; did user specify width?
                          05  18  01FE    804         BGEQ    50$                     ; yes, use it for field width
                      58  53  D0  0200    805         MOVL    R3,R8                   ; else use amount needed
                          0A  11  0203    806         BRB     60$                     ; continue
                                0205    807 50$:
                      58  53  D1  0205    808         CMPL    R3,R8                   ; is there space within specified width?
                          05  15  0208    809         BLEQ    60$                     ; yes, go on
                      57  2A  90  020A    810         MOVB    #^A/*/,R7               ; no room, fill with stars
                          50  D4  020D    811         CLRL    R0                      ; output no digits
                                020F    812
                                020F    813 60$:
                  F8  AD  52  D0  020F    814         MOVL    R2,LASTVAL(FP)          ; remember value to be converted
                                0213    815
                                0213    816 ;
                                0213    817 ; Insert the ASCII representation for the value in R2 into the
                                0213    818 ; output buffer.
                                0213    819 ;
                                0213    820
                                0213    821 CVT_BIN_TO_ASC:
                                0213    822
                    0840  8F  BB  0213    823         PUSHR   #^M<R6,R11>             ; save work registers
                      04  A8  9F  0217    824         PUSHAB  4(R8)                   ; compute stack space needed for buffer
                      6E  03  CA  021A    825         BICL    #3,(SP)                 ; round stack to longword
                      5B  5E  D0  021D    826         MOVL    SP,R11                  ; save stack pointer
                      5E  6B  C2  0220    827         SUBL    (R11),SP                ; leave buffer space on stack
```

```
                                  0223
                        53   D4   0223          CLRL    R3                      ; clear upper half of quad quotient
                  51    01   CE   0225          MNEGL   #1,R1                   ; init digit counter for loop
                        0D   11   0228          BRB     15$                     ; start loop
                                  022A  10$:
        56   52   52    54   7B   022A          EDIV    R4,R2,R2,R6             ; R2 <- quotient, R6 <- remainder
     7B   00000000'EF46      90   022F          MOVB    ASC_NAMES[R6],-(R11)    ; output ascii digit
                                  0237  15$:
              EF 51     50   F2   0237          AOBLSS  R0,R1,10$               ; one more digit, done yet?
                     05 55   E9   023B          BLBC    R5,20$                  ; branch if no sign to output
                  7B    2D   90   023E          MOVB    #^A/-/,-(R11)           ; output sign
                        51   D6   0241          INCL    R1                      ;
                                  0243  20$:
                                  0243
                                  0243  ;
                                  0243  ; If field (R8) is not full, then fill remainder with the fill character
                                  0243  ;
                                  0243
                        03   11   0243          BRB     40$                     ; start the loop
                                  0245  30$:
                  7B    57   90   0245          MOVB    R7,-(R11)               ; insert fill character
                                  0248  40$:
              F9 51     58   F3   0248          AOBLEQ  R8,R1,30$               ; fill until full
                                  024C
                                  024C  ;
                                  024C  ; Now copy stack back to buffer, checking for overflow
                                  024C  ;
                                  024C
                        08   11   024C          BRB     70$                     ; start loop
                                  024E  50$:
                     02 59   F4   024E          SOBGEQ  R9,60$                  ; update length, check for overflow
                        21   11   0251          BRB     INSERT_OVF              ; handle overflow
                  8A    8B   90   0253  60$:    MOVB    (R11)+,(R10)+           ; move char to output buffer
                     F5 58   F4   0256  70$:    SOBGEQ  R8,50$                  ; move entire string
                                  0259
                                  0259  ;
                                  0259  ; Now clean up mess on stack
                                  0259  ;
                                  0259
                  5E    5B   D0   0259          MOVL    R11,SP                  ; restore stack
                  0841  8F   BA   025C          POPR    #^M<R0,R6,R11>          ; remove top of stack and restore regs
                                  0260
                                  0260  ;
                                  0260  ; Restore registers and return from service routine.
                                  0260  ;
                                  0260
                        38   BA   0260          POPR    #^M<R3,R4,R5>
                        05        0262          RSB
```

```
                     0263    877          .SBTTL  QUICKSERVE - Small service routines
                     0263    878
                     0263    879 ;++
                     0263    880 ;
                     0263    881 ; FUNCTIONAL DESCRIPTION:
                     0263    882 ;
                     0263    883 ;       Following are a collection of short service routines for
                     0263    884 ;       FAO directives.
                     0263    885 ;
                     0263    886 ; CALLING SEQUENCE:
                     0263    887 ;
                     0263    888 ;       JSB or BSB
                     0263    889 ;
                     0263    890 ; INPUTS:
                     0263    891 ;
                     0263    892 ;       R3  - index in CNTRL_TABLE of the directive
                     0263    893 ;       R4  - second character of two-char directive, if any
                     0263    894 ;       R6  - user specified field width, if any (ignored for singal char
                     0263    895 ;             and argument directives)
                     0263    896 ;       R9  - output length remaining
                     0263    897 ;       R10 - output position pointer
                     0263    898 ;
                     0263    899 ; IMPLICIT INPUTS:
                     0263    900 ;
                     0263    901 ;       none
                     0263    902 ;
                     0263    903 ; OUTPUTS:
                     0263    904 ;
                     0263    905 ;       none
                     0263    906 ;
                     0263    907 ; IMPLICIT OUTPUTS:
                     0263    908 ;
                     0263    909 ;       R9 and R10 are modified
                     0263    910 ;
                     0263    911 ; COMPLETION CODES:
                     0263    912 ;
                     0263    913 ;       none
                     0263    914 ;
                     0263    915 ; SIDE EFFECTS:
                     0263    916 ;
                     0263    917 ;       none
                     0263    918 ;--
```

```
                        0263    920
                        0263    921 INCR_ARGPTR:
                        0263    922 ;
                        0263    923 ; Directive to skip next parameter in parameter list
                        0263    924 ;
                        0263    925
                8B  D5  0263    926         TSTL    (R11)+                  ; skip next parameter
                    05  0265    927         RSB                             ; exit
                        0266    928
                        0266    929 DECR_ARGPTR:
                        0266    930 ;
                        0266    931 ; Directive to back up and reuse last parameter in parameter list
                        0266    932 ;
                        0266    933
                7B  D5  0266    934         TSTL    -(R11)                  ; back up argument pointer
                    05  0268    935         RSB                             ; exit
                        0269    936
                        0269    937 NEWLINE:
                        0269    938 ;
                        0269    939 ; Insert carriage return, line feed into output buffer
                        0269    940 ;
                        0269    941
              02 59 F4  0269    942         SOBGEQ  R9,10$                  ; room for CR?, branch if so
                 06 11  026C    943         BRB     INSERT_OVF              ; no room in output buffer
                        026E    944 10$:
            8A  0D 90   026E    945         MOVB    #CR,(R10)+              ; insert CR in output buffer
                        0271    946                                         ; continue for LF insertion
                        0271    947
                        0271    948 INSERT_CHAR:
                        0271    949 ;
                        0271    950 ; Make simple one character insertion in the output buffer.
                        0271    951 ;
                        0271    952
              03 59 F4  0271    953         SOBGEQ  R9,INSERT_IT            ; check length, branch if ok
                        0274    954
                        0274    955 INSERT_OVF:
               FE33 31  0274    956         BRW     OVERFLOW                ; error , no room in output buffer
                        0277    957
                        0277    958 INSERT_IT:
                        0277    959 ;
                        0277    960 ; Insert the character by computing the index into the replacement table
                        0277    961 ;
                        0277    962
8A  00000021'EF43 90    0277    963         MOVB    REPLACEMENT-REPL_OFFSET[R3],(R10)+ ; insert the char
                    05  027F    964         RSB
                        0280    965
                        0280    966 ;
                        0280    967 ; Directive to repeat a particular character 'n' times, where 'n' is
                        0280    968 ; specified by the field width in the directive.
                        0280    969 ;
                        0280    970
                        0280    971 REPEATIT:
                38  BB  0280    972         PUSHR   #^M<R3,R4,R5>           ; save regs for MOVC5 clobber
                56  D5  0282    973         TSTL    R6                      ; check if width was specified
                15  19  0284    974         BLSS    ILLFIELD                ; illegal if none specified
            59  56  C2  0286    975         SUBL    R6,R9                   ; compute remaining output length
                E9  19  0289    976         BLSS    INSERT_OVF              ; not enough room, error
```

```
      6A   56   54   6E   00   2C  028B          MOVC5   #0,(SP),R4,R6,(R10)      ; fill with specified character
                      5A   56   C0  0291          ADDL    R6,R10                   ; update output pointer
                           38   BA  0294          POPR    #^M<R3,R4,R5>            ; restore regs
                                05  0296          RSB
                                    0297
                                    0297  ;
                                    0297  ; The field width is specified with the define field directive.  At the
                                    0297  ; end field directive, any of the field remaining is blank filled, else
                                    0297  ; the field is truncated to the specified length.
                                    0297  ;
                                    0297
                                    0297  STARTFIELD:
                           56   D5  0297          TSTL    R6                       ; did user specify field (must be specified)
                           03   18  0299          BGEQ    STARTOK                  ; yes, continue
                                    029B
                                    029B  ILLFIELD:
                         FE07   31  029B          BRW     ILLEGAL                  ; illegal directive
                                    029E
                                    029E  STARTOK:
            FC AD   5A   56   C1  029E          ADDL3   R6,R10,FIELDEND(FP)      ; compute and save ending address
                      59   56   D1  02A3          CMPL    R6,R9                    ; was that much space remaining?
                           CC   14  02A6          BGTR    INSERT_OVF               ; no, take error here
                                05  02A8          RSB                              ; return
                                    02A9
                                    02A9  ;
                                    02A9  ; Set up registers so that if fill is needed, a phony call is made
                                    02A9  ; to REPEATIT with the length in R6 and the 'blank' character in R4
                                    02A9  ;
                                    02A9
                                    02A9  ENDFIELD:
                      54   20   9A  02A9          MOVZBL  #^A/ /,R4                ; generate blank fill character
            56   FC AD   5A   C3  02AC          SUBL3   R10,FIELDEND(FP),R6      ; compute remaining field length
                           CD   14  02B1          BGTR    REPEATIT                 ; if any left, go fill with blanks
                 5A   FC AD   D0  02B3          MOVL    FIELDEND(FP),R10         ; else truncate by setting back pointer
                      59   56   C2  02B7          SUBL    R6,R9                    ; subtract negative difference from counter
                                05  02BA          RSB                              ; return
```

```
                     02BB  1015          .SBTTL  PERCENT - Time directives and plural 'S'
                     02BB  1016
                     02BB  1017 ;++
                     02BB  1018 ;
                     02BB  1019 ; FUNCTIONAL DESCRIPTION:
                     02BB  1020 ;
                     02BB  1021 ;       These directives are for date and time conversion, and for
                     02BB  1022 ;       conditionally inserting a plural 'S' into messages.
                     02BB  1023 ;       The time directives insert an ASCII time string into the output buffer.
                     02BB  1024 ;       The user may supply a quadword binary time to be converted,
                     02BB  1025 ;       or have the current date or time inserted.
                     02BB  1026 ;
                     02BB  1027 ; CALLING SEQUENCE:
                     02BB  1028 ;
                     02BB  1029 ;       JSB/BSB
                     02BB  1030 ;
                     02BB  1031 ; INPUTS:
                     02BB  1032 ;
                     02BB  1033 ;       R4  - second character of directive.  D -> convert
                     02BB  1034 ;               date and time, T -> convert time only
                     02BB  1035 ;               S -> plural indicator
                     02BB  1036 ;       R9  - remaining length of output buffer
                     02BB  1037 ;       R10 - current output buffer position
                     02BB  1038 ;       R11 - next parameter address
                     02BB  1039 ;
                     02BB  1040 ; IMPLICIT INPUTS:
                     02BB  1041 ;
                     02BB  1042 ;       none
                     02BB  1043 ;
                     02BB  1044 ; OUTPUTS:
                     02BB  1045 ;
                     02BB  1046 ;       none
                     02BB  1047 ;
                     02BB  1048 ; IMPLICIT OUTPUTS:
                     02BB  1049 ;
                     02BB  1050 ;       none
                     02BB  1051 ;
                     02BB  1052 ; ROUTINE VALUE:
                     02BB  1053 ;
                     02BB  1054 ;       none
                     02BB  1055 ;
                     02BB  1056 ; SIDE EFFECTS:
                     02BB  1057 ;
                     02BB  1058 ;       none
                     02BB  1059 ;--
```

```
                                02BB  1061 PERCENT:
        00000027'EF    03   54   3A  02BB  1062          LOCC    R4,#3,PERCENT_STR       ; find directive type
                            D6   13  02C3  1063          BEQL    ILLFIELD                ; illegal directive if not found
                            57   D4  02C5  1064          CLRL    R7                      ; assume date and time
                                02C7  1065          CASE    R0,<10$,30$>,B,#2       ; branch on directive type
                  01'   02   50   8F  02C7              CASEB   R0,#2,S^#<<30007$-30006$>/2>-1
                                02CB      30006$:
                     0006'      02CB              .SIGNED_WORD    10$-30006$
                     003F'      02CD              .SIGNED_WORD    30$-30006$
                                02CF      30007$:
                                02CF  1066
                                02CF  1067 ;
                                02CF  1068 ; Time only directive falls through here
                                02CF  1069 ;
                                02CF  1070
                            57   D6  02CF  1071          INCL    R7                      ; indicate time only
                                02D1  1072 10$:                                     ; time and date enters here
                            38   BB  02D1  1073          PUSHR   #^M<R3,R4,R5>           ; save registers
        6A   59   20   6A   00   2C  02D3  1074          MOVC5   #0,(R10),#^A/ /,R9,(R10) ; blank fill rest of output buffer
                       58   7E   DE  02D9  1075          MOVAL   -(SP),R8                ; space for return length
                       7E   59   7D  02DC  1076          MOVQ    R9,-(SP)                ; form descriptor for output buffer
                       52   6E   DE  02DF  1077          MOVAL   (SP),R2                 ; get address of buffer descriptor
                       51   8B   D0  02E2  1078          MOVL    (R11)+,R1               ; get binary time address
                                02E5  1079 ;        BEQL    12$                     ; branch if no address                  [01]
                                02E5  1080 ;        CMPL    (R1),4(R1)              ; let potential access violation        [01]
                                02E5  1081                                          ; ...happen in this frame rather than
                                02E5  1082                                          ; ...within $ASCTIM to help condition
                                02E5  1083                                          ; ...handler
                                02E5  1084 12$:     $ASCTIM_S (R8),(R2),(R1),R7     ; convert time to ascii
                            57   DD  02E5                      PUSHL   R7
                            61   7F  02E7                      PUSHAQ  (R1)
                            62   7F  02E9                      PUSHAQ  (R2)
                            68   3F  02EB                      PUSHAW  (R8)
        00000000'GF         04   FB  02ED                      CALLS   #4,G^SYS$ASCTIM
                  52        56   D0  02F4  1085          MOVL    R6,R2                   ; did user specify width?
                            03   18  02F7  1086          BGEQ    20$                     ; yes, use it
                  52        68   3C  02F9  1087          MOVZWL  (R8),R2                 ; else use returned length
                                02FC  1088 20$:
                  59        52   C2  02FC  1089          SUBL    R2,R9                   ; update output length
                            12   19  02FF  1090          BLSS    40$                     ; error, not enough room
                  5A        52   C0  0301  1091          ADDL    R2,R10                  ; update output buffer
                  5E        0C   C0  0304  1092          ADDL    #12,SP                  ; pop locals from stack
                            38   BA  0307  1093          POPR    #^M<R3,R4,R5>           ; restore registers
                                05  0309  1094          RSB                             ;
                                030A  1095 30$:
                                030A  1096
                                030A  1097 ;
                                030A  1098 ; Check if the last value converted was equal to one.  If so, then do
                                030A  1099 ; nothing, else output an 'S' into the output buffer.
                                030A  1100 ;
                                030A  1101
              F8 AD    01   D1  030A  1102          CMPL    #1,LASTVAL(FP)          ; was last value a one
                       13   13  030E  1103          BEQL    60$                     ; yes, simply return
                    03 59   F4  0310  1104          SOBGEQ  R9,50$                  ; check if room in buffer
                     FD94   31  0313  1105 40$:     BRW     OVERFLOW                ; no room , error
                                0316  1106
              8A    53 8F    90  0316  1107 50$:     MOVB    #^A/S/,(R10)+           ; plural, insert 'S'
```

```
                04 FE AA    05    E1  031A  1108          BBC     #5,-2(R10),60$          ; continue if previous character was
                                      031F  1109                                          ; ...upper case
                   FF AA    20    88  031F  1110          BISB    #^X20,-1(R10)           ; else convert upper 'S' to lower 's'
                                      0323  1111
                            05        0323  1112 60$:     RSB                             ; return
```

```
0324  1114          .SBTTL  HANDLER - Condition handler
0324  1115
0324  1116 ;++
0324  1117 ;
0324  1118 ; FUNCTIONAL DESCRIPTION:
0324  1119 ;
0324  1120 ;       This condition handler is used to catch any errors which
0324  1121 ;       ocurred while processing the arguments, such as access
0324  1122 ;       violation.  This is because we don't want exceptions
0324  1123 ;       occurring within the system service.
0324  1124 ;       Care must be taken in this handler to deal with a second access
0324  1125 ;       violation while storing the return value for $FAO.
0324  1126 ;
0324  1127 ; INPUTS:
0324  1128 ;
0324  1129 ;       CHF$L_SIGARGLST(AP) = Address of signal vector
0324  1130 ;       CHF$L_MCHARGLST(AP) = Address of mechanism vector
0324  1131 ;
0324  1132 ; OUTPUTS:
0324  1133 ;
0324  1134 ;       The final R0 is set to the status code and the service
0324  1135 ;       is exited via $UNWIND.
0324  1136 ;--
```

```
0324  1138 ;HANDLER:
0324  1139 ;       .WORD   0                                                                       [01]
0324  1140 ;                                                                                       [01]
0324  1141 ;       MOVAB   L^EXE$SIGTORET,(FP)     ;Simple handler for errors here                 [01]
0324  1142 ;                                                                                       [01]
0324  1143 ;       ASSUME  CHF$L_MCHARGLST,EQ,CHF$L_SIGARGLST+4                                    [01]
0324  1144 ;       MOVQ    CHF$L_SIGARGLST(AP),R0  ; Get address of signal argument list           [01]
0324  1145 ;       CMPL    #SS$_UNWIND,CHF$L_SIG_NAME(R0) ;Unwinding?                              [01]
0324  1146 ;       BEQL    90$                     ;Exit if yes                                    [01]
0324  1147 ;       TSTL    CHF$L_MCH_DEPTH(R1)     ;Exception within FAO?                          [01]
0324  1148 ;       BNEQ    80$                     ;Resignal if no                                 [01]
0324  1149 ;       MOVL    CHF$L_SIG_NAME(R0),CHF$L_MCH_SAVR0(R1) ;Set final return status        [01]
0324  1150 ;       CLRQ    -(SP)                   ;Clear depth and new PC arguments               [01]
0324  1151 ;       CALLS   #2,G^SYS$UNWIND         ;Unwind to establisher's caller                 [01]
0324  1152 ;                                       ;***** The next instruction my ACCVIO           [01]
0324  1153 ;       MOVL    SF$L_SAVE_AP(FP),R0     ;Get address of FAO's argument list             [01]
0324  1154 ;       MOVL    OUTLEN(R0),R0           ;Output length requested?                       [01]
0324  1155 ;       BEQL    10$                     ;Branch if not                                  [01]
0324  1156 ;       CLRW    (R0)                    ;Indicate nothing returned in buffer            [01]
0324  1157 ;10$:                                   ;***** End of potential ACCVIO                  [01]
0324  1158 ;80$:   MOVZWL  #SS$_RESIGNAL,R0        ;Resignal (ignore after UNWIND)                 [01]
0324  1159 ;90$:   RET                             ;                                               [01]
0324  1160
0324  1161         .END
```

```
ARGCOUNT                        = 00000000     D
ASC_NAMES                         00000000 R   D   02
CASE_BSB                          00000081 R   D   03
CASE_LOOP                         00000083 R   D   03
CNTRL_LENGTH                    = 00000010     D
CNTRL_TABLE                       00000010 R   D   02
CR                              = 0000000D     D
CVTASC                            00000104 R   D   03
CVTNUM                            00000178 R   D   03
CVT_BIN_TO_ASC                    00000213 R   D   03
DATA_TYPES                        00000024 R   D   02
DECR_ARGPTR                       00000266 R   D   03
DONE                              000000B3 R   D   03
ENDFIELD                          000002A9 R   D   03
EXCL                            = 00000021     D
EXE$FAO                           00000000 RG  D   03
EXE$FAOL                          00000008 RG  D   03
FAO                               0000000E R   D   03
FAO_CASE                          00000088 R   D   03
FAO_EXIT                          000000B6 R   D   03
FF                              = 0000000C     D
FIELDEND                        = FFFFFFFC     D
FIELDS                            0000002A R   D   02
FIRSTARG                        = 00000010     D
GETCHAR                           000000C2 R   D   03
GETCOUNT                          000000CF R   D   03
ILLEGAL                           000000A5 R   D   03
ILLFIELD                          0000029B R   D   03
INCR_ARGPTR                       00000263 R   D   03
INDSC                           = 00000004     D
INLEN                           = FFFFFFF0     D
INPTR                           = FFFFFFF4     D
INSERT_CHAR                       00000271 R   D   03
INSERT_IT                         00000277 R   D   03
INSERT_OVF                        00000274 R   D   03
LASTVAL                         = FFFFFFF8     D
LF                              = 0000000A     D
MAIN_SCAN                         0000001B R   D   03
NEWLINE                           00000269 R   D   03
OCT_HEX_DIGITS                    00000031 R   D   02
ONECHAR_INDEX                   = 00000008     D
ONE_CHAR_CNTRLS                   00000018 R   D   02
OUTDSC                          = 0000000C     D
OUTLEN                          = 00000008     D
OVERFLOW                          000000AA R   D   03
PARSE_DIRECTIVE                   00000046 R   D   03
PERCENT                           000002BB R   D   03
PERCENT_STR                       00000027 R   D   02
RADIX                             00000038 R   D   02
REPEATIT                          00000280 R   D   03
REPLACEMENT                       0000002D R   D   02
REPLACE_CHRS                      0000001C R   D   02
REPL_OFFSET                     = 0000000C     D
SS$_BADPARAM                    = 00000014     D
SS$_BUFFEROVF                   = 00000601     D
SS$_NORMAL                      = 00000001     D
STARTFIELD                        00000297 R   D   03
STARTOK                           0000029E R   D   03
STRING_TYPES                      00000020 R   D   02
SYS$ASCTIM                        ******** GX    03
TAB                             = 00000009     D
TWO_CHAR_CNTRLS                   00000010 R   D   02
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	00000000 (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
DATA	0000003D (61.)	02 (2.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC LONG
CODE	00000324 (804.)	03 (3.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
ARGCOUNT	=00000000	102 (1)	
ASC_NAMES	00000000-R	126 (1)	#-834 (1)
CASE_BSB	00000081-R	358 (1)	#-361 (1)
CASE_LOOP	00000083-R	360 (1)	#-357 (1)
CNTRL_LENGTH	=00000010	166 (1)	168 (1) #-339 (1) #-350 (1)
CNTRL_TABLE	00000010-R	143 (1)	166 (1) 168 (1) 170 (1) 339 (1)
CR	=0000000D	113 (1)	#-945 (1)
CVTASC	00000104-R	576 (1)	387 (1)
CVTNUM	00000178-R	733 (1)	#-389 (1)
CVT_BIN_TO_ASC	00000213-R	821 (1)	
DATA_TYPES	00000024-R	174 (1)	736 (1)
DECR_ARGPTR	00000266-R	929 (1)	387 (1)
DONE	000000B3-R	401 (1)	#-310 (1)
ENDFIELD	000002A9-R	1007 (1)	387 (1)
EXCL	=00000021	115 (1)	181 (1) #-301 (1)
EXE$FAO	00000000-R	270 (1)	
EXE$FAOL	00000008-R	281 (1)	
FAO	0000000E-R	288 (1)	#-275 (1)
FAO_CASE	00000088-R	374 (1)	#-359 (1)
FAO_EXIT	000000B6-R	404 (1)	#-394 (1) #-399 (1)
FF	=0000000C	117 (1)	181 (1)
FIELDEND	=FFFFFFFC	111 (1)	#-1009 (1) #-1011 (1) #-997 (1)
FIELDS	0000002A-R	178 (1)	#-742 (1) #-782 (1)
FIRSTARG	=00000010	106 (1)	274 (1) #-285 (1)
GETCHAR	000000C2-R	451 (1)	#-313 (1) #-328 (1) #-337 (1) #-343 (1)
			#-347 (1) #-514 (1) #-525 (1)
GETCOUNT	000000CF-R	500 (1)	#-327 (1) #-336 (1)
ILLEGAL	000000A5-R	392 (1)	#-340 (1) #-453 (1) #-664 (1) #-738 (1)
			#-994 (1)
ILLFIELD	0000029B-R	993 (1)	#-1063 (1) #-974 (1)
INCR_ARGPTR	00000263-R	921 (1)	387 (1)
INDSC	=00000004	103 (1)	#-290 (1)
INLEN	=FFFFFFF0	108 (1)	#-301 (1) #-305 (1) #-306 (1) #-452 (1)
INPTR	=FFFFFFF4	109 (1)	301 (1) 309 (1) #-311 (1) #-454 (1)
			#-455 (1) #-502 (1) #-506 (1) #-508 (1)
			#-517 (1)
INSERT_CHAR	00000271-R	948 (1)	387 (1)
INSERT_IT	00000277-R	958 (1)	#-953 (1)
INSERT_OVF	00000274-R	955 (1)	#-859 (1) #-943 (1) #-976 (1) #-999 (1)
LASTVAL	=FFFFFFF8	110 (1)	#-1102 (1) #-814 (1)
LF	=0000000A	114 (1)	181 (1)
MAIN_SCAN	0000001B-R	299 (1)	#-362 (1)
NEWLINE	00000269-R	937 (1)	387 (1)
OCT_HEX_DIGITS	00000031-R	190 (1)	#-759 (1)
ONECHAR_INDEX	=00000008	168 (1)	#-341 (1)
ONE_CHAR_CNTRLS	00000018-R	154 (1)	168 (1)
OUTDSC	=0000000C	105 (1)	#-291 (1) #-407 (1)
OUTLEN	=00000008	104 (1)	#-405 (1) #-407 (1)
OVERFLOW	000000AA-R	396 (1)	#-1105 (1) #-308 (1) #-662 (1) #-956 (1)
PARSE_DIRECTIVE	00000046-R	323 (1)	

```
PERCENT                         000002BB-R   1061    (1)      387    (1)
PERCENT_STR                     00000027-R   176     (1)      1062   (1)
RADIX                           00000038-R   194     (1)    #-745    (1)
REPEATIT                        00000280-R   971     (1)    #-1010   (1)      387    (1)
REPLACEMENT                     0000002D-R   180     (1)    #-963    (1)
REPLACE_CHRS                    0000001C-R   160     (1)      170    (1)
REPL_OFFSET                    =0000000C     170     (1)    #-963    (1)
SS$_BADPARAM                   =00000014                    #-393    (1)
SS$_BUFFEROVF                  =00000601                    #-397    (1)
SS$_NORMAL                     =00000001                    #-402    (1)
STARTFIELD                      00000297-R   989     (1)      387    (1)
STARTOK                         0000029E-R   996     (1)    #-991    (1)
STRING_TYPES                    00000020-R   172     (1)      579    (1)
SYS$ASCTIM                      00000000-XR                   1084    (1)
TAB                            =00000009     116     (1)      181    (1)
TWO_CHAR_CNTRLS                 00000010-R   144     (1)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	43	00:00:00.02	00:00:00.20
Command processing	933	00:00:00.27	00:00:01.05
Pass 1	371	00:00:01.10	00:00:02.35
Symbol table sort	0	00:00:00.14	00:00:00.14
Pass 2	21	00:00:00.57	00:00:01.52
Symbol table output	2	00:00:00.01	00:00:00.01
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	4	00:00:00.04	00:00:00.08
Assembler run totals	1378	00:00:02.16	00:00:05.36

```
The working set limit was 2400 pages.
58153 bytes (114 pages) of virtual memory were used to buffer the intermediate code.
There were 30 pages of symbol table space allocated to hold 469 non-local and 55 local symbols.
1161 source lines were read in Pass 1, producing 42 object records in Pass 2.
11 pages of virtual memory were used to define 10 macros.
```

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	1
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	6
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	7

```
492 GETS were required to define 7 macros.

There were no errors, warnings or information messages.
```

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 90 Libraries, Macros, Equated Symbols
(1) 121 Data Psect Declarations
(1) 143 VRSetFlg Routine - Set control flags
(1) 200 VRClrFlg Routine - Clear control flags
(1) 248 VRSetEF Routine - Set event flags
(1) 298 VRClrEF Routine - Clear event flags
(1) 348 VRShowFlg Routine - Show control flags
(1) 418 VRShowEF Routine - Show event flags

```
                        0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element FLAGS.MAR
                        0000     2 ; *1     6-FEB-1986 15:18:35 DS ""
                        0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element FLAGS.MAR
                        0000     4         .TITLE  FLAGS   *** FLAGS Set/Clear/Show flags
                        0000     5         .IDENT  /07-14/
                        0000     6         .NoShow Conditionals    ;                                                    [11]
                        0000     7
                        0000     8 ;++
                        0000     9 ; Copyright (c) 1977, 1982, 1985
                        0000    10 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
                        0000    11 ;
                        0000    12 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
                        0000    13 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
                        0000    14 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
                        0000    15 ; MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
                        0000    16 ; EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
                        0000    17 ; TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
                        0000    18 ; REMAIN IN DEC.
                        0000    19 ;
                        0000    20 ; THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
                        0000    21 ; AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
                        0000    22 ; CORPORATION.
                        0000    23 ;
                        0000    24 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
                        0000    25 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
                        0000    26 ;--
```

```
                        0000     28 ;++
                        0000     29 ; FACILITY:
                        0000     30 ;
                        0000     31 ;       VAX DIAGNOSTIC SUPERVISOR
                        0000     32 ;
                        0000     33 ; ABSTRACT:
                        0000     34 ;
                        0000     35 ;       Set/clear/show control and event flags.
                        0000     36 ;
                        0000     37 ; ENVIRONMENT:
                        0000     38 ;
                        0000     39 ; AUTHOR:
                        0000     40 ;
                        0000     41 ;       TOM SOUTTER     17-NOV-77       VERSION 01
                        0000     42 ;
                        0000     43 ; MODIFIED BY:
                        0000     44 ;       01      TOM SOUTTER     21-NOV-77       VERSION 02
                        0000     45 ;               DSPR #14 - DEFAULT FLAGS SETTING.
                        0000     46 ;
                        0000     47 ;       02      KEN CHAPMAN     05-DEC-77       VERSION 03 (ESSAA-3.05)
                        0000     48 ;               DSPR #45 - REMOVED HALTI.
                        0000     49 ;
                        0000     50 ;       03      KEN CHAPMAN     09-JAN-78       VERSION 04 (ESSAA-3.06)
                        0000     51 ;               DSPR #14 - DEFAULT FLAG SETTING (AND CLEARING).
                        0000     52 ;       04      SET AND CLEAR FLAGS ALL SHOULDN'T MODIFY APT FLAGS.
                        0000     53 ;
                        0000     54 ;       05      KEN CHAPMAN     19-JAN-78       VERSION 05 (ESSAA-3.07)
                        0000     55 ;               FIXED SET AND CLEAR FLAGS ALL BY DEFINING DSA$M_ALLFLAGS.
                        0000     56 ;
                        0000     57 ;       06      Dave Butenhof   15-feb-80
                        0000     58 ;               Include SEARCH flag
                        0000     59 ;
                        0000     60 ;       07      Dave Butenhof   30-apr-80
                        0000     61 ;               Change DSA$GL_FLAGS references from word relative to long
                        0000     62 ;               relative
                        0000     63 ;
                        0000     64 ;       08      - Jack Stansbury, 22-Oct-1981, Version 6.-
                        0000     65 ;               Fixed truncation errors by changing remaining W^'s to L^.
                        0000     66 ;               Also added .LIBRARY statements for $DS and $DIAG.
                        0000     67 ;
                        0000     68 ;       09      - Jack Stansbury, 4-Nov-1981, Version 6.-
                        0000     69 ;               Took out all references to the following:
                        0000     70 ;               LOCK, SPOOL, COMPAT, ENSPEC, HALTD, HALTI, SUBMIT, LOG, and
                        0000     71 ;               CONSOLE. These flags are no longer used anywhere. I changed
                        0000     72 ;               the HALTD and HALTI flags to just plain HALT.
                        0000     73 ;
                        0000     74 ;       10      - Jack Stansbury, 12-Nov-1981, Version 6.-
                        0000     75 ;               Added the VERIFY and BINARY flags.
                        0000     76 ;
                        0000     77 ;       11      - Jack Stansbury, 25-Mar-1982, Version 6.?
                        0000     78 ;               Added typecoding to the print statements.
                        0000     79 ;
                        0000     80 ;       [12]    Dave Butenhof   07-May-1982     Version 6.8
                        0000     81 ;               Fix truncation error
                        0000     82 ;
                        0000     83 ;       [13]    Marion Baggett  16-June-1982    Version 6.8
                        0000     84 ;               Show HALT  flag if cleared.
```

```
                        0000     85 ;
                        0000     86 ;       [14]    Amy Iorio,      19-July-1985    Version 8.3
                        0000     87 ;               Show ASKPROMPT flag, cleared and set.
                        0000     88 ;--
```

```
0000     90          .SBTTL  Libraries, Macros, Equated Symbols
0000     91 ;
0000     92 ; INCLUDE FILES:
0000     93 ;
0000     94          .Library        /Sys$Library:Lib/       ;                       [11]
0000     95          .Library        /$DS/                   ;                       [08]
0000     96          .Library        /$DIAG/                 ;                       [08]
0000     97
0000     98 ;
0000     99 ; MACROS:
0000    100 ;
0000    101
0000    102 ;
0000    103 ; EQUATED SYMBOLS:
0000    104 ;
0000    105
0000    106          $DS_DSADEF                      ; CONTROL FLAG DEFINITIONS
0000    107          CLIDEF                          ; CLI COMMAND BLOCK OFFSETS
0000    108          ENVDEF                          ; ENVIRONMENT BIT DEFINITIONS
```

```
                 0000   109        $DS_TypeDef                      ; Define TypeCodes                    [11]
                 0000   110
        00000002 0000   111        $ENV            = 1aV_ENV        ; FORCE SS CALLS TO SS VECTORS
                 0000   112
        00000013 0000   113        LEFTMOSTFLAG    = DSA$V_ASK_PROMPT; MSB for CVTREG function            [13]
                 0000   114
                 0000   115        DSA$M_ALLFLAGS  = DSA$M_HALT  ! DSA$M_LOOP    ! DSA$M_BELL  -   ;      [10]
                 0000   116                        ! DSA$M_IE1   ! DSA$M_IE2     ! DSA$M_IE3   -   ;      [09]
                 0000   117                        ! DSA$M_QUICK ! DSA$M_VERIFY  ! DSA$M_TRACE -   ;      [10]
                 0000   118                        ! DSA$M_OPER  ! DSA$M_PROMPT  ! DSA$M_IES   -   ;      [09]
        000037FD 0000   119        ;               ! DSA$M_ASK_PROMPT                                ;      [13]
```

```
                                        0000    121          .Subtitle       Data Psect Declarations
                                        0000    122 ;
                                        0000    123 ; OWN STORAGE:
                                        0000    124 ;
                                        0000    125
                                    00000000    126          .Psect  Data, Shr, NoExe, NoWrt, Byte
                                        0000    127
                                        0000    128 FMTSHOWFLGS:
66 20 6C 6F 72 74 6E 6F 43 2F 21 00'    0000    129          .ASCIC  .!/Control flags  set : !AC.
20 3A 20 74 65 73 20 20 73 67 61 6C     000C
                              43 41 21  0018
                                    1A  0000
                                        001B    130
                                        001B    131 FMTSHOWFLGC:
66 20 6C 6F 72 74 6E 6F 43 2F 21 00'    001B    132          .ASCIC  .!/Control flags clear: !AC!/.
20 3A 72 61 65 6C 63 20 73 67 61 6C     0027
                        2F 21 43 41 21  0033
                                    1C  001B
                                        0038    133
                                        0038    134 FMTSHOWEF:
61 6C 66 20 74 6E 65 76 45 2F 21 00'    0038    135          .ASCIC  .!/Event flags set: !AC!/.
21 43 41 21 20 3A 74 65 73 20 73 67     0044
                                    2F  0050
                                    18  0038
                                        0051    136
                                        0051    137 AFLAGMNE:
2C 74 70 6D 6F 72 50 5F 6B 73 41 00'    0051    138          .ASCIC  .Ask_Prompt,,,,,Search,Prompt,Oper,,Trace,Verify,Quick,.-       ;
50 2C 68 63 72 61 65 53 2C 2C 2C 2C     005D
2C 2C 72 65 70 4F 2C 74 70 6D 6F 72     0069
79 66 69 72 65 56 2C 65 63 61 72 54     0075
                        2C 6B 63 69 75  0081
2C 32 45 49 2C 33 45 49 2C 53 45 49     0088    139                  .IES,IE3,IE2,IE1,Bell,Loop,Binary,Halt.                         ;
6F 6F 4C 2C 6C 6C 65 42 2C 31 45 49     0094
6C 61 48 2C 79 72 61 6E 69 42 2C 70     00A0
                                    74  00AC
                                    5B  0051
                                        00AD    140 AEFNMNE:
30 32 2C 31 32 2C 32 32 2C 33 32 00'    00AD    141          .ASCIC  .23,22,21,20,19,18,17,16,15,14,13,12,11,10,9,8,7,6,5,4,3,2,1.
36 31 2C 37 31 2C 38 31 2C 39 31 2C     00B9
32 31 2C 33 31 2C 34 31 2C 35 31 2C     00C5
37 2C 38 2C 39 2C 30 31 2C 31 31 2C     00D1
31 2C 32 2C 33 2C 34 2C 35 2C 36 2C     00DD
                                    3B  00AD
```

```
                    00E9   143          .SBTTL  VRSetFlg Routine - Set control flags
                00000000   144          .PSECT  CODE, SHR, EXE, NOWRT, BYTE
                    0000   145 ;++
                    0000   146 ; FUNCTIONAL DESCRIPTION:
                    0000   147 ;
                    0000   148 ;       SETS SPECIFIED OPERATOR CONTROL FLAGS
                    0000   149 ;
                    0000   150 ; CALLING SEQUENCE:
                    0000   151 ;
                    0000   152 ;       BSBW    VRSETFLG
                    0000   153 ;
                    0000   154 ; INPUT PARAMETERS:
                    0000   155 ;
                    0000   156 ;       CLI$L_DATA = MASK OF SPECIFIED FLAGS
                    0000   157 ;
                    0000   158 ; IMPLICIT INPUTS:
                    0000   159 ;
                    0000   160 ;       R2      = BASE ADDRESS FOR CLI DATA BLOCK (DS$GL_CLIBASE).
                    0000   161 ;
                    0000   162 ; OUTPUT PARAMETERS:
                    0000   163 ;
                    0000   164 ;       NONE
                    0000   165 ;
                    0000   166 ; IMPLICIT OUTPUTS:
                    0000   167 ;
                    0000   168 ;       NONE
                    0000   169 ;
                    0000   170 ; COMPLETION CODES:
                    0000   171 ;
                    0000   172 ;       NONE
                    0000   173 ;
                    0000   174 ; SIDE EFFECTS:
                    0000   175 ;
                    0000   176 ;       NONE
                    0000   177 ;
                    0000   178 ;--
```

```
                                  0000  VRSETFLG::                                  ;
                0B 62   0C   E1   0000          BBC     #CLI$V_DEFAULT, -          ; SET TO DEFAULT ?
                                  0004                    CLI$L_FLAGS(R2), 10$
     0000FE00'EF   0000'8F   B0   0004          MOVW    #DSA$M_DFLTFLGS, -         ; Yes, plug in default
                                  000D                    L^DSA$GL_FLAGS
                        15   11   000D          BRB     VRSETFLG_X
                                  000F
                     1C A2   D5   000F  10$:    TSTL    CLI$L_DATA(R2)             ; CHECK FOR ALL.
                        08   18   0012          BGEQ    20$                        ; SKIP IF NOT.
                                  0014  ;       MOVZWL  #DSA$M_ALLFLAGS, -         ; GET "ALL" FLAGS.
                                  0014  ;                 CLI$L_DATA(R2)
       1C A2   000037FD 8F   D0   0014          MOVL    #DSA$M_ALLFLAGS, -         ; GET "ALL" FLAGS.
                                  001C                    CLI$L_DATA(R2)
                                  001C
       0000FE00'EF   1C A2   C8   001C  20$:    BISL2   CLI$L_DATA(R2), -          ; No, set the specified flags
                                  0024                    L^DSA$GL_FLAGS
                                  0024
                                  0024  VRSETFLG_X:
                            05    0024          RSB                                ; RETURN
```

```
0025    200          .SBTTL  VRClrFlg Routine - Clear control flags
0025    201 ;++
0025    202 ; FUNCTIONAL DESCRIPTION:
0025    203 ;
0025    204 ;       CLEARS SPECIFIED OPERATOR CONTROL FLAGS
0025    205 ;
0025    206 ; CALLING SEQUENCE:
0025    207 ;
0025    208 ;       BSBW    VRCLRFLG
0025    209 ;
0025    210 ; INPUT PARAMETERS:
0025    211 ;
0025    212 ;       CLI$L_DATA = MASK OF SPECIFIED FLAGS
0025    213 ;
0025    214 ; IMPLICIT INPUTS:
0025    215 ;
0025    216 ;       R2      = BASE ADDRESS FOR CLI DATA BLOCK (DS$GL_CLIBASE).
0025    217 ;
0025    218 ; OUTPUT PARAMETERS:
0025    219 ;
0025    220 ;       NONE
0025    221 ;
0025    222 ; IMPLICIT OUTPUTS:
0025    223 ;
0025    224 ;       NONE
0025    225 ;
0025    226 ; COMPLETION CODES:
0025    227 ;
0025    228 ;       NONE
0025    229 ;
0025    230 ; SIDE EFFECTS:
0025    231 ;
0025    232 ;       NONE
0025    233 ;
0025    234 ;--
```

```
                                 0025   236 VRCLRFLG::                                  ;
                     1C A2   D5  0025   237         TSTL    CLI$L_DATA(R2)             ; CHECK FOR "ALL".
                        08   18  0028   238         BGEQ    10$                        ; BR IF NOT.
                                 002A   239 ;       MOVZWL  #DSA$M_ALLFLAGS, -         ; GET "ALL" FLAGS.
                                 002A   240 ;                 CLI$L_DATA(R2)
     1C A2   000037FD 8F    D0  002A   241         MOVL    #DSA$M_ALLFLAGS, -         ; GET "ALL" FLAGS.
                                 0032   242                   CLI$L_DATA(R2)
                                 0032   243
     0000FE00'EF   1C A2    CA  0032   244 10$:    BICL2   CLI$L_DATA(R2), -          ; Clear specified flags
                                 003A   245                   L^DSA$GL_FLAGS
                            05  003A   246         RSB                                ; RETURN
```

```
                        .SBTTL  VRSetEF Routine - Set event flags
                ;++
                ; FUNCTIONAL DESCRIPTION:
                ;
                ;       SETS OPERATOR SPECIFIED EVENT FLAGS (1-23 ONLY)
                ;
                ; CALLING SEQUENCE:
                ;
                ;       BSBW    VRSETEF
                ;
                ; INPUT PARAMETERS:
                ;
                ;       CLI$L_DATA = MASK OF SPECIFIED FLAGS
                ;
                ; IMPLICIT INPUTS:
                ;
                ;       R2      = BASE ADDRESS FOR CLI DATA BLOCK (DS$GL_CLIBASE).
                ;
                ; OUTPUT PARAMETERS:
                ;
                ;       NONE
                ;
                ; IMPLICIT OUTPUTS:
                ;
                ;       NONE
                ;
                ; COMPLETION CODES:
                ;
                ;       NONE
                ;
                ; SIDE EFFECTS:
                ;
                ;       NONE
                ;
                ;--
```

```
                                 003B   284 VRSETEF::                                  ;
                        08   BB  003B   285         PUSHR   #^M<R3>                    ; SAVE SOME WORKING REGISTERS
      1C A2   FF000001  8F   CA  003D   286         BICL    #^XFF000001, -             ; CLEAR ILLEGAL FLAGS
                                 0045   287                   CLI$L_DATA(R2)
                                 0045   288
                53      17   D0  0045   289 10$:    MOVL    #23,R3                     ; UPPER FLAG NUMBER LIMIT
                                 0048   290
           09 1C A2     53   E1  0048   291 20$:    BBC     R3, CLI$L_DATA(R2), 30$    ; EFN SPECIFIED ?
                                 004D   292         $SETEF_S  R3                       ; YES, THEN GO SET IT
                        53   DD  004D                       PUSHL   R3
        00000000'GF     01   FB  004F                       CALLS   #1,G^SYS$SETEF
                                 0056   293
                   EF   53   F5  0056   294 30$:    SOBGTR  R3,20$                     ; NEXT TILL DONE (DON'T DO 0)
                        08   BA  0059   295         POPR    #^M<R3>                    ; RESTORE REGISTERS
                             05  005B   296         RSB                                ; RETURN
```

```
                        005C    298          .SBTTL  VRClrEF Routine - Clear event flags
                        005C    299 ;++
                        005C    300 ; FUNCTIONAL DESCRIPTION:
                        005C    301 ;
                        005C    302 ;       CLEARS OPERATOR SPECIFIED EVENT FLAGS (1-23 ONLY)
                        005C    303 ;
                        005C    304 ; CALLING SEQUENCE:
                        005C    305 ;
                        005C    306 ;       BSBW    VRCLREF
                        005C    307 ;
                        005C    308 ; INPUT PARAMETERS:
                        005C    309 ;
                        005C    310 ;       CLI$L_DATA = MASK OF SPECIFIED FLAGS
                        005C    311 ;
                        005C    312 ; IMPLICIT INPUTS:
                        005C    313 ;
                        005C    314 ;       R2      = BASE ADDRESS FOR CLI DATA BLOCK (DS$GL_CLIBASE).
                        005C    315 ;
                        005C    316 ; OUTPUT PARAMETERS:
                        005C    317 ;
                        005C    318 ;       NONE
                        005C    319 ;
                        005C    320 ; IMPLICIT OUTPUTS:
                        005C    321 ;
                        005C    322 ;       NONE
                        005C    323 ;
                        005C    324 ; COMPLETION CODES:
                        005C    325 ;
                        005C    326 ;       NONE
                        005C    327 ;
                        005C    328 ; SIDE EFFECTS:
                        005C    329 ;
                        005C    330 ;       NONE
                        005C    331 ;
                        005C    332 ;--
```

```
                                  005C   334 VRCLREF::                                  ;
                        08   BB   005C   335         PUSHR   #^M<R3>                    ; SAVE SOME WORKING REGISTERS
      1C A2   FF000001  8F   CA   005E   336         BICL    #^XFF000001, -             ; CHECK FOR ILLEGAL FLAGS
                                  0066   337                   CLI$L_DATA(R2)
                                  0066   338
                53      17   D0   0066   339 10$:    MOVL    #23,R3                     ; UPPER FLAG NUMBER LIMIT
                                  0069   340
           09 1C A2     53   E1   0069   341 20$:    BBC     R3, CLI$L_DATA(R2), 30$    ; EFN SPECIFIED ?
                                  006E   342         $CLREF_S  R3                       ; YES, THEN GO CLEAR IT
                        53   DD   006E                       PUSHL   R3
      00000000'GF       01   FB   0070                       CALLS   #1,G^SYS$CLREF
                                  0077   343
                   EF   53   F5   0077   344 30$:    SOBGTR  R3,20$                     ; NEXT TILL DONE (DON'T DO 0)
                        08   BA   007A   345         POPR    #^M<R3>                    ; RESTORE REGISTERS
                             05   007C   346         RSB                                ; RETURN
```

```
                        348          .SBTTL  VRShowFlg Routine - Show control flags
                        349 ;++
                        350 ; FUNCTIONAL DESCRIPTION:
                        351 ;
                        352 ;       DISPLAYS OPERATOR CONTROL FLAGS WHICH ARE SET FOLLOWED BY
                        353 ;       THOSE WHICH ARE CLEAR (I.E., DISPLAYS ALL CONTROL FLAGS)
                        354 ;
                        355 ; CALLING SEQUENCE:
                        356 ;
                        357 ;       BSBW    VRSHOWFLG
                        358 ;
                        359 ; INPUT PARAMETERS:
                        360 ;
                        361 ;       NONE
                        362 ;
                        363 ; IMPLICIT INPUTS:
                        364 ;
                        365 ;       DSA$GL_FLAGS = FLAGS WHICH ARE TO BE DISPLAYED
                        366 ;
                        367 ; OUTPUT PARAMETERS:
                        368 ;
                        369 ;       NONE
                        370 ;
                        371 ; IMPLICIT OUTPUTS:
                        372 ;
                        373 ;       NONE
                        374 ;
                        375 ; COMPLETION CODES:
                        376 ;
                        377 ;       NONE
                        378 ;
                        379 ; SIDE EFFECTS:
                        380 ;
                        381 ;       NONE
                        382 ;
                        383 ;--
```

```
                                  007D   385 VRSHOWFLG::                                  ;
                        04    BB  007D   386         PUSHR   #^M<R2>                      ; SAVE A WORKING REGISTER
                                  007F   387         $DS_CVTREG_S                      - ; BUILD MNEMONIC STRING
                                  007F   388             MSB=#LEFTMOSTFLAG,            - ; FIRST BIT TO BE INTERPRETED
                                  007F   389             DATA=L^DSA$GL_FLAGS,          - ; Register location
                                  007F   390             MNEADR=L^AFLAGMNE,            - ; CONTROL STRING ADDRESS                [08]
                                  007F   391             STRBUF=L^DS$GT_STRBUF,        - ; MNEMONIC STRING BUFFER                [08]
                                  007F   392             MAXLEN=#DS$K_STRBUF             ; SIZE OF ABOVE BUFFER
                        00    DD  007F                     PUSHL   #0
                        00    DD  0081                     PUSHL   #0
                        00    DD  0083                     PUSHL   #0
                        00    DD  0085                     PUSHL   #0
                        00    DD  0087                     PUSHL   #0
                        00    DD  0089                     PUSHL   #0
              00000000'8F    DD  008B                     PUSHL   #DS$K_STRBUF
              00000000'EF    9F  0091                     PUSHAB  L^DS$GT_STRBUF
              00000051'EF    9F  0097                     PUSHAB  L^AFLAGMNE
              0000FE00'EF    DD  009D                     PUSHL   L^DSA$GL_FLAGS
                        13    DD  00A3                     PUSHL   #LEFTMOSTFLAG
        00000000'9F   0B    FB  00A5                     CALLS   #11, @#DS$CVTREG
                                  00AC   393
                                  00AC   394         $Print -                          ; Display flags which are set             [11]
                                  00AC   395                 #DS$K_Type_Command_Out, -; ... typecode number                    [11]
                                  00AC   396                 #DS$K_PrintF, -           ; ... type of print                       [11]
                                  00AC   397                 L^FMTSHOWFLGS, -          ; ... the format string                   [11]
                                  00AC   398                 #DS$GT_STRBUF             ; .. the converted register output        [11]
              00000000'8F    DD  00AC                     PUSHL   #DS$GT_STRBUF
              00000000'EF    9F  00B2                     PUSHAB  L^FMTSHOWFLGS
                   7E    01    9A  00B8                     movzbl  #DS$K_PrintF, -(sp)
                   7E    16    98  00BB                     cvtbl   #DS$K_Type_Command_Out, -(sp)
        00000000'GF   04    FB  00BE                     CALLS   #$$N+2, G^DSX$PRINT
                                  00C5   399
        52    0000FE00'EF    D2  00C5   400         MCOML   L^DSA$GL_FLAGS, R2        ; Get cleared flags
                                  00CC   401
                                  00CC   402         $DS_CVTREG_S                      - ; BUILD MNEMONIC STRING
                                  00CC   403             MSB=#LEFTMOSTFLAG,            - ; FIRST BIT TO BE INTERPRETED
                                  00CC   404             DATA=R2,                      - ; REGISTER LOCATION
                                  00CC   405             MNEADR=L^AFLAGMNE,            - ; CONTROL STRING ADDRESS                [08]
                                  00CC   406             STRBUF=L^DS$GT_STRBUF,        - ; MNEMONIC STRING BUFFER                [08]
                                  00CC   407             MAXLEN=#DS$K_STRBUF             ; SIZE OF ABOVE BUFFER
                        00    DD  00CC                     PUSHL   #0
                        00    DD  00CE                     PUSHL   #0
                        00    DD  00D0                     PUSHL   #0
                        00    DD  00D2                     PUSHL   #0
                        00    DD  00D4                     PUSHL   #0
                        00    DD  00D6                     PUSHL   #0
              00000000'8F    DD  00D8                     PUSHL   #DS$K_STRBUF
              00000000'EF    9F  00DE                     PUSHAB  L^DS$GT_STRBUF
              00000051'EF    9F  00E4                     PUSHAB  L^AFLAGMNE
                        52    DD  00EA                     PUSHL   R2
                        13    DD  00EC                     PUSHL   #LEFTMOSTFLAG
        00000000'9F   0B    FB  00EE                     CALLS   #11, @#DS$CVTREG
                                  00F5   408
                                  00F5   409         $Print -                          ; Display flags which are clear           [11]
                                  00F5   410                 #DS$K_Type_Command_Out, -; ... typecode number                    [11]
                                  00F5   411                 #DS$K_PrintF, -           ; ... type of print                       [11]
                                  00F5   412                 L^FMTSHOWFLGC, -          ; ... the format string                   [11]
```

```
                          00F5   413                 $DS$GT_STRBUF           ; .. the converted register output      [11]
          00000000'8F     DD   00F5                  PUSHL   $DS$GT_STRBUF
          0000001B'EF     9F   00FB                  PUSHAB  L^FMTSHOWFLGC
                 7E   01  9A   0101                  movzbl  $DS$K_PrintF, -(sp)
                 7E   16  98   0104                  cvtbl   $DS$K_Type_Command_Out, -(sp)
       00000000'GF   04  FB   0107                  CALLS   $$N+2, G^DSX$PRINT
                          010E   414
                   04  BA   010E   415       POPR    $^M<R2>                 ; RESTORE REGISTERS
                         05   0110   416       RSB                             ; RETURN
```

```
0111    418          .SBTTL  VRShowEF Routine - Show event flags
0111    419 ;++
0111    420 ; FUNCTIONAL DESCRIPTION:
0111    421 ;
0111    422 ;       DISPLAYS ALL OPERATOR ACCESSABLE EVENT FLAGS WHICH ARE
0111    423 ;       CURRENTLY SET
0111    424 ;
0111    425 ; CALLING SEQUENCE:
0111    426 ;
0111    427 ;       BSBW    VRSHOWEF
0111    428 ;
0111    429 ; INPUT PARAMETERS:
0111    430 ;
0111    431 ;       NONE
0111    432 ;
0111    433 ; IMPLICIT INPUTS:
0111    434 ;
0111    435 ;       NONE
0111    436 ;
0111    437 ; OUTPUT PARAMETERS:
0111    438 ;
0111    439 ;       NONE
0111    440 ;
0111    441 ; IMPLICIT OUTPUTS:
0111    442 ;
0111    443 ;       DS$GL_EFC0 = CLUSTER 0 EVENT FLAGS
0111    444 ;
0111    445 ; COMPLETION CODES:
0111    446 ;
0111    447 ;       NONE
0111    448 ;
0111    449 ; SIDE EFFECTS:
0111    450 ;
0111    451 ;       NONE
0111    452 ;
0111    453 ;--
```

```
                                0111   455 VRSHOWEF::                                  ;
                        04   BB 0111   456         PUSHR   #^M<R2>                     ; SAVE A WORKING REGISTER
                                0113   457         $READEF_S  #0,L^DS$GL_EFC0          ; READ EVENT FLAG CLUSTER 0                [08]
              00000000'EF   DF 0113                     PUSHAL  L^DS$GL_EFC0
                        00   DD 0119                     PUSHL   #0
         00000000'GF    02   FB 011B                     CALLS   #2,G^SYS$READEF
   52   00000000'EF   FF 8F   9C 0122   458         ROTL    #-1,L^DS$GL_EFC0,R2         ; POSITION FOR CVTREG                      [12]
                                012B   459
                                012B   460         $DS_CVTREG_S                      - ; BUILD MNEMONIC STRING
                                012B   461             MSB=#22,                      - ; FIRST BIT TO BE INTERPRETED
                                012B   462             DATA=R2,                      - ; REGISTER LOCATION
                                012B   463             MNEADR=L^AEFNMNE,             - ; CONTROL STRING ADDRESS                 [08]
                                012B   464             STRBUF=L^DS$GT_STRBUF,        - ; MNEMONIC STRING BUFFER                 [08]
                                012B   465             MAXLEN=#DS$K_STRBUF             ; SIZE OF ABOVE BUFFER
                        00   DD 012B                     PUSHL   #0
                        00   DD 012D                     PUSHL   #0
                        00   DD 012F                     PUSHL   #0
                        00   DD 0131                     PUSHL   #0
                        00   DD 0133                     PUSHL   #0
                        00   DD 0135                     PUSHL   #0
              00000000'8F   DD 0137                     PUSHL   #DS$K_STRBUF
              00000000'EF   9F 013D                     PUSHAB  L^DS$GT_STRBUF
              000000AD'EF   9F 0143                     PUSHAB  L^AEFNMNE
                        52   DD 0149                     PUSHL   R2
                        16   DD 014B                     PUSHL   #22
         00000000'9F    0B   FB 014D                     CALLS   #11, @#DS$CVTREG
                                0154   466
                                0154   467         $Print -                            ; Display flags which are set              [11]
                                0154   468                 #DS$K_Type_Command_Out, -; ... typecode number                     [11]
                                0154   469                 #DS$K_PrintF, -             ; ... type of print                        [11]
                                0154   470                 L^FMTSHOWEF, -              ; ... the format string                    [11]
                                0154   471                 #DS$GT_STRBUF               ; .. the converted register output         [11]
              00000000'8F   DD 0154                     PUSHL   #DS$GT_STRBUF
              00000038'EF   9F 015A                     PUSHAB  L^FMTSHOWEF
                   7E   01   9A 0160                     movzbl  #DS$K_PrintF, -(sp)
                   7E   16   98 0163                     cvtbl   #DS$K_Type_Command_Out, -(sp)
         00000000'GF    04   FB 0166                     CALLS   #$$N+2, G^DSX$PRINT
                                016D   472
                        04   BA 016D   473         POPR    #^M<R2>                     ; RESTORE REGISTERS
                             05 016F   474         RSB                                 ; RETURN
                                0170   475         .END
```

```
$$N                             = 00000002    D
$ENV                            = 00000002    D
AEFNMNE                           000000AD R  D  02
AFLAGMNE                          00000051 R  D  02
BIT...                          = 00000004    D
CLI$K_BUFSIZ                    = 00000100    D
CLI$K_SIZE                        0000044C    D
CLI$L_ADDRESS                     00000018    D
CLI$L_COMMAND                     00000004    D
CLI$L_DATA                        0000001C    D
CLI$L_FLAGS                       00000000    D
CLI$L_FLAGS2                      00000444    D
CLI$L_LAST                        00000024    D
CLI$L_NEXT                        00000030    D
CLI$L_PASS                        0000002C    D
CLI$L_SUBT                        00000028    D
CLI$L_TEMP_BASE                   00000448    D
CLI$L_TEST                        00000020    D
CLI$M_START_OR_RUN              = 00000008    D
CLI$Q_BUFQWD                      00000034    D
CLI$Q_FILE                        00000008    D
CLI$Q_SECTION                     00000010    D
CLI$Q_TIME                        0000043C    D
CLI$T_BUFFER                      0000003C    D
CLI$V_ADAPTER                   = 00000018    D
CLI$V_ADR                       = 0000000B    D
CLI$V_ASCII                     = 00000013    D
CLI$V_BASE_QUAL                 = 00000002    D
CLI$V_BREAK                     = 0000000A    D
CLI$V_BRIEF                     = 0000001B    D
CLI$V_BYTE                      = 0000000D    D
CLI$V_CLEAR                     = 00000002    D
CLI$V_DEC                       = 00000010    D
CLI$V_DEFAULT                   = 0000000C    D
CLI$V_DEPOSIT                   = 00000019    D
CLI$V_EVENT                     = 00000008    D
CLI$V_EXAM                      = 00000005    D
CLI$V_FLAGS                     = 00000009    D
CLI$V_HEX                       = 00000012    D
CLI$V_KERNEL                    = 00000017    D
CLI$V_LOAD                      = 00000006    D
CLI$V_LONG                      = 0000000F    D
CLI$V_NEXT                      = 00000001    D
CLI$V_NOALLOC                   = 00000000    D
CLI$V_NOTNUF                    = 00000001    D
CLI$V_OCT                       = 00000011    D
CLI$V_PREG                      = 0000001A    D
CLI$V_QA                        = 00000007    D
CLI$V_QACKLOOPLOOPS             = 0000001C    D
CLI$V_QAERRORPRINTS             = 0000001B    D
CLI$V_QAMULTIPLEPASS            = 0000001F    D
CLI$V_QASUBTESTLOOPS            = 0000001E    D
CLI$V_QATESTLOOPS               = 0000001D    D
CLI$V_REG                       = 00000014    D
CLI$V_REQUIRED                  = 00000000    D
CLI$V_RUN                       = 00000015    D
CLI$V_SET                       = 00000003    D
CLI$V_SHOW                      = 00000004    D
CLI$V_START_OR_RUN              = 00000003    D
CLI$V_VALSEC                    = 00000016    D
CLI$V_WORD                      = 0000000E    D
DS$CVTREG                         ********    X  03
DS$GL_EFC0                        ********    X  03
DS$GT_STRBUF                      ********    X  03
DS$K_PRINTB                     = 00000002    D
DS$K_PRINTF                     = 00000001    D
DS$K_PRINTI                     = 00000000    D
DS$K_PRINTX                     = 00000003    D
DS$K_STRBUF                       ********    X  03
DS$K_TYPE_ABORT_PROGRAM         = 00000014    D
DS$K_TYPE_ABORT_TEST            = 00000013    D
DS$K_TYPE_COMMAND_ERR           = 00000015    D
DS$K_TYPE_COMMAND_OUT           = 00000016    D
DS$K_TYPE_CRD_AUTOTEST          = 0000001A    D
DS$K_TYPE_DS_PROMPT             = 00000001    D
DS$K_TYPE_DS_START              = 0000001D    D
DS$K_TYPE_ERRDEV                = 00000008    D
DS$K_TYPE_ERRHARD               = 00000006    D
DS$K_TYPE_ERROR_BODY            = 00000009    D
DS$K_TYPE_ERROR_END             = 0000000A    D
DS$K_TYPE_ERRPREP               = 0000001B    D
DS$K_TYPE_ERRSOFT               = 00000007    D
DS$K_TYPE_ERRSUP                = 00000004    D
DS$K_TYPE_ERRSYS                = 00000005    D
DS$K_TYPE_ERR_HALT              = 0000000D    D
DS$K_TYPE_EXCEPTION             = 0000000C    D
DS$K_TYPE_EXCEPTION_HEAD        = 0000000B    D
DS$K_TYPE_FIRST_PASS            = 00000011    D
DS$K_TYPE_GENERAL               = 00000000    D
DS$K_TYPE_GENERAL_ERROR         = 00000003    D
DS$K_TYPE_NO_TESTS              = 00000012    D
DS$K_TYPE_PARAM_ERROR           = 0000001C    D
DS$K_TYPE_PROGRAM_END           = 00000010    D
DS$K_TYPE_PROGRAM_INFO          = 00000017    D
DS$K_TYPE_PROGRAM_START         = 0000000F    D
DS$K_TYPE_QIO_INVADP            = 00000024    D
DS$K_TYPE_QIO_NODRIVER          = 00000022    D
DS$K_TYPE_QIO_WRONGVER          = 00000023    D
DS$K_TYPE_SCRIPT_ECHO           = 00000021    D
DS$K_TYPE_SCRIPT_PNF            = 0000001E    D
DS$K_TYPE_SCRIPT_PROMPT         = 00000020    D
DS$K_TYPE_SCRIPT_SKIP           = 0000001F    D
DS$K_TYPE_SEQUENCE_ERROR        = 00000019    D
DS$K_TYPE_START_ERR             = 00000018    D
DS$K_TYPE_START_LIST            = 00000025    D
DS$K_TYPE_SUMMARY               = 0000000E    D
DS$K_TYPE_USER_PROMPT           = 00000002    D
DSA$AL_APTMAIL                    0000FE00    D
DSA$AT_APTTXT                     0000FA00    D
DSA$GL_APTCOM                     0000FE04    D
DSA$GL_DEVLEN                     0000FE58    D
DSA$GL_ERRNO                      0000FE44    D
DSA$GL_EVENT                      0000FE48    D
DSA$GL_FLAGS                      0000FE00    D
```

```
DSA$GL_MSGTYP                     0000FE40     D
DSA$GL_PASSES                     0000FE08     D
DSA$GL_PASSNO                     0000FE54     D
DSA$GL_SECTNO                     0000FE10     D
DSA$GL_SID                        0000FE14     D
DSA$GL_SUBTNO                     0000FE4C     D
DSA$GL_TESTNO                     0000FE50     D
DSA$GL_UNITS                      0000FE0C     D
DSA$GQ_MSGPTR                     0000FE68     D
DSA$GT_DEVNAM                     0000FE5C     D
DSA$M_ALLFLAGS                  = 000037FD     D
DSA$M_BELL                      = 00000008     D
DSA$M_DFLTFLGS                    ********   X    03
DSA$M_HALT                      = 00000001     D
DSA$M_IE1                       = 00000010     D
DSA$M_IE2                       = 00000020     D
DSA$M_IE3                       = 00000040     D
DSA$M_IES                       = 00000080     D
DSA$M_LOOP                      = 00000004     D
DSA$M_OPER                      = 00001000     D
DSA$M_PROMPT                    = 00002000     D
DSA$M_QUICK                     = 00000100     D
DSA$M_TRACE                     = 00000400     D
DSA$M_VERIFY                    = 00000200     D
DSA$V_ASK_PROMPT                = 00000013     D
DSX$PRINT                         ********   X    03
FMTSHOWEF                         00000038 R   D    02
FMTSHOWFLGC                       0000001B R   D    02
FMTSHOWFLGS                       00000000 R   D    02
LEFTMOSTFLAG                    = 00000013     D
SIZ...                          = 00000001     D
SYS$CLREF                         ********  GX    03
SYS$READEF                        ********  GX    03
SYS$SETEF                         ********  GX    03
VRCLREF                           0000005C RG  D    03
VRCLRFLG                          00000025 RG  D    03
VRSETEF                           0000003B RG  D    03
VRSETFLG                          00000000 RG  D    03
VRSETFLG_X                        00000024 R   D    03
VRSHOWEF                          00000111 RG  D    03
VRSHOWFLG                         0000007D RG  D    03
V_ENV                           = 00000001     D
V_LVL                           = 00000000     D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000FE70 (65136.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
DATA	000000E9 (233.)	02 (2.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC BYTE
CODE	00000170 (368.)	03 (3.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC BYTE

```
                                    +-------------------------+
                                    ! Symbol Cross Reference !
                                    +-------------------------+

SYMBOL                          VALUE        DEFINITION      REFERENCES...
------                          -----        ----------      -------------
$$N                            =00000002     471    (1)      398    (1)      413    (1)      471    (1)
$ENV                           =00000002     111    (1)
AEFNMNE                         000000AD-R   140    (1)      465    (1)
AFLAGMNE                        00000051-R   137    (1)      392    (1)      407    (1)
BIT...                         =00000004     109    (1)      109    (1)
CLI$K_BUFSIZ                   =00000100     107    (1)      107    (1)
CLI$K_SIZE                      0000044C     107    (1)
CLI$L_ADDRESS                   00000018     107    (1)
CLI$L_COMMAND                   00000004     107    (1)
CLI$L_DATA                      0000001C     107    (1)    #-187    (1)    #-192    (1)    #-194    (1)    #-237    (1)
                                                           #-242    (1)    #-244    (1)    #-287    (1)      291    (1)
                                                           #-337    (1)      341    (1)
CLI$L_FLAGS                     00000000     107    (1)      182    (1)
CLI$L_FLAGS2                    00000444     107    (1)
CLI$L_LAST                      00000024     107    (1)
CLI$L_NEXT                      00000030     107    (1)
CLI$L_PASS                      0000002C     107    (1)
CLI$L_SUBT                      00000028     107    (1)
CLI$L_TEMP_BASE                 00000448     107    (1)
CLI$L_TEST                      00000020     107    (1)
CLI$M_START_OR_RUN             =00000008     107    (1)
CLI$Q_BUFQWD                    00000034     107    (1)
CLI$Q_FILE                      00000008     107    (1)
CLI$Q_SECTION                   00000010     107    (1)
CLI$Q_TIME                      0000043C     107    (1)
CLI$T_BUFFER                    0000003C     107    (1)
CLI$V_ADAPTER                  =00000018     107    (1)
CLI$V_ADR                      =0000000B     107    (1)
CLI$V_ASCII                    =00000013     107    (1)
CLI$V_BASE_QUAL                =00000002     107    (1)
CLI$V_BREAK                    =0000000A     107    (1)
CLI$V_BRIEF                    =0000001B     107    (1)
CLI$V_BYTE                     =0000000D     107    (1)
CLI$V_CLEAR                    =00000002     107    (1)
CLI$V_DEC                      =00000010     107    (1)
CLI$V_DEFAULT                  =0000000C     107    (1)    #-181    (1)
CLI$V_DEPOSIT                  =00000019     107    (1)
CLI$V_EVENT                    =00000008     107    (1)
CLI$V_EXAM                     =00000005     107    (1)
CLI$V_FLAGS                    =00000009     107    (1)
CLI$V_HEX                      =00000012     107    (1)
CLI$V_KERNEL                   =00000017     107    (1)
CLI$V_LOAD                     =00000006     107    (1)
CLI$V_LONG                     =0000000F     107    (1)
CLI$V_NEXT                     =00000001     107    (1)
CLI$V_NOALLOC                  =00000000     107    (1)
CLI$V_NOTNUF                   =00000001     107    (1)
CLI$V_OCT                      =00000011     107    (1)
CLI$V_PREG                     =0000001A     107    (1)
CLI$V_QA                       =00000007     107    (1)
```

```
CLI$V_QACKLOOPLOOPS             =0000001C     107    (1)
CLI$V_QAERRORPRINTS             =0000001B     107    (1)
CLI$V_QAMULTIPLEPASS            =0000001F     107    (1)
CLI$V_QASUBTESTLOOPS            =0000001E     107    (1)
CLI$V_QATESTLOOPS               =0000001D     107    (1)
CLI$V_REG                       =00000014     107    (1)
CLI$V_REQUIRED                  =00000000     107    (1)
CLI$V_RUN                       =00000015     107    (1)
CLI$V_SET                       =00000003     107    (1)
CLI$V_SHOW                      =00000004     107    (1)
CLI$V_START_OR_RUN              =00000003     107    (1)      107    (1)
CLI$V_VALSEC                    =00000016     107    (1)
CLI$V_WORD                      =0000000E     107    (1)
DS$CVTREG                        00000000-XR                  392    (1)      407    (1)      465    (1)
DS$GL_EFC0                       00000000-XR                  457    (1)    #-458    (1)
DS$GT_STRBUF                     00000000-XR                  392    (1)    #-398    (1)      407    (1)    #-413    (1)
                                                              465    (1)    #-471    (1)
DS$K_PRINTB                     =00000002     109    (1)
DS$K_PRINTF                     =00000001     109    (1)    #-398    (1)    #-413    (1)    #-471    (1)
DS$K_PRINTI                     =00000000     109    (1)
DS$K_PRINTX                     =00000003     109    (1)
DS$K_STRBUF                      00000000-XR                #-392    (1)    #-407    (1)    #-465    (1)
DS$K_TYPE_ABORT_PROGRAM         =00000014     109    (1)
DS$K_TYPE_ABORT_TEST            =00000013     109    (1)
DS$K_TYPE_COMMAND_ERR           =00000015     109    (1)
DS$K_TYPE_COMMAND_OUT           =00000016     109    (1)    #-398    (1)    #-413    (1)    #-471    (1)
DS$K_TYPE_CRD_AUTOTEST          =0000001A     109    (1)
DS$K_TYPE_DS_PROMPT             =00000001     109    (1)
DS$K_TYPE_DS_START              =0000001D     109    (1)
DS$K_TYPE_ERRDEV                =00000008     109    (1)
DS$K_TYPE_ERRHARD               =00000006     109    (1)
DS$K_TYPE_ERROR_BODY            =00000009     109    (1)
DS$K_TYPE_ERROR_END             =0000000A     109    (1)
DS$K_TYPE_ERRPREP               =0000001B     109    (1)
DS$K_TYPE_ERRSOFT               =00000007     109    (1)
DS$K_TYPE_ERRSUP                =00000004     109    (1)
DS$K_TYPE_ERRSYS                =00000005     109    (1)
DS$K_TYPE_ERR_HALT              =0000000D     109    (1)
DS$K_TYPE_EXCEPTION             =0000000C     109    (1)
DS$K_TYPE_EXCEPTION_HEAD        =0000000B     109    (1)
DS$K_TYPE_FIRST_PASS            =00000011     109    (1)
DS$K_TYPE_GENERAL               =00000000     109    (1)
DS$K_TYPE_GENERAL_ERROR         =00000003     109    (1)
DS$K_TYPE_NO_TESTS              =00000012     109    (1)
DS$K_TYPE_PARAM_ERROR           =0000001C     109    (1)
DS$K_TYPE_PROGRAM_END           =00000010     109    (1)
DS$K_TYPE_PROGRAM_INFO          =00000017     109    (1)
DS$K_TYPE_PROGRAM_START         =0000000F     109    (1)
DS$K_TYPE_QIO_INVADP            =00000024     109    (1)
DS$K_TYPE_QIO_NODRIVER          =00000022     109    (1)
DS$K_TYPE_QIO_WRONGVER          =00000023     109    (1)
DS$K_TYPE_SCRIPT_ECHO           =00000021     109    (1)
DS$K_TYPE_SCRIPT_PNF            =0000001E     109    (1)
DS$K_TYPE_SCRIPT_PROMPT         =00000020     109    (1)
DS$K_TYPE_SCRIPT_SKIP           =0000001F     109    (1)
DS$K_TYPE_SEQUENCE_ERROR        =00000019     109    (1)
DS$K_TYPE_START_ERR             =00000018     109    (1)
```

```
DS$K_TYPE_START_LIST          =00000025     109    (1)
DS$K_TYPE_SUMMARY             =0000000E     109    (1)
DS$K_TYPE_USER_PROMPT         =00000002     109    (1)
DSA$GL_FLAGS                   0000FE00                    #-184    (1)    #-195    (1)    #-245    (1)    #-392    (1)
                                                           #-400    (1)
DSA$M_ALLFLAGS                =000037FD     119    (1)     #-191    (1)    #-241    (1)
DSA$M_BELL                    =00000008                      115    (1)
DSA$M_DFLTFLGS                 00000000-XR                 #-183    (1)
DSA$M_HALT                    =00000001                      115    (1)
DSA$M_IE1                     =00000010                      116    (1)
DSA$M_IE2                     =00000020                      116    (1)
DSA$M_IE3                     =00000040                      116    (1)
DSA$M_IES                     =00000080                      118    (1)
DSA$M_LOOP                    =00000004                      115    (1)
DSA$M_OPER                    =00001000                      118    (1)
DSA$M_PROMPT                  =00002000                      118    (1)
DSA$M_QUICK                   =00000100                      117    (1)
DSA$M_TRACE                   =00000400                      117    (1)
DSA$M_VERIFY                  =00000200                      117    (1)
DSA$V_ASK_PROMPT              =00000013                      113    (1)
DSX$PRINT                      00000000-XR                    398    (1)      413    (1)      471    (1)
FMTSHOWEF                      00000038-R    134    (1)       471    (1)
FMTSHOWFLGC                    0000001B-R    131    (1)       413    (1)
FMTSHOWFLGS                    00000000-R    128    (1)       398    (1)
LEFTMOSTFLAG                  =00000013     113    (1)     #-392    (1)    #-407    (1)
SYS$CLREF                      00000000-XR                    342    (1)
SYS$READEF                     00000000-XR                    457    (1)
SYS$SETEF                      00000000-XR                    292    (1)
VRCLREF                        0000005C-R    334    (1)
VRCLRFLG                       00000025-R    236    (1)
VRSETEF                        0000003B-R    284    (1)
VRSETFLG                       00000000-R    180    (1)
VRSETFLG_X                     00000024-R    197    (1)     #-185    (1)
VRSHOWEF                       00000111-R    455    (1)
VRSHOWFLG                      0000007D-R    385    (1)
V_ENV                         =00000001     108    (1)       111    (1)
V_LVL                         =00000000     108    (1)

                                            +-------------------------+
                                            ! Performance indicators !
                                            +-------------------------+

Phase                     Page faults    CPU Time       Elapsed Time
-----                     -----------    --------       ------------
Initialization                     41    00:00:00.02    00:00:00.20
Command processing                955    00:00:00.29    00:00:00.92
Pass 1                            410    00:00:01.09    00:00:03.65
Symbol table sort                   0    00:00:00.04    00:00:00.05
Pass 2                             17    00:00:00.33    00:00:01.34
Symbol table output                 2    00:00:00.02    00:00:00.10
Psect synopsis output               2    00:00:00.00    00:00:00.00
Cross-reference output              4    00:00:00.06    00:00:00.19
Assembler run totals             1433    00:00:01.85    00:00:06.45

The working set limit was 2900 pages.
59865 bytes (117 pages) of virtual memory were used to buffer the intermediate code.
There were 20 pages of symbol table space allocated to hold 201 non-local and 9 local symbols.
```

```
475 source lines were read in Pass 1, producing 27 object records in Pass 2.
29 pages of virtual memory were used to define 21 macros.

                                        +----------------------------+
                                        ! Macro library statistics !
                                        +----------------------------+

Macro library name                                  Macros defined
------------------                                  --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1                        4
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                          3
SYS$COMMON:[SYSLIB]LIB.MLB;2                                     0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                          0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1                        0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1                       0
SYS$COMMON:[SYSLIB]LIB.MLB;2                                     0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                                 9
SYS$COMMON:[SYSLIB]STARLET.MLB;2                                 0
TOTALS (all libraries)                                          16

318 GETS were required to define 16 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

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(1)	86	DECLARATIONS
(2)	211	FIL$OPENFILE - RETURN FILE HEADER AND STATISTICS BLOCK
(3)	483	FIL$CACHE_INIT - INIT FILEREAD CACHE
(4)	571	FIL$CACHE_TRUNC - TRUNCATE FILEREAD CACHE
(5)	621	ASSIGN_DEV - ASSIGN A DEVICE AND RETURN A CHANNEL
(6)	665	STORE3DIGITS - STORE 3 ASCII DIGITS
(7)	700	FORMDIRSTRING - GET A DIRECTORY STRING
(8)	767	MOUNT - MOUNT THE VOLUME, INIT FOR FILE LOOKUP
(9)	883	FINDFILID - FIND FILE ID FOR SPECIFIED FILE
(10)	1150	FIL$FINDFILID - STRUCTURE LEVEL 2
(11)	1271	FIL$FINDFILID - STRUCTURE LEVEL 1
(12)	1354	READ_DIR_LBN - READ NEXT DIRECTORY LBN
(13)	1397	RDCHKFILHDR - READ AND CHECK FILE HEADER
(14)	1547	READVBN, WRITEVBN - READ/WRITE VIRTUAL BLOCK
(15)	1643	INIRTRVPTRSCAN - INITIALIZE RETRIEVAL POINTER SCAN
(16)	1676	GETRTRVPTR - CONVERT NEXT RETRIEVAL POINTER
(17)	1773	STATBLK - GET FILE STATISTICS BLOCK
(18)	1890	FIL$CHKFILHDR - CHECK FILE HEADER VALIDITY
(19)	1962	CHECKSUM - VALIDATE A CHECKSUM

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element FILEREAD.MAR
0000     2 ; *6    29-SEP-1987 09:45:36 TRABUCCHI "FIX TRUNCATION ERROR IN CALL TO FIL$RDWRTLBN
0000     3 ; *5    16-MAR-1987 15:24:08 GEARIN "FIXED TRUNC ERROR"
0000     4 ; *4    23-JAN-1987 15:48:47 GEARIN "ADD 1987 COPYRIGHT DATE"
0000     5 ; *3    23-JAN-1987 09:46:52 GEARIN "DISPLACEMENT BUG FIXED"
0000     6 ; *2    22-JAN-1987 14:30:04 GEARIN "FIXED TRUNCATION ERROR"
0000     7 ; *1     6-FEB-1986 15:18:31 DS ""
0000     8 ; DEC/CMS REPLACEMENT HISTORY, Element FILEREAD.MAR
0000     9         .TITLE  FILEREAD - FILES11 LEVEL 1 & 2 FILE READING ROUTINES
0000    10         .IDENT  '10-03'                                                ;G:3
0000    11
0000    12 ;
0000    13 ;*****************************************************************************
0000    14 ;*                                                                           *
0000    15 ;*  COPYRIGHT (c) 1978, 1980, 1982, 1983, 1987                               *  ;G:4
0000    16 ;*  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.                   *
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0000    28 ;*  CORPORATION.                                                             *
0000    29 ;*                                                                           *
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0000    31 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    32 ;*                                                                           *
0000    33 ;*                                                                           *
0000    34 ;*****************************************************************************
0000    35 ;
0000    36 ;++
0000    37 ; FACILITY:     USER CALLABLE PROCEDURES
0000    38 ;
0000    39 ; ABSTRACT:
0000    40 ;
0000    41 ;       THIS SET OF ROUTINES PROVIDES THE CAPABILITY OF "OPENING" AND
0000    42 ; READING FILES BY FILE NAME FROM A FILES11 STRUCTURE LEVEL 1 OR 2 VOLUME.
0000    43 ; THERE IS NO MULTI-VOLUME SUPPORT, AND MULTI-HEADER SUPPORT IS LIMITED
0000    44 ; TO RETURNING THE CORRECT FILE SIZE IN THE STATBLK.
0000    45 ;
0000    46 ; ENVIRONMENT:  USER MODE
0000    47 ;
0000    48 ; AUTHOR: PETER H. LIPMAN       , CREATION DATE: 14-DEC-76
0000    49 ;
0000    50 ; MODIFIED BY:
0000    51 ;       02      Bob Bergazzi    Jun 29,1983     Version 6.12
0000    52 ;               Adapted for supervisor 6.12.
0000    53 ;
0000    54 ;       03      David Gearin    Jan 22,1987     Version 10.02           ;G:2
0000    55 ;               Change displacement in call to FIL$RDWRTLBN from        ;G:2
0000    56 ;               word displacement to longword displacement.             ;G:2
0000    57 ;                                                                       ;G:2
```

```
                                0000     58 ;       V03-001 PHL0103         Peter H. Lipman         20-Jul-1982
                                0000     59 ;               Correct error in FIL$FINDFILID for structure level 1
                                0000     60 ;               when directory is cached.
                                0000     61 ;
                                0000     62 ;       V02-007 PHL0019         Peter H. Lipman         31-Oct-1981
                                0000     63 ;               Fix bug in FIL$RDCHKFILHDR having to do with overflowing
                                0000     64 ;               the callers retrieval pointer buffer for multi-header files.
                                0000     65 ;               Fix documentation for FIL$STATBLK showing that the returned
                                0000     66 ;               retrieval pointer length is the number of bytes that would
                                0000     67 ;               have been stored if the buffer had been large enough.
                                0000     68 ;
                                0000     69 ;       V02-006 PHL0009         Peter H. Lipman         06-May-1981
                                0000     70 ;               TOPSYS directory was not being used properly.
                                0000     71 ;
                                0000     72 ;       V02-005 PHL0007         Peter H. Lipman         14-Mar-1981
                                0000     73 ;               Add cacheing of directory lookups, directory header info,
                                0000     74 ;               directory data blocks, and index file header.
                                0000     75 ;               Change interface to FIL$RDWRTLBN to allow the reading
                                0000     76 ;               of multiple blocks.
                                0000     77 ;               Implement multiple level directory lookups and a new
                                0000     78 ;               top level directory in which all the system directories
                                0000     79 ;               are found.
                                0000     80 ;       V02-004 PHL0006         Peter H. Lipman         13-Dec-1980
                                0000     81 ;               Add capability to return retrieval pointer information
                                0000     82 ;               and thus allow all non-contiguous files to be handled
                                0000     83 ;               at boot time.
                                0000     84 ;--
```

```
0000     86          .SBTTL  DECLARATIONS
0000     87 ;
0000     88 ; INCLUDE FILES:
0000     89 ;
0000     90          .nocross
0000     91          $DIRDEF                         ;DIRECTORY ENTRY OFFSET DEFINITIONS
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000     92          $FATDEF                         ;RECORD ATTRIBUTE AREA DEFINITIONS
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000     93          $FH1DEF                         ;FILE HEADER DEFINITIONS, LEVEL 1
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000     94          $FH2DEF                         ;FILE HEADER DEFINITIONS, LEVEL 2
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000     95          $FM1DEF                         ;       MAP AREA, LEVEL 1
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000     96          $FM2DEF                         ;       MAP AREA, LEVEL 2
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000     97          $FIDDEF                         ;FILE ID OFFSET DEFINITIONS
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000     98          $HM1DEF                         ;HOME BLOCK DEFINITIONS, LEVEL 1
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000     99          $HM2DEF                         ;HOME BLOCK DEFINITIONS, LEVEL 2
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000    100          $IODEF                          ;I/O DEFINITIONS
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000    101          $PSLDEF                         ;PROCESSOR STATUS LONG WORD DEFINITIONS
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000    102          $SSDEF                          ;SYSTEM SERVICE DEFINITIONS
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000    103          $VADEF                          ;VIRTUAL ADDRESS DEFINITIONS
0000                 .SAVE   LOCAL_BLOCK
0000                 .RESTORE
0000    104 ;
0000    105 ; MACROS:
0000    106 ;
0000    107          .MACRO  READVBN CHAN,VBN,BUFADR,HDRADR
0000    108          .LIST   MEB
0000    109                  PUSHAL  HDRADR
0000    110                  PUSHAL  BUFADR
0000    111                  PUSHL   VBN
0000    112                  PUSHL   CHAN
0000    113                  CALLS   #4,W^FIL$READVBN
0000    114          .NLIST  MEB
0000    115          .ENDM   READVBN
0000    116
```

```
                     0000   117          .MACRO  READLBN CHAN,VBN,BUFADR
                     0000   118          .LIST   MEB
                     0000   119                  ROTL    #9,#1,-(SP)
                     0000   120                  MOVZWL  #IO$_READLBLK,-(SP)
                     0000   121                  PUSHAL  BUFADR
                     0000   122                  PUSHL   VBN
                     0000   123                  PUSHL   CHAN                                    ;G:6
                     0000   124                  CALLS   #5,L^FIL$RDWRTLBN                       ;G:5
                     0000   125          .NLIST  MEB
                     0000   126          .ENDM   READLBN
                     0000   127          .cross
                     0000   128 ;
                     0000   129 ; EQUATED SYMBOLS:
                     0000   130 ;
                     0000   131          ASSUME  FH1$B_MPOFFSET EQ FH2$B_MPOFFSET
                     0000   132          ASSUME  FH1$W_STRUCLEV EQ FH2$W_STRUCLEV
                     0000   133          ASSUME  FH1$W_CHECKSUM EQ FH2$W_CHECKSUM
                     0000   134          ASSUME  HM1$W_STRUCLEV EQ HM2$W_STRUCLEV
                     0000   135          ASSUME  HM1$W_CHECKSUM1 EQ HM2$W_CHECKSUM1
                     0000   136          ASSUME  HM1$W_CHECKSUM2 EQ HM2$W_CHECKSUM2
                     0000   137          ASSUME  FH1$W_CHECKSUM EQ HM1$W_CHECKSUM2
                     0000   138          ASSUME  FH1$V_CONTIG EQ FH2$V_CONTIG
                     0000   139
000001FE             0000   140          FH1$W_VBNOFFSET = FH1$W_CHECKSUM ;SAVE INDEX FILE VBN OFFSET
                     0000   141                                           ;IN THIS PLACE IN INDEX FILE HEADER
                     0000   142
                     0000   143          ASSUME  FH1$C_LEVEL1a-8 EQ 1
00000008             0000   144          FH1$V_LEVEL1 = 8
                     0000   145
                     0000   146          ASSUME  FH2$C_LEVEL2a-8 EQ 2
00000009             0000   147          FH2$V_LEVEL2 = 9
0000000A             0000   148          FH2$V_BIGFILNUM = 10            ;IF SET USE HIGH 8 BITS OF FILE ID RVN
                     0000   149                                          ;FIELD AS FILE NUMBER EXTENSION
                     0000   150                                          ;BIT IS PLACED IN FH2$W_STRUCLEV
                     0000   151                                          ;BY THE FIL$MOUNT CODE
                     0000   152
00000001             0000   153          FIL$C_CACHE_ID = 1              ;VERSION OF THE FILEREAD CACHE
                     0000   154 ;
                     0000   155 ; OFFSETS INTO HEADER PORTION OF THE FILEREAD CACHE
                     0000   156 ;
                     0000   157          $OFFSET 0,POSITIVE,<-
                     0000   158          <FIL$W_CACHE_ID,2>,-            ;CACHE IDENT. AND WRITE INTERLOCK BIT
                     0000   159          <,2>,-                          ;SPARE
                     0000   160          FIL$L_DIROFF,-                  ;OFFSET IN BYTES TO DIRECTORY CACHE
                     0000   161          FIL$L_DIRNXT,-                  ;NEXT OFFSET TO ALLOCATE DIR CACHE ENTRY
                     0000   162          <FIL$L_DIRMAX,0>,-              ;MAX OFFSET FOR DIR CACHE
                     0000   163          FIL$L_LBNOFF,-                  ;OFFSET IN BYTES TO BEGIN OF LBN CACHE
                     0000   164          FIL$L_LBNNXT,-                  ;NEXT OFFSET TO ALLOCATE LBN CACHE
                     0000   165          FIL$L_LBNMAX,-                  ;MAX OFFSET FOR LBN CACHE
                     0000   166          <FIL$A_IXFHDR,512>,-            ;INDEX FILE HEADER
                     0000   167          <FIL$C_SIZE,0>-                 ;START OF DIRECTORY CACHE
                     0000   168          >
                     0000                .SAVE   LOCAL_BLOCK
                     0000        FIL$W_CACHE_ID:
00000002             0000                .BLKB   2
00000004             0002                .BLKB   2
                     0004        FIL$L_DIROFF:
```

```
00000008  0004                .BLKB   4
          0008        FIL$L_DIRNXT:
0000000C  0008                .BLKB   4
          000C        FIL$L_DIRMAX:
          000C        FIL$L_LBNOFF:
00000010  000C                .BLKB   4
          0010        FIL$L_LBNNXT:
00000014  0010                .BLKB   4
          0014        FIL$L_LBNMAX:
00000018  0014                .BLKB   4
          0018        FIL$A_IXFHDR:
00000218  0018                .BLKB   512
          0218        FIL$C_SIZE:
          0000                .RESTORE
          0000    169 ;
          0000    170 ; OFFSETS INTO DIRECTORY CACHE ENTRIES
          0000    171 ;
          0000    172         $OFFSET 0,POSITIVE,<-
          0000    173         <FIL$A_DIR_FID,6>,-             ;DIRECTORY ID
          0000    174         <FIL$T_DIR_NAM,10>,-            ;COUNTED NAME OF DIRECTORY - NO ".DIR"
          0000    175         <FIL$Q_DIR_HDR,0>,-             ;DIRECTORY HEADER INFORMATION
          0000    176         <FIL$W_DIR_BKCNT,2>,-           ;SIZE IN BLOCKS OF DIRECTORY FILE
          0000    177         <FIL$B_DIR_LVL,1>,-             ;STRUCTURE LEVEL OF DIRECTORY
          0000    178         <,1>,-                          ;SPARE BYTE
          0000    179         FIL$L_DIR_LBN,-                 ;STARTING LBN OF DIRECTORY
          0000    180         FIL$L_DIR_BFOFF,-               ;OFFSET TO DIR LBN BUFFER
          0000    181         <FIL$W_DIR_BFCNT,2>,-           ;SIZE IN BLOCKS OF DIR LBN BUFFER
          0000    182         <FIL$A_DIR_OFID,6>,-            ;OUTPUT FILE ID FROM LOOKUP
          0000    183         <FIL$C_DIR_SIZE,0>-             ;SIZE OF DIRECTORY CACHE ENTRY
          0000    184         >
          0000                .SAVE   LOCAL_BLOCK
          0000                .PSECT $ABS$ ABS
00000000  0218                .=0
          0000        FIL$A_DIR_FID:
00000006  0000                .BLKB   6
          0006        FIL$T_DIR_NAM:
00000010  0006                .BLKB   10
          0010        FIL$Q_DIR_HDR:
          0010        FIL$W_DIR_BKCNT:
00000012  0010                .BLKB   2
          0012        FIL$B_DIR_LVL:
00000013  0012                .BLKB   1
00000014  0013                .BLKB   1
          0014        FIL$L_DIR_LBN:
00000018  0014                .BLKB   4
          0018        FIL$L_DIR_BFOFF:
0000001C  0018                .BLKB   4
          001C        FIL$W_DIR_BFCNT:
0000001E  001C                .BLKB   2
          001E        FIL$A_DIR_OFID:
00000024  001E                .BLKB   6
          0024        FIL$C_DIR_SIZE:
          0000                .RESTORE
          0000    185 ;
          0000    186 ; MAKE THESE GLOBAL SO THAT A CACHE SIZE CAN BE PROPERLY CALCULATED
          0000    187 ; THE CALCULATION IS:
          0000    188 ;
```

```
                 0000   ;       FIL$C_SIZE + (DIRCNT * FIIL$C_DIR_SIZE> + <LBNCNT * 512>
                 0000   ;
                 0000           .GLOBAL FIL$C_SIZE,FIL$C_DIR_SIZE
                 0000   ;
                 0000   ; DEFINE THE FOLLOWING WEAK REFERENCES, THEY NEED NOT BE PRESENT
                 0000   ;
                 0000           .WEAK   FIL$GQ_CACHE            ;DESCRIPTOR FOR FILEREAD CACHE
                 0000           .WEAK   FIL$GT_DDDEV            ;ASCIC DEFAULT DEVICE NAME STRING
                 0000           .WEAK   FIL$GT_TOPSYS           ;ASCIC TOP LEVEL SYSTEM DIRECTORY
                 0000   ;
                 0000   ; OWN STORAGE:
                 0000   ;
                 0000
              00000000           .psect  code, nowrt, exe, rd, shr, long ;                        [02]
                 0000
                 0000   FIL_GQ_CACHE:
       00000000' 0000           .ADDRESS FIL$GQ_CACHE
                 0004   FIL_GT_DDDEV:
       00000000' 0004           .ADDRESS FIL$GT_DDDEV
                 0008   FIL_GT_TOPSYS:
       00000000' 0008           .ADDRESS FIL$GT_TOPSYS
```

```
                        211          .SBTTL  FIL$OPENFILE - RETURN FILE HEADER AND STATISTICS BLOCK
                        212 ;++
                        213 ; FUNCTIONAL DESCRIPTION:
                        214 ;
                        215 ;       THE OPENFILE ROUTINE ACCEPTS A FULL FILE NAME IN THE FORMAT
                        216 ;       DEV:[DIR]FILE.TYP;VERSION.
                        217 ; IT ASSIGNS AND RETURNS A CHANNEL, READS THE FILE HEADER, RETURNS THE
                        218 ; STATISTICS BLOCK, AND OPTIONALLY RETURNS THE RETRIEVAL POINTERS IN
                        219 ; A NORMALIZED (LONG WORD COUNT, LONG WORD LBN) FORMAT.
                        220 ; THE DIRECTORY MAY BE IN ANY OF THE STANDARD FORMATS:
                        221 ;       [10,40], [010040], [ABCDEFGHI], OR WITH < AND > REPLACING [ AND ].
                        222 ; VERSION MAY BE ZERO IN WHICH CASE THE HIGHEST VERSION IS FOUND
                        223 ;
                        224 ; CALLING SEQUENCE:
                        225 ;
                        226 ;       CALLG   ARGLIST,FIL$OPENFILE
                        227 ;
                        228 ; INPUT PARAMETERS:
                        229 ;
                        230 ;       CHANADR(AP)     =       ADDRESS OF RPB                                  [02]
                        231 ;       FILNAM(AP)              ADDRESS OF 2 LONG WORD FILE NAME STRING DESCRIPTOR
                        232 ;                               1 - SIZE OF STRING
                        233 ;                               2 - ADDRESS OF STRING
                        234 ;                                       DB1:[10,40]FILTST.EXE
                        235 ;       IXFHDR(AP)              ADDRESS OF 512 BYTE BUFFER TO BE USED FOR
                        236 ;                                       THE INDEX FILE HEADER
                        237 ;       FILHDR(AP)              ADDRESS OF 512 BYTE BUFFER TO RETURN FILE HEADER
                        238 ;       STATBLK(AP)             ADDRESS OF 2 LONG WORD BLOCK IN WHICH THE
                        239 ;                               FOLLOWING WILL BE RETURNED
                        240 ;                               1 - LOGICAL BLOCK NUMBER OF FIRST BLOCK OF
                        241 ;                                       FILE OR 0 IF FILE IS NOT CONTIGUOUS
                        242 ;                               2 - SIZE OF FILE IN BLOCKS
                        243 ;       RTRVPTRLEN(AP)  =       ADDRESS TO RETURN THE NUMBER OF
                        244 ;                               BYTES OF RETRIEVAL POINTERS STORED
                        245 ;                               ***** OPTIONAL PARAMETER *****
                        246 ;       RTRVPTRBUF(AP)  =       ADDRESS OF RETRIEVAL POINTER
                        247 ;                               BUFFER DESCRIPTOR.  THIS PARAMETER
                        248 ;                               IS PRESENT IF AND ONLY IF
                        249 ;                               RTRVPTRLEN IS PRESENT.
                        250 ;                               THE RETRIEVAL POINTERS ARE RETURNED IN
                        251 ;                               THE FORM 32 BIT BLOCK COUNT, 32 BIT LBN
                        252 ;                               A ZERO BUFFER DESCRIPTOR ADDRESS OR A
                        253 ;                               ZERO BUFFER ADDRESS MEANS DON'T
                        254 ;                               RETURN RETRIEVAL POINTER INFO
                        255 ;
                        256 ; IMPLICIT INPUTS:
                        257 ;
                        258 ;       NONE
                        259 ;
                        260 ; OUTPUT PARAMETERS:
                        261 ;
                        262 ;       R0 = SYSTEM STATUS CODE
                        263 ;
                        264 ; IMPLICIT OUTPUTS:
                        265 ;
                        266 ;       NONE
                        267 ;
```

```
                     000C   268 ; COMPLETION CODES:
                     000C   269 ;
                     000C   270 ;       SS$_NORMAL              SUCCESSFUL COMPLETION
                     000C   271 ;       SS$_NOSUCHFILE          FAILED TO FIND DIRECTORY OR FILE
                     000C   272 ;       SS$_BADFILENAME         SYNTAX ERROR IN DIRECTORY OR FILE NAME STRING
                     000C   273 ;
                     000C   274 ; THE FOLLOWING COMPLETION CODES INDICATE FILE STRUCTURE PROBLEMS
                     000C   275 ;
                     000C   276 ;       SS$_BADCHKSUM           CHECKSUM ERROR IN HOME BLOCK, INDEX FILE HEADER
                     000C   277 ;                               DIRECTORY FILE HEADER OR FILE HEADER
                     000C   278 ;       SS$_BADFILEHDR          FILE HEADER CONSISTENCY CHECK FAILED FOR
                     000C   279 ;                               INDEX FILE, DIRECTORY FILE, OR DESIRED FILE
                     000C   280 ;       SS$_FILESTRUCT          HOME BLOCK INDICATES THAT THIS VOLUME
                     000C   281 ;                               CONTAINS A NON-SUPPORTED FILE STRUCTURE
                     000C   282 ;                               OR POSSIBLY THE HOMEBLOCK IS GARBAGE
                     000C   283 ;
                     000C   284 ; SIDE EFFECTS:
                     000C   285 ;
                     000C   286 ;       NONE
                     000C   287 ;
                     000C   288 ; EQUATED SYMBOLS
                     000C   289 ;
                     000C   290 ;    OFFSETS FROM AP
                     000C   291 ;
00000000             000C   292          ARGCNT          = 0
00000004             000C   293          CHANADR         = 4
00000008             000C   294          FILNAM          = 8
0000000C             000C   295          IXFHDR          = 12
00000010             000C   296          FILHDR          = 16
00000014             000C   297          STATBLK         = 20
00000018             000C   298          RTRVPTRLEN      = 24            ; OPTIONAL
0000001C             000C   299          RTRVPTRBUF      = 28            ; PRESENT IF AND ONLY IF RTRVPTRLEN IS
                     000C   300 ;
                     000C   301 ;    OFFSETS FROM FP
                     000C   302 ;
                     000C   303          $OFFSET 0,NEGATIVE,<-
                     000C   304          <FID,6>,-                       ;3 WORD FILE IDENTIFIER
                     000C   305          <DIRNAM,46>,-                   ;DIRECTORY NAME AREA
                     000C   306          <NAMBLK,40>,-                   ;5 WORD NAME BLOCK AREA
                     000C   307          <NAMDSC,12>,-                   ;NAME DESCRIPTOR AREA
                     000C   308          <SCRATCHSIZE,0>-                ;SIZE OF SCRATCH AREA
                     000C   309          >
                     000C                .SAVE   LOCAL_BLOCK
                     000C                .PSECT $ABS$ ABS
00000000             0218                .=0
FFFFFFFA             0000                .BLKB   -6
                     FFFA        FID:
FFFFFFCC             FFFA                .BLKB   -46
                     FFCC        DIRNAM:
FFFFFFA4             FFCC                .BLKB   -40
                     FFA4        NAMBLK:
FFFFFF98             FFA4                .BLKB   -12
                     FF98        NAMDSC:
                     FF98        SCRATCHSIZE:
                 0000000C                .RESTORE
                     000C   310 ;
                     000C   311 ; THE FILE DESCRIPTION ON THE STACK LOOKS AS FOLLOWS:
```

```
                                000C   ;
                                000C   ;       +-----------------------------+
                                000C   ;       |   DIRECTORY NAME COUNT      |   :NAMDSC
                                000C   ;       |-----------------------------|
                                000C   ;       | ADDRESS OF DIRECTORY NAME   |
                                000C   ;       +-----------------------------+
                                000C   ;       |     ADDRESS OF NAMBLK       |
                                000C   ;       +-----------------------------+
                                000C   ;       |                             |   :NAMBLK
                                000C   ;       +-----------------------------+
                                000C   ;       |                             |
                                000C   ;       +-----------------------------+
                                000C   ;       |                             |
                                000C   ;       |                             |
                                000C   ;       +-----------------------------+
                                000C   ;       |                             |   :DIRNAM
                                000C   ;       |      ASCII STRING OF        |
                                000C   ;       |       DIRECTORY FILE        |
                                000C   ;       |      NAME.TYPE;VERSION      |
                                000C   ;       |                             |
                                000C   ;       +-----------------------------+
                                000C   ;       |          FILE ID            |   :FILID
                                000C   ;       |          NUMBER             |
                                000C   ;       +-----------------------------+
                                000C   ;       |  RELATIVE VOLUME NUMBER     |
                                000C   ;       +-----------------------------+
                                000C   ;
                                000C   ;--
                                000C
                                000C           .ENABL  LSB
                                000C
                                000C   FIL$OPENFILE::
                                000C   ;       .WORD   ^M<R2,R3,R4,R5,R6,R7,R11>                                    [02]
                                000C   ;       BSBW    ASSIGN_DEV                ;ASSIGN THE DEVICE OONCE IN CALLER'S MODE
                                000C   ;       BLBS    R0,OPENFILE_2             ;BRANCH IF SUCCESSFUL                  [02]
                                000C   ;       RET                                                                      [02]
                                000C   OPENFILE_1:
                        08FC    000C           .WORD   ^M<R2,R3,R4,R5,R6,R7,R11>
                                000E   OPENFILE_2:
5E   00000068 8F        C2      000E           SUBL    #-SCRATCHSIZE,SP          ;RESERVE SCRATCH STORAGE
   A0 AD    A4 AD       DE      0015           MOVAL   NAMBLK(FP),NAMDSC+8(FP)   ;SET ADDRESS OF NAME BLOCK
                                001A   ;
                                001A   ; IF CACHE DESCRIPTOR EXISTS AND IS IN SYSTEM SPACE, THEN WE
                                001A   ; HAD BETTER BE IN KERNEL MODE TO USE THE CACHE.
                                001A   ;
     5B    FFE2 CF        D0      001A           MOVL    W^FIL_GQ_CACHE,R11        ;IS CACHE IN SYSTEM SPACE?
                02        14      001F           BGTR    10$                       ;BRANCH IF DESCRIPTOR PRESENT
                                0021                                             ;AND NOT IN SYSTEM SPACE
                10        13      0021           BEQL    20$                       ;BRANCH IF NO DESCRIPTOR PRESENT
                                0023   ;       MOVPSL  R0                        ;GET PSL                               [02]
                                0023   ;       EXTZV   #PSL$V_CURMOD,#PSL$S_CURMOD,R0,R0 ;FETCH CURRENT MODE            [02]
                                0023   ;       BEQL    10$                       ;BRANCH IF ALREADY IN KERNEL MODE        [02]
                                0023   ;       $CMKRNL_S B^OPENFILE_1,(AP)       ;CALL THIS PROCEDURE IN KERNEL MODE      [02]
                                0023   ;       CMPL    R0,#SS$_NOPRIV            ;ASSUME NOPRIV MEANS WE COULDN'T         [02]
                                0023   ;                                         ;GET IN TO KERNEL MODE                   [02]
                                0023   ;       BEQL    15$                                                              [02]
                                0023   ;       RET                                                                      [02]
```

```
                                                                                                                                
                5B   00000004'EF   D0   0023   369 10$:    MOVL    FIL$GQ_CACHE+4,R11      ;IS THE CACHE ENABLED?
                           07      13   002A   370          BEQL    20$                     ;BRANCH IF NOT
                     01    6B      B1   002C   371          CMPW    FIL$W_CACHE_ID(R11),#FIL$C_CACHE_ID ;CORRECT VERSION OF CACHE?
                           02      13   002F   372          BEQL    20$                     ;BRANCH IF YES
                           5B      D4   0031   373 15$:     CLRL    R11                     ;DISABLE THE CACHE
                57   00000000'EF   DE   0033   374 20$:     MOVAL   FIL$GT_DDSTRING,R7      ;ADDRESS OF COUNTED STRING
                        56   87    9A   003A   375          MOVZBL  (R7)+,R6                ;GET BYTE COUNT
                           57   D6   003D   376          INCL    R7                      ;STEP OVER BRACKET
                        56   02    C2   003F   377          SUBL    #2,R6                   ;DON'T COUNT THE BRACKETS
                                        0042   378 ;
                                        0042   379 ; GET FILE NAME STRING, AND STRIP DEVICE OFF IF PRESENT
                                        0042   380 ;
                     50    08 AC    D0   0042   381          MOVL    FILNAM(AP),R0           ;ADDRESS OF FILE NAME DESCRIPTOR
                           27      13   0046   382          BEQL    32$                     ;BRANCH IF NO NAME SPECIFIED
                        52   60    7D   0048   383          MOVQ    (R0),R2                 ;R2 = SIZE, R3 = ADDRESS
                63      52   3A    3A   004B   384          LOCC    #^A/:/,R2,(R3)          ;DEVICE NAME PRESENT?
                           07      13   004F   385          BEQL    25$                     ;BRANCH IF NOT
                     53    01 A1    9E   0051   386          MOVAB   1(R1),R3                ;ADDRESS BEYOND ":"
                        52   70    9E   0055   387          MOVAB   -(R0),R2                ;REMAINING SIZE
                                        0058   388 ;
                                        0058   389 ; SEE IF DIRECTORY SPECIFIED IN THE FILE NAME STRING
                                        0058   390 ;
                     63    5B 8F    91   0058   391 25$:     CMPB    #^A/[/,(R3)             ;DIRECTORY DELIMITER?
                           05      13   005C   392          BEQL    30$                     ;BRANCH IF YES
                        63   3C    91   005E   393          CMPB    #^A/</,(R3)             ;ALTERNATE CHARACTER
                           1D      12   0061   394          BNEQ    40$                     ;BRANCH IF NO DIRECTORY SPECIFIED
                50      83   02    81   0063   395 30$:     ADDB3   #2,(R3)+,R0             ;SCAN FOR MATCHING BRACKET ] OR >
                           52      D7   0067   396          DECL    R2                      ;ADJUST SIZE AND ADR OF STRING
                63      52   50    3A   0069   397          LOCC    R0,R2,(R3)              ;SCAN FOR CLOSE BRACKET
                           03      12   006D   398          BNEQ    35$                     ;BRANCH IF FOUND IT
                        03EB       31   006F   399 32$:     BRW     BADFILNAM               ;BAD FILE NAME IF NO CLOSE BRACKET
                     57    53      D0   0072   400 35$:     MOVL    R3,R7                   ;ADDRESS OF DIRECTORY NAME
                56   51    53      C3   0075   401          SUBL3   R3,R1,R6                ;SIZE OF DIRECTORY NAME
                     52    70      9E   0079   402          MOVAB   -(R0),R2                ;SIZE REMAINING SKIP CLOSE BRACKET
                  53    01 A1      DE   007C   403          MOVAL   1(R1),R3                ;ADR OF REMAINING STRING BEYOND CLOSE BRACKE
                                        0080   404 ;
                                        0080   405 ; SET UP COMMON ARGUMENT LIST FOR MOUNT, FINDFILID, RDCHKFILHDR
                                        0080   406 ;
                                        0080   407 ;       +-----------------------------+
                                        0080   408 ;       |       ARGUMENT COUNT        |   : AP
                                        0080   409 ;       +-----------------------------+
                                        0080   410 ;       |       CHANNEL NUMBER        |
                                        0080   411 ;       +-----------------------------+
                                        0080   412 ;       |      NAME DESCRIPTOR        |
                                        0080   413 ;       +-----------------------------+
                                        0080   414 ;       | INDEX FILE HEADER BUF ADR   |
                                        0080   415 ;       +-----------------------------+
                                        0080   416 ;       |  FILE HEADER BUFFER ADDR    |
                                        0080   417 ;       +-----------------------------+
                                        0080   418 ;       | ADDR OF STATISTICS BLOCK    |
                                        0080   419 ;       +-----------------------------+
                                        0080   420 ;       | ADDRESS OF FILE ID BLOCK    |
                                        0080   421 ;       +-----------------------------+
                                        0080   422 ;       |  ADDR OF RTRV PTR LENGTH    |
                                        0080   423 ;       +-----------------------------+
                                        0080   424 ;       | ADDR OF RTRV PTR BUF DSCR   |
                                        0080   425 ;       +-----------------------------+
```

```
                                0080   426 ;
                          7E    7C 0080   427 40$:    CLRQ    -(SP)                           ;ASSUME NO RETRIEVAL POINTERS REQUESTED
                       07 6C    D1 0082   428         CMPL    ARGCNT(AP),#RTRVPTRBUF/4        ;RETRIEVAL POINTER PARAMETERS PRESENT?
                          04    19 0085   429         BLSS    45$                             ;BRANCH IF NOT
                    6E    18 AC 7D 0087   430         MOVQ    RTRVPTRLEN(AP),(SP)             ;PUT RTRV PTR PARAMS IN LIST
                          FA AD DF 008B   431 45$:    PUSHAL  FID(FP)                         ;ADDRESS OF FILE ID
                    7E    10 AC 7D 008E   432         MOVQ    FILHDR(AP),-(SP)                ;PUSH STATBLK ADR, FILHDR ADR
                          0C AC DD 0092   433         PUSHL   IXFHDR(AP)                      ;INDEX FILE HEADER ADDRESS
                          98 AD DF 0095   434         PUSHAL  NAMDSC(FP)                      ;ADR OF 3 LONG WORD NAME DESCRIPTOR
                          04 AC DD 0098   435         PUSHL   CHANADR(AP)                     ;CHANNEL TO USE, LONG WORD FOR BOOTING  [02]
                             06 DD 009B   436         PUSHL   #6                              ;PARAMETER COUNT
                             5B D5 009D   437         TSTL    R11                             ;CACHE ENABLED?
                             07 13 009F   438         BEQL    50$
                 0C AE    18 AB DE 00A1   439         MOVAL   FIL$A_IXFHDR(R11),IXFHDR(SP) ;USE CACHED INDEX FILE HEADER
                             08 11 00A6   440         BRB     60$                             ;AND SKIP THE MOUNT
                  025D'CF    6E FA 00A8   441 50$:    CALLG   (SP),W^FIL$MOUNT                ;"MOUNT THE VOLUME" (READ HOME
                                00AD   442                                                     ;BLOCK, INDEX FILE HEADER, GET
                                00AD   443                                                     ;STRUCTURE LEVEL OF VOLUME)
                       61 50    E9 00AD   444         BLBC    R0,100$                         ;BRANCH IF ERROR
                                00B0   445 ;
                                00B0   446 ; SET UP FOR THE DIRECTORY LOOK UP
                                00B0   447 ;
                    FA AD    04 B0 00B0   448 60$:    MOVW    #FID$C_MFD,FID(FP)              ;MFD FILE NUMBER
                    FC AD    04 D0 00B4   449         MOVL    #FID$C_MFD,FID+2(FP)            ;MFD FILE SEQUENCE NO., RVN = 0
                       FF4C CF D5 00B8   450         TSTL    W^FIL_GT_TOPSYS                 ;TOP LEVEL SYSTEM DIRECTORY PRESENT?
                             1A 13 00BC   451         BEQL    70$                             ;BRANCH IF NOT
                 51    00000000'EF DE 00BE   452         MOVAL   FIL$GT_TOPSYS,R1                ;GET ADDRESS OF TOP LEVEL DIR STRING
                          50    81 9A 00C5   453         MOVZBL  (R1)+,R0                        ;GET SIZE TO R0, ADR TO R1
                             0E 13 00C8   454         BEQL    70$                             ;BRANCH IF NONE SPECIFIED
                          7E    56 7D 00CA   455         MOVQ    R6,-(SP)                        ;SAVE DIRECTORY STRING DESCRIPTOR
                          56    50 7D 00CD   456         MOVQ    R0,R6                           ;TREAT TOPSYS LIKE DIR STRING
                                011E 30 00D0   457         BSBW    FORMDIRSTRING                   ;FORM THE DIRECTORY NAME
                          56    8E 7D 00D3   458         MOVQ    (SP)+,R6                        ;RESTORE READ DIRECTORY DESCRIPTOR
                             03 11 00D6   459         BRB     75$
                                0116 30 00D8   460 70$:    BSBW    FORMDIRSTRING                   ;GET NEXT DIRECTORY TO LOOKUP
                       98 AD    50 7D 00DB   461 75$:    MOVQ    R0,NAMDSC(FP)                   ;STORE DESCRIPTOR OF ITS NAME
                             6E DF 00DF   462 80$:    PUSHAL  (SP)                            ;REAL ADDRESS OF ARGUMENT LIST
                             5B DD 00E1   463         PUSHL   R11                             ;CACHE ADDRESS IF ANY
                  02F1'CF    02 FB 00E3   464         CALLS   #2,W^FIL$FINDFILID              ;FIND THE FILE ID
                          26 50    E9 00E8   465         BLBC    R0,100$                         ;BRANCH IF ERROR
                             3F BB 00EB   466         PUSHR   #^M<R0,R1,R2,R3,R4,R5>          ; SAVE THE REGISTER
              A4 AD    00 8F    28 28 00ED   467         MOVC3   #<DIRNAM-NAMBLK>,#0,NAMBLK(FP) ;REINIT NAME BLOCK
                             3F BA 00F3   468         POPR    #^M<R0,R1,R2,R3,R4,R5>          ; RESTORE REGISTERS
                             56 D5 00F5   469         TSTL    R6                              ;ANY MORE DIRECTORY NAMES?
                             DF 14 00F7   470         BGTR    70$                             ;BRANCH IF YES, LOOKUP THE NEXT
                       98 AD    52 7D 00F9   471         MOVQ    R2,NAMDSC(FP)                   ;DESCRIPTOR FOR FILE TO LOOKUP
                             52 D4 00FD   472         CLRL    R2                              ;STOP THE LOOKUP LOOP
                          98 AD    D5 00FF   473         TSTL    NAMDSC(FP)                      ;ALREADY DONE?
                             DB 14 0102   474         BGTR    80$                             ;BRANCH IF NO, DO THE LAST ONE
                          07    6C D1 0104   475 85$:    CMPL    ARGCNT(AP),#RTRVPTRBUF/4        ;RETRIEVAL POINTERS DESIRED?
                             03 19 0107   476         BLSS    90$                             ;BRANCH IF NOT
                          6E    02 C0 0109   477         ADDL    #2,(SP)                         ;ADDITIONAL ARGUMENTS ARE PRESENT
                  05FA'CF    6E FA 010C   478 90$:    CALLG   (SP),W^FIL$RDCHKFILHDR          ;READ AND CHECK FILE HEADER
                             04 0111   479 100$:   RET
                                0112   480
                                0112   481         .DSABL  LSB
```

```
                     0112    483          .SBTTL  FIL$CACHE_INIT - INIT FILEREAD CACHE
                     0112    484 ;++
                     0112    485 ; FUNCTIONAL DESCRIPTION:
                     0112    486 ;
                     0112    487 ;       CACHE_INIT PERFORMS THE INITIALIZATION FOR THE FILEREAD CACHE
                     0112    488 ;
                     0112    489 ; CALLING SEQUENCE:
                     0112    490 ;
                     0112    491 ;       CALLG   ARGLIST,FIL$CACHE_INIT
                     0112    492 ;
                     0112    493 ; INPUT PARAMETERS:
                     0112    494 ;
                     0112    495 ;       CHANADR(AP)             ADDRESS TO RETURN LONG WORD CHANNEL
                     0112    496 ;       FILNAM(AP)              ADDRESS OF DEVICE NAME STRING DESCRIPTOR
                     0112    497 ;                               THE DEVICE NAME MUST CONTAIN THE ":"
                     0112    498 ;                               IF THE ADDRESS IS 0, THE STRING IS NULL,
                     0112    499 ;                               OR THE NAME DOES NOT CONTAIN A ":", THE
                     0112    500 ;                               DEFAULT DEVICE NAME IS USED
                     0112    501 ;       CACHE_SIZE(AP)          SIZE IN BYTES OF FILEREAD CACHE
                     0112    502 ;       CACHE_ADR(AP)           ADDRESS OF FILEREAD CACHE
                     0112    503 ;       DIR_CACHE_CNT(AP)       NUMBER OF DIRECTORY CACHE ENTRIES
                     0112    504 ;       LBN_CACHE_CNT(AP)       NUMBER OF LBN CACHE ENTRIES
                     0112    505 ;
                     0112    506 ; IMPLICIT INPUTS:
                     0112    507 ;
                     0112    508 ;       NONE
                     0112    509 ;
                     0112    510 ; OUTPUT PARAMETERS:
                     0112    511 ;
                     0112    512 ;       R0 = ALWAYS SUCCESSFUL STATUS CODE
                     0112    513 ;
                     0112    514 ; IMPLICIT OUTPUTS:
                     0112    515 ;
                     0112    516 ;       FIL$GQ_CACHE QUAD WORD FILLED IN WITH SIZE AND ADDRESS OF CACHE
                     0112    517 ;
                     0112    518 ; COMPLETION CODES:
                     0112    519 ;
                     0112    520 ;       SS$_NORMAL              SUCCESSFUL COMPLETION
                     0112    521 ;
                     0112    522 ; SIDE EFFECTS:
                     0112    523 ;
                     0112    524 ;       NONE
                     0112    525 ;
                     0112    526 ;
                     0112    527 ; EQUATED SYMBOLS, OFFSETS FROM AP
                     0112    528 ;
00000004             0112    529          CHANADR         =       4
00000008             0112    530          FILNAM          =       8
0000000C             0112    531          CACHE_SIZE      =       12
00000010             0112    532          CACHE_ADR       =       16
00000014             0112    533          DIR_CACHE_CNT   =       20
00000018             0112    534          LBN_CACHE_CNT   =       24
                     0112    535 ;
                     0112    536 ;--
                     0112    537 FIL$CACHE_INIT::
                 0C3C 0112    538          .WORD   ^M<R2,R3,R4,R5,R10,R11>
                     0114    539
```

```
                                    0114   540          ASSUME  CACHE_SIZE+4 EQ CACHE_ADR
                 5A    0C AC   7D  0114   541          MOVQ    CACHE_SIZE(AP),R10      ;R10=SIZE, R11=ADR
          50     5A   00000218 8F  C3  0118   542          SUBL3   #FIL$C_SIZE,R10,R0      ;BYTES LEFT FOR DIR AND LBN CACHES
                            60  19  0120   543          BLSS    100$                    ;BRANCH IF NOT ENOUGH CACHE SPACE
                         6B   01  B0  0122   544          MOVW    #FIL$C_CACHE_ID,FIL$W_CACHE_ID(R11) ;SET CACHE_ID
                                    0125   545                                          ;ALLOWS MOVING CACHES BETWEEN FILEREAD'S
            04 AB    00000218 8F  D0  0125   546          MOVL    #FIL$C_SIZE,FIL$L_DIROFF(R11) ;BEGINNING OF DIR CACHE
            08 AB    00000218 8F  D0  012D   547          MOVL    #FIL$C_SIZE,FIL$L_DIRNXT(R11) ;NEXT AVAILABLE SLOT IN DIR CACHE
               51     14 AC    24  C5  0135   548          MULL3   #FIL$C_DIR_SIZE,DIR_CACHE_CNT(AP),R1 ;BYTE COUNT FOR DIR CACHE
                         50   51  C2  013A   549          SUBL    R1,R0                   ;BYTE COUNT LEFT FOR LBN CACHE
                            43  19  013D   550          BLSS    100$                    ;BRANCH IF NOT ENOUGH SPACE
         0C AB   51    00000218 8F  C1  013F   551          ADDL3   #FIL$C_SIZE,R1,FIL$L_DIRMAX(R11) ;END OF DIR CACHE
                                    0148   552
                                    0148   553          ASSUME  FIL$L_DIRMAX EQ FIL$L_LBNOFF
               10 AB    0C AB   D0  0148   554          MOVL    FIL$L_LBNOFF(R11),FIL$L_LBNNXT(R11) ;NEXT LBN ENTRY TO ALLOCATE
               51     18 AC    09  78  014D   555          ASHL    #9,LBN_CACHE_CNT(AP),R1 ;BYTE COUNT IN LBN CACHE
                         50   51  D1  0152   556          CMPL    R1,R0                   ;ENOUGH ROOM FOR WHOLE LBN CACHE
                            08  15  0155   557          BLEQ    20$                     ;BRANCH IF YES
         51     50    000001FF 8F  CB  0157   558          BICL3   #^X1FF,R0,R1            ;USE WHAT IS LEFT TRUNCATED
            14 AB    10 AB    51  C1  015F   559 20$:     ADDL3   R1,FIL$L_LBNNXT(R11),FIL$L_LBNMAX(R11) ;END OF LBN CACHE
                        003D  30  0165   560          BSBW    ASSIGN_DEV              ;ASSIGN THE DEVICE
                      17 50   E9  0168   561          BLBC    R0,100$                 ;BRANCH IF ERROR
                      18 AB   DF  016B   562          PUSHAL  FIL$A_IXFHDR(R11)       ;ADDRESS TO READ INDEX FILE HEADER
                         7E   D4  016E   563          CLRL    -(SP)                   ;UNUSED PARAMETER
                      04 BC   DD  0170   564          PUSHL   @CHANADR(AP)            ;CHANNEL JUST ASSIGNED
                  025D'CF     03  FB  0173   565          CALLS   #3,W^FIL$MOUNT          ;MOUNT THE VOLUME, RETURN INDEX FILE HDR
                      07 50   E9  0178   566          BLBC    R0,100$                 ;BRANCH IF ERROR
               00000000'EF    5A  7D  017B   567          MOVQ    R10,FIL$GQ_CACHE        ;SAVE DESCRIPTOR OF CACHE
                         50   01  D0  0182   568 100$:    MOVL    S^#SS$_NORMAL,R0
                            04  0185   569          RET
```

```
                                0186          .SBTTL  FIL$CACHE_TRUNC - TRUNCATE FILEREAD CACHE
                                0186    ;++
                                0186    ; FUNCTIONAL DESCRIPTION:
                                0186    ;
                                0186    ;       CACHE_TRUNC TRUNCATES THE FILEREAD CACHE AND MAKES IT IMPOSSIBLE
                                0186    ; TO ADD MORE DIRECTORY CACHE OR DIRECTORY LBN ENTRIES TO IT.  IN EFFECT
                                0186    ; THIS ROUTINE TURNS THE CACHE INTO A READ-ONLY DATA BASE.
                                0186    ;
                                0186    ; CALLING SEQUENCE:
                                0186    ;
                                0186    ;       CALLG   ARGLIST,FIL$CACHE_TRUNC
                                0186    ;
                                0186    ; INPUT PARAMETERS:
                                0186    ;
                                0186    ;       NONE
                                0186    ;
                                0186    ; IMPLICIT INPUTS:
                                0186    ;
                                0186    ;       FIL$GQ_CACHE            DESCRIPTOR FOR THE CACHE
                                0186    ;
                                0186    ; OUTPUT PARAMETERS:
                                0186    ;
                                0186    ;       R0 = ALWAYS SUCCESSFUL STATUS CODE
                                0186    ;
                                0186    ; IMPLICIT OUTPUTS:
                                0186    ;
                                0186    ;       FIL$GQ_CACHE FILLED IN WITH ALTERED SIZE OF CACHE
                                0186    ;
                                0186    ; COMPLETION CODES:
                                0186    ;
                                0186    ;       SS$_NORMAL              SUCCESSFUL COMPLETION
                                0186    ;
                                0186    ; SIDE EFFECTS:
                                0186    ;
                                0186    ;       NONE
                                0186    ;
                                0186    ; EQUATED SYMBOLS
                                0186    ;
                                0186    ;
                                0186    ;--
                                0186
                                0186    FIL$CACHE_TRUNC::
                        0000    0186          .WORD   0
   50   00000004'EF      D0    0188          MOVL    FIL$GQ_CACHE+4,R0       ;ADDRESS OF THE CACHE
      0C A0    08 A0      D0    018F          MOVL    FIL$L_DIRNXT(R0),FIL$L_DIRMAX(R0) ;NO NEW DIRECTORY CACHE ENTRIES
      14 A0    10 A0      D0    0194          MOVL    FIL$L_LBNNXT(R0),FIL$L_LBNMAX(R0) ;NO MORE LBN BUFFERS
00000000'EF    10 A0      D0    0199          MOVL    FIL$L_LBNNXT(R0),FIL$GQ_CACHE   ;SET NEW SIZE OF CACHE
            50    01      D0    01A1          MOVL    S^#SS$_NORMAL,R0
                          04    01A4          RET
```

```
                                01A5   621          .SBTTL  ASSIGN_DEV - ASSIGN A DEVICE AND RETURN A CHANNEL
                                01A5   622 ;++
                                01A5   623 ; FUNCTIONAL DESCRIPTION:
                                01A5   624 ;
                                01A5   625 ;       ASSIGN THE GIVEN DEVICE AND RETURN A CHANNEL NUMBER
                                01A5   626 ;       FOR BOOTING THIS VALUE IS A LONG WORD
                                01A5   627 ;
                                01A5   628 ; INPUTS:
                                01A5   629 ;
                                01A5   630 ;       FILNAM(AP)      = ADDRESS OF STRING DESCRIPTOR
                                01A5   631 ;                         IF DEVICE NAME IS PRESENT IT MUST HAVE ":"
                                01A5   632 ;       CHANADR(AP)     = ADDRESS TO RETURN LONG WORD OF CHANNEL NUMBER
                                01A5   633 ;
                                01A5   634 ; OUTPUTS:
                                01A5   635 ;
                                01A5   636 ;       R0,R1 ALTERED
                                01A5   637 ;       R2 = SIZE OF DEVICE NAME STRING (DEFAULT IF NOT IN NAME STRING)
                                01A5   638 ;            MAYBE 0 IF DEFAULT DEVICE STRING WAS NOT PRESENT
                                01A5   639 ;            THIS IS THE CASE WHEN BOOTSTRAPPING.
                                01A5   640 ;       R3 = ADDRESS OF DEVICE NAME STRING
                                01A5   641 ;            0 IF DEFAULT DEVICE STRING WAS NOT PRESENT
                                01A5   642 ;
                                01A5   643 ;--
                                01A5   644
                                01A5   645 ASSIGN_DEV:
                    50    D4    01A5   646          CLRL    R0                      ;ASSUME NULL DEFAULT DEVICE STRING
                FE59    CF    01A7   647          TSTL    W^FIL_GT_DDDEV          ;ADDRESS OF DEFAULT DEVICE COUNTED STRING
                    0A    13    01AB   648          BEQL    10$                     ;BRANCH IF NO DEFAULT DEVICE STRING
            51  00000000'EF    01AD   649          MOVAL   FIL$GT_DDDEV,R1         ;GET THE ADDRESS
                    50    81    01B4   650          MOVZBL  (R1)+,R0                ;SIZE OF DEFAULT DEVICE STRING
                    03    BB    01B7   651 10$:     PUSHR   #^M<R0,R1>              ;PUSH DEFAULT DEVICE DESCRIPTOR
                    52    7C    01B9   652          CLRQ    R2                      ;ASSUME NULL STRING DESCRIPTOR
                 50   08    AC    01BB   653          MOVL    FILNAM(AP),R0           ;ADDRESS OF STRING DESCRIPTOR
                    11    13    01BF   654          BEQL    20$                     ;BRANCH IF NO NAME GIVEN
                    52    60    7D    01C1   655          MOVQ    (R0),R2         ;R2 = SIZE, R3 = ADR OF FILE NAME STRING
              63    52    3A    01C4   656          LOCC    #^A/:/,R2,(R3)          ;ANY DEVICE SPECIFIED?
                    08    13    01C8   657          BEQL    20$                     ;BRANCH IF NONE
                04  AE    53    D0    01CA   658          MOVL    R3,4(SP)        ;ADDRESS OF DEVICE NAME
              6E    51    53    C3    01CE   659          SUBL3   R3,R1,(SP)      ;SIZE OF DEVICE NAME STRING
                    50    5E    D0    01D2   660 20$:     MOVL    SP,R0           ;ADDRESS OF DEV NAME DESCRIPTOR
                                  01D5   661 ;           $ASSIGN_S (R0),@CHANADR(AP)     ;ASSIGN THE CHANNEL
                          0C    BA    01D5   662          POPR    #^M<R2,R3>      ;GET DEVICE NAME SIZE AND ADDRESS
                          05    01D7   663          RSB
```

```
                        01D8   665          .SBTTL  STORE3DIGITS - STORE 3 ASCII DIGITS
                        01D8   666 ;++
                        01D8   667 ; FUNCTIONAL DESCRIPTION:
                        01D8   668 ;
                        01D8   669 ;        STORE 3 DIGITS OF DIRECTORY STRING
                        01D8   670 ;
                        01D8   671 ; CALLING SEQUENCE:
                        01D8   672 ;
                        01D8   673 ;        BSBB    STORE3DIGITS
                        01D8   674 ;
                        01D8   675 ; INPUT:
                        01D8   676 ;
                        01D8   677 ;        R0 = NO. OF DIGITS TO PUT IN STRING
                        01D8   678 ;        R1 = ADDRESS + 1 OF RIGHT MOST DIGIT
                        01D8   679 ;        R2 = ADDRESS AT WHICH TO STORE 3 DIGITS
                        01D8   680 ;
                        01D8   681 ; OUTPUTS:
                        01D8   682 ;
                        01D8   683 ;        NONE
                        01D8   684 ;
                        01D8   685 ;--
                        01D8   686
                        01D8   687 STORE3DIGITS:
03   50   D1              01D8   688          CMPL    R0,#3                   ;3 DIGITS OR LESS SPECIFIED?
     03   15              01DB   689          BLEQ    5$                      ;YES. BRANCH.
   027D   31              01DD   690          BRW     BADFILNAM               ;NO. DIRECTORY STRING BAD. EXIT
                          01E0   691                                          ;WITH ERROR.
82 3030  8F   B0          01E0   692 5$:      MOVW    #^A/00/,(R2)+           ;BACKGROUND WITH ASCII 0
   82    30   90          01E5   693          MOVB    #^A/0/,(R2)+            ;
         03   11          01E8   694          BRB     20$                     ;START LOOP AT BOTTOM
   72    71   90          01EA   695 10$:     MOVB    -(R1),-(R2)             ;STORE BYTES LAST TO FIRST
                          01ED   696                                          ;LEAVING LEADING ASCII 0'S
   FA 50   F4             01ED   697 20$:     SOBGEQ  R0,10$                  ;LOOP ZERO OR MORE TIMES
                          05   01F0   698          RSB
```

```
                                01F1    700          .SBTTL  FORMDIRSTRING - GET A DIRECTORY STRING
                                01F1    701 ;++
                                01F1    702 ; FUNCTIONAL DESCRIPTION:
                                01F1    703 ;
                                01F1    704 ;       PULL THE FIRST DIRECTORY NAME OFF THE FRONT OF THE INPUT
                                01F1    705 ;       DIRECTORY STRING AND FORM THE FULL FILE NAME OF THE DIRECTORY
                                01F1    706 ;       TO LOOK UP.
                                01F1    707 ;
                                01F1    708 ; CALLING SEQUENCE:
                                01F1    709 ;
                                01F1    710 ;       BSBW    FORMDIRSTRING
                                01F1    711 ;
                                01F1    712 ; INPUTS:
                                01F1    713 ;
                                01F1    714 ;       R6 = SIZE OF DIRECTORY STRING
                                01F1    715 ;       R7 = ADDRESS OF DIRECTORY STRING
                                01F1    716 ;               THE STRING CONTAINS NO BRACKETS,
                                01F1    717 ;               IT MAY BE OF THE FORM "DIR1.DIR2.DIR3...DIRN"
                                01F1    718 ;               THE FIRST AND ONLY ITEM MAY BE IN THE FORM GROUP,MEMBER
                                01F1    719 ;       DIRNAM(FP) = ADDRESS OF AREA TO BUILD THE NAME
                                01F1    720 ;
                                01F1    721 ; OUTPUTS:
                                01F1    722 ;
                                01F1    723 ;       R0 = SIZE OF DIRECTORY STRING
                                01F1    724 ;       R1 = ADDRESS OF DIRECTORY STRING
                                01F1    725 ;       R2,R3 PRESERVED
                                01F1    726 ;       R6,R7 UPDATED TO POINT AT THE REST OF THE STRING
                                01F1    727 ;--
                                01F1    728
                                01F1    729 FORMDIRSTRING:
    67    56    2E    3A        01F1    730          LOCC    #^A/./,R6,(R7)          ;FIND NEXT DIRECTORY STRING
    56    50    01    C3        01F5    731          SUBL3   #1,R0,R6                ;SIZE OF REST, SKIP THE "."
                                01F9    732                                          ;-1 IF EMPTY
    50    51    57    C3        01F9    733          SUBL3   R7,R1,R0                ;BYTE COUNT OF DIRECTORY NAME
          51    57    D0        01FD    734          MOVL    R7,R1                   ;ADDRESS OF DIRECTORY NAME
    57    01  A140    9E        0200    735          MOVAB   1(R1)[R0],R7            ;ADDRESS OF NEXT BYTE BEYOND "."
                07    BB        0205    736          PUSHR   #^M<R0,R1,R2>           ;SAVE STRING DESCRIPTORS AND R2
          27    50    D1        0207    737          CMPL    R0,#39                  ;LENGTH OF DIRECTORY STRING OKAY?
                03    15        020A    738          BLEQ    5$                      ;YES. BRANCH.
              024E    31        020C    739          BRW     BADFILNAM               ;NO. EXIT WITH ERROR.
    61    50    2C    3A        020F    740 5$:      LOCC    #^A/,/,R0,(R1)          ;GOOD STRING: ANY ","?
                39    13        0213    741          BEQL    20$                     ;BRANCH IF NOT, RETURN THE DESCRIPTOR AS IS
                50    DD        0215    742          PUSHL   R0                      ;SAVE REMAINING BYTE COUNT
 50    04  AE    50    C3        0217    743          SUBL3   R0,4(SP),R0             ;BYTE COUNT TO LEFT OF ","
    52    CC  AD    DE        021C    744          MOVAL   DIRNAM(FP),R2           ;ADDRESS TO STORE FIRST 3 CHARS
                B6    10        0220    745          BSBB    STORE3DIGITS            ;STORE THEM
    50    8E    01    C3        0222    746          SUBL3   #1,(SP)+,R0             ;COUNT OF CHARS TO RIGHT OF ","
    51    8E    8E    C1        0226    747          ADDL3   (SP)+,(SP)+,R1          ;ADR OF BYTE TO RIGHT OF LAST CHAR
    52    CF  AD    DE        022A    748          MOVAL   DIRNAM+3(FP),R2         ;ADR TO STORE LAST 3 CHARS OF DIR NAME
                A8    10        022E    749          BSBB    STORE3DIGITS            ;STORE THEM
                04    BA        0230    750          POPR    #^M<R2>                 ;RESTORE SAVED R2
          50    06    D0        0232    751          MOVL    #6,R0                   ;6 BYTES STRING SIZE
    51    CC AD40    9E        0235    752 10$:     MOVAB   DIRNAM(FP)[R0],R1       ;POINT TO END OF STRING
81   5249442E  8F    D0        023A    753          MOVL    #^A/.DIR/,(R1)+         ;PUT TYPE IN STRING
    61   313B  8F    B0        0241    754          MOVW    #^A/;1/,(R1)            ;AND VERSION AS WELL
      51    CC  AD    9E        0246    755          MOVAB   DIRNAM(FP),R1           ;ADDRESS OF STRING
          50    06    C0        024A    756          ADDL    #6,R0                   ;SIZE INCLUDES ".DIR;1"
```

```
                            05   024D   757          RSB
                         38 BB   024E   758 20$:     PUSHR   #^M<R3,R4,R5>           ;SAVE THESE FROM MOVC3
                                 0250   759 ;
                                 0250   760 ; 12(SP) = SIZE OF STRING, 16(SP) = ADDRESS
                                 0250   761 ;
          CC AD   10 BE   0C AE  28   0250   762          MOVC3   12(SP),@16(SP),DIRNAM(FP) ;MOVE NAME TO SCRATCH AREA
                         38 BA   0257   763          POPR    #^M<R3,R4,R5>           ;RESTORE REGISTERS
                         07 BA   0259   764          POPR    #^M<R0,R1,R2>
                         D8 11   025B   765          BRB     10$
```

```
                     025D   767          .SBTTL  MOUNT - MOUNT THE VOLUME, INIT FOR FILE LOOKUP
                     025D   768 ;++
                     025D   769 ; FUNCTIONAL DESCRIPTION:
                     025D   770 ;
                     025D   771 ;       MOUNT PERFORMS THE NECESSARY INITIALIZATION FOR FILE LOOKUP.
                     025D   772 ; IT READS THE HOME BLOCK, AND THEN RETURNS THE INDEX FILE HEADER TO THE
                     025D   773 ; SPECIFIED BUFFER.  THE INDEX FILE HEADER IS ALTERED BY RECORDING THE
                     025D   774 ; VIRTUAL BLOCK OFFSET REQUIRED TO TRANSLATE 'FILE NUMBER' TO INDEX FILE VBN
                     025D   775 ;
                     025D   776 ; CALLING SEQUENCE:
                     025D   777 ;
                     025D   778 ;       CALLG   ARGLIST,FIL$MOUNT
                     025D   779 ;
                     025D   780 ; INPUT PARAMETERS:
                     025D   781 ;
                     025D   782 ;       CHAN(AP)                CHANNEL ON WHICH DEVICE IS ASSIGNED
                     025D   783 ;       UNUSED                  2ND PARAMETER NOT USED
                     025D   784 ;       IXFHDR(AP)              ADDRESS TO RETURN INDEX FILE HEADER
                     025D   785 ;
                     025D   786 ; IMPLICIT INPUTS:
                     025D   787 ;
                     025D   788 ;       NONE
                     025D   789 ;
                     025D   790 ; OUTPUT PARAMETERS:
                     025D   791 ;
                     025D   792 ;       R0 = SYSTEM STATUS CODE
                     025D   793 ;
                     025D   794 ; IMPLICIT OUTPUTS:
                     025D   795 ;
                     025D   796 ;       NONE
                     025D   797 ;
                     025D   798 ; COMPLETION CODES:
                     025D   799 ;
                     025D   800 ;       SS$_NORMAL              SUCCESSFUL COMPLETION
                     025D   801 ;       SS$_FILESTRUCT          FILE STRUCTURE LEVEL NOT SUPPORTED
                     025D   802 ;       SS$_BADCHKSUM           CHECKSUM ERROR ON HOME BLOCK OR INDEX FILE HEADER
                     025D   803 ;       SS$_BADFILEHDR          INDEX FILE HEADER IS BAD
                     025D   804 ;
                     025D   805 ; SIDE EFFECTS:                                                          ;G:6
                     025D   806 ;
                     025D   807 ;       NONE                                                            ;G:6
                     025D   808 ;
                     025D   809 ;
                     025D   810 ; EQUATED SYMBOLS, OFFSETS FROM AP
                     025D   811 ;
           00000004  025D   812          CHAN            =       4
           0000000C  025D   813          IXFHDR          =       12
                     025D   814 ;
                     025D   815 ;--
                     025D   816
                     025D   817 FIL$MOUNT::
                001C 025D   818          .WORD   ^M<R2,R3,R4>
     53   0C AC     D0 025F   819          MOVL    IXFHDR(AP),R3           ;ADDRESS OF BUFFER
  7E   01   09     9C 0263   820          ROTL    #9,#1,-(SP)             ;NUMBER OF BYTES TO READ
       7E   21     3C 0267   821          MOVZWL  #IO$_READLBLK,-(SP)     ;READ LOGICAL BLOCK FUNCTION
            53     DD 026A   822          PUSHL   R3                      ;BUFFER ADDRESS
            01     DD 026C   823          PUSHL   #1                      ;LOGICAL BLOCK NUMBER 1 IS HOME BLK
```

```
                    04 AC    DD  026E    824          PUSHL   CHAN(AP)                        ;CHANNEL
                       05    DD  0271    825          PUSHL   #5                              ;NO. OF ARGUMENTS
          00000000'EF   6E    FA  0273    826          CALLG   (SP),L^FIL$RDWRTLBN             ;READ THE HOME BLOCK                    ;G:6
                    73 50    E9  027A    827          BLBC    R0,30$                          ;BRANCH IF ERROR
                 51   53    D0  027D    828          MOVL    R3,R1                           ;ADDRESS OF HOME BLOCK
                 50   1D    3C  0280    829          MOVZWL  #HM1$W_CHECKSUM1a-1,R0          ;NO. OF WORDS IN FIRST CHECKSUM
                    05BF    30  0283    830          BSBW    FIL$CHECKSUM1                   ;CHECK THE FIRST CHECKSUM
                 51   53    D0  0286    831          MOVL    R3,R1                           ;ADR OF HOME BLOCK AGAIN
                    05B4    30  0289    832          BSBW    FIL$CHECKSUM                    ;CHECK THE MAIN CHECKSUM
                            028C    833          CASE    HM1$W_STRUCLEV+1(R3),<-
                            028C    834                  15$,-                           ;STRUCTURE LEVEL 1
                            028C    835                  10$-                            ;STRUCTURE LEVEL 2
                            028C    836                  >,TYPE=B,LIMIT=#1
          01'  01   0D A3   8F  028C                   CASEB   HM1$W_STRUCLEV+1(R3),#1,S^#<<30001$-30000$>/2>-1
                            0291                30000$:
                       001D' 0291                   .SIGNED_WORD    15$-30000$
                       000A' 0293                   .SIGNED_WORD    10$-30000$
                            0295                30001$:
             50    08C0 8F   3C  0295    837 5$:      MOVZWL  #SS$_FILESTRUCT,R0              ;UNSUPPORTED FILE STRUCTURE LEVEL
                       04    RET 029A    838          RET
                            029B    839 ;
                            029B    840 ; STRUCTURE LEVEL 2
                            029B    841 ;
                 51   18 A3   D0  029B    842 10$:     MOVL    HM2$L_IBMAPLBN(R3),R1           ;INDEX BIT MAP STARTING LBN
                 50   20 A3   3C  029F    843          MOVZWL  HM2$W_IBMAPSIZE(R3),R0          ;INDEX BIT MAP SIZE IN BLOCKS
                 54   1C A3   D0  02A3    844          MOVL    HM2$L_MAXFILES(R3),R4           ;MAXIMUM FILES ON VOLUME
                            02A7    845                                                  ;ONLY INTERESETED IN HIGH 16 BITS       ;G:6
          54    0E A3    04   A5  02A7    846          MULW3   #4,HM2$W_CLUSTER(R3),R4 ;4*CLUSTER TO LOW WORD OF R4
                       0B    11  02AC    847          BRB     20$
                            02AE    848 ;
                            02AE    849 ; STRUCTURE LEVEL 1
                            02AE    850 ;
          51    02 A3   10   9C  02AE    851 15$:     ROTL    #16,HM1$L_IBMAPLBN(R3),R1 ;LOGICAL BLK NO. OF 1ST INDEX BIT MAP BLK
                 50   63    3C  02B3    852          MOVZWL  HM1$W_IBMAPSIZE(R3),R0  ;NO. OF BLOCKS OF INDEX BIT MAP
                 54   02    D0  02B6    853          MOVL    #2,R4                   ;NUMBER OF VBN'S BEFORE INDEX FILE BIT MAP
                 54   50    A0  02B9    854 20$:     ADDW    R0,R4                   ;LOW WORD IS VBNOFFSET
                            02BC    855                                          ;FROM FILE ID TO INDEX FILE VBN
                            02BC    856 ;
                            02BC    857 ; READ INDEX FILE HEADER
                            02BC    858 ;       R0 - NUMBER OF BLOCKS IN INDEX FILE
                            02BC    859 ;       R1 - STARTING LBN OF INDEX FILE
                            02BC    860 ;
           08 AE    51    50   C1  02BC    861          ADDL3   R0,R1,8(SP)             ;DESIRED LBN TO ARG LIST
          00000000'EF    8E   FB  02C1    862          CALLS   (SP)+,L^FIL$RDWRTLBN    ;READ INDEX FILE HEADER                 ;G:6
                            02C8    863                                          ;STRIP OFF THE ARGUMENT LIST
                    25 50    E9  02C8    864          BLBC    R0,30$                  ;BRANCH IF ERROR
                 51   53    D0  02CB    865          MOVL    R3,R1                   ;ADDRESS OF HEADER
                      7E    D4  02CE    866          CLRL    -(SP)                   ;FORM FILE ID ON STACK
              00010001 8F    DD  02D0    867          PUSHL   #^X10001                ;FOR THE INDEX FILE HEADER
                 50   5E    D0  02D6    868          MOVL    SP,R0                   ;ADDRESS OF FILE ID
                    0526    30  02D9    869          BSBW    FIL$CHKFILHDR           ;CHECK THE FILE HEADER (SEE IF
                            02DC    870                                          ;FILE IDS MATCH)
             01FE C3    54   B0  02DC    871          MOVW    R4,FH1$W_VBNOFFSET(R3)  ;STORE VBN OFFSET
                            02E1    872 ;
                            02E1    873 ; IF MAXFILES WAS GREATER THAN ^XFFFF THEN HIGH 16 BITS OF R4 WILL BE
                            02E1    874 ; NON-ZERO.  IN THIS CASE, RECORD THE BIGFILNUM BIT IN THE STRUCLEV WORD
                            02E1    875 ;
```

```
                54   54   F0 8F   78  02E1   876          ASHL    #-16,R4,R4              ;SEE IF HIGH 16 BITS = 0
                                05   13  02E6   877          BEQL    25$
                  00 06 A3      0A   E2  02E8   878          BBSS    #FH2$V_BIGFILNUM,FH2$W_STRUCLEV(R3),25$ ;MUST USE HIGH 8 BITS
                                                 02ED   879                                                  ;OF RVN FIELD AS FILE NUMBER EXTENSION
                        50      01   3C  02ED   880 25$:    MOVZWL  #SS$_NORMAL,R0          ;SUCCESSFUL COMPLETION
                                     04  02F0   881 30$:    RET
```

```
                     02F1    883          .SBTTL  FINDFILID - FIND FILE ID FOR SPECIFIED FILE
                     02F1    884 ;++
                     02F1    885 ; FUNCTIONAL DESCRIPTION:
                     02F1    886 ;
                     02F1    887 ;       FINDFILID SCANS A SPECIFIED DIRECTORY FOR A FILE AND
                     02F1    888 ; RETURNS ITS FILE ID IF FOUND.  STRUCTURE LEVEL 1 AND 2 DIRECTORIES
                     02F1    889 ; ARE SUPPORTED, 0 VERSION NUMBER MEANS FIND MOST RECENT VERSION,
                     02F1    890 ; -1 VERSION (FIND OLDEST) IS NOT SUPPORTED.  VERSION FOUND IS RETURNED IN
                     02F1    891 ; THE NAME BLOCK ADDRESSED BY THE FILE DESCRIPTOR (LEVEL 1 ONLY).
                     02F1    892 ; NOTE THAT NON-CONTIGUOUS DIRECTORIES ARE NOT SUPPORTED.
                     02F1    893 ;
                     02F1    894 ; CALLING SEQUENCE:
                     02F1    895 ;
                     02F1    896 ;       CALLG   ARGLIST,FIL$FINDFILID
                     02F1    897 ;
                     02F1    898 ; INPUT PARAMETERS:
                     02F1    899 ;
                     02F1    900 ;       CHAN(AP)                ;CHANNEL ON WHICH DEVICE IS ASSIGNED
                     02F1    901 ;       FILDSC(AP)      =       ADDRESS OF 3 LONG WORD FILE DESCRIPTOR
                     02F1    902 ;                               1 - SIZE OF ASCII STRING,  A 0 VALUE MEANS
                     02F1    903 ;                                       USE THE CONTENTS OF THE NAMBLK BELOW
                     02F1    904 ;                               2 - ADDRESS OF ASCII STRING
                     02F1    905 ;                               3 - ADDRESS OF NAME BLOCK - USED ONLY FOR LEVEL 1
                     02F1    906 ;                                       MAY CONTAIN DEFAULTS, BUT MUST BE
                     02F1    907 ;                                       AT LEAST INITIALIZED TO ZERO
                     02F1    908 ;                                       IT WILL BE WRITTEN.
                     02F1    909 ;       IXFHDR(AP)              ADR OF INDEX FILE HDR AS RETURNED FROM FIL$MOUNT
                     02F1    910 ;       DIRBUF(AP)              ADR OF 512 BYTE BUFFER TO USE FOR DIRECTORY SCAN
                     02F1    911 ;       STATBLK(AP)             ADDRESS OF 2 LONG WORD AREA USED FOR A
                     02F1    912 ;                               SCRATCH STATISTICS BLOCK
                     02F1    913 ;       FILID(AP)               ADR OF 3 WORD AREA USED BOTH AS THE ID OF
                     02F1    914 ;                               THE DIRECTORY TO SCAN AND AS THE PLACE TO
                     02F1    915 ;                               RETURN THE ID OF THE FILE FOUND
                     02F1    916 ;
                     02F1    917 ; IMPLICIT INPUTS:
                     02F1    918 ;
                     02F1    919 ;       NONE
                     02F1    920 ;
                     02F1    921 ; OUTPUT PARAMETERS:
                     02F1    922 ;
                     02F1    923 ;       R0 = SYSTEM STATUS CODE
                     02F1    924 ;
                     02F1    925 ; IMPLICIT OUTPUTS:
                     02F1    926 ;
                     02F1    927 ;       NONE
                     02F1    928 ;
                     02F1    929 ; COMPLETION CODES:
                     02F1    930 ;
                     02F1    931 ;       SS$_NORMAL              SUCCESSFUL COMPLETION
                     02F1    932 ;       SS$_NOSUCHFILE          FILE NOT FOUND
                     02F1    933 ;       SS$_BADFILENAME         SYNTAX ERROR IN FILE NAME
                     02F1    934 ;       SS$_BADCHKSUM           CHECKSUM ERROR ON DIRECTORY FILE HEADER
                     02F1    935 ;       SS$_BADFILEHDR          DIRECTORY FILE HEADER WAS BAD
                     02F1    936 ;
                     02F1    937 ; SIDE EFFECTS:
                     02F1    938 ;
                     02F1    939 ;       NONE
```

```
                        02F1    940 ;
                        02F1    941 ;
                        02F1    942 ; EQUATED SYMBOLS, OFFSETS FROM AP
                        02F1    943 ;
00000004                02F1    944         CHAN            =       4
00000008                02F1    945         FILDSC          =       8
0000000C                02F1    946         IXFHDR          =       12
00000010                02F1    947         DIRBUF          =       16
00000014                02F1    948         STATBLK         =       20
00000018                02F1    949         FILID           =       24
                        02F1    950 ;
                        02F1    951 ; OFFSETS FROM FP
                        02F1    952 ;
                        02F1    953         $OFFSET 0,NEGATIVE,<-
                        02F1    954         DIR_BFCNT,-                     ;BUFFER COUNT REMAINING IN LBN CACHE
                        02F1    955         DIR_BUF,-                       ;NEXT BUFFER ADDRESS IN DIR LBN CACHE
                        02F1    956         ENTRY_ADR,-                     ;FOUND CACHE ENTRY ADR
                        02F1    957         <ENTRY,FIL$C_DIR_SIZE>,-        ;CACHE ENTRY FOR SEARCH/CREATE
                        02F1    958         <SCRATCH_SIZE,0>-               ;SIZE OF SCRATCH AREA
                        02F1    959         >
                        02F1                .SAVE   LOCAL_BLOCK
                        02F1                .PSECT $ABS$ ABS
00000000                FFFA                .=0
FFFFFFFC                0000                .BLKB   -4
                        FFFC        DIR_BFCNT:
FFFFFFF8                FFFC                .BLKB   -4
                        FFF8        DIR_BUF:
FFFFFFF4                FFF8                .BLKB   -4
                        FFF4        ENTRY_ADR:
FFFFFFD0                FFF4                .BLKB   -FIL$C_DIR_SIZE
                        FFD0        ENTRY:
                        FFD0        SCRATCH_SIZE:
                     000002F1                .RESTORE
                        02F1    960 ;
                        02F1    961 ;--
                        02F1    962
                        02F1    963 FIL$FINDFILID::
                    0FFC    02F1    964         .WORD   ^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>
                5E  30  C2  02F3    965         SUBL    #-SCRATCH_SIZE,SP       ;ALLOCATE SCRATCH SPACE
6E  30  00      6E  00  2C  02F6    966         MOVC5   #0,(SP),#0,#-SCRATCH_SIZE,(SP) ;ZERO THE SCRATCH STORAGE
                5B  D4  02FC    967         CLRL    R11                     ;ASSUME NO CACHE
                02  6C  D1  02FE    968         CMPL    (AP),#2                 ;IF ONLY 2 ARGUMENTS
                    08  12  0301    969         BNEQ    5$
            5B  04  AC  D0  0303    970         MOVL    4(AP),R11               ;THE FIRST IS THE CACHE ADDRESS
            5C  08  AC  D0  0307    971         MOVL    8(AP),AP                ;THE SECOND IS THE REAL ARGUMENT LIST
                5B  D5  030B    972 5$:     TSTL    R11                     ;CACHE ENABLED?
                66  13  030D    973         BEQL    65$                     ;BRANCH IF NOT
                        030F    974 ;
                        030F    975 ; WE DO HAVE A CACHE TO LOOK IN AND MAKE ENTRIES IN, SET UP THE
                        030F    976 ; SCRATCH REGION FOR A LOOKUP
                        030F    977 ;
                        030F    978         ASSUME  ENTRY EQ SCRATCH_SIZE   ;SCRATCH CACHE ENTRY MUST BE ON TOP
                        030F    979         ASSUME  FIL$A_DIR_FID EQ 0      ;DIR ID IS AT FRONT OF CACHE ENTRY
        6E  18  BC  06  28  030F    980         MOVC3   #6,aFILID(AP),(SP)      ;STORE DIRECTORY ID
            50  08  BC  7D  0314    981         MOVQ    aFILDSC(AP),R0          ;GET LOOKUP NAME DESCRIPTOR
                06  50  D1  0318    982         CMPL    R0,#6                   ;MUST BE MORE THAN ".DIR;1"
                    25  15  031B    983         BLEQ    10$                     ;BRANCH IF NOT A DIRECTORY NAME
```

```
                0F   50   D1   031D    984          CMPL    R0,#15                          ;AT MOST 9 CHAR WITH ".DIR;1"
                     20   14   0320    985          BGTR    10$                             ;BRANCH IF NOT A DIRECTORY NAME
             52 51   50   C1   0322    986          ADDL3   R0,R1,R2                        ;POINT OFF END OF NAME STRING
             72 313B 8F   B1   0326    987          CMPW    #^A/;1/,-(R2)                   ;LAST 2 BYTES ";1" ?
                     15   12   032B    988          BNEQ    10$                             ;BRANCH IF NOT A DIRECTORY NAME
          72 5249442E 8F   D1   032D    989          CMPL    #^A/.DIR/,-(R2)                 ;PRECEDED BY ".DIR" ?
                     0C   12   0334    990          BNEQ    10$                             ;BRANCH IF NOT A DIRECTORY NAME
                50   06   C2   0336    991          SUBL    #6,R0                           ;JUST KEEP THE NAME PART
              D6 AD   50   90   0339    992          MOVB    R0,FIL$T_DIR_NAM+ENTRY(FP)      ;PUT SIZE AND NAME STRING
           D7 AD   61   50   28   033D    993          MOVC3   R0,(R1),FIL$T_DIR_NAM+1+ENTRY(FP) ;IN ENTRY TO LOOKUP
           58   5B   04 AB   C1   0342    994 10$:     ADDL3   FIL$L_DIROFF(R11),R11,R8        ;ADDRESS OF DIRECTORY CACHE
           59   5B   08 AB   C1   0347    995          ADDL3   FIL$L_DIRNXT(R11),R11,R9       ;ADDRESS OF LAST+1 BYTE
                     1E   11   034C    996          BRB     60$                             ;LOOP 0 OR MORE TIMES
                          034E    997
                          034E    998          ASSUME  FIL$T_DIR_NAM EQ FIL$A_DIR_FID+6
           68   D0 AD   10   29   034E    999 20$:     CMPC3   #6+10,FIL$A_DIR_FID+ENTRY(FP), - ;DOES FID AND NAME MATCH?
                          0353   1000                  FIL$A_DIR_FID(R8)
                     06   12   0353   1001          BNEQ    30$                             ;BRANCH IF DIDN'T MATCH ALL OF IT
              F4 AD   58   D0   0355   1002          MOVL    R8,ENTRY_ADR(FP)                ;RECORD THAT A MATCH WAS FOUND
                     1E   11   0359   1003          BRB     70$
                          035B   1004 ;
                          035B   1005 ; FAILED TO MATCH THE ENTIRE ENTRY, DID WE MATCH THE DIR ID FIELD?
                          035B   1006 ;
                0A   50   D1   035B   1007 30$:     CMPL    R0,#10                          ;IF 10 OR LESS CHAR'S LEFT
                     09   14   035E   1008          BGTR    50$                             ;THEN MATCHED THE DIR ID
              F4 AD   58   D0   0360   1009          MOVL    R8,ENTRY_ADR(FP)                ;SAVE THIS PARTIAL MATCH
                 D6 AD   95   0364   1010          TSTB    FIL$T_DIR_NAM+ENTRY(FP)         ;IF NOT SEARCHING FOR A DIR NAME
                     10   13   0367   1011          BEQL    70$                             ;THEN THIS ENTRY WILL DO FINE
                58   24   C0   0369   1012 50$:     ADDL    #FIL$C_DIR_SIZE,R8              ;ADDRESS OF NEXT CACHE ENTRY
                59   58   D1   036C   1013 60$:     CMPL    R8,R9                           ;DONE SCANNING DIR CACHE?
                     DD   1F   036F   1014          BLSSU   20$                             ;BRANCH IF NOT, CHECK NEXT ENTRY
                          0371   1015 ;
                          0371   1016 ; ENTRY_ADR(FP) = ADDRESS OF CACHE HIT ENTRY
                          0371   1017 ;                = 0 IF NO MATCH FOUND
                          0371   1018 ; IF WE DROP THROUGH TO HERE AND WE GOT A CACHE HIT, THEN IT WAS
                          0371   1019 ; NOT EXACTLY WHAT WE WERE LOOKING FOR.  BUT IT DID MATCH THE DIRECTORY.
                          0371   1020 ;
           58   F4 AD   D0   0371   1021          MOVL    ENTRY_ADR(FP),R8                ;WAS THERE A CACHE HIT?
                45   13   0375   1022 65$:     BEQL    READ_DIR_HEADER                 ;BRANCH IF NO
                     0F   11   0377   1023          BRB     80$                             ;YES, FOR DIRECTORY LBN AND SIZE
                          0379   1024 ;
                          0379   1025 ; FOUND WHAT WE WERE LOOKING FOR - MAY ONLY NEED DIRECTORY LBN AND SIZE
                          0379   1026 ;
                1E A8   D5   0379   1027 70$:     TSTL    FIL$A_DIR_OFID(R8)              ;DID WE GET A FILE ID?
                     0A   13   037C   1028          BEQL    80$                             ;BRANCH IF NOT
       18 BC    1E A8   06   28   037E   1029          MOVC3   #6,FIL$A_DIR_OFID(R8),@FILID(AP) ;RETURN THE FILE ID
                50   01   3C   0384   1030          MOVZWL  S^#SS$_NORMAL,R0                ;SET SUCCESS STATUS
                     04   0387   1031 72$:     RET                                     ;AND RETURN
                          0388   1032 ;
                          0388   1033 ; CACHE HIT ONLY FOUND THE DIRECTORY LBN AND SIZE, SAVING THE
                          0388   1034 ; READ OF THE DIRECTORY FILE HEADER.
                          0388   1035 ;
          E0 AD   10 A8   7D   0388   1036 80$:     MOVQ    FIL$Q_DIR_HDR(R8),FIL$Q_DIR_HDR+ENTRY(FP) ;SAVE DIRHDR
                          038D   1037                                                     ;INFO FOR MAKING A NEW ENTRY
                          038D   1038                                                     ;WITH THE DIRECTORY FID IN IT
          E8 AD   18 A8   D0   038D   1039          MOVL    FIL$L_DIR_BFOFF(R8),FIL$L_DIR_BFOFF+ENTRY(FP)
          EC AD   1C A8   B0   0392   1040          MOVW    FIL$W_DIR_BFCNT(R8),FIL$W_DIR_BFCNT+ENTRY(FP)
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                                0397  1041                                    ;SAVE DIR LBN CACHE INFO TOO
                                0397  1042 ;
                                0397  1043 ; AT THIS POINT ENTRY(FP) CONTAINS DIRECTORY LBN CACHE INFORMATION
                                0397  1044 ; IF ONE HAD ALREADY EXISTED OR IF WE JUST CREATED IT.
                                0397  1045 ; SET UP THE WORKING LOCATIONS FOR THE DIRECTORY LBN CACHE
                                0397  1046 ;
      56   E4 AD    01    C3   0397  1047 90$:    SUBL3   #1,FIL$L_DIR_LBN+ENTRY(FP),R6 ;R6=STARTING LBN - 1
           57    E0 AD    3C   039C  1048         MOVZWL  FIL$W_DIR_BKCNT+ENTRY(FP),R7 ;R7=SIZE OF DIRECTORY IN BLOCKS
        FC AD    EC AD    3C   03A0  1049         MOVZWL  FIL$W_DIR_BFCNT+ENTRY(FP),DIR_BFCNT(FP) ;BUFFER COUNT IN LBN CACHE
   F8 AD    5B    E8 AD    C1   03A5  1050         ADDL3   FIL$L_DIR_BFOFF+ENTRY(FP),R11,DIR_BUF(FP) ;STARTING ADR IN CACHE
              57    56    C0   03AB  1051         ADDL    R6,R7                   ;LAST LBN OF FILE INCLUSIVE
           03 E2 AD    E9   03AE  1052         BLBC    FIL$B_DIR_LVL+ENTRY(FP),100$ ;BRANCH IF STRUCTURE LEVEL 1
                00BA    31   03B2  1053         BRW     FIND_LEVEL2_1
                0192    31   03B5  1054 100$:   BRW     FIND_LEVEL1_1
                             03B8  1055 BADDIR2:
                009C    31   03B8  1056         BRW     BADDIR
                             03BB  1057 BADRET1:
                      04     03BB  1058         RET
                             03BC  1059 ;
                             03BC  1060 ; CACHE WAS NOT ENABLED OR THERE WAS NOT A HIT FOR THIS DIRECTORY
                             03BC  1061 ;
                             03BC  1062 READ_DIR_HEADER:
 000005FA'EF    6C    FA    03BC  1063         CALLG   (AP),FIL$RDCHKFILHDR    ;READ AND CHECK DIRECTORY FILE HEADER
           F5 50    E9    03C3  1064         BLBC    R0,BADRET1              ;BRANCH IF ERROR
        55    10 AC    D0   03C6  1065         MOVL    DIRBUF(AP),R5           ;ADDRESS OF BUFFER TO READ DIRECTORY BLOCKS
   56   14 BC    01    C3   03CA  1066         SUBL3   #1,@STATBLK(AP),R6      ;GET START LBN - 1
                             03CF  1067 ;
                             03CF  1068 ; IF THIS RESULT IS NEGATIVE, THEN THE DIRECTORY WAS NOT CONTIGUOUS.
                             03CF  1069 ; THIS CODE SUPPORTS ONLY CONTIGUOUS DIRECTORIES, ANOTHER BUFFER WOULD
                             03CF  1070 ; BE REQUIRED TO HOLD THE DIRECTORY HEADER IN ORDER TO SUPPORT NON-CONTIGUOS
                             03CF  1071 ; DIRECTORIES.  SUCH DIRECTORIES ARE ONLY CREATED BY FILES-11 WHEN
                             03CF  1072 ; A DIRECTORY MUST BE EXTENDED AND THERE IS NOT ENOUGH CONTIGUOUS SPACE
                             03CF  1073 ; ANYWHERE ON THE VOLUME TO MAKE A NEW DIRECTORY OF THE CORRECT SIZE.
                             03CF  1074 ;
                E7    19     03CF  1075         BLSS    BADDIR2                 ;BRANCH IF NOT CONTIGUOUS
                             03D1  1076 ;
                             03D1  1077 ; SEE IF THIS LOOKS LIKE A DIRECTORY FILE
                             03D1  1078 ;
        54    0E A5    DE   03D1  1079         MOVAL   FH1$W_RECATTR(R5),R4    ;ADDRESS OF LEVEL 1 RECORD ATTRIBUTES
   5A   07 A5    01    83   03D5  1080         SUBB3   #1,FH1$W_STRUCLEV+1(R5),R10 ;0 IF LEVEL 1, 1 IF LEVEL 2
                04     13   03DA  1081         BEQL    10$                     ;BRANCH IF LEVEL 1
        54    14 A5    DE   03DC  1082         MOVAL   FH2$W_RECATTR(R5),R4    ;ADDRESS OF LEVEL 2 RECORD ATTRIBUTES
   57   08 A4    10    9C   03E0  1083 10$:    ROTL    #16,FAT$L_EFBLK(R4),R7  ;VBN OF DIRECTORY EOF
              0C A4    B5   03E5  1084         TSTW    FAT$W_FFBYTE(R4)        ;IF ZERO, EFBLK IS LAST+1 VBN
                02     12   03E8  1085         BNEQ    20$
                57     D7   03EA  1086         DECL    R7                      ;CORRECT TO GET LAST VBN
   E4 AD    56    01    C1   03EC  1087 20$:    ADDL3   #1,R6,FIL$L_DIR_LBN+ENTRY(FP) ;SAVE START LBN,
        E0 AD    57    B0   03F1  1088         MOVW    R7,FIL$W_DIR_BKCNT+ENTRY(FP) ;DIRECTORY SIZE,
        E2 AD    5A    90   03F5  1089         MOVB    R10,FIL$B_DIR_LVL+ENTRY(FP) ;AND STRUCTURE LEVEL
                             03F9  1090 ;
                             03F9  1091 ; SEE IF WE CAN SET UP A CACHE OF THE DIRECTORY BLOCKS FOR THIS DIRECTORY
                             03F9  1092 ;
                5B    D5     03F9  1093         TSTL    R11                     ;ANY CACHEING ENABLED?
                51    13     03FB  1094         BEQL    80$                     ;BRANCH IF NOT
52   14 AB    10 AB    C3   03FD  1095         SUBL3   FIL$L_LBNNXT(R11),FIL$L_LBNMAX(R11),R2 ;NO. OF BYTES
                             0403  1096                                         ;AVAILABLE TO ALLOCATE
   52   52    F7 8F    78   0403  1097         ASHL    #-9,R2,R2               ;NO. OF PAGES AVAILABLE
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                     44   13   0408  1098          BEQL    80$                          ;BRANCH IF NO SPACE AT ALL
                  57 52   D1   040A  1099          CMPL    R2,R7                        ;ENOUGH ROOM FOR WHOLE DIR
                     03   15   040D  1100          BLEQ    40$                          ;BRANCH IF NOT, USE WHAT IS LEFT
                  52 57   D0   040F  1101          MOVL    R7,R2                        ;YES, USE THE RIGHT SIZE
               53   10 AB   D0   0412  1102 40$:    MOVL    FIL$L_LBNNXT(R11),R3         ;OFFSET TO DIR LBN CACHE
                           0416  1103 ;
                           0416  1104 ; READ THE DISK BLOCKS INTO THE LBN CACHE.
                           0416  1105 ;
            7E   52   09   78   0416  1106          ASHL    #9,R2,-(SP)                  ;BYTE COUNT TO TRANSFER
                 7E   21   3C   041A  1107          MOVZWL  #IO$_READLBLK,-(SP)          ;READ LOGICAL BLOCK FUNCTION
                   6B43   9F   041D  1108          PUSHAB  (R11)[R3]                    ;BUFFER ADDRESS
                     E4 AD   DD   0420  1109          PUSHL   FIL$L_DIR_LBN+ENTRY(FP)      ;STARTING LBN
                     04 AC   DD   0423  1110          PUSHL   CHAN(AP)                     ;CHANNEL
      00000000'EF    05   FB   0426  1111          CALLS   #5,FIL$RDWRTLBN              ;FILL THE DIR LBN CACHE
                  1E 50   E9   042D  1112          BLBC    R0,80$                       ;BRANCH IF ERROR
                           0430  1113 ;
                           0430  1114 ; NOTE THAT DIRECTORY BLOCKS ARE IN MEMORY
                           0430  1115 ;
                  FC AD    52   D0   0430  1116          MOVL    R2,DIR_BFCNT(FP)             ;COUNT OF BLOCKS READ IN
                F8 AD   6B43   9E   0434  1117          MOVAB   (R11)[R3],DIR_BUF(FP)        ;ADDRESS OF FIRST BLOCK READ IN
                     D6 AD   95   0439  1118          TSTB    FIL$T_DIR_NAM+ENTRY(FP)      ;ARE WE LOOKING UP ANOTHER DIRECTORY?
                        10   12   043C  1119          BNEQ    80$                          ;BRANCH IF YES, DON'T ALLOCATE
                           043E  1120                                                       ;A PERMANENT CACHE ENTRY FOR
                           043E  1121                                                       ;AN INTERMEDIATE LEVEL DIRECTORY
                  EC AD    52   B0   043E  1122          MOVW    R2,FIL$W_DIR_BFCNT+ENTRY(FP) ;SET UP FOR PERMANENT ENTRY
                  E8 AD    53   D0   0442  1123          MOVL    R3,FIL$L_DIR_BFOFF+ENTRY(FP) ;SAVE THE SIZE AND OFFSET OF CACHE
               51   52   09   78   0446  1124          ASHL    #9,R2,R1                     ;NO. OF BYTES IN CACHE
                  10 AB    51   C0   044A  1125          ADDL    R1,FIL$L_LBNNXT(R11)         ;ALLOCATE THE CACHE
                           044E  1126 ;
                           044E  1127 ; IF IT WAS POSSIBLE TO READ THE DIRECTORY INTO THE LBN CACHE AREA,
                           044E  1128 ; THE SCAN WILL FIND THESE BLOCKS AS THEY ARE NEEDED.
                           044E  1129 ;
                           044E  1130 80$:
                           044E  1131 ;
                           044E  1132 ; R6 = STARTING LBN - 1 FOR THE DIRECTORY
                           044E  1133 ; R7 = COUNT OF BLOCKS OF DIRECTORY TO BE SCANNED
                           044E  1134 ; R10[0:7] = 0 IF STRUCTURE LEVEL 1
                           044E  1135 ;           = 1 IF STRUCTURE LEVEL 2
                           044E  1136 ;
                  57   56   C0   044E  1137          ADDL    R6,R7                        ;LAST LBN OF FILE (INCLUSIVE)
                    0F 5A   E8   0451  1138          BLBS    R10,FIND_LEVEL2              ;BRANCH IF STRUCTURE LEVEL 2
                     00E8   31   0454  1139          BRW     FIND_LEVEL1
                           0457  1140
                           0457  1141 ;
                           0457  1142 ; ERROR RETURNS.
                           0457  1143 ;
50   0828 8F    3C   0457  1144 BADDIR: MOVZWL  #SS$_BADIRECTORY,R0
                     04   045C  1145 BADRET: RET
                           045D  1146 BADFILNAM:
50   0818 8F    3C   045D  1147          MOVZWL  #SS$_BADFILENAME,R0      ;RETURN ERROR CODE.
                     04   0462  1148          RET
```

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                                0463  1150          .SBTTL  FIL$FINDFILID - STRUCTURE LEVEL 2
                                0463  1151 ;
                                0463  1152 ; STRUCTURE LEVEL 2
                                0463  1153 ;
                                0463  1154 FIND_LEVEL2:
            EF 34 A5    0D   E1  0463  1155          BBC     #FH2$V_DIRECTORY,FH2$L_FILECHAR(R5),BADDIR ;DIRECTORY BIT MUST BE SE
                                0468  1156
                                0468  1157          ASSUME  FAT$B_RATTRIB EQ FAT$B_RTYPE+1
                  0802 8F   B1  0468  1158          CMPW    #<FAT$M_NOSPAN @ 8 + FAT$C_VARIABLE>,- ;VARIABLE LENGTH
                       64       046C  1159                  FAT$B_RTYPE(R4)         ;RECORDS NOT CROSSING BLOCK BOUNDARIES
                       E8   12  046D  1160          BNEQ    BADDIR                  ;BRANCH IF BAD RECORD ATTRIBUTES
                                046F  1161 ;
                                046F  1162 ; ***** NOTE THAT EACH BLOCK MUST END IN A RECORD SIZE OF -1
                                046F  1163 ; ***** A RECORD IS NOT ALLOWED TO EXACTLY FILL THE BLOCK
                                046F  1164 ; ***** PDP-11 FILE CONTROL SERVICES WILL READ THIS FILE CORRECTLY, BUT
                                046F  1165 ; ***** WILL NOT WRITE IT PROPERLY.  LIKEWISE FOR RMS-11 AND RMS-32
                                046F  1166 ;
                                046F  1167 FIND_LEVEL2_1:
               58   08 BC   7D  046F  1168          MOVQ    @FILDSC(AP),R8          ;R8 = SIZE, R9 = ADDRESS OF FILE NAME STRING
                       5A   D4  0473  1169          CLRL    R10                     ;ASSUME DEFAULT VERSION
                    53   58   7D  0475  1170          MOVQ    R8,R3                   ;COPY FILE NAME DESCRIPTOR
                64  53   2E   3A  0478  1171          LOCC    #^A/./,R3,(R4)          ;FIND FILE TYPE DELIMITER IF PRESENT
                       07   13  047C  1172          BEQL    40$                     ;BRANCH IF NOT PRESENT
                    53   70   9E  047E  1173          MOVAB   -(R0),R3                ;SIZE OF REMAINING STRING
                  54   01 A1   9E  0481  1174          MOVAB   1(R1),R4                ;ADDRESS OF STRING BEYOND DELIMITER
                64  53   3B   3A  0485  1175 40$:     LOCC    #^A/;/,R3,(R4)          ;SEE IF VERSION DELIMITER PRESENT
                       06   12  0489  1176          BNEQ    60$                     ;BRANCH IF IT IS
                64  53   2E   3A  048B  1177          LOCC    #^A/./,R3,(R4)          ;TRY ALTERNATE VERSION DELIMITER
                       34   13  048F  1178          BEQL    120$                    ;BRANCH IF NO VERSION STRING PRESENT
                                0491  1179 ;
                                0491  1180 ; R0 = BYTE COUNT OF VERSION STRING PLUS DELIMITER
                                0491  1181 ; R1 = ADDRESS OF VERSION DELIMITER
                                0491  1182 ;
                    58   50   C2  0491  1183 60$:     SUBL    R0,R8                   ;REDUCE FILE NAME STRING SIZE
                                0494  1184                                          ;ELIMINATING VERSION STRING AND DELIMITER
                         7E   DF  0494  1185          PUSHAL  -(SP)                   ;RESERVE LONG WORD FOR VERSION NUMBER
                                0496  1186                                          ;AND PUSH ITS ADDRESS
                      01 A1   9F  0496  1187          PUSHAB  1(R1)                   ;ADDRESS OF VERSION STRING
                         70   9F  0499  1188          PUSHAB  -(R0)                   ;SIZE OF VERSION STRING
          00000000'EF    03   FB  049B  1189          CALLS   #3,LIB$CVT_DTB          ;CONVERT DECIMAL VERSION STRING TO BINARY
                   B8 50   E9  04A2  1190          BLBC    R0,BADFILNAM            ;BRANCH IF SYNTAX ERROR IN VERSION STRING
                    5A   8E   D0  04A5  1191          MOVL    (SP)+,R10               ;FETCH EXPLICIT VERSION NUMBER
                                04A8  1192 ;
                                04A8  1193 ; R6  = ADDRESS OF LAST LBN READ FROM DIRECTORY FILE (FIRST - 1)
                                04A8  1194 ; R7  = ADDRESS OF LAST LBN (INCLUSIVE) TO BE READ FROM DIRECTORY FILE
                                04A8  1195 ; R8  = SIZE OF NAME STRING TO SCAN FOR
                                04A8  1196 ; R9  = ADDRESS OF NAME STRING TO SCAN FOR
                                04A8  1197 ; R10 = FILE VERSION NUMBER IF EXPLICIT, OR 0 IF DEFAULT TO LATEST VERSION
                                04A8  1198 ;
                         1B   11  04A8  1199          BRB     120$                    ;BEGIN LOOP AT BOTTOM
                                04AA  1200 ;
                                04AA  1201 ; R5 = ADDRESS OF NEXT RECORD
                                04AA  1202 ;
                  54   05 A5   9A  04AA  1203 100$:    MOVZBL  DIR$B_NAMECOUNT(R5),R4  ;GET SIZE OF "NAME.TYP" STRING
06 A5   54   00   69   58   2D  04AE  1204          CMPC5   R8,(R9),#0,R4,DIR$T_NAME(R5) ;SEE IF STRINGS MATCH
                       1D   13  04B5  1205          BEQL    200$                    ;BRANCH IF THEY DO
                       10   19  04B7  1206          BLSS    140$                    ;BRANCH IF BEYOND WHERE NAME WOULD GO
```

```
                     50   65   3C   04B9  1207          MOVZWL  DIR$W_SIZE(R5),R0       ;USING THE SIZE OF THIS RECORD
                55   02 A540   9E   04BC  1208          MOVAB   2(R5)[R0],R5            ;FORM ADDRESS OF NEXT RECORD
                        65   B5   04C1  1209 110$:      TSTW    DIR$W_SIZE(R5)          ;END OF BLOCK? (MARKED WITH -1)
                        E5   14   04C3  1210          BGTR    100$                    ;BRANCH IF NOT
                   06 56   57   F3   04C5  1211 120$:      AOBLEQ  R7,R6,160$
                50   0910 8F   3C   04C9  1212 140$:      MOVZWL  #SS$_NOSUCHFILE,R0      ;CANNOT FIND FILE
                        04   04CE  1213 150$:      RET
                     00F8   30   04CF  1214 160$:      BSBW    READ_DIR_LBN            ;READ THE NEXT DIRECTORY LBN
                        ED   11   04D2  1215          BRB     110$
                             04D4  1216 ;
                             04D4  1217 ; FOUND A MATCH OF FILE NAME AND TYPE
                             04D4  1218 ;
                        54   D6   04D4  1219 200$:      INCL    R4                      ;ROUND UP NAME COUNT
                     54   01   CA   04D6  1220          BICL    #1,R4                   ;TO EVEN NUMBER OF BYTES
                53   06 A544   9E   04D9  1221          MOVAB   DIR$T_NAME(R5)[R4],R3   ;ADDRESS OF FIRST VERSION ENTRY
                     50   65   3C   04DE  1222          MOVZWL  DIR$W_SIZE(R5),R0       ;SIZE OF THIS RECORD
                55   02 A540   9E   04E1  1223          MOVAB   2(R5)[R0],R5            ;FORM ADDRESS OF BEGINNING OF NEX RECORD
                             04E6  1224                                                 ;WHICH IS ALSO THE END OF THE VERSIONS
                        5A   D5   04E6  1225          TSTL    R10                     ;LATEST VERSION DESIRED?
                        11   13   04E8  1226          BEQL    240$                    ;BRANCH IF YES, R3 IS ADDRESS OF
                             04EA  1227                                                 ;DESIRED VERSION AND FILE ID
                     63   5A   B1   04EA  1228 230$:      CMPW    R10,DIR$W_VERSION(R3)   ;IS THIS THE RIGHT VERSION?
                        0C   13   04ED  1229          BEQL    240$                    ;BRANCH IF YES
                        D8   1A   04EF  1230          BGTRU   140$                    ;BRANCH IF PAST WHERE IT WOULD BE
                53   08   C0   04F1  1231          ADDL    #DIR$C_VERSION,R3       ;NEXT VERSION ENTRY
                55   53   D1   04F4  1232          CMPL    R3,R5                   ;END OF RECORD?
                        F1   1F   04F7  1233          BLSSU   230$                    ;BRANCH IF NOT, CHECK NEXT VERSION
                        C6   11   04F9  1234          BRB     110$                    ;VERSION NOT IN THIS VERSION CHAIN
                             04FB  1235                                                 ;SEE IF IT IS IN THE NEXT RECORD
                             04FB  1236 ;
                             04FB  1237 ; FOUND THE FILE ID, RETURN IT TO CALLER
                             04FB  1238 ;
             56   02 A3   7D   04FB  1239 240$:      MOVQ    DIR$W_FID(R3),R6        ;GET THE FILE ID
                57   57   3C   04FF  1240          MOVZWL  R7,R7
          18 BC 02 A3   06   28   0502  1241          MOVC3   #6,DIR$W_FID(R3),@FILID(AP) ;AND RETURN IT TO THE CALLER
                             0508  1242 ;
                             0508  1243 ; SEE IF WE SHOULD MAKE A CACHE ENTRY FOR THIS LOOKUP
                             0508  1244 ; R6,R7 = FID
                             0508  1245 ;
                             0508  1246 EXIT_FILID_FND:
                        5B   D5   0508  1247          TSTL    R11                     ;IS THE CACHE ENABLED?
                        2C   13   050A  1248          BEQL    100$                    ;BRANCH IF NOT, JUST RETURN THE FID
                     D6 AD   95   050C  1249          TSTB    FIL$T_DIR_NAM+ENTRY(FP) ;WAS LOOKUP FOR A DIRECTORY?
                        07   12   050F  1250          BNEQ    20$                     ;BRANCH IF YES, MAKE A CACHE ENTRY
                     F4 AD   D5   0511  1251          TSTL    ENTRY_ADR(FP)           ;CACHE HIT FOR THIS DIR HDR?
                        22   12   0514  1252          BNEQ    100$                    ;BRANCH IF YES
                        08   11   0516  1253          BRB     30$                     ;MAKE THE CACHE ENTRY FOR THIS DIR HDR
             EE AD   56   D0   0518  1254 20$:      MOVL    R6,FIL$A_DIR_OFID+ENTRY(FP) ;STORE THE FID FOUND
             F2 AD   57   B0   051C  1255          MOVW    R7,FIL$A_DIR_OFID+4+ENTRY(FP)
             58   08 AB   D0   0520  1256 30$:      MOVL    FIL$L_DIRNXT(R11),R8    ;GET OFFSET TO FREE SPACE
          50   58   24   C1   0524  1257          ADDL3   #FIL$C_DIR_SIZE,R8,R0   ;FORM OFFSET TO END OF NEW ENTRY
             0C AB   50   D1   0528  1258          CMPL    R0,FIL$L_DIRMAX(R11)    ;ENOUGH SPACE FOR NEW ENTRY?
                        0A   14   052C  1259          BGTR    90$                     ;BRANCH IF NOT
             08 AB   50   D0   052E  1260          MOVL    R0,FIL$L_DIRNXT(R11)    ;YES, ALLOCATE THE NEW ENTRY
         6B48   D0 AD   24   28   0532  1261          MOVC3   #FIL$C_DIR_SIZE,ENTRY(FP),(R11)[R8] ;AND WRITE IT
                             0538  1262 90$:
                50   01   3C   0538  1263 100$:      MOVZWL  #SS$_NORMAL,R0          ;INDICATE SUCCESSFUL COMPLETION
```

```
                        04  053B  1264          RET
                            053C  1265 ;
                            053C  1266 ; BAD DIRECTORY FILE
                            053C  1267 ;
                            053C  1268 BADDIR1:
                    FF18    31  053C  1269          BRW     BADDIR
```

```
                                053F  1271          .SBTTL  FIL$FINDFILID - STRUCTURE LEVEL 1
                                053F  1272 ;
                                053F  1273 ; STRUCTURE LEVEL 1 FIND
                                053F  1274 ; R4 = ADDRESS OF RECORD ATTRIBUTES
                                053F  1275 ;
                                053F  1276 FIND_LEVEL1:
                   64   01   91 053F  1277          CMPB    #FAT$C_FIXED,FAT$B_RTYPE(R4) ;FIXED LENGTH RECORD?
                        F8   12 0542  1278          BNEQ    BADDIR1                      ;BRANCH IF NOT
                02 A4   10   B1 0544  1279          CMPW    #16,FAT$W_RSIZE(R4)          ;16 BYTES EACH
                        F2   12 0548  1280          BNEQ    BADDIR1                      ;BRANCH IF NOT
                                054A  1281 ;
                                054A  1282 ; GET FILE NAME BLOCK FOR STRUCTURE LEVEL 1 DIRECTORY SCAN
                                054A  1283 ;
                                054A  1284 FIND_LEVEL1_1:
                53   08 AC   D0 054A  1285          MOVL    FILDSC(AP),R3                ;ADDRESS OF 3 LONG WORD FILE DESCRIPTOR
                        63   D5 054E  1286          TSTL    (R3)                         ;SIZE OF ASCII STRING
                        0D   13 0550  1287          BEQL    25$                          ;BRANCH IF NAME BLOCK ALL SET UP
                     08 A3   DD 0552  1288          PUSHL   8(R3)                        ;ADDRESS OF NAME BLOCK
                        63   DF 0555  1289          PUSHAL  (R3)                         ;ADDRESS OF STRING DESCRIPTOR
           0000'CF      02   FB 0557  1290          CALLS   #2,W^FIL$CVTFILNAM           ;CONVERT ASCII STRING TO NAME BLOCK (RAD50)
                 5D 50  E9 055C  1291          BLBC    R0,90$                       ;BRANCH IF ERROR
                53   08 A3   D0 055F  1292 25$:     MOVL    8(R3),R3                     ;ADDRESS OF NAME BLOCK
                6E   08 A3   3C 0563  1293          MOVZWL  8(R3),(SP)                   ;SAVE FILE VERSION OVER FILE SIZE
                                0567  1294                                               ;THAT WAS LEFT FROM THE STATBLK CALL
                50   18 AC   D0 0567  1295          MOVL    FILID(AP),R0                 ;ADDRESS OF RETURN FILE ID
                        80   D4 056B  1296          CLRL    (R0)+                        ;INIT TO ZERO
                        60   B4 056D  1297          CLRW    (R0)                         ;ALL 3 WORDS.
                        3D   11 056F  1298          BRB     80$                          ;START DIRECTORY SCAN AT BOTTOM OF LOOP
                                0571  1299 ;
                                0571  1300 ; THE FOLLOWING REGISTER CONVENTION ARE USED IN THE DIRECTORY SCAN
                                0571  1301 ;       R2 = CURRENT DIRECTORY ENTRY BEING SCANNED
                                0571  1302 ;       R3 = NAMEBLOCK TO COMPARE AGAINST
                                0571  1303 ;       R4 = ADDRESS OF LAST BYTE OF DIRECTORY BLOCK
                                0571  1304 ;       R5 = ADDRESS OF DIRECTORY BUFFER
                                0571  1305 ;       R6 = LOGICAL BLOCK NUMBER OF CURRENT DIRECTORY BLOCK
                                0571  1306 ;       R7 = LAST LOGICAL BLOCK NUMBER (INCLUSIVE) TO SCAN
                                0571  1307 ;       0(SP) = VERSION OF FILE FROM NAME BLOCK
                                0571  1308 ;
                     0056   30 0571  1309 30$:     BSBW    READ_DIR_LBN                 ;READ THE NEXT DIRECTORY LBN
             54   01FF C5   DE 0574  1310          MOVAL   511(R5),R4                   ;ADDRESS OF LAST BYTE OF BUFFER
                52   55   D0 0579  1311          MOVL    R5,R2                        ;SET DIRECTORY RECORD POINTER
                        62   B5 057C  1312 40$:     TSTW    (R2)                         ;IS THIS DIRECTORY RECORD EMPTY
                        28   13 057E  1313          BEQL    70$                          ;BRANCH IF YES
                51   06 A2   DE 0580  1314          MOVAL   6(R2),R1                     ;STEP OVER FILE ID TO NAME PORTION
                50   53   D0 0584  1315          MOVL    R3,R0                        ;MAKE A SCRATCH COPY OF NAME BLOCK ADR
                81   80   D1 0587  1316          CMPL    (R0)+,(R1)+                  ;CHECK 1ST 2 WORDS OF RAD50 FILE NAME
                        1C   12 058A  1317          BNEQ    70$                          ;BRANCH IF NO MATCH
                81   80   D1 058C  1318          CMPL    (R0)+,(R1)+                  ;LAST WORD OF RAD50 FILE NAME
                                058F  1319                                               ;AND THE 1 WORD RAD50 FILE TYPE
                        17   12 058F  1320          BNEQ    70$                          ;BRANCH IF NO MATCH
                                0591  1321 ;
                                0591  1322 ; NOW CHECK THE VERSION, IF SPECIFIED VERSION WAS 0 WE'RE LOOKING FOR
                                0591  1323 ; THE LARGEST VERSION WHICH OTHERWISE MATCHES, KEEP THE CURRENT LARGEST
                                0591  1324 ; IN THE INPUT NAME BLOCK, THUS RETURNING THE VERSION NUMBER FOUND.
                                0591  1325 ;
                        6E   B5 0591  1326          TSTW    (SP)                         ;SEARCHING FOR HIGHEST VERSION?
                        07   13 0593  1327          BEQL    50$                          ;BRANCH IF YES
```

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                61    60    B1   0595  1328          CMPW    (R0),(R1)               ;NO, JUST COMPARE FOR EXACT MATCH
                      0E    12   0598  1329          BNEQ    70$                     ;BRANCH IF NO MATCH
                      21    11   059A  1330          BRB     100$                    ;FILE FOUND, EXIT LOOP
                61    60    B1   059C  1331 50$:     CMPW    (R0),(R1)               ;HIGHER THAN PREVIOUS HIGHEST VERSION?
                      07    1E   059F  1332          BGEQU   70$                     ;BRANCH IF NOT
                60    61    B0   05A1  1333          MOVW    (R1),(R0)               ;RECORD HIGHEST VERSION FOUND
             18 BC    62    D0   05A4  1334          MOVL    (R2),aFILID(AP)         ;AND RECORD ITS FILE ID
         FFCE 52      10    54   F1   05A8  1335 70$:     ACBL    R4,#16,R2,40$           ;NEXT DIRECTORY RECORD IF ANY
              BF 56   57    F3   05AE  1336 80$:     AOBLEQ  R7,R6,30$               ;NEXT DIRECTORY BLOCK IF ANY
                                 05B2  1337 ;
                                 05B2  1338 ; DIRECTORY COMPLETELY SCANNED, IF LOOKING FOR HIGHEST VERSION, THEN
                                 05B2  1339 ; POSSIBLY A FILE WAS FOUND, OTHERWISE NO MATCH.
                                 05B2  1340 ;
                   18 BC    D5   05B2  1341          TSTL    aFILID(AP)              ;IF ANY FILE ID WAS STORED
                                 05B5  1342                                          ;THEN A FILE WAS FOUND
                      0A    12   05B5  1343          BNEQ    120$                    ;BRANCH IF FILE WAS FOUND
                50    0910  8F   3C   05B7  1344          MOVZWL  #SS$_NOSUCHFILE,R0      ;NO SUCH FILE
                                 04   05BC  1345 90$:     RET
                                 05BD  1346 ;
                                 05BD  1347 ; EXACT MATCH, FILE FOUND
                                 05BD  1348 ;
                18 BC    62    D0   05BD  1349 100$:    MOVL    (R2),aFILID(AP)         ;RETURN THE FILE ID
                56   18 BC    D0   05C1  1350 120$:    MOVL    aFILID(AP),R6           ;FETCH FILE ID
                        57    D4   05C5  1351          CLRL    R7                      ;INTO R6,R7
                      FF3E    31   05C7  1352          BRW     EXIT_FILID_FND
```

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                                05CA  1354          .SBTTL  READ_DIR_LBN - READ NEXT DIRECTORY LBN
                                05CA  1355 ;++
                                05CA  1356 ; FUNCTIONAL DESCRIPTION:
                                05CA  1357 ;
                                05CA  1358 ;        READ THE NEXT DIRECTORY LBN FROM THE DISK OR POINT AT
                                05CA  1359 ;        THE CACHED COPY IF ONE IS PRESENT
                                05CA  1360 ;
                                05CA  1361 ; CALLING SEQUENCE:
                                05CA  1362 ;
                                05CA  1363 ;        BSBW    READ_DIR_LBN
                                05CA  1364 ;
                                05CA  1365 ; INPUT:
                                05CA  1366 ;
                                05CA  1367 ;        R6 = DESIRED LBN
                                05CA  1368 ;        DIRBUF(AP) = BUFFER ADDRESS TO READ IT INTO
                                05CA  1369 ;        CHAN(AP) = CHANNEL FOR FIL$RDWRTLBN
                                05CA  1370 ;        DIR_BFCNT(FP) = COUNT OF BUFFERS REMAINING IN DIR LBN CACHE
                                05CA  1371 ;        DIR_BUF(FP) = ADDRESS OF NEXT BUFFER IN DIR LBN CACHE
                                05CA  1372 ;
                                05CA  1373 ; OUTPUTS:
                                05CA  1374 ;
                                05CA  1375 ;        R5 = ADDRESS OF DESIRED DIRECTORY LBN
                                05CA  1376 ;        RSB IF SUCCESSFUL
                                05CA  1377 ;        RET WITH STATUS IN R0 IF ERROR
                                05CA  1378 ;        R0, R1 DESTROYED, OTHERS PRESERVED
                                05CA  1379 ;
                                05CA  1380 ;--
                                05CA  1381
                                05CA  1382 READ_DIR_LBN:
          FC AD    D5           05CA  1383          TSTL    DIR_BFCNT(FP)           ;ANYTHING LEFT IN DIR LBN CACHE?
             0E    13           05CD  1384          BEQL    20$                     ;BRANCH IF NOT
          FC AD    D7           05CF  1385          DECL    DIR_BFCNT(FP)           ;COUNT ANOTHER BUFFER USED
       55 F8 AD    D0           05D2  1386          MOVL    DIR_BUF(FP),R5          ;LOAD ADDRESS OF BUFFER
 F8 AD   0200 C5   DE           05D6  1387          MOVAL   512(R5),DIR_BUF(FP)     ;AND POINT TO NEXT BUFFER IF ANY
                   05           05DC  1388 10$:     RSB
                                05DD  1389 ;
                                05DD  1390 ; DIR LBN CACHE RAN OUT OF BLOCKS OR NEVER HAD ANY AT ALL
                                05DD  1391 ;
       55   10 AC   D0           05DD  1392 20$:     MOVL    DIRBUF(AP),R5           ;ADDRESS OF BUFFER TO READ INTO
                                05E1  1393          READLBN CHAN(AP),R6,(R5)        ;READ THE DESIRED LBN
    7E   01    09   9C           05E1                ROTL    #9,#1,-(SP)
         7E    21   3C           05E5                MOVZWL  #10$_READLBLK,-(SP)
               65   DF           05E8                PUSHAL  (R5)
               56   DD           05EA                PUSHL   R6
            04 AC   DD           05EC                PUSHL   CHAN(AP)
00000000'EF     05   FB           05EF                CALLS   #5,L^FIL$RDWRTLBN                               ;G:5
          E3 50     E8           05F6  1394          BLBS    R0,10$                  ;BRANCH IF READ SUCCESSFULLY
                    04           05F9  1395          RET                             ;RETURN ERROR STATUS
```

```
05FA  1397          .SBTTL  RDCHKFILHDR - READ AND CHECK FILE HEADER
05FA  1398 ;++
05FA  1399 ; FUNCTIONAL DESCRIPTION:
05FA  1400 ;
05FA  1401 ;       RDCHKFILHDR READS AND VALIDATES A FILE HEADER GIVEN ITS FILE ID
05FA  1402 ; AND THE INDEX FILE HEADER AS RETURNED BY FIL$MOUNT.
05FA  1403 ;
05FA  1404 ; CALLING SEQUENCE:
05FA  1405 ;
05FA  1406 ;       CALLG   ARGLIST,FIL$RDCHKFILHDR
05FA  1407 ;
05FA  1408 ; INPUT PARAMETERS:
05FA  1409 ;
05FA  1410 ;       CHAN(AP)                CHANNEL ON WHICH DEVICE IS ASSIGNED
05FA  1411 ;       UNUSED                  UNUSED PARAMETER
05FA  1412 ;       IXFHDR(AP)              ADR OF INDEX FILE HEADER AS RETURNED BY FIL$MOUNT
05FA  1413 ;       FILHDR(AP)              ADDRESS OF 512 BYTE BUFFER FOR FILE HEADER
05FA  1414 ;       STATBLK(AP)             ADR OF 2 LONG WORD AREA TO RETURN STATISTICS BLOCK
05FA  1415 ;       FILID(AP)               ADDRESS OF 3 WORD FILE ID OF DESIRED FILE HEADER
05FA  1416 ;       RTRVPTRLEN(AP)  =       ADDRESS TO RETURN THE NUMBER OF
05FA  1417 ;                               BYTES OF RETRIEVAL POINTERS STORED
05FA  1418 ;                               ***** OPTIONAL PARAMETER *****
05FA  1419 ;       RTRVPTRBUF(AP)  =       ADDRESS OF RETRIEVAL POINTER
05FA  1420 ;                               BUFFER DESCRIPTOR.  THIS PARAMETER
05FA  1421 ;                               IS PRESENT IF AND ONLY IF
05FA  1422 ;                               RTRVPTRLEN IS PRESENT.
05FA  1423 ;                               THE RETRIEVAL POINTERS ARE RETURNED IN
05FA  1424 ;                               THE FORM 32 BIT BLOCK COUNT, 32 BIT LBN
05FA  1425 ;                               A ZERO BUFFER DESCRIPTOR ADDRESS OR A
05FA  1426 ;                               ZERO BUFFER ADDRESS MEANS DON'T
05FA  1427 ;                               RETURN RETRIEVAL POINTER INFO
05FA  1428 ;
05FA  1429 ; IMPLICIT INPUTS:
05FA  1430 ;
05FA  1431 ;       NONE
05FA  1432 ;
05FA  1433 ; OUTPUT PARAMETERS:
05FA  1434 ;
05FA  1435 ;       R0 = SYSTEM STATUS CODE
05FA  1436 ;
05FA  1437 ; IMPLICIT OUTPUTS:
05FA  1438 ;
05FA  1439 ;       NONE
05FA  1440 ;
05FA  1441 ; COMPLETION CODES:
05FA  1442 ;
05FA  1443 ;       SS$_NORMAL              SUCCESSFUL COMPLETION
05FA  1444 ;
05FA  1445 ; SIDE EFFECTS:
05FA  1446 ;
05FA  1447 ;       NONE
05FA  1448 ;
05FA  1449 ;
05FA  1450 ; EQUATED SYMBOLS
05FA  1451 ;
05FA  1452 ;    OFFSETS FROM AP
05FA  1453 ;
```

```
                     00000000  05FA  1454          ARGCNT          =       0
                     00000004  05FA  1455          CHAN            =       4
                     0000000C  05FA  1456          IXFHDR          =       12
                     00000010  05FA  1457          FILHDR          =       16
                     00000014  05FA  1458          STATBLK         =       20
                     00000018  05FA  1459          FILID           =       24
                     0000001C  05FA  1460          RTRVPTRLEN      =       28      ; OPTIONAL PARAMETER
                     00000020  05FA  1461          RTRVPTRBUF      =       32      ; PRESENT IF AND ONLY IF RTRVPTRLEN IS
                               05FA  1462 ;
                               05FA  1463 ;    OFFSETS FROM FP
                               05FA  1464 ;
                               05FA  1465          $OFFSET 0,NEGATIVE,<-
                               05FA  1466          <HDRCNT>,-                      ;COUNT OF FILE HEADERS READ
                               05FA  1467          <TMPRTRVLEN>,-                  ;TEMP RTRV PTR BYTE COUNT
                               05FA  1468          <TMPRTRVDSC,8>-                 ;TEMP RTRV PTR BUFFER DESCRIPTOR
                               05FA  1469          >
                               05FA                .SAVE   LOCAL_BLOCK
                               05FA                .PSECT $ABS$ ABS
                     00000000  FFFC                .=0
                     FFFFFFFC  0000                .BLKB   -4
                               FFFC          HDRCNT:
                     FFFFFFF8  FFFC                .BLKB   -4
                               FFF8          TMPRTRVLEN:
                     FFFFFFF0  FFF8                .BLKB   -8
                               FFF0          TMPRTRVDSC:
                           000005FA                .RESTORE
                               05FA  1470 ;
                               05FA  1471 ;--
                               05FA  1472
                               05FA  1473 FIL$RDCHKFILHDR::
                                   007C  05FA  1474          .WORD   ^M<R2,R3,R4,R5,R6>
                        7E   01    CE   05FC  1475          MNEGL   #1,-(SP)                ;COUNT OF HEADER BLOCKS READ
                             7E    D4   05FF  1476          CLRL    -(SP)                   ;INIT RTRV PTR BYTE COUNT
                             7E    7C   0601  1477          CLRQ    -(SP)                   ;ASSUME NO RTRV PTR BUFFER
                        08   6C    D1   0603  1478          CMPL    ARGCNT(AP),#RTRVPTRBUF/4 ;RTRV PTR PARAMS PRESENT?
                             0D    19   0606  1479          BLSS    2$                      ;BRANCH IF NOT
                   50     20 AC    D0   0608  1480          MOVL    RTRVPTRBUF(AP),R0       ;RTRV BUFFER DESCRIPTOR ADDRESS
                             07    13   060C  1481          BEQL    2$                      ;BRANCH IF NONE SPECIFIED
                   F0 AD     60    7D   060E  1482          MOVQ    (R0),TMPRTRVDSC(FP)     ;MAKE COPY OF BUF DESCRIPTOR
                        1C BC    D4   0612  1483          CLRL    @RTRVPTRLEN(AP)         ;INIT RETURNED BYTE COUNT
                                      0615  1484
                                      0615  1485          ASSUME  FILHDR EQ IXFHDR+4
                   52     0C AC    7D   0615  1486 2$:      MOVQ    IXFHDR(AP),R2           ;R2 = INDEX FILE HEADER ADDRESS
                                      0619  1487                                          ;R3 = FILE HEADER ADDRESS
                                      0619  1488          ASSUME  FILID EQ STATBLK+4
                   54     14 AC    7D   0619  1489          MOVQ    STATBLK(AP),R4          ;R4 = RETURN STATBLK ADDRESS
                                      061D  1490                                          ;R5 = ADDRESS OF FILE ID
                        7E   65    7D   061D  1491          MOVQ    (R5),-(SP)              ;COPY FILE ID TO WRITABLE SCRATCH
                        55   5E    D0   0620  1492          MOVL    SP,R5                   ;AND REMEMBER ITS ADDRESS
                        56   7E    7E   0623  1493          MOVAQ   -(SP),R6                ;RESERVE SCRATCH STATISTICS BLOCK
                                      0626  1494                                          ;AND SAVE ITS ADDRESS IN R6
                             64    7C   0626  1495          CLRQ    (R4)                    ;INIT THE RETURN STAT BLOCK
                             64    D7   0628  1496          DECL    (R4)                    ;-1 LBN MEANS NOT YET STORED
                        7E   65    3C   062A  1497 5$:      MOVZWL  (R5),-(SP)              ;FILE NUMBER TO LONG WORD
                05 06 A2     0A    E1   062D  1498          BBC     #FH2$V_BIGFILNUM,FH2$W_STRUCLEV(R2),10$ ;BRANCH IF NO BIG FIL NUM
                02 AE    05  A5    90   0632  1499          MOVB    FID$B_NMX(R5),2(SP)     ;HIGH 8 BITS OF RVN COMPLETE FILE NUMBER
                        50   8E    D0   0637  1500 10$:     MOVL    (SP)+,R0                ;IF FILE ID IS ZERO,
```

```
                03   12  063A  1501          BNEQ    12$
              0081   31  063C  1502          BRW     40$                             ;THEN READ LAST HEADER BLOCK
     51    01FE C2   3C  063F  1503 12$:      MOVZWL  FH1$W_VBNOFFSET(R2),R1          ;RECOVER VBN OFFSET FROM INDEX FILE HEADER
           50   51   C0  0644  1504          ADDL    R1,R0                           ;ADD VBN OFFSET TO FORM INDEX FILE VBN
             FC AD   D6  0647  1505          INCL    HDRCNT(FP)                      ;COUNT EACH HEADER READ
                     064A  1506          READVBN CHAN(AP),R0,(R3),(R2)           ;READ THE FILE HEADER
                62   DF  064A                        PUSHAL  (R2)
                63   DF  064C                        PUSHAL  (R3)
                50   DD  064E                        PUSHL   R0
              04 AC   DD  0650                        PUSHL   CHAN(AP)
 06D9'CF       04   FB  0653                        CALLS   #4,W^FIL$READVBN
             76 50   E9  0658  1507          BLBC    R0,50$                          ;BRANCH IF ERROR
          71 FC AD   1F  E0  065B  1508          BBS     #31,HDRCNT(FP),50$              ;BRANCH IF JUST RE-READING MAIN HEADER
           50   55   D0  0660  1509          MOVL    R5,R0                           ;GET FILE ID ADDRESS
           51   53   D0  0663  1510          MOVL    R3,R1                           ;ADDRESS OF FILE HEADER
             0199   30  0666  1511          BSBW    FIL$CHKFILHDR                   ;CHECK THE FILE HEADER
     52    0C AC   D0  0669  1512          MOVL    IXFHDR(AP),R2                   ;INDEX FILE HEADER ADDRESS
           F0 AD   DF  066D  1513          PUSHAL  TMPRTRVDSC(FP)                  ;RTRV PTR BUF DESCRIPTOR
           F8 AD   DF  0670  1514          PUSHAL  TMPRTRVLEN(FP)                  ;ADDRESS TO RETURN BYTE COUNT
                56   DD  0673  1515          PUSHL   R6                              ;ADDRESS OF SCRATCH STAT BLOCK
                53   DD  0675  1516          PUSHL   R3                              ;ADDRESS OF FILE HEADER
 0792'CF       04   FB  0677  1517          CALLS   #4,W^FIL$STATBLK                ;READ STATISTICS BLOCK
     51    F8 AD   D0  067C  1518          MOVL    TMPRTRVLEN(FP),R1               ;ANY RTRV PTR INFO TO RETURN?
                16   13  0680  1519          BEQL    16$                             ;ZERO IF NONE REQUESTED
     1C BC   51   C0  0682  1520          ADDL    R1,@RTRVPTRLEN(AP)              ;ACCUMULATE RTRVPTR BYTE COUNT
     F0 AD   51   D1  0686  1521          CMPL    R1,TMPRTRVDSC(FP)               ;MORE SPACE NEEDED THAN WOULD FIT?
                04   15  068A  1522          BLEQ    14$                             ;BRANCH IF NOT
     51    F0 AD   D0  068C  1523          MOVL    TMPRTRVDSC(FP),R1               ;SAY WE USED IT ALL UP
     F4 AD   51   C0  0690  1524 14$:       ADDL    R1,TMPRTRVDSC+4(FP)             ;GET NEW STARTING ADDRESS
     F0 AD   51   C2  0694  1525          SUBL    R1,TMPRTRVDSC(FP)               ;AND CALC NEW SIZE REMAINING
        51   64   D2  0698  1526 16$:       MCOML   (R4),R1                         ;SEE IF START LBN HAS BEEN SET
                03   12  069B  1527          BNEQ    20$                             ;BRANCH IF IT HAS
        64   66   D0  069D  1528          MOVL    (R6),(R4)                       ;SET IT ONCE ONLY
04 A4     04 A6   C0  06A0  1529 20$:       ADDL    4(R6),4(R4)                     ;ADD IN THE SIZE FROM THIS HEADER
     65    0E A3   7D  06A5  1530          MOVQ    FH2$W_EXT_FID(R3),(R5)          ;GET EXTENSION FILE ID IF ANY
0F 06 A3     09   E0  06A9  1531          BBS     #FH2$V_LEVEL2,FH2$W_STRUCLEV(R3),30$ ;GOT IT IF LEVEL2
     50    01 A3   9A  06AE  1532          MOVZBL  FH1$B_MPOFFSET(R3),R0           ;GET WORD OFFSET TO LEVEL1 MAP AREA
      50    6340   3E  06B2  1533          MOVAW   (R3)[R0],R0                     ;ADDRESS OF MAP AREA
     65    02 A0   D0  06B6  1534          MOVL    FM1$W_EX_FILNUM(R0),(R5)        ;GET EXTENSION FILE NUMBER IF ANY
           04 A5   D4  06BA  1535          CLRL    4(R5)                           ;ZERO RVN
            FF6A   31  06BD  1536 30$:       BRW     5$                              ;READ THIS HEADER IF ANY
                     06C0  1537 ;
                     06C0  1538 ; LAST FILE HEADER READ, SEE IF MUST RE-READ THE ORIGINAL HEADER
                     06C0  1539 ;
           FC AD   D5  06C0  1540 40$:       TSTL    HDRCNT(FP)                      ;WAS -1, BUMPED ONCE PER READVBN
                09   15  06C3  1541          BLEQ    45$                             ;BRANCH IF STILL HAVE MASTER FILE HEADER
     65    18 BC   7D  06C5  1542          MOVQ    @FILID(AP),(R5)                 ;ORIGINAL FILE ID AGAIN
EF FC AD     1F   E3  06C9  1543          BBCS    #31,HDRCNT(FP),30$              ;SET SIGN BIT AND GO READ ORIGINAL HEADER
     50    01   3C  06CE  1544 45$:       MOVZWL  #SS$_NORMAL,R0                  ;RETURN SUCCESS STATUS
                04   06D1  1545 50$:       RET
```

```
                     06D2  1547          .SBTTL  READVBN, WRITEVBN - READ/WRITE VIRTUAL BLOCK
                     06D2  1548 ;++
                     06D2  1549 ; FUNCTIONAL DESCRIPTION:
                     06D2  1550 ;
                     06D2  1551 ;       THESE ROUTINES READ OR WRITE A VIRTUAL BLOCK FROM A FILE.
                     06D2  1552 ; VOLUME IS SPECIFIED BY THE CHANNEL TO WHICH IT IS ASSIGNED, AND THE
                     06D2  1553 ; FILE IS SPECIFIED BY THE ADDRESS OF ITS FILE HEADER WHICH WAS PREVIOUSLY
                     06D2  1554 ; READ BY A CALL TO FIL$RDFILHDR.
                     06D2  1555 ;
                     06D2  1556 ; CALLING SEQUENCE:
                     06D2  1557 ;
                     06D2  1558 ;       CALLG   ARGLIST,FIL$READVBN
                     06D2  1559 ;       CALLG   ARGLIST,FIL$WRITEVBN
                     06D2  1560 ;
                     06D2  1561 ; INPUT PARAMETERS:
                     06D2  1562 ;
                     06D2  1563 ;       CHAN(AP)        =               ;CHANNEL TO WHICH VOLUME IS ASSIGNED
                     06D2  1564 ;       VBN(AP)         =               ;DESIRED VIRTUAL BLOCK NUMBER
                     06D2  1565 ;       BUFADR(AP)      =               ;ADDRESS OF BUFFER TO READ INTO
                     06D2  1566 ;       FILHDR(AP)      =               ;ADDRESS OF FILE HEADER
                     06D2  1567 ;
                     06D2  1568 ; IMPLICIT INPUTS:
                     06D2  1569 ;
                     06D2  1570 ;       NONE
                     06D2  1571 ;
                     06D2  1572 ; OUTPUT PARAMETERS:
                     06D2  1573 ;
                     06D2  1574 ;       R0 = SYSTEM STATUS CODE
                     06D2  1575 ;
                     06D2  1576 ; IMPLICIT OUTPUTS:
                     06D2  1577 ;
                     06D2  1578 ;       NONE
                     06D2  1579 ;
                     06D2  1580 ; COMPLETION CODES:
                     06D2  1581 ;
                     06D2  1582 ;       SS$_NORMAL                  SUCCESSFUL RETURN
                     06D2  1583 ;       SS$_ENDOFFILE               SPECIFIED VBN BEYOND END OF FILE
                     06D2  1584 ;
                     06D2  1585 ; SIDE EFFECTS:
                     06D2  1586 ;
                     06D2  1587 ;       NONE
                     06D2  1588 ;
                     06D2  1589 ;
                     06D2  1590 ; EQUATED SYMBOLS:
                     06D2  1591 ;
                     06D2  1592 ;    OFFSET FROM AP
                     06D2  1593 ;
00000004             06D2  1594          CHAN            =       4       ;CHANNEL TO WHICH VOLUME IS ASSIGNED
00000008             06D2  1595          VBN             =       8       ;VIRTUAL BLOCK NUMBER
0000000C             06D2  1596          BUFADR          =       12      ;BUFFER ADDRESS TO READ INTO
00000010             06D2  1597          FILHDR          =       16      ;ADDRESS OF FILE HEADER
                     06D2  1598 ;
                     06D2  1599 ;    OFFSETS FROM FP
                     06D2  1600 ;
FFFFFFFC             06D2  1601          IOFUNCTION      =       -4      ;SAVED I/O FUNCTION CODE
                     06D2  1602 ;
                     06D2  1603 ;--
```

```
                                06D2  1604
                                06D2  1605 FIL$WRITEVBN::
                           003C 06D2  1606          .WORD   ^M<R2,R3,R4,R5>
                        7E 20  3C 06D4  1607          MOVZWL  #IO$_WRITELBLK,-(SP)
                           05  11 06D7  1608          BRB     RDWRTVBN
                                06D9  1609
                                06D9  1610 FIL$READVBN::
                           003C 06D9  1611          .WORD   ^M<R2,R3,R4,R5>
                        7E 21  3C 06DB  1612          MOVZWL  #IO$_READLBLK,-(SP)
                                06DE  1613
                                06DE  1614 RDWRTVBN:
                     55   10 AC  D0 06DE  1615          MOVL    FILHDR(AP),R5           ;BASE ADR OF FILE HEADER
                     52   06 A5  3C 06E2  1616          MOVZWL  FH1$W_STRUCLEV(R5),R2   ;STRUCTURE LEVEL
                           33  10 06E6  1617          BSBB    INIRTRVPTRSCAN          ;SET UP TO SCAN RETRIEVAL POINTERS
                                06E8  1618 ;
                                06E8  1619 ; R4 = POINTER TO FIRST RETRIEVAL POINTER,
                                06E8  1620 ; R5 = POINTER TO FIRST BYTE BEYOND LAST RETRIEVAL POINTER
                                06E8  1621 ; LOOP THROUGH RETRIEVAL POINTERS TO FIND THE ONE WHICH CONTAINS THE DESIRED VBN
                                06E8  1622 ;
                  53   08 AC  01  C3 06E8  1623          SUBL3   #1,VBN(AP),R3           ;VBN BASE 0 TO LOOK FOR
                           4A  10 06ED  1624 20$:        BSBB    GETRTRVPTR              ;FETCH NEXT RETRIEVAL POINTER
                        50  53  D1 06EF  1625          CMPL    R3,R0                   ;IS VBN IN THIS RETRIEVAL POINTER
                           0E  19 06F2  1626          BLSS    40$                     ;BRANCH IF YES
                        53  50  C2 06F4  1627          SUBL    R0,R3                   ;PASS OVER THAT MANY VBN'S
                        55  54  D1 06F7  1628          CMPL    R4,R5                   ;ANY MORE RETRIEVAL POINTERS?
                           F1  1F 06FA  1629          BLSSU   20$                     ;BRANCH IF YES
                     50   0870 8F  3C 06FC  1630          MOVZWL  #SS$_ENDOFFILE,R0       ;RETURN END OF FILE INDICATION
                           04  0701  1631          RET
                                0702  1632 ;
                                0702  1633 ; VBN IS IN THIS RETRIEVAL POINTER, R1 = STARTING LBN
                                0702  1634 ;
                     7E   01   09  9C 0702  1635 40$:      ROTL    #9,#1,-(SP)             ;NUMBER OF BYTES TO READ/WRITE
                           FC AD  DD 0706  1636          PUSHL   IOFUNCTION(FP)          ;FUNCTION CODE
                           0C AC  DD 0709  1637          PUSHL   BUFADR(AP)              ;BUFFER TO TRANSFER TO/FROM
                     7E   51   53  C1 070C  1638          ADDL3   R3,R1,-(SP)             ;LBN
                           04 AC  DD 0710  1639          PUSHL   CHAN(AP)                ;CHANNEL
               00000000'EF    05  FB 0713  1640          CALLS   #5,L^FIL$RDWRTLBN       ;TRANSFER THE BLOCK ; [03]          ;G:3
                                04  071A  1641          RET
```

```
                                071B  1643          .SBTTL  INIRTRVPTRSCAN - INITIALIZE RETRIEVAL POINTER SCAN
                                071B  1644 ;++
                                071B  1645 ; FUNCTIONAL DESCRIPTION:
                                071B  1646 ;
                                071B  1647 ;       LOCATE START AND END OF RETRIEVAL POINTERS IN A FILE HEADER.
                                071B  1648 ;
                                071B  1649 ; CALLING SEQUENCE:
                                071B  1650 ;
                                071B  1651 ;       BSBW    INIRTRVPTRSCAN
                                071B  1652 ;
                                071B  1653 ; INPUT:
                                071B  1654 ;
                                071B  1655 ;       R2 = STRUCTURE LEVEL
                                071B  1656 ;       R5 = FILE HEADER ADDRESS
                                071B  1657 ;
                                071B  1658 ; OUTPUT:
                                071B  1659 ;
                                071B  1660 ;       R4 = ADDRESS OF 1ST RETRIEVAL POINTER
                                071B  1661 ;       R5 = ADDRESS OF FIRST BYTE BEYOND LAST RETREIVAL POINTER
                                071B  1662 ;
                                071B  1663 ;--
                                071B  1664
                                071B  1665 INIRTRVPTRSCAN:
          50   01 A5   9A  071B  1666          MOVZBL  FH1$B_MPOFFSET(R5),R0   ;WORD OFFSET TO MAP AREA
           54    6540   3E  071F  1667          MOVAW   (R5)[R0],R4             ;BASE ADR OF MAP AREA
          0C 52    09   E0  0723  1668          BBS     #FH2$V_LEVEL2,R2,20$    ;BRANCH IF LEVEL2
          55   08 A4   9A  0727  1669          MOVZBL  FM1$B_INUSE(R4),R5      ;WORDS OF RETRIEVAL POINTERS IN USE
             54    0A   C0  072B  1670          ADDL    #FM1$C_POINTERS,R4      ;BEGINNING OF RETRIEVAL POINTERS
           55   6445   3E  072E  1671 10$:     MOVAW   (R4)[R5],R5             ;ADR JUST BEYOND LAST VALID RTRV PTR
                       05  0732  1672          RSB
          55   3A A5   9A  0733  1673 20$:     MOVZBL  FH2$B_MAP_INUSE(R5),R5  ;NO. OF WORDS OF RTRV PTRS IN USE
                 F5    11  0737  1674          BRB     10$
```

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                                0739  1676          .SBTTL  GETRTRVPTR - CONVERT NEXT RETRIEVAL POINTER
                                0739  1677 ;++
                                0739  1678 ; FUNCTIONAL DESCRIPTION:
                                0739  1679 ;
                                0739  1680 ;       CONVERT NEXT RETRIEVAL POINTER TO NUMBER OF BLOCKS COVERED BY
                                0739  1681 ;       POINTER AND STARTING LBN.
                                0739  1682 ;
                                0739  1683 ; CALLING SEQUENCE:
                                0739  1684 ;
                                0739  1685 ;       BSBW    GETRTRVPTR
                                0739  1686 ;
                                0739  1687 ; INPUTS:
                                0739  1688 ;
                                0739  1689 ;       R2 = STRUCTURE LEVEL WORD
                                0739  1690 ;       R4 = ADDRESS OF NEXT RETRIEVAL POINTER
                                0739  1691 ;
                                0739  1692 ; OUTPUTS:
                                0739  1693 ;
                                0739  1694 ;       R0 = NUMBER OF BLOCKS COVERED BY THE RETRIEVAL POINTER
                                0739  1695 ;       R1 = STARTING LOGICAL BLOCK NUMBER
                                0739  1696 ;       R2,R3 PRESERVED
                                0739  1697 ;
                                0739  1698 ;--
                                0739  1699
                                0739  1700 GETRTRVPTR:
          0F 52   09   E0       0739  1701          BBS     #FH2$V_LEVEL2,R2,20$    ;BRANCH IF STRUCTURE LEVEL 2
                                073D  1702 ;
                                073D  1703 ; STRUCTURE LEVEL 1 RETRIEVAL POINTERS - 4 BYTES EACH
                                073D  1704 ;       BYTE 0 = BITS 16 - 23 OF LOGICAL BLOCK NUMBER
                                073D  1705 ;       BYTE 1 = COUNT - 1 OF BLOCKS COVERED BY THIS POINTER
                                073D  1706 ;       BYTES 2-3 = BITS 0:15 OF LOGICAL BLOCK NUMBER
                                073D  1707 ;
          50   01 A4   9A       073D  1708          MOVZBL  1(R4),R0                ;COUNT - 1
          51   02 A4   3C       0741  1709          MOVZWL  2(R4),R1                ;LOW LBN BITS
51   08   10   84   F0           0745  1710          INSV    (R4)+,#16,#8,R1         ;PUT HIGH LBN BITS IN
               36   11           074A  1711          BRB     INCRSB                  ;INCREMENT COUNT AND EXIT
                                074C  1712 ;
                                074C  1713 ; STRUCTURE LEVEL 2 RETRIEVAL POINTERS
                                074C  1714 ;       BITS 14:15 = RETRIEVAL POINTER FORMAT
                                074C  1715 ;
50   64   02   0E   EF           074C  1716 20$:     EXTZV   #FM2$V_FORMAT,#FM2$S_FORMAT,(R4),R0 ;FORMAT TO R0
                                0751  1717          CASE    R0,<-
                                0751  1718                  PLACEMENT,-             ;PLACEMENT FORMAT
                                0751  1719                  FORMAT1,-               ;FORMAT 1
                                0751  1720                  FORMAT2-                ;FORMAT 2
                                0751  1721                  >
     02' 00   50   AF           0751                CASEW   R0,#0,S^#<<30003$-30002$>/2>-1
                                0755        30002$:
              0014' 0755                    .SIGNED_WORD    PLACEMENT-30002$
              001D' 0757                    .SIGNED_WORD    FORMAT1-30002$
              0030' 0759                    .SIGNED_WORD    FORMAT2-30002$
                                075B        30003$:
                                075B  1722 ;
                                075B  1723 ; FORMAT 3 = 8 BYTES
                                075B  1724 ;
                                075B  1725 ;       BITS 0:13 = BITS 16:29 OF COUNT - 1
                                075B  1726 ;       BITS 14:15 = FORMAT = 3
```

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                                075B  1727 ;       BYTES 2-3 = BITS 0:15 OF COUNT - 1
                                075B  1728 ;       BYTES 4-7 = LOGICAL BLOCK NUMBER
                                075B  1729 ;
                                075B  1730 FORMAT3:
          50   84   10   9C    075B  1731          ROTL    #16,(R4)+,R0            ;FORM COUNT - 1
     50   02   1E   00   F0    075F  1732          INSV    #0,#30,#2,R0            ;ZERO HIGH 2 BITS
               51   84   D0    0764  1733          MOVL    (R4)+,R1                ;GET LBN
                    19   11    0767  1734          BRB     INCRSB                  ;INCREMENT COUNT AND EXIT
                                0769  1735 ;
                                0769  1736 ; PLACEMENT CONTROL - THIS IS NOT A RETRIEVAL POINTER, RATHER IT
                                0769  1737 ;       CONSISTS OF 2 BYTES OF PLACEMENT INFORMATION.  TREAT AS IF 0
                                0769  1738 ;       LENGTH RETRIEVAL POINTER.
                                0769  1739 ;       R0 = 0
                                0769  1740 ;
                                0769  1741 PLACEMENT:
               51   01   CE    0769  1742          MNEGL   #1,R1                   ;IMPOSSIBLE LBN
               54   02   C0    076C  1743          ADDL    #2,R4                   ;BUMP THE POINTER
                    50   D4    076F  1744          CLRL    R0                      ;CLEAR BLOCK COUNT
                         05    0771  1745          RSB
                                0772  1746 ;
                                0772  1747 ; FORMAT 1 = 4 BYTES
                                0772  1748 ;       BITS 0:7 = COUNT - 1
                                0772  1749 ;       BITS 8:13 = BITS 16:21 OF LOGICAL BLOCK NUMBER
                                0772  1750 ;       BYTES 2-3 = BITS 0:15  OF LOGICAL BLOCK NUMBER
                                0772  1751 ;
                                0772  1752 FORMAT1:
               50   84   D0    0772  1753          MOVL    (R4)+,R0                ;FETCH ENTIRE RETRIEVAL POINTER
51   50   06   08   EF    0775  1754          EXTZV   #FM2$V_HIGHLBN,#FM2$S_HIGHLBN,R0,R1 ;FETCH HIGH LBN BITS
     50   50   10   79    077A  1755          ASHQ    #16,R0,R0               ;FORM R1 = LBN
          50   FC A4   9A    077E  1756          MOVZBL  -4(R4),R0               ;REFETCH COUNT - 1
                                0782  1757 INCRSB:
                    50   D6    0782  1758          INCL    R0                      ;FORM COUNT
                         05    0784  1759          RSB                             ;AND RETURN
                                0785  1760 ;
                                0785  1761 ; FORMAT 2 = 6 BYTES
                                0785  1762 ;
                                0785  1763 ;       BITS 0:13 = COUNT - 1
                                0785  1764 ;       BITS 14:15 = FORMAT = 2
                                0785  1765 ;       BYTES 2-5 = LBN
                                0785  1766 ;
                                0785  1767 FORMAT2:
               50   84   3C    0785  1768          MOVZWL  (R4)+,R0                ;FETCH COUNT - 1 AND FORMAT BITS
50   50   0E   00   EF    0788  1769          EXTZV   #FM2$V_COUNT2,#FM2$S_COUNT2,R0,R0 ;COUNT - 1
               51   84   D0    078D  1770          MOVL    (R4)+,R1                ;LBN
                    F0   11    0790  1771          BRB     INCRSB                  ;INCREMENT COUNT AND RETURN
```

```
                     .SBTTL  STATBLK - GET FILE STATISTICS BLOCK
                ;++
                ; FUNCTIONAL DESCRIPTION:
                ;
                ;       GIVEN A FILE HEADER, RETURN THE FILE STATISTICS BLOCK
                ;       AND OPTIONALLY RETURN THE RETRIEVAL POINTERS
                ;
                ; CALLING SEQUENCE:
                ;
                ;       CALLG   ARGLIST,FIL$STATBLK
                ;
                ; INPUT PARAMETERS:
                ;
                ;       FILHDR(AP)      =               ;ADDRESS OF THE FILE HEADER
                ;       STATBLK(AP)     =               ;ADDRESS TO RETURN STATISTICS BLOCK
                ;       RTRVPTRLEN(AP)  =               ;ADDRESS TO RETURN THE NUMBER OF
                ;                                       ;BYTES OF RETRIEVAL POINTERS
                ;                                       ;FOUND IN THE FILE HEADER(S).
                ;                                       ;***** OPTIONAL PARAMETER *****
                ;       RTRVPTRBUF(AP)  =               ;ADDRESS OF RETRIEVAL POINTER
                ;                                       ;BUFFER DESCRIPTOR.  THIS PARAMETER
                ;                                       ;IS PRESENT IF AND ONLY IF
                ;                                       ;RTRVPTRLEN IS PRESENT.
                ;                                       ;ZERO DESCRIPTOR ADDRESS OR ZERO
                ;                                       ;BUFFER ADDRESS MEANS DON'T
                ;                                       ;RETURN RETRIEVAL POINTER INFO
                ;
                ; IMPLICIT INPUTS:
                ;
                ;       NONE
                ;
                ; OUTPUT PARAMETERS:
                ;
                ;       R0 = SYSTEM STATUS CODE
                ;       STATBLK CONTAINS 2 LONGWORDS
                ;               LBN OF 1ST BLOCK IF CONTIGUOUS OR ZERO IF NOT
                ;               SIZE OF FILE IN BLOCKS
                ;       RTRVPTRLEN RECEIVES THE NUMBER OF BYTES OF RETRIEVAL POINTER
                ;               INFORMATION THAT WOULD HAVE BEEN STORED IN THE RETRIEVAL
                ;               POINTER BUFFER GIVEN A LARGE ENOUGH BUFFER.
                ;       THE RETRIEVAL POINTER BUFFER RECEIVES NORMALIZED RETRIEVAL
                ;               POINTERS IN THE FORMAT 32 BIT COUNT, 32 BIT STARTING LBN
                ;
                ; IMPLICIT OUTPUTS:
                ;
                ;       NONE
                ;
                ; COMPLETION CODES:
                ;
                ;       SS$_NORMAL                      SUCCESSFUL COMPLETION
                ;
                ; SIDE EFFECTS:
                ;
                ;       NONE
                ;
                ;
                ; EQUATED SYMBOLS:
```

```
                                0792  1830 ;
                                0792  1831 ;    OFFSETS FROM AP
                                0792  1832 ;
                    00000000    0792  1833          ARGCNT          =       0       ;NUMBER OF ARGUMENTS
                    00000004    0792  1834          FILHDR          =       4       ;ADDRESS OF FILE HEADER
                    00000008    0792  1835          STATBLK         =       8       ;ADDRESS TO RETURN STATISTICS BLOCK
                    0000000C    0792  1836          RTRVPTRLEN      =       12      ;ADDRESS TO RETURN COUNT OF BYTES
                                0792  1837                                          ;STORED IN THE RETRIEVAL POINTER BUFFER
                    00000010    0792  1838          RTRVPTRBUF      =       16      ;ADDRESS OF RETRIEVAL POINTER
                                0792  1839                                          ;BUFFER DESCRIPTOR
                                0792  1840 ;
                                0792  1841 ;--
                                0792  1842
                                0792  1843 FIL$STATBLK::
                        00FC    0792  1844          .WORD   ^M<R2,R3,R4,R5,R6,R7>
                     56   7C    0794  1845          CLRQ    R6                      ;ASSUME NOT DOING RETRIEVAL POINTERS
                  04 6C   D1    0796  1846          CMPL    ARGCNT(AP),#RTRVPTRBUF/4 ;RTRV PTR PARAMS PRESENT?
                     0F   19    0799  1847          BLSS    5$                      ;BRANCH IF NOT
                50   10 AC   D0    079B  1848          MOVL    RTRVPTRBUF(AP),R0       ;ADDRESS OF BUFFER DESCRIPTOR
                     09   13    079F  1849          BEQL    5$                      ;BRANCH IF NOT SPECIFIED
                  56   60   7D    07A1  1850          MOVQ    (R0),R6                 ;R6 = MAX SIZE, R7 = BUFFER ADR
                  56   07   CA    07A4  1851          BICL    #7,R6                   ;EVEN MULTIPLE OF 8 BYTES
                    0C BC   D4    07A7  1852          CLRL    @RTRVPTRLEN(AP)         ;INIT RETURN BYTE COUNT
                55   04 AC   D0    07AA  1853 5$:      MOVL    FILHDR(AP),R5           ;ADDRESS OF FILE HEADER
                52   06 A5   3C    07AE  1854          MOVZWL  FH1$W_STRUCLEV(R5),R2   ;STRUCTURE LEVEL
                50   34 A5   9A    07B2  1855          MOVZBL  FH2$L_FILECHAR(R5),R0   ;FILE CHARACTERISTICS IF LEVEL 2
                04 52   09   E0    07B6  1856          BBS     #FH2$V_LEVEL2,R2,10$    ;BRANCH IF STRUCTURE LEVEL 2
                50   0C A5   9A    07BA  1857          MOVZBL  FH1$W_FILECHAR(R5),R0   ;GET LEVEL 1 FILE CHARACTERISTICS
          7E    50   01   07   EF    07BE  1858 10$:     EXTZV   #FH1$V_CONTIG,#1,R0,-(SP) ;CONTIGUOUS BIT TO TOP OF STACK
                    FF55   30   07C3  1859          BSBW    INIRTRVPTRSCAN          ;INIT FOR SCAN OF RETRIEVAL POINTERS
                     53   D4   07C6  1860          CLRL    R3                      ;INIT REGISTER TO COUNT BLOCKS
                     29   11   07C8  1861          BRB     50$                     ;START AT BOTTOM OF LOOP IN CASE
                                07CA  1862                                          ;FILE HAS NO RETRIEVAL POINTERS
                    FF6C   30   07CA  1863 20$:     BSBW    GETRTRVPTR              ;GET THE NEXT RETRIEVAL POINTER
                     53   D5   07CD  1864          TSTL    R3                      ;IS THIS FIRST RTRV PTR?
                     0A   12   07CF  1865          BNEQ    40$                     ;BRANCH IF ALREADY COUNTED SOME
                                07D1  1866 ;
                                07D1  1867 ; FIRST RETRIEVAL POINTER
                                07D1  1868 ;
                     50   D5   07D1  1869          TSTL    R0                      ;IGNORE EMPTY ONES
                     1E   13   07D3  1870          BEQL    50$
                  03 6E   E9   07D5  1871          BLBC    (SP),40$                ;BRANCH IF FILE NOT CONTIGUOUS
                                07D8  1872                                          ;0(SP) = 0 IN THIS CASE
                6E   51   D0   07D8  1873          MOVL    R1,(SP)                 ;SET LBN OF 1ST NON-ZERO RTRV PTR
                53   50   C0   07DB  1874 40$:     ADDL    R0,R3                   ;ACCUMULATE COUNT OF BLOCKS
                     56   D5   07DE  1875          TSTL    R6                      ;ANY MORE ROOM FOR RTRV PTRS?
                     09   13   07E0  1876          BEQL    45$                     ;BRANCH IF NO MORE BUFFER SPACE
                87   50   D0   07E2  1877          MOVL    R0,(R7)+                ;STORE SIZE OF RETRIEVAL POINTER
                87   51   D0   07E5  1878          MOVL    R1,(R7)+                ;AND STORE LBN
                56   08   C2   07E8  1879          SUBL    #8,R6                   ;USED 8 MORE BYTES OF SPACE
                     57   D5   07EB  1880 45$:     TSTL    R7                      ;DOES CALLER WANT RTRV PTR INFO?
                     04   13   07ED  1881          BEQL    50$                     ;BRANCH IF NOT, DON'T COUNT POINTERS
             0C BC   08   C0   07EF  1882          ADDL    #8,@RTRVPTRLEN(AP)      ;UPDATE RTRV PTR BYTE COUNT
                55   54   D1   07F3  1883 50$:     CMPL    R4,R5                   ;ANY MORE RETRIEVAL POINTERS?
                     D2   1F   07F6  1884          BLSSU   20$                     ;BRANCH IF YES
                     04   BA   07F8  1885          POPR    #^M<R2>                 ;GET SAVED STARTING LBN
             08 BC   52   7D   07FA  1886          MOVQ    R2,@STATBLK(AP)         ;RETURN THE STATISTICS BLOCK
```

```
                50   01   3C  07FE  1887          MOVZWL  #SS$_NORMAL,R0          ;SUCCESSFUL COMPLETION
                          04  0801  1888          RET
```

```
                                0802  1890          .SBTTL  FIL$CHKFILHDR - CHECK FILE HEADER VALIDITY
                                0802  1891 ;++
                                0802  1892 ; FUNCTIONAL DESCRIPTION:
                                0802  1893 ;
                                0802  1894 ;       CHECK THE VALIDITY OF A FILE HEADER
                                0802  1895 ;
                                0802  1896 ; CALLING SEQUENCE:
                                0802  1897 ;
                                0802  1898 ;       BSBW    FIL$CHKFILHDR
                                0802  1899 ;
                                0802  1900 ; INPUT PARAMETERS:
                                0802  1901 ;
                                0802  1902 ;       R0 = ADDRESS OF FILE ID
                                0802  1903 ;       R1 = ADDRESS OF FILE HEADER
                                0802  1904 ;
                                0802  1905 ; IMPLICIT INPUTS:
                                0802  1906 ;
                                0802  1907 ;       NONE
                                0802  1908 ;
                                0802  1909 ; OUTPUT PARAMETERS:
                                0802  1910 ;
                                0802  1911 ;       RSB TO CALLER IF FILE HEADER VALID
                                0802  1912 ;       RET IF NOT VALID WITH R0 = ERROR STATUS
                                0802  1913 ;
                                0802  1914 ; IMPLICIT OUTPUTS:
                                0802  1915 ;
                                0802  1916 ;       NONE
                                0802  1917 ;
                                0802  1918 ; COMPLETION CODES:
                                0802  1919 ;
                                0802  1920 ;       SS$_BADFILEHDR          FILE ID CODES DON'T MATCH
                                0802  1921 ;       SS$_NOSUCHFILE          FILE IS MARKED AS DELETED
                                0802  1922 ;
                                0802  1923 ; SIDE EFFECTS:
                                0802  1924 ;
                                0802  1925 ;       NONE
                                0802  1926 ;
                                0802  1927 ;--
                                0802  1928
                                0802  1929 FIL$CHKFILHDR:
                                0802  1930          CASE    FH1$W_STRUCLEV+1(R1),<-
                                0802  1931                  5$,-                    ;STRUCTURE LEVEL 1
                                0802  1932                  10$-                    ;STRUCTURE LEVEL 2
                                0802  1933                  >,TYPE=B,LIMIT=#1
01'  01    07 A1    8F          0802                  CASEB   FH1$W_STRUCLEV+1(R1),#1,S^#<<30005$-30004$>/2>-1
                                0807          30004$:
                     0006'      0807                  .SIGNED_WORD    5$-30004$
                     000F'      0809                  .SIGNED_WORD    10$-30004$
                                080B          30005$:
                  27    11      080B  1934          BRB     30$                     ;BAD FILE HEADER
                                080D  1935 ;
                                080D  1936 ; STRUCTURE LEVEL 1
                                080D  1937 ;
          7E      01    CE      080D  1938 5$:      MNEGL   #1,-(SP)                ;NO RVN TO CHECK
       7E    02 A1    D0      0810  1939          MOVL    FH1$W_FID_NUM(R1),-(SP) ;PUSH FILE ID ON STACK
                  08    11      0814  1940          BRB     15$
                                0816  1941 ;
```

```
                                0816  1942 ; STRUCTURE LEVEL 2
                                0816  1943 ;
          7E    0C A1    3C     0816  1944 10$:    MOVZWL  FH2$W_FID_RVN(R1),-(SP) ;PUSH RELATIVE VOLUME NUMBER
          7E    08 A1    D0     081A  1945         MOVL    FH2$W_FID_NUM(R1),-(SP) ;PUSH FILE ID ON STACK
                   6E    B5     081E  1946 15$:    TSTW    (SP)                    ;FILE DELETED?
                   18    13     0820  1947         BEQL    40$                     ;BRANCH IF YES
                8E 80    D1     0822  1948         CMPL    (R0)+,(SP)+             ;FILE NUM AND FILE SEQ NUM AGREE?
                   0D    12     0825  1949         BNEQ    30$                     ;BRANCH IF NOT, BAD HEADER
                   6E    D5     0827  1950         TSTL    (SP)                    ;CHECKING RVN?
                   05    19     0829  1951         BLSS    20$                     ;BRANCH IF NOT
                6E 60    B1     082B  1952         CMPW    (R0),(SP)               ;RELATIVE VOLUME NUMBER AND
                                082E  1953                                         ;FILE NUMBER EXTENSION AGREE
                   04    12     082E  1954         BNEQ    30$                     ;BRANCH IF NOT
                   01    BA     0830  1955 20$:    POPR    #^M<R0>                 ;CLEAN OFF STACK
                   0C    11     0832  1956         BRB     FIL$CHECKSUM            ;GO VERIFY THE CHECKSUM
       50   0810 8F    3C     0834  1957 30$:    MOVZWL  #SS$_BADFILEHDR,R0      ;THIS HEADER IS BAD
                               0839  1958         RET
       50   0910 8F    3C     083A  1959 40$:    MOVZWL  #SS$_NOSUCHFILE,R0      ;DELETED FILE
                               083F  1960         RET
```

```
                     0840  1962          .SBTTL  CHECKSUM - VALIDATE A CHECKSUM
                     0840  1963 ;++
                     0840  1964 ; FUNCTIONAL DESCRIPTION:
                     0840  1965 ;
                     0840  1966 ;       THIS ROUTINE CALCULATES AND CHECKS THE FILE11 CHECKSUM FOR
                     0840  1967 ; FILE HEADERS AND THE HOMEBLOCK.
                     0840  1968 ;
                     0840  1969 ; CALLING SEQUENCE:
                     0840  1970 ;
                     0840  1971 ;       BSBW    FIL$CHECKSUM            ;CHECK FILE HEADER CHECKSUM
                     0840  1972 ;       BSBW    FIL$CHECKSUM1           ;CHECK SPECIFIED NO. OF WORDS IN R0
                     0840  1973 ;
                     0840  1974 ; INPUT PARAMETERS:
                     0840  1975 ;
                     0840  1976 ;       R0 = NO. OF WORDS TO CHECK IF ENTERING AT CHECKSUM1
                     0840  1977 ;       R1 = ADDRESS OF BUFFER TO CHECK
                     0840  1978 ;
                     0840  1979 ; IMPLICIT INPUTS:
                     0840  1980 ;
                     0840  1981 ;       NONE
                     0840  1982 ;
                     0840  1983 ; OUTPUT PARAMETERS:
                     0840  1984 ;
                     0840  1985 ;       RSB TO CALLER IF CHECKSUM IS OK
                     0840  1986 ;       RET TO TOP LEVEL WITH ERROR CODE IN R0 IF CHECKSUM IS WRONG
                     0840  1987 ;
                     0840  1988 ; IMPLICIT OUTPUTS:
                     0840  1989 ;
                     0840  1990 ;       NONE
                     0840  1991 ;
                     0840  1992 ; COMPLETION CODES:
                     0840  1993 ;
                     0840  1994 ;       NONE
                     0840  1995 ;
                     0840  1996 ; SIDE EFFECTS:
                     0840  1997 ;
                     0840  1998 ;       NONE
                     0840  1999 ;
                     0840  2000 ;--
                     0840  2001
                     0840  2002 FIL$CHECKSUM:
50   00FF 8F   3C    0840  2003          MOVZWL  #FH1$W_CHECKSUM@-1,R0   ;NO. OF WORDS TO CHECK
                     0845  2004 FIL$CHECKSUM1:
     52   D4        0845  2005          CLRL    R2                      ;INIT THE SUM
                     0847  2006 10$:
52   81   A0        0847  2007          ADDW    (R1)+,R2                ;ACCUMULATE THE SUM
  FA 50   F5        084A  2008          SOBGTR  R0,10$                  ;ONCE FOR EACH WORD
61   52   B1        084D  2009          CMPW    R2,(R1)                 ;CHECKSUM OK?
     01   12        0850  2010          BNEQ    20$                     ;BRANCH IF NOT
          05        0852  2011          RSB
                     0853  2012 20$:
50   0808 8F   3C    0853  2013          MOVZWL  #SS$_BADCHKSUM,R0       ;ERROR STATUS IN R0
          04        0858  2014          RET
                     0859  2015
                     0859  2016
                     0859  2017          .END
```

```
ARGCNT                          = 00000000     D
ASSIGN_DEV                        000001A5 R   D   02
BADDIR                            00000457 R   D   02
BADDIR1                           0000053C R   D   02
BADDIR2                           000003B8 R   D   02
BADFILNAM                         0000045D R   D   02
BADRET                            0000045C R   D   02
BADRET1                           000003BB R   D   02
BUFADR                          = 0000000C     D
CACHE_ADR                       = 00000010     D
CACHE_SIZE                      = 0000000C     D
CHAN                            = 00000004     D
CHANADR                         = 00000004     D
DIR$B_NAMECOUNT                 = 00000005     D
DIR$C_VERSION                   = 00000008     D
DIR$T_NAME                      = 00000006     D
DIR$W_FID                       = 00000002     D
DIR$W_SIZE                      = 00000000     D
DIR$W_VERSION                   = 00000000     D
DIR...                          = FFFFFFFF     D
DIRBUF                          = 00000010     D
DIRNAM                            FFFFFFCC     D
DIR_BFCNT                         FFFFFFFC     D
DIR_BUF                           FFFFFFF8     D
DIR_CACHE_CNT                   = 00000014     D
ENTRY                             FFFFFFD0     D
ENTRY_ADR                         FFFFFFF4     D
EXIT_FILID_FND                    00000508 R   D   02
FAT$B_RATTRIB                   = 00000001     D
FAT$B_RTYPE                     = 00000000     D
FAT$C_FIXED                     = 00000001     D
FAT$C_VARIABLE                  = 00000002     D
FAT$L_EFBLK                     = 00000008     D
FAT$M_NOSPAN                    = 00000008     D
FAT$W_FFBYTE                    = 0000000C     D
FAT$W_RSIZE                     = 00000002     D
FH1$B_MPOFFSET                  = 00000001     D
FH1$C_LEVEL1                    = 00000101     D
FH1$V_CONTIG                    = 00000007     D
FH1$V_LEVEL1                    = 00000008     D
FH1$W_CHECKSUM                  = 000001FE     D
FH1$W_FID_NUM                   = 00000002     D
FH1$W_FILECHAR                  = 0000000C     D
FH1$W_RECATTR                   = 0000000E     D
FH1$W_STRUCLEV                  = 00000006     D
FH1$W_VBNOFFSET                 = 000001FE     D
FH2$B_MAP_INUSE                 = 0000003A     D
FH2$B_MPOFFSET                  = 00000001     D
FH2$C_LEVEL2                    = 00000200     D
FH2$L_FILECHAR                  = 00000034     D
FH2$V_BIGFILNUM                 = 0000000A     D
FH2$V_CONTIG                    = 00000007     D
FH2$V_DIRECTORY                 = 0000000D     D
FH2$V_LEVEL2                    = 00000009     D
FH2$W_CHECKSUM                  = 000001FE     D
FH2$W_EXT_FID                   = 0000000E     D
FH2$W_FID_NUM                   = 00000008     D
FH2$W_FID_RVN                   = 0000000C     D
FH2$W_RECATTR                   = 00000014     D
FH2$W_STRUCLEV                  = 00000006     D
FID                               FFFFFFFA     D
FID$B_NMX                       = 00000005     D
FID$C_MFD                       = 00000004     D
FIL$A_DIR_FID                     00000000     D
FIL$A_DIR_OFID                    0000001E     D
FIL$A_IXFHDR                      00000018     D
FIL$B_DIR_LVL                     00000012     D
FIL$CACHE_INIT                    00000112 RG  D   02
FIL$CACHE_TRUNC                   00000186 RG  D   02
FIL$CHECKSUM                      00000840 R   D   02
FIL$CHECKSUM1                     00000845 R   D   02
FIL$CHKFILHDR                     00000802 R   D   02
FIL$CVTFILNAM                     ********       X 02
FIL$C_CACHE_ID                  = 00000001     D
FIL$C_DIR_SIZE                    00000024   G D
FIL$C_SIZE                        00000218   G D
FIL$FINDFILID                     000002F1 RG  D   02
FIL$GQ_CACHE                      ********W GX     00
FIL$GT_DDDEV                      ********W GX     00
FIL$GT_DDSTRING                   ********     X   02
FIL$GT_TOPSYS                     ********W GX     00
FIL$L_DIRMAX                      0000000C     D
FIL$L_DIRNXT                      00000008     D
FIL$L_DIROFF                      00000004     D
FIL$L_DIR_BFOFF                   00000018     D
FIL$L_DIR_LBN                     00000014     D
FIL$L_LBNMAX                      00000014     D
FIL$L_LBNNXT                      00000010     D
FIL$L_LBNOFF                      0000000C     D
FIL$MOUNT                         0000025D RG  D   02
FIL$OPENFILE                      0000000C RG  D   02
FIL$Q_DIR_HDR                     00000010     D
FIL$RDCHKFILHDR                   000005FA RG  D   02
FIL$RDWRTLBN                      ********       X 02
FIL$READVBN                       000006D9 RG  D   02
FIL$STATBLK                       00000792 RG  D   02
FIL$T_DIR_NAM                     00000006     D
FIL$WRITEVBN                      000006D2 RG  D   02
FIL$W_CACHE_ID                    00000000     D
FIL$W_DIR_BFCNT                   0000001C     D
FIL$W_DIR_BKCNT                   00000010     D
FILDSC                          = 00000008     D
FILHDR                          = 00000004     D
FILID                           = 00000018     D
FILNAM                          = 00000008     D
FIL_GQ_CACHE                      00000000 R   D   02
FIL_GT_DDDEV                      00000004 R   D   02
FIL_GT_TOPSYS                     00000008 R   D   02
FIND_LEVEL1                       0000053F R   D   02
FIND_LEVEL1_1                     0000054A R   D   02
FIND_LEVEL2                       00000463 R   D   02
FIND_LEVEL2_1                     0000046F R   D   02
FM1$B_INUSE                     = 00000008     D
FM1$C_POINTERS                  = 0000000A     D
```

```
FM1$W_EX_FILNUM          = 00000002    D          TMPRTRVLEN                FFFFFFF8    D
FM2$S_COUNT2             = 0000000E    D          VBN                     = 00000008    D
FM2$S_FORMAT             = 00000002    D
FM2$S_HIGHLBN            = 00000006    D
FM2$V_COUNT2             = 00000000    D
FM2$V_FORMAT             = 0000000E    D
FM2$V_HIGHLBN            = 00000008    D
FORMAT1                    00000772 R  D  02
FORMAT2                    00000785 R  D  02
FORMAT3                    0000075B R  D  02
FORMDIRSTRING              000001F1 R  D  02
GETRTRVPTR                 00000739 R  D  02
HDRCNT                     FFFFFFFC    D
HM1$L_IBMAPLBN           = 00000002    D
HM1$W_CHECKSUM1          = 0000003A    D
HM1$W_CHECKSUM2          = 000001FE    D
HM1$W_IBMAPSIZE          = 00000000    D
HM1$W_STRUCLEV           = 0000000C    D
HM2$L_IBMAPLBN           = 00000018    D
HM2$L_MAXFILES           = 0000001C    D
HM2$W_CHECKSUM1          = 0000003A    D
HM2$W_CHECKSUM2          = 000001FE    D
HM2$W_CLUSTER            = 0000000E    D
HM2$W_IBMAPSIZE          = 00000020    D
HM2$W_STRUCLEV           = 0000000C    D
INCRSB                     00000782 R  D  02
INIRTRVPTRSCAN             0000071B R  D  02
IO$_READLBLK             = 00000021    D
IO$_WRITELBLK            = 00000020    D
IOFUNCTION               = FFFFFFFC    D
IXFHDR                   = 0000000C    D
LBN_CACHE_CNT            = 00000018    D
LIB$CVT_DTB                ********    X  02
NAMBLK                     FFFFFFA4    D
NAMDSC                     FFFFFF98    D
OPENFILE_1                 0000000C R  D  02
OPENFILE_2                 0000000E R  D  02
PLACEMENT                  00000769 R  D  02
RDWRTVBN                   000006DE R  D  02
READ_DIR_HEADER            000003BC R  D  02
READ_DIR_LBN               000005CA R  D  02
RTRVPTRBUF               = 00000010    D
RTRVPTRLEN               = 0000000C    D
SAVABS...                = FFFFFFF0    D
SCRATCHSIZE                FFFFFF98    D
SCRATCH_SIZE               FFFFFFD0    D
SS$_BADCHKSUM            = 00000808    D
SS$_BADFILEHDR           = 00000810    D
SS$_BADFILENAME          = 00000818    D
SS$_BADIRECTORY          = 00000828    D
SS$_ENDOFFILE            = 00000870    D
SS$_FILESTRUCT           = 000008C0    D
SS$_NORMAL               = 00000001    D
SS$_NOSUCHFILE           = 00000910    D
STATBLK                  = 00000008    D
STORE3DIGITS               000001D8 R  D  02
TMPRTRVDSC                 FFFFFFF0    D
```

```
                                    +----------------+
                                    ! Psect synopsis !
                                    +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           FFFFFFFC  (    0.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
CODE                            00000859  ( 2137.)  02 (  2.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD  NOWRT NOVEC LONG
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
ARGCNT	=00000000	1833 (17)	#-1478 (13) #-1846 (17) #-428 (2) #-475 (2)
ASSIGN_DEV	000001A5-R	645 (5)	#-560 (3)
BADDIR	00000457-R	1144 (9)	#-1056 (9) #-1155 (10) #-1160 (10) #-1269 (10)
BADDIR1	0000053C-R	1268 (10)	#-1278 (11) #-1280 (11)
BADDIR2	000003B8-R	1055 (9)	#-1075 (9)
BADFILNAM	0000045D-R	1146 (9)	#-1190 (10) #-399 (2) #-690 (6) #-739 (7)
BADRET	0000045C-R	1145 (9)	
BADRET1	000003BB-R	1057 (9)	#-1064 (9)
BUFADR	=0000000C	1596 (14)	#-1637 (14)
CACHE_ADR	=00000010	532 (3)	540 (3)
CACHE_SIZE	=0000000C	531 (3)	540 (3) #-541 (3)
CHAN	=00000004	1594 (14)	#-1110 (9) #-1393 (12) #-1506 (13) #-1639 (14)
			#-824 (8)
CHANADR	=00000004	529 (3)	#-435 (2) #-564 (3)
DIR$B_NAMECOUNT	=00000005		#-1203 (10)
DIR$C_VERSION	=00000008		#-1231 (10)
DIR$T_NAME	=00000006		1204 (10) 1221 (10)
DIR$W_FID	=00000002		#-1239 (10) 1241 (10)
DIR$W_SIZE	=00000000		#-1207 (10) #-1209 (10) #-1222 (10)
DIR$W_VERSION	=00000000		#-1228 (10)
DIR...	=FFFFFFFF	1469 (13)	1469 (13) 168 (1) 184 (1) 309 (2)
			959 (9)
DIRBUF	=00000010	947 (9)	#-1065 (9) #-1392 (12)
DIRNAM	FFFFFFCC	309 (2)	#-467 (2) 744 (7) 748 (7) 752 (7)
			755 (7) 762 (7)
DIR_BFCNT	FFFFFFFC	959 (9)	#-1049 (9) #-1116 (9) #-1383 (12) #-1385 (12)
DIR_BUF	FFFFFFF8	959 (9)	#-1050 (9) #-1117 (9) #-1386 (12) #-1387 (12)
DIR_CACHE_CNT	=00000014	533 (3)	#-548 (3)
ENTRY	FFFFFFD0	959 (9)	#-1010 (9) #-1036 (9) #-1039 (9) #-1040 (9)
			#-1047 (9) #-1048 (9) #-1049 (9) #-1050 (9)
			#-1052 (9) #-1087 (9) #-1088 (9) #-1089 (9)
			#-1109 (9) #-1118 (9) #-1122 (9) #-1123 (9)
			#-1249 (10) #-1254 (10) #-1255 (10) 1261 (10)
			978 (9) #-992 (9) 993 (9) 999 (9)
ENTRY_ADR	FFFFFFF4	959 (9)	#-1002 (9) #-1009 (9) #-1021 (9) #-1251 (10)
EXIT_FILID_FND	00000508-R	1246 (10)	#-1352 (11)
FAT$B_RATTRIB	=00000001		1157 (10)
FAT$B_RTYPE	=00000000		1157 (10) #-1159 (10) #-1277 (11)
FAT$C_FIXED	=00000001		#-1277 (11)
FAT$C_VARIABLE	=00000002		#-1158 (10)
FAT$L_EFBLK	=00000008		#-1083 (9)
FAT$M_NOSPAN	=00000008		#-1158 (10)
FAT$W_FFBYTE	=0000000C		#-1084 (9)
FAT$W_RSIZE	=00000002		#-1279 (11)
FH1$B_MPOFFSET	=00000001		131 (1) #-1532 (13) #-1666 (15)
FH1$C_LEVEL1	=00000101		143 (1)
FH1$V_CONTIG	=00000007		138 (1) #-1858 (17)
FH1$V_LEVEL1	=00000008	144 (1)	
FH1$W_CHECKSUM	=000001FE		133 (1) 137 (1) 140 (1) #-2003 (19)
FH1$W_FID_NUM	=00000002		#-1939 (18)

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FH1$W_FILECHAR                  =0000000C                       #-1857   (17)
FH1$W_RECATTR                   =0000000E                         1079   (9)
FH1$W_STRUCLEV                  =00000006                       #-1080   (9)      132    (1)    #-1616   (14)   #-1854   (17)
                                                                #-1933   (18)
FH1$W_VBNOFFSET                 =000001FE       140     (1)     #-1503   (13)   #-871   (8)
FH2$B_MAP_INUSE                 =0000003A                       #-1673   (15)
FH2$B_MPOFFSET                  =00000001                         131    (1)
FH2$C_LEVEL2                    =00000200                         146    (1)
FH2$L_FILECHAR                  =00000034                         1155   (10)   #-1855   (17)
FH2$V_BIGFILNUM                 =0000000A       148     (1)     #-1498   (13)   #-878   (8)
FH2$V_CONTIG                    =00000007                         138    (1)
FH2$V_DIRECTORY                 =0000000D                       #-1155   (10)
FH2$V_LEVEL2                    =00000009       147     (1)     #-1531   (13)   #-1668   (15)   #-1701   (16)   #-1856   (17)
FH2$W_CHECKSUM                  =000001FE                         133    (1)
FH2$W_EXT_FID                   =0000000E                       #-1530   (13)
FH2$W_FID_NUM                   =00000008                       #-1945   (18)
FH2$W_FID_RVN                   =0000000C                       #-1944   (18)
FH2$W_RECATTR                   =00000014                         1082   (9)
FH2$W_STRUCLEV                  =00000006                         132    (1)      1498   (13)     1531   (13)     878    (8)
FID                              FFFFFFFA       309     (2)       431    (2)    #-448   (2)    #-449   (2)
FID$B_NMX                       =00000005                       #-1499   (13)
FID$C_MFD                       =00000004                       #-448    (2)    #-449   (2)
FIL$A_DIR_FID                    00000000       184     (1)       1000   (9)      979   (9)      998    (9)      999    (9)
FIL$A_DIR_OFID                   0000001E       184     (1)     #-1027   (9)      1029   (9)    #-1254   (10)   #-1255   (10)
FIL$A_IXFHDR                     00000018       168     (1)       439    (2)      562   (3)
FIL$B_DIR_LVL                    00000012       184     (1)     #-1052   (9)    #-1089   (9)
FIL$CACHE_INIT                   00000112-R     537     (3)
FIL$CACHE_TRUNC                  00000186-R     612     (4)
FIL$CHECKSUM                     00000840-R     2002    (19)    #-1956   (18)   #-832   (8)
FIL$CHECKSUM1                    00000845-R     2004    (19)    #-830    (8)
FIL$CHKFILHDR                    00000802-R     1929    (18)    #-1511   (13)   #-869   (8)
FIL$CVTFILNAM                    00000000-XR                     1290     (11)
FIL$C_CACHE_ID                  =00000001       153     (1)     #-371    (2)    #-544   (3)
FIL$C_DIR_SIZE                   00000024       184     (1)     #-1012   (9)    #-1257   (10)   #-1261   (10)     191    (1)
                                                                #-548    (3)      959   (9)
FIL$C_SIZE                       00000218       168     (1)       191    (1)    #-542   (3)    #-546    (3)    #-547    (3)
                                                                #-551    (3)
FIL$FINDFILID                    000002F1-R     963     (9)       464    (2)
FIL$GQ_CACHE                     00000000-XR                       195    (1)      205   (1)    #-369    (2)    #-567    (3)
                                                                #-614    (4)    #-617   (4)
FIL$GT_DDDEV                     00000000-XR                       196    (1)      207   (1)      649    (5)
FIL$GT_DDSTRING                  00000000-XR                       374    (2)
FIL$GT_TOPSYS                    00000000-XR                       197    (1)      209   (1)      452    (2)
FIL$L_DIRMAX                     0000000C       168     (1)     #-1258   (10)   #-551   (3)      553    (3)    #-615    (4)
FIL$L_DIRNXT                     00000008       168     (1)     #-1256   (10)   #-1260   (10)   #-547    (3)    #-615    (4)
                                                                #-995    (9)
FIL$L_DIROFF                     00000004       168     (1)     #-546    (3)    #-994   (9)
FIL$L_DIR_BFOFF                  00000018       184     (1)     #-1039   (9)    #-1050   (9)    #-1123   (9)
FIL$L_DIR_LBN                    00000014       184     (1)     #-1047   (9)    #-1087   (9)    #-1109   (9)
FIL$L_LBNMAX                     00000014       168     (1)     #-1095   (9)    #-559   (3)    #-616    (4)
FIL$L_LBNNXT                     00000010       168     (1)     #-1095   (9)    #-1102   (9)   #-1125   (9)    #-554    (3)
                                                                #-559    (3)    #-616   (4)    #-617    (4)
FIL$L_LBNOFF                     0000000C       168     (1)       553    (3)    #-554   (3)
FIL$MOUNT                        0000025D-R     817     (8)       441    (2)      565   (3)
FIL$OPENFILE                     0000000C-R     343     (2)
FIL$Q_DIR_HDR                    00000010       184     (1)     #-1036   (9)
FIL$RDCHKFILHDR                  000005FA-R     1473    (13)      1063   (9)      478   (2)
```

```
FIL$RDWRTLBN                  00000000-XR                  1111   (9)      1393   (12)     1640   (14)     826    (8)
                                                            862   (8)
FIL$READVBN                   000006D9-R   1610   (14)     1506   (13)
FIL$STATBLK                   00000792-R   1843   (17)     1517   (13)
FIL$T_DIR_NAM                 00000006     184    (1)    #-1010   (9)    #-1118   (9)    #-1249   (10)   #-992    (9)
                                                            993   (9)      998    (9)
FIL$WRITEVBN                  000006D2-R   1605   (14)
FIL$W_CACHE_ID                00000000     168    (1)    #-371    (2)    #-544    (3)
FIL$W_DIR_BFCNT               0000001C     184    (1)    #-1040   (9)    #-1049   (9)    #-1122   (9)
FIL$W_DIR_BKCNT               00000010     184    (1)    #-1048   (9)    #-1088   (9)
FILDSC                       =00000008     945    (9)    #-1168   (10)   #-1285   (11)   #-981    (9)
FILHDR                       =00000004     1834   (17)     1485   (13)   #-1615   (14)   #-1853   (17)   #-432    (2)
FILID                        =00000018     1459   (13)     1029   (9)      1241   (10)   #-1295   (11)   #-1334   (11)
                                                         #-1341   (11)   #-1349   (11)   #-1350   (11)     1488   (13)
                                                         #-1542   (13)     980    (9)
FILNAM                       =00000008     530    (3)    #-381    (2)    #-653    (5)
FIL_GQ_CACHE                  00000000-R   204    (1)    #-357    (2)
FIL_GT_DDDEV                  00000004-R   206    (1)    #-647    (5)
FIL_GT_TOPSYS                 00000008-R   208    (1)    #-450    (2)
FIND_LEVEL1                   0000053F-R   1276   (11)   #-1139   (9)
FIND_LEVEL1_1                 0000054A-R   1284   (11)   #-1054   (9)
FIND_LEVEL2                   00000463-R   1154   (10)   #-1138   (9)
FIND_LEVEL2_1                 0000046F-R   1167   (10)   #-1053   (9)
FM1$B_INUSE                  =00000008                   #-1669   (15)
FM1$C_POINTERS               =0000000A                   #-1670   (15)
FM1$W_EX_FILNUM              =00000002                   #-1534   (13)
FM2$S_COUNT2                 =0000000E                   #-1769   (16)
FM2$S_FORMAT                 =00000002                   #-1716   (16)
FM2$S_HIGHLBN                =00000006                   #-1754   (16)
FM2$V_COUNT2                 =00000000                   #-1769   (16)
FM2$V_FORMAT                 =0000000E                   #-1716   (16)
FM2$V_HIGHLBN                =00000008                   #-1754   (16)
FORMAT1                       00000772-R   1752   (16)     1721   (16)
FORMAT2                       00000785-R   1767   (16)     1721   (16)
FORMAT3                       0000075B-R   1730   (16)
FORMDIRSTRING                 000001F1-R   729    (7)    #-457    (2)    #-460    (2)
GETRTRVPTR                    00000739-R   1700   (16)   #-1624   (14)   #-1863   (17)
HDRCNT                        FFFFFFFC     1469   (13)   #-1505   (13)     1508   (13)   #-1540   (13)     1543   (13)
HM1$L_IBMAPLBN               =00000002                   #-851    (8)
HM1$W_CHECKSUM1              =0000003A                     135    (1)    #-829    (8)
HM1$W_CHECKSUM2              =000001FE                     136    (1)      137    (1)
HM1$W_IBMAPSIZE              =00000000                   #-852    (8)
HM1$W_STRUCLEV               =0000000C                     134    (1)    #-836    (8)
HM2$L_IBMAPLBN               =00000018                   #-842    (8)
HM2$L_MAXFILES               =0000001C                   #-844    (8)
HM2$W_CHECKSUM1              =0000003A                     135    (1)
HM2$W_CHECKSUM2              =000001FE                     136    (1)
HM2$W_CLUSTER                =0000000E                   #-846    (8)
HM2$W_IBMAPSIZE              =00000020                   #-843    (8)
HM2$W_STRUCLEV               =0000000C                     134    (1)
INCRSB                        00000782-R   1757   (16)   #-1711   (16)   #-1734   (16)   #-1771   (16)
INIRTRVPTRSCAN                0000071B-R   1665   (15)   #-1617   (14)   #-1859   (17)
IO$_READLBLK                 =00000021                   #-1107   (9)    #-1393   (12)   #-1612   (14)   #-821    (8)
IO$_WRITELBLK                =00000020                   #-1607   (14)
IOFUNCTION                   =FFFFFFFC     1601   (14)   #-1636   (14)
IXFHDR                       =0000000C     1456   (13)     1485   (13)   #-1486   (13)   #-1512   (13)   #-433    (2)
                                                         #-439    (2)    #-819    (8)
```

```
LBN_CACHE_CNT                =00000018     534    (3)    #-555    (3)
LIB$CVT_DTB                   00000000-XR                 1189    (10)
NAMBLK                        FFFFFFA4     309    (2)      352    (2)    #-467    (2)
NAMDSC                        FFFFFF98     309    (2)    #-352    (2)      434    (2)    #-461    (2)    #-471    (2)
                                                         #-473    (2)
OPENFILE_1                    0000000C-R   348    (2)
OPENFILE_2                    0000000E-R   350    (2)
PLACEMENT                     00000769-R   1741   (16)     1721   (16)
RDWRTVBN                      000006DE-R   1614   (14)   #-1608   (14)
READ_DIR_HEADER               000003BC-R   1062   (9)    #-1022   (9)
READ_DIR_LBN                  000005CA-R   1382   (12)   #-1214   (10)   #-1309   (11)
RTRVPTRBUF                   =00000010     1838   (17)   #-1478   (13)   #-1480   (13)   #-1846   (17)   #-1848   (17)
                                                         #-428    (2)    #-475    (2)
RTRVPTRLEN                   =0000000C     1836   (17)   #-1483   (13)   #-1520   (13)   #-1852   (17)   #-1882   (17)
                                                         #-430    (2)
SAVABS...                    =FFFFFFF0     1469   (13)
SCRATCHSIZE                   FFFFFF98     309    (2)    #-351    (2)
SCRATCH_SIZE                  FFFFFFD0     959    (9)    #-965    (9)    #-966    (9)      978    (9)
SS$_BADCHKSUM                =00000808                   #-2013   (19)
SS$_BADFILEHDR               =00000810                   #-1957   (18)
SS$_BADFILENAME              =00000818                   #-1147   (9)
SS$_BADIRECTORY              =00000828                   #-1144   (9)
SS$_ENDOFFILE                =00000870                   #-1630   (14)
SS$_FILESTRUCT               =000008C0                   #-837    (8)
SS$_NORMAL                   =00000001                   #-1030   (9)    #-1263   (10)   #-1544   (13)   #-1887   (17)
                                                         #-568    (3)    #-618    (4)    #-880    (8)
SS$_NOSUCHFILE               =00000910                   #-1212   (10)   #-1344   (11)   #-1959   (18)
STATBLK                      =00000008     1835   (17)   #-1066   (9)      1488   (13)   #-1489   (13)   #-1886   (17)
STORE3DIGITS                  000001D8-R   687    (6)    #-745    (7)    #-749    (7)
TMPRTRVDSC                    FFFFFFF0     1469   (13)   #-1482   (13)     1513   (13)   #-1521   (13)   #-1523   (13)
                                                         #-1524   (13)   #-1525   (13)
TMPRTRVLEN                    FFFFFFF8     1469   (13)     1514   (13)   #-1518   (13)
VBN                          =00000008     1595   (14)   #-1623   (14)
```

```
                                  +-------------------------+
                                  ! Performance indicators !
                                  +-------------------------+
```

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.02	00:00:00.34
Command processing	892	00:00:00.35	00:00:02.00
Pass 1	783	00:00:03.50	00:00:05.85
Symbol table sort	0	00:00:00.39	00:00:00.39
Pass 2	70	00:00:01.31	00:00:02.99
Symbol table output	2	00:00:00.04	00:00:00.07
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	5	00:00:00.17	00:00:00.23
Assembler run totals	1781	00:00:05.78	00:00:11.87

The working set limit was 2900 pages.
176666 bytes (346 pages) of virtual memory were used to buffer the intermediate code.
There were 70 pages of symbol table space allocated to hold 1265 non-local and 111 local symbols.
2017 source lines were read in Pass 1, producing 85 object records in Pass 2.
27 pages of virtual memory were used to define 25 macros.

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                  0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1                1
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1               0
SYS$COMMON:[SYSLIB]LIB.MLB;2                             9
SYS$COMMON:[SYSLIB]STARLET.MLB;2                        10
SYS$COMMON:[SYSLIB]STARLET.MLB;2                         0
TOTALS (all libraries)                                  20

1325 GETS were required to define 20 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 64 CREATE I/O DRIVER FORK PROCESS
(2) 85 CREATE FORK PROCESS
(3) 113 SOFTWARE INTERRUPT FORK DISPATCHER

```
                        0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element FRKCTL.MAR
                        0000     2 ; *1     6-FEB-1986 15:18:39 DS ""
                        0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element FRKCTL.MAR
                        0000     4         .TITLE  FRKCTL  *** FRKCTL QIO fork control
                        0000     5         .IDENT  /06-03/
                        0000     6         .LIST   MEB
                        0000     7         .NLIST  CND
                        0000     8
                        0000     9 ;
                        0000    10 ;*****************************************************************************
                        0000    11 ;*                                                                           *
                        0000    12 ;*  COPYRIGHT (c) 1976, 1977, 1978, 1979, 1980                               *
                        0000    13 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
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                        0000    28 ;*                                                                           *
                        0000    29 ;*****************************************************************************
                        0000    30 ;
                        0000    31 ; D. N. CUTLER 9-AUG-76
                        0000    32 ;
                        0000    33 ; MODIFIED BY R.HEINEN ON 13-OCT-76; ALLOW FORK TO IPL 6
                        0000    34 ; FORK CREATION AND DISPATCHING
                        0000    35 ;
                        0000    36 ; MODIFIED BY  T.L. SOUTTER  20-FEB-78
                        0000    37 ;
                        0000    38 ;       ADAPTED TO DIAGNOSTIC SUPERVISOR ENVIRONMENT
                        0000    39 ;
                        0000    40 ;               Dave Butenhof   13-may-1980, Version 5.4
                        0000    41 ;       02      Create .UPD file to modify VMS V2.0 source to
                        0000    42 ;               Supervisor environment
                        0000    43 ;               Dave Butenhof, 23-feb-1981, version 6.3
                        0000    44 ;       03      Fix some truncation errors.
                        0000    45 ; MACRO LIBRARY CALLS
                        0000    46 ;
                        0000    47
                        0000    48
                        0000    52
                        0000    53         $FKBDEF                          ;DEFINE FKB OFFSETS
                        0000               .SAVE   LOCAL_BLOCK
                        0000               .IIF    NB,FKB$L_FQFL,  FKB$L_FQFL:
00000004                0000                       .BLKL   1
                        0004               .IIF    NB,FKB$L_FQBL,  FKB$L_FQBL:
00000008                0004                       .BLKL   1
                        0008               .IIF    NB,FKB$W_SIZE,  FKB$W_SIZE:
0000000A                0008                       .BLKW   1
```

```
                    000A                .IIF    NB,FKB$B_TYPE,  FKB$B_TYPE:
0000000B  000A                                  .BLKB   1
                    000B                .IIF    NB,FKB$B_FIPL,  FKB$B_FIPL:
0000000C  000B                                  .BLKB   1
                    000C                .IIF    NB,FKB$L_FPC,   FKB$L_FPC:
00000010  000C                                  .BLKL   1
                    0010                .IIF    NB,FKB$L_FR3,   FKB$L_FR3:
00000014  0010                                  .BLKL   1
                    0014                .IIF    NB,FKB$L_FR4,   FKB$L_FR4:
00000018  0014                                  .BLKL   1
                    0018                .IIF    NB,FKB$C_LENGTH,        FKB$C_LENGTH:
                    0018                .IIF    NB,FKB$K_LENGTH,        FKB$K_LENGTH:
                    0000                .RESTORE
                    0000    54          $PRDEF                          ;DEFINE PROCESSOR REGISTERS
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
00000000            0018                .=0
                    0000                .RESTORE
                    0000    55          $UCBDEF                         ;DEFINE UCB OFFSETS
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
00000000            0018                .=0
                    0000                .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                    0000                .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
00000004            0000                        .BLKL   1
                    0004                .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                    0004                .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
00000008            0004                        .BLKL   1
                    0008                .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
0000000A            0008                        .BLKW   1
                    000A                .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
0000000B            000A                        .BLKB   1
                    000B                .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
0000000C            000B                        .BLKB   1
                    000C                .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                    000C                .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                    000C                .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
0000000D            000C                        .BLKB   1
00000010            000D                        .BLKB   3
                    0010                .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                    0010                .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
00000014            0010                        .BLKL   1
                    0014                .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                    0014                .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                    0014                .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
00000016            0014                        .BLKW   1
                    0016                .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
00000018            0016                        .BLKW   1
                    0018                .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                    0018                .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
0000001A            0018                        .BLKW   1
                    001A                .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                    001A                .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
0000001C            001A                        .BLKW   1
                    001C                .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
00000020            001C                        .BLKL   1
                    0020                .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
```

```
                    00000024  0020                          .BLKL   1
                              0024          .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
                    00000028  0024                          .BLKL   1
                              0028          .IIF    NB,UCB$L_PID,   UCB$L_PID:
                    0000002C  0028                          .BLKL   1
                              002C          .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
                    00000030  002C                          .BLKL   1
                              0030          .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
                    00000034  0030                          .BLKL   1
                              0034          .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
                    00000038  0034                          .BLKL   1
                              0038          .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
                    00000039  0038                          .BLKB   1
                              0039          .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
                    0000003A  0039                          .BLKB   1
                              003A          .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
                    0000003C  003A                          .BLKW   1
                              003C          .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
                              003C          .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
                              003C          .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
                    0000003D  003C                          .BLKB   1
                              003D          .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
                              003D          .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
                    0000003E  003D                          .BLKB   1
                              003E          .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
                              003E          .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
                    0000003F  003E                          .BLKB   1
                              003F          .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
                    00000040  003F                          .BLKB   1
                              0040          .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
                    00000044  0040                          .BLKL   1
                              0044          .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
                    00000048  0044                          .BLKL   1
                              0048          .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
                    0000004A  0048                          .BLKW   1
                              004A          .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
                              004A          .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
                    0000004B  004A                          .BLKB   1
                              004B          .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
                    0000004C  004B                          .BLKB   1
                              004C          .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
                    00000050  004C                          .BLKL   1
                              0050          .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
                    00000052  0050                          .BLKW   1
                              0052          .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
                              0052          .IIF    NB,UCB$B_STATE, UCB$B_STATE:
                    00000053  0052                          .BLKB   1
                              0053          .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
                    00000054  0053                          .BLKB   1
                              0054          .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
                    00000058  0054                          .BLKL   1
                              0058          .IIF    NB,UCB$W_STS,   UCB$W_STS:
                    0000005A  0058                          .BLKW   1
                              005A          .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
                    0000005C  005A                          .BLKW   1
                              005C          .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
                              005C          .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
```

```
00000060  005C                        .BLKL   1
                  0060          .IIF  NB,UCB$L_OPCNT, UCB$L_OPCNT:
00000064  0060                        .BLKL   1
                  0064          .IIF  NB,UCB$L_LOGADR,        UCB$L_LOGADR:
                  0064          .IIF  NB,UCB$L_SVPN,  UCB$L_SVPN:
00000068  0064                        .BLKL   1
                  0068          .IIF  NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
0000006C  0068                        .BLKL   1
                  006C          .IIF  NB,UCB$W_BOFF,  UCB$W_BOFF:
0000006E  006C                        .BLKW   1
                  006E          .IIF  NB,UCB$W_BCNT,  UCB$W_BCNT:
00000070  006E                        .BLKW   1
                  0070          .IIF  NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
00000071  0070                        .BLKB   1
                  0071          .IIF  NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
00000072  0071                        .BLKB   1
                  0072          .IIF  NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074  0072                        .BLKW   1
                  0074          .IIF  NB,UCB$C_LENGTH,        UCB$C_LENGTH:
                  0074          .IIF  NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000  0074                .  = 0
                  0000          .IIF  NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002  0000                        .BLKW   1
00000074  0002                .  = 116
                  0074          .IIF  NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078  0074                        .BLKL   1
                  0078          .IIF  NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C  0078                        .BLKL   1
                  007C          .IIF  NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080  007C                        .BLKL   1
                  0080          .IIF  NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084  0080                        .BLKL   1
                  0084          .IIF  NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088  0084                        .BLKL   1
                  0088          .IIF  NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C  0088                        .BLKL   1
                  008C          .IIF  NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090  008C                        .BLKL   1
                  0090          .IIF  NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
                  0090          .IIF  NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074  0090                .  = 116
                  0074          .IIF  NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075  0074                        .BLKB   1
                  0075          .IIF  NB,UCB$B_SPR,   UCB$B_SPR:
00000076  0075                        .BLKB   1
                  0076          .IIF  NB,UCB$B_FEX,   UCB$B_FEX:
00000077  0076                        .BLKB   1
                  0077          .IIF  NB,UCB$B_CEX,   UCB$B_CEX:
00000078  0077                        .BLKB   1
                  0078          .IIF  NB,UCB$L_EMB,   UCB$L_EMB:
0000007C  0078                        .BLKL   1
0000007E  007C                        .BLKW   1
                  007E          .IIF  NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080  007E                        .BLKW   1
                  0080          .IIF  NB,UCB$L_DPC,   UCB$L_DPC:
00000084  0080                        .BLKL   1
00000080  0084                . = 128
```

```
00000084  0080                                  .BLKL   1
          0084                  .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088  0084                                  .BLKL   1
          0088                  .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A  0088                                  .BLKW   1
          008A                  .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C  008A                                  .BLKW   1
          008C                  .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
          008C                  .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E  008C                                  .BLKW   1
          008E                  .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090  008E                                  .BLKW   1
          0090                  .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092  0090                                  .BLKW   1
          0092                  .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
00000094  0092                                  .BLKW   1
          0094                  .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095  0094                                  .BLKB   1
          0095                  .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096  0095                                  .BLKB   1
          0096                  .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098  0096                                  .BLKW   1
00000096  0098                  . = 150
00000098  0096                                  .BLKW   1
          0098                  .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C  0098                                  .BLKL   1
          009C                  .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0  009C                                  .BLKL   1
          00A0                  .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
000000A4  00A0                                  .BLKL   1
          00A4                  .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
000000A6  00A4                                  .BLKW   1
          00A6                  .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
000000A7  00A6                                  .BLKB   1
000000A8  00A7                                  .BLKB   1
00000074  00A8                  . = 116
00000078  0074                                  .BLKL   1
0000007C  0078                                  .BLKL   1
00000080  007C                                  .BLKL   1
00000084  0080                                  .BLKL   1
00000088  0084                                  .BLKL   1
0000008C  0088                                  .BLKL   1
          008C                  .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
00000090  008C                                  .BLKL   1
00000094  0090                                  .BLKL   1
00000098  0094                                  .BLKL   1
0000009C  0098                                  .BLKL   1
          009C                  .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
0000009D  009C                                  .BLKB   1
          009D                  .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
0000009E  009D                                  .BLKB   1
          009E                  .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
0000009F  009E                                  .BLKB   1
000000A0  009F                                  .BLKB   1
          00A0                  .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
000000A1  00A0                                  .BLKB   1
          00A1                  .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
```

```
                    000000A2  00A1                          .BLKB   1
                              00A2          .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
                    000000A3  00A2                          .BLKB   1
                    000000A4  00A3                          .BLKB   1
                              00A4          .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
                    000000A5  00A4                          .BLKB   1
                              00A5          .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
                    000000A7  00A5                          .BLKW   1
                    000000A8  00A7                          .BLKB   1
                              00A8          .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
                    000000AC  00A8                          .BLKL   1
                    000000B0  00AC                          .BLKL   1
                    000000B4  00B0                          .BLKL   1
                    000000B8  00B4                          .BLKL   1
                              00B8          .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
                    000000BC  00B8                          .BLKL   1
                              00BC          .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
                              00BC          .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
                    00000074  00BC          . = 116
                              0074          .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
                    00000078  0074                          .BLKL   1
                              0078          .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
                    0000007C  0078                          .BLKL   1
                              007C          .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
                    0000007E  007C                          .BLKW   1
                    00000080  007E                          .BLKW   1
                              0000          .RESTORE
                              0000    59
                              0000    60
                    00000000  0000    61    .PSECT  SEP, SHR, EXE, WRT, LONG
                              0000    62
```

```
                        0000     64          .SBTTL  CREATE I/O DRIVER FORK PROCESS
                        0000     65 ;+
                        0000     66 ; EXE$IOFORK - CREATE I/O DRIVER FORK PROCESS
                        0000     67 ;
                        0000     68 ; THIS ROUTINE IS CALLED BY AN I/O DRIVER TO CREATE A FORK PROCESS.
                        0000     69 ;
                        0000     70 ; INPUTS:
                        0000     71 ;
                        0000     72 ;       00(SP) = RETURN ADDRESS OF CALLER.
                        0000     73 ;       04(SP) = RETURN ADDRESS OF CALLER'S CALLER.
                        0000     74 ;
                        0000     75 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                        0000     76 ;
                        0000     77 ; OUTPUTS:
                        0000     78 ;
                        0000     79 ;       ***TBS***
                        0000     80 ;-
                        0000     81
                        0000     82 EXE$IOFORK::                                 ;CREATE I/O DRIVER FORK PROCESS
00 58 A5   00   E5      0000     83          BBCC    #UCB$V_TIM,UCB$W_STS(R5),EXE$FORK ;DISABLE TIMEOUT
```

```
                        0005     85          .SBTTL  CREATE FORK PROCESS
                        0005     86 ;+
                        0005     87 ; EXE$FORK - CREATE FORK PROCESS
                        0005     88 ;
                        0005     89 ; THIS ROUTINE IS CALLED TO CREATE A FORK PROCESS.
                        0005     90 ;
                        0005     91 ; INPUTS:
                        0005     92 ;
                        0005     93 ;       00(SP) = RETURN ADDRESS OF CALLER.
                        0005     94 ;       04(SP) = RETURN ADDRESS OF CALLER'S CALLER.
                        0005     95 ;
                        0005     96 ;       R5 = ADDRESS OF FORK BLOCK.
                        0005     97 ;
                        0005     98 ; OUTPUTS:
                        0005     99 ;
                        0005    100 ;       ***TBS***
                        0005    101 ;-
                        0005    102
                        0005    103 EXE$FORK::                                  ;CREATE FORK PROCESS
          10 A5   53    7D    0005    104         MOVQ    R3,FKB$L_FR3(R5)      ;SAVE REGISTERS R3 AND R4
              0C A5 8ED0    0009    105         POPL    FKB$L_FPC(R5)         ;SET FORK PROCESS PC
          54  0B A5   9A    000D    106         MOVZBL  FKB$B_FIPL(R5),R4     ;GET FORK IPL
    53 FFFFFFD0'EF44   7E    0011    107         MOVAQ   L^SWI$GL_FQFL-<6*8>[R4], R3     ; Get address of fork queue
          04 B3   65   0E    0019    108         INSQUE  (R5),@4(R3)           ;INSERT FORK BLOCK IN FORK QUEUE
                03   12    001D    109         BNEQ    10$                   ;IF NEQ NOT FIRST ENTRY IN QUEUE
                        001F    110         SOFTINT R4                    ;INITIATE SOFTWARE INTERRUPT
            14  54   DA    001F                MTPR    R4,S^#PR$_SIRR
                05   0022    111 10$:    RSB                               ;
```

```
                                0023   113          .SBTTL  SOFTWARE INTERRUPT FORK DISPATCHER
                                0023   114 ;+
                                0023   115 ; EXE$FORKDSPTH - SOFTWARE INTERRUPT FORK DISPATCHER
                                0023   116 ;
                                0023   117 ; THIS ROUTINE IS AUTOMATICALLY VECTORED TO WHEN THE SOFTWARE INTERRUPT
                                0023   118 ; PRIORITY ARBITRATION LOGIC IN THE CENTRAL PROCESSOR DETECTS A PENDING
                                0023   119 ; INTERRUPT AT LEVEL 6, 7, 8, 9, 10, OR 11 AND THE CURRENT PRIORITY LEVEL IS
                                0023   120 ; LOWER THAN THE PENDING LEVEL. THE STATE OF THE STACK ON ENTRY IS:
                                0023   121 ;
                                0023   122 ;       00(SP) = INTERRUPT PC.
                                0023   123 ;       04(SP) = INTERRUPT PSL.
                                0023   124 ;
                                0023   125 ; FOR EACH OF THE LEVELS 6, 7, 8, 9, 10, AND 11, THERE EXISTS A QUEUE OF FORK
                                0023   126 ; BLOCKS WAITING TO BE PROCESSED. WHEN A FORK BLOCK IS ENTERED IN ITS
                                0023   127 ; CORRESPONDING QUEUE AND IT IS THE FIRST TO BE ENTERED (I. E. THE QUEUE
                                0023   128 ; WAS PREVIOUSLY EMPTY), A SOFTWARE INTERRUPT IS REQUESTED FOR THAT LEVEL.
                                0023   129 ; THE FORK DISPATCHER GAINS CONTROL AND EMPTIES THE QUEUE ONE ENTRY AT A
                                0023   130 ; TIME. AS EACH FORK IS DISPATCHED, REGISTERS R3 AND R4 ARE RESTORED FROM
                                0023   131 ; THE FORK BLOCK AND THE FORK PROCESS IS CALLED VIA A JSB INSTRUCTION.
                                0023   132 ; ON RETURN, THE FORK DISPATCHER RETRIEVES THE NEXT ENTRY FROM THE QUEUE
                                0023   133 ; AND REPEATS THE DISPATCHING OPERATION. THIS PROCESS CONTINUES UNTIL
                                0023   134 ; THERE ARE NO MORE FORKS TO DISPATCH AT WHICH TIME THE INTERRUPT IS
                                0023   135 ; DISMISSED.
                                0023   136 ;-
                                0023   137
                                0023   138          .ALIGN  LONG
                                0024   139 EXE$FORKDSPTH::                                    ;SOFTWARE INTERRUPT FORK DISPATCHER
                       3F   BB  0024   140          PUSHR   #^M<R0,R1,R2,R3,R4,R5>            ;SAVE FORK PROCESS REGISTER SET
                    50   12  DB  0026   141 10$:     MFPR    #PR$_IPL,R0                       ;READ CURRENT IPL
                51  FFFFFFD0'EF40  7E  0029   142          MOVAQ   L^SWI$GL_FQFL-<6*8>[R0], R1       ; Get address of fork queue
                    55   91  0F  0031   143          REMQUE  @(R1)+,R5                         ;REMOVE NEXT ENTRY FROM FORK QUEUE
                         2D  1D  0034   144          BVS     20$                               ;IF VS NO ENTRY REMOVED
                53   10 A5  7D  0036   145          MOVQ    FKB$L_FR3(R5),R3                  ;RESTORE REGISTERS R3 AND R4
                                003A   146
                                003A   147 ;
                                003A   148 ; DISPATCH FORK PROCESS WITH:
                                003A   149 ;
                                003A   150 ;       R0 THRU R2 = SCRATCH REGISTERS.
                                003A   151 ;       R3 AND R4 = RESTORED FROM FORK BLOCK.
                                003A   152 ;       R5 = ADDRESS OF FORK BLOCK.
                                003A   153 ;
                                003A   154
                51   0C A5  D0  003A   155          MOVL    FKB$L_FPC(R5),R1                  ;SAVE DISPATCH ADDRESS
                         03  BB  003E   156          PUSHR   #^M<R0,R1>                        ;SAVE IPL AND DISPATCH ADDRESS
                         61  16  0040   157          JSB     (R1)                              ;DISPATCH FORK
                         03  BA  0042   158          POPR    #^M<R0,R1>                        ;RESTORE IPL, DISPATCH ADDRESS
                    52   12  DB  0044   159          MFPR    #PR$_IPL,R2                       ;GET EXIT IPL
                    52   50  D1  0047   160          CMPL    R0,R2                             ;EXIT IPL MUST EQUAL ENTRY
                         DA  13  004A   161          BEQL    10$                               ;GO AGAIN
                                004C   162
                                004C   163          BUG_CHECK BADFORKIPL,FATAL                ;BAD FORK EXIT INTERRUPT PRIORITY LEVEL
             00000000'9F    16  004C                JSB     @#BUG$CHECK
2C 4C 50 49 4B 52 4F 46 44 41 42 00' 0052          .ASCIC  "BADFORKIPL,FATAL"
                   4C 41 54 41 46  005E
                                10  0052
                         3F  BA  0063   164 20$:     POPR    #^M<R0,R1,R2,R3,R4,R5>            ;RESTORE FORK PROCESS REGISTER SET
                         02  0065   165          REI                                       ;
```

```
                        0066   166
                        0066   167          .END
```

BUG$CHECK	********	X	02	UCB$L_CPID	0000005C	D	UCB$W_DIRSEQ	00000088	D
EXE$FORK	00000005	RG D	02	UCB$L_CRB	00000020	D	UCB$W_DSTADDR	00000018	D
EXE$FORKDSPTH	00000024	RG D	02	UCB$L_DDB	00000024	D	UCB$W_DX_BCR	000000A4	D
EXE$IOFORK	00000000	RG D	02	UCB$L_DEVCHAR	00000034	D	UCB$W_EC1	00000090	D
FKB$B_FIPL	0000000B	D		UCB$L_DEVDEPEND	0000003C	D	UCB$W_EC2	00000092	D
FKB$B_TYPE	0000000A	D		UCB$L_DPC	00000080	D	UCB$W_ERRCNT	00000072	D
FKB$C_LENGTH	00000018	D		UCB$L_DUETIM	0000005C	D	UCB$W_FUNC	0000007E	D
FKB$K_LENGTH	00000018	D		UCB$L_DX_BFPNT	0000009C	D	UCB$W_MB_SEED	00000000	D
FKB$L_FPC	0000000C	D		UCB$L_DX_BUF	00000098	D	UCB$W_MSGCNT	00000016	D
FKB$L_FQBL	00000004	D		UCB$L_DX_RXDB	000000A0	D	UCB$W_MSGMAX	00000014	D
FKB$L_FQFL	00000000	D		UCB$L_EMB	00000078	D	UCB$W_NT_CHAN	0000007C	D
FKB$L_FR3	00000010	D		UCB$L_FIRST	00000014	D	UCB$W_OFFSET	0000008A	D
FKB$L_FR4	00000014	D		UCB$L_FPC	0000000C	D	UCB$W_REFC	00000050	D
FKB$W_SIZE	00000008	D		UCB$L_FQBL	00000004	D	UCB$W_SIZE	00000008	D
PR$_IPL	= 00000012	D		UCB$L_FQFL	00000000	D	UCB$W_SRCADDR	0000001A	D
PR$_SIRR	= 00000014	D		UCB$L_FR3	00000010	D	UCB$W_STS	00000058	D
SIZ...	= 00000002	D		UCB$L_FR4	00000014	D	UCB$W_TT_DESIZE	000000A5	D
SWI$GL_FQFL	********	X	02	UCB$L_IOQBL	00000044	D	UCB$W_UNIT	00000048	D
UCB$B_AMOD	00000053	D		UCB$L_IOQFL	00000040	D	UCB$W_VPROT	0000001A	D
UCB$B_CEX	00000077	D		UCB$L_IRP	0000004C	D			
UCB$B_CM1	0000004A	D		UCB$L_LINK	0000002C	D			
UCB$B_CM2	0000004B	D		UCB$L_LOGADR	00000064	D			
UCB$B_DEVCLASS	00000038	D		UCB$L_MAXBLOCK	00000084	D			
UCB$B_DEVTYPE	00000039	D		UCB$L_MB_MBX	0000007C	D			
UCB$B_DIPL	00000052	D		UCB$L_MB_PORT	0000008C	D			
UCB$B_DX_SCTCNT	000000A6	D		UCB$L_MB_RAST	00000078	D			
UCB$B_ERTCNT	00000070	D		UCB$L_MB_SHB	00000080	D			
UCB$B_ERTMAX	00000071	D		UCB$L_MB_WAST	00000074	D			
UCB$B_FEX	00000076	D		UCB$L_MB_WIOQBL	00000088	D			
UCB$B_FIPL	0000000B	D		UCB$L_MB_WIOQFL	00000084	D			
UCB$B_LOCSRV	0000003C	D		UCB$L_MEDIA	0000008C	D			
UCB$B_OFFNDX	00000094	D		UCB$L_NT_DATSSB	00000074	D			
UCB$B_OFFRTC	00000095	D		UCB$L_NT_INTSSB	00000078	D			
UCB$B_REMSRV	0000003D	D		UCB$L_OPCNT	00000060	D			
UCB$B_SECTORS	0000003C	D		UCB$L_OWNUIC	0000001C	D			
UCB$B_SLAVE	00000074	D		UCB$L_PID	00000028	D			
UCB$B_SPR	00000075	D		UCB$L_RQBL	00000004	D			
UCB$B_STATE	00000052	D		UCB$L_RQFL	00000000	D			
UCB$B_TRACKS	0000003D	D		UCB$L_SVAPTE	00000068	D			
UCB$B_TT_CRFILL	0000009D	D		UCB$L_SVPN	00000064	D			
UCB$B_TT_DECRF	000000A1	D		UCB$L_TT_DECHAR	000000A8	D			
UCB$B_TT_DELFF	000000A2	D		UCB$L_TT_RDUE	0000008C	D			
UCB$B_TT_DESPEE	000000A0	D		UCB$L_TT_RTIMOU	000000B8	D			
UCB$B_TT_DETYPE	000000A4	D		UCB$L_VCB	00000030	D			
UCB$B_TT_LFFILL	0000009E	D		UCB$T_PARTNER	0000000C	D			
UCB$B_TT_SPEED	0000009C	D		UCB$V_TIM	= 00000000	D			
UCB$B_TYPE	0000000A	D		UCB$W_BCNT	0000006E	D			
UCB$B_VERTSZ	0000003F	D		UCB$W_BCR	00000096	D			
UCB$C_LENGTH	00000074	D		UCB$W_BOFF	0000006C	D			
UCB$C_MB_LENGTH	00000090	D		UCB$W_BUFQUO	00000018	D			
UCB$C_TT_LENGTH	000000BC	D		UCB$W_BYTESTOGO	0000003E	D			
UCB$K_LENGTH	00000074	D		UCB$W_CHARGE	0000004A	D			
UCB$K_MB_LENGTH	00000090	D		UCB$W_CYLINDERS	0000003E	D			
UCB$K_TT_LENGTH	000000BC	D		UCB$W_DA	0000008C	D			
UCB$L_AMB	00000054	D		UCB$W_DC	0000008E	D			
UCB$L_ASTQBL	00000010	D		UCB$W_DEVBUFSIZ	0000003A	D			
UCB$L_ASTQFL	0000000C	D		UCB$W_DEVSTS	0000005A	D			

```
                                    +----------------+
                                    ! Psect synopsis !
                                    +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           000000BC  (  188.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
SEP                             00000066  (  102.)  02 (  2.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD    WRT NOVEC LONG
```

```
                                        +-------------------------+
                                        ! Symbol Cross Reference !
                                        +-------------------------+

SYMBOL          VALUE        DEFINITION      REFERENCES...
------          -----        ----------      -------------
BUG$CHECK       00000000-XR                  163    (3)
EXE$FORK        00000005-R   103    (2)    #-83    (1)
EXE$FORKDSPTH   00000024-R   139    (3)
EXE$IOFORK      00000000-R   82     (1)
FKB$B_FIPL      0000000B                   #-106   (2)
FKB$L_FPC       0000000C                   #-105   (2)    #-155   (3)
FKB$L_FR3       00000010                   #-104   (2)    #-145   (3)
PR$_IPL        =00000012                   #-141   (3)    #-159   (3)
PR$_SIRR       =00000014                   #-110   (2)
SWI$GL_FQFL     00000000-XR                  107    (2)      142   (3)
UCB$V_TIM      =00000000                   #-83    (1)
UCB$W_STS       00000058                     83    (1)

                                        +-------------------------+
                                        ! Performance indicators !
                                        +-------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    25    00:00:00.04    00:00:00.19
Command processing               895    00:00:00.24    00:00:01.40
Pass 1                           437    00:00:00.93    00:00:02.16
Symbol table sort                  0    00:00:00.07    00:00:00.08
Pass 2                            25    00:00:00.23    00:00:00.75
Symbol table output                2    00:00:00.02    00:00:00.06
Psect synopsis output              2    00:00:00.00    00:00:00.00
Cross-reference output             3    00:00:00.01    00:00:00.10
Assembler run totals            1391    00:00:01.54    00:00:04.74

The working set limit was 1900 pages.
55458 bytes (109 pages) of virtual memory were used to buffer the intermediate code.
There were 20 pages of symbol table space allocated to hold 302 non-local and 3 local symbols.
167 source lines were read in Pass 1, producing 29 object records in Pass 2.
15 pages of virtual memory were used to define 14 macros.

                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                  1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1                2
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1               0
SYS$COMMON:[SYSLIB]LIB.MLB;2                             1
SYS$COMMON:[SYSLIB]STARLET.MLB;2                         6
SYS$COMMON:[SYSLIB]STARLET.MLB;2                         0
TOTALS (all libraries)                                  10

503 GETS were required to define 10 macros.
```

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(2) 44 GET TIME

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element GETTIM.MAR
0000     2 ; *1     6-FEB-1986 15:18:41 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element GETTIM.MAR
```

```
                                        .TITLE  GETTIM - SYSTEM SERVICE GET TIME
                                        .IDENT  /01/

                                ;
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                                ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
                                ;
                                ; D. N. CUTLER 30-SEP-76
                                ;
                                ; SYSTEM SERVICE GET TIME
                                ;
                                ; MACRO LIBRARY CALLS
                                ;

                                        $SSDEF                          ;DEFINE SYSTEM STATUS VALUES
                                        .SAVE   LOCAL_BLOCK
                                        .RESTORE

                                ;
                                ; LOCAL SYMBOLS
                                ;
                                ; ARGUMENT LIST OFFSET DEFINITIONS
                                ;

00000004                        TIMADR=4                                ;ADDRESS OF QUADWORD TO RECEIVE TIME
```

```
                                  0000          .SBTTL  GET TIME
                                  0000    ;+
                                  0000    ; EXE$GETTIM - GET TIME
                                  0000    ;
                                  0000    ; THIS SERVICE PROVIDES THE CAPABILITY TO RETRIEVE THE CURRENT SYSTEM TIME
                                  0000    ; IN 64 BIT FORMAT.
                                  0000    ;
                                  0000    ; INPUTS:
                                  0000    ;
                                  0000    ;       TIMADR(AP) = ADDRESS OF QUADWORD THAT IS TO RECEIVE TIME.
                                  0000    ;
                                  0000    ; OUTPUTS:
                                  0000    ;
                                  0000    ;       R0 LOW BIT CLEAR INDICATES FAILURE TO RETRIEVE SYSTEM TIME.
                                  0000    ;
                                  0000    ;               R0 = SS$_ACCVIO - QUADWORD TO RECEIVE TIME CANNOT BE
                                  0000    ;                       WRITTEN BY CALLING ACCESS MODE.
                                  0000    ;
                                  0000    ;       R0 LOW BIT SET INDICATES SUCCESSFUL COMPLETION.
                                  0000    ;
                                  0000    ;               R0 = SS$_NORMAL - NORMAL COMPLETION.
                                  0000    ;-
                                  0000
                              00000000          .PSECT  SEP, SHR, WRT, EXE, LONG
                                  0000    EXE$GETTIM::                                    ;GET TIME
                            0000  0000          .WORD   0                               ;ENTRY MASK
          51    04 AC       D0  0002          MOVL    TIMADR(AP),R1                   ;GET ADDRESS OF QUADWORD TO RECEIVE TIME
             50    0C       3C  0006          MOVZWL  #SS$_ACCVIO,R0                  ;ASSUME QUADWORD NOT WRITABLE
                                  0009          IFNOWRT #8,(R1),10$                     ;CAN QUADWORD BE WRITTEN?
       61    08    00       0D  0009                  PROBEW  #0,#8,(R1)
                   0A       13  000D                  BEQL    10$
   61    00000000'EF       7D  000F          MOVQ    EXE$GQ_SYSTIME,(R1)             ;STORE SYSTEM TIME IN QUADWORD
             50    01       3C  0016          MOVZWL  #SS$_NORMAL,R0                  ;SET NORMAL COMPLETION
                            04  0019    10$:  RET                                     ;
                                  001A
                                  001A          .END
```

```
EXE$GETTIM                  00000000 RG D  02
EXE$GQ_SYSTIME              ********   X   02
SS$_ACCVIO                = 0000000C    D
SS$_NORMAL                = 00000001    D
TIMADR                    = 00000004    D

                                        +----------------+
                                        ! Psect synopsis !
                                        +----------------+

PSECT name                  Allocation          PSECT No.  Attributes
----------                  ----------          ---------  ----------
.  ABS  .                   00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                       00000000  (    0.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
SEP                         0000001A  (   26.)  02 (  2.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD    WRT NOVEC LONG
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
EXE$GETTIM	00000000-R	68 (2)	
EXE$GQ_SYSTIME	00000000-XR		#-73 (2)
SS$_ACCVIO	=0000000C		#-71 (2)
SS$_NORMAL	=00000001		#-74 (2)
TIMADR	=00000004	42 (2)	#-70 (2)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	41	00:00:00.03	00:00:00.24
Command processing	920	00:00:00.24	00:00:01.26
Pass 1	422	00:00:00.75	00:00:01.78
Symbol table sort	0	00:00:00.11	00:00:00.12
Pass 2	28	00:00:00.21	00:00:00.45
Symbol table output	2	00:00:00.00	00:00:00.00
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	4	00:00:00.00	00:00:00.00
Assembler run totals	1421	00:00:01.36	00:00:03.86

The working set limit was 1900 pages.
39972 bytes (79 pages) of virtual memory were used to buffer the intermediate code.
There were 30 pages of symbol table space allocated to hold 413 non-local and 1 local symbols.
77 source lines were read in Pass 1, producing 35 object records in Pass 2.
9 pages of virtual memory were used to define 8 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	1
SYS$COMMON:[SYSLIB]STARLET.MLB;2	4
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	5

473 GETS were required to define 5 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1)   56   GET I/O CHANNEL DEVICE INFORMATION

```
                        0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element GTCHAN.MAR
                        0000     2 ; *1     6-FEB-1986 15:18:43 DS ""
                        0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element GTCHAN.MAR
                        0000     4         .TITLE  GTCHAN  *** GTCHAN Get channel information
                        0000     5         .IDENT  /02-01/
                        0000     6
                        0000     7 ;
                        0000     8 ; COPYRIGHT (C) 1977,, 1980
                        0000     9 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.
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                        0000    24 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
                        0000    25 ;
                        0000    26 ; D. N. CUTLER 22-SEP-76
                        0000    27 ;
                        0000    28 ; MODIFICATION HISTORY
                        0000    29 ;                N. HOWGATE      20-FEB-78       VERSION 02 (ESSAA-4.00).
                        0000    30 ;       01       DIAGNOSTIC SUPERVISOR INTEGRATION
                        0000    31 ;
                        0000    32 ; SYSTEM SERVICE GET I/O CHANNEL DEVICE INFORMATION
                        0000    33
                        0000    34 ;
                        0000    35 ; MACRO LIBRARY CALLS
                        0000    36 ;
                        0000    37
                        0000    38         $CCBDEF                                 ;DEFINE CCB OFFSETS
                        0000               .SAVE   LOCAL_BLOCK
                        0000               .IIF    NB,CCB$L_UCB,   CCB$L_UCB:
00000004                0000                       .BLKL   1
                        0004               .IIF    NB,CCB$L_WIND,  CCB$L_WIND:
00000008                0004                       .BLKL   1
                        0008               .IIF    NB,CCB$B_STS,   CCB$B_STS:
00000009                0008                       .BLKB   1
                        0009               .IIF    NB,CCB$B_AMOD,  CCB$B_AMOD:
0000000A                0009                       .BLKB   1
                        000A               .IIF    NB,CCB$W_IOC,   CCB$W_IOC:
0000000C                000A                       .BLKW   1
                        000C               .IIF    NB,CCB$L_DIRP,  CCB$L_DIRP:
00000010                000C                       .BLKL   1
                        0010               .IIF    NB,CCB$C_LENGTH,        CCB$C_LENGTH:
                        0010               .IIF    NB,CCB$K_LENGTH,        CCB$K_LENGTH:
                        0000               .RESTORE
                        0000    39         $DDBDEF                                 ;DEFINE DDB OFFSETS
                        0000               .SAVE   LOCAL_BLOCK
                        0000               .PSECT  $ABS$,ABS
```

```
                    00000000  0010                .=0
                              0000                .IIF    NB,DDB$L_LINK,  DDB$L_LINK:
                    00000004  0000                        .BLKL   1
                              0004                .IIF    NB,DDB$L_UCB,   DDB$L_UCB:
                    00000008  0004                        .BLKL   1
                              0008                .IIF    NB,DDB$W_SIZE,  DDB$W_SIZE:
                    0000000A  0008                        .BLKW   1
                              000A                .IIF    NB,DDB$B_TYPE,  DDB$B_TYPE:
                    0000000B  000A                        .BLKB   1
                    0000000C  000B                        .BLKB   1
                              000C                .IIF    NB,DDB$L_DDT,   DDB$L_DDT:
                    00000010  000C                        .BLKL   1
                              0010                .IIF    NB,DDB$L_ACPD,  DDB$L_ACPD:
                    00000013  0010                        .BLKB   3
                              0013                .IIF    NB,DDB$B_ACPCLASS,      DDB$B_ACPCLASS:
                    00000014  0013                        .BLKB   1
                              0014                .IIF    NB,DDB$T_NAME,  DDB$T_NAME:
                    00000015  0014                        .BLKB   1
                    00000024  0015                        .BLKB   15
                              0024                .IIF    NB,DDB$T_DRVNAME,       DDB$T_DRVNAME:
                    00000025  0024                        .BLKB   1
                    00000034  0025                        .BLKB   15
                              0034                .IIF    NB,DDB$C_LENGTH,        DDB$C_LENGTH:
                              0034                .IIF    NB,DDB$K_LENGTH,        DDB$K_LENGTH:
                              0000                .RESTORE
                              0000        40      $DEVDEF                         ;DEFINE DEVICE CHARACTERISTICS
                              0000                .SAVE   LOCAL_BLOCK
                              0000                .PSECT  $ABS$,ABS
                    00000000  0034                .=0
                              0000                .RESTORE
                              0000        41      $SSDEF                          ;DEFINE SYSTEM STATUS VALUES
                              0000                .SAVE   LOCAL_BLOCK
                              0000                .PSECT  $ABS$,ABS
                    00000000  0034                .=0
                              0000                .RESTORE
                              0000        42      $UCBDEF                         ;DEFINE UCB OFFSETS
                              0000                .SAVE   LOCAL_BLOCK
                              0000                .PSECT  $ABS$,ABS
                    00000000  0034                .=0
                              0000                .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                              0000                .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
                    00000004  0000                        .BLKL   1
                              0004                .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                              0004                .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
                    00000008  0004                        .BLKL   1
                              0008                .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
                    0000000A  0008                        .BLKW   1
                              000A                .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
                    0000000B  000A                        .BLKB   1
                              000B                .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
                    0000000C  000B                        .BLKB   1
                              000C                .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                              000C                .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                              000C                .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
                    0000000D  000C                        .BLKB   1
                    00000010  000D                        .BLKB   3
                              0010                .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
```

```
                    0010                .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
00000014            0010                        .BLKL   1
                    0014                .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                    0014                .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                    0014                .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
00000016            0014                        .BLKW   1
                    0016                .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
00000018            0016                        .BLKW   1
                    0018                .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                    0018                .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
0000001A            0018                        .BLKW   1
                    001A                .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                    001A                .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
0000001C            001A                        .BLKW   1
                    001C                .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
00000020            001C                        .BLKL   1
                    0020                .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
00000024            0020                        .BLKL   1
                    0024                .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
00000028            0024                        .BLKL   1
                    0028                .IIF    NB,UCB$L_PID,   UCB$L_PID:
0000002C            0028                        .BLKL   1
                    002C                .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
00000030            002C                        .BLKL   1
                    0030                .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
00000034            0030                        .BLKL   1
                    0034                .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
00000038            0034                        .BLKL   1
                    0038                .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
00000039            0038                        .BLKB   1
                    0039                .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
0000003A            0039                        .BLKB   1
                    003A                .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
0000003C            003A                        .BLKW   1
                    003C                .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
                    003C                .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
                    003C                .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
0000003D            003C                        .BLKB   1
                    003D                .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
                    003D                .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
0000003E            003D                        .BLKB   1
                    003E                .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
                    003E                .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
0000003F            003E                        .BLKB   1
                    003F                .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
00000040            003F                        .BLKB   1
                    0040                .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
00000044            0040                        .BLKL   1
                    0044                .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
00000048            0044                        .BLKL   1
                    0048                .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
0000004A            0048                        .BLKW   1
                    004A                .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
                    004A                .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
0000004B            004A                        .BLKB   1
                    004B                .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
0000004C            004B                        .BLKB   1
```

```
                        004C            .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
00000050  004C                                 .BLKL   1
                        0050            .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
00000052  0050                                 .BLKW   1
                        0052            .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
                        0052            .IIF    NB,UCB$B_STATE, UCB$B_STATE:
00000053  0052                                 .BLKB   1
                        0053            .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
00000054  0053                                 .BLKB   1
                        0054            .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
00000058  0054                                 .BLKL   1
                        0058            .IIF    NB,UCB$W_STS,   UCB$W_STS:
0000005A  0058                                 .BLKW   1
                        005A            .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
0000005C  005A                                 .BLKW   1
                        005C            .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
                        005C            .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
00000060  005C                                 .BLKL   1
                        0060            .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
00000064  0060                                 .BLKL   1
                        0064            .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
                        0064            .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
00000068  0064                                 .BLKL   1
                        0068            .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
0000006C  0068                                 .BLKL   1
                        006C            .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
0000006E  006C                                 .BLKW   1
                        006E            .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
00000070  006E                                 .BLKW   1
                        0070            .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
00000071  0070                                 .BLKB   1
                        0071            .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
00000072  0071                                 .BLKB   1
                        0072            .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074  0072                                 .BLKW   1
                        0074            .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
                        0074            .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000  0074          . = 0
                        0000            .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002  0000                                 .BLKW   1
00000074  0002          . = 116
                        0074            .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078  0074                                 .BLKL   1
                        0078            .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C  0078                                 .BLKL   1
                        007C            .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080  007C                                 .BLKL   1
                        0080            .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084  0080                                 .BLKL   1
                        0084            .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088  0084                                 .BLKL   1
                        0088            .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C  0088                                 .BLKL   1
                        008C            .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090  008C                                 .BLKL   1
                        0090            .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
                        0090            .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
```

```
00000074  0090                .= 116
                  0074          .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075  0074                                .BLKB   1
                  0075          .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076  0075                                .BLKB   1
                  0076          .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077  0076                                .BLKB   1
                  0077          .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078  0077                                .BLKB   1
                  0078          .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C  0078                                .BLKL   1
0000007E  007C                                .BLKW   1
                  007E          .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080  007E                                .BLKW   1
                  0080          .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084  0080                                .BLKL   1
00000080  0084                .= 128
00000084  0080                                .BLKL   1
                  0084          .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088  0084                                .BLKL   1
                  0088          .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A  0088                                .BLKW   1
                  008A          .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C  008A                                .BLKW   1
                  008C          .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
                  008C          .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E  008C                                .BLKW   1
                  008E          .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090  008E                                .BLKW   1
                  0090          .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092  0090                                .BLKW   1
                  0092          .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
00000094  0092                                .BLKW   1
                  0094          .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095  0094                                .BLKB   1
                  0095          .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096  0095                                .BLKB   1
                  0096          .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098  0096                                .BLKW   1
00000096  0098                .= 150
00000098  0096                                .BLKW   1
                  0098          .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C  0098                                .BLKL   1
                  009C          .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0  009C                                .BLKL   1
                  00A0          .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
000000A4  00A0                                .BLKL   1
                  00A4          .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
000000A6  00A4                                .BLKW   1
                  00A6          .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
000000A7  00A6                                .BLKB   1
000000A8  00A7                                .BLKB   1
00000074  00A8                .= 116
00000078  0074                                .BLKL   1
0000007C  0078                                .BLKL   1
00000080  007C                                .BLKL   1
00000084  0080                                .BLKL   1
```

```
                     00000088  0084                        .BLKL   1
                     0000008C  0088                        .BLKL   1
                               008C          .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
                     00000090  008C                        .BLKL   1
                     00000094  0090                        .BLKL   1
                     00000098  0094                        .BLKL   1
                     0000009C  0098                        .BLKL   1
                               009C          .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
                     0000009D  009C                        .BLKB   1
                               009D          .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
                     0000009E  009D                        .BLKB   1
                               009E          .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
                     0000009F  009E                        .BLKB   1
                     000000A0  009F                        .BLKB   1
                               00A0          .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
                     000000A1  00A0                        .BLKB   1
                               00A1          .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
                     000000A2  00A1                        .BLKB   1
                               00A2          .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
                     000000A3  00A2                        .BLKB   1
                     000000A4  00A3                        .BLKB   1
                               00A4          .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
                     000000A5  00A4                        .BLKB   1
                               00A5          .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
                     000000A7  00A5                        .BLKW   1
                     000000A8  00A7                        .BLKB   1
                               00A8          .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
                     000000AC  00A8                        .BLKL   1
                     000000B0  00AC                        .BLKL   1
                     000000B4  00B0                        .BLKL   1
                     000000B8  00B4                        .BLKL   1
                               00B8          .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
                     000000BC  00B8                        .BLKL   1
                               00BC          .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
                               00BC          .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
                     00000074  00BC          . = 116
                               0074          .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
                     00000078  0074                        .BLKL   1
                               0078          .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
                     0000007C  0078                        .BLKL   1
                               007C          .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
                     0000007E  007C                        .BLKW   1
                     00000080  007E                        .BLKW   1
                               0000          .RESTORE
                               0000     43
                               0000     44 ;
                               0000     45 ; LOCAL SYMBOLS
                               0000     46 ;
                               0000     47 ; ARGUMENT LIST OFFSET DEFINITIONS
                               0000     48 ;
                               0000     49
                     00000004  0000     50 CHAN=4                                  ;I/O CHANNEL NUMBER
                     00000008  0000     51 PRILEN=8                                ;ADDRESS TO STORE LENGTH OF PRIMARY STRING
                     0000000C  0000     52 PRIBUF=12                               ;ADDRESS OF PRIMARY BUFFER DESCRIPTOR
                     00000010  0000     53 SCDLEN=16                               ;ADDRESS TO STORE LENGTH OF SECONDARY STRING
                     00000014  0000     54 SCDBUF=20                               ;ADDRESS OF SECONDARY BUFFER DESCRIPTOR
```

```
                                0000     56          .SBTTL  GET I/O CHANNEL DEVICE INFORMATION
                                0000     57 ;+
                                0000     58 ; EXE$GTCHAN - GET I/O CHANNEL DEVICE INFORMATION
                                0000     59 ;
                                0000     60 ; THIS SERVICE PROVIDES THE CAPABILITY TO RETRIEVE INFORMATION ABOUT A
                                0000     61 ; DEVICE THAT IS ASSIGNED TO A CHANNEL AND ITS ASSOCIATED DEVICE IF ANY.
                                0000     62 ;
                                0000     63 ; INPUTS:
                                0000     64 ;
                                0000     65 ;       CHAN(AP) = I/O CHANNEL NUMBER.
                                0000     66 ;       PRILEN(AP) = ADDRESS TO STORE LENGTH OF PRIMARY STRING.
                                0000     67 ;       PRIBUF(AP) = ADDRESS OF PRIMARY BUFFER DESCRIPTOR.
                                0000     68 ;       SCDLEN(AP) = ADDRESS TO STORE LENGTH OF SECONDARY STRING.
                                0000     69 ;       SCDBUF(AP) = ADDRESS OF SECONDARY BUFFER DESCRIPTOR.
                                0000     70 ;
                                0000     71 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                                0000     72 ;
                                0000     73 ; OUTPUTS:
                                0000     74 ;
                                0000     75 ;       R0 LOW BIT CLEAR INDICATES FAILURE TO RETRIEVE DEVICE INFORMATION.
                                0000     76 ;
                                0000     77 ;               R0 = SS$_ACCVIO - PRIMARY OR SECONDARY BUFFER DESCRIPTOR
                                0000     78 ;                    CANNOT BE READ BY CALLING ACCESS MODE, OR PRIMARY
                                0000     79 ;                    OR SECONDARY BUFFER CANNOT BE WRITTEN BY CALLING
                                0000     80 ;                    ACCESS MODE.
                                0000     81 ;
                                0000     82 ;               R0 = SS$_IVCHAN - INVALID CHANNEL NUMBER SPECIFIED.
                                0000     83 ;
                                0000     84 ;               R0 = SS$_NOPRIV - SPECIFIED CHANNEL IS NOT ASSIGNED TO A
                                0000     85 ;                    DEVICE OR THE CALLING ACCESS MODE DOES NOT HAVE
                                0000     86 ;                    PRIVILEGE TO ACCESS THE CHANNEL.
                                0000     87 ;
                                0000     88 ;       R0 LOW BIT SET INDICATES SUCCESSFUL COMPLETION.
                                0000     89 ;
                                0000     90 ;               R0 = SS$_BUFFEROVF - NORMAL COMPLETION, ALL CHARACTERISTIC
                                0000     91 ;                    INFORMATION DID NOT FIT IN SPECIFIED BUFFER(S).
                                0000     92 ;
                                0000     93 ;               R0 = SS$_NORMAL - NORMAL COMPLETION, ALL CHARACTERISTIC
                                0000     94 ;                    INFORMATION TRANSFERED.
                                0000     95 ;-
                                0000     96
                          00000000      97          .PSECT  SEP,    SHR,    EXE,    WRT,    LONG
                                0000     98
                            01FC 0000     99 .ENTRY  EXE$GTCHAN,^M<R2,R3,R4,R5,R6,R7,R8>
                                0002    100
    50    04 AC    3C  0002    101          MOVZWL  CHAN(AP),R0             ;GET CHANNEL NUMBER
          FFF7'    30  0006    102          BSBW    IOC$VERIFYCHAN          ;VERIFY CHANNEL NUMBER
       2F 50       E9  0009    103          BLBC    R0,40$                  ;IF LBC INVALID CHANNEL
    55    61       D0  000C    104          MOVL    CCB$L_UCB(R1),R5        ;GET DEVICE UNIT UCB ADDRESS
    54    55       D0  000F    105          MOVL    R5,R4                   ;ASSUME ASSOCIATED UCB NOT SPOOL DEVICE
04 34 A5    06     E1  0012    106          BBC     #DEV$V_SPL,UCB$L_DEVCHAR(R5),10$ ;IF CLR, THEN DEVICE NOT SPOOLED
    54    54 A5    D0  0017    107          MOVL    UCB$L_AMB(R5),R4        ;GET INTERMEDIATE DEVICE UCB ADDRESS
    56    01       3C  001B    108 10$:     MOVZWL  #SS$_NORMAL,R6          ;ASSUME ALL INFO CAN BE RETURNED
    57    08 AC    7D  001E    109          MOVQ    PRILEN(AP),R7           ;GET PRIMARY BUFFER PARAMETERS
          18       10  0022    110          BSBB    FILBUF                  ;FILL PRIMARY BUFFER
    54    54 A5    D0  0024    111          MOVL    UCB$L_AMB(R5),R4        ;ANY ASSOCIATED UCB?
          05       13  0028    112          BEQL    20$                     ;IF EQL NO
```

```
                03 34 A5    06    E1   002A   113           BBC     #DEV$V_SPL,UCB$L_DEVCHAR(R5),30$ ;IF CLR, THEN DEVICE NOT SPOOLED
                      54    55    D0   002F   114 20$:      MOVL    R5,R4                            ;SET SECONDARY DEVICE UCB ADDRESS
                   57   10 AC    7D   0032   115 30$:      MOVQ    SCDLEN(AP),R7                    ;GET SECONDARY BUFFER PARAMETERS
                         04    10   0036   116              BSBB    FILBUF                           ;FILL SECONDARY BUFFER
                      50   56    D0   0038   117              MOVL    R6,R0                            ;SET FINAL REQUEST STATUS
                                04   003B   118 40$:      RET                                      ;
                                     003C   119
                                     003C   120 ;
                                     003C   121 ; SUBROUTINE TO FILL CHARACTERISTIC BUFFER
                                     003C   122 ;
                                     003C   123
                            58       D5   003C   124 FILBUF: TSTL    R8                               ;ANY BUFFER SPECIFIED?
                            43       13   003E   125              BEQL    50$                              ;IF EQL NO
                                          0040   126 ;            IFNORD  #8,(R8),60$                      ;CAN OUTPUT BUFFER DESCRIPTOR BE READ?
                      52    68       3C   0040   127              MOVZWL  (R8),R2                          ;GET SIZE OF OUTPUT BUFFER
                            31       13   0043   128              BEQL    30$                              ;IF EQL NULL
                   53   04 A8       D0   0045   129              MOVL    4(R8),R3                         ;GET ADDRESS OF OUTPUT BUFFER
                                          0049   130 ;            IFNOWRT R2,(R3),60$                      ;CAN ENTIRE BUFFER BE WRITTEN?
                   51   34 A4       DE   0049   131              MOVAL   UCB$L_DEVCHAR(R4),R1             ;GET ADDRESS OF CHARACTERISTICS
                      50   0C       D0   004D   132              MOVL    #12,R0                           ;SET BYTE COUNT
                                    16   0050   133              BSBB    10$                              ;MOVE CHARACTERISTICS TO BUFFER
                   51   48 A4       DE   0052   134              MOVAL   UCB$W_UNIT(R4),R1                ;GET ADDRESS OF UNIT NUMBER
                      50   02       D0   0056   135              MOVL    #2,R0                            ;SET BYTE COUNT
                                    0D   0059   136              BSBB    10$                              ;MOVE UNIT NUMBER OT BUFFER
                   51   24 A4       D0   005B   137              MOVL    UCB$L_DDB(R4),R1                 ;GET ADDRESS OF DDB
                   51   14 A1       DE   005F   138              MOVAL   DDB$T_NAME(R1),R1                ;GET ADDRESS OF GENERIC DEVICE NAME
                      50   61       9A   0063   139              MOVZBL  (R1),R0                          ;GET LENGTH OF NAME IN BYTES
                                    50   D6   0066   140              INCL    R0                               ;ACCOUNT FOR COUNT BYTE
                                    52   D7   0068   141 10$:      DECL    R2                               ;ANY SPACE LEFT IN BUFFER?
                                    08   19   006A   142              BLSS    20$                              ;IF LSS NO
                            83      81   90   006C   143              MOVB    (R1)+,(R3)+                      ;MOVE BYTE TO BUFFER
                              F6    50   F5   006F   144              SOBGTR  R0,10$                           ;ANY MORE BYTES TO MOVE?
                                    07   11   0072   145              BRB     40$                              ;
                                    52   D6   0074   146 20$:      INCL    R2                               ;ADJUST COUNT OF REMAINING BYTES
                50    0601    8F    3C   0076   147 30$:      MOVZWL  #SS$_BUFFEROVF,R0                ;SET BUFFER OVERFLOW
                                    57   D5   007B   148 40$:      TSTL    R7                               ;ADDRESS SPECIFIED TO STORE RESULT LENGTH?
                                    04   13   007D   149              BEQL    50$                              ;IF EQL NO
                                               007F   150 ;            IFNOWRT #2,(R7),60$                      ;CAN LENGTH BE WRITTEN?
                67    68        52    A3   007F   151              SUBW3   R2,(R8),(R7)                     ;CALCULATE LENGTH OF RESULT STRING
                                          05   0083   152 50$:      RSB                                      ;
                      50        0C    3C   0084   153 60$:      MOVZWL  #SS$_ACCVIO,R0                   ;SET ACCESS VIOLATION
                                          04   0087   154              RET                              ;
                                               0088   155
                                               0088   156              .END
```

```
CCB$B_AMOD                      00000009    D
CCB$B_STS                       00000008    D
CCB$C_LENGTH                    00000010    D
CCB$K_LENGTH                    00000010    D
CCB$L_DIRP                      0000000C    D
CCB$L_UCB                       00000000    D
CCB$L_WIND                      00000004    D
CCB$W_IOC                       0000000A    D
CHAN                          = 00000004    D
DDB$B_ACPCLASS                  00000013    D
DDB$B_TYPE                      0000000A    D
DDB$C_LENGTH                    00000034    D
DDB$K_LENGTH                    00000034    D
DDB$L_ACPD                      00000010    D
DDB$L_DDT                       0000000C    D
DDB$L_LINK                      00000000    D
DDB$L_UCB                       00000004    D
DDB$T_DRVNAME                   00000024    D
DDB$T_NAME                      00000014    D
DDB$W_SIZE                      00000008    D
DEV$V_SPL                     = 00000006    D
EXE$GTCHAN                      00000000 RG D   02
FILBUF                          0000003C R  D   02
IOC$VERIFYCHAN                  ********   X   02
PRIBUF                        = 0000000C    D
PRILEN                        = 00000008    D
SCDBUF                        = 00000014    D
SCDLEN                        = 00000010    D
SIZ...                        = 00000002    D
SS$_ACCVIO                    = 0000000C    D
SS$_BUFFEROVF                 = 00000601    D
SS$_NORMAL                    = 00000001    D
UCB$B_AMOD                      00000053    D
UCB$B_CEX                       00000077    D
UCB$B_CM1                       0000004A    D
UCB$B_CM2                       0000004B    D
UCB$B_DEVCLASS                  00000038    D
UCB$B_DEVTYPE                   00000039    D
UCB$B_DIPL                      00000052    D
UCB$B_DX_SCTCNT                 000000A6    D
UCB$B_ERTCNT                    00000070    D
UCB$B_ERTMAX                    00000071    D
UCB$B_FEX                       00000076    D
UCB$B_FIPL                      0000000B    D
UCB$B_LOCSRV                    0000003C    D
UCB$B_OFFNDX                    00000094    D
UCB$B_OFFRTC                    00000095    D
UCB$B_REMSRV                    0000003D    D
UCB$B_SECTORS                   0000003C    D
UCB$B_SLAVE                     00000074    D
UCB$B_SPR                       00000075    D
UCB$B_STATE                     00000052    D
UCB$B_TRACKS                    0000003D    D
UCB$B_TT_CRFILL                 0000009D    D
UCB$B_TT_DECRF                  000000A1    D
UCB$B_TT_DELFF                  000000A2    D
UCB$B_TT_DESPEE                 000000A0    D
UCB$B_TT_DETYPE                 000000A4    D
UCB$B_TT_LFFILL                 0000009E    D
UCB$B_TT_SPEED                  0000009C    D
UCB$B_TYPE                      0000000A    D
UCB$B_VERTSZ                    0000003F    D
UCB$C_LENGTH                    00000074    D
UCB$C_MB_LENGTH                 00000090    D
UCB$C_TT_LENGTH                 000000BC    D
UCB$K_LENGTH                    00000074    D
UCB$K_MB_LENGTH                 00000090    D
UCB$K_TT_LENGTH                 000000BC    D
UCB$L_AMB                       00000054    D
UCB$L_ASTQBL                    00000010    D
UCB$L_ASTQFL                    0000000C    D
UCB$L_CPID                      0000005C    D
UCB$L_CRB                       00000020    D
UCB$L_DDB                       00000024    D
UCB$L_DEVCHAR                   00000034    D
UCB$L_DEVDEPEND                 0000003C    D
UCB$L_DPC                       00000080    D
UCB$L_DUETIM                    0000005C    D
UCB$L_DX_BFPNT                  0000009C    D
UCB$L_DX_BUF                    00000098    D
UCB$L_DX_RXDB                   000000A0    D
UCB$L_EMB                       00000078    D
UCB$L_FIRST                     00000014    D
UCB$L_FPC                       0000000C    D
UCB$L_FQBL                      00000004    D
UCB$L_FQFL                      00000000    D
UCB$L_FR3                       00000010    D
UCB$L_FR4                       00000014    D
UCB$L_IOQBL                     00000044    D
UCB$L_IOQFL                     00000040    D
UCB$L_IRP                       0000004C    D
UCB$L_LINK                      0000002C    D
UCB$L_LOGADR                    00000064    D
UCB$L_MAXBLOCK                  00000084    D
UCB$L_MB_MBX                    0000007C    D
UCB$L_MB_PORT                   0000008C    D
UCB$L_MB_RAST                   00000078    D
UCB$L_MB_SHB                    00000080    D
UCB$L_MB_WAST                   00000074    D
UCB$L_MB_WIOQBL                 00000088    D
UCB$L_MB_WIOQFL                 00000084    D
UCB$L_MEDIA                     0000008C    D
UCB$L_NT_DATSSB                 00000074    D
UCB$L_NT_INTSSB                 00000078    D
UCB$L_OPCNT                     00000060    D
UCB$L_OWNUIC                    0000001C    D
UCB$L_PID                       00000028    D
UCB$L_RQBL                      00000004    D
UCB$L_RQFL                      00000000    D
UCB$L_SVAPTE                    00000068    D
UCB$L_SVPN                      00000064    D
UCB$L_TT_DECHAR                 000000A8    D
UCB$L_TT_RDUE                   0000008C    D
UCB$L_TT_RTIMOU                 000000B8    D
```

```
UCB$L_VCB                    00000030    D
UCB$T_PARTNER                0000000C    D
UCB$W_BCNT                   0000006E    D
UCB$W_BCR                    00000096    D
UCB$W_BOFF                   0000006C    D
UCB$W_BUFQUO                 00000018    D
UCB$W_BYTESTOGO              0000003E    D
UCB$W_CHARGE                 0000004A    D
UCB$W_CYLINDERS              0000003E    D
UCB$W_DA                     0000008C    D
UCB$W_DC                     0000008E    D
UCB$W_DEVBUFSIZ              0000003A    D
UCB$W_DEVSTS                 0000005A    D
UCB$W_DIRSEQ                 00000088    D
UCB$W_DSTADDR                00000018    D
UCB$W_DX_BCR                 000000A4    D
UCB$W_EC1                    00000090    D
UCB$W_EC2                    00000092    D
UCB$W_ERRCNT                 00000072    D
UCB$W_FUNC                   0000007E    D
UCB$W_MB_SEED                00000000    D
UCB$W_MSGCNT                 00000016    D
UCB$W_MSGMAX                 00000014    D
UCB$W_NT_CHAN                0000007C    D
UCB$W_OFFSET                 0000008A    D
UCB$W_REFC                   00000050    D
UCB$W_SIZE                   00000008    D
UCB$W_SRCADDR                0000001A    D
UCB$W_STS                    00000058    D
UCB$W_TT_DESIZE              000000A5    D
UCB$W_UNIT                   00000048    D
UCB$W_VPROT                  0000001A    D

                                  +----------------+
                                  ! Psect synopsis !
                                  +----------------+

PSECT name                   Allocation          PSECT No.  Attributes
----------                   ----------          ---------  ----------
.  ABS  .                    00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                        000000BC  (  188.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
SEP                          00000088  (  136.)  02 (  2.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD    WRT NOVEC LONG
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
CCB$L_UCB	00000000		#-104 (1)
CHAN	=00000004	50 (1)	#-101 (1)
DDB$T_NAME	00000014		138 (1)
DEV$V_SPL	=00000006		#-106 (1) #-113 (1)
EXE$GTCHAN	00000000-R	99 (1)	
FILBUF	0000003C-R	124 (1)	#-110 (1) #-116 (1)
IOC$VERIFYCHAN	00000000-XR		#-102 (1)
PRIBUF	=0000000C	52 (1)	
PRILEN	=00000008	51 (1)	#-109 (1)
SCDBUF	=00000014	54 (1)	
SCDLEN	=00000010	53 (1)	#-115 (1)
SS$_ACCVIO	=0000000C		#-153 (1)
SS$_BUFFEROVF	=00000601		#-147 (1)
SS$_NORMAL	=00000001		#-108 (1)
UCB$L_AMB	00000054		#-107 (1) #-111 (1)
UCB$L_DDB	00000024		#-137 (1)
UCB$L_DEVCHAR	00000034		106 (1) 113 (1) 131 (1)
UCB$W_UNIT	00000048		134 (1)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	26	00:00:00.02	00:00:00.22
Command processing	930	00:00:00.27	00:00:02.28
Pass 1	542	00:00:01.68	00:00:03.08
Symbol table sort	0	00:00:00.19	00:00:00.20
Pass 2	38	00:00:00.42	00:00:00.81
Symbol table output	2	00:00:00.04	00:00:00.23
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	3	00:00:00.01	00:00:00.01
Assembler run totals	1545	00:00:02.63	00:00:06.83

The working set limit was 1900 pages.
94152 bytes (184 pages) of virtual memory were used to buffer the intermediate code.
There were 40 pages of symbol table space allocated to hold 671 non-local and 10 local symbols.
156 source lines were read in Pass 1, producing 51 object records in Pass 2.
15 pages of virtual memory were used to define 14 macros.

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                  0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1                4
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1               0
SYS$COMMON:[SYSLIB]LIB.MLB;2                             0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                         6
SYS$COMMON:[SYSLIB]STARLET.MLB;2                         0
TOTALS (all libraries)                                  10

868 GETS were required to define 10 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element HELP.B32
;    0002  0      ! *2    17-SEP-1987 09:19:30 MEIER "ADDED L AND J AS VALID LETTERS FOR HELP FILE NAMES"
;    0003  0      ! *1     6-FEB-1986 15:18:45 DS ""
;    0004  0      ! DEC/CMS REPLACEMENT HISTORY, Element HELP.B32
;    0005  0      %TITLE '*** HELP Handle HELP command'
;    0006  0      MODULE help (                                   ! Supervisor HELP facility
;    0007  0                   IDENT = '10.10-2'                                              !G:2
;    0008  0                   ) =
;    0009  0      !
;    0010  0      ! Copyright (c) 1980, 1982, 1983, 1984, 1985, 1986, 1987                    !G:2
;    0011  0      ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
;    0012  0      !
;    0013  0      ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
;    0014  0      ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
;    0015  0      ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
;    0016  0      ! MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
;    0017  0      ! EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
;    0018  0      ! TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
;    0019  0      ! REMAIN IN DEC.
;    0020  0      !
;    0021  0      ! THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
;    0022  0      ! AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
;    0023  0      ! CORPORATION.
;    0024  0      !
;    0025  0      ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
;    0026  0      ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
```

```
;    0028  0
;    0029  0     !++
;    0030  0     ! FACILITY: DIAGNOSTIC SUPERVISOR
;    0031  0     !
;    0032  0     ! ABSTRACT:
;    0033  0     !
;    0034  0     !       This module implements a Diagnostic Supervisor HELP command in a
;    0035  0     !       manner more-or-less compatible with VMS.
;    0036  0     !
;    0037  0     ! AUTHOR:       Dave Butenhof   22-jun-1980
;    0038  0     ! MODIFIED BY:
;    0039  0     !
;    0040  0     !               Dave Butenhof 8-sep-1980, version 6.0
;    0041  0     !       1       Convert to use RMS calls for file read.
;    0042  0     !
;    0043  0     !               Dave Butenhof 2-oct-1980, version 6.1
;    0044  0     !       2       Rename entry point to DSX$HELP, since DSV prefix routines
;    0045  0     !               should be JSB entry, whereas DSX is CALLable.
;    0046  0     !               Dave Butenhof, 8-apr-1981, version 6.3
;    0047  0     !       3       On printing other help for not-found key, be sure to skip
;    0048  0     !               the record SAVERFA is pointing to (lest is cause infinite
;    0049  0     !               loop)!
;    0050  0     !              -Dave Butenhof 02-Jun-1981, version 6.4
;    0051  0     !       04      Redefine file specs to make library access more flexible
;    0052  0     !
;    0053  0     !       05      - Dave Butenhof, 03-Feb-1982, Version 6.6
;    0054  0     !               Make KEY_EQUAL be global (as alias DSR$KEY_EQUAL) so
;    0055  0     !               Directory can use it.  Also make it CALL linkage to avoid
;    0056  0     !               complications.
;    0057  0     !
;    0058  0     !       [06]    Dave Butenhof, 29-Mar-1982, version 6.6
;    0059  0     !               Fix bug in READ handling of no-attribute.  Don't check
;    0060  0     !               'last two' characters unless they're really there.
;    0061  0     !       07      Dave butenhof, 20-Apr-1982
;    0062  0     !               Change name HLP$V_HELP to HLP$V_HELP_KEY; LIB now openly defines
;    0063  0     !               something called HLP$V_HELP.
;    0064  0     !
;    0065  0     !       08      Jack Stansbury, 16-Dec-1982, Version 6.11
;    0066  0     !               Changed the field width for qualifiers and other key words to
;    0067  0     !               be 16 rather than 8. This improves the Help output some.
;    0068  0     !
;    0069  0     !       09      M. Baggett,     18-Nov-1983     Version 6.13
;    0070  0     !               The restriction on the second character has been removed.
;    0071  0     !
;    0072  0     !       10      Bob Bergazzi    May 31, 1984    Version 7.0
;    0073  0     !               Edit 09 broke HELP EXAMINE, so fix it and also add support
;    0074  0     !               for all new processors.
;    0075  0     !
;    0076  0     !       11      M. Baggett      3-Jun-1985      Version 8.3
;    0077  0     !               Fixed compare keys routine so ULTRIX text is converted to upper case.
;    0078  0     !               Change AURORA help file to have 'A'.
;    0079  0     !                                                                       !G:2
;    0080  0     !       (Edit #'s are cms generation #'s now)                           !G:2
;    0081  0     !                                                                       !G:2
;    0082  0     !       2       Stephen Meier   16-Sept-87      Version 10.10           !G:2
;    0083  0     !               Added "L" to the list of valid second letters of a help file name.  !G:2
;    0084  0     !--
```

```
;   0085  0
```

```
;    0087  1     BEGIN
;    0088  1     !+
;    0089  1     ! INCLUDE FILES:
;    0090  1     !-
;    0091  1
;    0092  1     LIBRARY '$diag';                    !                                   [04]
;    0093  1
;    0094  1     LIBRARY '$ds';                      !                                   [04]
;    0095  1
;    0096  1     LIBRARY 'sys$library:starlet.l32';
;    0097  1
```

```
;    0099  1      !+
;    0100  1      ! linkages
;    0101  1      !-
;    0102  1
;    0103  1      LINKAGE
;    0104  1          jsb_2 = JSB (REGISTER = 0, REGISTER = 1),
;    0105  1          jsb_3 = JSB (REGISTER = 0, REGISTER = 1, REGISTER = 2);
;    0106  1
```

```
;    0108  1      !+
;    0109  1      ! TABLE OF CONTENTS:
;    0110  1      !-
;    0111  1
;    0112  1      FORWARD ROUTINE
;    0113  1          dsx$help,                          ! Main program
;    0114  1          do_help,                           ! Recursive file search
;    0115  1          is_key_on_line,                    ! Check for key record
;    0116  1          print_keys : NOVALUE,              ! Print keys level 1 - x
;    0117  1          print_text,                        ! Print help text for level
;    0118  1          print_otherhelp,                   ! List all keys at level
;    0119  1          READ,                              ! Read random RFA
;    0120  1          dsr$key_equal,                     ! Compare keys (wildcard, partial match, etc)
;    0121  1          skip_blanks,                       ! Skip spaces/tabs
;    0122  1          scan_word,                         ! Find length of word
;    0123  1          find_char : jsb_2,                 ! Find character on line
;    0124  1          print_crlf : jsb_none NOVALUE;     ! Cause a blank line to magically appear
;    0125  1
```

```
;    0127  1      !+
;    0128  1      ! PSECT definitions:
;    0129  1      !-
;    0130  1      PSECT
;    0131  1          PLIT = data(SHARE, ADDRESSING_MODE (LONG_RELATIVE));
;    0132  1
;    0133  1      PSECT
;    0134  1          GLOBAL = work(NOSHARE, ADDRESSING_MODE (LONG_RELATIVE));
;    0135  1
;    0136  1      PSECT
;    0137  1          CODE = CODE(EXECUTE, SHARE, NOWRITE);
;    0138  1
```

```
;   0140  1     !+
;   0141  1     ! Literals
;   0142  1     !-
;   0143  1
;   0144  1     BIND
;   0145  1         help_help = $ascid ('HELP');                ! Default first level key
;   0146  1      literal
;   0147  1      ultrix_v_mode = 0;                             ! ultrix flag                  [11]
;   0148  1     !
;   0149  1     ! External
;   0150  1     !
;   0151  1      external
;   0152  1             Ultrix_flags    :Byte addressing_mode (long_relative);  ! Flags for ultrix disk struc. [11]
```

```
;   0154  1     !+
;   0155  1     ! OWN storage:
;   0156  1     !-
;   0157  1
;   0158  1     GLOBAL
;   0159  1         helpinfo : bblock [hlp$c_size];          ! Help processing data block
;   0160  1
```

```
;    0162  1      %SBTTL 'Help control routine'
;    0163  1
;    0164  1      GLOBAL ROUTINE dsx$help (desc) =
;    0165  1
;    0166  1      !++
;    0167  1      ! FUNCTIONAL DESCRIPTION
;    0168  1      !       Process HELP command.  Scans appropriate file to extract help text
;    0169  1      !       for keywords
;    0170  1      !
;    0171  1      ! INPUTS
;    0172  1      !       desc    address of descriptor for remainder of command line
;    0173  1      !
;    0174  1      ! IMPLICIT INPUTS
;    0175  1      !       none
;    0176  1      !
;    0177  1      ! OUTPUTS
;    0178  1      !       desc    descriptor is updated to end of line
;    0179  1      !
;    0180  1      ! IMPLICIT OUTPUTS
;    0181  1      !       typeout to console
;    0182  1      !
;    0183  1      ! SIDE EFFECTS
;    0184  1      !       none
;    0185  1      !
;    0186  1      ! RETURN CODES
;    0187  1      !       none
;    0188  1      !--
;    0189  1
```

```
;    0191  2          BEGIN
;    0192  2
;    0193  2          LOCAL
;    0194  2              helpfab : $fab_decl,                    ! FAB block
;    0195  2              helprab : $rab_decl,                    ! RAB block
;    0196  2              startrfa : bblock [rfa$c_length],       ! Beginning of file
;    0197  2              buffer : bblock [hlp$c_maxrecsiz],      ! Allocate input buffer
;    0198  2              nextkey : VECTOR [hlp$c_maxrecsiz, BYTE],
;    0199  2              nextdesc : bblock [dsc$c_s_bln],
;    0200  2              level,
;    0201  2              elipsis,
;    0202  2              keylist : bblock [hlp$c_maxkeys*dsc$c_s_bln];   ! Keyword descriptors
;    0203  2
;    0204  2          MAP
;    0205  2              desc : REF bblock [dsc$c_s_bln];
;    0206  2
;    0207  2          print_crlf ();                              ! Leading blank line
;    0208  2          elipsis = '....';                           ! Three dots
;    0209  2          CH$FILL (0, hlp$c_size, helpinfo);          ! Clear data table
;    0210  2          helpinfo [hlp$l_allhelp] = hlp$c_maxkeys + 1;       ! Init 'allhelp' to deactivate it
;    0211  2          CH$FILL (0, hlp$c_maxkeys*dsc$c_s_bln, keylist);    ! Clear key descriptors
;    0212  2          helpinfo [hlp$l_keylist] = keylist;         ! Set up pointer to keys
;    0213  2          level = 0;
;    0214  2          helpinfo [hlp$l_rab] = helprab;             ! Set up pointer to RMS
;    0215  2              IF      .Ultrix_flags<ultrix_v_mode,1>
;    0216  2               THEN
;    0217  3                   $fab_init (fab = helpfab, dnm = '.hlp', fnm = 'evsaa.hlp')  ! Initialize FAB for Ultrix [11]
;    0218  2              ELSE
;    0219  2                   $fab_init (fab = helpfab, dnm = '.HLP', fnm = 'EVSAA');     ! Initialize FAB
;    0220  2          $rab_init (rab = helprab, fab = helpfab, ubf = buffer, usz = hlp$c_maxrecsiz);      ! Initialize RAB
;    0221  2
;    0222  2          WHILE 1 DO                                  ! Isolate the keywords
;    0223  3              BEGIN
;    0224  3
;    0225  3              BIND
;    0226  3                  curkey = keylist + dsc$c_s_bln*.level : bblock,
;    0227  3                  wildflags = helpinfo [hlp$b_wildflags] : BITVECTOR,
;    0228  3                  keytext = curkey [dsc$a_pointer] : REF VECTOR [, BYTE];
;    0229  3
;    0230  3              LOCAL
;    0231  3                  next_qual,
;    0232  3                  ptr;
;    0233  3
;    0234  3              IF NOT skip_blanks (.desc) THEN EXITLOOP;       ! End of line
;    0235  3
;    0236  3              curkey [dsc$a_pointer] = .desc [dsc$a_pointer]; ! Beginning of a word
;    0237  3              next_qual = find_char (.desc, %C'/');
;    0238  3
;    0239  3              IF .next_qual EQL 0                     ! If we're lookin' at it,
;    0240  3              THEN
;    0241  3                  next_qual = .desc [dsc$w_length];   !  it's a start, not an end
;    0242  3
;    0243  3              curkey [dsc$w_length] =                 ! Find length of word
;    0244  3              MIN (.next_qual, find_char (.desc, %C' '), find_char (.desc, %C'        '));
;    0245  3              desc [dsc$w_length] = .desc [dsc$w_length] -    ! Update descriptor
;    0246  3              .curkey [dsc$w_length];
;    0247  3              desc [dsc$a_pointer] = .desc [dsc$a_pointer] + .curkey [dsc$w_length];
```

```
;    0248  3              ptr = CH$FIND_SUB (.curkey [dsc$w_length], .curkey [dsc$a_pointer], 3, elipsis);
;    0249  3                                                    ! Look for '...' in key
;    0250  3
;    0251  4              IF NOT CH$FAIL (.ptr) AND .ptr EQL (.curkey [dsc$a_pointer] + .curkey [dsc$w_length] - 3)
;    0252  3              THEN                                  ! "<word>..."
;    0253  4                  BEGIN
;    0254  4                  helpinfo [hlp$l_allhelp] = .level + 2;      ! All lower keys wildcarded
;    0255  4                  curkey [dsc$w_length] = .curkey [dsc$w_length] - 3; ! Discard '...'
;    0256  4
;    0257  4                  IF .curkey [dsc$w_length] EQL 0     ! If just '...', wilcard this level, too
;    0258  4                  THEN
;    0259  4                      helpinfo [hlp$l_allhelp] = .helpinfo [hlp$l_allhelp] - 1
;    0260  4                  ELSE
;    0261  4                      level = .level + 1;             ! Count level if '...' had company
;    0262  4
;    0263  4                  INCR i FROM .helpinfo [hlp$l_allhelp] TO hlp$c_maxkeys DO
;    0264  4                      wildflags [.i - 1] = 1;         ! Set the wildcard flags
;    0265  4
;    0266  4                  EXITLOOP                            ! Don't need more keys
;    0267  3                  END;
;    0268  3
;    0269  3              INCR i FROM 0 TO .curkey [dsc$w_length] - 1 DO
;    0270  3
;    0271  3                  IF .keytext [.i] EQL %C'%' OR .keytext [.i] EQL %C'*' THEN wildflags [.level] = 1;
;    0272  3
;    0273  3                                                    ! Set flag if wildcard char.
;    0274  3              level = .level + 1
;    0275  2              END;
;    0276  2
;    0277  2          helpinfo [hlp$l_realkeys] = .level;       ! Number of keys
;    0278  2
;    0279  2          IF .level GTR 0
;    0280  2          THEN                                      ! If there's a key,
;    0281  3              BEGIN                                 ! Check for diagnostic help
;    0282  3
;    0283  3              BIND
;    0284  3                  key1text = keylist [dsc$a_pointer] : REF VECTOR [, BYTE];
;    0285  3
;    0286  4              IF ((.key1text [0] EQL %C'E') OR (.key1text [0] EQL %C'e'))     !                          [11]
;    0287  4                                  AND (.KEY1TEXT [1] EQL %C'V' OR             !                          [10]
;    0288  4                                       .KEY1TEXT [1] EQL %C'v' OR             !                          [11]
;    0289  4                                       .KEY1TEXT [1] EQL %C'S' OR             !                          [10]
;    0290  4                                       .KEY1TEXT [1] EQL %C's' OR             !                          [11]
;    0291  4                                       .KEY1TEXT [1] EQL %C'C' OR             !                          [10]
;    0292  4                                       .KEY1TEXT [1] EQL %C'c' OR             !                          [11]
;    0293  4                                       .KEY1TEXT [1] EQL %C'N' OR             !                          [10]
;    0294  4                                       .KEY1TEXT [1] EQL %C'n' OR             !                          [11]
;    0295  4                                       .KEY1TEXT [1] EQL %C'T' OR             !                          [10]
;    0296  4                                       .KEY1TEXT [1] EQL %C't' OR             !                          [11]
;    0297  4                                       .KEY1TEXT [1] EQL %C'D' OR             !                          [10]
;    0298  4                                       .KEY1TEXT [1] EQL %C'd' OR             !                          [11]
;    0299  4                                       .KEY1TEXT [1] EQL %C'A' OR             !                          [11]
;    0300  4                                       .KEY1TEXT [1] EQL %C'a' OR             !                          [11]
;    0301  4                                       .KEY1TEXT [1] EQL %C'B' OR             !                          [10]
;    0302  4                                       .KEY1TEXT [1] EQL %C'b' OR             !                          [11]
;    0303  4                                       .KEY1TEXT [1] EQL %C'L' OR             !                          [10] !G:2
;    0304  4                                       .KEY1TEXT [1] EQL %C'l' OR             !                          [11] !G:2
```

```
;   0305  4                                        .KEY1TEXT [1] EQL %C'J' OR      !                                [10] !G:2
;   0306  4                                        .KEY1TEXT [1] EQL %C'j' OR      !                                [11] !G:2
;   0307  4                                        .KEY1TEXT [1] EQL %C'Z' OR      !                                [10]
;   0308  4                                        .KEY1TEXT [1] EQL %C'z')        !                                [11]
;   0309  3            THEN
;   0310  4                BEGIN                                   ! Key 1 is actually file specifier for diagnostic help file
;   0311  4                helpfab [fab$l_fna] = .keylist [dsc$a_pointer];     ! Change filename
;   0312  4                helpfab [fab$b_fns] = .keylist [dsc$w_length];
;   0313  4                CH$MOVE ((hlp$c_maxkeys - 1)*dsc$c_s_bln, keylist + dsc$c_s_bln, keylist);
;   0314  4                                                        ! Move other keys down one
;   0315  4                helpinfo [hlp$b_wildflags] = .helpinfo [hlp$b_wildflags]^-1;        ! Move flags down one bit
;   0316  4
;   0317  4                IF .helpinfo [hlp$l_allhelp] LEQ hlp$c_maxkeys
;   0318  4                THEN                                    ! Correct ALLHELP level
;   0319  4                    helpinfo [hlp$l_allhelp] = .helpinfo [hlp$l_allhelp] - 1;
;   0320  4
;   0321  4                helpinfo [hlp$l_realkeys] = .helpinfo [hlp$l_realkeys] - 1
;   0322  4                END
;   0323  4
;   0324  2            END;
;   0325  2
;   0326  2        IF .helpinfo [hlp$l_realkeys] EQL 0 OR .keylist [dsc$w_length] EQL 0
;   0327  2        THEN                                            ! If null first key, make it
;   0328  3            BEGIN                                       ! 'HELP' by default
;   0329  3            CH$MOVE (dsc$c_s_bln, help_help, keylist);
;   0330  3            helpinfo [hlp$l_realkeys] = 1               ! Set one key found
;   0331  2            END;
;   0332  2
;   0333  2        IF NOT .(helpinfo [hlp$b_wildflags])<0, 1, 0>       !  If key 1 not wild
;   0334  2        THEN
;   0335  2
;   0336  3            IF (
;   0337  3
;   0338  3                LOCAL
;   0339  3                    w;
;   0340  3
;   0341  3                dsr$key_equal (help_help, keylist, w))      !  and it matches 'HELP'
;   0342  2            THEN
;   0343  2                helpinfo [hlp$v_help_key] = 1;      !  then set flag                                    [07]
;   0344  2
;   0345  2        startrfa [rfa$l_vbn] = 1;                       ! Start of file
;   0346  2        startrfa [rfa$w_offset] = 0;
;   0347  3        (                                               ! Open the file
;   0348  3
;   0349  3        LOCAL
;   0350  3            stat;
;   0351  3
;   0352  2        stat = $open (fab = helpfab); IF NOT .stat THEN RETURN .stat);
;   0353  2
;   0354  3        IF (.helpfab [fab$b_rat] NEQ 0) OR  ( .Ultrix_flags<ultrix_v_mode,1> EQL 1 )
;   0355  3                                            ! If not no-attribute or ULTRIX          [11]
;   0356  2        THEN
;   0357  2            helpinfo [hlp$v_cr] = 1;                    ! Need explicit CR on typeout
;   0358  2
;   0359  3        (
;   0360  3
;   0361  3        LOCAL
```

```
;    0362  3              stat;
;    0363  3
;    0364  3          stat = $connect (rab = helprab);           ! Connect record stream
;    0365  2          IF NOT .stat THEN RETURN .stat);
;    0366  2          nextdesc [dsc$a_pointer] = nextkey;        ! Set key space for key 1
;    0367  3          (
;    0368  3
;    0369  3          LOCAL
;    0370  3              stat;
;    0371  3
;    0372  3          stat = do_help (1, startrfa, nextdesc);    ! Do everything, recursively
;    0373  2          IF NOT .stat THEN RETURN .stat);
;    0374  3          BEGIN                                      ! Check for tail-end stuff
;    0375  3
;    0376  3          LOCAL
;    0377  3              noerr;
;    0378  3
;    0379  3          startrfa [rfa$l_vbn] = 1;                  ! Reset RFA
;    0380  3          startrfa [rfa$w_offset] = 0;
;    0381  3
;    0382  4          IF NOT (noerr = .helpinfo [hlp$v_foundhelp])       ! If no help found
;    0383  3              OR .helpinfo [hlp$v_help_key]          !  or key 1 was 'HELP'                                  [07]
;    0384  3          THEN
;    0385  4              (
;    0386  4
;    0387  4              LOCAL
;    0388  4                  stat;
;    0389  4
;    0390  4              stat = print_otherhelp (1, startrfa, .noerr);   ! print error and/or otherhelp
;    0391  4              IF NOT .stat THEN RETURN .stat)
;    0392  4
;    0393  2          END;
;    0394  2          print_crlf ();                             ! Cause a trailing CRLF
;    0395  3          $close (fab = helpfab)                     ! Close the file
;    0396  1          END;                                       ! of help

                                                                .TITLE  HELP *** HELP Handle HELP command
                                                                .IDENT  \10.10-2\

                                                                .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                                    50  4C  45  48  00000 P.AAB: .ASCII  \HELP\                                          ;
                                          00000004  00004 P.AAA: .LONG   4                                              ;
                                          00000000' 00008        .ADDRESS P.AAB                                         ;
                            70  6C  68  2E  61  61  73  76  65  0000C P.AAC: .ASCII  \evsaa.hlp\                         ;
                                        70  6C  68  2E  00015 P.AAD: .ASCII  \.hlp\                                     ;
                                    41  41  53  56  45  00019 P.AAE: .ASCII  \EVSAA\                                    ;
                                        50  4C  48  2E  0001E P.AAF: .ASCII  \.HLP\                                     ;

                                                                .PSECT  WORK,NOEXE,2

                                                        00000 HELPINFO::
                                                                .BLKB   46

                                                              HELP_HELP=        P.AAA
                                                              WILDFLAGS=        HELPINFO+44
```

```
                                                                  .EXTRN  ULTRIX_FLAGS, SYS$OPEN
                                                                  .EXTRN  SYS$CONNECT, SYS$CLOSE

                                                                  .PSECT  CODE,NOWRT,  SHR,2

                                                 0FFC 00000       .ENTRY  DSX$HELP, Save R2,R3,R4,R5,R6,R7,R8,R9,R10,-; 0164
                                                                          R11                                         ;
                                  5A      0000V  CF  9E 00002     MOVAB   FIND_CHAR, R10                              ;
                                  59 00000000G   EF  9E 00007     MOVAB   ULTRIX_FLAGS, R9                            ;
                                  58 00000000'   EF  9E 0000E     MOVAB   HELP_HELP, R8                               ;
                                  57 00000000'   EF  9E 00015     MOVAB   HELPINFO, R7                                ;
                                  5E      FD2C   CE  9E 0001C     MOVAB   -724(SP), SP                                ;
                                                0000V 30 00021    BSBW    PRINT_CRLF                                  ; 0207
                                  6E 2E2E2E2E    8F  D0 00024     MOVL    #774778414, ELIPSIS                         ; 0208
        2E          00            6E             00  2C 0002B     MOVC5   #0, (SP), #0, #46, HELPINFO                 ; 0209
                                                 67     00030                                                         ;
                                  67             06  D0 00031     MOVL    #6, HELPINFO                                ; 0210
        28          00            6E             00  2C 00034     MOVC5   #0, (SP), #0, #40, KEYLIST                  ; 0211
                                          08     AE     00039                                                         ;
                            24    A7        08   AE  9E 0003B     MOVAB   KEYLIST, HELPINFO+36                        ; 0212
                                                 56  D4 00040     CLRL    LEVEL                                       ; 0213
                            04    A7      FF6C   CD  9E 00042     MOVAB   HELPRAB, HELPINFO+4                         ; 0214
                                  27             69  E9 00048     BLBC    ULTRIX_FLAGS, 1$                            ; 0215
   0050   8F          00            6E             00  2C 0004B     MOVC5   #0, (SP), #0, #80, $RMS_PTR                 ; 0217
                                          B0     AD     00052                                                         ;
                            B0    AD      5003   8F  B0 00054     MOVW    #20483, $RMS_PTR                            ;
                            C6    AD             02  90 0005A     MOVB    #2, $RMS_PTR+22                             ;
                            CF    AD             02  90 0005E     MOVB    #2, $RMS_PTR+31                             ;
                            DC    AD        08   A8  9E 00062     MOVAB   P.AAC, $RMS_PTR+44                          ;
                            E0    AD        11   A8  9E 00067     MOVAB   P.AAD, $RMS_PTR+48                          ;
                            E4    AD             09  90 0006C     MOVB    #9, $RMS_PTR+52                             ;
                                                 25  11 00070     BRB     2$                                          ;
   0050   8F          00            6E             00  2C 00072 1$: MOVC5   #0, (SP), #0, #80, $RMS_PTR                 ; 0219
                                          B0     AD     00079                                                         ;
                            B0    AD      5003   8F  B0 0007B     MOVW    #20483, $RMS_PTR                            ;
                            C6    AD             02  90 00081     MOVB    #2, $RMS_PTR+22                             ;
                            CF    AD             02  90 00085     MOVB    #2, $RMS_PTR+31                             ;
                            DC    AD        15   A8  9E 00089     MOVAB   P.AAE, $RMS_PTR+44                          ;
                            E0    AD        1A   A8  9E 0008E     MOVAB   P.AAF, $RMS_PTR+48                          ;
                            E4    AD             05  90 00093     MOVB    #5, $RMS_PTR+52                             ;
                            E5    AD             04  90 00097 2$: MOVB    #4, $RMS_PTR+53                             ; 0217
   0044   8F          00            6E             00  2C 0009B     MOVC5   #0, (SP), #0, #68, $RMS_PTR                 ; 0220
                                          FF6C   CD     000A2                                                         ;
                          FF6C    CD      4401   8F  B0 000A5     MOVW    #17409, $RMS_PTR                            ;
                            8C    AD      0100   8F  B0 000AC     MOVW    #256, $RMS_PTR+32                           ;
                            90    AD      0138   CE  9E 000B2     MOVAB   BUFFER, $RMS_PTR+36                         ;
                            A8    AD        B0   AD  9E 000B8     MOVAB   HELPFAB, $RMS_PTR+60                        ;
                                  53        08 AE46  7E 000BD 3$: MOVAQ   KEYLIST[LEVEL], R3                          ; 0226
                                  55        04   A3  9E 000C2     MOVAB   4(R3), R5                                   ; 0228
                                  52        04   AC  D0 000C6     MOVL    DESC, R2                                    ; 0234
                                                 52  DD 000CA     PUSHL   R2                                          ;
                          0000V   CF             01  FB 000CC     CALLS   #1, SKIP_BLANKS                             ;
                                  03             50  E8 000D1     BLBS    R0, 4$                                      ;
                                                00D5 31 000D4     BRW     22$                                         ;
                            04    A3        04   A2  D0 000D7 4$: MOVL    4(R2), 4(R3)                                ; 0236
                                  51             2F  D0 000DC     MOVL    #47, R1                                     ; 0237
                                  50             52  D0 000DF     MOVL    R2, R0                                      ;
```

```
                                  6A  16 000E2          JSB     FIND_CHAR                                  ;
                     54           50  D0 000E4          MOVL    R0, NEXT_QUAL                              ;
                                  03  12 000E7          BNEQ    5$                                         ; 0239
                     54           62  3C 000E9          MOVZWL  (R2), NEXT_QUAL                            ; 0241
                     51           20  D0 000EC 5$:      MOVL    #32, R1                                    ; 0244
                     50           52  D0 000EF          MOVL    R2, R0                                     ;
                                  6A  16 000F2          JSB     FIND_CHAR                                  ;
                     50           54  D1 000F4          CMPL    R4, R0                                     ;
                                  03  15 000F7          BLEQ    6$                                         ;
                     54           50  D0 000F9          MOVL    R0, R4                                     ;
                     51           09  D0 000FC 6$:      MOVL    #9, R1                                     ;
                     50           52  D0 000FF          MOVL    R2, R0                                     ;
                                  6A  16 00102          JSB     FIND_CHAR                                  ;
                     50           54  D1 00104          CMPL    R4, R0                                     ;
                                  03  15 00107          BLEQ    7$                                         ;
                     54           50  D0 00109          MOVL    R0, R4                                     ;
                     63           54  B0 0010C 7$:      MOVW    R4, (R3)                                   ;
                     62           63  A2 0010F          SUBW2   (R3), (R2)                                 ; 0245
                     50           63  3C 00112          MOVZWL  (R3), R0                                   ; 0247
                04   A2           50  C0 00115          ADDL2   R0, 4(R2)                                  ;
                     54           63  3C 00119          MOVZWL  (R3), R4                                   ; 0248
                     54           03  C2 0011C          SUBL2   #3, R4                                     ;
                     52           01  CE 0011F          MNEGL   #1, R2                                     ;
                                  24  11 00122          BRB     12$                                        ;
                                  50  D4 00124 8$:      CLRL    R0                                         ;
        51           52     04    A3  C1 00126 9$:      ADDL3   4(R3), R2, R1                              ;
                   6E40         6041  91 0012B          CMPB    (R0)[R1], ELIPSIS[R0]                      ;
                                  04  13 00130          BEQL    10$                                        ;
                                  50  D4 00132          CLRL    R0                                         ;
                                  07  11 00134          BRB     11$                                        ;
        EC           50           02  F3 00136 10$:     AOBLEQ  #2, R0, 9$                                 ;
                     50           01  CE 0013A          MNEGL   #1, R0                                     ;
                                  09  13 0013D 11$:     BEQL    12$                                        ;
        51           52     04    A3  C1 0013F          ADDL3   4(R3), R2, R1                              ;
                                  51  D7 00144          DECL    R1                                         ;
                                  07  11 00146          BRB     13$                                        ;
        D8           52           54  F3 00148 12$:     AOBLEQ  R4, R2, 8$                                 ;
                     51           01  CE 0014C          MNEGL   #1, R1                                     ;
                     50     01    A1  9E 0014F 13$:     MOVAB   1(R1), PTR                                 ;
                                  33  13 00153          BEQL    18$                                        ; 0251
                     51           63  3C 00155          MOVZWL  (R3), R1                                   ;
                     51     04    A3  C0 00158          ADDL2   4(R3), R1                                  ;
                     51           03  C2 0015C          SUBL2   #3, R1                                     ;
                     51           50  D1 0015F          CMPL    PTR, R1                                    ;
                                  24  12 00162          BNEQ    18$                                        ;
                     67     02    A6  9E 00164          MOVAB   2(R6), HELPINFO                            ; 0254
                     63           03  A2 00168          SUBW2   #3, (R3)                                   ; 0255
                                  04  12 0016B          BNEQ    14$                                        ; 0257
                                  67  D7 0016D          DECL    HELPINFO                                   ; 0259
                                  02  11 0016F          BRB     15$                                        ;
                                  56  D6 00171 14$:     INCL    LEVEL                                      ; 0261
        50           67           01  C3 00173 15$:     SUBL3   #1, HELPINFO, I                            ; 0263
                                  09  11 00177          BRB     17$                                        ;
                     51     FF    A0  9E 00179 16$:     MOVAB   -1(R0), R1                                 ; 0264
        00     2C    A7           51  E2 0017D          BBSS    R1, WILDFLAGS, 17$                         ;
        F3           50           05  F3 00182 17$:     AOBLEQ  #5, I, 16$                                 ;
                                  24  11 00186          BRB     22$                                        ; 0266
```

```
                                                51            63  3C 00188 18$:    MOVZWL  (R3), R1                                ; 0269
                                                50            01  CE 0018B         MNEGL   #1, I                                   ;
                                                              13  11 0018E         BRB     21$                                     ;
                                                25        00 B540 91 00190 19$:    CMPB    a0(R5)[I], #37                          ; 0271
                                                              07  13 00195         BEQL    20$                                     ;
                                                2A        00 B540 91 00197         CMPB    a0(R5)[I], #42                          ;
                                                              05  12 0019C         BNEQ    21$                                     ;
                                    00      2C  A7            56  E2 0019E 20$:    BBSS    LEVEL, WILDFLAGS, 21$                   ;
                                    E9          50            51  F2 001A3 21$:    AOBLSS  R1, I, 19$                              ; 0269
                                                              56  D6 001A7         INCL    LEVEL                                   ; 0274
                                                            FF11  31 001A9         BRW     3$                                      ;
                                            28  A7            56  D0 001AC 22$:    MOVL    LEVEL, HELPINFO+40                      ; 0277
                                                              03  14 001B0         BGTR    24$                                     ; 0279
                                                          00BE    31 001B2 23$:    BRW     28$                                     ;
                                                51        0C  AE  D0 001B5 24$:    MOVL    KEY1TEXT, R1                            ; 0286
                                            45  8F            61  91 001B9         CMPB    (R1), #69                               ;
                                                              06  13 001BD         BEQL    25$                                     ;
                                            65  8F            61  91 001BF         CMPB    (R1), #101                              ;
                                                              ED  12 001C3         BNEQ    23$                                     ;
                                                50        01  A1  9A 001C5 25$:    MOVZBL  1(R1), R0                               ; 0287
                                            56  8F            50  91 001C9         CMPB    R0, #86                                 ;
                                                              7E  13 001CD         BEQL    26$                                     ;
                                            76  8F            50  91 001CF         CMPB    R0, #118                                ; 0288
                                                              78  13 001D3         BEQL    26$                                     ;
                                            53  8F            50  91 001D5         CMPB    R0, #83                                 ; 0289
                                                              72  13 001D9         BEQL    26$                                     ;
                                            73  8F            50  91 001DB         CMPB    R0, #115                                ; 0290
                                                              6C  13 001DF         BEQL    26$                                     ;
                                            43  8F            50  91 001E1         CMPB    R0, #67                                 ; 0291
                                                              66  13 001E5         BEQL    26$                                     ;
                                            63  8F            50  91 001E7         CMPB    R0, #99                                 ; 0292
                                                              60  13 001EB         BEQL    26$                                     ;
                                            4E  8F            50  91 001ED         CMPB    R0, #78                                 ; 0293
                                                              5A  13 001F1         BEQL    26$                                     ;
                                            6E  8F            50  91 001F3         CMPB    R0, #110                                ; 0294
                                                              54  13 001F7         BEQL    26$                                     ;
                                            54  8F            50  91 001F9         CMPB    R0, #84                                 ; 0295
                                                              4E  13 001FD         BEQL    26$                                     ;
                                            74  8F            50  91 001FF         CMPB    R0, #116                                ; 0296
                                                              48  13 00203         BEQL    26$                                     ;
                                            44  8F            50  91 00205         CMPB    R0, #68                                 ; 0297
                                                              42  13 00209         BEQL    26$                                     ;
                                            64  8F            50  91 0020B         CMPB    R0, #100                                ; 0298
                                                              3C  13 0020F         BEQL    26$                                     ;
                                            41  8F            50  91 00211         CMPB    R0, #65                                 ; 0299
                                                              36  13 00215         BEQL    26$                                     ;
                                            61  8F            50  91 00217         CMPB    R0, #97                                 ; 0300
                                                              30  13 0021B         BEQL    26$                                     ;
                                            42  8F            50  91 0021D         CMPB    R0, #66                                 ; 0301
                                                              2A  13 00221         BEQL    26$                                     ;
                                            62  8F            50  91 00223         CMPB    R0, #98                                 ; 0302
                                                              24  13 00227         BEQL    26$                                     ;
                                            4C  8F            50  91 00229         CMPB    R0, #76                                 ; 0303
                                                              1E  13 0022D         BEQL    26$                                     ;
                                            6C  8F            50  91 0022F         CMPB    R0, #108                                ; 0304
                                                              18  13 00233         BEQL    26$                                     ;
                                            4A  8F            50  91 00235         CMPB    R0, #74                                 ; 0305
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                                                    12  13 00239          BEQL    26$                                          ;
                                 6A   8F              50  91 0023B          CMPB    R0, #106                                     ; 0306
                                                     0C  13 0023F          BEQL    26$                                          ;
                                 5A   8F              50  91 00241          CMPB    R0, #90                                      ; 0307
                                                     06  13 00245          BEQL    26$                                          ;
                                 7A   8F              50  91 00247          CMPB    R0, #122                                     ; 0308
                                                     26  12 0024B          BNEQ    28$                                          ;
                                 DC   AD              51  D0 0024D 26$:     MOVL    R1, HELPFAB+44                               ; 0311
                                 E4   AD        08    AE  90 00251          MOVB    KEYLIST, HELPFAB+52                          ; 0312
                08   AE          10   AE              20  28 00256          MOVC3   #32, KEYLIST+8, KEYLIST                      ; 0313
                                     50        2C    A7  9A 0025C          MOVZBL  HELPINFO+44, R0                              ; 0315
                     50              50        FF    8F  78 00260          ASHL    #-1, R0, R0                                  ;
                                 2C   A7              50  90 00265          MOVB    R0, HELPINFO+44                              ;
                                     05              67  D1 00269          CMPL    HELPINFO, #5                                 ; 0317
                                                     02  14 0026C          BGTR    27$                                          ;
                                                     67  D7 0026E          DECL    HELPINFO                                     ; 0319
                                               28    A7  D7 00270 27$:     DECL    HELPINFO+40                                  ; 0321
                                               28    A7  D5 00273 28$:     TSTL    HELPINFO+40                                  ; 0326
                                                     05  13 00276          BEQL    29$                                          ;
                                               08    AE  B5 00278          TSTW    KEYLIST                                      ;
                                                     09  12 0027B          BNEQ    30$                                          ;
                08   AE              68              08  28 0027D 29$:     MOVC3   #8, HELP_HELP, KEYLIST                       ; 0329
                                 28   A7              01  D0 00282          MOVL    #1, HELPINFO+40                              ; 0330
                                     14        2C    A7  E8 00286 30$:     BLBS    HELPINFO+44, 31$                             ; 0333
                                               04    AE  9F 0028A          PUSHAB  W                                            ; 0341
                                               0C    AE  9F 0028D          PUSHAB  KEYLIST                                      ;
                                                     58  DD 00290          PUSHL   R8                                           ;
                            0000V  CF                    03  FB 00292          CALLS   #3, DSR$KEY_EQUAL                        ;
                                     04              50  E9 00297          BLBC    R0, 31$                                      ;
                                   2D   A7              01  88 0029A          BISB2   #1, HELPINFO+45                              ; 0343
                                 FF64   CD              01  D0 0029E 31$:     MOVL    #1, STARTRFA                                 ; 0345
                                               FF68    CD  B4 002A3          CLRW    STARTRFA+4                                   ; 0346
                                                 B0    AD  9F 002A7          PUSHAB  HELPFAB                                      ; 0352
                            00000000G  00                01  FB 002AA          CALLS   #1, SYS$OPEN                             ;
                                     63              50  E9 002B1          BLBC    STAT, 36$                                    ;
                                               CE    AD  95 002B4          TSTB    HELPFAB+30                                   ; 0354
                                                     03  12 002B7          BNEQ    32$                                          ;
                                     04              69  E9 002B9          BLBC    ULTRIX_FLAGS, 33$                            ;
                                   2D   A7              08  88 002BC 32$:     BISB2   #8, HELPINFO+45                              ; 0357
                                               FF6C    CD  9F 002C0 33$:     PUSHAB  HELPRAB                                      ; 0364
                            00000000G  00                01  FB 002C4          CALLS   #1, SYS$CONNECT                          ;
                                     49              50  E9 002CB          BLBC    STAT, 36$                                    ; 0365
                                   34   AE        38    AE  9E 002CE          MOVAB   NEXTKEY, NEXTDESC+4                          ; 0366
                                               30    AE  9F 002D3          PUSHAB  NEXTDESC                                     ; 0372
                                               FF64    CD  9F 002D6          PUSHAB  STARTRFA                                     ;
                                                     01  DD 002DA          PUSHL   #1                                           ;
                                 0000V  CF                    03  FB 002DC          CALLS   #3, DO_HELP                              ;
                                     33              50  E9 002E1          BLBC    STAT, 36$                                    ; 0373
                                 FF64   CD              01  D0 002E4          MOVL    #1, STARTRFA                                 ; 0379
                                               FF68    CD  B4 002E9          CLRW    STARTRFA+4                                   ; 0380
50                   2D   A7                 01              02  EF 002ED          EXTZV   #2, #1, HELPINFO+45, NOERR           ; 0382
                                     04              50  E9 002F3          BLBC    NOERR, 34$                                   ;
                                     10        2D    A7  E9 002F6          BLBC    HELPINFO+45, 35$                             ; 0383
                                                     50  DD 002FA 34$:     PUSHL   NOERR                                        ; 0390
                                               FF64    CD  9F 002FC          PUSHAB  STARTRFA                                     ;
                                                     01  DD 00300          PUSHL   #1                                           ;
                                 0000V  CF                    03  FB 00302          CALLS   #3, PRINT_OTHERHELP                      ;
```

```
                                  0D          50  E9 00307          BLBC    STAT, 36$                                  ; 0391
                                            0000V 30 0030A 35$:     BSBW    PRINT_CRLF                                 ; 0394
                                        B0    AD  9F 0030D          PUSHAB  HELPFAB                                    ; 0395
                         00000000G  00        01  FB 00310          CALLS   #1, SYS$CLOSE                              ;
                                                  04 00317 36$:     RET                                                ; 0396

; Routine Size:  792 bytes,    Routine Base:  CODE + 0000


;   0397  1
```

```
;    0399  1      %SBTTL 'do help stuff'
;    0400  1      ROUTINE do_help (level, firstrfa, key) =
;    0401  1
;    0402  1      !++
;    0403  1      ! FUNCTIONAL DESCRIPTION
;    0404  1      !       Recursive routine to scan for all help.  Each incarnation will call
;    0405  1      !       itself at each matched key of it's level, to scan lower levels of
;    0406  1      !       that key.  Matched keys are printed, lowest level help text is
;    0407  1      !       printed.  If there is no match, the message 'No help for...' is
;    0408  1      !       typed, and a list of other help available is typed.  This list is
;    0409  1      !       typed anyway at the first level if the first level key is 'HELP'.
;    0410  1      !
;    0411  1      ! INPUTS
;    0412  1      !       level           the level of help for which this incarnation is
;    0413  1      !                       to extract help.
;    0414  1      !
;    0415  1      !       firstrfa        The RFA to begin searching the file at.
;    0416  1      !       key             address of descriptor to save our key
;    0417  1      !
;    0418  1      ! IMPLICIT INPUTS
;    0419  1      !       none
;    0420  1      !
;    0421  1      ! OUTPUTS
;    0422  1      !       none
;    0423  1      !
;    0424  1      ! IMPLICIT OUTPUTS
;    0425  1      !       several flags in the HELPINFO block.
;    0426  1      !
;    0427  1      ! SIDE EFFECTS
;    0428  1      !       updates RFA block beyond text used at this level, unless Allhelped
;    0429  1      !
;    0430  1      ! RETURN CODES
;    0431  1      !       none
;    0432  1      !--
;    0433  1
```

```
;    0435  2          BEGIN
;    0436  2
;    0437  2          BIND
;    0438  2              rab = .helpinfo [hlp$l_rab] : bblock,
;    0439  2              curkey = (.helpinfo [hlp$l_keylist] + ((.level - 1)*dsc$c_s_bln)) : bblock;
;    0440  2
;    0441  2          MAP
;    0442  2              key : REF bblock,
;    0443  2              firstrfa : REF bblock;
;    0444  2
;    0445  2          LOCAL
;    0446  2              linelevel,                              ! level of current key line
;    0447  2              qualifier,                              ! Set if curkey begins w/ "/"
;    0448  2              char : BYTE,
;    0449  2              nextkey : VECTOR [hlp$c_maxrecsiz, BYTE],       ! space to hold lower key
;    0450  2              nextdesc : bblock [dsc$c_s_bln],        ! descriptor lower key
;    0451  2              keydesc : bblock [dsc$c_s_bln],
;    0452  2              bound_level,
;    0453  2              lastlevel,                              ! last key level found
;    0454  2              saverfa : bblock [rfa$c_length];        ! Where we started
;    0455  2
;    0456  3          IF .level GTR hlp$c_maxkeys OR (.level GTR .helpinfo [hlp$l_realkeys] AND .level LSS .helpinfo [hlp$l_allhelp
;    0457  3              ])
;    0458  2          THEN
;    0459  2              RETURN 1;                               ! We oughtn't to be here,
;    0460  2
;    0461  2          IF .curkey [dsc$a_pointer] NEQ 0            ! If key is not null
;    0462  2          THEN
;    0463  2              char = .(.curkey [dsc$a_pointer])<0, 8, 0>      ! Get first char of input key
;    0464  2          ELSE
;    0465  2              char = 0;                               ! otherwise, clear it
;    0466  2
;    0467  2          qualifier = .char EQL %C'/';
;    0468  2          bound_level = lastlevel = .level - 1;       ! Init last level found
;    0469  2          CH$MOVE (rfa$c_length, .firstrfa, rab [rab$w_rfa]); ! Set RFA to read
;    0470  2
;    0471  2          DO
;    0472  3              BEGIN                                   ! Find first key of right level
;    0473  3
;    0474  3              LOCAL
;    0475  3                  stat;                               ! status
;    0476  3
;    0477  3              CH$MOVE (rfa$c_length, rab [rab$w_rfa], saverfa);       ! Save start RFA
;    0478  3              stat = READ ();                         ! Read a record
;    0479  3
;    0480  3              IF NOT .stat                            ! If some nasty error hit us
;    0481  3              THEN
;    0482  3
;    0483  3                  IF .stat EQL rms$_eof THEN EXITLOOP ELSE RETURN .stat;      ! Say it didn't work out
;    0484  3
;    0485  3              linelevel = is_key_on_line (keydesc);   ! Get level and key from line
;    0486  3              END
;    0487  4          UNTIL (IF NOT .qualifier THEN (.linelevel LEQ .level) ELSE (.linelevel EQL hlp$c_maxkeys + 1 OR .linelevel
;    0488  3                  LEQ .bound_level))                  ! Qual. search can skip 1 level
;    0489  2              AND .linelevel NEQ 0;                   ! until we find our level, or won't
;    0490  2
;    0491  2          IF .linelevel LSS .level                    ! No help at this level
```

```
;    0492  2              AND NOT .qualifier
;    0493  2          THEN
;    0494  3              BEGIN
;    0495  3              CH$MOVE (rfa$c_length, rab [rab$w_rfa], .firstrfa);     ! Backup RFA
;    0496  3              RETURN 1
;    0497  2              END;
;    0498  2
```

```
;    0500  2
;    0501  2          !+
;    0502  2          ! Now process the file, from current position to the next key of higher level
;    0503  2          ! (i.e., level 2 processing ends when level 1 key is found, level 1
;    0504  2          ! processing ends when end-of-file is reached).
;    0505  2          !-
;    0506  2
;    0507  2          rab [rab$b_rac] = rab$c_rfa;                ! Set random for fst record
;    0508  2
;    0509  2          WHILE 1 DO
;    0510  3              BEGIN
;    0511  3
;    0512  3              LOCAL
;    0513  3                  wildkey,                            ! Flag for wildcarding key
;    0514  3                  stat,                               ! Status
;    0515  3                  linelevel;                          ! level of current line
;    0516  3
;    0517  3              stat = READ ();                         ! Read next record
;    0518  3
;    0519  3              IF NOT .stat
;    0520  3              THEN
;    0521  3
;    0522  3                  IF .stat EQL rms$_eof THEN EXITLOOP ELSE RETURN .stat;
;    0523  3
;    0524  3              linelevel = is_key_on_line (keydesc);   ! Find key on this line
;    0525  3
;    0526  3              IF .linelevel LEQ hlp$c_maxkeys         ! If this is numeric key
;    0527  3                  AND .linelevel GTR 0                !  level (not qualifier)
;    0528  3              THEN
;    0529  3                  lastlevel = .linelevel;             ! then remember it
;    0530  3
;    0531  3              IF .linelevel LEQ .bound_level AND .linelevel NEQ 0 THEN EXITLOOP;      ! Exit if found key we don't want
;    0532  3
;    0533  3              IF .linelevel EQL .level                ! If levels match,
;    0534  3                  OR .level GEQ .helpinfo [hlp$l_allhelp]     !  or ALLHELPed
;    0535  4                  OR (.qualifier                      !  or key is qualifier
;    0536  4                  AND .linelevel EQL hlp$c_maxkeys + 1        !   and so is line
;    0537  4                  AND .lastlevel EQL .bound_level)    !   and it's at right level
;    0538  3              THEN                                    ! This is a possible
;    0539  3
;    0540  3                  IF dsr$key_equal (keydesc, curkey, wildkey) ! Compare the keys
;    0541  3                      OR .level GEQ .helpinfo [hlp$l_allhelp] !  see if all help ('...') used
;    0542  3                  THEN
;    0543  4                      BEGIN                           ! They ARE equal...go to it
;    0544  4
;    0545  4                      BIND
;    0546  4                          keynames = helpinfo [hlp$l_keynames] : VECTOR [hlp$c_maxkeys, LONG];
;    0547  4
;    0548  4                      keynames [.bound_level] = .key; ! Set up static key pointer
;    0549  4                      CH$MOVE (key [dsc$w_length] =   ! Set up key text--all rest
;    0550  4                          .helpinfo [hlp$l_bufdesc] -         !  or record from key on
;    0551  4                          (.keydesc [dsc$a_pointer] - .(helpinfo [hlp$l_bufdesc] + 4)), .keydesc [dsc$a_pointer],
;    0552  4                          .key [dsc$a_pointer]);      ! Copy key to save it
;    0553  4                      helpinfo [hlp$v_qual] = .linelevel EQL hlp$c_maxkeys + 1;       ! Set flag if this is qualifier
;    0554  4
;    0555  4                      IF .level EQL .helpinfo [hlp$l_realkeys]        ! If this is lowest level
;    0556  4                          OR .level GEQ .helpinfo [hlp$l_allhelp]     !  or we want it all
```

```
;    0557  4                    THEN
;    0558  5                        BEGIN
;    0559  5                        helpinfo [hlp$v_foundhelp] = 1;     ! We've found something
;    0560  5                        print_keys (.level);        ! Print out keywords found
;    0561  5                        print_text (.linelevel, .level);    ! Print out text under key
;    0562  5                        rab [rab$b_rac] = rab$c_rfa ! Set random
;    0563  4                        END;
;    0564  4
;    0565  4                    nextdesc [dsc$a_pointer] = nextkey;     ! Set up lower key space
;    0566  5                    (
;    0567  5
;    0568  5                    LOCAL
;    0569  5                        stat;
;    0570  5
;    0571  5                    stat = do_help (.level + 1, rab [rab$w_rfa], nextdesc); ! Find lower level help
;    0572  4                    IF NOT .stat THEN RETURN .stat);
;    0573  4
;    0574  4                    IF .level EQL .helpinfo [hlp$l_realkeys]        ! If lowest level
;    0575  4                    THEN
;    0576  5                        (
;    0577  5
;    0578  5                        LOCAL
;    0579  5                            stat;
;    0580  5
;    0581  5                        stat = print_otherhelp (.level + 1, rab [rab$w_rfa], 1);    ! type lower keys
;    0582  4                        IF NOT .stat THEN RETURN .stat);
;    0583  4
;    0584  4                    IF NOT .wildkey AND .level LSS .helpinfo [hlp$l_allhelp] THEN RETURN 1;
;    0585  4
;    0586  4                    ! If this key wasn't wild, (even implicitly) don't continue searching
;    0587  4                    rab [rab$b_rac] = rab$c_rfa     ! Next loop read is rnd
;    0588  3                    END;                            ! Key found
;    0589  3
;    0590  2                END;                                ! Loop
;    0591  2
```

```
;   0593  2     !+
;   0594  2     ! Now, type out list of other keys at this level if:
;   0595  2     !       o There was no help found at this level (or a lower level)
;   0596  2     !         and this level is the highest wild-carded level or no levels
;   0597  2     !         are wildcarded.
;   0598  2     !       o If this is level 1 and the key was 'HELP' or if no text or
;   0599  2     !         other keys were printed out elsewhere.
;   0600  2     !-
;   0601  3         BEGIN
;   0602  3
;   0603  3         LOCAL
;   0604  3             position,
;   0605  3             size,
;   0606  3             first,
;   0607  3             wildpath;
;   0608  3
;   0609  3         BUILTIN
;   0610  3             FFS;
;   0611  3
;   0612  3         position = 0;
;   0613  3         size = .level - 1;
;   0614  3         wildpath = NOT FFS (position, size,          ! See if wild path here
;   0615  3             helpinfo [hlp$b_wildflags], first);
;   0616  3
;   0617  4         IF ( NOT .helpinfo [hlp$v_foundhelp]         ! If haven't found help
;   0618  5             AND NOT (.level GEQ .helpinfo [hlp$l_allhelp]   !  and not all-helped
;   0619  4             OR .wildpath))                           !  and not wild path
;   0620  3         THEN
;   0621  4             BEGIN                                    !                                                    [03]
;   0622  4
;   0623  4             LOCAL
;   0624  4                 stat;
;   0625  4
;   0626  4             rab [rab$b_rac] = rab$c_rfa;             ! Set to random access                               [03]
;   0627  4             CH$MOVE (6, saverfa, rab [rab$w_rfa]);   ! Copy begin RFA                                     [03]
;   0628  4             stat = READ ();                          ! Position record stream                             [03]
;   0629  4             stat = READ ();                          ! Advance past begin key                             [03]
;   0630  4
;   0631  4             IF NOT .stat THEN RETURN .stat;          !                                                    [03]
;   0632  4
;   0633  4             stat = print_otherhelp (.level, rab [rab$w_rfa], 0);    ! Type out other keys
;   0634  4
;   0635  4             IF NOT .stat THEN RETURN .stat
;   0636  4
;   0637  4             END                                      !                                                    [03]
;   0638  2         END;
;   0639  2
;   0640  2         1
;   0641  1         END;                                         ! of do_help


                                                                KEYNAMES=          HELPINFO+16


                                                  0FFC 00000 DO_HELP:.WORD   Save R2,R3,R4,R5,R6,R7,R8,R9,R10,R11        ; 0400
                                5E     FEDC   CE  9E 00002         MOVAB   -292(SP), SP                                  ;
```

```
                                58 00000000'  EF  D0 00007          MOVL    HELPINFO+4, R8                          ; 0438
                                59        04  AC  D0 0000E          MOVL    LEVEL, R9                               ; 0439
                                5B 00000000'FF49  7E 00012          MOVAQ   @HELPINFO+36[R9], R11                   ;
                                5B            08  C2 0001A          SUBL2   #8, R11                                 ;
                                05            59  D1 0001D          CMPL    R9, #5                                  ; 0456
                                              03  15 00020          BLEQ    1$                                      ;
                                            01ED  31 00022          BRW     29$                                     ;
                     00000000'  EF            59  D1 00025 1$:      CMPL    R9, HELPINFO+40                         ;
                                              09  15 0002C          BLEQ    2$                                      ;
                     00000000'  EF            59  D1 0002E          CMPL    R9, HELPINFO                            ; 0457
                                              73  19 00035          BLSS    12$                                     ;
                                        04    AB  D5 00037 2$:      TSTL    4(R11)                                  ; 0461
                                              06  13 0003A          BEQL    3$                                      ;
                                51      04    BB  90 0003C          MOVB    @4(R11), CHAR                           ; 0463
                                              02  11 00040          BRB     4$                                      ;
                                              51  94 00042 3$:      CLRB    CHAR                                    ; 0465
                                              50  D4 00044 4$:      CLRL    R0                                      ; 0467
                                2F            51  91 00046          CMPB    CHAR, #47                               ;
                                              02  12 00049          BNEQ    5$                                      ;
                                              50  D6 0004B          INCL    R0                                      ;
                                57            50  D0 0004D 5$:      MOVL    R0, QUALIFIER                           ;
                                56      FF    A9  9E 00050          MOVAB   -1(R9), LASTLEVEL                       ; 0468
                                6E            56  D0 00054          MOVL    LASTLEVEL, BOUND_LEVEL                  ;
          10    A8        08    BC            06  28 00057          MOVC3   #6, @FIRSTRFA, 16(R8)                   ; 0469
                          04    AE            57  D2 0005D          MCOML   QUALIFIER, 4(SP)                        ; 0487
          0C    AE        10    A8            06  28 00061 6$:      MOVC3   #6, 16(R8), SAVERFA                     ; 0477
                        0000V   CF            00  FB 00067          CALLS   #0, READ                                ; 0478
                                0A            50  E8 0006C          BLBS    STAT, 7$                                ; 0480
                     0001827A   8F            50  D1 0006F          CMPL    STAT, #98938                            ; 0483
                                              23  13 00076          BEQL    11$                                     ;
                                                  04 00078          RET                                             ;
                                        14    AE  9F 00079 7$:      PUSHAB  KEYDESC                                 ; 0485
                        0000V   CF            01  FB 0007C          CALLS   #1, IS_KEY_ON_LINE                      ;
                                5A            50  D0 00081          MOVL    R0, LINELEVEL                           ;
                                05      04    AE  E9 00084          BLBC    4(SP), 8$                               ; 0487
                                59            5A  D1 00088          CMPL    LINELEVEL, R9                           ;
                                              08  11 0008B          BRB     9$                                      ;
                                06            5A  D1 0008D 8$:      CMPL    LINELEVEL, #6                           ;
                                              05  13 00090          BEQL    10$                                     ;
                                6E            5A  D1 00092          CMPL    LINELEVEL, BOUND_LEVEL                  ; 0488
                                              CA  14 00095 9$:      BGTR    6$                                      ;
                                              5A  D5 00097 10$:     TSTL    LINELEVEL                               ; 0489
                                              C6  13 00099          BEQL    6$                                      ;
                                59            5A  D1 0009B 11$:     CMPL    LINELEVEL, R9                           ; 0491
                                              0D  18 0009E          BGEQ    13$                                     ;
                                09      04    AE  E9 000A0          BLBC    4(SP), 13$                              ; 0492
          08    BC        10    A8            06  28 000A4          MOVC3   #6, 16(R8), @FIRSTRFA                   ; 0495
                                            0165  31 000AA 12$:     BRW     29$                                     ; 0496
                          1E    A8            02  90 000AD 13$:     MOVB    #2, 30(R8)                              ; 0507
                        0000V   CF            00  FB 000B1 14$:     CALLS   #0, READ                                ; 0517
                                0D            50  E8 000B6          BLBS    STAT, 17$                               ; 0519
                     0001827A   8F            50  D1 000B9          CMPL    STAT, #98938                            ; 0522
                                              03  12 000C0          BNEQ    16$                                     ;
                                            00FB  31 000C2 15$:     BRW     27$                                     ;
                                                  04 000C5 16$:     RET                                             ;
                                        14    AE  9F 000C6 17$:     PUSHAB  KEYDESC                                 ; 0524
                        0000V   CF            01  FB 000C9          CALLS   #1, IS_KEY_ON_LINE                      ;
```

```
                                    5A            50  D0 000CE          MOVL    R0, LINELEVEL                                   ;
                                    05            5A  D1 000D1          CMPL    LINELEVEL, #5                                   ; 0526
                                                  07  14 000D4          BGTR    18$                                             ;
                                                  5A  D5 000D6          TSTL    LINELEVEL                                       ; 0527
                                                  03  15 000D8          BLEQ    18$                                             ;
                                    56            5A  D0 000DA          MOVL    LINELEVEL, LASTLEVEL                            ; 0529
                                    6E            5A  D1 000DD 18$:     CMPL    LINELEVEL, BOUND_LEVEL                          ; 0531
                                                  04  14 000E0          BGTR    19$                                             ;
                                                  5A  D5 000E2          TSTL    LINELEVEL                                       ;
                                                  DC  12 000E4          BNEQ    15$                                             ;
                                    59            5A  D1 000E6 19$:     CMPL    LINELEVEL, R9                                   ; 0533
                                                  16  13 000E9          BEQL    20$                                             ;
                         00000000'  EF            59  D1 000EB          CMPL    R9, HELPINFO                                    ; 0534
                                                  0D  18 000F2          BGEQ    20$                                             ;
                                    BA            57  E9 000F4          BLBC    QUALIFIER, 14$                                  ; 0535
                                    06            5A  D1 000F7          CMPL    LINELEVEL, #6                                   ; 0536
                                                  B5  12 000FA          BNEQ    14$                                             ;
                                    6E            56  D1 000FC          CMPL    LASTLEVEL, BOUND_LEVEL                          ; 0537
                                                  B0  12 000FF          BNEQ    14$                                             ;
                                          08      AE  9F 00101 20$:     PUSHAB  WILDKEY                                         ; 0540
                                                  5B  DD 00104          PUSHL   R11                                             ;
                                          1C      AE  9F 00106          PUSHAB  KEYDESC                                         ;
                                    0000V CF                  03  FB 00109          CALLS   #3, DSR$KEY_EQUAL                       ;
                                    09                        50  E8 0010E          BLBS    R0, 21$                                 ;
                         00000000'  EF                        59  D1 00111          CMPL    R9, HELPINFO                            ; 0541
                                                              97  19 00118          BLSS    14$                                     ;
                                    50            0C          AC  D0 0011A 21$:     MOVL    KEY, R0                                 ; 0548
                                    51                        6E  D0 0011E          MOVL    BOUND_LEVEL, R1                         ;
                               00000000'EF41                  50  D0 00121          MOVL    R0, KEYNAMES[R1]                        ;
                                  51 00000000'  EF      18    AE  C3 00129          SUBL3   KEYDESC+4, HELPINFO+12, R1              ; 0551
                                                51 00000000'  EF  C0 00132          ADDL2   HELPINFO+8, R1                          ;
                                                60            51  B0 00139          MOVW    R1, (R0)                                ;
                                04  B0        18  BE            51  28 0013C          MOVC3   R1, @KEYDESC+4, @4(R0)                  ; 0552
                                                                 50  D4 00142          CLRL    R0                                      ; 0553
                                                06               5A  D1 00144          CMPL    LINELEVEL, #6                           ;
                                                                 02  12 00147          BNEQ    22$                                     ;
                                                                 50  D6 00149          INCL    R0                                      ;
00000000'  EF                   01               01            50  F0 0014B 22$:     INSV    R0, #1, #1, HELPINFO+45                 ;
                                   00000000'  EF                 59  D1 00154          CMPL    R9, HELPINFO+40                         ; 0555
                                                                 09  13 0015B          BEQL    23$                                     ;
                                   00000000'  EF                 59  D1 0015D          CMPL    R9, HELPINFO                            ; 0556
                                                                 1B  19 00164          BLSS    24$                                     ;
                                   00000000'  EF                 04  88 00166 23$:     BISB2   #4, HELPINFO+45                         ; 0559
                                                                 59  DD 0016D          PUSHL   R9                                      ; 0560
                                       0000V  CF                 01  FB 0016F          CALLS   #1, PRINT_KEYS                          ;
                                                                 59  DD 00174          PUSHL   R9                                      ; 0561
                                                                 5A  DD 00176          PUSHL   LINELEVEL                               ;
                                       0000V  CF                 02  FB 00178          CALLS   #2, PRINT_TEXT                          ;
                                         1E   A8                 02  90 0017D          MOVB    #2, 30(R8)                              ; 0562
                                         20   AE          24     AE  9E 00181 24$:     MOVAB   NEXTKEY, NEXTDESC+4                     ; 0565
                                                          1C     AE  9F 00186          PUSHAB  NEXTDESC                                ; 0571
                                                          10     A8  9F 00189          PUSHAB  16(R8)                                  ;
                                                          01     A9  9F 0018C          PUSHAB  1(R9)                                   ;
                                       FE6C   CF                 03  FB 0018F          CALLS   #3, DO_HELP                             ;
                                                                 7E  50  E9 00194          BLBC    STAT, 30$                               ; 0572
                                   00000000'  EF                 59  D1 00197          CMPL    R9, HELPINFO+40                         ; 0574
                                                                 10  12 0019E          BNEQ    25$                                     ;
```

```
                                                  01  DD 001A0          PUSHL   #1                                          ; 0581
                                            10    A8  9F 001A2          PUSHAB  16(R8)                                      ;
                                            01    A9  9F 001A5          PUSHAB  1(R9)                                       ;
                          0000V  CF               03  FB 001A8          CALLS   #3, PRINT_OTHERHELP                         ;
                                 65               50  E9 001AD          BLBC    STAT, 30$                                   ; 0582
                                 09         08    AE  E8 001B0 25$:     BLBS    WILDKEY, 26$                                ; 0584
                     00000000'   EF               59  D1 001B4          CMPL    R9, HELPINFO                                ;
                                                  55  19 001BB          BLSS    29$                                         ;
                                               FEED  31 001BD 26$:      BRW     13$                                         ; 0587
                                                  52  D4 001C0 27$:     CLRL    POSITION                                    ; 0612
                                 51         FF    A9  9E 001C2          MOVAB   -1(R9), SIZE                                ; 0613
                                                  50  D4 001C6          CLRL    R0                                          ; 0615
     53 00000000'  EF            51               52  EA 001C8          FFS     POSITION, SIZE, HELPINFO+44, FIRST          ;
                                                  02  12 001D1          BNEQ    28$                                         ;
                                                  50  D6 001D3          INCL    R0                                          ;
                                 50               50  D2 001D5 28$:     MCOML   R0, WILDPATH                                ;
                  32 00000000'   EF               02  E0 001D8          BBS     #2, HELPINFO+45, 29$                        ; 0617
                     00000000'   EF               59  D1 001E0          CMPL    R9, HELPINFO                                ; 0618
                                                  29  18 001E7          BGEQ    29$                                         ;
                                 26               50  E8 001E9          BLBS    WILDPATH, 29$                               ; 0619
                            1E   A8               02  90 001EC          MOVB    #2, 30(R8)                                  ; 0626
              10    A8      0C   AE               06  28 001F0          MOVC3   #6, SAVERFA, 16(R8)                         ; 0627
                          0000V  CF               00  FB 001F6          CALLS   #0, READ                                    ; 0628
                          0000V  CF               00  FB 001FB          CALLS   #0, READ                                    ; 0629
                                 12               50  E9 00200          BLBC    STAT, 30$                                   ; 0631
                                                  7E  D4 00203          CLRL    -(SP)                                       ; 0633
                                            10    A8  9F 00205          PUSHAB  16(R8)                                      ;
                                                  59  DD 00208          PUSHL   R9                                          ;
                          0000V  CF               03  FB 0020A          CALLS   #3, PRINT_OTHERHELP                         ;
                                 03               50  E9 0020F          BLBC    STAT, 30$                                   ; 0635
                                 50               01  D0 00212 29$:     MOVL    #1, R0                                      ; 0641
                                                      04 00215 30$:     RET                                                 ;

; Routine Size:  534 bytes,    Routine Base:  CODE + 0318
```

```
;    0643  1      %SBTTL 'check for key on line'
;    0644  1      ROUTINE is_key_on_line (key) =
;    0645  1
;    0646  1      !++
;    0647  1      ! FUNCTIONAL DESCRIPTION
;    0648  1      !       Scan the current line to see if it has a keyword on it.  The valid
;    0649  1      !       formats for a keyword line are "n key" and "/key" where n is a number
;    0650  1      !       from 1 to hlp$c_maxkeys, and key is a valid symbol (A-Z, a-z, $, _).
;    0651  1      !       It will return n, or hlp$c_maxkeys+1 if the qualifier form "/key" is
;    0652  1      !       found, or 0 if no key is found.
;    0653  1      !
;    0654  1      ! INPUTS
;    0655  1      !       key             address of descriptor of buffer for keyword
;    0656  1      !
;    0657  1      ! IMPLICIT INPUTS
;    0658  1      !       none
;    0659  1      !
;    0660  1      ! OUTPUTS
;    0661  1      !       none
;    0662  1      !
;    0663  1      ! IMPLICIT OUTPUTS
;    0664  1      !       none
;    0665  1      !
;    0666  1      ! SIDE EFFECTS
;    0667  1      !       none
;    0668  1      !
;    0669  1      ! RETURN CODES  (R0)
;    0670  1      !       level of key found
;    0671  1      !       hlp$c_maxkeys+1 if qualifier line
;    0672  1      !       0 if no key found
;    0673  1      !--
;    0674  1
```

```
;    0676  2          BEGIN
;    0677  2
;    0678  2          MAP
;    0679  2              key : REF bblock;
;    0680  2
;    0681  2          BIND
;    0682  2              line = helpinfo [hlp$l_bufdesc] : bblock;
;    0683  2
;    0684  2          LOCAL
;    0685  2              locdesc : bblock [dsc$c_s_bln],
;    0686  2              char : BYTE,
;    0687  2              level;
;    0688  2
;    0689  2          IF .line [dsc$w_length] EQL 0                ! If line is null,
;    0690  2          THEN
;    0691  2              RETURN 0;                                !  then can't be key on it
;    0692  2
;    0693  2          level = 0;                                   ! Initialize level
;    0694  2          CH$MOVE (dsc$c_s_bln, line, locdesc);        ! Initialize local descriptor
;    0695  2          char = CH$RCHAR (.locdesc [dsc$a_pointer]); ! Read first character
;    0696  2
;    0697  3          IF (.char LSSU %C'0'                         ! If not numeric
;    0698  2              OR .char GEQU %C'9') AND .char NEQ %C'/'         ! And not a qualifier line
;    0699  2          THEN
;    0700  2              RETURN 0                                 !  then it's not a key line
;    0701  2          ELSE
;    0702  3              BEGIN                                    !  else it IS a key line
;    0703  3
;    0704  3              IF .char NEQ %C'/'                       ! If it's a normal keyword
;    0705  3              THEN
;    0706  4                  BEGIN
;    0707  4
;    0708  4                  LOCAL
;    0709  4                      ptr,
;    0710  4                      len;
;    0711  4
;    0712  4                  ptr = .locdesc [dsc$a_pointer];      ! Get number ptr, len
;    0713  4                  len = scan_word (locdesc);           !  and scan past it
;    0714  4
;    0715  4                  WHILE .len GTR 0                     ! convert ascii to binary
;    0716  4                      AND CH$RCHAR (.ptr) GEQU %C'0' AND CH$RCHAR (.ptr) LEQU %C'9' DO
;    0717  5                      BEGIN
;    0718  5                      level = .level*10 + (CH$RCHAR_A (ptr) - %C'0');
;    0719  5                      len = .len - 1
;    0720  4                      END;
;    0721  4
;    0722  4                  IF .level GTR hlp$c_maxkeys          ! If level is illegally high,
;    0723  4                  THEN
;    0724  4                      RETURN 0;                        !  don't recognize it
;    0725  4
;    0726  4                  skip_blanks (locdesc)                ! Skip to keyword
;    0727  4                  END
;    0728  3              ELSE
;    0729  3                  level = hlp$c_maxkeys + 1;           ! Specify qualifier
;    0730  3
;    0731  3          key [dsc$a_pointer] = .locdesc [dsc$a_pointer]; ! Remember start of word
;    0732  3          key [dsc$w_length] = MIN (scan_word (locdesc), hlp$c_maxrecsiz) ! Length of string
```

```
;   0733  2          END;
;   0734  2
;   0735  2      .level
;   0736  1      END;                                  ! of is_key_on_line


                                                  LINE=              HELPINFO+8


                                        00FC 00000 IS_KEY_ON_LINE:
                                                        .WORD   Save R2,R3,R4,R5,R6,R7                  ; 0644
                    57 00000000'  EF  9E 00002          MOVAB   LINE, R7                                ;
                    5E            08  C2 00009          SUBL2   #8, SP                                  ;
                                  67  B5 0000C          TSTW    LINE                                    ; 0689
                                  4D  13 0000E          BEQL    5$                                      ;
                                  56  D4 00010          CLRL    LEVEL                                   ; 0693
          6E        67            08  28 00012          MOVC3   #8, LINE, LOCDESC                       ; 0694
                    50       04   BE  90 00016          MOVB    @LOCDESC+4, CHAR                        ; 0695
                    30            50  91 0001A          CMPB    CHAR, #48                               ; 0697
                                  05  1F 0001D          BLSSU   1$                                      ;
                    39            50  91 0001F          CMPB    CHAR, #57                               ; 0698
                                  05  1F 00022          BLSSU   2$                                      ;
                    2F            50  91 00024 1$:      CMPB    CHAR, #47                               ;
                                  34  12 00027          BNEQ    5$                                      ;
                    2F            50  91 00029 2$:      CMPB    CHAR, #47                               ; 0704
                                  3B  13 0002C          BEQL    7$                                      ;
                    52       04   AE  D0 0002E          MOVL    LOCDESC+4, PTR                          ; 0712
                                  5E  DD 00032          PUSHL   SP                                      ; 0713
              0000V CF            01  FB 00034          CALLS   #1, SCAN_WORD                           ;
                    53            50  D0 00039          MOVL    R0, LEN                                 ;
                                  1A  15 0003C 3$:      BLEQ    4$                                      ; 0715
                    30            62  91 0003E          CMPB    (PTR), #48                              ; 0716
                                  15  1F 00041          BLSSU   4$                                      ;
                    39            62  91 00043          CMPB    (PTR), #57                              ;
                                  10  1A 00046          BGTRU   4$                                      ;
          50        56            0A  C5 00048          MULL3   #10, LEVEL, R0                          ; 0718
                    51            82  9A 0004C          MOVZBL  (PTR)+, R1                              ;
                    56       D0 A140  9E 0004F          MOVAB   -48(R1)[R0], LEVEL                      ;
                                  53  D7 00054          DECL    LEN                                     ; 0719
                                  E4  11 00056          BRB     3$                                      ;
                    05            56  D1 00058 4$:      CMPL    LEVEL, #5                               ; 0722
                                  03  15 0005B          BLEQ    6$                                      ;
                                  50  D4 0005D 5$:      CLRL    R0                                      ; 0724
                                      04 0005F          RET                                             ;
                                  5E  DD 00060 6$:      PUSHL   SP                                      ; 0726
              0000V CF            01  FB 00062          CALLS   #1, SKIP_BLANKS                         ;
                                  03  11 00067          BRB     8$                                      ;
                    56            06  D0 00069 7$:      MOVL    #6, LEVEL                               ; 0729
                    52       04   AC  D0 0006C 8$:      MOVL    KEY, R2                                 ; 0731
                04  A2       04   AE  D0 00070          MOVL    LOCDESC+4, 4(R2)                        ;
                                  5E  DD 00075          PUSHL   SP                                      ; 0732
              0000V CF            01  FB 00077          CALLS   #1, SCAN_WORD                           ;
          00000100  8F            50  D1 0007C          CMPL    R0, #256                                ;
                                  05  15 00083          BLEQ    9$                                      ;
                    50     0100   8F  3C 00085          MOVZWL  #256, R0                                ;
                    62            50  B0 0008A 9$:      MOVW    R0, (R2)                                ;
```

```
                    50          56  D0 0008D        MOVL    LEVEL, R0                          ; 0736
                                    04 00090        RET                                        ;

; Routine Size:  145 bytes,    Routine Base:  CODE + 052E
```

```
;    0738  1      %SBTTL 'print key list'
;    0739  1      ROUTINE print_keys (level) : NOVALUE =
;    0740  1
;    0741  1      !++
;    0742  1      ! FUNCTIONAL DESCRIPTION
;    0743  1      !       A list of pointers to string descriptors for keys along the path
;    0744  1      !       to the current level (i.e., key1 descriptor, key2 descriptor, etc.)
;    0745  1      !       is stored in the helpinfo block.  This routine will print, with
;    0746  1      !       the correct indentation, all keys along that path.
;    0747  1      !
;    0748  1      ! INPUTS
;    0749  1      !       level           The current level (lowest key name to output)
;    0750  1      !
;    0751  1      ! IMPLICIT INPUTS
;    0752  1      !       none
;    0753  1      !
;    0754  1      ! OUTPUTS
;    0755  1      !       none
;    0756  1      !
;    0757  1      ! IMPLICIT OUTPUTS
;    0758  1      !       none
;    0759  1      !
;    0760  1      ! SIDE EFFECTS
;    0761  1      !       none
;    0762  1      !
;    0763  1      ! RETURN CODES
;    0764  1      !       none
;    0765  1      !--
;    0766  1
```

```
;   0768  2          BEGIN
;   0769  2
;   0770  2          BIND
;   0771  2              keynames = helpinfo [hlp$l_keynames] : VECTOR [, LONG];
;   0772  2
;   0773  2          INCR i FROM 1 TO .level DO
;   0774  2
;   0775  2              !+
;   0776  2              ! Print; with trailing CRLF unless this is lowest level key and
;   0777  2              ! it's a qualifier.
;   0778  2              !-
;   0779  2
; P 0780  2              $ds_printf ((IF .helpinfo [hlp$v_qual] AND .i EQL .level THEN $ascic ('!/!#* !AS') ELSE $ascic (
;   0781  2                          '!/!#* !AS!/')), .i*2, .keynames [.i - 1]);
;   0782  2
;   0783  1          END;


                                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                 53  41  21  20  2A  23  21  2F  21  09  00022 P.AAG:   .ASCII  <9>\!/!#* !AS\                          ;
          2F  21 53  41  21  20  2A  23  21  2F  21  0B  0002C P.AAH:   .ASCII  <11>\!/!#* !AS!/\                        ;

                                                                KEYNAMES=          HELPINFO+16
                                                                        .EXTRN  DS$PRINTF

                                                                        .PSECT  CODE,NOWRT,  SHR,2

                                                    0004 00000 PRINT_KEYS:
                                                                        .WORD   Save R2                                   ; 0739
                                                 52  D4 00002           CLRL    I                                         ; 0773
                                                 32  11 00004           BRB     4$                                        ;
                                  00000000'EF42  DD 00006 1$:           PUSHL   KEYNAMES-4[I]                             ; 0781
                 7E            52              01  78 0000D           ASHL    #1, I, -(SP)                              ;
                 0F 00000000'  EF              01  E1 00011           BBC     #1, HELPINFO+45, 2$                       ;
                         04    AC              52  D1 00019           CMPL    I, LEVEL                                  ;
                                               09  12 0001D           BNEQ    2$                                        ;
                               50 00000000'    EF  9E 0001F           MOVAB   P.AAG, R0                                 ;
                                               07  11 00026           BRB     3$                                        ;
                               50 00000000'    EF  9E 00028 2$:       MOVAB   P.AAH, R0                                 ;
                                               50  DD 0002F 3$:       PUSHL   R0                                        ;
                    00000000G  9F              03  FB 00031           CALLS   #3, a#DS$PRINTF                           ;
                 C9            52        04    AC  F3 00038 4$:       AOBLEQ  LEVEL, I, 1$                              ; 0773
                                                   04 0003D           RET                                               ; 0783

; Routine Size:  62 bytes,    Routine Base:  CODE + 05BF
```

```
;    0785  1      %SBTTL 'print help text'
;    0786  1      ROUTINE print_text (level, indent) =
;    0787  1
;    0788  1      !++
;    0789  1      ! FUNCTIONAL DESCRIPTION
;    0790  1      !       Print out help text.  Scan from given RFA until another key
;    0791  1      !       line is found, printing each line.  A qualifier key line which
;    0792  1      !       is imbedded within the text for a level is printed out as text.
;    0793  1      !
;    0794  1      ! INPUTS
;    0795  1      !       level           The level for which help is wanted (this can be
;    0796  1      !                       1 to hlp$c_maxkeys; or hlp$c_maxkeys+1 for
;    0797  1      !                       qualifier help)
;    0798  1      !       indent          position of key in input list
;    0799  1      !
;    0800  1      ! IMPLICIT INPUTS
;    0801  1      !       none
;    0802  1      !
;    0803  1      ! OUTPUTS
;    0804  1      !
;    0805  1      ! IMPLICIT OUTPUTS
;    0806  1      !       none
;    0807  1      !
;    0808  1      ! SIDE EFFECTS
;    0809  1      !       none
;    0810  1      !
;    0811  1      ! RETURN CODES
;    0812  1      !       none
;    0813  1      !--
;    0814  1
```

```
;    0816  2          BEGIN
;    0817  2
;    0818  2          LOCAL
;    0819  2              stat,
;    0820  2              logtabs,                        ! Number of logical tabs to indent
;    0821  2              linelevel,                      ! Level of key record
;    0822  2              lastqual,                       ! Flag for qualifier help text
;    0823  2              keydesc : bblock [dsc$c_s_bln];         ! Descriptor for key
;    0824  2
;    0825  2          logtabs = .indent + (IF .level LEQ hlp$c_maxkeys THEN 1 ELSE 0);
;    0826  2
;    0827  2          !+
;    0828  2          ! Now print out lines until we find another qualifier.  Note that
;    0829  2          ! unless we are looking for qualifier help, or we are in ALLHELP
;    0830  2          ! mode, a qualifier key line counts as text!
;    0831  2          !-
;    0832  2
;    0833  2          lastqual = 1;                           ! Pre-set switch so it works
;    0834  2
;    0835  2          WHILE
;    0836  3              BEGIN
;    0837  3              stat = READ ();                     ! Read next record
;    0838  3
;    0839  3              IF NOT .stat AND .stat NEQ rms$_eof THEN RETURN .stat;
;    0840  3
;    0841  4              BEGIN
;    0842  4
;    0843  4              IF NOT .stat
;    0844  4              THEN
;    0845  4                  0                           ! If end of file, no more text
;    0846  4              ELSE
;    0847  5                  BEGIN
;    0848  5                  linelevel = is_key_on_line (keydesc);       ! Get help key
;    0849  6                  (.linelevel EQL 0                   ! continue if no key on line
;    0850  7                  OR (.level EQL hlp$c_maxkeys + 1 AND .lastqual)     ! or second qual in row
;    0851  7                  OR (.linelevel EQL hlp$c_maxkeys + 1        ! or qual line and not printing
;    0852  6                  AND .level LEQ hlp$c_maxkeys))      ! qualifier help
;    0853  5                  END
;    0854  5
;    0855  4              END
;    0856  3              END
;    0857  2          DO
;    0858  3              BEGIN
;    0859  3              lastqual = (IF .linelevel EQL hlp$c_maxkeys + 1 THEN 1 ELSE 0);
;    0860  4              $ds_printf ($ascic ('!/!#* !AS'), .logtabs*2, helpinfo [hlp$l_bufdesc])
;    0861  2              END;
;    0862  2
;    0863  2          print_crlf ();                          ! Force double space after text
;    0864  2          .stat
;    0865  1          END;                                    ! of print_text


                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                 53  41  21  20  2A  23  21  2F  21  09  00038 P.AAI:  .ASCII  <9>\!/!#* !AS\                    ;
```

```
                                                                .PSECT  CODE,NOWRT,  SHR,2

                                                  0FFC 00000 PRINT_TEXT:
                                                                .WORD   Save R2,R3,R4,R5,R6,R7,R8,R9,R10,R11          ; 0786
                          5E                 08  C2 00002       SUBL2   #8, SP                                        ;
                                             56  D4 00005       CLRL    R6                                            ; 0825
                          05          04     AC  D1 00007       CMPL    LEVEL, #5                                     ;
                                             07  14 0000B       BGTR    1$                                            ;
                                             56  D6 0000D       INCL    R6                                            ;
                          50                 01  D0 0000F       MOVL    #1, R0                                        ;
                                             02  11 00012       BRB     2$                                            ;
                                             50  D4 00014 1$:   CLRL    R0                                            ;
                          50          08     AC  C0 00016 2$:   ADDL2   INDENT, LOGTABS                               ;
                          52                 01  D0 0001A       MOVL    #1, LASTQUAL                                  ; 0833
                 55       50                 01  78 0001D       ASHL    #1, LOGTABS, R5                               ; 0860
                     0000V CF                 00  FB 00021 3$:   CALLS   #0, READ                                      ; 0837
                          53                 50  D0 00026       MOVL    R0, STAT                                      ;
                          0C                 53  E8 00029       BLBS    STAT, 4$                                      ; 0839
                 0001827A 8F                 53  D1 0002C       CMPL    STAT, #98938                                  ;
                                             46  12 00033       BNEQ    10$                                           ;
                          40                 53  E9 00035       BLBC    STAT, 9$                                      ; 0843
                                             5E  DD 00038 4$:   PUSHL   SP                                            ; 0848
                     FEF2 CF                 01  FB 0003A       CALLS   #1, IS_KEY_ON_LINE                            ;
                          54                 50  D0 0003F       MOVL    R0, LINELEVEL                                 ;
                                             11  13 00042       BEQL    6$                                            ; 0849
                          06          04     AC  D1 00044       CMPL    LEVEL, #6                                     ; 0850
                                             03  12 00048       BNEQ    5$                                            ;
                          08                 52  E8 0004A       BLBS    LASTQUAL, 6$                                  ;
                          06                 54  D1 0004D 5$:   CMPL    LINELEVEL, #6                                 ; 0851
                                             26  12 00050       BNEQ    9$                                            ;
                          23                 56  E9 00052       BLBC    R6, 9$                                        ; 0852
                          06                 54  D1 00055 6$:   CMPL    LINELEVEL, #6                                 ; 0859
                                             05  12 00058       BNEQ    7$                                            ;
                          52                 01  D0 0005A       MOVL    #1, LASTQUAL                                  ;
                                             02  11 0005D       BRB     8$                                            ;
                                             52  D4 0005F 7$:   CLRL    LASTQUAL                                      ;
                             00000000'       EF  9F 00061 8$:   PUSHAB  HELPINFO+8                                    ; 0860
                                             55  DD 00067       PUSHL   R5                                            ;
                             00000000'       EF  9F 00069       PUSHAB  P.AAI                                         ;
                 00000000G 9F                 03  FB 0006F       CALLS   #3, a#DS$PRINTF                               ;
                                             A9  11 00076       BRB     3$                                            ;
                                         0000V 30 00078 9$:     BSBW    PRINT_CRLF                                    ; 0863
                          50                 53  D0 0007B 10$:  MOVL    STAT, R0                                      ; 0865
                                                 04 0007E       RET                                                   ;

; Routine Size:  127 bytes,    Routine Base:  CODE + 05FD
```

```
;    0867  1      %SBTTL 'List other keys'
;    0868  1      ROUTINE print_otherhelp (level, keyrfa, errflg) =
;    0869  1
;    0870  1      !++
;    0871  1      ! FUNCTIONAL DESCRIPTION
;    0872  1      !       When the search for a help key fails, or if the key is level 1, and
;    0873  1      !       is 'HELP', a list is printed of all 'other' help keys valid for
;    0874  1      !       that level.
;    0875  1      !
;    0876  1      ! INPUTS
;    0877  1      !       level           The level for which keys are to be listed
;    0878  1      !       keyrfa          The RFA to begin scan at (immediately following the
;    0879  1      !                       RFA for the next highest level)
;    0880  1      !       errflg          0 if 'no keys found' message should be typed
;    0881  1      !
;    0882  1      ! IMPLICIT INPUTS
;    0883  1      !       none
;    0884  1      !
;    0885  1      ! OUTPUTS
;    0886  1      !
;    0887  1      ! IMPLICIT OUTPUTS
;    0888  1      !       none
;    0889  1      !
;    0890  1      ! SIDE EFFECTS
;    0891  1      !       Updates RAB RFA past keys
;    0892  1      !
;    0893  1      ! RETURN CODES
;    0894  1      !       none
;    0895  1      !--
;    0896  1
```

```
;    0898  2          BEGIN
;    0899  2
;    0900  2          BIND
;    0901  2              rab = .helpinfo [hlp$l_rab] : bblock,
;    0902  2              fmt = $ascic ('!/  !AD'),                  ! Format output line
;    0903  2              otherinfo = $ascic ('!/  Additional information available:!/');
;    0904  2
;    0905  2          LOCAL
;    0906  2              qualine,                                   ! Flag for qualifier line
;    0907  2              no_qual_yet,                               ! Flag for qual. line found
;    0908  2              lastlevel,                                 ! Last key level found
;    0909  2              linelevel,                                 ! Level of current record
;    0910  2              first,                                     ! First-time flag
;    0911  2              linecol,                                   ! Current column of line
;    0912  2              ptr,                                       ! Pointer to output buffer
;    0913  2              keydesc : bblock [dsc$c_s_bln],            ! Key descriptor
;    0914  2              outbuf : VECTOR [hlp$c_maxrecsiz, BYTE];       ! Output buffer
;    0915  2
```

```
;   0917  2     %SBTTL 'PrintHeader'
;   0918  2         ROUTINE printheader (err, lev) : jsb_2 NOVALUE =
;   0919  3             BEGIN
;   0920  3
;   0921  3             BIND
;   0922  3                 nodocmsg = $ascic ('!/  Sorry, no documentation on !AS !AS !AS !AS !AS!/'),
;   0923  3                 keylist = .helpinfo [hlp$l_keylist] : VECTOR [, LONG];
;   0924  3
;   0925  3             IF NOT .err
;   0926  3             THEN
;   0927  4                 BEGIN
;   0928  4                 helpinfo [hlp$v_foundhelp] = 1;     ! Say we found something.
;   0929  4                 print_keys (.lev - 1);              ! Print keys to next higher
;   0930  5                 $ds_printf (nodocmsg, keylist [0], keylist [2], keylist [4], keylist [6], keylist [8])
;   0931  5                                                     ! Print out "no help" msg
;   0932  3                 END;
;   0933  3
;   0934  4             $ds_printf (otherinfo)
;   0935  2             END;


                                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                                44  41  21  20  20  2F  21  07  00042 P.AAJ:  .ASCII  <7>\!/  !AD\                                  ;
6C  61  6E  6F  69  74  69  64  64  41  20  20  2F  21  27  0004A P.AAK:  .ASCII  \'!/  Additional information available:!/\  ;
76  61  20  6E  6F  69  74  61  6D  72  6F  66  6E  69  20  00059                                                                ;
                    2F  21  3A  65  6C  62  61  6C  69  61  00068                                                                ;
20  6F  6E  20  2C  79  72  72  6F  53  20  20  2F  21  34  00072 P.AAL:  .ASCII  \4!/  Sorry, no documentation on !AS !AS \  ;
6F  20  6E  6F  69  74  61  74  6E  65  6D  75  63  6F  64  00081                                                                ;
                    20  53  41  21  20  53  41  21  20  6E  00090                                                                ;
        2F  21  53  41  21  20  53  41  21  20  53  41  21  0009A         .ASCII  \!AS !AS !AS!/\                                ;

                                                                FMT=                P.AAJ
                                                                OTHERINFO=          P.AAK
                                                                NODOCMSG=           P.AAL


                                                                        .PSECT  CODE,NOWRT,  SHR,2

                                                    52  DD 00000 PRINTHEADER:
                                                                        PUSHL   R2                                          ; 0918
                            52 00000000'            EF  D0 00002        MOVL    HELPINFO+36, R2                             ; 0923
                            2A                      50  E8 00009        BLBS    ERR, 1$                                     ; 0925
                00000000'   EF                      04  88 0000C        BISB2   #4, HELPINFO+45                             ; 0928
                                        FF          A1  9F 00013        PUSHAB  -1(LEV)                                     ; 0929
                    FF28    CF                      01  FB 00016        CALLS   #1, PRINT_KEYS                              ;
                                        20          A2  9F 0001B        PUSHAB  32(R2)                                      ; 0930
                                        18          A2  9F 0001E        PUSHAB  24(R2)                                      ;
                                        10          A2  9F 00021        PUSHAB  16(R2)                                      ;
                                        08          A2  9F 00024        PUSHAB  8(R2)                                       ;
                                                    52  DD 00027        PUSHL   R2                                          ;
                                00000000'           EF  9F 00029        PUSHAB  NODOCMSG                                    ;
                00000000G   9F                      06  FB 0002F        CALLS   #6, a#DS$PRINTF                             ;
                                00000000'           EF  9F 00036 1$:    PUSHAB  OTHERINFO                                   ; 0934
                00000000G   9F                      01  FB 0003C        CALLS   #1, a#DS$PRINTF                             ;
                                                    04  BA 00043        POPR    #^M<R2>                                     ; 0935
```

```
                                05 00045        RSB                                     ;

; Routine Size:  70 bytes,    Routine Base:  CODE + 067C
```

```
;    0937  2      %SBTTL 'print_otherhelp main code'
;    0938  2
;    0939  2          IF .level GEQ .helpinfo [hlp$l_allhelp] OR .helpinfo [hlp$v_qual] THEN RETURN 1;
;    0940  2
;    0941  2          first = 1;                                  ! Set first-time flag
;    0942  2          lastlevel = .level - 1;                     ! Init last key found
;    0943  2          no_qual_yet = 1;                            ! Haven't found qualifier yet
;    0944  2          ptr = CH$PTR (outbuf);
;    0945  2          linecol = 0;                                ! Set column pointer
;    0946  2          CH$MOVE (rfa$c_length, .keyrfa, rab [rab$w_rfa]);   ! Initialize local RFA
;    0947  2          rab [rab$b_rac] = rab$c_rfa;                ! Set random access
;    0948  2
;    0949  2          WHILE
;    0950  3              BEGIN
;    0951  3
;    0952  3              LOCAL
;    0953  3                  stat;
;    0954  3
;    0955  3              stat = READ ();                         ! Read next record
;    0956  3              rab [rab$b_rac] = rab$c_seq;            ! Set back to sequential
;    0957  3
;    0958  3              IF NOT .stat AND .stat NEQ rms$_eof THEN RETURN .stat;
;    0959  3
;    0960  4              BEGIN
;    0961  4
;    0962  4              IF NOT .stat
;    0963  4              THEN
;    0964  5                  (0)
;    0965  4              ELSE
;    0966  5                  BEGIN
;    0967  5                  linelevel = is_key_on_line (keydesc);
;    0968  5
;    0969  5                  IF (.linelevel GTR 0) AND (.linelevel LEQ hlp$c_maxkeys) THEN lastlevel = .linelevel;
;    0970  5
;    0971  5                  qualine = (IF (.linelevel LEQ hlp$c_maxkeys) OR (.lastlevel NEQ .level) THEN 0 ELSE 1);
;    0972  6                  ((.linelevel GEQ .level) OR (.linelevel EQL 0))
;    0973  5                  END
;    0974  5
;    0975  4              END
;    0976  3              END
;    0977  2          DO
;    0978  2
;    0979  2              IF (.linelevel EQL .level) OR .qualine  ! Type keys & qualifiers
;    0980  2              THEN
;    0981  3                  BEGIN
;    0982  3
;    0983  3                  LOCAL
;    0984  3                      length,
;    0985  3                      reallen,
;    0986  3                      outlen;
;    0987  3
;    0988  3                  reallen = .helpinfo [hlp$l_bufdesc] - (.keydesc [dsc$a_pointer] - .(helpinfo [hlp$l_bufdesc] + 4));
;    0989  3                                                      ! Length of rest of record
;    0990  3                  !+
;    0991  3                  ! At this point, the following are true:
;    0992  3                  !   RealLen = the length of the key word or the qualifier to be printed
;    0993  3                  !   LineCol = Current column in the line (starting at 0)
```

```
;    0994  3                !-
;    0995  3
;    0996  3                !+
;    0997  3                ! Now set Length to the length of the key word plus at least one space
;    0998  3                ! and make the Length modulo 15. That is, if the RealLen of the key word
;    0999  3                ! is 8, the Length will be 15 (15 mod 15 = 0). If the RealLen of the key
;    1000  3                ! word is 15, the Length will be 30 (30 mod 15 = 0). In this second
;    1001  3                ! example, the one space required after the key word makes it 16 plus the
;    1002  3                ! additional spaces (for which 14 wuld be needed to bring it to the next
;    1003  3                ! field).
;    1004  3                !-
;    1005  3
;    1006  3                length = ((.reallen + 15) / 15) * 15;
;    1007  3
;    1008  3                outlen = CH$DIFF (.ptr, CH$PTR (outbuf));
;    1009  3
;    1010  4                IF ((.outlen + .length) GTR 78) OR (.no_qual_yet AND .qualine)
;    1011  3                THEN
;    1012  4                    BEGIN
;    1013  4
;    1014  4                    IF .qualine THEN no_qual_yet = 0;
;    1015  4
;    1016  4                    IF .first THEN printheader (.errflg, .level);
;    1017  4
;    1018  4                    first = 0;
;    1019  4                    $ds_printf (fmt, .outlen, outbuf);
;    1020  4                    ptr = CH$PTR (outbuf);
;    1021  4                    linecol = 0
;    1022  3                    END;
;    1023  3
;    1024  3                ptr = CH$COPY (.reallen, .keydesc [dsc$a_pointer], %C' ', .length, .ptr);
;    1025  3                                                ! Copy key into output descriptor
;    1026  3                linecol = .linecol + .length    ! Update column count
;    1027  2                END;
;    1028  2
;    1029  2            IF .linecol GTR 0                   ! If we have a partial line left,
;    1030  2            THEN
;    1031  3                BEGIN
;    1032  3
;    1033  3                IF .first THEN printheader (.errflg, .level);
;    1034  3
;    1035  4                $ds_printf ($ascic ('!/  !AD!/'), CH$DIFF (.ptr, CH$PTR (outbuf)), outbuf)
;    1036  2                END;
;    1037  2
;    1038  2            1
;    1039  1            END;                                ! of print_otherhelp


                                                            .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                    2F  21  44  41  21  20  20  2F  21  09  000A7 P.AAM:  .ASCII  <9>\!/  !AD!/\                    ;


                                                            .PSECT  CODE,NOWRT,  SHR,2
```

```
                                                  0FFC 00000 PRINT_OTHERHELP:
                                                                  .WORD   Save R2,R3,R4,R5,R6,R7,R8,R9,R10,R11          ; 0868
                          5E      FEE8   CE  9E 00002             MOVAB   -280(SP), SP                                  ;
                          56 00000000'   EF  D0 00007             MOVL    HELPINFO+4, R6                                ; 0901
                          57        04   AC  D0 0000E             MOVL    LEVEL, R7                                     ; 0939
              00000000'   EF             57  D1 00012             CMPL    R7, HELPINFO                                  ;
                                         03  19 00019             BLSS    2$                                            ;
                                      011A  31 0001B 1$:          BRW     18$                                           ;
          F5 00000000'   EF             01  E0 0001E 2$:          BBS     #1, HELPINFO+45, 1$                           ;
                    04   AE             01  D0 00026             MOVL    #1, FIRST                                     ; 0941
                    08   AE        FF   A7  9E 0002A             MOVAB   -1(R7), LASTLEVEL                             ; 0942
                    0C   AE             01  D0 0002F             MOVL    #1, NO_QUAL_YET                               ; 0943
                          5A        10   AE  9E 00033             MOVAB   OUTBUF, PTR                                   ; 0944
                                         6E  D4 00037             CLRL    LINECOL                                       ; 0945
      10   A6       08   BC             06  28 00039             MOVC3   #6, @KEYRFA, 16(R6)                           ; 0946
                    1E   A6             02  90 0003F             MOVB    #2, 30(R6)                                    ; 0947
                 0000V   CF             00  FB 00043 3$:          CALLS   #0, READ                                      ; 0955
                                   1E   A6  94 00048             CLRB    30(R6)                                        ; 0956
                          10             50  E8 0004B             BLBS    STAT, 5$                                      ; 0958
              0001827A   8F             50  D1 0004E             CMPL    STAT, #98938                                  ;
                                         01  13 00055             BEQL    4$                                            ;
                                            04 00057             RET                                                   ;
                          03             50  E8 00058 4$:          BLBS    STAT, 5$                                      ; 0962
                                      00B0  31 0005B             BRW     16$                                           ;
                                   F8   AD  9F 0005E 5$:          PUSHAB  KEYDESC                                       ; 0967
                 FE06   CF             01  FB 00061             CALLS   #1, IS_KEY_ON_LINE                            ;
                          59             50  D0 00066             MOVL    R0, LINELEVEL                                 ;
                                         09  15 00069             BLEQ    6$                                            ; 0969
                          05             59  D1 0006B             CMPL    LINELEVEL, #5                                 ;
                                         04  14 0006E             BGTR    6$                                            ;
                    08   AE             59  D0 00070             MOVL    LINELEVEL, LASTLEVEL                          ;
                          05             59  D1 00074 6$:          CMPL    LINELEVEL, #5                                 ; 0971
                                         06  15 00077             BLEQ    7$                                            ;
                          57        08   AE  D1 00079             CMPL    LASTLEVEL, R7                                 ;
                                         04  13 0007D             BEQL    8$                                            ;
                                         5B  D4 0007F 7$:          CLRL    QUALINE                                       ;
                                         03  11 00081             BRB     9$                                            ;
                          5B             01  D0 00083 8$:          MOVL    #1, QUALINE                                   ;
                          57             59  D1 00086 9$:          CMPL    LINELEVEL, R7                                 ; 0972
                                         04  18 00089             BGEQ    10$                                           ;
                                         59  D5 0008B             TSTL    LINELEVEL                                     ;
                                         7F  12 0008D             BNEQ    16$                                           ;
                          57             59  D1 0008F 10$:         CMPL    LINELEVEL, R7                                 ; 0979
                                         03  13 00092             BEQL    11$                                           ;
                          AC             5B  E9 00094             BLBC    QUALINE, 3$                                   ;
          50 00000000'   EF        FC   AD  C3 00097 11$:         SUBL3   KEYDESC+4, HELPINFO+12, R0                    ; 0988
          53             50 00000000'   EF  C1 000A0             ADDL3   HELPINFO+8, R0, REALLEN                       ;
                          50        0F   A3  9E 000A8             MOVAB   15(R3), R0                                    ; 1006
                          50             0F  C6 000AC             DIVL2   #15, R0                                       ;
          58             50             0F  C5 000AF             MULL3   #15, R0, LENGTH                               ;
                          50        10   AE  9E 000B3             MOVAB   OUTBUF, R0                                    ; 1008
          52             5A             50  C3 000B7             SUBL3   R0, PTR, OUTLEN                               ;
          50             52             58  C1 000BB             ADDL3   LENGTH, OUTLEN, R0                            ; 1010
              0000004E   8F             50  D1 000BF             CMPL    R0, #78                                       ;
                                         07  14 000C6             BGTR    12$                                           ;
                          32        0C   AE  E9 000C8             BLBC    NO_QUAL_YET, 15$                              ;
                          2F             5B  E9 000CC             BLBC    QUALINE, 15$                                  ;
```

```
                                  03          5B  E9 000CF 12$:   BLBC    QUALINE, 13$                                  ; 1014
                                        0C    AE  D4 000D2        CLRL    NO_QUAL_YET                                   ;
                                  0A    04    AE  E9 000D5 13$:   BLBC    FIRST, 14$                                    ; 1016
                                  51          57  D0 000D9        MOVL    R7, R1                                        ;
                                  50    0C    AC  D0 000DC        MOVL    ERRFLG, R0                                    ;
                                            FED7  30 000E0        BSBW    PRINTHEADER                                   ;
                                        04    AE  D4 000E3 14$:   CLRL    FIRST                                         ; 1018
                                        10    AE  9F 000E6        PUSHAB  OUTBUF                                        ; 1019
                                              52  DD 000E9        PUSHL   OUTLEN                                        ;
                                  00000000'   EF  9F 000EB        PUSHAB  FMT                                           ;
                        00000000G 9F          03  FB 000F1        CALLS   #3, a#DS$PRINTF                               ;
                                  5A    10    AE  9E 000F8        MOVAB   OUTBUF, PTR                                   ; 1020
                                              6E  D4 000FC        CLRL    LINECOL                                       ; 1021
     58           20        FC    BD          53  2C 000FE 15$:   MOVC5   REALLEN, aKEYDESC+4, #32, LENGTH, (PTR)       ; 1024
                                              6A     00104                                                              ;
                                  5A          53  D0 00105        MOVL    R3, PTR                                       ;
                                  6E          58  C0 00108        ADDL2   LENGTH, LINECOL                               ; 1026
                                            FF35  31 0010B        BRW     3$                                            ; 0949
                                              6E  D5 0010E 16$:   TSTL    LINECOL                                       ; 1029
                                              26  15 00110        BLEQ    18$                                           ;
                                  0A    04    AE  E9 00112        BLBC    FIRST, 17$                                    ; 1033
                                  51          57  D0 00116        MOVL    R7, R1                                        ;
                                  50    0C    AC  D0 00119        MOVL    ERRFLG, R0                                    ;
                                            FE9A  30 0011D        BSBW    PRINTHEADER                                   ;
                                        10    AE  9F 00120 17$:   PUSHAB  OUTBUF                                        ; 1035
                                  50    14    AE  9E 00123        MOVAB   OUTBUF, R0                                    ;
                        7E        5A          50  C3 00127        SUBL3   R0, PTR, -(SP)                                ;
                                  00000000'   EF  9F 0012B        PUSHAB  P.AAM                                         ;
                        00000000G 9F          03  FB 00131        CALLS   #3, a#DS$PRINTF                               ;
                                  50          01  D0 00138 18$:   MOVL    #1, R0                                        ; 1039
                                                  04 0013B        RET                                                   ;

; Routine Size:  316 bytes,    Routine Base:  CODE + 06C2
```

```
;    1041  1      %SBTTL 'Read random record'
;    1042  1      ROUTINE READ =
;    1043  1
;    1044  1      !++
;    1045  1      ! FUNCTIONAL DESCRIPTION
;    1046  1      !       Read a logical record from the current help file
;    1047  1      !
;    1048  1      ! INPUTS
;    1049  1      !
;    1050  1      ! IMPLICIT INPUTS
;    1051  1      !       helpinfo        HELP module storage block
;    1052  1      !       RAB
;    1053  1      !
;    1054  1      ! OUTPUTS
;    1055  1      !       none
;    1056  1      !
;    1057  1      ! IMPLICIT OUTPUTS
;    1058  1      !       helpinfo [hlp$l_bufdesc] is set to describe the record read.
;    1059  1      !
;    1060  1      ! SIDE EFFECTS
;    1061  1      !       none
;    1062  1      !
;    1063  1      ! RETURN CODES  (R0)
;    1064  1      !       SS$_NORMAL
;    1065  1      !       any RMS error code
;    1066  1      !--
;    1067  1
```

```
;    1069  2          BEGIN
;    1070  2
;    1071  2          LOCAL
;    1072  2              len,
;    1073  2              ptr,
;    1074  2              stat;
;    1075  2
;    1076  2          BIND
;    1077  2              rab = .helpinfo [hlp$l_rab] : bblock,   ! Map to RAB
;    1078  2              fab = .rab [rab$l_fab] : bblock;        ! Map to FAB
;    1079  2
;    1080  2          stat = $get (rab = rab);                    ! Read a record
;    1081  2          rab [rab$b_rac] = rab$c_seq;                ! Restore sequential access
;    1082  2          len = .rab [rab$w_rsz];                     ! Get length
;    1083  2          ptr = .rab [rab$l_rbf];                     !  and address
;    1084  2              IF      .Ultrix_flags<ultrix_v_mode,1>
;    1085  2              THEN
;    1086  2              ELSE
;    1087  3                 BEGIN
;    1088  3          IF .fab [fab$b_rat] EQL fab$m_ftn           ! If fortran format
;    1089  3              AND .len GTR 0                          !  and not null record
;    1090  3          THEN
;    1091  4              BEGIN
;    1092  4              len = .len - 1;                         ! Lose the CR byte
;    1093  4              ptr = .ptr + 1
;    1094  3              END;
;    1095  3
;    1096  3          IF .fab [fab$b_rat] EQL 0                   ! If no attribute
;    1097  3              AND .len GEQ 2                          ! .. and there are two chars                    [06]
;    1098  3              AND .(.ptr + .len - 2)<0, 16> EQL %X'0a0d'      ! .. and last chars are CRLF
;    1099  3          THEN
;    1100  3              len = .len - 2;                         ! Slice off CRLF
;    1101  2              END;
;    1102  2          helpinfo [hlp$l_bufdesc] = .len;            ! Length read
;    1103  2          helpinfo [hlp$l_bufdesc] + 4 = .ptr;
;    1104  2
;    1105  2          IF .stat EQL rms$_rfa THEN stat = rms$_eof; ! Fake error type if bad RFA
;    1106  2
;    1107  2          .stat
;    1108  1          END;                                        ! of read


                                                        .EXTRN  SYS$GET

                                        000C 00000 READ:    .WORD   Save R2,R3                              ; 1042
                              52 00000000'  EF  D0 00002        MOVL    HELPINFO+4, R2                    ; 1077
                              53       3C   A2  D0 00009        MOVL    60(R2), R3                        ; 1078
                                            52  DD 0000D        PUSHL   R2                                ; 1080
                    00000000G  00           01  FB 0000F        CALLS   #1, SYS$GET                       ;
                                         1E   A2  94 00016        CLRB    30(R2)                           ; 1081
                              51         22   A2  3C 00019        MOVZWL  34(R2), LEN                      ; 1082
                              52         28   A2  D0 0001D        MOVL    40(R2), PTR                      ; 1083
                              26 00000000G    EF  E8 00021        BLBS    ULTRIX_FLAGS, 2$                 ; 1084
                              01         1E   A3  91 00028        CMPB    30(R3), #1                       ; 1088
                                              08  12 0002C        BNEQ    1$                               ;
                                              51  D5 0002E        TSTL    LEN                              ; 1089
```

```
                                        04  15 00030          BLEQ    1$                                  ;
                                        51  D7 00032          DECL    LEN                                 ; 1092
                                        52  D6 00034          INCL    PTR                                 ; 1093
                                  1E    A3  95 00036 1$:      TSTB    30(R3)                              ; 1096
                                        13  12 00039          BNEQ    2$                                  ;
                          02            51  D1 0003B          CMPL    LEN, #2                             ; 1097
                                        0E  19 0003E          BLSS    2$                                  ;
                                  FE A142  9F 00040          PUSHAB  -2(LEN)[PTR]                        ; 1098
                    0A0D  8F            9E  B1 00044          CMPW    @(SP)+, #2573                       ;
                                        03  12 00049          BNEQ    2$                                  ;
                          51            02  C2 0004B          SUBL2   #2, LEN                             ; 1100
                00000000'  EF           51  7D 0004E 2$:      MOVQ    LEN, HELPINFO+8                     ; 1102
                0001865C  8F            50  D1 00055          CMPL    STAT, #99932                        ; 1105
                                        07  12 0005C          BNEQ    3$                                  ;
                          50 0001827A   8F  D0 0005E          MOVL    #98938, STAT                        ;
                                            04 00065 3$:      RET                                         ; 1108

; Routine Size:  102 bytes,    Routine Base:  CODE + 07FE
```

```
;    1110  1      %SBTTL 'compare keys'
;    1111  1
;    1112  1      GLOBAL ROUTINE dsr$key_equal (key1, key2, wildcompare) =
;    1113  1
;    1114  1      !++
;    1115  1      ! FUNCTIONAL DESCRIPTION
;    1116  1      !       Using wildcard characters ('*' and '%') compare two strings.
;    1117  1      !
;    1118  1      ! INPUTS
;    1119  1      !       key1            The non-wildcard match string
;    1120  1      !       key2            The pattern string (possibly wildcarded)
;    1121  1      !       wildcompare     Address of flag to set if wildcarded compare
;    1122  1      !
;    1123  1      ! IMPLICIT INPUTS
;    1124  1      !       none
;    1125  1      !
;    1126  1      ! OUTPUTS
;    1127  1      !       none
;    1128  1      !
;    1129  1      ! IMPLICIT OUTPUTS
;    1130  1      !       none
;    1131  1      !
;    1132  1      ! SIDE EFFECTS
;    1133  1      !       none
;    1134  1      !
;    1135  1      ! RETURN CODES  (R0)
;    1136  1      !       0       strings do not match
;    1137  1      !       1       strings match
;    1138  1      !--
;    1139  1
```

```
;    1141  2          BEGIN
;    1142  2
;    1143  2          MAP
;    1144  2              key1 : REF bblock,
;    1145  2              key2 : REF bblock;
;    1146  2
;    1147  2          LABEL
;    1148  2              loop;
;    1149  2
;    1150  2          LOCAL
;    1151  2              wild,
;    1152  2              len1,
;    1153  2              len2,
;    1154  2              ptr1,
;    1155  2              ptr2,
;    1156  2              savlen1,
;    1157  2              savlen2,
;    1158  2              savptr1,
;    1159  2              savptr2;
;    1160  2
;    1161  2          .wildcompare = wild = 0;                ! Init wild flag
;    1162  2          savlen1 = 0;                            ! Use savelen1 as 'flag' to see if saved
;    1163  2          len1 = .key1 [dsc$w_length];
;    1164  2          len2 = .key2 [dsc$w_length];
;    1165  2          ptr1 = .key1 [dsc$a_pointer];
;    1166  2          ptr2 = .key2 [dsc$a_pointer];
;    1167  2
;    1168  2          WHILE 1 DO
;    1169  2      loop :
;    1170  3              BEGIN
;    1171  3
;    1172  3              LOCAL
;    1173  3                  char : BYTE;
;    1174  3
;    1175  3              len2 = .len2 - 1;
;    1176  3
;    1177  3              IF .len2 LSS 0
;    1178  3              THEN
;    1179  3
;    1180  3                  IF .len1 EQL 0
;    1181  3                  THEN
;    1182  3                      RETURN 1
;    1183  3                  ELSE
;    1184  4                      BEGIN
;    1185  4
;    1186  4                      IF (savlen1 = .savlen1 - 1) LSS 0       ! Partial match
;    1187  4                      THEN
;    1188  4
;    1189  4                          IF .wild
;    1190  4                          THEN
;    1191  4                              RETURN 0                ! Don't take partial, if wild
;    1192  4                          ELSE
;    1193  5                              RETURN (.wildcompare = 1)       ! Partial OK, elsewise
;    1194  4                      ELSE
;    1195  4
;    1196  5                          BEGIN                       ! Restore saved valued--backup
;    1197  5                          ptr1 = (savptr1 = .savptr1 + 1);    ! Advance to next char.
```

```
;    1198  5                      ptr2 = .savptr2;
;    1199  5                      len1 = .savlen1;
;    1200  5                      len2 = .savlen2
;    1201  4                      END;
;    1202  4
;    1203  4                  LEAVE loop                          ! Proceed to next iteration of loop
;    1204  3                  END;
;    1205  3
;    1206  3              char = CH$RCHAR_A (ptr2);               ! Get next pattern character
;    1207  3              IF      .Ultrix_flags<ultrix_v_mode,1>
;    1208  3              THEN
;    1209  4                BEGIN
;    1210  5                char = .char - (IF .char GEQU %C'a' AND .char LEQU %C'z'      ! convert to upper case
;    1211  4                     THEN %C'a' - %C'A' ELSE 0);
;    1212  3                 END;
;    1213  3              IF .char EQL %C'*'
;    1214  3              THEN
;    1215  4                  BEGIN                               ! If wildcard char, save descriptors for later backup.
;    1216  4                  wild = 1;                           ! Set wildcard flag
;    1217  4
;    1218  4                  IF .len2 EQL 0 THEN RETURN (.wildcompare = 1);      ! '*' at end matches all
;    1219  4
;    1220  4                  savptr1 = .ptr1;
;    1221  4                  savptr2 = .ptr2;
;    1222  4                  savlen1 = .len1;
;    1223  4                  savlen2 = .len2
;    1224  4                  END
;    1225  3              ELSE
;    1226  3
;    1227  3                  IF
;    1228  4                      BEGIN
;    1229  4                      len1 = .len1 - 1;
;    1230  5                      BEGIN
;    1231  5
;    1232  5                      LOCAL
;    1233  5                          ch : BYTE;
;    1234  5
;    1235  5                      ch = CH$RCHAR_A (ptr1);
;    1236  7                      (.ch - (IF .ch GEQU %C'a' AND .ch LEQU %C'z'    ! convert to upper case
;    1237  6                      THEN %C'a' - %C'A' ELSE 0))
;    1238  5                      END
;    1239  4                      END
;    1240  3                      NEQ .char                       ! If not a match
;    1241  3                  THEN
;    1242  3
;    1243  3                      IF .char NEQ %C'%'              ! and not a character wildcard
;    1244  3                      THEN
;    1245  3
;    1246  3                          IF (savlen1 = .savlen1 - 1) LSS 0
;    1247  3                          THEN
;    1248  3                              RETURN 0
;    1249  3                          ELSE
;    1250  4                              BEGIN                   ! Restore values
;    1251  4                              ptr1 = (savptr1 = .savptr1 + 1);        ! Advance to next char
;    1252  4                              ptr2 = .savptr2;
;    1253  4                              len1 = .savlen1;
;    1254  4                              len2 = .savlen2
```

```
;    1255  4                          END
;    1256  4
;    1257  3                     ELSE
;    1258  3                          .wildcompare = 1
;    1259  3
;    1260  2                END;                                  ! loop
;    1261  2
;    1262  2           0                                          ! If we leave loop, no good.
;    1263  1           END;                                       ! of Dsr$Key_Equal



                                    0FFC 00000          .ENTRY  DSR$KEY_EQUAL, Save R2,R3,R4,R5,R6,R7,R8,-  ; 1112
                                                                R9,R10,R11                                      ;
                              5E          04  C2 00002          SUBL2   #4, SP                                  ;
                                          5B  D4 00005          CLRL    WILD                                    ; 1161
                                    0C    BC  D4 00007          CLRL    @WILDCOMPARE                            ;
                                          53  D4 0000A          CLRL    SAVLEN1                                 ; 1162
                              51    04    AC  D0 0000C          MOVL    KEY1, R1                                ; 1163
                              55          61  3C 00010          MOVZWL  (R1), LEN1                              ;
                              50    08    AC  D0 00013          MOVL    KEY2, R0                                ; 1164
                              54          60  3C 00017          MOVZWL  (R0), LEN2                              ;
                              58    04    A1  D0 0001A          MOVL    4(R1), PTR1                             ; 1165
                              57    04    A0  D0 0001E          MOVL    4(R0), PTR2                             ; 1166
                              0D          54  F4 00022 1$:      SOBGEQ  LEN2, 2$                                ; 1175
                                          55  D5 00025          TSTL    LEN1                                    ; 1180
                                          39  13 00027          BEQL    7$                                      ;
                                    79          53  F4 00029          SOBGEQ  SAVLEN1, 13$                    ; 1186
                                    2F          5B  E9 0002C          BLBC    WILD, 6$                        ; 1189
                                          0089  31 0002F          BRW     15$                                     ; 1191
                                    52          87  90 00032 2$:      MOVB    (PTR2)+, CHAR                   ; 1206
                                    16 00000000G  EF  E9 00035          BLBC    ULTRIX_FLAGS, 5$                ; 1207
                              61    8F          52  91 0003C          CMPB    CHAR, #97                       ; 1210
                                          0B  1F 00040          BLSSU   3$                                      ;
                              7A    8F          52  91 00042          CMPB    CHAR, #122                      ;
                                          05  1A 00046          BGTRU   3$                                      ;
                                    50          20  D0 00048          MOVL    #32, R0                         ; 1211
                                          02  11 0004B          BRB     4$                                      ;
                                          50  D4 0004D 3$:      CLRL    R0                                      ;
                                    52          50  82 0004F 4$:      SUBB2   R0, CHAR                        ; 1210
                                    2A          52  91 00052 5$:      CMPB    CHAR, #42                       ; 1213
                                          1D  12 00055          BNEQ    10$                                     ;
                                    5B          01  D0 00057          MOVL    #1, WILD                        ; 1216
                                          54  D5 0005A          TSTL    LEN2                                    ; 1218
                                          08  12 0005C          BNEQ    8$                                      ;
                              0C    BC          01  D0 0005E 6$:      MOVL    #1, @WILDCOMPARE                ;
                                    50          01  D0 00062 7$:      MOVL    #1, R0                          ;
                                          04  00065          RET                                             ;
                                    56          58  D0 00066 8$:      MOVL    PTR1, SAVPTR1                   ; 1220
                                    59          57  D0 00069          MOVL    PTR2, SAVPTR2                   ; 1221
                                    53          55  D0 0006C          MOVL    LEN1, SAVLEN1                   ; 1222
                                    5A          54  D0 0006F          MOVL    LEN2, SAVLEN2                   ; 1223
                                          AE  11 00072 9$:      BRB     1$                                      ;
                                          55  D7 00074 10$:     DECL    LEN1                                    ; 1229
                                    51          88  90 00076          MOVB    (PTR1)+, CH                     ; 1235
```

```
                        61   8F        51  91 00079          CMPB    CH, #97                          ; 1236
                                       0B  1F 0007D          BLSSU   11$                              ;
                        7A   8F        51  91 0007F          CMPB    CH, #122                         ;
                                       05  1A 00083          BGTRU   11$                              ;
                             50        20  D0 00085          MOVL    #32, R0                          ; 1237
                                       02  11 00088          BRB     12$                              ;
                                       50  D4 0008A 11$:     CLRL    R0                               ;
                             6E        51  9A 0008C 12$:     MOVZBL  CH, (SP)                         ; 1236
                             50        6E  C2 0008F          SUBL2   (SP), R0                         ;
                             50        50  CE 00092          MNEGL   R0, R0                           ; 1228
     50          52          08        00  ED 00095          CMPZV   #0, #8, CHAR, R0                 ; 1240
                                       86  13 0009A          BEQL    1$                               ;
                             25        52  91 0009C          CMPB    CHAR, #37                        ; 1243
                                       14  13 0009F          BEQL    14$                              ;
                                       53  D7 000A1          DECL    SAVLEN1                          ; 1246
                                       16  19 000A3          BLSS    15$                              ;
                                       56  D6 000A5 13$:     INCL    SAVPTR1                          ; 1251
                             58        56  D0 000A7          MOVL    SAVPTR1, PTR1                    ;
                             57        59  D0 000AA          MOVL    SAVPTR2, PTR2                    ; 1252
                             55        53  D0 000AD          MOVL    SAVLEN1, LEN1                    ; 1253
                             54        5A  D0 000B0          MOVL    SAVLEN2, LEN2                    ; 1254
                                       BD  11 000B3          BRB     9$                               ;
                        0C   BC        01  D0 000B5 14$:     MOVL    #1, @WILDCOMPARE                 ; 1258
                                       B7  11 000B9          BRB     9$                               ;
                                       50  D4 000BB 15$:     CLRL    R0                               ; 1263
                                           04 000BD          RET                                      ;

; Routine Size:  190 bytes,    Routine Base:  CODE + 0864

;   1264  1
```

```
;    1266  1     %SBTTL 'skip_blanks'
;    1267  1     ROUTINE skip_blanks (desc) =
;    1268  1
;    1269  1     !++
;    1270  1     ! FUNCTIONAL DESCRIPTION
;    1271  1     !       Advance line descriptor past blanks
;    1272  1     !
;    1273  1     ! INPUTS
;    1274  1     !       desc    pointer to descriptor of text
;    1275  1     !
;    1276  1     ! IMPLICIT INPUTS
;    1277  1     !       none
;    1278  1     !
;    1279  1     ! OUTPUTS
;    1280  1     !       desc    descriptor is updated past blanks
;    1281  1     !
;    1282  1     ! IMPLICIT OUTPUTS
;    1283  1     !       none
;    1284  1     !
;    1285  1     ! SIDE EFFECTS
;    1286  1     !       none
;    1287  1     !
;    1288  1     ! RETURN CODES
;    1289  1     !       0       if end-of-line detected
;    1290  1     !       1       if non-blank character found
;    1291  1     !--
;    1292  1
```

```
;   1294  2         BEGIN
;   1295  2
;   1296  2         MAP
;   1297  2             desc : REF bblock;
;   1298  2
;   1299  2         LOCAL
;   1300  2             char : BYTE;
;   1301  2
;   1302  2         WHILE .desc [dsc$w_length] GTR 0 DO
;   1303  3             BEGIN
;   1304  3             char = CH$RCHAR (.desc [dsc$a_pointer]);        ! Get next character
;   1305  3
;   1306  3             IF .char EQL %C'!' THEN RETURN 0;       ! Comment delimits line
;   1307  3
;   1308  3             IF .char NEQ %C' ' AND .char NEQ %C'    ' THEN RETURN 1;        ! Done
;   1309  3
;   1310  3             desc [dsc$a_pointer] = .desc [dsc$a_pointer] + 1;       ! Advance descriptor
;   1311  3             desc [dsc$w_length] = .desc [dsc$w_length] - 1
;   1312  2             END;
;   1313  2
;   1314  2         0                                           ! Hit end of line
;   1315  1         END;                                        ! of skip_blanks


                                0000 00000 SKIP_BLANKS:
                                                        .WORD   Save nothing                    ; 1267
                50      04   AC  D0 00002               MOVL    DESC, R0                        ; 1302
                             60  B5 00006 1$:           TSTW    (R0)                            ;
                             1E  13 00008               BEQL    3$                              ;
                51      04   B0  90 0000A               MOVB    @4(R0), CHAR                    ; 1304
                21           51  91 0000E               CMPB    CHAR, #33                       ; 1306
                             15  13 00011               BEQL    3$                              ;
                20           51  91 00013               CMPB    CHAR, #32                       ; 1308
                             09  13 00016               BEQL    2$                              ;
                09           51  91 00018               CMPB    CHAR, #9                        ;
                             04  13 0001B               BEQL    2$                              ;
                50           01  D0 0001D               MOVL    #1, R0                          ;
                                 04 00020               RET                                     ;
                        04   A0  D6 00021 2$:           INCL    4(R0)                           ; 1310
                             60  B7 00024               DECW    (R0)                            ; 1311
                             DE  11 00026               BRB     1$                              ;
                             50  D4 00028 3$:           CLRL    R0                              ; 1315
                                 04 0002A               RET                                     ;

; Routine Size:  43 bytes,    Routine Base:  CODE + 0922
```

```
;    1317  1      %SBTTL 'scan_word'
;    1318  1      ROUTINE scan_word (desc) =
;    1319  1
;    1320  1      !++
;    1321  1      ! FUNCTIONAL DESCRIPTION
;    1322  1      !       scan descriptor over a word
;    1323  1      !
;    1324  1      ! INPUTS
;    1325  1      !       desc    address of descriptor for string
;    1326  1      !
;    1327  1      ! IMPLICIT INPUTS
;    1328  1      !       none
;    1329  1      !
;    1330  1      ! OUTPUTS
;    1331  1      !       desc    descriptor is updated past word scanned
;    1332  1      !       R0      length of word scanned
;    1333  1      !
;    1334  1      ! IMPLICIT OUTPUTS
;    1335  1      !       none
;    1336  1      !
;    1337  1      ! SIDE EFFECTS
;    1338  1      !       none
;    1339  1      !
;    1340  1      ! RETURN CODES
;    1341  1      !       none    (R0 if function value)
;    1342  1      !--
;    1343  1
```

```
;   1345  2         BEGIN
;   1346  2
;   1347  2         MAP
;   1348  2             desc : REF bblock;
;   1349  2
;   1350  2         LOCAL
;   1351  2             firstchar,                          ! flag
;   1352  2             startpointer;                       ! Point to initial character
;   1353  2
;   1354  2         startpointer = .desc [dsc$a_pointer];
;   1355  2         firstchar = 1;                          ! On first character
;   1356  2
;   1357  2         WHILE .desc [dsc$w_length] GTR 0 DO     ! Scan string
;   1358  3             BEGIN
;   1359  3
;   1360  3             LOCAL
;   1361  3                 char : BYTE;
;   1362  3
;   1363  3             char = CH$RCHAR (.desc [dsc$a_pointer]);        ! Read next character
;   1364  3             !
;   1365  3             ! If it's not a legal character to have inside a word, exit
;   1366  3             !
;   1367  3
;   1368  5             IF NOT ((.char GEQU %C'A' AND .char LEQU %C'Z') OR (.char GEQU %C'a' AND .char LEQU %C'z') OR (.char GEQU
;   1369  5                 %C'0' AND .char LEQU %C'9') OR (.char EQL %C'$')    ! dollar sign
;   1370  5                 OR (.char EQL %C'_')                ! underscore
;   1371  5                 OR (.char EQL %C'-')                ! hyphen
;   1372  5                 OR (.char EQL %C'.')                ! period
;   1373  5                 OR (.char EQL %C'%')                ! wildcard
;   1374  5                 OR (.char EQL %C'*')                ! wildcard
;   1375  4                 OR (.firstchar AND (.char EQL %C'/')))      ! slash (for qualifier)
;   1376  3             THEN
;   1377  3                 EXITLOOP;                           ! Exit if done with word
;   1378  3
;   1379  3             firstchar = 0;                          ! Reset flag
;   1380  3             desc [dsc$a_pointer] = .desc [dsc$a_pointer] + 1;
;   1381  3             desc [dsc$w_length] = .desc [dsc$w_length] - 1
;   1382  2             END;
;   1383  2
;   1384  3         (CH$DIFF (.desc [dsc$a_pointer], .startpointer))
;   1385  1         END;                                    ! of scan_word


                                        000C 00000 SCAN_WORD:
                                                        .WORD   Save R2,R3                          ; 1318
                    50      04  AC  D0 00002            MOVL    DESC, R0                            ; 1354
                    53      04  A0  D0 00006            MOVL    4(R0), STARTPOINTER                 ;
                    52          01  D0 0000A            MOVL    #1, FIRSTCHAR                       ; 1355
                                60  B5 0000D 1$:        TSTW    (R0)                                ; 1357
                                56  13 0000F            BEQL    6$                                  ;
                    51      04  B0  90 00011            MOVB    @4(R0), CHAR                        ; 1363
                41  8F          51  91 00015            CMPB    CHAR, #65                           ; 1368
                                06  1F 00019            BLSSU   2$                                  ;
                5A  8F          51  91 0001B            CMPB    CHAR, #90                           ;
```

```
                                    3D  1B 0001F          BLEQU   5$                                      ;
                  61   8F           51  91 00021 2$:      CMPB    CHAR, #97                               ;
                                    06  1F 00025          BLSSU   3$                                      ;
                  7A   8F           51  91 00027          CMPB    CHAR, #122                              ;
                                    31  1B 0002B          BLEQU   5$                                      ;
                       30           51  91 0002D 3$:      CMPB    CHAR, #48                               ; 1369
                                    05  1F 00030          BLSSU   4$                                      ;
                       39           51  91 00032          CMPB    CHAR, #57                               ;
                                    27  1B 00035          BLEQU   5$                                      ;
                       24           51  91 00037 4$:      CMPB    CHAR, #36                               ;
                                    22  13 0003A          BEQL    5$                                      ;
                  5F   8F           51  91 0003C          CMPB    CHAR, #95                               ; 1370
                                    1C  13 00040          BEQL    5$                                      ;
                       2D           51  91 00042          CMPB    CHAR, #45                               ; 1371
                                    17  13 00045          BEQL    5$                                      ;
                       2E           51  91 00047          CMPB    CHAR, #46                               ; 1372
                                    12  13 0004A          BEQL    5$                                      ;
                       25           51  91 0004C          CMPB    CHAR, #37                               ; 1373
                                    0D  13 0004F          BEQL    5$                                      ;
                       2A           51  91 00051          CMPB    CHAR, #42                               ; 1374
                                    08  13 00054          BEQL    5$                                      ;
                       0E           52  E9 00056          BLBC    FIRSTCHAR, 6$                           ; 1375
                       2F           51  91 00059          CMPB    CHAR, #47                               ;
                                    09  12 0005C          BNEQ    6$                                      ;
                                    52  D4 0005E 5$:      CLRL    FIRSTCHAR                               ; 1379
                            04      A0  D6 00060          INCL    4(R0)                                   ; 1380
                                    60  B7 00063          DECW    (R0)                                    ; 1381
                                    A6  11 00065          BRB     1$                                      ;
          50       04   A0           53  C3 00067 6$:      SUBL3   STARTPOINTER, 4(R0), R0                 ; 1384
                                        04 0006C          RET                                             ; 1385

; Routine Size:  109 bytes,    Routine Base:  CODE + 094D
```

```
;    1387  1      %SBTTL 'find character'
;    1388  1      ROUTINE find_char (desc, character) : jsb_2 =
;    1389  1
;    1390  1      !++
;    1391  1      ! FUNCTIONAL DESCRIPTION
;    1392  1      !       find distance to character in string
;    1393  1      !
;    1394  1      ! INPUTS
;    1395  1      !       desc            address of string descriptor to search
;    1396  1      !       character       the character to look for
;    1397  1      !
;    1398  1      ! IMPLICIT INPUTS
;    1399  1      !       none
;    1400  1      !
;    1401  1      ! OUTPUTS
;    1402  1      !       R0              distance in string to character
;    1403  1      !
;    1404  1      ! IMPLICIT OUTPUTS
;    1405  1      !       none
;    1406  1      !
;    1407  1      ! SIDE EFFECTS
;    1408  1      !       none
;    1409  1      !
;    1410  1      ! RETURN CODES
;    1411  1      !       R0 is function value
;    1412  1      !--
;    1413  1
```

```
;   1415  2          BEGIN
;   1416  2
;   1417  2          LOCAL
;   1418  2              ptr,
;   1419  2              len;
;   1420  2
;   1421  2          MAP
;   1422  2              desc : REF bblock,
;   1423  2              character : BYTE;
;   1424  2
;   1425  2          len = .desc [dsc$w_length];
;   1426  2          ptr = .desc [dsc$a_pointer];
;   1427  2
;   1428  2          WHILE .len GTR 0 DO
;   1429  3              BEGIN
;   1430  3              len = .len - 1;
;   1431  3
;   1432  3              IF CH$RCHAR (.ptr) EQL .character THEN EXITLOOP;        ! If we found it
;   1433  3
;   1434  3              ptr = .ptr + 1
;   1435  2              END;
;   1436  2
;   1437  2          CH$DIFF (.ptr, .desc [dsc$a_pointer])        ! Return distance
;   1438  1          END;                                         ! of find_char



                                        0C  BB 00000 FIND_CHAR:
                                                          PUSHR   #^M<R2,R3>                          ; 1388
                        53              60  3C 00002      MOVZWL  (DESC), LEN                         ; 1425
                        52      04      A0  D0 00005      MOVL    4(DESC), PTR                        ; 1426
                                        53  D5 00009 1$:  TSTL    LEN                                 ; 1428
                                        0B  15 0000B      BLEQ    2$                                  ;
                                        53  D7 0000D      DECL    LEN                                 ; 1430
                        51              62  91 0000F      CMPB    (PTR), CHARACTER                    ; 1432
                                        04  13 00012      BEQL    2$                                  ;
                                        52  D6 00014      INCL    PTR                                 ; 1434
                                        F1  11 00016      BRB     1$                                  ;
                50      52      04      A0  C3 00018 2$:  SUBL3   4(DESC), PTR, R0                    ; 1437
                                        0C  BA 0001D      POPR    #^M<R2,R3>                          ; 1438
                                            05 0001F      RSB                                         ;

; Routine Size:  32 bytes,    Routine Base:  CODE + 09BA
```

```
;    1440  1      %SBTTL 'print blank line'
;    1441  1      ROUTINE print_crlf : jsb_none NOVALUE =
;    1442  1
;    1443  1      !++
;    1444  1      ! Print a blank line
;    1445  1      !--
;    1446  1
;    1447  2          BEGIN
;    1448  3          $ds_printf ($ascic ('!/'))
;    1449  1          END;                                    ! of print_crlf


                                                            .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                                        2F  21  02  000B1 P.AAN:  .ASCII  <2>\!/\                                   ;


                                                            .PSECT  CODE,NOWRT,  SHR,2

                                00000000'  EF  9F 00000 PRINT_CRLF:
                                                            PUSHAB  P.AAN                                           ; 1448
                        00000000G  9F       01  FB 00006        CALLS   #1, a#DS$PRINTF                             ;
                                            05 0000D            RSB                                                 ; 1449

; Routine Size:  14 bytes,    Routine Base:  CODE + 09DA
```

```
;   1451  1     END
;   1452  1
;   1453  0     ELUDOM



;                                  PSECT SUMMARY
;
;       Name                    Bytes                        Attributes
;
;  DATA                           180  NOVEC,NOWRT,  RD ,NOEXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  WORK                            46  NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  CODE                          2536  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)



Symbol              Type  Defined  Referenced ...
------------------ -------- ----- ----------------
$ASCIC             Macro    Lib01   780     860     902     903     922    1035    1448
$ASCID             Macro    Lib01   145
$CLOSE             KeyWMacr Lib03   395
$CONNECT           KeyWMacr Lib03   364
$DS_PRINTF         Macro    Lib01   780     860     930     934    1019    1035    1448
$FAB_DECL          Macro    Lib03   194
$FAB_INIT          KeyWMacr Lib03   217     219
$GET               KeyWMacr Lib03  1080
$OPEN              KeyWMacr Lib03   352
$RAB_DECL          Macro    Lib03   195
$RAB_INIT          KeyWMacr Lib03   220
$RMS_BITFLD_INI    Macro    Lib03   217     219     220
$RMS_BITS          Macro    Lib03   217     219
$RMS_CODFLD_INI    Macro    Lib03   217     219     220
$RMS_OR            Macro    Lib03   217     219
$RMS_PTR           Unbound          220
                   Bind       217   217=
                   Bind       219   219=
                   Bind       220   220=
$RMS_VALFLD_INI    Unbound          220
                   Macro    Lib03   217     219     220
BBLOCK             Structur Lib02   159     196     197     199     202     205     226     438     439     442     443     450
                                    451     454     679     682     685     823     901     913    1077    1078    1144    1145
                                   1297    1348    1422
BOUND_LEVEL        Local      452   468=    488.    531.    537.    548.
BUFFER             Local      197   220a
CH                 Local     1233  1235=   1236.
CHAR               Local      448   463=    465=    467.
                   Local      686   695=    697.    698.    704.
                   Local     1173  1206=   1210=   1210.   1213.   1240.   1243.
                   Local     1300  1304=   1306.   1308.
                   Local     1361  1363=   1368.   1369.   1370.   1371.   1372.   1373.   1374.   1375.
CHARACTER          RoutForm  1388  1423m   1432.
CURKEY             Bind       226   228a    236=    243=    246.    247.    248.    251.    255=    255.    257.    269.
```

Symbol	Type	Defined	Referenced ...											
	Bind	439	461.	463a.	540a									
DESC	RoutForm	164	205m	234.	236a.	237.	241a.	244.	245a=	245a.	247a=	247a.		
	RoutForm	1267	1297m	1302a.	1304a.	1310a=	1310a.	1311a=	1311a.					
	RoutForm	1318	1348m	1354a.	1357a.	1363a.	1380a=	1380a.	1381a=	1381a.	1384a.			
	RoutForm	1388	1422m	1425a.	1426a.	1437a.								
DO_HELP	Routine	400	114f	372c	571c									
DS$PRINTF	ExtRout	781	781c	860e	860c	930e	930c	934e	934c	1019e	1019c	1035e	1035c	1448e
			1448c											
DSC$A_POINTER	Macro	Lib03	228	236	247	248	251	284	311	366	461	463	551	552
			565	695	712	731	988	1024	1165	1166	1304	1310	1354	1363
			1380	1384	1426	1437								
DSC$C_S_BLN	Literal	Lib03	199	202	205	211	226	313	329	439	450	451	685	694
			823	913										
DSC$W_LENGTH	Macro	Lib03	241	243	245	246	247	248	251	255	257	269	312	326
			549	689	732	1163	1164	1302	1311	1357	1381	1425		
DSR$KEY_EQUAL	GlobRout	1112	120f	341c	540c									
DSX$HELP	GlobRout	164	113f											
ELIPSIS	Local	201	208=	248	248.	248a								
ERR	RoutForm	918	925.											
ERRFLG	RoutForm	868	1016.	1033.										
FAB	Bind	1078	1088.	1096.										
FAB$B_BID	Macro	Lib03	217	219										
FAB$B_BKS	Macro	Lib03	217	219										
FAB$B_BLN	Macro	Lib03	217	219										
FAB$B_DNS	Macro	Lib03	217	219										
FAB$B_FAC	Macro	Lib03	217	219										
FAB$B_FNS	Macro	Lib03	217	219	312									
FAB$B_FSZ	Macro	Lib03	217	219										
FAB$B_JOURNAL	Macro	Lib03	217	219										
FAB$B_ORG	Macro	Lib03	217	219										
FAB$B_RAT	Macro	Lib03	217	219	354	1088	1096							
FAB$B_RFM	Macro	Lib03	217	219										
FAB$B_RTV	Macro	Lib03	217	219										
FAB$B_RU_FACILITY	Macro	Lib03	217	219										
FAB$B_SHR	Macro	Lib03	217	219										
FAB$C_BID	Literal	Lib03	217	219										
FAB$C_BLN	Literal	Lib03	194	217	219									
FAB$C_VAR	Literal	Lib03	217	219										
FAB$L_ALQ	Macro	Lib03	217	219										
FAB$L_CTX	Macro	Lib03	217	219										
FAB$L_DNA	Macro	Lib03	217	219										
FAB$L_FNA	Macro	Lib03	217	219	311									
FAB$L_FOP	Macro	Lib03	217	219										
FAB$L_MRN	Macro	Lib03	217	219										
FAB$L_NAM	Macro	Lib03	217	219										
FAB$L_XAB	Macro	Lib03	217	219										
FAB$M_FTN	Literal	Lib03	1088											
FAB$M_GET	Literal	Lib03	217	219										
FAB$V_CHAN_MODE	Macro	Lib03	217	219										
FAB$V_FILE_MODE	Macro	Lib03	217	219										
FAB$V_LNM_MODE	Macro	Lib03	217	219										
FAB$W_BLS	Macro	Lib03	217	219										
FAB$W_DEQ	Macro	Lib03	217	219										
FAB$W_GBC	Macro	Lib03	217	219										
FAB$W_MRS	Macro	Lib03	217	219										

Symbol	Type	Defined	Referenced ...											
FFS	Builtin	610	614											
FIND_CHAR	Routine	1388	123f	237c	244c									
FIRST	Local	606	615=											
	Local	910	941=	1016.	1018=	1033.								
FIRSTCHAR	Local	1351	1355=	1375.	1379=									
FIRSTRFA	RoutForm	400	443m	469a.	495a=									
FMT	Bind	902	1019a											
HELPFAB	Local	194	217a	219a	220a	311=	312=	352a	354.	395a				
HELPINFO	Global	159	209=	210=	212=	214=	227a	254=	259=	259.	263.	277=	315=	315.
			317.	319=	319.	321=	321.	326.	330=	333.	343=	357=	382.	383.
			438.	439.	456.	457.	534.	541.	546a	550.	551.	553=	555.	556.
			559=	574.	584.	615.	617.	618.	682a	771a	781.	860a	901.	923.
			928=	939.	988.	1077.	1102=	1103=						
HELPRAB	Local	195	214a	220a	364a									
HELP_HELP	Bind	145	329.	341a										
HLP$B_WILDFLAGS	Macro	Lib02	227	315	333	615								
HLP$C_MAXKEYS	Literal	Lib02	202	210	211	263	313	317	456	487	526	536	546	553
			722	729	825	850	851	852	859	969	971			
HLP$C_MAXRECSIZ	Literal	Lib02	197	198	220	449	732	914						
HLP$C_SIZE	Literal	Lib02	159	209										
HLP$L_ALLHELP	Macro	Lib02	210	254	259	263	317	319	456	534	541	556	584	618
			939											
HLP$L_BUFDESC	Macro	Lib02	550	551	682	860	988	1102	1103					
HLP$L_KEYLIST	Macro	Lib02	212	439	923									
HLP$L_KEYNAMES	Macro	Lib02	546	771										
HLP$L_RAB	Macro	Lib02	214	438	901	1077								
HLP$L_REALKEYS	Macro	Lib02	277	321	326	330	456	555	574					
HLP$V_CR	Macro	Lib02	357											
HLP$V_FOUNDHELP	Macro	Lib02	382	559	617	928								
HLP$V_HELP_KEY	Macro	Lib02	343	383										
HLP$V_QUAL	Macro	Lib02	553	780	939									
I	Local	263	264.											
	Local	269	271.											
	Local	773	781.											
INDENT	RoutForm	786	825.											
IS_KEY_ON_LINE	Routine	644	115f	485c	524c	848c	967c							
JSB_2	Linkage	104	123	918	1388									
JSB_3	Linkage	105												
JSB_NONE	Linkage	Lib02	124	1441										
KEY	RoutForm	400	442m	548.	549a=	552a=								
	RoutForm	644	679m	731a=	732a=									
KEY1	RoutForm	1112	1144m	1163a.	1165a.									
KEY1TEXT	Bind	284	286a.	287a.	288a.	289a.	290a.	291a.	292a.	293a.	294a.	295a.	296a.	297a.
			298a.	299a.	300a.	301a.	302a.	303a.	304a.	305a.	306a.	307a.	308a.	
KEY2	RoutForm	1112	1145m	1164a.	1166a.									
KEYDESC	Local	451	485a	524a	540a	551.	551a.							
	Local	823	848a											
	Local	913	967a	988.	1024a.									
KEYLIST	Local	202	211=	212a	226a	284a	311.	312.	313.	313=	326.	329=	341a	
	Bind	923	930a											
KEYNAMES	Bind	546	548=											
	Bind	771	781.											
KEYRFA	RoutForm	868	946a.											
KEYTEXT	Bind	228	271a.											
LASTLEVEL	Local	453	468=	529=	537.									

Symbol	Type	Defined	Referenced ...										
	Local	908	942=	969=	971.								
LASTQUAL	Local	822	833=	850.	859=								
LEN	Local	710	713=	715.	719=	719.							
	Local	1072	1082=	1089.	1092=	1092.	1097.	1098.	1100=	1100.	1102.		
	Local	1419	1425=	1428.	1430=	1430.							
LEN1	Local	1152	1163=	1180.	1199=	1222.	1229=	1229.	1253=				
LEN2	Local	1153	1164=	1175=	1175.	1177.	1200=	1218.	1223.	1254=			
LENGTH	Local	984	1006=	1010.	1024.	1026.							
LEV	RoutForm	918	929.										
LEVEL	Local	200	213=	226.	254.	261=	261.	271.	274=	274.	277.	279.	
	RoutForm	400	439.	456.	468.	487.	491.	533.	534.	541.	555.	556.	560. 561.
			571.	574.	581.	584.	613.	618.	633.				
	Local	687	693=	718=	718.	722.	729=	735.					
	RoutForm	739	773.	781.									
	RoutForm	786	825.	850.	852.								
	RoutForm	868	939.	942.	971.	972.	979.	1016.	1033.				
LINE	Bind	682	689.	694.									
LINECOL	Local	911	945=	1021=	1026=	1026.	1029.						
LINELEVEL	Local	446	485=	487.	489.	491.							
	Local	515	524=	526.	527.	529.	531.	533.	536.	553.	561.		
	Local	821	848=	849.	851.	859.							
	Local	909	967=	969.	971.	972.	979.						
LOCDESC	Local	685	694=	695a.	712.	713a	726a	731.	732a				
LOGTABS	Local	820	825=	860.									
LOOP	Label	1148	1169	1203									
NEXTDESC	Local	199	366=	372a									
	Local	450	565=	571a									
NEXTKEY	Local	198	366a										
	Local	449	565a										
NEXT_QUAL	Local	231	237=	239.	241=	244.							
NODOCMSG	Bind	922	930a										
NOERR	Local	377	382=	390.									
NO_QUAL_YET	Local	907	943=	1010.	1014=								
OTHERINFO	Bind	903	934a										
OUTBUF	Local	914	944a	1008a	1019a	1020a	1035a						
OUTLEN	Local	986	1008=	1010.	1019.								
POSITION	Local	604	612=	614.									
PRINTHEADER	Routine	918	1016c	1033c									
PRINT_CRLF	Routine	1441	124f	207c	394c	863c							
PRINT_KEYS	Routine	739	116f	560c	929c								
PRINT_OTHERHELP	Routine	868	118f	390c	581c	633c							
PRINT_TEXT	Routine	786	117f	561c									
PTR	Local	232	248=	251.									
	Local	709	712=	716a.	718.	718=							
	Local	912	944=	1008.	1020=	1024=	1024a=	1035.					
	Local	1073	1083=	1093=	1093.	1098.	1103.						
	Local	1418	1426=	1432a.	1434=	1434.	1437.						
PTR1	Local	1154	1165=	1197=	1220.	1235.	1235=	1251=					
PTR2	Local	1155	1166=	1198=	1206.	1206=	1221.	1252=					
QUALIFIER	Local	447	467=	487.	492.	535.							
QUALINE	Local	906	971=	979.	1010.	1014.							
RAB	Bind	438	469=	477.	495.	507=	562=	571a	581a	587=	626=	627=	633a
	Bind	901	946=	947=	956=								
	Bind	1077	1078.	1080a	1081=	1082.	1083.						
RAB$B_BID	Macro	Lib03	220										

Symbol	Type	Defined	Referenced ...						
RAB$B_BLN	Macro	Lib03	220						
RAB$B_KRF	Macro	Lib03	220						
RAB$B_KSZ	Unbound		220						
RAB$B_MBC	Macro	Lib03	220						
RAB$B_MBF	Macro	Lib03	220						
RAB$B_RAC	Macro	Lib03	220	507	562	587	626	947	956	1081
RAB$B_TMO	Macro	Lib03	220						
RAB$C_BID	Literal	Lib03	220						
RAB$C_BLN	Literal	Lib03	195	220					
RAB$C_RFA	Literal	Lib03	507	562	587	626	947		
RAB$C_SEQ	Literal	Lib03	956	1081					
RAB$L_BKT	Macro	Lib03	220						
RAB$L_CTX	Macro	Lib03	220						
RAB$L_FAB	Macro	Lib03	220	1078					
RAB$L_KBF	Unbound		220						
RAB$L_RBF	Macro	Lib03	220	1083					
RAB$L_RHB	Macro	Lib03	220						
RAB$L_ROP	Macro	Lib03	220						
RAB$L_UBF	Macro	Lib03	220						
RAB$L_XAB	Macro	Lib03	220						
RAB$W_RFA	Macro	Lib03	469	477	495	571	581	627	633	946
RAB$W_RSZ	Macro	Lib03	220	1082					
RAB$W_USZ	Macro	Lib03	220						
READ	Routine	1042	119f	478c	517c	628c	629c	837c	955c	
REALLEN	Local	985	988=	1006.	1024.					
RFA$C_LENGTH	Literal	Lib02	196	454	469	477	495	946		
RFA$L_VBN	Macro	Lib02	345	379						
RFA$W_OFFSET	Macro	Lib02	346	380						
RMS$_EOF	Literal	Lib03	483	522	839	958	1105			
RMS$_RFA	Literal	Lib03	1105							
SAVERFA	Local	454	477=	627.						
SAVLEN1	Local	1156	1162=	1186=	1186.	1199.	1222=	1246=	1246.	1253.
SAVLEN2	Local	1157	1200.	1223=	1254.					
SAVPTR1	Local	1158	1197=	1197.	1220=	1251=	1251.			
SAVPTR2	Local	1159	1198.	1221=	1252.					
SCAN_WORD	Routine	1318	122f	713c	732c					
SDL$STARLET_CONCAT	Macro	Lib03	352	364	395	1080				
SDL$STARLET_OPT	Macro	Lib03	352	364	395	1080				
SDL$STARLET_REQ	Macro	Lib03	352	364	395	1080				
SIZE	Local	605	613=	614.						
SKIP_BLANKS	Routine	1267	121f	234c	726c					
STARTPOINTER	Local	1352	1354=	1384.						
STARTRFA	Local	196	345=	346=	372a	379=	380=	390a		
STAT	Local	350	352=	352.						
	Local	362	364=	365.						
	Local	370	372=	373.						
	Local	388	390=	391.						
	Local	475	478=	480.	483.					
	Local	514	517=	519.	522.					
	Local	569	571=	572.						
	Local	579	581=	582.						
	Local	624	628=	629=	631.	633=	635.			
	Local	819	837=	839.	843.	864.				
	Local	953	955=	958.	962.					
	Local	1074	1080=	1105.	1105=	1107.				

Symbol	Type	Defined	Referenced ...			
SYS$CLOSE	ExtRout	395	395c			
SYS$CONNECT	ExtRout	364	364c			
SYS$GET	ExtRout	1080	1080c			
SYS$OPEN	ExtRout	352	352c			
ULTRIX_FLAGS	External	152	215.	354.	1084.	1207.
ULTRIX_V_MODE	Literal	147	215	354	1084	1207
W	Local	339	341a			
WILD	Local	1151	1161=	1189.	1216=	
WILDCOMPARE	RoutForm	1112	1161a=	1193a=	1218a=	1258a=
WILDFLAGS	Bind	227	264=	271=		
WILDKEY	Local	513	540a	584.		
WILDPATH	Local	607	614=	619.		

CROSS REFERENCE MAP

Line #	Event	File ...
1	Source (start)	DISK$DS:[DS.LOCAL.RELEASE.WORK]HELP.B32;1
6	Module HELP	
92	Library #1	DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
94	Library #2	DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
96	Library #3	SYS$COMMON:[SYSLIB]STARLET.L32;3
1453	Eludom HELP	

KEY TO REFERENCE TYPE FLAGS

.	Fetch
=	Store
c	Routine call
a	Address use
@	Indirect use
e	External, external routine, or external literal declaration
f	Forward or forward routine declaration
h	Condition handler enabling
m	Map declaration
u	Undeclare declaration

Library Statistics

File	Symbols Total	Symbols Loaded	Symbols Percent	Pages Mapped	Processing Time
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1	942	3	0	96	00:00.0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1	675	19	2	47	00:00.0
SYS$COMMON:[SYSLIB]STARLET.L32;3	10904	77	0	642	00:00.4

```
;                                   COMMAND QUALIFIERS

;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:HELP.B32

; Size:         2536 code + 226 data bytes
; Run Time:        00:09.2
; Elapsed Time:    00:13.5
; Lines/CPU Min:    9517
; Lexemes/CPU-Min:107174
; Memory Used:  321 pages
; Compilation Complete
```

Table of contents

(2) 167 DECLARATIONS
(3) 210 Device description database

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element ICODE.MAR
0000     2 ; *9    12-NOV-1987 14:27:39 MI "ADDED A FEW MACROS FOR COMPILE AND LINK"
0000     3 ; *8    11-NOV-1987 16:45:28 MI "FIXED THE COMPILATON PROBLEM"
0000     4 ; *7    11-NOV-1987 15:02:13 MI "ELIMINATED MACROS DEFINED IN DIAG.MLB ALREADY"
0000     5 ; *6    16-MAR-1987 15:30:37 BARANSKI "Fix undefined LN01 label"
0000     6 ; *5     4-MAR-1987 14:06:24 BERGAZZI "ADDED RA70, LG01,LG02,LG03"
0000     7 ; *4    11-MAR-1986 15:52:02 BARANSKI "<no reason given>"
0000     8 ; *3    19-FEB-1986 20:16:03 BARANSKI "Fixing CMS error."
0000     9 ; *2    12-FEB-1986 13:25:52 BARANSKI "<no reason given>"
0000    10 ; *1     6-FEB-1986 15:18:51 DS ""
0000    11 ; DEC/CMS REPLACEMENT HISTORY, Element ICODE.MAR
0000    12         .TITLE  ICODE - Interpreted code for TSP
0000    13         .IDENT  "10.10-08"                                          ;G:9
0000    14         .LIST   MEB
0000    15         .NLIST  CND
0000    16
0000    17 ;
0000    18 ; Copyright (c) 1979, 1982, 1983, 1984, 1985, 1987                  ;G:7
0000    19 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    20 ;
0000    21 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0000    22 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
0000    23 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
0000    24 ; MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
0000    25 ; EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
0000    26 ; TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
0000    27 ; REMAIN IN DEC.
0000    28 ;
0000    29 ; THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
0000    30 ; AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
0000    31 ; CORPORATION.
0000    32 ;
0000    33 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0000    34 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    35
0000    36 ;++
0000    37 ; FACILITY:     TSP
0000    38 ;
0000    39 ; ABSTRACT:     This module is used to generate the necessary driver
0000    40 ;               for the APT Attach command interpreter.  It is really
0000    41 ;               part of TSP.
0000    42 ;
0000    43 ; ENVIRONMENT:
0000    44 ;
0000    45 ; AUTHOR:       R. Riggs        15-Jul-1979
0000    46 ;
0000    47 ; MODIFIED BY:
0000    48 ;               Dave Butenhof, 2-apr-1981 (with Supervisor V6.3)
0000    49 ;       01      Add PTdescriptors for ML11, KA730, LP25, TM78 and TU78
0000    50 ;
0000    51 ;       02      Dave Butenhof, 13-Nov-1981, version 6.5
0000    52 ;               Add Ptable descriptors for DW730, DMF32[A,P,S, ], UDA50,
0000    53 ;               RB730, R80, and RA80.
0000    54 ;
0000    55 ;       [03] Dave butenhof, 09-Apr-1982, version 6.7
0000    56 ;               Support $DS_$NAME directive (ignore it)
0000    57 ;       [04] Dave Butenhof, 03-May-1982, version 6.7
```

```
                                0000     58 ;              Add RA81 and RA60 devices
                                0000     59 ;
                                0000     60 ;        05    M. Baggett       24-Sept-1982 Version 6.9
                                0000     61 ;              added CI750
                                0000     62 ;
                                0000     63 ;        06    Bob Bergazzi     2-Nov-1982      Version 6.9
                                0000     64 ;              added UNA11
                                0000     65 ;
                                0000     66 ;        07    M. Baggett       3-Nov-1982      Version 6.9
                                0000     67 ;              Added CI750 macro call.
                                0000     68 ;
                                0000     69 ;        08    M. BAGGETT       1-Dec-1982      Version 6.10
                                0000     70 ;              Added TU80 and DZ32.
                                0000     71 ;
                                0000     72 ;        09    M. BAGGETT       8-DEC-1982      Version 6.10
                                0000     73 ;              Added TU81.
                                0000     74 ;
                                0000     75 ;        10    M. BAGGETT       10-DEC-1982     Version 6.10
                                0000     76 ;              Added VS100.
                                0000     77 ;
                                0000     78 ;        11    M. BAGGETT       14-JAN-1983     Version 6.11
                                0000     79 ;              Added RC25.
                                0000     80 ;
                                0000     81 ;        12    M. Baggett       23-Feb-1983     Version 6.11
                                0000     82 ;              Added CI_NODE and RCF25,VS300.
                                0000     83 ;
                                0000     84 ;        13    M. Baggett       14-Mar-1983     Version 6.11
                                0000     85 ;              Added p-table for LESI controller.
                                0000     86 ;
                                0000     87 ;        14    M. Baggett       21-Mar-1983     Version 6.11
                                0000     88 ;              Added VT220,VT240,LA12,LA100,LN01.
                                0000     89 ;
                                0000     90 ;        15    Richard Brown    18-July-83      Version 6.12
                                0000     91 ;              Added CONSOLE, KAXXX, KAYYY, LP07, LP26, LP27,
                                0000     92 ;              RC11, SBIA.
                                0000     93 ;
                                0000     94 ;        16    M. Baggett       8-Aug-1983      Version 6.12
                                0000     95 ;              Added IEU11A.
                                0000     96 ;
                                0000     97 ;        17    M. Baggett       7-Sep-1983      Version 6.13
                                0000     98 ;              Added VS125.
                                0000     99 ;
                                0000    100 ;        18    M. Baggett       22-Nov-1983     Version 6.13
                                0000    101 ;              Added TS05,DISK.
                                0000    102 ;
                                0000    103 ;        19    Richard Brown    5-Mar-84        Version 6.14
                                0000    104 ;              Added DEQNA, DLVJ1, DZV11, RQDX1, RX50, RD51, RD52
                                0000    105 ;              for MicroVAX I.
                                0000    106 ;
                                0000    107 ;        20    Richard Brown    3-Apr-84        Version 7.0
                                0000    108 ;              Corrected typo which included RD51 twice and
                                0000    109 ;              excluded RD52.  Now both RD51 and  RD52  are
                                0000    110 ;              there.
                                0000    111 ;
                                0000    112 ;        21    M. Baggett       21-Jun-84       Version 7.0
                                0000    113 ;              Added DMZ32.
                                0000    114 ;
```

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0000    115 ;       22      Richard Brown   7-Jul-84        Version 7.0
0000    116 ;               Removed RC11, since it is really LESI.
0000    117 ;
0000    118 ;       23      Amy Iorio       1-Oct-84        Version 7.1
0000    119 ;               Changed KAXXX to KA86.
0000    120 ;
0000    121 ;       24      Amy Iorio       11-Oct-84       Version 7.1
0000    122 ;               Added KAXXX.
0000    123 ;
0000    124 ;       25      M. Baggett      2-NOV-1984      Version 7.1
0000    125 ;               Added TK50.
0000    126 ;
0000    127 ;       26      M. Baggett      15-Nov-1984     Version 7.1
0000    128 ;               Added RUX50,RX50,RX31,RX32,RX180.
0000    129 ;
0000    130 ;       27      Bob Bergazzi    Nov. 29,1984    Version 8.0
0000    131 ;               Removed KAXXX. Added KA810.
0000    132 ;
0000    133 ;       28      M. Baggett      18-Dec-1984     Version 8.0
0000    134 ;               Added VT101, VT102, VT125.
0000    135 ;
0000    136 ;       29      A. Iorio        18-Jan-1985     Version 8.1
0000    137 ;               Added DHU11, DR11C.
0000    138 ;
0000    139 ;       30      A. Iorio        5-Mar-1985      Version 8.1
0000    140 ;               Added DX20,TU70,TU72.
0000    141 ;                                                                   ;G:9
0000    142 ;       31      A. Iorio        12-Mar-1985     Version 8.1
0000    143 ;               Added DHV11.
0000    144 ;
0000    145 ;       32      A. Iorio        12-Aug-1985     Version 8.3
0000    146 ;               Added LN03, LA210, VT61, VT71, VT131, VT132.
0000    147 ;
0000    148 ;       33      J. Baranski     14-Oct-1985     Version 9.0
0000    149 ;               Added RA82 disk, and LUA11, removed KA810 and RC11.
0000    150 ;
0000    151 ;       34      J. Baranski     30-Jan-1986     Version 9.1
0000    152 ;               Fix $DS_$HEX Macro to match Macro in DIAG.
0000    153 ;                                                                   ;G:4
0000    154 ;       35      J.Baranski      11-Mar-1986     Version 10.0        ;G:4
0000    155 ;               Add RRD50, Compact Disc Rom Drive.                  ;G:4
0000    156 ;                                                                   ;G:5
0000    157 ;       36      Bob Bergazzi    4-Mar-1986      Version 10.7        ;G:5
0000    158 ;               Added LG01,LG02,LG03,RA70.                          ;G:5
0000    159 ;                                                                   ;G:7
0000    160 ;               Jason Mi        11-Nov-1987     Version 10.10       ;G:7
0000    161 ;               Eliminated the MACRO's which are already defined in DIAG.MLB.;G:7 ;G
0000    162 ;                                                                   ;G:9
0000    163 ;               Jason Mi        12-Nov-1987     Version 10.10       ;G:9
0000    164 ;               Keep the old Macros except for $ds_disk $ds_ra90    ;G:9
0000    165 ;--                                                                 ;G:9
```

```
                     0000   167          .SBTTL  DECLARATIONS
                     0000   168 ;
                     0000   169 ; INCLUDE FILES:
                     0000   170 ;
                     0000   171
                     0000   172 .LIBRARY        /$DIAG/
                     0000   173
                     0000   174          $DS_HPODEF                                          ;G:8
                     0000               .SAVE   LOCAL_BLOCK
                     0000               .IIF    NB,HP$Q_DEVICE, HP$Q_DEVICE:
00000008             0000               .IIF    NB,.BLKQ,       .BLKQ   1
                     0008               .IIF    NB,HP$W_SIZE,   HP$W_SIZE:
0000000A             0008               .IIF    NB,.BLKW,       .BLKW   1
                     000A               .IIF    NB,HP$B_FLAGS,  HP$B_FLAGS:
0000000B             000A               .IIF    NB,.BLKB,       .BLKB   1
                     000B               .IIF    NB,HP$B_DRIVE,  HP$B_DRIVE:
0000000C             000B               .IIF    NB,.BLKB,       .BLKB   1
                     000C               .IIF    NB,HP$T_DEVICE, HP$T_DEVICE:
00000018             000C               .IIF    NB,.BLKB,       .BLKB   12
                     0018               .IIF    NB,HP$A_DEVICE, HP$A_DEVICE:
0000001C             0018               .IIF    NB,.BLKL,       .BLKL   1
                     001C               .IIF    NB,HP$A_DVA,    HP$A_DVA:
00000020             001C               .IIF    NB,.BLKL,       .BLKL   1
                     0020               .IIF    NB,HP$A_LINK,   HP$A_LINK:
00000024             0020               .IIF    NB,.BLKL,       .BLKL   1
                     0024               .IIF    NB,HP$W_VECTOR, HP$W_VECTOR:
00000026             0024               .IIF    NB,.BLKW,       .BLKW   1
                     0026               .IIF    NB,HP$T_TYPE,   HP$T_TYPE:
00000032             0026               .IIF    NB,.BLKB,       .BLKB   12
                     0032               .IIF    NB,HP$A_DEPENDENT,      HP$A_DEPENDENT:
                     0000               .RESTORE
                     0000   175         $DS_HPEODEF                                         ;G:8
                     0000               .SAVE   LOCAL_BLOCK
                     0000               .PSECT  $ABS$,ABS
00000000             0032               .=0
                     0000               .IIF    NB,HPE$T_DEVICE,        HPE$T_DEVICE:
00000014             0000               .IIF    NB,.BLKL,       .BLKL   5
                     0014               .IIF    NB,HPE$W_EXT_DRIVE,     HPE$W_EXT_DRIVE:
00000016             0014               .IIF    NB,.BLKW,       .BLKW   1
                     0016               .IIF    NB,HPE$A_EPB,   HPE$A_EPB:
0000001A             0016               .IIF    NB,.BLKL,       .BLKL   1
                     0000               .RESTORE
                     0000   176         $DS_DHUV_DEF                                        ;G:9
                     0000               .SAVE   LOCAL_BLOCK
                     0000               .PSECT  $ABS$,ABS
                     0032               .IIF    NB,HP$L_DHUV_CSR,       HP$L_DHUV_CSR:
00000036             0032               .IIF    NB,.BLKL,       .BLKL   1
                     0036               .IIF    NB,HP$W_DHUV_VEC,       HP$W_DHUV_VEC:
00000038             0036               .IIF    NB,.BLKW,       .BLKW   1
                     0038               .IIF    NB,HP$B_DHUV_BR,        HP$B_DHUV_BR:
00000039             0038               .IIF    NB,.BLKB,       .BLKB   1
                     0039               .IIF    NB,HP$K_DHUV_LEN,       HP$K_DHUV_LEN:
                     0000               .RESTORE
                     0000   177         $DS_CI_DEF                                          ;G:9
                     0000               .SAVE   LOCAL_BLOCK
                     0000               .PSECT  $ABS$,ABS
00000032             0039               .=HP$A_DEPENDENT
```

```
                        0032                .IIF    NB,HP$B_CI_TR,  HP$B_CI_TR:
                        0032                .IIF    NB,CI$B_BI_ID,  CI$B_BI_ID:
                        0032                .IIF    NB,CI$B_TR,     CI$B_TR:
                00000033 0032               .IIF    NB,.BLKB,       .BLKB   1
                        0033                .IIF    NB,HP$B_CI_BR,  HP$B_CI_BR:
                        0033                .IIF    NB,CI$B_BR,     CI$B_BR:
                00000034 0033               .IIF    NB,.BLKB,       .BLKB   1
                        0034                .IIF    NB,HP$B_CI_NODE,        HP$B_CI_NODE:
                        0034                .IIF    NB,CI$B_NODE,   CI$B_NODE:
                00000035 0034               .IIF    NB,.BLKB,       .BLKB   1
                        0035                .IIF    NB,HP$L_CI_FUNC,        HP$L_CI_FUNC:
                        0035                .IIF    NB,Ci$L_Func,   Ci$L_Func:
                00000039 0035               .IIF    NB,.BlkL,       .BlkL   1
                        0039                .IIF    NB,HP$L_CI_MAINT_ID,    HP$L_CI_MAINT_ID:
                        0039                .IIF    NB,Ci$L_Maint_Id,       Ci$L_Maint_Id:
                0000003D 0039               .IIF    NB,.BlkL,       .BlkL   1
                        003D                .IIF    NB,HP$L_CI_INDEX,       HP$L_CI_INDEX:
                        003D                .IIF    NB,Ci$L_Index,  Ci$L_Index:
                00000041 003D               .IIF    NB,.BlkL,       .BlkL   1
                        0041                .IIF    NB,HP$K_CI_LEN, HP$K_CI_LEN:
                        0041                .IIF    NB,CI$K_LEN,    CI$K_LEN:
                        0000                .RESTORE
                        0000    178                                                                     ;G:9
                        0000    179         .MACRO  $DS_DISK_DEF    $GBL                    ;           [163
                        0000    180         $DEFINI DISK,$GBL,HP$A_DEPENDENT                            ;G:9
                        0000    181         $DEF    HP$K_DISK_LEN                                       ;G:9
                        0000    182         $DEF    DISK$K_LEN                                          ;G:9
                        0000    183         $DEFEND DISK,$GBL,DEF                                       ;G:9
                        0000    184 .ENDM   $DS_DISK_DEF                            ;           [163]   ;G:9
                        0000    185                                                                     ;G:9
                        0000    186 .MACRO  $DS_DISK                                                    ;G:9
                        0000    187         $DS_DISK_DEF                                                ;G:9
                        0000    188         $DS_$INITIALIZE DISK,DISK$K_LEN,255                         ;G:77
                        0000    189         $DS_$Name       Ptd$M_DEVICE, DU        ;           [164]   ;G:9
                        0000    190         $DS_$END                                                    ;G:9
                        0000    191 .ENDM   $DS_DISK                                ;           [163]   ;G:9
                        0000    192                                                                     ;G:9
                        0000    193 .MACRO  $DS_RA90_DEF    $GBL                                        ;G:77
                        0000    194         $DEFINI RA90,$GBL,HP$A_DEPENDENT                            ;G:77
                        0000    195         $DEF    HP$K_RA90_LEN                                       ;G:77
                        0000    196         $DEF    RA90$K_LEN                                          ;G:77
                        0000    197         $DEFEND RA90,$GBL,DEF                                       ;G:77
                        0000    198 .ENDM   $DS_RA90_DEF                                                ;G:77
                        0000    199                                                                     ;G:77
                        0000    200 .MACRO  $DS_RA90                                                    ;G:77
                        0000    201         $DS_RA90_DEF                                                ;G:77
                        0000    202         $DS_$INITIALIZE RA90,RA90$K_LEN,255                         ;G:77
                        0000    203         $DS_$NAME       PTD$M_ENDDEVICE, DU                         ;G:77
                        0000    204         $DS_$LITERAL    HP$M_ALLOC                                  ;G:77
                        0000    205         $DS_$STORE      HP$B_FLAGS,0,8                              ;G:77
                        0000    206         $DS_$END                                                    ;G:77
                        0000    207 .ENDM   $DS_RA90                                                    ;G:77
                        0000    208                                                                     ;G:8
```

```
                        0000    210          .SBTTL  Device description database
                        0000    211 ;
                        0000    212 ;       The following list contains the descriptor for each type
                        0000    213 ;       of device the supervisor known about.
                        0000    214 ;
                        0000    215
                        0000    216 DS$GA_PTDESC::
                        0000    217          $DS_DEVTYP      <>,<AA11K,AD11K,CI_NODE,CI780,CI750,CONSOLE,-    ; [15]
                        0000    218                  CR11,DEQNA,DHU11,DHV11,DISK,DL11,DLVJ1 -                 ; [18][19][2
                        0000    219                  DMC11,DMF32,DMF32A,DMF32P,DMF32S,-                       ; [02]
                        0000    220                  DMP11,DMR11,DMZ32,DR11B,DR11C,-                          ; [21][29]
                        0000    221                  DR11K,DR11W,DR750,DR780, -
                        0000    222                  DUP11,DW730,DW750,DW780,DX20,DZ11,DZ32,DZV11,-            ; [02][19][3
                        0000    223                  IEU11A, -                                                ;G:2
                        0000    224                  KA730,KA750,KA780,KA785,KA86, -                           ; [01][15][2
                        0000    225                  KMC11,KW11K,LA12,LA34,LA36,LA38, -                        ; [14] ;G:2
                        0000    226                  LA100,LA120,LA180,LA210, -                               ;G:5
                        0000    227                  LESI, -                                                   ; [13] ;G:5
                        0000    228                  LG01,LG02,LG03, -                                         ; [36] ;G:5
                        0000    229                  LN01,LN03,LP04, -                                         ; [32] ;G:5
                        0000    230                  LP05,LP06,LP07,LP11,LP14, -                               ; [15]
                        0000    231                  LP25,LP26,LP27,LPA11K,LUA11,MA780,MBE,-                   ; [01][15][3
                        0000    232                  ML11,MS750,MS780,NBIA,NBIB,PCL11,-                        ; [01]
                        0000    233                  PX780,-                                                   ;
                        0000    234                  R80,RA60,RA70,RA80,RA81,RA82,RA90,RB730,RCF25,RC25, -     ; [12][15][2
                        0000    235                  RD51,RD52,RH750,RH780,RL01,RL02, -                        ; [19][20]
                        0000    236                  RL11,RK06,RK07,RK611, -
                        0000    237                  RM03,RM05,RM80, -
                        0000    238                  RP04,RP05,RP06,RP07,RQDX1,RRD50,RUX50,RX02, -             ; [19][26][3
                        0000    239                  RX211,RX31,RX32,RX50,RX180,-                              ; [26]
                        0000    240                  SBIA,TE16,TK50,TM03,TM78,-                                ; [01][15][1
                        0000    241                  TS04,TS05,TS11,TU45,TU58,TU70,TU72,TU77,TU78,TU80,TU81-   ; [18][30]
                        0000    242                  UBE,UDA50,UNA11,-                                         ; [06]
                        0000    243                  VS100,VS125,VS300,VT50,VT52,VT55,VT61,VT71,-              ; [12][32]
                        0000    244                  VT100,VT101,VT102,VT125,VT131,VT132,VT220,-               ; [32]
                        0000    245                  VT240>
00000094                0000            AL_DEVTYP:      .LONG   $$N
00000254'               0004                            .LONG   AA11K
000002A5'               0008                            .LONG   AD11K
000002F6'               000C                            .LONG   CI_NODE
00000491'               0010                            .LONG   CI780
00000412'               0014                            .LONG   CI750
00000518'               0018                            .LONG   CONSOLE
00000526'               001C                            .LONG   CR11
0000057D'               0020                            .LONG   DEQNA
000005A5'               0024                            .LONG   DHU11
000005F3'               0028                            .LONG   DHV11
00000641'               002C                            .LONG   DISK
00000651'               0030                            .LONG   DL11
0000069E'               0034                            .LONG   DLVJ1
00000752'               0038                            .LONG   DMC11
000007A0'               003C                            .LONG   DMF32
000007F3'               0040                            .LONG   DMF32A
00000915'               0044                            .LONG   DMF32P
0000098F'               0048                            .LONG   DMF32S
00000A03'               004C                            .LONG   DMP11
00000ACC'               0050                            .LONG   DMR11
```

```
00000B1A' 0054          .LONG   DMZ32
00000C78' 0058          .LONG   DR11B
00000CC6' 005C          .LONG   DR11C
00000D0F' 0060          .LONG   DR11K
00000D60' 0064          .LONG   DR11W
00000DAE' 0068          .LONG   DR750
00000E39' 006C          .LONG   DR780
00000ECC' 0070          .LONG   DUP11
00000F67' 0074          .LONG   DW730
00000F96' 0078          .LONG   DW750
00000FDA' 007C          .LONG   DW780
0000104E' 0080          .LONG   DX20
0000107C' 0084          .LONG   DZ11
000010E5' 0088          .LONG   DZ32
000011D6' 008C          .LONG   DZV11
00001213' 0090          .LONG   IEU11A
0000125E' 0094          .LONG   KA730
00001339' 0098          .LONG   KA750
00001405' 009C          .LONG   KA780
00001556' 00A0          .LONG   KA785
000014AE' 00A4          .LONG   KA86
000015FF' 00A8          .LONG   KMC11
0000164D' 00AC          .LONG   KW11K
0000169E' 00B0          .LONG   LA12
00001709' 00B4          .LONG   LA34
00001723' 00B8          .LONG   LA36
0000173D' 00BC          .LONG   LA38
000016B8' 00C0          .LONG   LA100
000016D3' 00C4          .LONG   LA120
000016EE' 00C8          .LONG   LA180
00001757' 00CC          .LONG   LA210
00001772' 00D0          .LONG   LESI
000017BE' 00D4          .LONG   LG01
000017D8' 00D8          .LONG   LG02
000017F2' 00DC          .LONG   LG03
0000180C' 00E0          .LONG   LN01
00001826' 00E4          .LONG   LN03
0000183B' 00E8          .LONG   LP04
00001855' 00EC          .LONG   LP05
0000186F' 00F0          .LONG   LP06
00001889' 00F4          .LONG   LP07
000018A3' 00F8          .LONG   LP11
000018F0' 00FC          .LONG   LP14
0000190A' 0100          .LONG   LP25
00001924' 0104          .LONG   LP26
0000193E' 0108          .LONG   LP27
00001958' 010C          .LONG   LPA11K
000019B1' 0110          .LONG   LUA11
00001AD2' 0114          .LONG   MA780
00001B4D' 0118          .LONG   MBE
00001B61' 011C          .LONG   ML11
00001BC3' 0120          .LONG   MS750
00001BD4' 0124          .LONG   MS780
000019FF' 0128          .LONG   NBIA
00001A6F' 012C          .LONG   NBIB
00001C24' 0130          .LONG   PCL11
00001C6D' 0134          .LONG   PX780
```

```
                00001CD6' 0138          .LONG   R80
                00001CEF' 013C          .LONG   RA60
                00001D09' 0140          .LONG   RA70
                00001D23' 0144          .LONG   RA80
                00001D3D' 0148          .LONG   RA81
                00001D57' 014C          .LONG   RA82
                00001D71' 0150          .LONG   RA90
                00001D8B' 0154          .LONG   RB730
                00001DBA' 0158          .LONG   RCF25
                00001DD5' 015C          .LONG   RC25
                00001DEF' 0160          .LONG   RD51
                00001E09' 0164          .LONG   RD52
                00001E23' 0168          .LONG   RH750
                00001E7C' 016C          .LONG   RH780
                00001EE1' 0170          .LONG   RL01
                00001EFB' 0174          .LONG   RL02
                00001F15' 0178          .LONG   RL11
                00001F62' 017C          .LONG   RK06
                00001F7C' 0180          .LONG   RK07
                00001F96' 0184          .LONG   RK611
                00001FE4' 0188          .LONG   RM03
                00002008' 018C          .LONG   RM05
                0000202C' 0190          .LONG   RM80
                00002050' 0194          .LONG   RP04
                00002074' 0198          .LONG   RP05
                00002098' 019C          .LONG   RP06
                000020BC' 01A0          .LONG   RP07
                000020E0' 01A4          .LONG   RQDX1
                00002107' 01A8          .LONG   RRD50
                00002163' 01AC          .LONG   RUX50
                000021AB' 01B0          .LONG   RX02
                000021C5' 01B4          .LONG   RX211
                00002213' 01B8          .LONG   RX31
                00002223' 01BC          .LONG   RX32
                00002233' 01C0          .LONG   RX50
                00002248' 01C4          .LONG   RX180
                00002259' 01C8          .LONG   SBIA
                0000229B' 01CC          .LONG   TE16
                000022B5' 01D0          .LONG   TK50
                000022CF' 01D4          .LONG   TM03
                000022FD' 01D8          .LONG   TM78
                0000232B' 01DC          .LONG   TS04
                00002382' 01E0          .LONG   TS05
                000023EC' 01E4          .LONG   TS11
                00002443' 01E8          .LONG   TU45
                0000245D' 01EC          .LONG   TU58
                00002477' 01F0          .LONG   TU70
                00002491' 01F4          .LONG   TU72
                000024AB' 01F8          .LONG   TU77
                000024C5' 01FC          .LONG   TU78
                000024DF' 0200          .LONG   TU80
                0000254E' 0204          .LONG   TU81
                000025A5' 0208          .LONG   UBE
                000025E0' 020C          .LONG   UDA50
                00002649' 0210          .LONG   UNA11
                00002697' 0214          .LONG   VS100
                000026EF' 0218          .LONG   VS125
```

```
00002747' 021C                  .LONG   VS300
0000279F' 0220                  .LONG   VT50
000027B9' 0224                  .LONG   VT52
000027D3' 0228                  .LONG   VT55
000027ED' 022C                  .LONG   VT61
00002807' 0230                  .LONG   VT71
00002821' 0234                  .LONG   VT100
0000283C' 0238                  .LONG   VT101
00002857' 023C                  .LONG   VT102
00002872' 0240                  .LONG   VT125
0000288D' 0244                  .LONG   VT131
000028A8' 0248                  .LONG   VT132
000028C3' 024C                  .LONG   VT220
000028DE' 0250                  .LONG   VT240
```

```
                                0254   247          .LIST   MEB,MC
                                0254   248
                                0254   249 AA11K:   $DS_AA11K
                                0254                .SAVE   LOCAL_BLOCK
                                0254                .PSECT  $ABS$,ABS
                            00000032  0041                .=HP$A_DEPENDENT
                                      0032                .IIF    NB,AA11K$B_BR,  AA11K$B_BR:
                            00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                                      0033                .IIF    NB,AA11K$K_LEN, AA11K$K_LEN:
                                00000254                  .RESTORE
                     4B 31 31 41 41 00' 0254              .ASCIC  "AA11K" ; AA11K name
                                   05   0254
                                   33   025A              .BYTE   AA11K$K_LEN             ; AA11K$K_LEN of resultant P-table
                                   04   025B              .BYTE   4                       ; Maximum unit number                   ;G:65
                                 0000   025C              .WORD   ^A""    ; Two character mnemonic for QIO AA11K
                                   80   025E              .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                   8D   025F              .Byte   Pd$_Name        ; Directive op-code
                                   03   0260              .Byte   Ptd$M_Device            ; Enforced AA codes
                               41 41 00' 0261              .Ascic  "AA"    ; Enforced device name prefix
                                   02   0261
                                   83   0264              .BYTE   Pd$_Octal       ; Indicate scan octal
52 53 43 20 53 55 42 20 4F 2F 49 00' 0265                .ASCIC  "I/O BUS CSR"   ; I/O BUS CSR string
                                   0B   0265
                     0003FFFE 0003E000  0271              .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                                   88   0279              .BYTE   Pd$_Store       ; Indicate store operation
                                 0018   027A              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                   00   027C              .BYTE   0                       ; 0 HP$A_DEVICE to data
                                   12   027D              .BYTE   18                      ; 18 of data field
                                   83   027E              .BYTE   Pd$_Octal       ; Indicate scan octal
                  52 4F 54 43 45 56 00' 027F              .ASCIC  "VECTOR"        ; VECTOR string
                                   06   027F
                        000001FE 00000002  0286              .LONG   ^O2,^O776       ; 2 , 776 limits on input
                                   88   028E              .BYTE   Pd$_Store       ; Indicate store operation
                                 0024   028F              .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                   00   0291              .BYTE   0                       ; 0 HP$W_VECTOR to data
                                   09   0292              .BYTE   9                       ; 9 of data field
                                   82   0293              .BYTE   Pd$_Decimal     ; Indicate scan decimal
                               52 42 00' 0294              .ASCIC  "BR"    ; BR string
                                   02   0294
                        00000007 00000004  0297              .LONG   4,7     ; 4 , 7 limits on input
                                   88   029F              .BYTE   Pd$_Store       ; Indicate store operation
                                 0032   02A0              .WORD   AA11K$B_BR              ; Byte AA11K$B_BR to data
                                   00   02A2              .BYTE   0                       ; 0 AA11K$B_BR to data
                                   08   02A3              .BYTE   8                       ; 8 of data field
                                   81   02A4              .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                        02A5   250 AD11K:   $DS_AD11K                       ;
                                        02A5                .SAVE   LOCAL_BLOCK
                                        02A5                .PSECT  $ABS$,ABS
                                    00000032  0041                .=HP$A_DEPENDENT
                                              0032                .IIF    NB,AD11K$B_BR,  AD11K$B_BR:
                                    00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                                              0033                .IIF    NB,AD11K$K_LEN, AD11K$K_LEN:
                                        000002A5                  .RESTORE
                           4B 31 31 44 41 00' 02A5              .ASCIC  "AD11K" ; AD11K name
                                        05   02A5
                                        33   02AB              .BYTE   AD11K$K_LEN             ; AD11K$K_LEN of resultant P-table
                                        04   02AC              .BYTE   4                       ; Maximum unit number                   ;G:65
```

```
                          0000  02AD                .WORD   ^A""     ; Two character mnemonic for QIO AD11K
                            80  02AF                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                            8D  02B0                .Byte   Pd$_Name        ; Directive op-code
                            03  02B1                .Byte   Ptd$M_Device            ; Enforced AD codes
                     44 41 00'  02B2                .Ascic  "AD"    ; Enforced device name prefix
                            02  02B2
                            83  02B5                .BYTE   Pd$_Octal       ; Indicate scan octal
52 53 43 20 53 55 42 20 4F 2F 49 00' 02B6           .ASCIC  "I/O BUS CSR"   ; I/O BUS CSR string
                            0B  02B6
                  0003FFFE 0003E000  02C2           .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                            88  02CA                .BYTE   Pd$_Store       ; Indicate store operation
                          0018  02CB                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                            00  02CD                .BYTE   0               ; 0 HP$A_DEVICE to data
                            12  02CE                .BYTE   18              ; 18 of data field
                            83  02CF                .BYTE   Pd$_Octal       ; Indicate scan octal
               52 4F 54 43 45 56 00' 02D0           .ASCIC  "VECTOR"        ; VECTOR string
                            06  02D0
                  000001FE 00000002  02D7           .LONG   ^O2,^O776       ; 2 , 776 limits on input
                            88  02DF                .BYTE   Pd$_Store       ; Indicate store operation
                          0024  02E0                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                            00  02E2                .BYTE   0               ; 0 HP$W_VECTOR to data
                            09  02E3                .BYTE   9               ; 9 of data field
                            82  02E4                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                     52 42 00'  02E5                .ASCIC  "BR"    ; BR string
                            02  02E5
                  00000007 00000004  02E8           .LONG   4,7     ; 4 , 7 limits on input
                            88  02F0                .BYTE   Pd$_Store       ; Indicate store operation
                          0032  02F1                .WORD   AD11K$B_BR              ; Byte AD11K$B_BR to data
                            00  02F3                .BYTE   0               ; 0 AD11K$B_BR to data
                            08  02F4                .BYTE   8               ; 8 of data field
                            81  02F5                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                02F6    251 CI_NODE:$DS_CI_NODE                         ;               [12]
         45 44 4F 4E 5F 49 43 00'  02F6             .ASCIC  "CI_NODE"       ; CI_NODE name
                            07  02F6
                            41  02FE                .BYTE   CI$K_LEN                ; CI$K_LEN of resultant P-table
                            00  02FF                .BYTE   0               ; Maximum unit number                   ;G:65
                          0000  0300                .WORD   ^A""    ; Two character mnemonic for QIO CI_NODE
                            80  0302                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                            8D  0303                .Byte   Pd$_Name        ; Directive op-code
                            04  0304                .Byte   Ptd$M_NAME              ; Enforced  codes
                            00' 0305                .Ascic  ""      ; Enforced device name prefix
                            00  0305
                            87  0306                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                          0018  0307                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                            00  0309                .BYTE   0               ; 0 HP$A_DEVICE to data
                            20  030A                .BYTE   32              ; 32 of data field
                            88  030B                .BYTE   Pd$_Store       ; Indicate store operation
                          001C  030C                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                            00  030E                .BYTE   0               ; 0 HP$A_DVA to data
                            20  030F                .BYTE   32              ; 32 of data field
                            85  0310                .BYTE   Pd$_String      ; Indicate scan and verify string
65 70 79 74 5F 65 64 6F 4E 00' 0311                 .ASCIC  "Node_type"     ; Node_type string
                            09  0311
                       00 01  031B                .BYTE   1, 0
                       00 01  031D                .BYTE   1, 0
               30 38 37 58 41 56 00' 031F           .ASCIC  "VAX780"
                            06  031F
```

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                30 35 37 58 41 56 00' 0326              .ASCIC  "VAX750"
                                  06  0326
                   30 35 43 53 48 00' 032D              .ASCIC  "HSC50"
                                  05  032D
                               00 01  0333              .BYTE   1, 0
                      30 31 4C 4B 00' 0335              .ASCIC  "KL10"
                                  04  0335
                      54 4E 49 43 00' 033A              .ASCIC  "CINT"
                                  04  033A
                   35 38 37 58 41 56 00' 033F           .ASCIC  "VAX785"
                                  06  033F
             30 30 36 38 58 41 56 00' 0346              .ASCIC  "VAX8600"
                                  07  0346
             30 30 32 38 58 41 56 00' 034E              .ASCIC  "VAX8200"
                                  07  034E
             30 30 38 38 58 41 56 00' 0356              .ASCIC  "VAX8800"
                                  07  0356
                                  00  035E              .BYTE   0               ; Null length is end of valid ,,
                                  88  035F              .BYTE   Pd$_Store       ; Indicate store operation
                               003D  0360              .WORD   Ci$L_Index              ; Byte Ci$L_Index to data
                                  00  0362              .BYTE   0               ; 0 Ci$L_Index to data
                                  20  0363              .BYTE   32              ; 32 of data field
                                  8C  0364              .BYTE   Pd$_Case        ; Indicate case operation
                                  05  0365              .BYTE   $$_$            ; Count of pairs
                   00000002 00000003  0366              .LONG   ^X3,                    ^X2             ; Store the pair
                   00000002 00000008  036E              .LONG   ^X8,                    ^X2             ; Store the pair
                   00000002 00000009  0376              .LONG   ^X9,                    ^X2             ; Store the pair
                   00000002 0000000A  037E              .LONG   ^XA,                    ^X2             ; Store the pair
                   00000002 0000000B  0386              .LONG   ^XB,                    ^X2             ; Store the pair
                                  88  038E              .BYTE   Pd$_Store       ; Indicate store operation
                               0039  038F              .WORD   Ci$L_Maint_Id           ; Byte Ci$L_Maint_Id to data
                                  00  0391              .BYTE   0               ; 0 Ci$L_Maint_Id to data
                                  20  0392              .BYTE   32              ; 32 of data field
                                  87  0393              .BYTE   Pd$_Fetch       ; Indicate fetch operation
                               003D  0394              .WORD   Ci$L_index              ; Byte Ci$L_index to data
                                  00  0396              .BYTE   0               ; 0 Ci$L_index to data
                                  20  0397              .BYTE   32              ; 32 of data field
                                  8C  0398              .BYTE   Pd$_Case        ; Indicate case operation
                                  09  0399              .BYTE   $$_$            ; Count of pairs
                   FFFF0F00 00000002  039A              .LONG   ^X2,                    ^XFFFF0F00      ; Store the pair
                   FFFF0F00 00000003  03A2              .LONG   ^X3,                    ^XFFFF0F00      ; Store the pair
                   4F710200 00000004  03AA              .LONG   ^X4,                    ^X4F710200      ; Store the pair
                   A3FFAD00 00000006  03B2              .LONG   ^X6,                    ^XA3FFAD00      ; Store the pair
                   FFFFFF00 00000007  03BA              .LONG   ^X7,                    ^XFFFFFF00      ; Store the pair
                   FFFF0F00 00000008  03C2              .LONG   ^X8,                    ^XFFFF0F00      ; Store the pair
                   FFFF0F00 00000009  03CA              .LONG   ^X9,                    ^XFFFF0F00      ; Store the pair
                   FFFF0F00 0000000A  03D2              .LONG   ^XA,                    ^XFFFF0F00      ; Store the pair
                   FFFF0F00 0000000B  03DA              .LONG   ^XB,                    ^XFFFF0F00      ; Store the pair
                                  88  03E2              .BYTE   Pd$_Store       ; Indicate store operation
                               0035  03E3              .WORD   Ci$L_Func               ; Byte Ci$L_Func to data
                                  00  03E5              .BYTE   0               ; 0 Ci$L_Func to data
                                  20  03E6              .BYTE   32              ; 32 of data field
                                  82  03E7              .BYTE   Pd$_Decimal     ; Indicate scan decimal
73 65 72 64 64 61 5F 65 64 6F 4E 00' 03E8              .ASCIC  "Node_address"  ; Node_address string
                                  73  03F4
                                  0C  03E8
                   000000FF 00000000  03F5              .LONG   0,255   ; 0 , 255 limits on input
```

```
                      88  03FD                .BYTE   Pd$_Store       ; Indicate store operation
                    0034  03FE                .WORD   CI$B_NODE               ; Byte CI$B_NODE to data
                      00  0400                .BYTE   0               ; 0 CI$B_NODE to data
                      08  0401                .BYTE   8               ; 8 of data field
                      88  0402                .BYTE   Pd$_Store       ; Indicate store operation
                    000B  0403                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                      00  0405                .BYTE   0               ; 0 HP$B_DRIVE to data
                      08  0406                .BYTE   8               ; 8 of data field
                      86  0407                .BYTE   Pd$_Literal     ; Indicate literal
                80000000  0408                .LONG   ^X80000000              ; Constant
                      8A  040C                .BYTE   Pd$_Add         ; Indicate add value to field operation
                    0039  040D                .WORD   CI$L_MAINT_ID           ; Byte CI$L_MAINT_ID to data
                      00  040F                .BYTE   0               ; 0 CI$L_MAINT_ID to data
                      20  0410                .BYTE   32              ; 32 of data field
                      81  0411                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          0412    252 CI750:  $DS_CI750                       ;               [07]
          30 35 37 49 43 00' 0412               .ASCIC  "CI750" ; CI750 name
                      05  0412
                      41  0418                .BYTE   CI$K_LEN                ; CI$K_LEN of resultant P-table
                      08  0419                .BYTE   8               ; Maximum unit number                   ;G:65
                    0000  041A                .WORD   ^A""    ; Two character mnemonic for QIO CI750
                      80  041C                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  041D                .Byte   Pd$_Name        ; Directive op-code
                      03  041E                .Byte   Ptd$M_Device            ; Enforced PA codes
                41 50 00' 041F                .Ascic  "PA"    ; Enforced device name prefix
                      02  041F
                      86  0422                .BYTE   Pd$_Literal     ; Indicate literal
                40F30000  0423                .LONG   ^X40F30000              ; Constant
                      88  0427                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  0428                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  042A                .BYTE   0               ; 0 HP$A_DEVICE to data
                      20  042B                .BYTE   32              ; 32 of data field
                      82  042C                .BYTE   Pd$_Decimal     ; Indicate scan decimal
             74 6F 6C 53 00' 042D               .ASCIC  "Slot"  ; Slot string
                      04  042D
            0000000F 0000000A 0432              .LONG   10,15   ; 10 , 15 limits on input
                      88  043A                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  043B                .WORD   CI$B_TR         ; Byte CI$B_TR to data
                      00  043D                .BYTE   0               ; 0 CI$B_TR to data
                      08  043E                .BYTE   8               ; 8 of data field
                      88  043F                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  0440                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      0D  0442                .BYTE   13              ; 13 HP$A_DEVICE to data
                      04  0443                .BYTE   4               ; 4 of data field
                      88  0444                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  0445                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      02  0447                .BYTE   2               ; 2 HP$W_VECTOR to data
                      04  0448                .BYTE   4               ; 4 of data field
                      87  0449                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  044A                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  044C                .BYTE   0               ; 0 HP$A_DEVICE to data
                      20  044D                .BYTE   32              ; 32 of data field
                      88  044E                .BYTE   Pd$_Store       ; Indicate store operation
                    001C  044F                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      00  0451                .BYTE   0               ; 0 HP$A_DVA to data
                      20  0452                .BYTE   32              ; 32 of data field
                      82  0453                .BYTE   Pd$_Decimal     ; Indicate scan decimal
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                52 42 00' 0454                  .ASCIC  "BR"    ; BR string
                   02  0454
          00000007 00000004  0457               .LONG   4,7     ; 4 , 7 limits on input
                   88  045F                     .BYTE   Pd$_Store       ; Indicate store operation
                 0033  0460                     .WORD   CI$B_BR         ; Byte CI$B_BR to data
                   00  0462                     .BYTE   0               ; 0 CI$B_BR to data
                   08  0463                     .BYTE   8               ; 8 of data field
                   88  0464                     .BYTE   Pd$_Store       ; Indicate store operation
                 0024  0465                     .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                   06  0467                     .BYTE   6               ; 6 HP$W_VECTOR to data
                   03  0468                     .BYTE   3               ; 3 of data field
                   82  0469                     .BYTE   Pd$_Decimal     ; Indicate scan decimal
             65 64 6F 4E 00' 046A               .ASCIC  "Node"  ; Node string
                   04  046A
          000000FF 00000000  046F               .LONG   0,255   ; 0 , 255 limits on input
                   88  0477                     .BYTE   Pd$_Store       ; Indicate store operation
                 0034  0478                     .WORD   CI$B_NODE               ; Byte CI$B_NODE to data
                   00  047A                     .BYTE   0               ; 0 CI$B_NODE to data
                   08  047B                     .BYTE   8               ; 8 of data field
                   86  047C                     .BYTE   Pd$_Literal     ; Indicate literal
               FFFF0F00  047D                   .LONG   ^XFFFF0F00              ; Constant
                   88  0481                     .BYTE   Pd$_Store       ; Indicate store operation
                 0035  0482                     .WORD   Ci$L_Func               ; Byte Ci$L_Func to data
                   00  0484                     .BYTE   0               ; 0 Ci$L_Func to data
                   20  0485                     .BYTE   32              ; 32 of data field
                   86  0486                     .BYTE   Pd$_Literal     ; Indicate literal
               80000002  0487                   .LONG   ^X80000002              ; Constant
                   88  048B                     .BYTE   Pd$_Store       ; Indicate store operation
                 0039  048C                     .WORD   Ci$L_Maint_Id           ; Byte Ci$L_Maint_Id to data
                   00  048E                     .BYTE   0               ; 0 Ci$L_Maint_Id to data
                   20  048F                     .BYTE   32              ; 32 of data field
                   81  0490                     .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                       0491  253 CI780:          $DS_CI780                       ;               [02]
30 38 37 49 43 00' 0491                         .ASCIC  "CI780" ; CI780 name
                   05  0491
                   41  0497                     .BYTE   CI$K_LEN                ; CI$K_LEN of resultant P-table
                   08  0498                     .BYTE   8               ; Maximum unit number                   ;G:65
                 0000  0499                     .WORD   ^A""    ; Two character mnemonic for QIO CI780
                   80  049B                     .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                   8D  049C                     .Byte   Pd$_Name        ; Directive op-code
                   03  049D                     .Byte   Ptd$M_Device            ; Enforced PA codes
             41 50 00' 049E                     .Ascic  "PA"    ; Enforced device name prefix
                   02  049E
                   82  04A1                     .BYTE   Pd$_Decimal     ; Indicate scan decimal
             52 54 00' 04A2                     .ASCIC  "TR"    ; TR string
                   02  04A2
          0000000F 00000001  04A5               .LONG   1,15    ; 1 , 15 limits on input
                   88  04AD                     .BYTE   Pd$_Store       ; Indicate store operation
                 0032  04AE                     .WORD   CI$B_TR         ; Byte CI$B_TR to data
                   00  04B0                     .BYTE   0               ; 0 CI$B_TR to data
                   08  04B1                     .BYTE   8               ; 8 of data field
                   88  04B2                     .BYTE   Pd$_Store       ; Indicate store operation
                 0018  04B3                     .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                   0D  04B5                     .BYTE   13              ; 13 HP$A_DEVICE to data
                   04  04B6                     .BYTE   4               ; 4 of data field
                   88  04B7                     .BYTE   Pd$_Store       ; Indicate store operation
                 0024  04B8                     .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
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                      02  04BA                .BYTE   2               ; 2 HP$W_VECTOR to data
                      04  04BB                .BYTE   4               ; 4 of data field
                      82  04BC                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 42 00' 04BD                .ASCIC  "BR"    ; BR string
                      02  04BD
          00000007 00000004  04C0                .LONG   4,7     ; 4 , 7 limits on input
                      88  04C8                .BYTE   Pd$_Store       ; Indicate store operation
                    0033  04C9                .WORD   CI$B_BR         ; Byte CI$B_BR to data
                      00  04CB                .BYTE   0               ; 0 CI$B_BR to data
                      08  04CC                .BYTE   8               ; 8 of data field
                      88  04CD                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  04CE                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      06  04D0                .BYTE   6               ; 6 HP$W_VECTOR to data
                      02  04D1                .BYTE   2               ; 2 of data field
                      86  04D2                .BYTE   Pd$_Literal     ; Indicate literal
                00000006  04D3                .LONG   6               ; Constant
                      88  04D7                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  04D8                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      1C  04DA                .BYTE   28              ; 28 HP$A_DEVICE to data
                      04  04DB                .BYTE   4               ; 4 of data field
                      87  04DC                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  04DD                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  04DF                .BYTE   0               ; 0 HP$A_DEVICE to data
                      20  04E0                .BYTE   32              ; 32 of data field
                      88  04E1                .BYTE   Pd$_Store       ; Indicate store operation
                    001C  04E2                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      00  04E4                .BYTE   0               ; 0 HP$A_DVA to data
                      20  04E5                .BYTE   32              ; 32 of data field
                      86  04E6                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  04E7                .LONG   1               ; Constant
                      88  04EB                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  04EC                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      08  04EE                .BYTE   8               ; 8 HP$W_VECTOR to data
                      01  04EF                .BYTE   1               ; 1 of data field
                      82  04F0                .BYTE   Pd$_Decimal     ; Indicate scan decimal
             65 64 6F 4E 00' 04F1                .ASCIC  "Node"  ; Node string
                      04  04F1
          000000FF 00000000  04F6                .LONG   0,255   ; 0 , 255 limits on input
                      88  04FE                .BYTE   Pd$_Store       ; Indicate store operation
                    0034  04FF                .WORD   CI$B_NODE               ; Byte CI$B_NODE to data
                      00  0501                .BYTE   0               ; 0 CI$B_NODE to data
                      08  0502                .BYTE   8               ; 8 of data field
                      86  0503                .BYTE   Pd$_Literal     ; Indicate literal
                FFFF0F00  0504                .LONG   ^XFFFF0F00              ; Constant
                      88  0508                .BYTE   Pd$_Store       ; Indicate store operation
                    0035  0509                .WORD   Ci$L_Func               ; Byte Ci$L_Func to data
                      00  050B                .BYTE   0               ; 0 Ci$L_Func to data
                      20  050C                .BYTE   32              ; 32 of data field
                      86  050D                .BYTE   Pd$_Literal     ; Indicate literal
                80000002  050E                .LONG   ^X80000002              ; Constant
                      88  0512                .BYTE   Pd$_Store       ; Indicate store operation
                    0039  0513                .WORD   Ci$L_Maint_Id           ; Byte Ci$L_Maint_Id to data
                      00  0515                .BYTE   0               ; 0 Ci$L_Maint_Id to data
                      20  0516                .BYTE   32              ; 32 of data field
                      81  0517                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          0518    254 CONSOLE:$DS_CONSOLE                     ;                       [15]
                          0518                .SAVE   LOCAL_BLOCK
```

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                            0518                .PSECT  $ABS$,ABS
                   00000032 0041                .=Hp$A_Dependent
                            0032                .IIF    NB,Console$K_Len,       Console$K_Len:
                   00000518                     .RESTORE
 65 6C 6F 73 6E 6F 63 00'   0518                .ASCIC  "console"       ; console name
                         07 0518
                         32 0520                .BYTE   Console$K_Len           ; Console$K_Len of resultant P-table
                         01 0521                .BYTE   1                       ; Maximum unit number                   ;G:65
                       0000 0522                .WORD   ^A""    ; Two character mnemonic for QIO console
                         80 0524                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                         81 0525                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                            0526    255 CR11:   $DS_CR11
                            0526                .SAVE   LOCAL_BLOCK
                            0526                .PSECT  $ABS$,ABS
                   00000032 0041                .=HP$A_DEPENDENT
                            0032                .IIF    NB,CR11$L_CSR,  CR11$L_CSR:
                   00000036 0032                .IIF    NB,.BLKL,       .BLKL   1
                            0036                .IIF    NB,CR11$B_BR,   CR11$B_BR:
                   00000037 0036                .IIF    NB,.BLKB,       .BLKB   1
                            0037                .IIF    NB,CR11$K_LEN,  CR11$K_LEN:
                   00000526                     .RESTORE
              31 31 52 43 00' 0526              .ASCIC  "CR11"  ; CR11 name
                         04 0526
                         37 052B                .BYTE   CR11$K_LEN              ; CR11$K_LEN of resultant P-table
                         01 052C                .BYTE   1                       ; Maximum unit number                   ;G:65
                       0000 052D                .WORD   ^A""    ; Two character mnemonic for QIO CR11
                         80 052F                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                         8D 0530                .Byte   Pd$_Name        ; Directive op-code
                         03 0531                .Byte   Ptd$M_Device            ; Enforced CR codes
                    52 43 00' 0532              .Ascic  "CR"    ; Enforced device name prefix
                         02 0532
                         86 0535                .BYTE   Pd$_Literal     ; Indicate literal
                   00000001 0536                .LONG   HP$M_ALLOC              ; Constant
                         88 053A                .BYTE   Pd$_Store       ; Indicate store operation
                       000A 053B                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                         00 053D                .BYTE   0               ; 0 HP$B_FLAGS to data
                         08 053E                .BYTE   8               ; 8 of data field
                         83 053F                .BYTE   Pd$_Octal       ; Indicate scan octal
                    52 53 43 00' 0540           .ASCIC  "CSR"   ; CSR string
                         03 0540
                0003FFFE 0003E000 0544          .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                         88 054C                .BYTE   Pd$_Store       ; Indicate store operation
                       0032 054D                .WORD   CR11$L_CSR              ; Byte CR11$L_CSR to data
                         00 054F                .BYTE   0               ; 0 CR11$L_CSR to data
                         20 0550                .BYTE   32              ; 32 of data field
                         88 0551                .BYTE   Pd$_Store       ; Indicate store operation
                       0018 0552                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                         00 0554                .BYTE   0               ; 0 HP$A_DEVICE to data
                         12 0555                .BYTE   18              ; 18 of data field
                         83 0556                .BYTE   Pd$_Octal       ; Indicate scan octal
 52 4F 54 43 45 56 00'   0557                .ASCIC  "VECTOR"        ; VECTOR string
                         06 0557
                000001FE 00000002 055E          .LONG   ^O2,^O776       ; 2 , 776 limits on input
                         88 0566                .BYTE   Pd$_Store       ; Indicate store operation
                       0024 0567                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                         00 0569                .BYTE   0               ; 0 HP$W_VECTOR to data
                         09 056A                .BYTE   9               ; 9 of data field
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                      82  056B                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 42 00' 056C                .ASCIC  "BR"    ; BR string
                      02  056C
          00000007 00000004  056F             .LONG   4,7     ; 4 , 7 limits on input
                      88  0577                .BYTE   Pd$_Store       ; Indicate store operation
                    0036  0578                .WORD   CR11$B_BR               ; Byte CR11$B_BR to data
                      00  057A                .BYTE   0               ; 0 CR11$B_BR to data
                      08  057B                .BYTE   8               ; 8 of data field
                      81  057C                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          057D    256 DEQNA:  $DS_DEQNA                       ;               [19]
                          057D                .SAVE   LOCAL_BLOCK
                          057D                .PSECT  $ABS$,ABS
                00000032  0041                .=HP$A_DEPENDENT
                          0032                .IIF    NB,DEQNA$L_CSR, DEQNA$L_CSR:
                00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                          0036                .IIF    NB,DEQNA$K_LEN, DEQNA$K_LEN:
                          0000057D            .RESTORE
          41 4E 51 45 44 00' 057D             .ASCIC  "DEQNA" ; DEQNA name
                      05  057D
                      36  0583                .BYTE   DEQNA$K_LEN             ; DEQNA$K_LEN of resultant P-table
                      00  0584                .BYTE   0               ; Maximum unit number                   ;G:65
                    0000  0585                .WORD   ^A""    ; Two character mnemonic for QIO DEQNA
                      80  0587                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  0588                .Byte   Pd$_Name        ; Directive op-code
                      02  0589                .Byte   Ptd$M_Controller                ; Enforced XQ codes
                51 58 00' 058A                .Ascic  "XQ"    ; Enforced device name prefix
                      02  058A
                      83  058D                .BYTE   Pd$_Octal       ; Indicate scan octal
             52 53 43 00' 058E                .ASCIC  "CSR"   ; CSR string
                      03  058E
          0003FFFC 0003E000  0592             .LONG   ^O760000,^O777774       ; 760000 , 777774 limits on input
                      88  059A                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  059B                .WORD   DEQNA$L_CSR             ; Byte DEQNA$L_CSR to data
                      00  059D                .BYTE   0               ; 0 DEQNA$L_CSR to data
                      20  059E                .BYTE   32              ; 32 of data field
                      88  059F                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  05A0                .WORD   Hp$A_Device             ; Byte Hp$A_Device to data
                      00  05A2                .BYTE   0               ; 0 Hp$A_Device to data
                      12  05A3                .BYTE   18              ; 18 of data field
                      81  05A4                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          05A5    257 DHU11:  $DS_DHU11                       ;               [29]
          31 31 55 48 44 00' 05A5             .ASCIC  "DHU11" ; DHU11 name
                      05  05A5
                      39  05AB                .BYTE   HP$K_DHUV_LEN           ; HP$K_DHUV_LEN of resultant P-table
                      08  05AC                .BYTE   8               ; Maximum unit number                   ;G:65
                    5854  05AD                .WORD   ^A"TX"  ; Two character mnemonic for QIO DHU11 TX
                      80  05AF                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  05B0                .Byte   Pd$_Name        ; Directive op-code
                      02  05B1                .Byte   Ptd$M_Controller                ; Enforced TX codes
                58 54 00' 05B2                .Ascic  "TX"    ; Enforced device name prefix
                      02  05B2
                      83  05B5                .BYTE   Pd$_Octal       ; Indicate scan octal
             52 53 43 00' 05B6                .ASCIC  "CSR"   ; CSR string
                      03  05B6
          0003FFFE 0003E000  05BA             .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  05C2                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  05C3                .WORD   HP$L_DHUV_CSR           ; Byte HP$L_DHUV_CSR to data
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                      00  05C5                .BYTE   0                       ; 0 HP$L_DHUV_CSR to data
                      20  05C6                .BYTE   32                      ; 32 of data field
                      88  05C7                .BYTE   Pd$_Store               ; Indicate store operation
                    0018  05C8                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                      00  05CA                .BYTE   0                       ; 0 HP$A_DEVICE to data
                      12  05CB                .BYTE   18                      ; 18 of data field
                      83  05CC                .BYTE   Pd$_Octal               ; Indicate scan octal
          52 4F 54 43 45 56 00' 05CD          .ASCIC  "VECTOR"                ; VECTOR string
                      06  05CD
       000001FE 00000000  05D4                .LONG   ^O0,^O776               ; 0 , 776 limits on input
                      88  05DC                .BYTE   Pd$_Store               ; Indicate store operation
                    0036  05DD                .WORD   HP$W_DHUV_VEC                   ; Byte HP$W_DHUV_VEC to data
                      00  05DF                .BYTE   0                       ; 0 HP$W_DHUV_VEC to data
                      10  05E0                .BYTE   16                      ; 16 of data field
                      82  05E1                .BYTE   Pd$_Decimal             ; Indicate scan decimal
                 52 42 00' 05E2                .ASCIC  "BR"    ; BR string
                      02  05E2
       00000007 00000004  05E5                .LONG   4,7     ; 4 , 7 limits on input
                      88  05ED                .BYTE   Pd$_Store               ; Indicate store operation
                    0038  05EE                .WORD   HP$B_DHUV_BR                    ; Byte HP$B_DHUV_BR to data
                      00  05F0                .BYTE   0                       ; 0 HP$B_DHUV_BR to data
                      08  05F1                .BYTE   8                       ; 8 of data field
                      81  05F2                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          05F3    258 DHV11:  $DS_DHV11                               ;               [32]
          31 31 56 48 44 00' 05F3             .ASCIC  "DHV11" ; DHV11 name
                      05  05F3
                      39  05F9                .BYTE   HP$K_DHUV_LEN           ; HP$K_DHUV_LEN of resultant P-table
                      08  05FA                .BYTE   8                       ; Maximum unit number                   ;G:65
                    5854  05FB                .WORD   ^A"TX"  ; Two character mnemonic for QIO DHV11 TX
                      80  05FD                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  05FE                .Byte   Pd$_Name                ; Directive op-code
                      02  05FF                .Byte   Ptd$M_Controller                ; Enforced TX codes
                 58 54 00' 0600             .Ascic  "TX"    ; Enforced device name prefix
                      02  0600
                      83  0603                .BYTE   Pd$_Octal               ; Indicate scan octal
                 52 53 43 00' 0604             .ASCIC  "CSR"   ; CSR string
                      03  0604
       0003FFFE 0003E000  0608                .LONG   ^O760000,^O777776               ; 760000 , 777776 limits on input
                      88  0610                .BYTE   Pd$_Store               ; Indicate store operation
                    0032  0611                .WORD   HP$L_DHUV_CSR                   ; Byte HP$L_DHUV_CSR to data
                      00  0613                .BYTE   0                       ; 0 HP$L_DHUV_CSR to data
                      20  0614                .BYTE   32                      ; 32 of data field
                      88  0615                .BYTE   Pd$_Store               ; Indicate store operation
                    0018  0616                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                      00  0618                .BYTE   0                       ; 0 HP$A_DEVICE to data
                      12  0619                .BYTE   18                      ; 18 of data field
                      83  061A                .BYTE   Pd$_Octal               ; Indicate scan octal
          52 4F 54 43 45 56 00' 061B          .ASCIC  "VECTOR"                ; VECTOR string
                      06  061B
       000001FE 00000000  0622                .LONG   ^O0,^O776               ; 0 , 776 limits on input
                      88  062A                .BYTE   Pd$_Store               ; Indicate store operation
                    0036  062B                .WORD   HP$W_DHUV_VEC                   ; Byte HP$W_DHUV_VEC to data
                      00  062D                .BYTE   0                       ; 0 HP$W_DHUV_VEC to data
                      10  062E                .BYTE   16                      ; 16 of data field
                      82  062F                .BYTE   Pd$_Decimal             ; Indicate scan decimal
                 52 42 00' 0630             .ASCIC  "BR"    ; BR string
                      02  0630
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                00000007 00000004  0633                .LONG   4,7     ; 4 , 7 limits on input
                              88   063B                .BYTE   Pd$_Store       ; Indicate store operation
                            0038   063C                .WORD   HP$B_DHUV_BR            ; Byte HP$B_DHUV_BR to data
                              00   063E                .BYTE   0               ; 0 HP$B_DHUV_BR to data
                              08   063F                .BYTE   8               ; 8 of data field
                              81   0640                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                   0641    259 DISK:    $DS_DISK                        ;               [18]
                                   0641                .SAVE   LOCAL_BLOCK
                                   0641                .PSECT  $ABS$,ABS
                          00000032 0041                .=HP$A_DEPENDENT
                                   0032                .IIF    NB,HP$K_DISK_LEN,       HP$K_DISK_LEN:
                                   0032                .IIF    NB,DISK$K_LEN,  DISK$K_LEN:
                                00000641               .RESTORE
                     4B 53 49 44 00' 0641               .ASCIC  "DISK"  ; DISK name
                              04   0641
                              32   0646                .BYTE   DISK$K_LEN              ; DISK$K_LEN of resultant P-table
                              FF   0647                .BYTE   255             ; Maximum unit number                   ;G:65
                            0000   0648                .WORD   ^A""    ; Two character mnemonic for QIO DISK
                              80   064A                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                              8D   064B                .Byte   Pd$_Name        ; Directive op-code
                              03   064C                .Byte   Ptd$M_DEVICE            ; Enforced DU codes
                           55 44 00' 064D               .Ascic  "DU"    ; Enforced device name prefix
                              02   064D
                              81   0650                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                   0651    260 DL11:    $DS_DL11
                                   0651                .SAVE   LOCAL_BLOCK
                                   0651                .PSECT  $ABS$,ABS
                          00000032 0041                .=HP$A_DEPENDENT
                                   0032                .IIF    NB,DL11$L_CSR,  DL11$L_CSR:
                          00000036 0032                .IIF    NB,.BLKL,       .BLKL   1
                                   0036                .IIF    NB,DL11$B_BR,   DL11$B_BR:
                          00000037 0036                .IIF    NB,.BLKB,       .BLKB   1
                                   0037                .IIF    NB,DL11$K_LEN,  DL11$K_LEN:
                                00000651               .RESTORE
                        31 31 4C 44 00' 0651           .ASCIC  "DL11"  ; DL11 name
                              04   0651
                              37   0656                .BYTE   DL11$K_LEN              ; DL11$K_LEN of resultant P-table
                              00   0657                .BYTE   0               ; Maximum unit number                   ;G:65
                            0000   0658                .WORD   ^A""    ; Two character mnemonic for QIO DL11
                              80   065A                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                              8D   065B                .Byte   Pd$_Name        ; Directive op-code
                              02   065C                .Byte   Ptd$M_Controller                ; Enforced TT codes
                           54 54 00' 065D               .Ascic  "TT"    ; Enforced device name prefix
                              02   065D
                              83   0660                .BYTE   Pd$_Octal       ; Indicate scan octal
                        52 53 43 00' 0661              .ASCIC  "CSR"   ; CSR string
                              03   0661
                00003FFFE 0003E000 0665                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                              88   066D                .BYTE   Pd$_Store       ; Indicate store operation
                            0032   066E                .WORD   DL11$L_CSR              ; Byte DL11$L_CSR to data
                              00   0670                .BYTE   0               ; 0 DL11$L_CSR to data
                              20   0671                .BYTE   32              ; 32 of data field
                              88   0672                .BYTE   Pd$_Store       ; Indicate store operation
                            0018   0673                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                              00   0675                .BYTE   0               ; 0 HP$A_DEVICE to data
                              12   0676                .BYTE   18              ; 18 of data field
                              83   0677                .BYTE   Pd$_Octal       ; Indicate scan octal
```

```
                52 4F 54 43 45 56 00' 0678                  .ASCIC  "VECTOR"          ; VECTOR string
                                   06 0678
                   000001FE 00000002  067F                  .LONG   ^O2,^O776         ; 2 , 776 limits on input
                                   88 0687                  .BYTE   Pd$_Store         ; Indicate store operation
                                 0024 0688                  .WORD   HP$W_VECTOR               ; Byte HP$W_VECTOR to data
                                   00 068A                  .BYTE   0                 ; 0 HP$W_VECTOR to data
                                   09 068B                  .BYTE   9                 ; 9 of data field
                                   82 068C                  .BYTE   Pd$_Decimal       ; Indicate scan decimal
                              52 42 00' 068D                .ASCIC  "BR"      ; BR string
                                   02 068D
                   00000007 00000004  0690                  .LONG   4,7       ; 4 , 7 limits on input
                                   88 0698                  .BYTE   Pd$_Store         ; Indicate store operation
                                 0036 0699                  .WORD   DL11$B_BR                 ; Byte DL11$B_BR to data
                                   00 069B                  .BYTE   0                 ; 0 DL11$B_BR to data
                                   08 069C                  .BYTE   8                 ; 8 of data field
                                   81 069D                  .BYTE   Pd$_End           ; Indicate end of PT-descriptor
                                      069E    261 DLVJ1:    $DS_DLVJ1                         ;                   [19]
                                      069E                  .SAVE   LOCAL_BLOCK
                                      069E                  .PSECT  $ABS$,ABS
                                   00000032  0041                  .=HP$A_DEPENDENT
                                             0032                  .IIF    NB,DLVJ1$L_CSR, DLVJ1$L_CSR:
                                   00000036  0032                  .IIF    NB,.BLKL,       .BLKL   1
                                             0036                  .IIF    NB,DLVJ1$B_FLAGS,       DLVJ1$B_FLAGS:
                                   00000037  0036                  .IIF    NB,.BLKB,       .BLKB   1
                                             0037                  .IIF    NB,DLVJ1$K_LEN, DLVJ1$K_LEN:
                                      0000069E                  .RESTORE
                   31 4A 56 4C 44 00' 069E                  .ASCIC  "DLVJ1" ; DLVJ1 name
                                   05 069E
                                   37 06A4                  .BYTE   DLVJ1$K_LEN               ; DLVJ1$K_LEN of resultant P-table
                                   00 06A5                  .BYTE   0                 ; Maximum unit number                          ;G:65
                                 0000 06A6                  .WORD   ^A""      ; Two character mnemonic for QIO DLVJ1
                                   80 06A8                  .BYTE   Pd$_Start         ; Constant to identify start of descriptor
                                   8D 06A9                  .Byte   Pd$_Name          ; Directive op-code
                                   02 06AA                  .Byte   Ptd$M_Controller                  ; Enforced TT codes
                              54 54 00' 06AB                .Ascic  "TT"      ; Enforced device name prefix
                                   02 06AB
                                   83 06AE                  .BYTE   Pd$_Octal         ; Indicate scan octal
                           52 53 43 00' 06AF                .ASCIC  "CSR"     ; CSR string
                                   03 06AF
                   0003FFFE 0003E000  06B3                  .LONG   ^O760000,^O777776         ; 760000 , 777776 limits on input
                                   88 06BB                  .BYTE   Pd$_Store         ; Indicate store operation
                                 0032 06BC                  .WORD   DLVJ1$L_CSR               ; Byte DLVJ1$L_CSR to data
                                   00 06BE                  .BYTE   0                 ; 0 DLVJ1$L_CSR to data
                                   20 06BF                  .BYTE   32                ; 32 of data field
                                   88 06C0                  .BYTE   Pd$_Store         ; Indicate store operation
                                 0018 06C1                  .WORD   HP$A_DEVICE               ; Byte HP$A_DEVICE to data
                                   00 06C3                  .BYTE   0                 ; 0 HP$A_DEVICE to data
                                   12 06C4                  .BYTE   18                ; 18 of data field
                                   83 06C5                  .BYTE   Pd$_Octal         ; Indicate scan octal
                52 4F 54 43 45 56 00' 06C6                  .ASCIC  "VECTOR"          ; VECTOR string
                                   06 06C6
                   000001FE 00000002  06CD                  .LONG   ^O2,^O776         ; 2 , 776 limits on input
                                   88 06D5                  .BYTE   Pd$_Store         ; Indicate store operation
                                 0024 06D6                  .WORD   HP$W_VECTOR               ; Byte HP$W_VECTOR to data
                                   00 06D8                  .BYTE   0                 ; 0 HP$W_VECTOR to data
                                   09 06D9                  .BYTE   9                 ; 9 of data field
                                   85 06DA                  .BYTE   Pd$_String        ; Indicate scan and verify string
```

```
64 20 66 6F 20 72 65 62 6D 75 4E 00' 06DB                .ASCIC  "Number of data bits"   ; Number of data bits string
            73 74 69 62 20 61 74 61  06E7
                                  13  06DB
                              37 00' 06EF                .ASCIC  "7"
                                 01  06EF
                              38 00' 06F1                .ASCIC  "8"
                                 01  06F1
                                 00  06F3                .BYTE   0                   ; Null length is end of valid 7,8
                                 88  06F4                .BYTE   Pd$_Store           ; Indicate store operation
                               0036  06F5                .WORD   DLVJ1$B_FLAGS               ; Byte DLVJ1$B_FLAGS to data
                                 00  06F7                .BYTE   DLVJ1$V_NDATA               ; DLVJ1$V_NDATA DLVJ1$B_FLAGS to data
                                 01  06F8                .BYTE   1                   ; 1 of data field
                                 85  06F9                .BYTE   Pd$_String          ; Indicate scan and verify string
73 20 66 6F 20 72 65 62 6D 75 4E 00' 06FA                .ASCIC  "Number of stop bits"   ; Number of stop bits string
            73 74 69 62 20 70 6F 74  0706
                                  13  06FA
                              31 00' 070E                .ASCIC  "1"
                                 01  070E
                              32 00' 0710                .ASCIC  "2"
                                 01  0710
                                 00  0712                .BYTE   0                   ; Null length is end of valid 1,2
                                 88  0713                .BYTE   Pd$_Store           ; Indicate store operation
                               0036  0714                .WORD   DLVJ1$B_FLAGS               ; Byte DLVJ1$B_FLAGS to data
                                 01  0716                .BYTE   DLVJ1$V_NSTOP               ; DLVJ1$V_NSTOP DLVJ1$B_FLAGS to data
                                 01  0717                .BYTE   1                   ; 1 of data field
                                 8B  0718                .BYTE   Pd$_Logical         ; Indicate logical value operation
65 74 65 64 20 79 74 69 72 61 50 00' 0719                .ASCIC  \Parity detection enabled\      ; Parity detection enabled string
65 6C 62 61 6E 65 20 6E 6F 69 74 63  0725
                                  64  0731
                                  18  0719
                                  88  0732                        .BYTE   Pd$_Store           ; Indicate store operation
                               0036   0733                        .WORD   DLVJ1$B_FLAGS               ; Byte DLVJ1$B_FLAGS to data
                                 02   0735                        .BYTE   DLVJ1$V_PARITY              ; DLVJ1$V_PARITY DLVJ1$B_FLAGS to data
                                 01   0736                        .BYTE   1                   ; 1 of data field
                                 8B   0737                        .BYTE   Pd$_Logical         ; Indicate logical value operation
79 74 69 72 61 70 20 6E 65 76 45 00'  0738                        .ASCIC  \Even parity enabled\   ; Even parity enabled string
            64 65 6C 62 61 6E 65 20   0744
                                  13  0738
                                  88  074C                        .BYTE   Pd$_Store           ; Indicate store operation
                               0036   074D                        .WORD   DLVJ1$B_FLAGS               ; Byte DLVJ1$B_FLAGS to data
                                 03   074F                        .BYTE   DLVJ1$V_EVEPAR              ; DLVJ1$V_EVEPAR DLVJ1$B_FLAGS to data
                                 01   0750                        .BYTE   1                   ; 1 of data field
                                 81   0751                        .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                                      0752    262 DMC11:          $DS_DMC11
                                      0752                        .SAVE   LOCAL_BLOCK
                                      0752                        .PSECT  $ABS$,ABS
                             00000032 0041                        .=HP$A_DEPENDENT
                                      0032                        .IIF    NB,DMC11$L_CSR, DMC11$L_CSR:
                             00000036 0032                        .IIF    NB,,BLKL,       .BLKL   1
                                      0036                        .IIF    NB,DMC11$B_BR,  DMC11$B_BR:
                             00000037 0036                        .IIF    NB,,BLKB,       .BLKB   1
                                      0037                        .IIF    NB,DMC11$K_LEN, DMC11$K_LEN:
                                 00000752                         .RESTORE
                        31 31 43 4D 44 00' 0752                   .ASCIC  "DMC11" ; DMC11 name
                                  05  0752
                                  37  0758                        .BYTE   DMC11$K_LEN             ; DMC11$K_LEN of resultant P-table
                                  00  0759                        .BYTE   0                   ; Maximum unit number                   ;G:65
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                        4D58  075A                .WORD   ^A"XM"  ; Two character mnemonic for QIO DMC11 XM
                          80  075C                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  075D                .Byte   Pd$_Name        ; Directive op-code
                          03  075E                .Byte   Ptd$M_Device            ; Enforced XM codes
                    4D 58 00' 075F                .Ascic  "XM"    ; Enforced device name prefix
                          02  075F
                          83  0762                .BYTE   Pd$_Octal       ; Indicate scan octal
                 52 53 43 00' 0763                .ASCIC  "CSR"   ; CSR string
                          03  0763
              0003FFFE 0003E000  0767                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                          88  076F                .BYTE   Pd$_Store       ; Indicate store operation
                        0032  0770                .WORD   DMC11$L_CSR             ; Byte DMC11$L_CSR to data
                          00  0772                .BYTE   0               ; 0 DMC11$L_CSR to data
                          20  0773                .BYTE   32              ; 32 of data field
                          88  0774                .BYTE   Pd$_Store       ; Indicate store operation
                        0018  0775                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                          00  0777                .BYTE   0               ; 0 HP$A_DEVICE to data
                          12  0778                .BYTE   18              ; 18 of data field
                          83  0779                .BYTE   Pd$_Octal       ; Indicate scan octal
           52 4F 54 43 45 56 00' 077A                .ASCIC  "VECTOR"        ; VECTOR string
                          06  077A
              000001FE 00000002  0781                .LONG   ^O2,^O776       ; 2 , 776 limits on input
                          88  0789                .BYTE   Pd$_Store       ; Indicate store operation
                        0024  078A                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                          00  078C                .BYTE   0               ; 0 HP$W_VECTOR to data
                          09  078D                .BYTE   9               ; 9 of data field
                          82  078E                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                    52 42 00' 078F                .ASCIC  "BR"    ; BR string
                          02  078F
              00000007 00000004  0792                .LONG   4,7     ; 4 , 7 limits on input
                          88  079A                .BYTE   Pd$_Store       ; Indicate store operation
                        0036  079B                .WORD   DMC11$B_BR              ; Byte DMC11$B_BR to data
                          00  079D                .BYTE   0               ; 0 DMC11$B_BR to data
                          08  079E                .BYTE   8               ; 8 of data field
                          81  079F                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                              07A0    263 DMF32:  $DS_DMF32                       ;               [02]
                              07A0                .SAVE   LOCAL_BLOCK
                              07A0                .PSECT  $ABS$,ABS
                    00000032  0041                .=HP$A_DEPENDENT
                              0032                .IIF    NB,HP$B_DMF32_COMMON,   HP$B_DMF32_COMMON:
                              0032                .IIF    NB,DMF32$B_COMMON,      DMF32$B_COMMON:
                    00000033  0032                .IIF    NB,..BLKB,      .BLKB   1
                              0033                .IIF    NB,HP$B_DMF32_FLAGS,    HP$B_DMF32_FLAGS:
                              0033                .IIF    NB,DMF32$B_FLAGS,       DMF32$B_FLAGS:
                    00000034  0033                .IIF    NB,..BLKB,      .BLKB   1
                              0034                .IIF    NB,HP$B_DMF32_BR,       HP$B_DMF32_BR:
                              0034                .IIF    NB,DMF32$B_BR,  DMF32$B_BR:
                    00000035  0034                .IIF    NB,..BLKB,      .BLKB   1
                              0035                .IIF    NB,HP$L_DMF32_CSR,      HP$L_DMF32_CSR:
                              0035                .IIF    NB,DMF32$L_CSR, DMF32$L_CSR:
                    00000039  0035                .IIF    NB,..BLKL,      .BLKL   1
                              0039                .IIF    NB,HP$K_DMF32_LEN,      HP$K_DMF32_LEN:
                              0039                .IIF    NB,DMF32$K_LEN, DMF32$K_LEN:
                              07A0                .RESTORE
           32 33 46 4D 44 00' 07A0                .ASCIC  "DMF32" ; DMF32 name
                          05  07A0
                          39  07A6                .BYTE   DMF32$K_LEN             ; DMF32$K_LEN of resultant P-table
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                    05  07A7          .BYTE   5                   ; Maximum unit number                          ;G:65
                  434C  07A8          .WORD   ^A"LC"   ; Two character mnemonic for QIO DMF32 LC
                    80  07AA          .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                    83  07AB          .BYTE   Pd$_Octal           ; Indicate scan octal
          52 53 43 00'  07AC          .ASCIC  "CSR"    ; CSR string
                    03  07AC
     0003FFFE 0003E000  07B0          .LONG   ^O760000,^O777776           ; 760000 , 777776 limits on input
                    88  07B8          .BYTE   Pd$_Store           ; Indicate store operation
                  0035  07B9          .WORD   DMF32$L_CSR                 ; Byte DMF32$L_CSR to data
                    00  07BB          .BYTE   0                   ; 0 DMF32$L_CSR to data
                    20  07BC          .BYTE   32                  ; 32 of data field
                    88  07BD          .BYTE   Pd$_Store           ; Indicate store operation
                  0018  07BE          .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                    00  07C0          .BYTE   0                   ; 0 HP$A_DEVICE to data
                    12  07C1          .BYTE   18                  ; 18 of data field
                    83  07C2          .BYTE   Pd$_Octal           ; Indicate scan octal
  72 6F 74 63 65 56 00'  07C3          .ASCIC  "Vector"            ; Vector string
                    06  07C3
     000001FE 000000C0  07CA          .LONG   ^O300,^O776         ; 300 , 776 limits on input
                    88  07D2          .BYTE   Pd$_Store           ; Indicate store operation
                  0024  07D3          .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                    00  07D5          .BYTE   0                   ; 0 HP$W_VECTOR to data
                    09  07D6          .BYTE   9                   ; 9 of data field
                    82  07D7          .BYTE   Pd$_Decimal         ; Indicate scan decimal
              52 42 00'  07D8          .ASCIC  "BR"     ; BR string
                    02  07D8
     00000007 00000004  07DB          .LONG   4,7      ; 4 , 7 limits on input
                    88  07E3          .BYTE   Pd$_Store           ; Indicate store operation
                  0034  07E4          .WORD   DMF32$B_BR                  ; Byte DMF32$B_BR to data
                    00  07E6          .BYTE   0                   ; 0 DMF32$B_BR to data
                    08  07E7          .BYTE   8                   ; 8 of data field
                    86  07E8          .BYTE   Pd$_Literal         ; Indicate literal
              00000001  07E9          .LONG   1                   ; Constant
                    88  07ED          .BYTE   Pd$_Store           ; Indicate store operation
                  0032  07EE          .WORD   DMF32$B_COMMON              ; Byte DMF32$B_COMMON to data
                    00  07F0          .BYTE   0                   ; 0 DMF32$B_COMMON to data
                    08  07F1          .BYTE   8                   ; 8 of data field
                    81  07F2          .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                        07F3  264 DMF32A: $DS_DMF32A                        ;                [02]
                        07F3          .SAVE   LOCAL_BLOCK
                        07F3          .PSECT  $ABS$,ABS
              00000032  0041          .=HP$A_DEPENDENT
                        0032          .IIF    NB,HP$B_DMF32A_BR,      HP$B_DMF32A_BR:
                        0032          .IIF    NB,DMF32A$B_BR, DMF32A$B_BR:
              00000033  0032          .IIF    NB,.BLKB,       .BLKB   1
                        0033          .IIF    NB,HP$B_DMF32A_ACTIV,   HP$B_DMF32A_ACTIV:
                        0033          .IIF    NB,DMF32A$B_ACTIV,      DMF32A$B_ACTIV:
              00000034  0033          .IIF    NB,.BLKB,       .BLKB   1
                        0034          .IIF    NB,HP$B_DMF32A_SPEED,   HP$B_DMF32A_SPEED:
                        0034          .IIF    NB,DMF32A$B_SPEED,      DMF32A$B_SPEED:
              00000035  0034          .IIF    NB,.BLKB,       .BLKB   1
                        0035          .IIF    NB,HP$W_DMF32A_FLAGS,   HP$W_DMF32A_FLAGS:
                        0035          .IIF    NB,DMF32A$W_FLAGS,      DMF32A$W_FLAGS:
              00000037  0035          .IIF    NB,.BLKW,       .BLKW   1
                        0037          .IIF    NB,HP$B_DMF32A_JUMP,    HP$B_DMF32A_JUMP:
                        0037          .IIF    NB,DMF32A$B_JUMP,       DMF32A$B_JUMP:
              00000038  0037          .IIF    NB,.BLKB,       .BLKB   1
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                        0038            .IIF    NB,HP$K_DMF32A_LEN,     HP$K_DMF32A_LEN:
                        0038            .IIF    NB,DMF32A$K_LEN,        DMF32A$K_LEN:
                    000007F3            .RESTORE
 41 32 33 46 4D 44 00' 07F3             .ASCIC  "DMF32A"        ; DMF32A name
                      06  07F3
                      38  07FA            .BYTE   DMF32A$K_LEN            ; DMF32A$K_LEN of resultant P-table
                      00  07FB            .BYTE   0                       ; Maximum unit number                   ;G:65
                    5854  07FC            .WORD   ^A"TX"  ; Two character mnemonic for QIO DMF32A TX
                      80  07FE            .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  07FF            .Byte   Pd$_Name        ; Directive op-code
                      02  0800            .Byte   Ptd$M_Controller                ; Enforced TX codes
                58 54 00' 0801            .Ascic  "TX"    ; Enforced device name prefix
                      02  0801
                      83  0804            .BYTE   Pd$_Octal       ; Indicate scan octal
             52 53 43 00' 0805            .ASCIC  "CSR"   ; CSR string
                      03  0805
    0003FFFE 0003E000  0809             .LONG   ^O00760000,^O00777776     ; 0760000 , 0777776 limits on input
                      88  0811            .BYTE   Pd$_Store       ; Indicate store operation
                    0018  0812            .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  0814            .BYTE   0                       ; 0 HP$A_DEVICE to data
                      12  0815            .BYTE   18                      ; 18 of data field
                      83  0816            .BYTE   Pd$_Octal       ; Indicate scan octal
 72 6F 74 63 65 56 00' 0817             .ASCIC  "Vector"        ; Vector string
                      06  0817
    000001FE 000000C0  081E             .LONG   ^O300,^O776     ; 300 , 776 limits on input
                      88  0826            .BYTE   Pd$_Store       ; Indicate store operation
                    0024  0827            .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  0829            .BYTE   0                       ; 0 HP$W_VECTOR to data
                      09  082A            .BYTE   9                       ; 9 of data field
                      82  082B            .BYTE   Pd$_Decimal     ; Indicate scan decimal
                 52 42 00' 082C             .ASCIC  "BR"    ; BR string
                      02  082C
                00000007 00000004  082F             .LONG   4,7     ; 4 , 7 limits on input
                      88  0837            .BYTE   Pd$_Store       ; Indicate store operation
                    0032  0838            .WORD   DMF32A$B_BR             ; Byte DMF32A$B_BR to data
                      00  083A            .BYTE   0                       ; 0 DMF32A$B_BR to data
                      08  083B            .BYTE   8                       ; 8 of data field
                      83  083C            .BYTE   Pd$_Octal       ; Indicate scan octal
65 6E 69 4C 20 65 76 69 74 63 41 00' 083D             .ASCIC  "Active Lines"  ; Active Lines string
                      73  0849
                      0C  083D
                000000FF 00000001  084A             .LONG   ^O1,^O377       ; 1 , 377 limits on input
                      88  0852            .BYTE   Pd$_Store       ; Indicate store operation
                    0033  0853            .WORD   DMF32A$B_ACTIV          ; Byte DMF32A$B_ACTIV to data
                      00  0855            .BYTE   0                       ; 0 DMF32A$B_ACTIV to data
                      08  0856            .BYTE   8                       ; 8 of data field
                      85  0857            .BYTE   Pd$_String      ; Indicate scan and verify string
    65 74 61 52 20 64 75 61 42 00' 0858             .ASCIC  "Baud Rate"     ; Baud Rate string
                      09  0858
                 30 35 00' 0862             .ASCIC  "50"
                      02  0862
                 35 37 00' 0865             .ASCIC  "75"
                      02  0865
                30 31 31 00' 0868             .ASCIC  "110"
                      03  0868
                35 2E 34 33 31 00' 086C             .ASCIC  "134.5"
                      05  086C
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                     30 35 31 00' 0872          .ASCIC  "150"
                        03  0872
                     30 30 33 00' 0876          .ASCIC  "300"
                        03  0876
                     30 30 36 00' 087A          .ASCIC  "600"
                        03  087A
                  30 30 32 31 00' 087E          .ASCIC  "1200"
                        04  087E
                  30 30 38 31 00' 0883          .ASCIC  "1800"
                        04  0883
                  30 30 30 32 00' 0888          .ASCIC  "2000"
                        04  0888
                  30 30 34 32 00' 088D          .ASCIC  "2400"
                        04  088D
                  30 30 36 33 00' 0892          .ASCIC  "3600"
                        04  0892
                  30 30 38 34 00' 0897          .ASCIC  "4800"
                        04  0897
                  30 30 32 37 00' 089C          .ASCIC  "7200"
                        04  089C
                  30 30 36 39 00' 08A1          .ASCIC  "9600"
                        04  08A1
               30 30 32 39 31 00' 08A6          .ASCIC  "19200"
                        05  08A6
                        00  08AC          .BYTE   0               ; Null length is end of valid 50,75,110,134.5,150,30
                        88  08AD          .BYTE   Pd$_Store       ; Indicate store operation
                      0034  08AE          .WORD   DMF32A$B_SPEED          ; Byte DMF32A$B_SPEED to data
                        00  08B0          .BYTE   0               ; 0 DMF32A$B_SPEED to data
                        08  08B1          .BYTE   8               ; 8 of data field
                        85  08B2          .BYTE   Pd$_String      ; Indicate scan and verify string
79 54 20 6B 63 61 62 70 6F 6F 4C 00' 08B3          .ASCIC  "Loopback Type" ; Loopback Type string
                     65 70  08BF
                        0D  08B3
            4C 41 4E 52 45 54 4E 49 00' 08C1          .ASCIC  "INTERNAL"
                        08  08C1
                     38 34 32 33 48 00' 08CA          .ASCIC  "H3248"
                        05  08CA
4D 45 44 4F 4D 5F 4C 41 43 4F 4C 00' 08D0          .ASCIC  "LOCAL_MODEM"
                        0B  08D0
4C 42 41 4D 4D 41 52 47 4F 52 50 00' 08DC          .ASCIC  "PROGRAMMABLE_MODEM"
                  4D 45 44 4F 4D 5F 45  08E8
                        12  08DC
                     39 34 32 33 48 00' 08EF          .ASCIC  "H3249"
                        05  08EF
                        00  08F5          .BYTE   0               ; Null length is end of valid INTERNAL,<H3248>,LOCAL
                        88  08F6          .BYTE   Pd$_Store       ; Indicate store operation
                      0035  08F7          .WORD   DMF32A$W_FLAGS          ; Byte DMF32A$W_FLAGS to data
                        00  08F9          .BYTE   0               ; 0 DMF32A$W_FLAGS to data
                        05  08FA          .BYTE   5               ; 5 of data field
                        8B  08FB          .BYTE   Pd$_Logical     ; Indicate logical value operation
74 69 6E 49 20 73 75 62 69 6E 55 00' 08FC          .ASCIC  \Unibus Init Jumper\    ; Unibus Init Jumper string
                  72 65 70 6D 75 4A 20  0908
                        12  08FC
                        88  090F          .BYTE   Pd$_Store       ; Indicate store operation
                      0037  0910          .WORD   DMF32A$B_JUMP           ; Byte DMF32A$B_JUMP to data
                        00  0912          .BYTE   0               ; 0 DMF32A$B_JUMP to data
                        01  0913          .BYTE   1               ; 1 of data field
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                          81  0914                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                              0915    265 DMF32P: $DS_DMF32P                          ;                [02]
                              0915                .SAVE   LOCAL_BLOCK
                              0915                .PSECT  $ABS$,ABS
                    00000032  0041                .=HP$A_DEPENDENT
                              0032                .IIF    NB,HP$B_DMF32P_COMMON,  HP$B_DMF32P_COMMON:
                              0032                .IIF    NB,DMF32P$B_COMMON,     DMF32P$B_COMMON:
                    00000033  0032                .IIF    NB,,BLKB,       .BLKB   1
                              0033                .IIF    NB,HP$B_DMF32P_FLAGS,   HP$B_DMF32P_FLAGS:
                              0033                .IIF    NB,DMF32P$B_FLAGS,      DMF32P$B_FLAGS:
                    00000034  0033                .IIF    NB,,BLKB,       .BLKB   1
                              0034                .IIF    NB,HP$B_DMF32P_BR,      HP$B_DMF32P_BR:
                              0034                .IIF    NB,DMF32P$B_BR, DMF32P$B_BR:
                    00000035  0034                .IIF    NB,,BLKB,       .BLKB   1
                              0035                .IIF    NB,HP$L_DMF32P_CSR,     HP$L_DMF32P_CSR:
                              0035                .IIF    NB,DMF32P$L_CSR,        DMF32P$L_CSR:
                    00000039  0035                .IIF    NB,,BLKL,       .BLKL   1
                              0039                .IIF    NB,HP$K_DMF32P_LEN,     HP$K_DMF32P_LEN:
                              0039                .IIF    NB,DMF32P$K_LEN,        DMF32P$K_LEN:
                    00000915  0915                .RESTORE
          50 32 33 46 4D 44 00' 0915                .ASCIC  "DMF32P"        ; DMF32P name
                          06  0915
                          39  091C                .BYTE   DMF32P$K_LEN            ; DMF32P$K_LEN of resultant P-table
                          00  091D                .BYTE   0                       ; Maximum unit number                   ;G:65
                        434C  091E                .WORD   ^A"LC"  ; Two character mnemonic for QIO DMF32P LC
                          80  0920                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  0921                .Byte   Pd$_Name        ; Directive op-code
                          02  0922                .Byte   Ptd$M_Controller                ; Enforced LC codes
                    43 4C 00' 0923                .Ascic  "LC"    ; Enforced device name prefix
                          02  0923
                          83  0926                .BYTE   Pd$_Octal       ; Indicate scan octal
                 52 53 43 00' 0927                .ASCIC  "CSR"   ; CSR string
                          03  0927
              0003FFFE 0003E000  092B                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                          88  0933                .BYTE   Pd$_Store       ; Indicate store operation
                        0035  0934                .WORD   DMF32P$L_CSR            ; Byte DMF32P$L_CSR to data
                          00  0936                .BYTE   0                       ; 0 DMF32P$L_CSR to data
                          20  0937                .BYTE   32                      ; 32 of data field
                          88  0938                .BYTE   Pd$_Store       ; Indicate store operation
                        0018  0939                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                          00  093B                .BYTE   0                       ; 0 HP$A_DEVICE to data
                          12  093C                .BYTE   18                      ; 18 of data field
                          83  093D                .BYTE   Pd$_Octal       ; Indicate scan octal
       72 6F 74 63 65 56 00' 093E                .ASCIC  "Vector"        ; Vector string
                          06  093E
              000001FE 000000C0  0945                .LONG   ^O300,^O776     ; 300 , 776 limits on input
                          88  094D                .BYTE   Pd$_Store       ; Indicate store operation
                        0024  094E                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                          00  0950                .BYTE   0                       ; 0 HP$W_VECTOR to data
                          09  0951                .BYTE   9                       ; 9 of data field
                          82  0952                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                    52 42 00' 0953                .ASCIC  "BR"    ; BR string
                          02  0953
              00000007 00000004  0956                .LONG   4,7     ; 4 , 7 limits on input
                          88  095E                .BYTE   Pd$_Store       ; Indicate store operation
                        0034  095F                .WORD   DMF32P$B_BR             ; Byte DMF32P$B_BR to data
                          00  0961                .BYTE   0                       ; 0 DMF32P$B_BR to data
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                            08  0962                .BYTE   8                       ; 8 of data field
                            85  0963                .BYTE   Pd$_String              ; Indicate scan and verify string
65 63 69 76 65 44 20 74 72 6F 50 00' 0964           .ASCIC  "Port Device"           ; Port Device string
                            0B  0964
                  52 45 48 54 4F 00' 0970           .ASCIC  "OTHER"
                            05  0970
                        50 4C 00' 0976              .ASCIC  "LP"
                            02  0976
                     50 41 52 57 00' 0979           .ASCIC  "WRAP"
                            04  0979
                            00  097E                .BYTE   0                       ; Null length is end of valid OTHER,LP,WRAP
                            88  097F                .BYTE   Pd$_Store               ; Indicate store operation
                          0033  0980                .WORD   DMF32P$B_FLAGS                  ; Byte DMF32P$B_FLAGS to data
                            00  0982                .BYTE   0                       ; 0 DMF32P$B_FLAGS to data
                            08  0983                .BYTE   8                       ; 8 of data field
                            86  0984                .BYTE   Pd$_Literal             ; Indicate literal
                      00000001  0985                .LONG   1                       ; Constant
                            88  0989                .BYTE   Pd$_Store               ; Indicate store operation
                          0032  098A                .WORD   DMF32P$B_COMMON                 ; Byte DMF32P$B_COMMON to data
                            00  098C                .BYTE   0                       ; 0 DMF32P$B_COMMON to data
                            08  098D                .BYTE   8                       ; 8 of data field
                            81  098E                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                                098F    266 DMF32S: $DS_DMF32S                      ;                       [02]
                                098F                .SAVE   LOCAL_BLOCK
                                098F                .PSECT  $ABS$,ABS
                      00000032  0041                .=HP$A_DEPENDENT
                                0032                .IIF    NB,HP$B_DMF32S_COMMON,  HP$B_DMF32S_COMMON:
                                0032                .IIF    NB,DMF32S$B_COMMON,     DMF32S$B_COMMON:
                      00000033  0032                .IIF    NB,,BLKB,       .BLKB   1
                                0033                .IIF    NB,HP$B_DMF32S_FLAGS,   HP$B_DMF32S_FLAGS:
                                0033                .IIF    NB,DMF32S$B_FLAGS,      DMF32S$B_FLAGS:
                      00000034  0033                .IIF    NB,,BLKB,       .BLKB   1
                                0034                .IIF    NB,HP$B_DMF32S_BR,      HP$B_DMF32S_BR:
                                0034                .IIF    NB,DMF32S$B_BR, DMF32S$B_BR:
                      00000035  0034                .IIF    NB,,BLKB,       .BLKB   1
                                0035                .IIF    NB,HP$L_DMF32S_CSR,     HP$L_DMF32S_CSR:
                                0035                .IIF    NB,DMF32S$L_CSR,        DMF32S$L_CSR:
                      00000039  0035                .IIF    NB,,BLKL,       .BLKL   1
                                0039                .IIF    NB,HP$K_DMF32S_LEN,     HP$K_DMF32S_LEN:
                                0039                .IIF    NB,DMF32S$K_LEN,        DMF32S$K_LEN:
                             0000098F               .RESTORE
                  53 32 33 46 4D 44 00' 098F        .ASCIC  "DMF32S"                ; DMF32S name
                            06  098F
                            39  0996                .BYTE   DMF32$K_LEN                     ; DMF32$K_LEN of resultant P-table
                            01  0997                .BYTE   1                       ; Maximum unit number                   ;G:65
                          4758  0998                .WORD   ^A"XG"  ; Two character mnemonic for QIO DMF32S XG
                            80  099A                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                            8D  099B                .Byte   Pd$_Name                ; Directive op-code
                            03  099C                .Byte   Ptd$M_Device                    ; Enforced XG codes
                        47 58 00' 099D              .Ascic  "XG"    ; Enforced device name prefix
                            02  099D
                            83  09A0                .BYTE   Pd$_Octal               ; Indicate scan octal
                     52 53 43 00' 09A1              .ASCIC  "CSR"   ; CSR string
                            03  09A1
                 0003FFFE 0003E000  09A5            .LONG   ^O760000,^O777776               ; 760000 , 777776 limits on input
                            88  09AD                .BYTE   Pd$_Store               ; Indicate store operation
                          0035  09AE                .WORD   DMF32S$L_CSR                    ; Byte DMF32S$L_CSR to data
```

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                          00  09B0                .BYTE   0                       ; 0 DMF32S$L_CSR to data
                          20  09B1                .BYTE   32                      ; 32 of data field
                          88  09B2                .BYTE   Pd$_Store               ; Indicate store operation
                        0018  09B3                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                          00  09B5                .BYTE   0                       ; 0 HP$A_DEVICE to data
                          12  09B6                .BYTE   18                      ; 18 of data field
                          83  09B7                .BYTE   Pd$_Octal               ; Indicate scan octal
              72 6F 74 63 65 56 00' 09B8          .ASCIC  "Vector"                ; Vector string
                          06  09B8
             000001FE 00000002  09BF              .LONG   ^02,^0776               ; 2 , 776 limits on input
                          88  09C7                .BYTE   Pd$_Store               ; Indicate store operation
                        0024  09C8                .WORD   HP$W_VECTOR                     ; Byte HP$W_VECTOR to data
                          00  09CA                .BYTE   0                       ; 0 HP$W_VECTOR to data
                          09  09CB                .BYTE   9                       ; 9 of data field
                          82  09CC                .BYTE   Pd$_Decimal             ; Indicate scan decimal
                       52 42 00' 09CD             .ASCIC  "BR"    ; BR string
                          02  09CD
             00000007 00000004  09D0              .LONG   4,7     ; 4 , 7 limits on input
                          88  09D8                .BYTE   Pd$_Store               ; Indicate store operation
                        0034  09D9                .WORD   DMF32S$B_BR                     ; Byte DMF32S$B_BR to data
                          00  09DB                .BYTE   0                       ; 0 DMF32S$B_BR to data
                          08  09DC                .BYTE   8                       ; 8 of data field
                          85  09DD                .BYTE   Pd$_String              ; Indicate scan and verify string
72 57 20 6C 61 6E 72 65 74 78 45 00' 09DE          .ASCIC  "External Wrap" ; External Wrap string
                       70 61  09EA
                          0D  09DE
                  45 4E 4F 4E 00' 09EC             .ASCIC  "NONE"
                          04  09EC
              4D 45 44 4F 4D 00' 09F1              .ASCIC  "MODEM"
                          05  09F1
                 50 41 52 57 00' 09F7              .ASCIC  "WRAP"
                          04  09F7
                          00  09FC                .BYTE   0                       ; Null length is end of valid NONE,MODEM,WRAP
                          88  09FD                .BYTE   Pd$_Store               ; Indicate store operation
                        0033  09FE                .WORD   DMF32S$B_FLAGS                  ; Byte DMF32S$B_FLAGS to data
                          00  0A00                .BYTE   0                       ; 0 DMF32S$B_FLAGS to data
                          02  0A01                .BYTE   2                       ; 2 of data field
                          81  0A02                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                              0A03    267 DMP11:  $DS_DMP11
                              0A03                .SAVE   LOCAL_BLOCK
                              0A03                .PSECT  $ABS$,ABS
                    00000032  0041                .=HP$A_DEPENDENT
                              0032                .IIF    NB,DMP11$B_COMMON,      DMP11$B_COMMON:
                    00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                              0033                .IIF    NB,DMP11$B_FLAGS,       DMP11$B_FLAGS:
                    00000034  0033                .IIF    NB,.BLKB,       .BLKB   1
                              0034                .IIF    NB,DMP11$B_BR,  DMP11$B_BR:
                    00000035  0034                .IIF    NB,.BLKB,       .BLKB   1
                              0035                .IIF    NB,DMP11$L_CSR, DMP11$L_CSR:
                    00000039  0035                .IIF    NB,.BLKL,       .BLKL   1
                              0039                .IIF    NB,DMP11$K_LEN, DMP11$K_LEN:
                            00000A03              .RESTORE
                31 31 50 4D 44 00' 0A03           .ASCIC  "DMP11" ; DMP11 name
                          05  0A03
                          39  0A09                .BYTE   DMP11$K_LEN                     ; DMP11$K_LEN of resultant P-table
                          00  0A0A                .BYTE   0                       ; Maximum unit number                           ;G:65
                        4458  0A0B                .WORD   ^A"XD"  ; Two character mnemonic for QIO DMP11 XD
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                        80  0A0D                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                        8D  0A0E                .Byte   Pd$_Name        ; Directive op-code
                        03  0A0F                .Byte   Ptd$M_Device            ; Enforced XD codes
                  44 58 00' 0A10                .Asci   "XD"    ; Enforced device name prefix
                        02  0A10
                        83  0A13                .BYTE   Pd$_Octal       ; Indicate scan octal
                  52 53 43 00' 0A14             .ASCIC  "CSR"   ; CSR string
                        03  0A14
            0003FFFE 0003E000  0A18             .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                        88  0A20                .BYTE   Pd$_Store       ; Indicate store operation
                      0035  0A21                .WORD   DMP11$L_CSR             ; Byte DMP11$L_CSR to data
                        00  0A23                .BYTE   0               ; 0 DMP11$L_CSR to data
                        20  0A24                .BYTE   32              ; 32 of data field
                        88  0A25                .BYTE   Pd$_Store       ; Indicate store operation
                      0018  0A26                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                        00  0A28                .BYTE   0               ; 0 HP$A_DEVICE to data
                        12  0A29                .BYTE   18              ; 18 of data field
                        83  0A2A                .BYTE   Pd$_Octal       ; Indicate scan octal
      52 4F 54 43 45 56 00' 0A2B                .ASCIC  "VECTOR"        ; VECTOR string
                        06  0A2B
            000001FE 00000002  0A32             .LONG   ^O2,^O776       ; 2 , 776 limits on input
                        88  0A3A                .BYTE   Pd$_Store       ; Indicate store operation
                      0024  0A3B                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                        00  0A3D                .BYTE   0               ; 0 HP$W_VECTOR to data
                        09  0A3E                .BYTE   9               ; 9 of data field
                        82  0A3F                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                  52 42 00' 0A40                .ASCIC  "BR"    ; BR string
                        02  0A40
            00000007 00000004  0A43             .LONG   4,7     ; 4 , 7 limits on input
                        88  0A4B                .BYTE   Pd$_Store       ; Indicate store operation
                      0034  0A4C                .WORD   DMP11$B_BR              ; Byte DMP11$B_BR to data
                        00  0A4E                .BYTE   0               ; 0 DMP11$B_BR to data
                        08  0A4F                .BYTE   8               ; 8 of data field
                        85  0A50                .BYTE   Pd$_String      ; Indicate scan and verify string
61 74 53 20 6C 6F 72 74 6E 6F 43 00' 0A51       .ASCIC  "Control Station"       ; Control Station string
                  6E 6F 69 74   0A5D
                        0F  0A51
                     4F 4E 00'  0A61            .ASCIC  "NO"
                        02  0A61
                  53 45 59 00'  0A64            .ASCIC  "YES"
                        03  0A64
                        00  0A68                .BYTE   0               ; Null length is end of valid NO,YES
                        88  0A69                .BYTE   Pd$_Store       ; Indicate store operation
                      0033  0A6A                .WORD   DMP11$B_FLAGS           ; Byte DMP11$B_FLAGS to data
                        00  0A6C                .BYTE   0               ; 0 DMP11$B_FLAGS to data
                        01  0A6D                .BYTE   1               ; 1 of data field
                        85  0A6E                .BYTE   Pd$_String      ; Indicate scan and verify string
   79 72 61 74 75 62 69 72 54 00' 0A6F          .ASCIC  "Tributary"     ; Tributary string
                        09  0A6F
                     4F 4E 00'  0A79            .ASCIC  "NO"
                        02  0A79
                  53 45 59 00'  0A7C            .ASCIC  "YES"
                        03  0A7C
                        00  0A80                .BYTE   0               ; Null length is end of valid NO,YES
                        88  0A81                .BYTE   Pd$_Store       ; Indicate store operation
                      0033  0A82                .WORD   DMP11$B_FLAGS           ; Byte DMP11$B_FLAGS to data
                        01  0A84                .BYTE   1               ; 1 DMP11$B_FLAGS to data
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                                  01  0A85                .BYTE   1                   ; 1 of data field
                                  85  0A86                .BYTE   Pd$_String          ; Indicate scan and verify string
69 6C 69 62 61 74 61 70 6D 6F 43 00' 0A87                .ASCIC  "Compatability Mode"    ; Compatability Mode string
                65 64 6F 4D 20 79 74  0A93
                                  12  0A87
                            4F 4E 00' 0A9A                .ASCIC  "NO"
                                  02  0A9A
                         53 45 59 00' 0A9D                .ASCIC  "YES"
                                  03  0A9D
                                  00  0AA1                .BYTE   0                   ; Null length is end of valid NO,YES
                                  88  0AA2                .BYTE   Pd$_Store           ; Indicate store operation
                                0033  0AA3                .WORD   DMP11$B_FLAGS               ; Byte DMP11$B_FLAGS to data
                                  02  0AA5                .BYTE   2                   ; 2 DMP11$B_FLAGS to data
                                  01  0AA6                .BYTE   1                   ; 1 of data field
                                  85  0AA7                .BYTE   Pd$_String          ; Indicate scan and verify string
78 65 6C 70 75 44 20 66 6C 61 48 00' 0AA8                .ASCIC  "Half Duplex"       ; Half Duplex string
                                  0B  0AA8
                            4F 4E 00' 0AB4                .ASCIC  "NO"
                                  02  0AB4
                         53 45 59 00' 0AB7                .ASCIC  "YES"
                                  03  0AB7
                                  00  0ABB                .BYTE   0                   ; Null length is end of valid NO,YES
                                  88  0ABC                .BYTE   Pd$_Store           ; Indicate store operation
                                0033  0ABD                .WORD   DMP11$B_FLAGS               ; Byte DMP11$B_FLAGS to data
                                  03  0ABF                .BYTE   3                   ; 3 DMP11$B_FLAGS to data
                                  01  0AC0                .BYTE   1                   ; 1 of data field
                                  86  0AC1                .BYTE   Pd$_Literal         ; Indicate literal
                            00000001  0AC2                .LONG   1                   ; Constant
                                  88  0AC6                .BYTE   Pd$_Store           ; Indicate store operation
                                0032  0AC7                .WORD   DMP11$B_COMMON              ; Byte DMP11$B_COMMON to data
                                  00  0AC9                .BYTE   0                   ; 0 DMP11$B_COMMON to data
                                  08  0ACA                .BYTE   8                   ; 8 of data field
                                  81  0ACB                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                                      0ACC   268 DMR11:   $DS_DMR11
                                      0ACC                .SAVE   LOCAL_BLOCK
                                      0ACC                .PSECT  $ABS$,ABS
                            00000032  0041                .=HP$A_DEPENDENT
                                      0032                .IIF    NB,DMR11$L_CSR, DMR11$L_CSR:
                            00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                                      0036                .IIF    NB,DMR11$B_BR,  DMR11$B_BR:
                            00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                                      0037                .IIF    NB,DMR11$K_LEN, DMR11$K_LEN:
                                00000ACC                .RESTORE
                31 31 52 4D 44 00' 0ACC                .ASCIC  "DMR11" ; DMR11 name
                                  05  0ACC
                                  37  0AD2                .BYTE   DMR11$K_LEN                 ; DMR11$K_LEN of resultant P-table
                                  00  0AD3                .BYTE   0                   ; Maximum unit number                        ;G:65
                                4D58  0AD4                .WORD   ^A"XM"  ; Two character mnemonic for QIO DMR11 XM
                                  80  0AD6                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                                  8D  0AD7                .Byte   Pd$_Name            ; Directive op-code
                                  03  0AD8                .Byte   Ptd$M_Device                ; Enforced XM codes
                            4D 58 00' 0AD9                .Ascic  "XM"    ; Enforced device name prefix
                                  02  0AD9
                                  83  0ADC                .BYTE   Pd$_Octal           ; Indicate scan octal
                         52 53 43 00' 0ADD                .ASCIC  "CSR"   ; CSR string
                                  03  0ADD
                0003FFFE 0003E000  0AE1                .LONG   ^O760000,^O777776           ; 760000 , 777776 limits on input
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                      88  0AE9                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  0AEA                .WORD   DMR11$L_CSR             ; Byte DMR11$L_CSR to data
                      00  0AEC                .BYTE   0               ; 0 DMR11$L_CSR to data
                      20  0AED                .BYTE   32              ; 32 of data field
                      88  0AEE                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  0AEF                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  0AF1                .BYTE   0               ; 0 HP$A_DEVICE to data
                      12  0AF2                .BYTE   18              ; 18 of data field
                      83  0AF3                .BYTE   Pd$_Octal       ; Indicate scan octal
           52 4F 54 43 45 56 00' 0AF4         .ASCIC  "VECTOR"        ; VECTOR string
                      06  0AF4
       000001FE 00000002  0AFB                .LONG   ^O2,^O776       ; 2 , 776 limits on input
                      88  0B03                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  0B04                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  0B06                .BYTE   0               ; 0 HP$W_VECTOR to data
                      09  0B07                .BYTE   9               ; 9 of data field
                      82  0B08                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                 52 42 00' 0B09               .ASCIC  "BR"    ; BR string
                      02  0B09
       00000007 00000004  0B0C                .LONG   4,7     ; 4 , 7 limits on input
                      88  0B14                .BYTE   Pd$_Store       ; Indicate store operation
                    0036  0B15                .WORD   DMR11$B_BR              ; Byte DMR11$B_BR to data
                      00  0B17                .BYTE   0               ; 0 DMR11$B_BR to data
                      08  0B18                .BYTE   8               ; 8 of data field
                      81  0B19                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          0B1A   269 DMZ32:   $DS_DMZ32                       ;               [21]
                          0B1A                .SAVE   LOCAL_BLOCK
                          0B1A                .PSECT  $ABS$,ABS
                 00000032 0041                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$B_DMZ32_BR,       HP$B_DMZ32_BR:
                 00000033 0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,HP$B_DMZ32_OCTET0,   HP$B_DMZ32_OCTET0:
                 00000034 0033                .IIF    NB,.BLKB,       .BLKB   1
                          0034                .IIF    NB,HP$B_DMZ32_OCTET1,   HP$B_DMZ32_OCTET1:
                 00000035 0034                .IIF    NB,.BLKB,       .BLKB   1
                          0035                .IIF    NB,HP$B_DMZ32_OCTET2,   HP$B_DMZ32_OCTET2:
                 00000036 0035                .IIF    NB,.BLKB,       .BLKB   1
                          0036                .IIF    NB,HP$B_DMZ32_SPEED,    HP$B_DMZ32_SPEED:
                 00000037 0036                .IIF    NB,.BLKB,       .BLKB   1
                          0037                .IIF    NB,HP$W_DMZ32_LOOP,     HP$W_DMZ32_LOOP:
                 00000039 0037                .IIF    NB,.BLKW,       .BLKW   1
                          0039                .IIF    NB,HP$B_DMZ32_MODEM,    HP$B_DMZ32_MODEM:
                 0000003A 0039                .IIF    NB,.BLKB,       .BLKB   1
                          003A                .IIF    NB,HP$K_DMZ32_LEN,      HP$K_DMZ32_LEN:
                      00000B1A                .RESTORE
        32 33 5A 4D 44 00' 0B1A               .ASCIC  "DMZ32" ; DMZ32 name
                      05  0B1A
                      3A  0B20                .BYTE   HP$K_DMZ32_LEN          ; HP$K_DMZ32_LEN of resultant P-table
                      00  0B21                .BYTE   0               ; Maximum unit number                   ;G:65
                    0000  0B22                .WORD   ^A""    ; Two character mnemonic for QIO DMZ32
                      80  0B24                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  0B25                .Byte   Pd$_Name        ; Directive op-code
                      02  0B26                .Byte   PTD$M_CONTROLLER                ; Enforced TX codes
                 58 54 00' 0B27               .Ascic  "TX"    ; Enforced device name prefix
                      02  0B27
                      83  0B2A                .BYTE   Pd$_Octal       ; Indicate scan octal
                 52 53 43 00' 0B2B            .ASCIC  "CSR"   ; CSR string
```

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                                  03  0B2B
                  0003FFFE 0003E000  0B2F          .LONG   ^O760000,^O0777776      ; 760000 , 0777776 limits on input
                                  88  0B37          .BYTE   Pd$_Store       ; Indicate store operation
                                0018  0B38          .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                  00  0B3A          .BYTE   0               ; 0 HP$A_DEVICE to data
                                  12  0B3B          .BYTE   18              ; 18 of data field
                                  83  0B3C          .BYTE   Pd$_Octal       ; Indicate scan octal
              72 6F 74 63 65 56 00'  0B3D          .ASCIC  "Vector"        ; Vector string
                                  06  0B3D
                  000001FE 000000C0  0B44          .LONG   ^O300,^O776     ; 300 , 776 limits on input
                                  88  0B4C          .BYTE   Pd$_Store       ; Indicate store operation
                                0024  0B4D          .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                  00  0B4F          .BYTE   0               ; 0 HP$W_VECTOR to data
                                  09  0B50          .BYTE   9               ; 9 of data field
                                  82  0B51          .BYTE   Pd$_Decimal     ; Indicate scan decimal
                           52 42 00'  0B52          .ASCIC  "BR"    ; BR string
                                  02  0B52
                  00000006 00000005  0B55          .LONG   5,6     ; 5 , 6 limits on input
                                  88  0B5D          .BYTE   Pd$_Store       ; Indicate store operation
                                0032  0B5E          .WORD   HP$B_DMZ32_BR           ; Byte HP$B_DMZ32_BR to data
                                  00  0B60          .BYTE   0               ; 0 HP$B_DMZ32_BR to data
                                  08  0B61          .BYTE   8               ; 8 of data field
                                  83  0B62          .BYTE   Pd$_Octal       ; Indicate scan octal
20 53 45 4E 49 4C 20 54 53 45 54 00'  0B63          .ASCIC  "TEST LINES (OCTET0)"   ; TEST LINES (OCTET0) string
           29 30 54 45 54 43 4F 28  0B6F
                                  13  0B63
                  000000FF 00000000  0B77          .LONG   ^O0,^O377       ; 0 , 377 limits on input
                                  88  0B7F          .BYTE   Pd$_Store       ; Indicate store operation
                                0033  0B80          .WORD   HP$B_DMZ32_OCTET0               ; Byte HP$B_DMZ32_OCTET0 to data
                                  00  0B82          .BYTE   0               ; 0 HP$B_DMZ32_OCTET0 to data
                                  08  0B83          .BYTE   8               ; 8 of data field
                                  83  0B84          .BYTE   Pd$_Octal       ; Indicate scan octal
4C 4E 4F 20 33 20 4C 45 56 45 4C 00'  0B85          .ASCIC  "LEVEL 3 ONLY - TEST LINES (OCTET1)"    ; LEVEL 3 ONLY - TEST LINES
4E 49 4C 20 54 53 45 54 20 2D 20 59  0B91
   29 31 54 45 54 43 4F 28 20 53 45  0B9D
                                  22  0B85
                  000000FF 00000000  0BA8          .LONG   ^O0,^O377       ; 0 , 377 limits on input
                                  88  0BB0          .BYTE   Pd$_Store       ; Indicate store operation
                                0034  0BB1          .WORD   HP$B_DMZ32_OCTET1               ; Byte HP$B_DMZ32_OCTET1 to data
                                  00  0BB3          .BYTE   0               ; 0 HP$B_DMZ32_OCTET1 to data
                                  08  0BB4          .BYTE   8               ; 8 of data field
                                  83  0BB5          .BYTE   Pd$_Octal       ; Indicate scan octal
4C 4E 4F 20 33 20 4C 45 56 45 4C 00'  0BB6          .ASCIC  "LEVEL 3 ONLY - TEST LINES (OCTET2)"    ; LEVEL 3 ONLY - TEST LINES
4E 49 4C 20 54 53 45 54 20 2D 20 59  0BC2
   29 32 54 45 54 43 4F 28 20 53 45  0BCE
                                  22  0BB6
                  000000FF 00000000  0BD9          .LONG   ^O0,^O377       ; 0 , 377 limits on input
                                  88  0BE1          .BYTE   Pd$_Store       ; Indicate store operation
                                0035  0BE2          .WORD   HP$B_DMZ32_OCTET2               ; Byte HP$B_DMZ32_OCTET2 to data
                                  00  0BE4          .BYTE   0               ; 0 HP$B_DMZ32_OCTET2 to data
                                  08  0BE5          .BYTE   8               ; 8 of data field
                                  85  0BE6          .BYTE   Pd$_String      ; Indicate scan and verify string
      65 74 61 52 20 64 75 61 42 00'  0BE7          .ASCIC  "Baud Rate"     ; Baud Rate string
                                  09  0BE7
                           30 35 00'  0BF1          .ASCIC  "50"
                                  02  0BF1
                           35 37 00'  0BF4          .ASCIC  "75"
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                        02  0BF4
                30 31 31 00' 0BF7               .ASCIC  "110"
                        03  0BF7
             35 2E 34 33 31 00' 0BFB            .ASCIC  "134.5"
                        05  0BFB
                30 35 31 00' 0C01               .ASCIC  "150"
                        03  0C01
                30 30 33 00' 0C05               .ASCIC  "300"
                        03  0C05
                30 30 36 00' 0C09               .ASCIC  "600"
                        03  0C09
             30 30 32 31 00' 0C0D               .ASCIC  "1200"
                        04  0C0D
             30 30 38 31 00' 0C12               .ASCIC  "1800"
                        04  0C12
             30 30 30 32 00' 0C17               .ASCIC  "2000"
                        04  0C17
             30 30 34 32 00' 0C1C               .ASCIC  "2400"
                        04  0C1C
             30 30 38 34 00' 0C21               .ASCIC  "4800"
                        04  0C21
             30 30 36 39 00' 0C26               .ASCIC  "9600"
                        04  0C26
          30 30 32 39 31 00' 0C2B               .ASCIC  "19200"
                        05  0C2B
                        00  0C31                .BYTE   0               ; Null length is end of valid 50,75,110,134.5,150,30
                        88  0C32                .BYTE   Pd$_Store       ; Indicate store operation
                      0036  0C33                .WORD   HP$B_DMZ32_SPEED                ; Byte HP$B_DMZ32_SPEED to data
                        00  0C35                .BYTE   0               ; 0 HP$B_DMZ32_SPEED to data
                        08  0C36                .BYTE   8               ; 8 of data field
                        85  0C37                .BYTE   Pd$_String      ; Indicate scan and verify string
79 54 20 6B 63 61 62 70 6F 6F 4C 00' 0C38       .ASCIC  "Loopback Type" ; Loopback Type string
                     65 70  0C44
                        0D  0C38
                     30 00' 0C46                .ASCIC  "0"
                        01  0C46
                     31 00' 0C48                .ASCIC  "1"
                        01  0C48
                     32 00' 0C4A                .ASCIC  "2"
                        01  0C4A
                     33 00' 0C4C                .ASCIC  "3"
                        01  0C4C
                     34 00' 0C4E                .ASCIC  "4"
                        01  0C4E
                     35 00' 0C50                .ASCIC  "5"
                        01  0C50
                     36 00' 0C52                .ASCIC  "6"
                        01  0C52
                     37 00' 0C54                .ASCIC  "7"
                        01  0C54
                     38 00' 0C56                .ASCIC  "8"
                        01  0C56
                        00  0C58                .BYTE   0               ; Null length is end of valid 0,1,2,3,4,5,6,7,8
                        88  0C59                .BYTE   Pd$_Store       ; Indicate store operation
                      0037  0C5A                .WORD   HP$W_DMZ32_LOOP         ; Byte HP$W_DMZ32_LOOP to data
                        00  0C5C                .BYTE   0               ; 0 HP$W_DMZ32_LOOP to data
                        05  0C5D                .BYTE   5               ; 5 of data field
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                      8B  0C5E                .BYTE   Pd$_Logical     ; Indicate logical value operation
72 74 6E 6F 43 20 6D 65 64 6F 4D 00' 0C5F     .ASCIC  \Modem Control\ ; Modem Control string
                   6C 6F  0C6B
                      0D  0C5F
                      88  0C6D                .BYTE   Pd$_Store       ; Indicate store operation
                    0039  0C6E                .WORD   HP$B_DMZ32_MODEM                    ; Byte HP$B_DMZ32_MODEM to data
                      00  0C70                .BYTE   0               ; 0 HP$B_DMZ32_MODEM to data
                      02  0C71                .BYTE   2               ; 2 of data field
                      86  0C72                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  0C73                .LONG   1               ; Constant
                      81  0C77                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          0C78    270 DR11B:  $DS_DR11B
                          0C78                .SAVE   LOCAL_BLOCK
                          0C78                .PSECT  $ABS$,ABS
                00000032  0041                .=HP$A_DEPENDENT
                          0032                .IIF    NB,DR11B$L_CSR, DR11B$L_CSR:
                00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                          0036                .IIF    NB,DR11B$B_BR,  DR11B$B_BR:
                00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                          0037                .IIF    NB,DR11B$K_LEN, DR11B$K_LEN:
                      0000C78                 .RESTORE
            42 31 31 52 44 00' 0C78           .ASCIC  "DR11B" ; DR11B name
                      05  0C78
                      37  0C7E                .BYTE   DR11B$K_LEN             ; DR11B$K_LEN of resultant P-table
                      00  0C7F                .BYTE   0               ; Maximum unit number                       ;G:65
                    0000  0C80                .WORD   ^A""    ; Two character mnemonic for QIO DR11B
                      80  0C82                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  0C83                .Byte   Pd$_Name        ; Directive op-code
                      03  0C84                .Byte   Ptd$M_Device            ; Enforced XB codes
                42 58 00' 0C85                .Ascic  "XB"    ; Enforced device name prefix
                      02  0C85
                      83  0C88                .BYTE   Pd$_Octal       ; Indicate scan octal
                52 53 43 00' 0C89             .ASCIC  "CSR"   ; CSR string
                      03  0C89
          0003FFFE 0003E000  0C8D             .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  0C95                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  0C96                .WORD   DR11B$L_CSR             ; Byte DR11B$L_CSR to data
                      00  0C98                .BYTE   0               ; 0 DR11B$L_CSR to data
                      20  0C99                .BYTE   32              ; 32 of data field
                      88  0C9A                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  0C9B                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  0C9D                .BYTE   0               ; 0 HP$A_DEVICE to data
                      12  0C9E                .BYTE   18              ; 18 of data field
                      83  0C9F                .BYTE   Pd$_Octal       ; Indicate scan octal
      52 4F 54 43 45 56 00' 0CA0              .ASCIC  "VECTOR"        ; VECTOR string
                      06  0CA0
          000001FE 00000002  0CA7             .LONG   ^O2,^O776       ; 2 , 776 limits on input
                      88  0CAF                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  0CB0                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  0CB2                .BYTE   0               ; 0 HP$W_VECTOR to data
                      09  0CB3                .BYTE   9               ; 9 of data field
                      82  0CB4                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 42 00' 0CB5                .ASCIC  "BR"    ; BR string
                      02  0CB5
          00000007 00000004  0CB8             .LONG   4,7     ; 4 , 7 limits on input
                      88  0CC0                .BYTE   Pd$_Store       ; Indicate store operation
                    0036  0CC1                .WORD   DR11B$B_BR              ; Byte DR11B$B_BR to data
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                      00  0CC3                .BYTE   0                       ; 0 DR11B$B_BR to data
                      08  0CC4                .BYTE   8                       ; 8 of data field
                      81  0CC5                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          0CC6    271 DR11C:   $DS_DR11C                                ;               [29]
                          0CC6                .SAVE   LOCAL_BLOCK
                          0CC6                .PSECT  $ABS$,ABS
                 00000032 0041                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$B_DR11C_BR,       HP$B_DR11C_BR:
                 00000033 0032                .IIF    NB,,BLKB,               .BLKB   1
                          0033                .IIF    NB,HP$K_DR11C_LEN,      HP$K_DR11C_LEN:
                      00000CC6                .RESTORE
           43 31 31 52 44 00' 0CC6            .ASCIC  "DR11C" ; DR11C name
                      05  0CC6
                      33  0CCC                .BYTE   HP$K_DR11C_LEN          ; HP$K_DR11C_LEN of resultant P-table
                      00  0CCD                .BYTE   0                       ; Maximum unit number                   ;G:65
                    414F  0CCE                .WORD   ^A"OA"  ; Two character mnemonic for QIO DR11C OA
                      80  0CD0                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  0CD1                .Byte   Pd$_Name        ; Directive op-code
                      02  0CD2                .Byte   Ptd$M_Controller                ; Enforced OA codes
                 41 4F 00' 0CD3              .Ascic  "OA"    ; Enforced device name prefix
                      02  0CD3
                      83  0CD6                .BYTE   Pd$_Octal       ; Indicate scan octal
              52 53 43 00' 0CD7               .ASCIC  "CSR"   ; CSR string
                      03  0CD7
           0003FFFE 0003E000  0CDB            .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  0CE3                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  0CE4                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  0CE6                .BYTE   0                       ; 0 HP$A_DEVICE to data
                      12  0CE7                .BYTE   18                      ; 18 of data field
                      83  0CE8                .BYTE   Pd$_Octal       ; Indicate scan octal
        52 4F 54 43 45 56 00' 0CE9            .ASCIC  "VECTOR"        ; VECTOR string
                      06  0CE9
           000001FE 00000000  0CF0            .LONG   ^O0,^O776       ; 0 , 776 limits on input
                      88  0CF8                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  0CF9                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  0CFB                .BYTE   0                       ; 0 HP$W_VECTOR to data
                      10  0CFC                .BYTE   16                      ; 16 of data field
                      82  0CFD                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                 52 42 00' 0CFE              .ASCIC  "BR"    ; BR string
                      02  0CFE
           00000007 00000004  0D01            .LONG   4,7     ; 4 , 7 limits on input
                      88  0D09                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  0D0A                .WORD   HP$B_DR11C_BR           ; Byte HP$B_DR11C_BR to data
                      00  0D0C                .BYTE   0                       ; 0 HP$B_DR11C_BR to data
                      08  0D0D                .BYTE   8                       ; 8 of data field
                      81  0D0E                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          0D0F    272 DR11K:   $DS_DR11K
                          0D0F                .SAVE   LOCAL_BLOCK
                          0D0F                .PSECT  $ABS$,ABS
                 00000032 0041                .=HP$A_DEPENDENT
                          0032                .IIF    NB,DR11K$B_BR,  DR11K$B_BR:
                 00000033 0032                .IIF    NB,,BLKB,       .BLKB   1
                          0033                .IIF    NB,DR11K$K_LEN, DR11K$K_LEN:
                      00000D0F                .RESTORE
           4B 31 31 52 44 00' 0D0F            .ASCIC  "DR11K" ; DR11K name
                      05  0D0F
                      33  0D15                .BYTE   DR11K$K_LEN             ; DR11K$K_LEN of resultant P-table
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                                 06  0D16                .BYTE   6                  ; Maximum unit number                          ;G:65
                               0000  0D17                .WORD   ^A""     ; Two character mnemonic for QIO DR11K
                                 80  0D19                .BYTE   Pd$_Start          ; Constant to identify start of descriptor
                                 8D  0D1A                .Byte   Pd$_Name           ; Directive op-code
                                 03  0D1B                .Byte   Ptd$M_Device                ; Enforced XR codes
                          52 58 00'  0D1C                .Ascic  "XR"     ; Enforced device name prefix
                                 02  0D1C
                                 83  0D1F                .BYTE   Pd$_Octal          ; Indicate scan octal
52 53 43 20 53 55 42 20 4F 2F 49 00'  0D20                .ASCIC  "I/O BUS CSR"      ; I/O BUS CSR string
                                 0B  0D20
                  0003FFFE 0003E000  0D2C                .LONG   ^O760000,^O777776          ; 760000 , 777776 limits on input
                                 88  0D34                .BYTE   Pd$_Store          ; Indicate store operation
                               0018  0D35                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                                 00  0D37                .BYTE   0                  ; 0 HP$A_DEVICE to data
                                 12  0D38                .BYTE   18                 ; 18 of data field
                                 83  0D39                .BYTE   Pd$_Octal          ; Indicate scan octal
              52 4F 54 43 45 56 00'  0D3A                .ASCIC  "VECTOR"           ; VECTOR string
                                 06  0D3A
                  000001FE 00000002  0D41                .LONG   ^O2,^O776          ; 2 , 776 limits on input
                                 88  0D49                .BYTE   Pd$_Store          ; Indicate store operation
                               0024  0D4A                .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                                 00  0D4C                .BYTE   0                  ; 0 HP$W_VECTOR to data
                                 09  0D4D                .BYTE   9                  ; 9 of data field
                                 82  0D4E                .BYTE   Pd$_Decimal        ; Indicate scan decimal
                          52 42 00'  0D4F                .ASCIC  "BR"     ; BR string
                                 02  0D4F
                  00000007 00000004  0D52                .LONG   4,7      ; 4 , 7 limits on input
                                 88  0D5A                .BYTE   Pd$_Store          ; Indicate store operation
                               0032  0D5B                .WORD   DR11K$B_BR                  ; Byte DR11K$B_BR to data
                                 00  0D5D                .BYTE   0                  ; 0 DR11K$B_BR to data
                                 08  0D5E                .BYTE   8                  ; 8 of data field
                                 81  0D5F                .BYTE   Pd$_End            ; Indicate end of PT-descriptor
                                     0D60   273 DR11W:   $DS_DR11W
                                     0D60                .SAVE   LOCAL_BLOCK
                                     0D60                .PSECT  $ABS$,ABS
                          00000032  0041                .=HP$A_DEPENDENT
                                     0032                .IIF    NB,DR11W$L_CSR, DR11W$L_CSR:
                          00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                                     0036                .IIF    NB,DR11W$B_BR,  DR11W$B_BR:
                          00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                                     0037                .IIF    NB,DR11W$K_LEN, DR11W$K_LEN:
                                 00000D60                .RESTORE
                  57 31 31 52 44 00'  0D60                .ASCIC  "DR11W" ; DR11W name
                                 05  0D60
                                 37  0D66                .BYTE   DR11W$K_LEN                 ; DR11W$K_LEN of resultant P-table
                                 00  0D67                .BYTE   0                  ; Maximum unit number                          ;G:65
                               4158  0D68                .WORD   ^A"XA"   ; Two character mnemonic for QIO DR11W XA
                                 80  0D6A                .BYTE   Pd$_Start          ; Constant to identify start of descriptor
                                 8D  0D6B                .Byte   Pd$_Name           ; Directive op-code
                                 03  0D6C                .Byte   Ptd$M_Device                ; Enforced XA codes
                          41 58 00'  0D6D                .Ascic  "XA"     ; Enforced device name prefix
                                 02  0D6D
                                 83  0D70                .BYTE   Pd$_Octal          ; Indicate scan octal
                       52 53 43 00'  0D71                .ASCIC  "CSR"    ; CSR string
                                 03  0D71
                  0003FFFE 0003E000  0D75                .LONG   ^O760000,^O777776          ; 760000 , 777776 limits on input
                                 88  0D7D                .BYTE   Pd$_Store          ; Indicate store operation
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                        0032  0D7E                .WORD   DR11W$L_CSR             ; Byte DR11W$L_CSR to data
                          00  0D80                .BYTE   0                   ; 0 DR11W$L_CSR to data
                          20  0D81                .BYTE   32                  ; 32 of data field
                          88  0D82                .BYTE   Pd$_Store           ; Indicate store operation
                        0018  0D83                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                          00  0D85                .BYTE   0                   ; 0 HP$A_DEVICE to data
                          12  0D86                .BYTE   18                  ; 18 of data field
                          83  0D87                .BYTE   Pd$_Octal           ; Indicate scan octal
              52 4F 54 43 45 56 00' 0D88          .ASCIC  "VECTOR"            ; VECTOR string
                          06  0D88
             000001FE 00000002  0D8F              .LONG   ^O2,^O776           ; 2 , 776 limits on input
                          88  0D97                .BYTE   Pd$_Store           ; Indicate store operation
                        0024  0D98                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                          00  0D9A                .BYTE   0                   ; 0 HP$W_VECTOR to data
                          09  0D9B                .BYTE   9                   ; 9 of data field
                          82  0D9C                .BYTE   Pd$_Decimal         ; Indicate scan decimal
                       52 42 00' 0D9D             .ASCIC  "BR"    ; BR string
                          02  0D9D
             00000007 00000004  0DA0              .LONG   4,7     ; 4 , 7 limits on input
                          88  0DA8                .BYTE   Pd$_Store           ; Indicate store operation
                        0036  0DA9                .WORD   DR11W$B_BR              ; Byte DR11W$B_BR to data
                          00  0DAB                .BYTE   0                   ; 0 DR11W$B_BR to data
                          08  0DAC                .BYTE   8                   ; 8 of data field
                          81  0DAD                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                              0DAE    274 DR750:  $DS_DR750
                              0DAE                .SAVE   LOCAL_BLOCK
                              0DAE                .PSECT  $ABS$,ABS
                        00000032  0041            .=HP$A_DEPENDENT
                              0032                .IIF    NB,DR750$B_SLOT,        DR750$B_SLOT:
                        00000033  0032            .IIF    NB,,BLKB,       .BLKB   1
                              0033                .IIF    NB,DR750$B_BR,  DR750$B_BR:
                        00000034  0033            .IIF    NB,,BLKB,       .BLKB   1
                              0034                .IIF    NB,DR750$B_SELF,        DR750$B_SELF:
                        00000035  0034            .IIF    NB,,BLKB,       .BLKB   1
                              0035                .IIF    NB,DR750$B_CONFIG,      DR750$B_CONFIG:
                        00000036  0035            .IIF    NB,,BLKB,       .BLKB   1
                              0036                .IIF    NB,DR750$B_UUT, DR750$B_UUT:
                        00000037  0036            .IIF    NB,,BLKB,       .BLKB   1
                              0037                .IIF    NB,DR750$K_LEN, DR750$K_LEN:
                                00000DAE          .RESTORE
              30 35 37 52 44 00' 0DAE             .ASCIC  "DR750" ; DR750 name
                          05  0DAE
                          37  0DB4                .BYTE   DR750$K_LEN             ; DR750$K_LEN of resultant P-table
                          FF  0DB5                .BYTE   255             ; Maximum unit number                   ;G:65
                        4658  0DB6                .WORD   ^A"XF"  ; Two character mnemonic for QIO DR750 XF
                          80  0DB8                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  0DB9                .Byte   Pd$_Name        ; Directive op-code
                          03  0DBA                .Byte   Ptd$M_Device            ; Enforced XF codes
                       46 58 00' 0DBB             .Ascic  "XF"    ; Enforced device name prefix
                          02  0DBB
                          86  0DBE                .BYTE   Pd$_Literal     ; Indicate literal
                    40F30000  0DBF                .LONG   ^X40F30000              ; Constant
                          88  0DC3                .BYTE   Pd$_Store       ; Indicate store operation
                        0018  0DC4                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                          00  0DC6                .BYTE   0                   ; 0 HP$A_DEVICE to data
                          20  0DC7                .BYTE   32                  ; 32 of data field
                          82  0DC8                .BYTE   Pd$_Decimal         ; Indicate scan decimal
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                    54 4F 4C 53 00' 0DC9              .ASCIC  "SLOT"  ; SLOT string
                                 04 0DC9
                 0000000F 0000000A  0DCE              .LONG   10,15   ; 10 , 15 limits on input
                                 88  0DD6              .BYTE   Pd$_Store       ; Indicate store operation
                               0032  0DD7              .WORD   DR750$B_SLOT            ; Byte DR750$B_SLOT to data
                                 00  0DD9              .BYTE   0               ; 0 DR750$B_SLOT to data
                                 08  0DDA              .BYTE   8               ; 8 of data field
                                 88  0DDB              .BYTE   Pd$_Store       ; Indicate store operation
                               0018  0DDC              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                 0D  0DDE              .BYTE   13              ; 13 HP$A_DEVICE to data
                                 04  0DDF              .BYTE   4               ; 4 of data field
                                 88  0DE0              .BYTE   Pd$_Store       ; Indicate store operation
                               0024  0DE1              .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                 02  0DE3              .BYTE   2               ; 2 HP$W_VECTOR to data
                                 04  0DE4              .BYTE   4               ; 4 of data field
                                 82  0DE5              .BYTE   Pd$_Decimal     ; Indicate scan decimal
                          52 42 00'  0DE6              .ASCIC  "BR"    ; BR string
                                 02  0DE6
                 00000007 00000004  0DE9              .LONG   4,7     ; 4 , 7 limits on input
                                 88  0DF1              .BYTE   Pd$_Store       ; Indicate store operation
                               0033  0DF2              .WORD   DR750$B_BR              ; Byte DR750$B_BR to data
                                 00  0DF4              .BYTE   0               ; 0 DR750$B_BR to data
                                 08  0DF5              .BYTE   8               ; 8 of data field
                                 88  0DF6              .BYTE   Pd$_Store       ; Indicate store operation
                               0024  0DF7              .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                 06  0DF9              .BYTE   6               ; 6 HP$W_VECTOR to data
                                 03  0DFA              .BYTE   3               ; 3 of data field
                                 8B  0DFB              .BYTE   Pd$_Logical     ; Indicate logical value operation
     54 53 45 54 20 46 4C 45 53 00' 0DFC              .ASCIC  \SELF TEST\     ; SELF TEST string
                                 09  0DFC
                                 88  0E06              .BYTE   Pd$_Store       ; Indicate store operation
                               0034  0E07              .WORD   DR750$B_SELF            ; Byte DR750$B_SELF to data
                                 00  0E09              .BYTE   0               ; 0 DR750$B_SELF to data
                                 08  0E0A              .BYTE   8               ; 8 of data field
                                 85  0E0B              .BYTE   Pd$_String      ; Indicate scan and verify string
47 49 46 4E 4F 43 20 54 53 45 54 00' 0E0C              .ASCIC  "TEST CONFIG"   ; TEST CONFIG string
                                 0B  0E0C
                    55 50 43 31 00' 0E18              .ASCIC  "1CPU"
                                 04  0E18
                    55 50 43 32 00' 0E1D              .ASCIC  "2CPU"
                                 04  0E1D
                                 00  0E22              .BYTE   0               ; Null length is end of valid 1CPU,2CPU
                                 88  0E23              .BYTE   Pd$_Store       ; Indicate store operation
                               0035  0E24              .WORD   DR750$B_CONFIG          ; Byte DR750$B_CONFIG to data
                                 00  0E26              .BYTE   0               ; 0 DR750$B_CONFIG to data
                                 08  0E27              .BYTE   8               ; 8 of data field
                                 8B  0E28              .BYTE   Pd$_Logical     ; Indicate logical value operation
        54 49 4E 55 20 54 53 45 54 00' 0E29              .ASCIC  \TEST UNIT\     ; TEST UNIT string
                                 09  0E29
                                 88  0E33              .BYTE   Pd$_Store       ; Indicate store operation
                               0036  0E34              .WORD   DR750$B_UUT             ; Byte DR750$B_UUT to data
                                 00  0E36              .BYTE   0               ; 0 DR750$B_UUT to data
                                 08  0E37              .BYTE   8               ; 8 of data field
                                 81  0E38              .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                     0E39  275 DR780:  $DS_DR780
                                     0E39              .SAVE   LOCAL_BLOCK
                                     0E39              .PSECT  $ABS$,ABS
```

```
                    00000032  0041              .=HP$A_DEPENDENT
                              0032              .IIF    NB,DR780$B_TR,  DR780$B_TR:
                    00000033  0032              .IIF    NB,.BLKB,       .BLKB   1
                              0033              .IIF    NB,DR780$B_BR,  DR780$B_BR:
                    00000034  0033              .IIF    NB,.BLKB,       .BLKB   1
                              0034              .IIF    NB,DR780$B_SELF,        DR780$B_SELF:
                    00000035  0034              .IIF    NB,.BLKB,       .BLKB   1
                              0035              .IIF    NB,DR780$B_CONFIG,      DR780$B_CONFIG:
                    00000036  0035              .IIF    NB,.BLKB,       .BLKB   1
                              0036              .IIF    NB,DR780$B_UUT, DR780$B_UUT:
                    00000037  0036              .IIF    NB,.BLKB,       .BLKB   1
                              0037              .IIF    NB,DR780$K_LEN, DR780$K_LEN:
                       00000E39                 .RESTORE
                30 38 37 52 44 00' 0E39        .ASCIC  "DR780" ; DR780 name
                          05  0E39
                          37  0E3F              .BYTE   DR780$K_LEN             ; DR780$K_LEN of resultant P-table
                          FF  0E40              .BYTE   255             ; Maximum unit number                   ;G:65
                        4658  0E41              .WORD   ^A"XF"  ; Two character mnemonic for QIO DR780 XF
                          80  0E43              .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  0E44              .Byte   Pd$_Name        ; Directive op-code
                          03  0E45              .Byte   Ptd$M_Device            ; Enforced XF codes
                    46 58 00' 0E46              .Ascic  "XF"    ; Enforced device name prefix
                          02  0E46
                          82  0E49              .BYTE   Pd$_Decimal     ; Indicate scan decimal
                    52 54 00' 0E4A              .ASCIC  "TR"    ; TR string
                          02  0E4A
                0000000F 00000001  0E4D         .LONG   1,15    ; 1 , 15 limits on input
                          88  0E55              .BYTE   Pd$_Store       ; Indicate store operation
                        0032  0E56              .WORD   DR780$B_TR              ; Byte DR780$B_TR to data
                          00  0E58              .BYTE   0               ; 0 DR780$B_TR to data
                          08  0E59              .BYTE   8               ; 8 of data field
                          88  0E5A              .BYTE   Pd$_Store       ; Indicate store operation
                        0018  0E5B              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                          0D  0E5D              .BYTE   13              ; 13 HP$A_DEVICE to data
                          04  0E5E              .BYTE   4               ; 4 of data field
                          88  0E5F              .BYTE   Pd$_Store       ; Indicate store operation
                        0024  0E60              .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                          02  0E62              .BYTE   2               ; 2 HP$W_VECTOR to data
                          04  0E63              .BYTE   4               ; 4 of data field
                          82  0E64              .BYTE   Pd$_Decimal     ; Indicate scan decimal
                    52 42 00' 0E65              .ASCIC  "BR"    ; BR string
                          02  0E65
                00000007 00000004  0E68         .LONG   4,7     ; 4 , 7 limits on input
                          88  0E70              .BYTE   Pd$_Store       ; Indicate store operation
                        0033  0E71              .WORD   DR780$B_BR              ; Byte DR780$B_BR to data
                          00  0E73              .BYTE   0               ; 0 DR780$B_BR to data
                          08  0E74              .BYTE   8               ; 8 of data field
                          88  0E75              .BYTE   Pd$_Store       ; Indicate store operation
                        0024  0E76              .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                          06  0E78              .BYTE   6               ; 6 HP$W_VECTOR to data
                          02  0E79              .BYTE   2               ; 2 of data field
                          86  0E7A              .BYTE   Pd$_Literal     ; Indicate literal
                    00000006  0E7B              .LONG   6               ; Constant
                          88  0E7F              .BYTE   Pd$_Store       ; Indicate store operation
                        0018  0E80              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                          1C  0E82              .BYTE   28              ; 28 HP$A_DEVICE to data
                          04  0E83              .BYTE   4               ; 4 of data field
```

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                                    86  0E84                .BYTE   Pd$_Literal      ; Indicate literal
                               00000001  0E85                .LONG   1               ; Constant
                                    88  0E89                .BYTE   Pd$_Store       ; Indicate store operation
                                  0024  0E8A                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                    08  0E8C                .BYTE   8               ; 8 HP$W_VECTOR to data
                                    01  0E8D                .BYTE   1               ; 1 of data field
                                    8B  0E8E                .BYTE   Pd$_Logical     ; Indicate logical value operation
          54 53 45 54 20 46 4C 45 53 00' 0E8F                .ASCIC  \SELF TEST\     ; SELF TEST string
                                    09  0E8F
                                    88  0E99                .BYTE   Pd$_Store       ; Indicate store operation
                                  0034  0E9A                .WORD   DR780$B_SELF            ; Byte DR780$B_SELF to data
                                    00  0E9C                .BYTE   0               ; 0 DR780$B_SELF to data
                                    08  0E9D                .BYTE   8               ; 8 of data field
                                    85  0E9E                .BYTE   Pd$_String      ; Indicate scan and verify string
47 49 46 4E 4F 43 20 54 53 45 54 00' 0E9F                .ASCIC  "TEST CONFIG"   ; TEST CONFIG string
                                    0B  0E9F
                        55 50 43 31 00' 0EAB                .ASCIC  "1CPU"
                                    04  0EAB
                        55 50 43 32 00' 0EB0                .ASCIC  "2CPU"
                                    04  0EB0
                                    00  0EB5                .BYTE   0               ; Null length is end of valid 1CPU,2CPU
                                    88  0EB6                .BYTE   Pd$_Store       ; Indicate store operation
                                  0035  0EB7                .WORD   DR780$B_CONFIG          ; Byte DR780$B_CONFIG to data
                                    00  0EB9                .BYTE   0               ; 0 DR780$B_CONFIG to data
                                    08  0EBA                .BYTE   8               ; 8 of data field
                                    8B  0EBB                .BYTE   Pd$_Logical     ; Indicate logical value operation
          54 49 4E 55 20 54 53 45 54 00' 0EBC                .ASCIC  \TEST UNIT\     ; TEST UNIT string
                                    09  0EBC
                                    88  0EC6                .BYTE   Pd$_Store       ; Indicate store operation
                                  0036  0EC7                .WORD   DR780$B_UUT             ; Byte DR780$B_UUT to data
                                    00  0EC9                .BYTE   0               ; 0 DR780$B_UUT to data
                                    08  0ECA                .BYTE   8               ; 8 of data field
                                    81  0ECB                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                        0ECC    276 DUP11:  $DS_DUP11
                                        0ECC                .SAVE   LOCAL_BLOCK
                                        0ECC                .PSECT  $ABS$,ABS
                                  00000032  0041            .=HP$A_DEPENDENT
                                        0032                .IIF    NB,DUP11$L_CSR, DUP11$L_CSR:
                                  00000036  0032            .IIF    NB,.BLKL,       .BLKL   1
                                        0036                .IIF    NB,DUP11$B_BR,  DUP11$B_BR:
                                  00000037  0036            .IIF    NB,.BLKB,       .BLKB   1
                                        0037                .IIF    NB,DUP11$K_LEN, DUP11$K_LEN:
                                  00000ECC                  .RESTORE
                     31 31 50 55 44 00' 0ECC                .ASCIC  "DUP11" ; DUP11 name
                                    05  0ECC
                                    37  0ED2                .BYTE   DUP11$K_LEN             ; DUP11$K_LEN of resultant P-table
                                    00  0ED3                .BYTE   0               ; Maximum unit number                   ;G:65
                                  0000  0ED4                .WORD   ^A""    ; Two character mnemonic for QIO DUP11
                                    80  0ED6                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                    8D  0ED7                .Byte   Pd$_Name        ; Directive op-code
                                    03  0ED8                .Byte   Ptd$M_Device            ; Enforced XW codes
                        57 58 00' 0ED9                .Ascic  "XW"    ; Enforced device name prefix
                                    02  0ED9
                                    83  0EDC                .BYTE   Pd$_Octal       ; Indicate scan octal
                           52 53 43 00' 0EDD                .ASCIC  "CSR"   ; CSR string
                                    03  0EDD
                  0003FFFE 0003E000  0EE1                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
```

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                      88  0EE9                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  0EEA                .WORD   DUP11$L_CSR             ; Byte DUP11$L_CSR to data
                      00  0EEC                .BYTE   0               ; 0 DUP11$L_CSR to data
                      20  0EED                .BYTE   32              ; 32 of data field
                      88  0EEE                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  0EEF                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  0EF1                .BYTE   0               ; 0 HP$A_DEVICE to data
                      12  0EF2                .BYTE   18              ; 18 of data field
                      83  0EF3                .BYTE   Pd$_Octal       ; Indicate scan octal
           52 4F 54 43 45 56 00' 0EF4         .ASCIC  "VECTOR"        ; VECTOR string
                      06  0EF4
       000001FE 00000002  0EFB                .LONG   ^O2,^O776       ; 2 , 776 limits on input
                      88  0F03                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  0F04                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  0F06                .BYTE   0               ; 0 HP$W_VECTOR to data
                      09  0F07                .BYTE   9               ; 9 of data field
                      82  0F08                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                 52 42 00' 0F09               .ASCIC  "BR"    ; BR string
                      02  0F09
       00000007 00000004  0F0C                .LONG   4,7     ; 4 , 7 limits on input
                      88  0F14                .BYTE   Pd$_Store       ; Indicate store operation
                    0036  0F15                .WORD   DUP11$B_BR              ; Byte DUP11$B_BR to data
                      00  0F17                .BYTE   0               ; 0 DUP11$B_BR to data
                      08  0F18                .BYTE   8               ; 8 of data field
                      81  0F19                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          0F1A    277 DV11:   $DS_DV11
                          0F1A                .SAVE   LOCAL_BLOCK
                          0F1A                .PSECT  $ABS$,ABS
                00000032  0041                .=HP$A_DEPENDENT
                          0032                .IIF    NB,DV11$L_CSR,  DV11$L_CSR:
                00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                          0036                .IIF    NB,DV11$B_BR,   DV11$B_BR:
                00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                          0037                .IIF    NB,DV11$K_LEN,  DV11$K_LEN:
                    00000F1A                  .RESTORE
           31 31 56 44 00' 0F1A               .ASCIC  "DV11"  ; DV11 name
                      04  0F1A
                      37  0F1F                .BYTE   DV11$K_LEN              ; DV11$K_LEN of resultant P-table
                      00  0F20                .BYTE   0               ; Maximum unit number                   ;G:65
                    0000  0F21                .WORD   ^A""    ; Two character mnemonic for QIO DV11
                      80  0F23                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  0F24                .Byte   Pd$_Name        ; Directive op-code
                      03  0F25                .Byte   Ptd$M_Device            ; Enforced XV codes
                 56 58 00' 0F26               .Ascic  "XV"    ; Enforced device name prefix
                      02  0F26
                      83  0F29                .BYTE   Pd$_Octal       ; Indicate scan octal
                52 53 43 00' 0F2A             .ASCIC  "CSR"   ; CSR string
                      03  0F2A
       0003FFFE 0003E000  0F2E                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  0F36                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  0F37                .WORD   DV11$L_CSR              ; Byte DV11$L_CSR to data
                      00  0F39                .BYTE   0               ; 0 DV11$L_CSR to data
                      20  0F3A                .BYTE   32              ; 32 of data field
                      88  0F3B                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  0F3C                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  0F3E                .BYTE   0               ; 0 HP$A_DEVICE to data
                      12  0F3F                .BYTE   18              ; 18 of data field
```

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                      83  0F40                .BYTE   Pd$_Octal        ; Indicate scan octal
          52 4F 54 43 45 56 00' 0F41          .ASCIC  "VECTOR"         ; VECTOR string
                      06  0F41
             000001FE 00000002  0F48          .LONG   ^O2,^O776        ; 2 , 776 limits on input
                      88  0F50                .BYTE   Pd$_Store        ; Indicate store operation
                    0024  0F51                .WORD   HP$W_VECTOR              ; Byte HP$W_VECTOR to data
                      00  0F53                .BYTE   0                ; 0 HP$W_VECTOR to data
                      09  0F54                .BYTE   9                ; 9 of data field
                      82  0F55                .BYTE   Pd$_Decimal      ; Indicate scan decimal
                   52 42 00' 0F56             .ASCIC  "BR"     ; BR string
                      02  0F56
             00000007 00000004  0F59          .LONG   4,7      ; 4 , 7 limits on input
                      88  0F61                .BYTE   Pd$_Store        ; Indicate store operation
                    0036  0F62                .WORD   DV11$B_BR                ; Byte DV11$B_BR to data
                      00  0F64                .BYTE   0                ; 0 DV11$B_BR to data
                      08  0F65                .BYTE   8                ; 8 of data field
                      81  0F66                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          0F67    278 DW730:  $DS_DW730                        ;                [02]
                          0F67                .SAVE   LOCAL_BLOCK
                          0F67                .PSECT  $ABS$,ABS
                   00000032   0041            .=HP$A_DEPENDENT
                              0032            .IIF    NB,DW730$K_LEN, DW730$K_LEN:
                          0000F67             .RESTORE
          30 33 37 57 44 00' 0F67             .ASCIC  "DW730" ; DW730 name
                      05  0F67
                      32  0F6D                .BYTE   DW730$K_LEN              ; DW730$K_LEN of resultant P-table
                      01  0F6E                .BYTE   1                ; Maximum unit number                          ;G:65
                    0000  0F6F                .WORD   ^A""     ; Two character mnemonic for QIO DW730
                      80  0F71                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                      8D  0F72                .Byte   Pd$_Name         ; Directive op-code
                      01  0F73                .Byte   Ptd$M_Unit               ; Enforced DW codes
                57 44 00' 0F74                .Ascic  "DW"     ; Enforced device name prefix
                      02  0F74
                      86  0F77                .BYTE   Pd$_Literal      ; Indicate literal
                40F26000  0F78                .LONG   ^X40F26000               ; Constant
                      88  0F7C                .BYTE   Pd$_Store        ; Indicate store operation
                    0018  0F7D                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                      00  0F7F                .BYTE   0                ; 0 HP$A_DEVICE to data
                      20  0F80                .BYTE   32               ; 32 of data field
                      86  0F81                .BYTE   Pd$_Literal      ; Indicate literal
                40FC0000  0F82                .LONG   ^X40FC0000               ; Constant
                      88  0F86                .BYTE   Pd$_Store        ; Indicate store operation
                    001C  0F87                .WORD   HP$A_DVA                 ; Byte HP$A_DVA to data
                      00  0F89                .BYTE   0                ; 0 HP$A_DVA to data
                      20  0F8A                .BYTE   32               ; 32 of data field
                      86  0F8B                .BYTE   Pd$_Literal      ; Indicate literal
                00000200  0F8C                .LONG   ^X200            ; Constant
                      88  0F90                .BYTE   Pd$_Store        ; Indicate store operation
                    0024  0F91                .WORD   HP$W_VECTOR              ; Byte HP$W_VECTOR to data
                      00  0F93                .BYTE   0                ; 0 HP$W_VECTOR to data
                      10  0F94                .BYTE   16               ; 16 of data field
                      81  0F95                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          0F96    279 DW750:  $DS_DW750
                          0F96                .SAVE   LOCAL_BLOCK
                          0F96                .PSECT  $ABS$,ABS
                   00000032   0041            .=HP$A_DEPENDENT
                              0032            .IIF    NB,DW750$K_LEN, DW750$K_LEN:
```

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                    00000F96                .RESTORE
          30 35 37 57 44 00' 0F96           .ASCIC  "DW750" ; DW750 name
                       05  0F96
                       32  0F9C           .BYTE   DW750$K_LEN             ; DW750$K_LEN of resultant P-table
                       04  0F9D           .BYTE   4                       ; Maximum unit number                   ;G:65
                     0000  0F9E           .WORD   ^A""    ; Two character mnemonic for QIO DW750
                       80  0FA0           .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  0FA1           .Byte   Pd$_Name        ; Directive op-code
                       01  0FA2           .Byte   Ptd$M_Unit              ; Enforced DW codes
                    57 44 00' 0FA3        .Ascic  "DW"    ; Enforced device name prefix
                       02  0FA3
                       86  0FA6           .BYTE   Pd$_Literal     ; Indicate literal
                 40F30000  0FA7           .LONG   ^X40F30000              ; Constant
                       88  0FAB           .BYTE   Pd$_Store       ; Indicate store operation
                     0018  0FAC           .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                       00  0FAE           .BYTE   0                       ; 0 HP$A_DEVICE to data
                       20  0FAF           .BYTE   32                      ; 32 of data field
                       86  0FB0           .BYTE   Pd$_Literal     ; Indicate literal
                 40F80000  0FB1           .LONG   ^X40F80000              ; Constant
                       88  0FB5           .BYTE   Pd$_Store       ; Indicate store operation
                     001C  0FB6           .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                       00  0FB8           .BYTE   0                       ; 0 HP$A_DVA to data
                       20  0FB9           .BYTE   32                      ; 32 of data field
                       86  0FBA           .BYTE   Pd$_Literal     ; Indicate literal
                 00000200  0FBB           .LONG   ^X200           ; Constant
                       88  0FBF           .BYTE   Pd$_Store       ; Indicate store operation
                     0024  0FC0           .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                       00  0FC2           .BYTE   0                       ; 0 HP$W_VECTOR to data
                       10  0FC3           .BYTE   16                      ; 16 of data field
                       87  0FC4           .BYTE   Pd$_Fetch       ; Indicate fetch operation
                     000B  0FC5           .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                       00  0FC7           .BYTE   0                       ; 0 HP$B_DRIVE to data
                       08  0FC8           .BYTE   8                       ; 8 of data field
                       88  0FC9           .BYTE   Pd$_Store       ; Indicate store operation
                     0018  0FCA           .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                       0D  0FCC           .BYTE   13                      ; 13 HP$A_DEVICE to data
                       01  0FCD           .BYTE   1                       ; 1 of data field
                       8A  0FCE           .BYTE   Pd$_Add         ; Indicate add value to field operation
                     0024  0FCF           .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                       09  0FD1           .BYTE   9                       ; 9 HP$W_VECTOR to data
                       02  0FD2           .BYTE   2                       ; 2 of data field
                       89  0FD3           .BYTE   Pd$_Complement  ; Indicate complement value operation
                       88  0FD4           .BYTE   Pd$_Store       ; Indicate store operation
                     001C  0FD5           .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                       12  0FD7           .BYTE   18                      ; 18 HP$A_DVA to data
                       01  0FD8           .BYTE   1                       ; 1 of data field
                       81  0FD9           .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                           0FDA  280 DW780:  $DS_DW780
                           0FDA              .SAVE   LOCAL_BLOCK
                           0FDA              .PSECT  $ABS$,ABS
                 00000032  0041              .=HP$A_DEPENDENT
                           0032              .IIF    NB,DW780$B_TR,  DW780$B_TR:
                 00000033  0032              .IIF    NB,.BLKB,       .BLKB   1
                           0033              .IIF    NB,DW780$B_BR,  DW780$B_BR:
                 00000034  0033              .IIF    NB,.BLKB,       .BLKB   1
                           0034              .IIF    NB,DW780$K_LEN, DW780$K_LEN:
                      00000FDA               .RESTORE
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                30 38 37 57 44 00' 0FDA                 .ASCIC  "DW780" ; DW780 name
                                05  0FDA
                                34  0FE0                 .BYTE   DW780$K_LEN             ; DW780$K_LEN of resultant P-table
                                08  0FE1                 .BYTE   8                       ; Maximum unit number                   ;G:65
                              0000  0FE2                 .WORD   ^A""    ; Two character mnemonic for QIO DW780
                                80  0FE4                 .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                8D  0FE5                 .Byte   Pd$_Name        ; Directive op-code
                                01  0FE6                 .Byte   Ptd$M_Unit              ; Enforced DW codes
                            57 44 00' 0FE7               .Ascic  "DW"    ; Enforced device name prefix
                                02  0FE7
                                82  0FEA                 .BYTE   Pd$_Decimal     ; Indicate scan decimal
                            52 54 00' 0FEB               .ASCIC  "TR"    ; TR string
                                02  0FEB
                        0000000F 00000001  0FEE          .LONG   1,15    ; 1 , 15 limits on input
                                88  0FF6                 .BYTE   Pd$_Store       ; Indicate store operation
                              0032  0FF7                 .WORD   DW780$B_TR              ; Byte DW780$B_TR to data
                                00  0FF9                 .BYTE   0               ; 0 DW780$B_TR to data
                                08  0FFA                 .BYTE   8               ; 8 of data field
                                88  0FFB                 .BYTE   Pd$_Store       ; Indicate store operation
                              0018  0FFC                 .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                0D  0FFE                 .BYTE   13              ; 13 HP$A_DEVICE to data
                                04  0FFF                 .BYTE   4               ; 4 of data field
                                88  1000                 .BYTE   Pd$_Store       ; Indicate store operation
                              0024  1001                 .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                02  1003                 .BYTE   2               ; 2 HP$W_VECTOR to data
                                04  1004                 .BYTE   4               ; 4 of data field
                                82  1005                 .BYTE   Pd$_Decimal     ; Indicate scan decimal
                            52 42 00' 1006               .ASCIC  "BR"    ; BR string
                                02  1006
                        00000007 00000004  1009          .LONG   4,7     ; 4 , 7 limits on input
                                88  1011                 .BYTE   Pd$_Store       ; Indicate store operation
                              0033  1012                 .WORD   DW780$B_BR              ; Byte DW780$B_BR to data
                                00  1014                 .BYTE   0               ; 0 DW780$B_BR to data
                                08  1015                 .BYTE   8               ; 8 of data field
                                88  1016                 .BYTE   Pd$_Store       ; Indicate store operation
                              0024  1017                 .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                06  1019                 .BYTE   6               ; 6 HP$W_VECTOR to data
                                02  101A                 .BYTE   2               ; 2 of data field
                                87  101B                 .BYTE   Pd$_Fetch       ; Indicate fetch operation
                              000B  101C                 .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                                00  101E                 .BYTE   0               ; 0 HP$B_DRIVE to data
                                08  101F                 .BYTE   8               ; 8 of data field
                                88  1020                 .BYTE   Pd$_Store       ; Indicate store operation
                              001C  1021                 .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                                12  1023                 .BYTE   18              ; 18 HP$A_DVA to data
                                02  1024                 .BYTE   2               ; 2 of data field
                                86  1025                 .BYTE   Pd$_Literal     ; Indicate literal
                          00000006  1026                 .LONG   6               ; Constant
                                88  102A                 .BYTE   Pd$_Store       ; Indicate store operation
                              0018  102B                 .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                1C  102D                 .BYTE   28              ; 28 HP$A_DEVICE to data
                                04  102E                 .BYTE   4               ; 4 of data field
                                88  102F                 .BYTE   Pd$_Store       ; Indicate store operation
                              001C  1030                 .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                                1C  1032                 .BYTE   28              ; 28 HP$A_DVA to data
                                04  1033                 .BYTE   4               ; 4 of data field
                                87  1034                 .BYTE   Pd$_Fetch       ; Indicate fetch operation
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                     0018  1035                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                       19  1037                .BYTE   25                  ; 25 HP$A_DEVICE to data
                       02  1038                .BYTE   2                   ; 2 of data field
                       88  1039                .BYTE   Pd$_Store           ; Indicate store operation
                     001C  103A                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                       19  103C                .BYTE   25                  ; 25 HP$A_DVA to data
                       02  103D                .BYTE   2                   ; 2 of data field
                       86  103E                .BYTE   Pd$_Literal         ; Indicate literal
                 00000001  103F                .LONG   1                   ; Constant
                       88  1043                .BYTE   Pd$_Store           ; Indicate store operation
                     001C  1044                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                       14  1046                .BYTE   20                  ; 20 HP$A_DVA to data
                       01  1047                .BYTE   1                   ; 1 of data field
                       88  1048                .BYTE   Pd$_Store           ; Indicate store operation
                     0024  1049                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                       08  104B                .BYTE   8                   ; 8 HP$W_VECTOR to data
                       01  104C                .BYTE   1                   ; 1 of data field
                       81  104D                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                           104E    281 DX20:   $DS_DX20                        ;                   [30]
                           104E                .SAVE   LOCAL_BLOCK
                           104E                .PSECT  $ABS$,ABS
                 00000032  0041                .=HP$A_DEPENDENT
                           0032                .IIF    NB,HP$B_DX20_DRIVE,     HP$B_DX20_DRIVE::
                           0032                .IIF    NB,DX20$B_DRIVE,        DX20$B_DRIVE::
                 00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                           0033                .IIF    NB,HP$K_DX20_LEN,       HP$K_DX20_LEN::
                           0033                .IIF    NB,DX20$K_LEN,  DX20$K_LEN::
                       0000104E                .RESTORE
           30 32 58 44 00' 104E                .ASCIC  "DX20"  ; DX20 name
                       04  104E
                       33  1053                .BYTE   DX20$K_LEN              ; DX20$K_LEN of resultant P-table
                       08  1054                .BYTE   8                   ; Maximum unit number                   ;G:65
                     0000  1055                .WORD   ^A""    ; Two character mnemonic for QIO DX20
                       80  1057                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  1058                .Byte   Pd$_Name        ; Directive op-code
                       02  1059                .Byte   PTD$M_CONTROLLER                ; Enforced MR codes
                 52 4D 00' 105A                .Ascic  "MR"    ; Enforced device name prefix
                       02  105A
                       82  105D                .BYTE   Pd$_Decimal     ; Indicate scan decimal
           45 56 49 52 44 00' 105E             .ASCIC  "DRIVE" ; DRIVE string
                       05  105E
           00000007 00000000  1064             .LONG   0,7     ; 0 , 7 limits on input
                       88  106C                .BYTE   Pd$_Store           ; Indicate store operation
                     0032  106D                .WORD   DX20$B_DRIVE            ; Byte DX20$B_DRIVE to data
                       00  106F                .BYTE   0                   ; 0 DX20$B_DRIVE to data
                       08  1070                .BYTE   8                   ; 8 of data field
                       88  1071                .BYTE   Pd$_Store           ; Indicate store operation
                     000B  1072                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                       00  1074                .BYTE   0                   ; 0 HP$B_DRIVE to data
                       08  1075                .BYTE   8                   ; 8 of data field
                       88  1076                .BYTE   Pd$_Store           ; Indicate store operation
                     0018  1077                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                       07  1079                .BYTE   7                   ; 7 HP$A_DEVICE to data
                       03  107A                .BYTE   3                   ; 3 of data field
                       81  107B                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                           107C    282 DZ11:   $DS_DZ11
                           107C                .SAVE   LOCAL_BLOCK
```

```
                                  107C          .PSECT  $ABS$,ABS
                        00000032  0041          .=HP$A_DEPENDENT
                                  0032          .IIF    NB,DZ11$L_CSR,  DZ11$L_CSR:
                        00000036  0032          .IIF    NB,.BLKL,       .BLKL   1
                                  0036          .IIF    NB,DZ11$B_BR,   DZ11$B_BR:
                        00000037  0036          .IIF    NB,.BLKB,       .BLKB   1
                                  0037          .IIF    NB,DZ11$B_MTYPE,        DZ11$B_MTYPE:
                        00000038  0037          .IIF    NB,.BLKB,       .BLKB   1
                                  0038          .IIF    NB,DZ11$K_LEN,  DZ11$K_LEN:
                              0000107C          .RESTORE
                  31 31 5A 44 00' 107C          .ASCIC  "DZ11"  ; DZ11 name
                              04  107C
                              38  1081          .BYTE   DZ11$K_LEN              ; DZ11$K_LEN of resultant P-table
                              00  1082          .BYTE   0               ; Maximum unit number                   ;G:65
                            5454  1083          .WORD   ^A"TT"  ; Two character mnemonic for QIO DZ11 TT
                              80  1085          .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                              8D  1086          .Byte   Pd$_Name        ; Directive op-code
                              02  1087          .Byte   Ptd$M_Controller                ; Enforced TT codes
                        54 54 00' 1088          .Ascic  "TT"    ; Enforced device name prefix
                              02  1088
                              83  108B          .BYTE   Pd$_Octal       ; Indicate scan octal
                     52 53 43 00' 108C          .ASCIC  "CSR"   ; CSR string
                              03  108C
                 0003FFFE 0003E000  1090          .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                              88  1098          .BYTE   Pd$_Store       ; Indicate store operation
                            0032  1099          .WORD   DZ11$L_CSR              ; Byte DZ11$L_CSR to data
                              00  109B          .BYTE   0               ; 0 DZ11$L_CSR to data
                              20  109C          .BYTE   32              ; 32 of data field
                              88  109D          .BYTE   Pd$_Store       ; Indicate store operation
                            0018  109E          .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                              00  10A0          .BYTE   0               ; 0 HP$A_DEVICE to data
                              12  10A1          .BYTE   18              ; 18 of data field
                              83  10A2          .BYTE   Pd$_Octal       ; Indicate scan octal
              52 4F 54 43 45 56 00' 10A3          .ASCIC  "VECTOR"        ; VECTOR string
                              06  10A3
                 000001FE 00000002  10AA          .LONG   ^O2,^O776       ; 2 , 776 limits on input
                              88  10B2          .BYTE   Pd$_Store       ; Indicate store operation
                            0024  10B3          .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                              00  10B5          .BYTE   0               ; 0 HP$W_VECTOR to data
                              09  10B6          .BYTE   9               ; 9 of data field
                              82  10B7          .BYTE   Pd$_Decimal     ; Indicate scan decimal
                        52 42 00' 10B8          .ASCIC  "BR"    ; BR string
                              02  10B8
                 00000007 00000004  10BB          .LONG   4,7     ; 4 , 7 limits on input
                              88  10C3          .BYTE   Pd$_Store       ; Indicate store operation
                            0036  10C4          .WORD   DZ11$B_BR               ; Byte DZ11$B_BR to data
                              00  10C6          .BYTE   0               ; 0 DZ11$B_BR to data
                              08  10C7          .BYTE   8               ; 8 of data field
                              85  10C8          .BYTE   Pd$_String      ; Indicate scan and verify string
45 50 59 54 20 45 4C 55 44 4F 4D 00' 10C9          .ASCIC  "MODULE TYPE"   ; MODULE TYPE string
                              0B  10C9
                     41 49 45 00' 10D5          .ASCIC  "EIA"
                              03  10D5
                  41 4D 30 32 00' 10D9          .ASCIC  "20MA"
                              04  10D9
                              00  10DE          .BYTE   0               ; Null length is end of valid EIA,20MA
                              88  10DF          .BYTE   Pd$_Store       ; Indicate store operation
```

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                        0037  10E0                .WORD   DZ11$B_MTYPE              ; Byte DZ11$B_MTYPE to data
                          00  10E2                .BYTE   0                   ; 0 DZ11$B_MTYPE to data
                          08  10E3                .BYTE   8                   ; 8 of data field
                          81  10E4                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                              10E5    283 DZ32:   $DS_DZ32                    ;                   [08]
                              10E5                .SAVE   LOCAL_BLOCK
                              10E5                .PSECT  $ABS$,ABS
                    00000032  0041                .=HP$A_DEPENDENT
                              0032                .IIF    NB,HP$B_DZ32_BRLVL,     HP$B_DZ32_BRLVL:
                              0032                .IIF    NB,DZ32$B_BRLVL,        DZ32$B_BRLVL:
                    00000033  0032                .IIF    NB,,BLKB,       .BLKB   1
                              0033                .IIF    NB,HP$B_DZ32_ACTIV,     HP$B_DZ32_ACTIV:
                              0033                .IIF    NB,DZ32$B_ACTIV,        DZ32$B_ACTIV:
                    00000034  0033                .IIF    NB,,BLKB,       .BLKB   1
                              0034                .IIF    NB,HP$B_DZ32_SPEED,     HP$B_DZ32_SPEED:
                              0034                .IIF    NB,DZ32$B_SPEED,        DZ32$B_SPEED:
                    00000035  0034                .IIF    NB,,BLKB,       .BLKB   1
                              0035                .IIF    NB,HP$W_DZ32_FLAGS,     HP$W_DZ32_FLAGS:
                              0035                .IIF    NB,DZ32$W_FLAGS,        DZ32$W_FLAGS:
                    00000037  0035                .IIF    NB,,BLKW,       .BLKW   1
                              0037                .IIF    NB,HP$K_LEN,    HP$K_LEN:
                              0037                .IIF    NB,DZ32$_LEN,   DZ32$_LEN:
                          000010E5                .RESTORE
                 32 33 5A 44 00' 10E5             .ASCIC  "DZ32"  ; DZ32 name
                          04  10E5
                          37  10EA                .BYTE   DZ32$_LEN               ; DZ32$_LEN of resultant P-table
                          00  10EB                .BYTE   0                   ; Maximum unit number                   ;G:65
                        0000  10EC                .WORD   ^A""    ; Two character mnemonic for QIO DZ32
                          80  10EE                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                          8D  10EF                .Byte   Pd$_Name            ; Directive op-code
                          02  10F0                .Byte   Ptd$M_Controller                ; Enforced TT codes
                    54 54 00' 10F1                .Ascic  "TT"    ; Enforced device name prefix
                          02  10F1
                          83  10F4                .BYTE   Pd$_Octal           ; Indicate scan octal
                 52 53 43 00' 10F5                .ASCIC  "CSR"   ; CSR string
                          03  10F5
              0003FFFE 0003E000  10F9             .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                          88  1101                .BYTE   Pd$_Store           ; Indicate store operation
                        0018  1102                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                          00  1104                .BYTE   0                   ; 0 HP$A_DEVICE to data
                          12  1105                .BYTE   18                  ; 18 of data field
                          83  1106                .BYTE   Pd$_Octal           ; Indicate scan octal
           52 4F 54 43 45 56 00' 1107             .ASCIC  "VECTOR"            ; VECTOR string
                          06  1107
              000001FE 00000002  110E             .LONG   ^O2,^O776           ; 2 , 776 limits on input
                          88  1116                .BYTE   Pd$_Store           ; Indicate store operation
                        0024  1117                .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                          00  1119                .BYTE   0                   ; 0 HP$W_VECTOR to data
                          10  111A                .BYTE   16                  ; 16 of data field
                          83  111B                .BYTE   Pd$_Octal           ; Indicate scan octal
                    52 42 00' 111C                .ASCIC  "BR"    ; BR string
                          02  111C
              00000007 00000004  111F             .LONG   ^O4,^O7 ; 4 , 7 limits on input
                          88  1127                .BYTE   Pd$_Store           ; Indicate store operation
                        0032  1128                .WORD   DZ32$B_BRLVL                ; Byte DZ32$B_BRLVL to data
                          00  112A                .BYTE   0                   ; 0 DZ32$B_BRLVL to data
                          08  112B                .BYTE   8                   ; 8 of data field
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                                83  112C                .BYTE   Pd$_Octal        ; Indicate scan octal
45 4E 49 4C 20 45 56 49 54 43 41 00' 112D                .ASCIC  "ACTIVE LINES"   ; ACTIVE LINES string
                                53  1139
                                0C  112D
                  000000FF 00000000  113A                .LONG   ^O0,^O377        ; 0 , 377 limits on input
                                88  1142                .BYTE   Pd$_Store        ; Indicate store operation
                              0033  1143                .WORD   DZ32$B_ACTIV             ; Byte DZ32$B_ACTIV to data
                                00  1145                .BYTE   0                ; 0 DZ32$B_ACTIV to data
                                08  1146                .BYTE   8                ; 8 of data field
                                83  1147                .BYTE   Pd$_Octal        ; Indicate scan octal
      45 54 41 52 20 44 55 41 42 00' 1148                .ASCIC  "BAUD RATE"      ; BAUD RATE string
                                09  1148
                  0000000E 00000000  1152                .LONG   ^O0,^O16         ; 0 , 16 limits on input
                                88  115A                .BYTE   Pd$_Store        ; Indicate store operation
                              0034  115B                .WORD   DZ32$B_SPEED             ; Byte DZ32$B_SPEED to data
                                00  115D                .BYTE   0                ; 0 DZ32$B_SPEED to data
                                08  115E                .BYTE   8                ; 8 of data field
                                83  115F                .BYTE   Pd$_Octal        ; Indicate scan octal
59 54 20 4B 43 41 42 50 4F 4F 4C 00' 1160                .ASCIC  "LOOPBACK TYPE"  ; LOOPBACK TYPE string
                             45 50  116C
                                0D  1160
                  00000004 00000000  116E                .LONG   ^O0,^O4 ; 0 , 4 limits on input
                                88  1176                .BYTE   Pd$_Store        ; Indicate store operation
                              0035  1177                .WORD   DZ32$W_FLAGS             ; Byte DZ32$W_FLAGS to data
                                00  1179                .BYTE   0                ; 0 DZ32$W_FLAGS to data
                                03  117A                .BYTE   3                ; 3 of data field
                                83  117B                .BYTE   Pd$_Octal        ; Indicate scan octal
53 20 54 45 53 45 52 20 48 4E 49 00' 117C                .ASCIC  "INH RESET SWITCH"       ; INH RESET SWITCH string
                   48 43 54 49 57  1188
                                10  117C
                  00000001 00000000  118D                .LONG   ^O0,^O1 ; 0 , 1 limits on input
                                88  1195                .BYTE   Pd$_Store        ; Indicate store operation
                              0035  1196                .WORD   DZ32$W_FLAGS             ; Byte DZ32$W_FLAGS to data
                                03  1198                .BYTE   3                ; 3 DZ32$W_FLAGS to data
                                01  1199                .BYTE   1                ; 1 of data field
                                83  119A                .BYTE   Pd$_Octal        ; Indicate scan octal
48 43 54 49 57 53 20 45 44 4F 4D 00' 119B                .ASCIC  "MODE SWITCH"    ; MODE SWITCH string
                                0B  119B
                  00000001 00000000  11A7                .LONG   ^O0,^O1 ; 0 , 1 limits on input
                                88  11AF                .BYTE   Pd$_Store        ; Indicate store operation
                              0035  11B0                .WORD   DZ32$W_FLAGS             ; Byte DZ32$W_FLAGS to data
                                04  11B2                .BYTE   4                ; 4 DZ32$W_FLAGS to data
                                01  11B3                .BYTE   1                ; 1 of data field
                                83  11B4                .BYTE   Pd$_Octal        ; Indicate scan octal
44 45 45 50 53 20 54 49 4C 50 53 00' 11B5                .ASCIC  "SPLIT SPEED JUMPER"     ; SPLIT SPEED JUMPER string
             52 45 50 4D 55 4A 20  11C1
                                12  11B5
                  00000002 00000000  11C8                .LONG   ^O0,^O2 ; 0 , 2 limits on input
                                88  11D0                .BYTE   Pd$_Store        ; Indicate store operation
                              0035  11D1                .WORD   DZ32$W_FLAGS             ; Byte DZ32$W_FLAGS to data
                                05  11D3                .BYTE   5                ; 5 DZ32$W_FLAGS to data
                                02  11D4                .BYTE   2                ; 2 of data field
                                81  11D5                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                                    11D6    284 DZV11:  $DS_DZV11                ;                [19]
                                    11D6                .SAVE   LOCAL_BLOCK
                                    11D6                .PSECT  $ABS$,ABS
                        00000032    0041                .=HP$A_DEPENDENT
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```
                        0032                .IIF    NB,DZV11$L_CSR, DZV11$L_CSR:
                00000036  0032                .IIF    NB,,BLKL,       .BLKL   1
                        0036                .IIF    NB,DZV11$K_LEN, DZV11$K_LEN:
                      11D6                .RESTORE
      31 31 56 5A 44 00'  11D6                .ASCIC  "DZV11" ; DZV11 name
                        05  11D6
                        36  11DC                .BYTE   DZV11$K_LEN             ; DZV11$K_LEN of resultant P-table
                        00  11DD                .BYTE   0                       ; Maximum unit number                   ;G:65
                      5454  11DE                .WORD   ^A"TT"  ; Two character mnemonic for QIO DZV11 TT
                        80  11E0                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                        8D  11E1                .Byte   Pd$_Name        ; Directive op-code
                        02  11E2                .Byte   Ptd$M_Controller                ; Enforced TT codes
                  54 54 00' 11E3                .Ascic  "TT"    ; Enforced device name prefix
                        02  11E3
                        83  11E6                .BYTE   Pd$_Octal       ; Indicate scan octal
                  52 53 43 00' 11E7                .ASCIC  "CSR"   ; CSR string
                        03  11E7
              0003FFFE 0003E000  11EB                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                        88  11F3                .BYTE   Pd$_Store       ; Indicate store operation
                      0032  11F4                .WORD   DZV11$L_CSR             ; Byte DZV11$L_CSR to data
                        00  11F6                .BYTE   0                       ; 0 DZV11$L_CSR to data
                        20  11F7                .BYTE   32                      ; 32 of data field
                        88  11F8                .BYTE   Pd$_Store       ; Indicate store operation
                      0018  11F9                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                        00  11FB                .BYTE   0                       ; 0 HP$A_DEVICE to data
                        12  11FC                .BYTE   18                      ; 18 of data field
                        83  11FD                .BYTE   Pd$_Octal       ; Indicate scan octal
          52 4F 54 43 45 56 00' 11FE                .ASCIC  "VECTOR"        ; VECTOR string
                        06  11FE
              000001FE 00000002  1205                .LONG   ^O2,^O776       ; 2 , 776 limits on input
                        88  120D                .BYTE   Pd$_Store       ; Indicate store operation
                      0024  120E                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                        00  1210                .BYTE   0                       ; 0 HP$W_VECTOR to data
                        09  1211                .BYTE   9                       ; 9 of data field
                        81  1212                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                            1213  285 IEU11A: $DS_IEU11A                        ;               [16]
                            1213                .SAVE   LOCAL_BLOCK
                            1213                .PSECT  $ABS$,ABS
                00000032  0041                .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$B_IEU11A_BR,      HP$B_IEU11A_BR:
                        0032                .IIF    NB,IEU11A$B_BR, IEU11A$B_BR:
                00000033  0032                .IIF    NB,,BLKB,       .BLKB   1
                        0033                .IIF    NB,HP$K_IEU11A_LEN,     HP$K_IEU11A_LEN:
                        0033                .IIF    NB,IEU11A$K_LEN,        IEU11A$K_LEN:
                      1213                .RESTORE
  41 31 31 55 45 49 00' 1213                .ASCIC  "IEU11A"        ; IEU11A name
                        06  1213
                        33  121A                .BYTE   IEU11A$K_LEN             ; IEU11A$K_LEN of resultant P-table
                        01  121B                .BYTE   1                       ; Maximum unit number                   ;G:65
                      0000  121C                .WORD   ^A""    ; Two character mnemonic for QIO IEU11A
                        80  121E                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                        8D  121F                .Byte   Pd$_Name        ; Directive op-code
                        02  1220                .Byte   PTD$M_CONTROLLER                ; Enforced IX codes
                  58 49 00' 1221                .Ascic  "IX"    ; Enforced device name prefix
                        02  1221
                        83  1224                .BYTE   Pd$_Octal       ; Indicate scan octal
            65 73 61 42 00' 1225                .ASCIC  "Base"  ; Base string
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                    04  1225
     0003FFF0 0003E000  122A          .LONG   ^O760000,^O777760       ; 760000 , 777760 limits on input
                    88  1232          .BYTE   Pd$_Store       ; Indicate store operation
                  0018  1233          .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                    00  1235          .BYTE   0               ; 0 HP$A_DEVICE to data
                    12  1236          .BYTE   18              ; 18 of data field
                    83  1237          .BYTE   Pd$_Octal       ; Indicate scan octal
  72 6F 74 63 65 56 00' 1238          .ASCIC  "Vector"        ; Vector string
                    06  1238
     000001FC 00000000  123F          .LONG   ^O0,^O774       ; 0 , 774 limits on input
                    88  1247          .BYTE   Pd$_Store       ; Indicate store operation
                  0024  1248          .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                    00  124A          .BYTE   0               ; 0 HP$W_VECTOR to data
                    10  124B          .BYTE   16              ; 16 of data field
                    82  124C          .BYTE   Pd$_Decimal     ; Indicate scan decimal
              52 42 00' 124D          .ASCIC  "BR"    ; BR string
                    02  124D
     00000007 00000004  1250          .LONG   4,7     ; 4 , 7 limits on input
                    88  1258          .BYTE   Pd$_Store       ; Indicate store operation
                  0032  1259          .WORD   IEU11A$B_BR             ; Byte IEU11A$B_BR to data
                    00  125B          .BYTE   0               ; 0 IEU11A$B_BR to data
                    08  125C          .BYTE   8               ; 8 of data field
                    81  125D          .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                        125E  286     $DS_KA_DEF
                        125E          .SAVE   LOCAL_BLOCK
                        125E          .PSECT  $ABS$,ABS
              00000032  0041          .=HP$A_Dependent
                        0032          .IIF    NB,KA$L_Flags,  KA$L_Flags::
              00000036  0032          .IIF    NB,.Blkl,       .Blkl   1
                        0036          .IIF    NB,KA$W_WCS,    KA$W_WCS::
              00000038  0036          .IIF    NB,.Blkw,       .Blkw   1
                        0038          .IIF    NB,KA$W_Reserved,       KA$W_Reserved::
              0000003A  0038          .IIF    NB,.Blkw,       .Blkw   1
                        003A          .IIF    NB,KA$L_SID,    KA$L_SID::
              0000003D  003A          .IIF    NB,.Blkb,       .Blkb   3
                        003D          .IIF    NB,KA$B_SID_Type,       KA$B_SID_Type::
              0000003E  003D          .IIF    NB,.Blkb,       .Blkb   1
                        003E          .IIF    NB,KA$W_Latency,        KA$W_Latency::
              00000040  003E          .IIF    NB,.Blkw,       .Blkw   1
                        0040          .IIF    NB,KA$W_Progress,       KA$W_Progress::
              00000042  0040          .IIF    NB,.Blkw,       .Blkw   1
                        0042          .IIF    NB,KA$B_Acc_Type,       KA$B_Acc_Type::
              00000043  0042          .IIF    NB,.Blkb,       .Blkb   1
                        0043          .IIF    NB,KA$B_Reserved,       KA$B_Reserved::
              00000044  0043          .IIF    NB,.Blkb,       .Blkb   1
                        0044          .IIF    NB,KA$W_Mem_Size,       KA$W_Mem_Size::
              00000046  0044          .IIF    NB,.Blkw,       .Blkw   1
                        0046          .IIF    NB,KA$B_Node_ID,        KA$B_Node_ID::
              00000047  0046          .IIF    NB,.Blkb,       .Blkb   1
                        0047          .IIF    NB,KA$L_Mem_Size,       KA$L_Mem_Size::
              0000004B  0047          .IIF    NB,.Blkl,       .Blkl   1
                        004B          .IIF    NB,HP$L_KAA_Slot,       HP$L_KAA_Slot::
              0000004F  004B          .IIF    NB,.Blkl,       .Blkl   1
                        004F          .IIF    NB,HP$B_Cpu_ID, HP$B_Cpu_ID::
              00000050  004F          .IIF    NB,.Blkb,       .Blkb   1
                        0050          .IIF    NB,KA$K_Len,    KA$K_Len::
                    0000125E          .RESTORE
```

```
                                  125E   287 KA730:  $DS_KA730                          ;                [01]
                30 33 37 41 4B 00'  125E              .ASCIC  "KA730" ; KA730 name
                                 05  125E
                                 50  1264              .BYTE   KA$K_LEN                  ; KA$K_LEN of resultant P-table
                                 04  1265              .BYTE   4                 ; Maximum unit number                          ;G:65
                               0000  1266              .WORD   ^A""     ; Two character mnemonic for QIO KA730
                                 80  1268              .BYTE   Pd$_Start         ; Constant to identify start of descriptor
                                 8D  1269              .Byte   Pd$_Name          ; Directive op-code
                                 01  126A              .Byte   Ptd$M_Unit                ; Enforced KA codes
                          41 4B 00'  126B              .Ascic  "KA"     ; Enforced device name prefix
                                 02  126B
                                 86  126E              .BYTE   Pd$_Literal       ; Indicate literal
                          40F30000  126F              .LONG   ^X40F30000                ; Constant
                                 88  1273              .BYTE   Pd$_Store         ; Indicate store operation
                               0018  1274              .WORD   HP$A_DEVICE               ; Byte HP$A_DEVICE to data
                                 00  1276              .BYTE   0                 ; 0 HP$A_DEVICE to data
                                 20  1277              .BYTE   32                ; 32 of data field
                                 86  1278              .BYTE   Pd$_Literal       ; Indicate literal
                          000001FF  1279              .LONG   KA$M_F_FLOAT + KA$M_D_FLOAT +                    KA$M_CRC +
                                 88  127D              .BYTE   Pd$_Store         ; Indicate store operation
                               0032  127E              .WORD   KA$L_FLAGS                ; Byte KA$L_FLAGS to data
                                 00  1280              .BYTE   0                 ; 0 KA$L_FLAGS to data
                                 20  1281              .BYTE   32                ; 32 of data field
                                 8B  1282              .BYTE   Pd$_Logical       ; Indicate logical value operation
61 65 79 2D 66 6F 2D 65 6D 69 54 00'  1283              .ASCIC  \Time-of-year clock\     ; Time-of-year clock string
              6B 63 6F 6C 63 20 72  128F
                                 12  1283
                                 88  1296              .BYTE   Pd$_Store         ; Indicate store operation
                               0032  1297              .WORD   KA$L_FLAGS                ; Byte KA$L_FLAGS to data
                                 10  1299              .BYTE   KA$V_TODR                 ; KA$V_TODR KA$L_FLAGS to data
                                 01  129A              .BYTE   1                 ; 1 of data field
                                 84  129B              .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
64 61 20 74 73 61 6C 20 53 43 57 00'  129C              .ASCIC  "WCS last address"       ; WCS last address string
                    73 73 65 72 64  12A8
                                 10  129C
                 0000FFFF 00000000  12AD              .LONG   ^X0,^X1@16-1     ; 0 , 1@16-1 limits on input
                                 88  12B5              .BYTE   Pd$_Store         ; Indicate store operation
                               0036  12B6              .WORD   KA$W_WCS                  ; Byte KA$W_WCS to data
                                 00  12B8              .BYTE   0                 ; 0 KA$W_WCS to data
                                 10  12B9              .BYTE   16                ; 16 of data field
                                 86  12BA              .BYTE   Pd$_Literal       ; Indicate literal
                          00002710  12BB              .LONG   10000             ; Constant
                                 88  12BF              .BYTE   Pd$_Store         ; Indicate store operation
                               003E  12C0              .WORD   KA$W_LATENCY              ; Byte KA$W_LATENCY to data
                                 00  12C2              .BYTE   0                 ; 0 KA$W_LATENCY to data
                                 20  12C3              .BYTE   32                ; 32 of data field
                                 86  12C4              .BYTE   Pd$_Literal       ; Indicate literal
                          000003E8  12C5              .LONG   1000              ; Constant
                                 88  12C9              .BYTE   Pd$_Store         ; Indicate store operation
                               0040  12CA              .WORD   KA$W_PROGRESS             ; Byte KA$W_PROGRESS to data
                                 00  12CC              .BYTE   0                 ; 0 KA$W_PROGRESS to data
                                 20  12CD              .BYTE   32                ; 32 of data field
                                 82  12CE              .BYTE   Pd$_Decimal       ; Indicate scan decimal
72 6F 74 61 72 65 6C 65 63 63 41 00'  12CF              .ASCIC  "Accelerator type"       ; Accelerator type string
                    65 70 79 74 20  12DB
                                 10  12CF
                 000000FF 00000000  12E0              .LONG   0,255    ; 0 , 255 limits on input
```

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                                  88  12E8                .BYTE   Pd$_Store        ; Indicate store operation
                                0042  12E9                .WORD   KA$B_ACC_TYPE            ; Byte KA$B_ACC_TYPE to data
                                  00  12EB                .BYTE   0                ; 0 KA$B_ACC_TYPE to data
                                  08  12EC                .BYTE   8                ; 8 of data field
                                  82  12ED                .BYTE   Pd$_Decimal      ; Indicate scan decimal
20 66 6F 20 73 65 74 79 62 2D 4B 00'  12EE                .ASCIC  "K-bytes of Main Memory"        ; K-bytes of Main Memory string
   79 72 6F 6D 65 4D 20 6E 69 61 4D   12FA
                                  16  12EE
                  00001400 00000000  1305                .LONG   0,5120  ; 0 , 5120 limits on input
                                  88  130D                .BYTE   Pd$_Store        ; Indicate store operation
                                0044  130E                .WORD   KA$W_MEM_SIZE            ; Byte KA$W_MEM_SIZE to data
                                  00  1310                .BYTE   0                ; 0 KA$W_MEM_SIZE to data
                                  10  1311                .BYTE   16               ; 16 of data field
                                  8B  1312                .BYTE   Pd$_Logical      ; Indicate logical value operation
6F 6C 20 53 43 57 20 72 65 73 55 00'  1313                .ASCIC  \User WCS loaded\        ; User WCS loaded string
                        64 65 64 61   131F
                                  0F  1313
                                  88  1323                .BYTE   Pd$_Store        ; Indicate store operation
                                0032  1324                .WORD   KA$L_FLAGS               ; Byte KA$L_FLAGS to data
                                  18  1326                .BYTE   KA$V_WCS_LD              ; KA$V_WCS_LD KA$L_FLAGS to data
                                  01  1327                .BYTE   1                ; 1 of data field
                                  8B  1328                .BYTE   Pd$_Logical      ; Indicate logical value operation
      73 72 6F 72 72 65 20 42 53 00'  1329                .ASCIC  \SB errors\      ; SB errors string
                                  09  1329
                                  88  1333                .BYTE   Pd$_Store        ; Indicate store operation
                                0032  1334                .WORD   KA$L_FLAGS               ; Byte KA$L_FLAGS to data
                                  19  1336                .BYTE   KA$V_SB_ERR              ; KA$V_SB_ERR KA$L_FLAGS to data
                                  01  1337                .BYTE   1                ; 1 of data field
                                  81  1338                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                                      1339   288 KA750:   $DS_KA750
                  30 35 37 41 4B 00'  1339                .ASCIC  "KA750" ; KA750 name
                                  05  1339
                                  50  133F                .BYTE   KA$K_LEN                 ; KA$K_LEN of resultant P-table
                                  04  1340                .BYTE   4                ; Maximum unit number                        ;G:65
                                0000  1341                .WORD   ^A""     ; Two character mnemonic for QIO KA750
                                  80  1343                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                                  8D  1344                .Byte   Pd$_Name         ; Directive op-code
                                  01  1345                .Byte   Ptd$M_Unit               ; Enforced KA codes
                           41 4B 00'  1346                .Ascic  "KA"     ; Enforced device name prefix
                                  02  1346
                                  86  1349                .BYTE   Pd$_Literal      ; Indicate literal
                           40F30000  134A                .LONG   ^X40F30000               ; Constant
                                  88  134E                .BYTE   Pd$_Store        ; Indicate store operation
                                0018  134F                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                                  00  1351                .BYTE   0                ; 0 HP$A_DEVICE to data
                                  20  1352                .BYTE   32               ; 32 of data field
                                  86  1353                .BYTE   Pd$_Literal      ; Indicate literal
                           000001F3  1354                .LONG   KA$M_F_FLOAT + KA$M_D_FLOAT +                    KA$M_CRC +
                                  88  1358                .BYTE   Pd$_Store        ; Indicate store operation
                                0032  1359                .WORD   KA$L_FLAGS               ; Byte KA$L_FLAGS to data
                                  00  135B                .BYTE   0                ; 0 KA$L_FLAGS to data
                                  20  135C                .BYTE   32               ; 32 of data field
                                  8B  135D                .BYTE   Pd$_Logical      ; Indicate logical value operation
20 67 6E 69 74 61 6F 6C 66 2D 47 00'  135E                .ASCIC  \G-floating instructions\       ; G-floating instructions string
73 6E 6F 69 74 63 75 72 74 73 6E 69   136A
                                  17  135E
                                  88  1376                .BYTE   Pd$_Store        ; Indicate store operation
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                                0032  1377                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                                  02  1379                .BYTE   KA$V_G_FLOAT            ; KA$V_G_FLOAT KA$L_FLAGS to data
                                  01  137A                .BYTE   1               ; 1 of data field
                                  8B  137B                .BYTE   Pd$_Logical      ; Indicate logical value operation
20 67 6E 69 74 61 6F 6C 66 2D 48 00' 137C                .ASCIC  \H-floating instructions\       ; H-floating instructions string
73 6E 6F 69 74 63 75 72 74 73 6E 69  1388
                                  17  137C
                                  88  1394                .BYTE   Pd$_Store        ; Indicate store operation
                                0032  1395                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                                  03  1397                .BYTE   KA$V_H_FLOAT            ; KA$V_H_FLOAT KA$L_FLAGS to data
                                  01  1398                .BYTE   1               ; 1 of data field
                                  8B  1399                .BYTE   Pd$_Logical      ; Indicate logical value operation
61 65 79 2D 66 6F 2D 65 6D 69 54 00' 139A                .ASCIC  \Time-of-year clock\    ; Time-of-year clock string
                   6B 63 6F 6C 63 20 72  13A6
                                  12  139A
                                  88  13AD                .BYTE   Pd$_Store        ; Indicate store operation
                                0032  13AE                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                                  10  13B0                .BYTE   KA$V_TODR               ; KA$V_TODR KA$L_FLAGS to data
                                  01  13B1                .BYTE   1               ; 1 of data field
                                  84  13B2                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
64 61 20 74 73 61 6C 20 53 43 57 00' 13B3                .ASCIC  "WCS last address"      ; WCS last address string
                      73 73 65 72 64  13BF
                                  10  13B3
                        0000FFFF 00000000  13C4                .LONG   ^X0,^X1a16-1    ; 0 , 1a16-1 limits on input
                                  88  13CC                .BYTE   Pd$_Store        ; Indicate store operation
                                0036  13CD                .WORD   KA$W_WCS                ; Byte KA$W_WCS to data
                                  00  13CF                .BYTE   0               ; 0 KA$W_WCS to data
                                  10  13D0                .BYTE   16              ; 16 of data field
                                  86  13D1                .BYTE   Pd$_Literal      ; Indicate literal
                             00002710  13D2                .LONG   10000           ; Constant
                                  88  13D6                .BYTE   Pd$_Store        ; Indicate store operation
                                003E  13D7                .WORD   KA$W_LATENCY             ; Byte KA$W_LATENCY to data
                                  00  13D9                .BYTE   0               ; 0 KA$W_LATENCY to data
                                  20  13DA                .BYTE   32              ; 32 of data field
                                  86  13DB                .BYTE   Pd$_Literal      ; Indicate literal
                             000003E8  13DC                .LONG   1000            ; Constant
                                  88  13E0                .BYTE   Pd$_Store        ; Indicate store operation
                                0040  13E1                .WORD   KA$W_PROGRESS            ; Byte KA$W_PROGRESS to data
                                  00  13E3                .BYTE   0               ; 0 KA$W_PROGRESS to data
                                  20  13E4                .BYTE   32              ; 32 of data field
                                  82  13E5                .BYTE   Pd$_Decimal      ; Indicate scan decimal
72 6F 74 61 72 65 6C 65 63 63 41 00' 13E6                .ASCIC  "Accelerator type"      ; Accelerator type string
                      65 70 79 74 20  13F2
                                  10  13E6
                        000000FF 00000000  13F7                .LONG   0,255   ; 0 , 255 limits on input
                                  88  13FF                .BYTE   Pd$_Store        ; Indicate store operation
                                0042  1400                .WORD   KA$B_ACC_TYPE            ; Byte KA$B_ACC_TYPE to data
                                  00  1402                .BYTE   0               ; 0 KA$B_ACC_TYPE to data
                                  08  1403                .BYTE   8               ; 8 of data field
                                  81  1404                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                                      1405    289 KA780:  $DS_KA780
                        30 38 37 41 4B 00' 1405                .ASCIC  "KA780" ; KA780 name
                                  05  1405
                                  50  140B                .BYTE   KA$K_LEN                ; KA$K_LEN of resultant P-table
                                  04  140C                .BYTE   4               ; Maximum unit number                   ;G:65
                                0000  140D                .WORD   ^A""    ; Two character mnemonic for QIO KA780
                                  80  140F                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
```

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                                  8D  1410          .Byte   Pd$_Name        ; Directive op-code
                                  01  1411          .Byte   Ptd$M_Unit              ; Enforced KA codes
                          41 4B 00'  1412          .Ascic  "KA"    ; Enforced device name prefix
                                  02  1412
                                  86  1415          .BYTE   Pd$_Literal     ; Indicate literal
                          000101F3  1416          .LONG   KA$M_F_FLOAT + KA$M_D_FLOAT +                   KA$M_CRC +
                                  88  141A          .BYTE   Pd$_Store       ; Indicate store operation
                                0032  141B          .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                                  00  141D          .BYTE   0               ; 0 KA$L_FLAGS to data
                                  20  141E          .BYTE   32              ; 32 of data field
                                  8B  141F          .BYTE   Pd$_Logical     ; Indicate logical value operation
20 67 6E 69 74 61 6F 6C 66 2D 47 00'  1420          .ASCIC  \G-floating instructions\       ; G-floating instructions string
73 6E 6F 69 74 63 75 72 74 73 6E 69  142C
                                  17  1420
                                  88  1438          .BYTE   Pd$_Store       ; Indicate store operation
                                0032  1439          .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                                  02  143B          .BYTE   KA$V_G_FLOAT            ; KA$V_G_FLOAT KA$L_FLAGS to data
                                  01  143C          .BYTE   1               ; 1 of data field
                                  8B  143D          .BYTE   Pd$_Logical     ; Indicate logical value operation
20 67 6E 69 74 61 6F 6C 66 2D 48 00'  143E          .ASCIC  \H-floating instructions\       ; H-floating instructions string
73 6E 6F 69 74 63 75 72 74 73 6E 69  144A
                                  17  143E
                                  88  1456          .BYTE   Pd$_Store       ; Indicate store operation
                                0032  1457          .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                                  03  1459          .BYTE   KA$V_H_FLOAT            ; KA$V_H_FLOAT KA$L_FLAGS to data
                                  01  145A          .BYTE   1               ; 1 of data field
                                  84  145B          .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
64 61 20 74 73 61 6C 20 53 43 57 00'  145C          .ASCIC  "WCS last address"      ; WCS last address string
                     73 73 65 72 64  1468
                                  10  145C
                  0000FFFF 00000000  146D          .LONG   ^X0,^X1@16-1    ; 0 , 1@16-1 limits on input
                                  88  1475          .BYTE   Pd$_Store       ; Indicate store operation
                                0036  1476          .WORD   KA$W_WCS                ; Byte KA$W_WCS to data
                                  00  1478          .BYTE   0               ; 0 KA$W_WCS to data
                                  10  1479          .BYTE   16              ; 16 of data field
                                  86  147A          .BYTE   Pd$_Literal     ; Indicate literal
                          00002710  147B          .LONG   10000           ; Constant
                                  88  147F          .BYTE   Pd$_Store       ; Indicate store operation
                                003E  1480          .WORD   KA$W_LATENCY            ; Byte KA$W_LATENCY to data
                                  00  1482          .BYTE   0               ; 0 KA$W_LATENCY to data
                                  20  1483          .BYTE   32              ; 32 of data field
                                  86  1484          .BYTE   Pd$_Literal     ; Indicate literal
                          000003E8  1485          .LONG   1000            ; Constant
                                  88  1489          .BYTE   Pd$_Store       ; Indicate store operation
                                0040  148A          .WORD   KA$W_PROGRESS           ; Byte KA$W_PROGRESS to data
                                  00  148C          .BYTE   0               ; 0 KA$W_PROGRESS to data
                                  20  148D          .BYTE   32              ; 32 of data field
                                  82  148E          .BYTE   Pd$_Decimal     ; Indicate scan decimal
72 6F 74 61 72 65 6C 65 63 63 41 00'  148F          .ASCIC  "Accelerator type"      ; Accelerator type string
                     65 70 79 74 20  149B
                                  10  148F
                  000000FF 00000000  14A0          .LONG   0,255   ; 0 , 255 limits on input
                                  88  14A8          .BYTE   Pd$_Store       ; Indicate store operation
                                0042  14A9          .WORD   KA$B_ACC_TYPE           ; Byte KA$B_ACC_TYPE to data
                                  00  14AB          .BYTE   0               ; 0 KA$B_ACC_TYPE to data
                                  08  14AC          .BYTE   8               ; 8 of data field
                                  81  14AD          .BYTE   Pd$_End         ; Indicate end of PT-descriptor
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                                  14AE   290 KA86:   $DS_KA86                          ;                [23][50]
                  36 38 41 4B 00'  14AE              .ASCIC  "KA86"  ; KA86 name
                              04   14AE
                              50   14B3              .BYTE   KA$K_LEN                  ; KA$K_LEN of resultant P-table
                              04   14B4              .BYTE   4                 ; Maximum unit number                          ;G:65
                            0000   14B5              .WORD   ^A""     ; Two character mnemonic for QIO KA86
                              80   14B7              .BYTE   Pd$_Start         ; Constant to identify start of descriptor
                              8D   14B8              .Byte   Pd$_Name          ; Directive op-code
                              01   14B9              .Byte   Ptd$M_Unit                ; Enforced KA codes
                        41 4B 00'  14BA              .Ascic  "KA"     ; Enforced device name prefix
                              02   14BA
                              86   14BD              .BYTE   Pd$_Literal       ; Indicate literal
                        000101F3   14BE              .LONG   KA$M_F_FLOAT + KA$M_D_FLOAT +                    KA$M_CRC +
                              88   14C2              .BYTE   Pd$_Store         ; Indicate store operation
                            0032   14C3              .WORD   KA$L_FLAGS                ; Byte KA$L_FLAGS to data
                              00   14C5              .BYTE   0                 ; 0 KA$L_FLAGS to data
                              20   14C6              .BYTE   32                ; 32 of data field
                              8B   14C7              .BYTE   Pd$_Logical       ; Indicate logical value operation
20 67 6E 69 74 61 6F 6C 66 2D 47 00'  14C8              .ASCIC  \G-floating instructions\        ; G-floating instructions string
73 6E 6F 69 74 63 75 72 74 73 6E 69  14D4
                              17   14C8
                              88   14E0              .BYTE   Pd$_Store         ; Indicate store operation
                            0032   14E1              .WORD   KA$L_FLAGS                ; Byte KA$L_FLAGS to data
                              02   14E3              .BYTE   KA$V_G_FLOAT              ; KA$V_G_FLOAT KA$L_FLAGS to data
                              01   14E4              .BYTE   1                 ; 1 of data field
                              8B   14E5              .BYTE   Pd$_Logical       ; Indicate logical value operation
20 67 6E 69 74 61 6F 6C 66 2D 48 00'  14E6              .ASCIC  \H-floating instructions\        ; H-floating instructions string
73 6E 6F 69 74 63 75 72 74 73 6E 69  14F2
                              17   14E6
                              88   14FE              .BYTE   Pd$_Store         ; Indicate store operation
                            0032   14FF              .WORD   KA$L_FLAGS                ; Byte KA$L_FLAGS to data
                              03   1501              .BYTE   KA$V_H_FLOAT              ; KA$V_H_FLOAT KA$L_FLAGS to data
                              01   1502              .BYTE   1                 ; 1 of data field
                              84   1503              .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
64 61 20 74 73 61 6C 20 53 43 57 00'  1504              .ASCIC  "WCS last address"        ; WCS last address string
                  73 73 65 72 64   1510
                              10   1504
                0000FFFF 00000000   1515              .LONG   ^X0,^X1@16-1      ; 0 , 1@16-1 limits on input
                              88   151D              .BYTE   Pd$_Store         ; Indicate store operation
                            0036   151E              .WORD   KA$W_WCS                  ; Byte KA$W_WCS to data
                              00   1520              .BYTE   0                 ; 0 KA$W_WCS to data
                              10   1521              .BYTE   16                ; 16 of data field
                              86   1522              .BYTE   Pd$_Literal       ; Indicate literal
                        00002710   1523              .LONG   10000             ; Constant
                              88   1527              .BYTE   Pd$_Store         ; Indicate store operation
                            003E   1528              .WORD   KA$W_LATENCY              ; Byte KA$W_LATENCY to data
                              00   152A              .BYTE   0                 ; 0 KA$W_LATENCY to data
                              20   152B              .BYTE   32                ; 32 of data field
                              86   152C              .BYTE   Pd$_Literal       ; Indicate literal
                        000003E8   152D              .LONG   1000              ; Constant
                              88   1531              .BYTE   Pd$_Store         ; Indicate store operation
                            0040   1532              .WORD   KA$W_PROGRESS             ; Byte KA$W_PROGRESS to data
                              00   1534              .BYTE   0                 ; 0 KA$W_PROGRESS to data
                              20   1535              .BYTE   32                ; 32 of data field
                              82   1536              .BYTE   Pd$_Decimal       ; Indicate scan decimal
72 6F 74 61 72 65 6C 65 63 63 41 00'  1537              .ASCIC  "Accelerator type"        ; Accelerator type string
                  65 70 79 74 20   1543
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                                10  1537
                 000000FF 00000000  1548                .LONG   0,255   ; 0 , 255 limits on input
                                88  1550                .BYTE   Pd$_Store       ; Indicate store operation
                              0042  1551                .WORD   KA$B_ACC_TYPE           ; Byte KA$B_ACC_TYPE to data
                                00  1553                .BYTE   0               ; 0 KA$B_ACC_TYPE to data
                                08  1554                .BYTE   8               ; 8 of data field
                                81  1555                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                    1556   291 KA785:   $DS_KA785                       ;                [15]
                 35 38 37 41 4B 00' 1556                .ASCIC  "KA785" ; KA785 name
                                05  1556
                                50  155C                .BYTE   KA$K_LEN                ; KA$K_LEN of resultant P-table
                                04  155D                .BYTE   4               ; Maximum unit number                    ;G:65
                              0000  155E                .WORD   ^A""    ; Two character mnemonic for QIO KA785
                                80  1560                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                8D  1561                .Byte   Pd$_Name        ; Directive op-code
                                01  1562                .Byte   Ptd$M_Unit              ; Enforced KA codes
                         41 4B 00' 1563                .Ascic  "KA"    ; Enforced device name prefix
                                02  1563
                                86  1566                .BYTE   Pd$_Literal     ; Indicate literal
                         000101F3  1567                .LONG   KA$M_F_FLOAT + KA$M_D_FLOAT +                   KA$M_CRC +
                                88  156B                .BYTE   Pd$_Store       ; Indicate store operation
                              0032  156C                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                                00  156E                .BYTE   0               ; 0 KA$L_FLAGS to data
                                20  156F                .BYTE   32              ; 32 of data field
                                8B  1570                .BYTE   Pd$_Logical     ; Indicate logical value operation
20 67 6E 69 74 61 6F 6C 66 2D 47 00' 1571                .ASCIC  \G-floating instructions\       ; G-floating instructions string
73 6E 6F 69 74 63 75 72 74 73 6E 69  157D
                                17  1571
                                88  1589                .BYTE   Pd$_Store       ; Indicate store operation
                              0032  158A                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                                02  158C                .BYTE   KA$V_G_FLOAT            ; KA$V_G_FLOAT KA$L_FLAGS to data
                                01  158D                .BYTE   1               ; 1 of data field
                                8B  158E                .BYTE   Pd$_Logical     ; Indicate logical value operation
20 67 6E 69 74 61 6F 6C 66 2D 48 00' 158F                .ASCIC  \H-floating instructions\       ; H-floating instructions string
73 6E 6F 69 74 63 75 72 74 73 6E 69  159B
                                17  158F
                                88  15A7                .BYTE   Pd$_Store       ; Indicate store operation
                              0032  15A8                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                                03  15AA                .BYTE   KA$V_H_FLOAT            ; KA$V_H_FLOAT KA$L_FLAGS to data
                                01  15AB                .BYTE   1               ; 1 of data field
                                84  15AC                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
64 61 20 74 73 61 6C 20 53 43 4A 00' 15AD                .ASCIC  "JCS last address"      ; JCS last address string
                     73 73 65 72 64  15B9
                                10  15AD
                 0000FFFF 00000000  15BE                .LONG   ^X0,^X1@16-1    ; 0 , 1@16-1 limits on input
                                88  15C6                .BYTE   Pd$_Store       ; Indicate store operation
                              0036  15C7                .WORD   KA$W_WCS                ; Byte KA$W_WCS to data
                                00  15C9                .BYTE   0               ; 0 KA$W_WCS to data
                                10  15CA                .BYTE   16              ; 16 of data field
                                86  15CB                .BYTE   Pd$_Literal     ; Indicate literal
                         00002710  15CC                .LONG   10000           ; Constant
                                88  15D0                .BYTE   Pd$_Store       ; Indicate store operation
                              003E  15D1                .WORD   KA$W_LATENCY            ; Byte KA$W_LATENCY to data
                                00  15D3                .BYTE   0               ; 0 KA$W_LATENCY to data
                                20  15D4                .BYTE   32              ; 32 of data field
                                86  15D5                .BYTE   Pd$_Literal     ; Indicate literal
                         000003E8  15D6                .LONG   1000            ; Constant
```

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                                  88  15DA                .BYTE   Pd$_Store        ; Indicate store operation
                                0040  15DB                .WORD   KA$W_PROGRESS            ; Byte KA$W_PROGRESS to data
                                  00  15DD                .BYTE   0                ; 0 KA$W_PROGRESS to data
                                  20  15DE                .BYTE   32               ; 32 of data field
                                  82  15DF                .BYTE   Pd$_Decimal      ; Indicate scan decimal
72 6F 74 61 72 65 6C 65 63 63 41 00'  15E0                .ASCIC  "Accelerator type"       ; Accelerator type string
                     65 70 79 74 20  15EC
                                  10  15E0
                  000000FF 00000000  15F1                .LONG   0,255    ; 0 , 255 limits on input
                                  88  15F9                .BYTE   Pd$_Store        ; Indicate store operation
                                0042  15FA                .WORD   KA$B_ACC_TYPE            ; Byte KA$B_ACC_TYPE to data
                                  00  15FC                .BYTE   0                ; 0 KA$B_ACC_TYPE to data
                                  08  15FD                .BYTE   8                ; 8 of data field
                                  81  15FE                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                                      15FF   292 KMC11:   $DS_KMC11
                                      15FF                .SAVE   LOCAL_BLOCK
                                      15FF                .PSECT  $ABS$,ABS
                          00000032  0050                .=HP$A_DEPENDENT
                                      0032                .IIF    NB,KMC11$L_CSR, KMC11$L_CSR:
                          00000036  0032                .IIF    NB,.BLKL,        .BLKL   1
                                      0036                .IIF    NB,KMC11$B_BR,  KMC11$B_BR:
                          00000037  0036                .IIF    NB,.BLKB,        .BLKB   1
                                      0037                .IIF    NB,KMC11$K_LEN, KMC11$K_LEN:
                                000015FF                .RESTORE
                  31 31 43 4D 4B 00'  15FF                .ASCIC  "KMC11" ; KMC11 name
                                  05  15FF
                                  37  1605                .BYTE   KMC11$K_LEN              ; KMC11$K_LEN of resultant P-table
                                  00  1606                .BYTE   0                ; Maximum unit number                    ;G:65
                                0000  1607                .WORD   ^A""     ; Two character mnemonic for QIO KMC11
                                  80  1609                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                                  8D  160A                .Byte   Pd$_Name         ; Directive op-code
                                  03  160B                .Byte   Ptd$M_Device             ; Enforced XK codes
                          4B 58 00'  160C                .Ascic  "XK"     ; Enforced device name prefix
                                  02  160C
                                  83  160F                .BYTE   Pd$_Octal        ; Indicate scan octal
                       52 53 43 00'  1610                .ASCIC  "CSR"    ; CSR string
                                  03  1610
                  0003FFFE 0003E000  1614                .LONG   ^O760000,^O777776        ; 760000 , 777776 limits on input
                                  88  161C                .BYTE   Pd$_Store        ; Indicate store operation
                                0032  161D                .WORD   KMC11$L_CSR              ; Byte KMC11$L_CSR to data
                                  00  161F                .BYTE   0                ; 0 KMC11$L_CSR to data
                                  20  1620                .BYTE   32               ; 32 of data field
                                  88  1621                .BYTE   Pd$_Store        ; Indicate store operation
                                0018  1622                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                                  00  1624                .BYTE   0                ; 0 HP$A_DEVICE to data
                                  12  1625                .BYTE   18               ; 18 of data field
                                  83  1626                .BYTE   Pd$_Octal        ; Indicate scan octal
                 52 4F 54 43 45 56 00'  1627                .ASCIC  "VECTOR"         ; VECTOR string
                                  06  1627
                  000001FE 00000002  162E                .LONG   ^O2,^O776        ; 2 , 776 limits on input
                                  88  1636                .BYTE   Pd$_Store        ; Indicate store operation
                                0024  1637                .WORD   HP$W_VECTOR              ; Byte HP$W_VECTOR to data
                                  00  1639                .BYTE   0                ; 0 HP$W_VECTOR to data
                                  09  163A                .BYTE   9                ; 9 of data field
                                  82  163B                .BYTE   Pd$_Decimal      ; Indicate scan decimal
                          52 42 00'  163C                .ASCIC  "BR"     ; BR string
                                  02  163C
```

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                  00000007 00000004  163F                 .LONG   4,7     ; 4 , 7 limits on input
                                88   1647                 .BYTE   Pd$_Store       ; Indicate store operation
                              0036   1648                 .WORD   KMC11$B_BR              ; Byte KMC11$B_BR to data
                                00   164A                 .BYTE   0               ; 0 KMC11$B_BR to data
                                08   164B                 .BYTE   8               ; 8 of data field
                                81   164C                 .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                     164D    293 KW11K:   $DS_KW11K
                                     164D                 .SAVE   LOCAL_BLOCK
                                     164D                 .PSECT  $ABS$,ABS
                          00000032   0050                 .=HP$A_DEPENDENT
                                     0032                 .IIF    NB,KW11K$B_BR,  KW11K$B_BR:
                          00000033   0032                 .IIF    NB,.BLKB,       .BLKB   1
                                     0033                 .IIF    NB,KW11K$K_LEN, KW11K$K_LEN:
                                0000164D                  .RESTORE
                  4B 31 31 57 4B 00' 164D                 .ASCIC  "KW11K" ; KW11K name
                                05   164D
                                33   1653                 .BYTE   KW11K$K_LEN             ; KW11K$K_LEN of resultant P-table
                                02   1654                 .BYTE   2               ; Maximum unit number                   ;G:65
                              0000   1655                 .WORD   ^A""    ; Two character mnemonic for QIO KW11K
                                80   1657                 .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                8D   1658                 .Byte   Pd$_Name        ; Directive op-code
                                03   1659                 .Byte   Ptd$M_Device            ; Enforced KW codes
                          57 4B 00' 165A                 .Ascic  "KW"    ; Enforced device name prefix
                                02   165A
                                83   165D                 .BYTE   Pd$_Octal       ; Indicate scan octal
52 53 43 20 53 55 42 20 4F 2F 49 00' 165E                 .ASCIC  "I/O BUS CSR"   ; I/O BUS CSR string
                                0B   165E
                  0003FFFE 0003E000  166A                 .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                                88   1672                 .BYTE   Pd$_Store       ; Indicate store operation
                              0018   1673                 .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                00   1675                 .BYTE   0               ; 0 HP$A_DEVICE to data
                                12   1676                 .BYTE   18              ; 18 of data field
                                83   1677                 .BYTE   Pd$_Octal       ; Indicate scan octal
                  52 4F 54 43 45 56 00' 1678             .ASCIC  "VECTOR"        ; VECTOR string
                                06   1678
                  000001FE 00000002  167F                 .LONG   ^O2,^O776       ; 2 , 776 limits on input
                                88   1687                 .BYTE   Pd$_Store       ; Indicate store operation
                              0024   1688                 .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                00   168A                 .BYTE   0               ; 0 HP$W_VECTOR to data
                                09   168B                 .BYTE   9               ; 9 of data field
                                82   168C                 .BYTE   Pd$_Decimal     ; Indicate scan decimal
                          52 42 00' 168D                 .ASCIC  "BR"    ; BR string
                                02   168D
                  00000007 00000004  1690                 .LONG   4,7     ; 4 , 7 limits on input
                                88   1698                 .BYTE   Pd$_Store       ; Indicate store operation
                              0032   1699                 .WORD   KW11K$B_BR              ; Byte KW11K$B_BR to data
                                00   169B                 .BYTE   0               ; 0 KW11K$B_BR to data
                                08   169C                 .BYTE   8               ; 8 of data field
                                81   169D                 .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                     169E    294 LA12:    $DS_LA12                        ;               [14]
                                     169E                 .SAVE   LOCAL_BLOCK
                                     169E                 .PSECT  $ABS$,ABS
                          00000032   0050                 .=HP$A_DEPENDENT
                                     0032                 .IIF    NB,HP$K_LA12_LEN,       HP$K_LA12_LEN:
                                     0032                 .IIF    NB,LA12$K_LEN,  LA12$K_LEN:
                                0000169E                  .RESTORE
                     32 31 41 4C 00' 169E                 .ASCIC  "LA12"  ; LA12 name
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                      04  169E
                      32  16A3                .BYTE   LA12$K_LEN              ; LA12$K_LEN of resultant P-table
                      FF  16A4                .BYTE   255                 ; Maximum unit number                       ;G:65
                    0000  16A5                .WORD   ^A""     ; Two character mnemonic for QIO LA12
                      80  16A7                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                      8D  16A8                .Byte   Pd$_Name            ; Directive op-code
                      1B  16A9                .Byte   Ptd$M_EndDevice             ; Enforced TT codes
               54 54 00'  16AA                .Ascic  "TT"     ; Enforced device name prefix
                      02  16AA
                      86  16AD                .BYTE   Pd$_Literal         ; Indicate literal
                00000001  16AE                .LONG   HP$M_ALLOC                  ; Constant
                      88  16B2                .BYTE   Pd$_Store           ; Indicate store operation
                    000A  16B3                .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                      00  16B5                .BYTE   0                   ; 0 HP$B_FLAGS to data
                      08  16B6                .BYTE   8                   ; 8 of data field
                      81  16B7                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                          16B8    295 LA100:  $DS_LA100                           ;                   [14]
                          16B8                .SAVE   LOCAL_BLOCK
                          16B8                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_LA100_LEN,      HP$K_LA100_LEN:
                          0032                .IIF    NB,LA100$K_LEN, LA100$K_LEN:
                          000016B8            .RESTORE
         30 30 31 41 4C 00'  16B8             .ASCIC  "LA100" ; LA100 name
                      05  16B8
                      32  16BE                .BYTE   LA100$K_LEN             ; LA100$K_LEN of resultant P-table
                      FF  16BF                .BYTE   255                 ; Maximum unit number                       ;G:65
                    0000  16C0                .WORD   ^A""     ; Two character mnemonic for QIO LA100
                      80  16C2                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                      8D  16C3                .Byte   Pd$_Name            ; Directive op-code
                      1B  16C4                .Byte   Ptd$M_EndDevice             ; Enforced TT codes
               54 54 00'  16C5                .Ascic  "TT"     ; Enforced device name prefix
                      02  16C5
                      86  16C8                .BYTE   Pd$_Literal         ; Indicate literal
                00000001  16C9                .LONG   HP$M_ALLOC                  ; Constant
                      88  16CD                .BYTE   Pd$_Store           ; Indicate store operation
                    000A  16CE                .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                      00  16D0                .BYTE   0                   ; 0 HP$B_FLAGS to data
                      08  16D1                .BYTE   8                   ; 8 of data field
                      81  16D2                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                          16D3    296 LA120:  $DS_LA120
                          16D3                .SAVE   LOCAL_BLOCK
                          16D3                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LA120$K_LEN, LA120$K_LEN:
                          000016D3            .RESTORE
         30 32 31 41 4C 00'  16D3             .ASCIC  "LA120" ; LA120 name
                      05  16D3
                      32  16D9                .BYTE   LA120$K_LEN             ; LA120$K_LEN of resultant P-table
                      FF  16DA                .BYTE   255                 ; Maximum unit number                       ;G:65
                    0000  16DB                .WORD   ^A""     ; Two character mnemonic for QIO LA120
                      80  16DD                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                      8D  16DE                .Byte   Pd$_Name            ; Directive op-code
                      1B  16DF                .Byte   Ptd$M_EndDevice             ; Enforced TT codes
               54 54 00'  16E0                .Ascic  "TT"     ; Enforced device name prefix
                      02  16E0
                      86  16E3                .BYTE   Pd$_Literal         ; Indicate literal
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                    00000001  16E4                .LONG   HP$M_ALLOC              ; Constant
                          88  16E8                .BYTE   Pd$_Store       ; Indicate store operation
                        000A  16E9                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                          00  16EB                .BYTE   0               ; 0 HP$B_FLAGS to data
                          08  16EC                .BYTE   8               ; 8 of data field
                          81  16ED                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                              16EE    297 LA180:  $DS_LA180
                              16EE                .SAVE   LOCAL_BLOCK
                              16EE                .PSECT  $ABS$,ABS
                    00000032  0050                .=HP$A_DEPENDENT
                              0032                .IIF    NB,LA180$K_LEN, LA180$K_LEN:
                              16EE                .RESTORE
                 30 38 31 41 4C 00' 16EE          .ASCIC  "LA180" ; LA180 name
                          05  16EE
                          32  16F4                .BYTE   LA180$K_LEN             ; LA180$K_LEN of resultant P-table
                          FF  16F5                .BYTE   255             ; Maximum unit number                   ;G:65
                        0000  16F6                .WORD   ^A""    ; Two character mnemonic for QIO LA180
                          80  16F8                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  16F9                .Byte   Pd$_Name        ; Directive op-code
                          1B  16FA                .Byte   Ptd$M_EndDevice         ; Enforced LP codes
                    50 4C 00' 16FB                .Ascic  "LP"    ; Enforced device name prefix
                          02  16FB
                          86  16FE                .BYTE   Pd$_Literal     ; Indicate literal
                    00000001  16FF                .LONG   HP$M_ALLOC              ; Constant
                          88  1703                .BYTE   Pd$_Store       ; Indicate store operation
                        000A  1704                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                          00  1706                .BYTE   0               ; 0 HP$B_FLAGS to data
                          08  1707                .BYTE   8               ; 8 of data field
                          81  1708                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                              1709    298 LA34:   $DS_LA34
                              1709                .SAVE   LOCAL_BLOCK
                              1709                .PSECT  $ABS$,ABS
                    00000032  0050                .=HP$A_DEPENDENT
                              0032                .IIF    NB,LA34$K_LEN,  LA34$K_LEN:
                              1709                .RESTORE
                 34 33 41 4C 00' 1709             .ASCIC  "LA34"  ; LA34 name
                          04  1709
                          32  170E                .BYTE   LA34$K_LEN              ; LA34$K_LEN of resultant P-table
                          FF  170F                .BYTE   255             ; Maximum unit number                   ;G:65
                        0000  1710                .WORD   ^A""    ; Two character mnemonic for QIO LA34
                          80  1712                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  1713                .Byte   Pd$_Name        ; Directive op-code
                          1B  1714                .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                    54 54 00' 1715                .Ascic  "TT"    ; Enforced device name prefix
                          02  1715
                          86  1718                .BYTE   Pd$_Literal     ; Indicate literal
                    00000001  1719                .LONG   HP$M_ALLOC              ; Constant
                          88  171D                .BYTE   Pd$_Store       ; Indicate store operation
                        000A  171E                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                          00  1720                .BYTE   0               ; 0 HP$B_FLAGS to data
                          08  1721                .BYTE   8               ; 8 of data field
                          81  1722                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                              1723    299 LA36:   $DS_LA36
                              1723                .SAVE   LOCAL_BLOCK
                              1723                .PSECT  $ABS$,ABS
                    00000032  0050                .=HP$A_DEPENDENT
                              0032                .IIF    NB,LA36$K_LEN,  LA36$K_LEN:
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                    00001723                    .RESTORE
          36 33 41 4C 00' 1723                  .ASCIC  "LA36"  ; LA36 name
                      04  1723
                      32  1728                  .BYTE   LA36$K_LEN              ; LA36$K_LEN of resultant P-table
                      FF  1729                  .BYTE   255             ; Maximum unit number                   ;G:65
                    0000  172A                  .WORD   ^A""    ; Two character mnemonic for QIO LA36
                      80  172C                  .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  172D                  .Byte   Pd$_Name        ; Directive op-code
                      1B  172E                  .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                54 54 00' 172F                  .Ascic  "TT"    ; Enforced device name prefix
                      02  172F
                      86  1732                  .BYTE   Pd$_Literal     ; Indicate literal
                00000001  1733                  .LONG   HP$M_ALLOC              ; Constant
                      88  1737                  .BYTE   Pd$_Store       ; Indicate store operation
                    000A  1738                  .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  173A                  .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  173B                  .BYTE   8               ; 8 of data field
                      81  173C                  .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          173D    300 LA38:     $DS_LA38
                          173D                  .SAVE   LOCAL_BLOCK
                          173D                  .PSECT  $ABS$,ABS
                00000032  0050                  .=HP$A_DEPENDENT
                          0032                  .IIF    NB,LA38$K_LEN,  LA38$K_LEN:
                    0000173D                    .RESTORE
          38 33 41 4C 00' 173D                  .ASCIC  "LA38"  ; LA38 name
                      04  173D
                      32  1742                  .BYTE   LA38$K_LEN              ; LA38$K_LEN of resultant P-table
                      FF  1743                  .BYTE   255             ; Maximum unit number                   ;G:65
                    0000  1744                  .WORD   ^A""    ; Two character mnemonic for QIO LA38
                      80  1746                  .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1747                  .Byte   Pd$_Name        ; Directive op-code
                      1B  1748                  .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                54 54 00' 1749                  .Ascic  "TT"    ; Enforced device name prefix
                      02  1749
                      86  174C                  .BYTE   Pd$_Literal     ; Indicate literal
                00000001  174D                  .LONG   HP$M_ALLOC              ; Constant
                      88  1751                  .BYTE   Pd$_Store       ; Indicate store operation
                    000A  1752                  .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  1754                  .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  1755                  .BYTE   8               ; 8 of data field
                      81  1756                  .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1757    301 LA210:    $DS_LA210                       ;               [32]
                          1757                  .SAVE   LOCAL_BLOCK
                          1757                  .PSECT  $ABS$,ABS
                00000032  0050                  .=HP$A_DEPENDENT
                          0032                  .IIF    NB,HP$K_LA210_LEN,      HP$K_LA210_LEN:
                          0032                  .IIF    NB,LA210$K_LEN, LA210$K_LEN:
                    00001757                    .RESTORE
       30 31 32 41 4C 00' 1757                  .ASCIC  "LA210" ; LA210 name
                      05  1757
                      32  175D                  .BYTE   LA210$K_LEN             ; LA210$K_LEN of resultant P-table
                      08  175E                  .BYTE   8               ; Maximum unit number                   ;G:65
                    0000  175F                  .WORD   ^A""    ; Two character mnemonic for QIO LA210
                      80  1761                  .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1762                  .Byte   Pd$_Name        ; Directive op-code
                      1B  1763                  .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                54 54 00' 1764                  .Ascic  "TT"    ; Enforced device name prefix
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                      02  1764
                      86  1767                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  1768                .LONG   HP$M_ALLOC              ; Constant
                      88  176C                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  176D                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  176F                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  1770                .BYTE   8               ; 8 of data field
                      81  1771                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1772    302 LESI:   $DS_LESI                ;               [13]
                          1772                .SAVE   LOCAL_BLOCK
                          1772                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$L_LESI_IP,        HP$L_LESI_IP:
                          0032                .IIF    NB,LESI$L_IP,   LESI$L_IP:
                00000036  0032                .IIF    NB,,BLKL,       .BLKL   1
                          0036                .IIF    NB,HP$B_LESI_BR,        HP$B_LESI_BR:
                          0036                .IIF    NB,LESI$B_BR,   LESI$B_BR:
                00000037  0036                .IIF    NB,,BLKB,       .BLKB   1
                          0037                .IIF    NB,HP$K_LESI_LEN,       HP$K_LESI_LEN:
                          0037                .IIF    NB,LESI$K_LEN,  LESI$K_LEN:
                      0000177 2               .RESTORE
             49 53 45 4C 00'  1772                .ASCIC  "LESI"  ; LESI name
                      04  1772
                      37  1777                .BYTE   HP$K_LESI_LEN           ; HP$K_LESI_LEN of resultant P-table
                      00  1778                .BYTE   0               ; Maximum unit number                    ;G:65
                    0000  1779                .WORD   ^A""    ; Two character mnemonic for QIO LESI
                      80  177B                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  177C                .Byte   Pd$_Name        ; Directive op-code
                      02  177D                .Byte   Ptd$M_Controller                ; Enforced DA codes
                41 44 00'  177E                .Ascic  "DA"    ; Enforced device name prefix
                      02  177E
                      83  1781                .BYTE   Pd$_Octal       ; Indicate scan octal
                50 49 00'  1782                .ASCIC  "IP"    ; IP string
                      02  1782
            0003FFFC 0003E000  1785                .LONG   ^O760000,^O777774       ; 760000 , 777774 limits on input
                      88  178D                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  178E                .WORD   HP$L_LESI_IP            ; Byte HP$L_LESI_IP to data
                      00  1790                .BYTE   0               ; 0 HP$L_LESI_IP to data
                      20  1791                .BYTE   32              ; 32 of data field
                      88  1792                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  1793                .WORD   Hp$A_Device              ; Byte Hp$A_Device to data
                      00  1795                .BYTE   0               ; 0 Hp$A_Device to data
                      12  1796                .BYTE   18              ; 18 of data field
                      83  1797                .BYTE   Pd$_Octal       ; Indicate scan octal
   72 6F 74 63 65 56 00'  1798                .ASCIC  "Vector"        ; Vector string
                      06  1798
            000001FC 00000004  179F                .LONG   ^O4,^O774       ; 4 , 774 limits on input
                      88  17A7                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  17A8                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  17AA                .BYTE   0               ; 0 HP$W_VECTOR to data
                      08  17AB                .BYTE   8               ; 8 of data field
                      82  17AC                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 42 00'  17AD                .ASCIC  "BR"    ; BR string
                      02  17AD
            00000007 00000004  17B0                .LONG   4,7     ; 4 , 7 limits on input
                      88  17B8                .BYTE   Pd$_Store       ; Indicate store operation
                    0036  17B9                .WORD   HP$B_LESI_BR            ; Byte HP$B_LESI_BR to data
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                      00  17BB                .BYTE   0                       ; 0 HP$B_LESI_BR to data
                      08  17BC                .BYTE   8                       ; 8 of data field
                      81  17BD                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          17BE    303 LG01:    $DS_LG01                                ;                       [36]                    ;G:5
                          17BE                .SAVE   LOCAL_BLOCK
                          17BE                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LG01$K_LEN,  LG01$K_LEN:
                   000017BE                  .RESTORE
            31 30 47 4C 00' 17BE                .ASCIC  "LG01"  ; LG01 name
                      04  17BE
                      32  17C3                .BYTE   LG01$K_LEN                      ; LG01$K_LEN of resultant P-table
                      01  17C4                .BYTE   1                       ; Maximum unit number                   ;G:65
                    0000  17C5                .WORD   ^A""    ; Two character mnemonic for QIO LG01
                      80  17C7                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  17C8                .Byte   Pd$_Name                ; Directive op-code
                      1B  17C9                .Byte   Ptd$M_EndDevice                 ; Enforced LG codes
                 47 4C 00' 17CA               .Ascic  "LG"    ; Enforced device name prefix
                      02  17CA
                      86  17CD                .BYTE   Pd$_Literal             ; Indicate literal
                 00000001 17CE                .LONG   HP$M_ALLOC                      ; Constant
                      88  17D2                .BYTE   Pd$_Store               ; Indicate store operation
                    000A  17D3                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                      00  17D5                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  17D6                .BYTE   8                       ; 8 of data field
                      81  17D7                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          17D8    304 LG02:    $DS_LG02                                ;                       [36]                    ;G:5
                          17D8                .SAVE   LOCAL_BLOCK
                          17D8                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LG02$K_LEN,  LG02$K_LEN:
                   000017D8                  .RESTORE
            32 30 47 4C 00' 17D8                .ASCIC  "LG02"  ; LG02 name
                      04  17D8
                      32  17DD                .BYTE   LG02$K_LEN                      ; LG02$K_LEN of resultant P-table
                      01  17DE                .BYTE   1                       ; Maximum unit number                   ;G:65
                    0000  17DF                .WORD   ^A""    ; Two character mnemonic for QIO LG02
                      80  17E1                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  17E2                .Byte   Pd$_Name                ; Directive op-code
                      1B  17E3                .Byte   Ptd$M_EndDevice                 ; Enforced LG codes
                 47 4C 00' 17E4               .Ascic  "LG"    ; Enforced device name prefix
                      02  17E4
                      86  17E7                .BYTE   Pd$_Literal             ; Indicate literal
                 00000001 17E8                .LONG   HP$M_ALLOC                      ; Constant
                      88  17EC                .BYTE   Pd$_Store               ; Indicate store operation
                    000A  17ED                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                      00  17EF                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  17F0                .BYTE   8                       ; 8 of data field
                      81  17F1                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          17F2    305 LG03:    $DS_LG03                                ;                       [36]                    ;G:5
                          17F2                .SAVE   LOCAL_BLOCK
                          17F2                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LG03$K_LEN,  LG03$K_LEN:
                   000017F2                  .RESTORE
            33 30 47 4C 00' 17F2                .ASCIC  "LG03"  ; LG03 name
                      04  17F2
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                      32  17F7                .BYTE   LG03$K_LEN              ; LG03$K_LEN of resultant P-table
                      01  17F8                .BYTE   1                       ; Maximum unit number                   ;G:65
                    0000  17F9                .WORD   ^A""    ; Two character mnemonic for QIO LG03
                      80  17FB                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  17FC                .Byte   Pd$_Name        ; Directive op-code
                      1B  17FD                .Byte   Ptd$M_EndDevice         ; Enforced LG codes
                 47 4C 00' 17FE               .Ascic  "LG"    ; Enforced device name prefix
                      02  17FE
                      86  1801                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  1802                .LONG   HP$M_ALLOC              ; Constant
                      88  1806                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  1807                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  1809                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  180A                .BYTE   8               ; 8 of data field
                      81  180B                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          180C    306 LN01:   $DS_LN01                ;               [14]                    ;G:6
                          180C                .SAVE   LOCAL_BLOCK
                          180C                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LN01$K_LEN,  LN01$K_LEN:
                      0000180C                .RESTORE
              31 30 4E 4C 00' 180C              .ASCIC  "LN01"  ; LN01 name
                      04  180C
                      32  1811                .BYTE   LN01$K_LEN              ; LN01$K_LEN of resultant P-table
                      FF  1812                .BYTE   255             ; Maximum unit number                   ;G:65
                    0000  1813                .WORD   ^A""    ; Two character mnemonic for QIO LN01
                      80  1815                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1816                .Byte   Pd$_Name        ; Directive op-code
                      1B  1817                .Byte   Ptd$M_EndDevice         ; Enforced LP codes
                 50 4C 00' 1818               .Ascic  "LP"    ; Enforced device name prefix
                      02  1818
                      86  181B                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  181C                .LONG   HP$M_ALLOC              ; Constant
                      88  1820                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  1821                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  1823                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  1824                .BYTE   8               ; 8 of data field
                      81  1825                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1826    307 LN03:   $DS_LN03                ;               [32]
                          1826                .SAVE   LOCAL_BLOCK
                          1826                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LN03$K_LEN,  LN03$K_LEN:
                      00001826                .RESTORE
              33 30 4E 4C 00' 1826              .ASCIC  "LN03"  ; LN03 name
                      04  1826
                      32  182B                .BYTE   LN03$K_LEN              ; LN03$K_LEN of resultant P-table
                      FF  182C                .BYTE   255             ; Maximum unit number                   ;G:65
                    0000  182D                .WORD   ^A""    ; Two character mnemonic for QIO LN03
                      80  182F                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      86  1830                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  1831                .LONG   HP$M_ALLOC              ; Constant
                      88  1835                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  1836                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  1838                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  1839                .BYTE   8               ; 8 of data field
                      81  183A                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
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                          183B   308 LP04:   $DS_LP04
                          183B               .SAVE   LOCAL_BLOCK
                          183B               .PSECT  $ABS$,ABS
                00000032  0050               .=HP$A_DEPENDENT
                          0032               .IIF    NB,LP04$K_LEN,  LP04$K_LEN:
                 0000183B                    .RESTORE
          34 30 50 4C 00' 183B               .ASCIC  "LP04"  ; LP04 name
                      04  183B
                      32  1840               .BYTE   LP04$K_LEN              ; LP04$K_LEN of resultant P-table
                      01  1841               .BYTE   1                       ; Maximum unit number                   ;G:65
                    0000  1842               .WORD   ^A""    ; Two character mnemonic for QIO LP04
                      80  1844               .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1845               .Byte   Pd$_Name        ; Directive op-code
                      1B  1846               .Byte   Ptd$M_EndDevice         ; Enforced LP codes
                50 4C 00' 1847               .Ascic  "LP"    ; Enforced device name prefix
                      02  1847
                      86  184A               .BYTE   Pd$_Literal     ; Indicate literal
                00000001  184B               .LONG   HP$M_ALLOC              ; Constant
                      88  184F               .BYTE   Pd$_Store       ; Indicate store operation
                    000A  1850               .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  1852               .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  1853               .BYTE   8               ; 8 of data field
                      81  1854               .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1855   309 LP05:   $DS_LP05
                          1855               .SAVE   LOCAL_BLOCK
                          1855               .PSECT  $ABS$,ABS
                00000032  0050               .=HP$A_DEPENDENT
                          0032               .IIF    NB,LP05$K_LEN,  LP05$K_LEN:
                 00001855                    .RESTORE
          35 30 50 4C 00' 1855               .ASCIC  "LP05"  ; LP05 name
                      04  1855
                      32  185A               .BYTE   LP05$K_LEN              ; LP05$K_LEN of resultant P-table
                      01  185B               .BYTE   1                       ; Maximum unit number                   ;G:65
                    0000  185C               .WORD   ^A""    ; Two character mnemonic for QIO LP05
                      80  185E               .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  185F               .Byte   Pd$_Name        ; Directive op-code
                      1B  1860               .Byte   Ptd$M_EndDevice         ; Enforced LP codes
                50 4C 00' 1861               .Ascic  "LP"    ; Enforced device name prefix
                      02  1861
                      86  1864               .BYTE   Pd$_Literal     ; Indicate literal
                00000001  1865               .LONG   HP$M_ALLOC              ; Constant
                      88  1869               .BYTE   Pd$_Store       ; Indicate store operation
                    000A  186A               .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  186C               .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  186D               .BYTE   8               ; 8 of data field
                      81  186E               .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          186F   310 LP06:   $DS_LP06
                          186F               .SAVE   LOCAL_BLOCK
                          186F               .PSECT  $ABS$,ABS
                00000032  0050               .=HP$A_DEPENDENT
                          0032               .IIF    NB,LP06$K_LEN,  LP06$K_LEN:
                 0000186F                    .RESTORE
          36 30 50 4C 00' 186F               .ASCIC  "LP06"  ; LP06 name
                      04  186F
                      32  1874               .BYTE   LP06$K_LEN              ; LP06$K_LEN of resultant P-table
                      01  1875               .BYTE   1                       ; Maximum unit number                   ;G:65
                    0000  1876               .WORD   ^A""    ; Two character mnemonic for QIO LP06
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                      80  1878                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1879                .Byte   Pd$_Name        ; Directive op-code
                      1B  187A                .Byte   Ptd$M_EndDevice         ; Enforced LP codes
                50 4C 00' 187B                .Ascic  "LP"    ; Enforced device name prefix
                      02  187B
                      86  187E                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  187F                .LONG   HP$M_ALLOC                      ; Constant
                      88  1883                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  1884                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                      00  1886                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  1887                .BYTE   8                       ; 8 of data field
                      81  1888                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          1889    311 LP07:   $DS_LP07                               ;                       [15]
                          1889                .SAVE   LOCAL_BLOCK
                          1889                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LP07$K_LEN,  LP07$K_LEN:
                      1889                    .RESTORE
             37 30 50 4C 00' 1889             .ASCIC  "LP07"  ; LP07 name
                      04  1889
                      32  188E                .BYTE   LP07$K_LEN              ; LP07$K_LEN of resultant P-table
                      01  188F                .BYTE   1                       ; Maximum unit number                   ;G:65
                    0000  1890                .WORD   ^A""    ; Two character mnemonic for QIO LP07
                      80  1892                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1893                .Byte   Pd$_Name        ; Directive op-code
                      1B  1894                .Byte   Ptd$M_EndDevice         ; Enforced LP codes
                50 4C 00' 1895                .Ascic  "LP"    ; Enforced device name prefix
                      02  1895
                      86  1898                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  1899                .LONG   HP$M_ALLOC                      ; Constant
                      88  189D                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  189E                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                      00  18A0                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  18A1                .BYTE   8                       ; 8 of data field
                      81  18A2                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          18A3    312 LP11:   $DS_LP11
                          18A3                .SAVE   LOCAL_BLOCK
                          18A3                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LP11$L_CSR,  LP11$L_CSR:
                00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                          0036                .IIF    NB,LP11$B_BR,   LP11$B_BR:
                00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                          0037                .IIF    NB,LP11$K_LEN,  LP11$K_LEN:
                      18A3                    .RESTORE
          31 31 50 4C 00' 18A3                .ASCIC  "LP11"  ; LP11 name
                      04  18A3
                      37  18A8                .BYTE   LP11$K_LEN              ; LP11$K_LEN of resultant P-table
                      00  18A9                .BYTE   0                       ; Maximum unit number                   ;G:65
                    504C  18AA                .WORD   ^A"LP"  ; Two character mnemonic for QIO LP11 LP
                      80  18AC                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  18AD                .Byte   Pd$_Name        ; Directive op-code
                      02  18AE                .Byte   Ptd$M_Controller                ; Enforced LP codes
                50 4C 00' 18AF                .Ascic  "LP"    ; Enforced device name prefix
                      02  18AF
                      83  18B2                .BYTE   Pd$_Octal       ; Indicate scan octal
             52 53 43 00' 18B3                .ASCIC  "CSR"   ; CSR string
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                      03  18B3
          0003FFFE 0003E000  18B7                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  18BF                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  18C0                .WORD   LP11$L_CSR              ; Byte LP11$L_CSR to data
                      00  18C2                .BYTE   0               ; 0 LP11$L_CSR to data
                      20  18C3                .BYTE   32              ; 32 of data field
                      88  18C4                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  18C5                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  18C7                .BYTE   0               ; 0 HP$A_DEVICE to data
                      12  18C8                .BYTE   18              ; 18 of data field
                      83  18C9                .BYTE   Pd$_Octal       ; Indicate scan octal
    52 4F 54 43 45 56 00' 18CA                .ASCIC  "VECTOR"        ; VECTOR string
                      06  18CA
          000001FE 00000002  18D1                .LONG   ^O2,^O776       ; 2 , 776 limits on input
                      88  18D9                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  18DA                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  18DC                .BYTE   0               ; 0 HP$W_VECTOR to data
                      09  18DD                .BYTE   9               ; 9 of data field
                      82  18DE                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                   52 42 00' 18DF             .ASCIC  "BR"    ; BR string
                      02  18DF
          00000007 00000004  18E2                .LONG   4,7     ; 4 , 7 limits on input
                      88  18EA                .BYTE   Pd$_Store       ; Indicate store operation
                    0036  18EB                .WORD   LP11$B_BR               ; Byte LP11$B_BR to data
                      00  18ED                .BYTE   0               ; 0 LP11$B_BR to data
                      08  18EE                .BYTE   8               ; 8 of data field
                      81  18EF                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          18F0    313 LP14:     $DS_LP14
                          18F0                .SAVE   LOCAL_BLOCK
                          18F0                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LP14$K_LEN,  LP14$K_LEN:
                      000018F0                .RESTORE
    34 31 50 4C 00' 18F0                      .ASCIC  "LP14"  ; LP14 name
                      04  18F0
                      32  18F5                .BYTE   LP14$K_LEN              ; LP14$K_LEN of resultant P-table
                      01  18F6                .BYTE   1               ; Maximum unit number                   ;G:65
                    0000  18F7                .WORD   ^A""    ; Two character mnemonic for QIO LP14
                      80  18F9                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  18FA                .Byte   Pd$_Name        ; Directive op-code
                      1B  18FB                .Byte   Ptd$M_EndDevice         ; Enforced LP codes
                50 4C 00' 18FC                .Ascic  "LP"    ; Enforced device name prefix
                      02  18FC
                      86  18FF                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  1900                .LONG   HP$M_ALLOC              ; Constant
                      88  1904                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  1905                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  1907                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  1908                .BYTE   8               ; 8 of data field
                      81  1909                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          190A    314 LP25:     $DS_LP25                        ;                       [01]
                          190A                .SAVE   LOCAL_BLOCK
                          190A                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LP25$K_LEN,  LP25$K_LEN:
                      0000190A                .RESTORE
    35 32 50 4C 00' 190A                      .ASCIC  "LP25"  ; LP25 name
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                      04  190A
                      32  190F                .BYTE   LP25$K_LEN              ; LP25$K_LEN of resultant P-table
                      01  1910                .BYTE   1                       ; Maximum unit number                   ;G:65
                    0000  1911                .WORD   ^A""     ; Two character mnemonic for QIO LP25
                      80  1913                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1914                .Byte   Pd$_Name        ; Directive op-code
                      1B  1915                .Byte   Ptd$M_EndDevice         ; Enforced LP codes
                50 4C 00' 1916                .Ascic  "LP"    ; Enforced device name prefix
                      02  1916
                      86  1919                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  191A                .LONG   HP$M_ALLOC              ; Constant
                      88  191E                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  191F                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  1921                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  1922                .BYTE   8                       ; 8 of data field
                      81  1923                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1924    315 LP26:   $DS_LP26                       ;               [15]
                          1924                .SAVE   LOCAL_BLOCK
                          1924                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LP26$K_LEN,  LP26$K_LEN:
                          1924                .RESTORE
             36 32 50 4C 00' 1924             .ASCIC  "LP26"  ; LP26 name
                      04  1924
                      32  1929                .BYTE   LP26$K_LEN              ; LP26$K_LEN of resultant P-table
                      01  192A                .BYTE   1                       ; Maximum unit number                   ;G:65
                    0000  192B                .WORD   ^A""     ; Two character mnemonic for QIO LP26
                      80  192D                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  192E                .Byte   Pd$_Name        ; Directive op-code
                      1B  192F                .Byte   Ptd$M_EndDevice         ; Enforced LP codes
                50 4C 00' 1930                .Ascic  "LP"    ; Enforced device name prefix
                      02  1930
                      86  1933                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  1934                .LONG   HP$M_ALLOC              ; Constant
                      88  1938                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  1939                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  193B                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  193C                .BYTE   8                       ; 8 of data field
                      81  193D                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          193E    316 LP27:   $DS_LP27                       ;               [15]
                          193E                .SAVE   LOCAL_BLOCK
                          193E                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LP27$K_LEN,  LP27$K_LEN:
                      0000193E                .RESTORE
             37 32 50 4C 00' 193E             .ASCIC  "LP27"  ; LP27 name
                      04  193E
                      32  1943                .BYTE   LP27$K_LEN              ; LP27$K_LEN of resultant P-table
                      01  1944                .BYTE   1                       ; Maximum unit number                   ;G:65
                    0000  1945                .WORD   ^A""     ; Two character mnemonic for QIO LP27
                      80  1947                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1948                .Byte   Pd$_Name        ; Directive op-code
                      1B  1949                .Byte   Ptd$M_EndDevice         ; Enforced LP codes
                50 4C 00' 194A                .Ascic  "LP"    ; Enforced device name prefix
                      02  194A
                      86  194D                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  194E                .LONG   HP$M_ALLOC              ; Constant
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                      88  1952                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  1953                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  1955                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  1956                .BYTE   8               ; 8 of data field
                      81  1957                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1958    317 LPA11K: $DS_LPA11K
                          1958                .SAVE   LOCAL_BLOCK
                          1958                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LPA11K$L_CSR,        LPA11K$L_CSR:
                 00000036 0032                .IIF    NB,.BLKL,       .BLKL   1
                          0036                .IIF    NB,LPA11K$B_BR, LPA11K$B_BR:
                 00000037 0036                .IIF    NB,.BLKB,       .BLKB   1
                          0037                .IIF    NB,LPA11K$K_LEN,        LPA11K$K_LEN:
                      00001958                .RESTORE
           4B 31 31 41 50 4C 00' 1958         .ASCIC  "LPA11K"        ; LPA11K name
                      06  1958
                      37  195F                .BYTE   LPA11K$K_LEN            ; LPA11K$K_LEN of resultant P-table
                      01  1960                .BYTE   1               ; Maximum unit number                   ;G:65
                    414C  1961                .WORD   ^A"LA"  ; Two character mnemonic for QIO LPA11K LA
                      80  1963                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1964                .Byte   Pd$_Name        ; Directive op-code
                      03  1965                .Byte   Ptd$M_Device            ; Enforced LA codes
                 41 4C 00' 1966                .Asci   "LA"    ; Enforced device name prefix
                      02  1966
                      86  1969                .BYTE   Pd$_Literal     ; Indicate literal
                 00000001 196A                .LONG   HP$M_ALLOC              ; Constant
                      88  196E                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  196F                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  1971                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  1972                .BYTE   8               ; 8 of data field
                      83  1973                .BYTE   Pd$_Octal       ; Indicate scan octal
              52 53 43 00' 1974                .ASCIC  "CSR"   ; CSR string
                      03  1974
           0003FFFE 0003E000  1978             .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  1980                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  1981                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  1983                .BYTE   0               ; 0 HP$A_DEVICE to data
                      12  1984                .BYTE   18              ; 18 of data field
                      88  1985                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  1986                .WORD   LPA11K$L_CSR            ; Byte LPA11K$L_CSR to data
                      00  1988                .BYTE   0               ; 0 LPA11K$L_CSR to data
                      20  1989                .BYTE   32              ; 32 of data field
                      83  198A                .BYTE   Pd$_Octal       ; Indicate scan octal
        52 4F 54 43 45 56 00' 198B            .ASCIC  "VECTOR"        ; VECTOR string
                      06  198B
           000001FE 00000002  1992             .LONG   ^O2,^O776       ; 2 , 776 limits on input
                      88  199A                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  199B                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  199D                .BYTE   0               ; 0 HP$W_VECTOR to data
                      09  199E                .BYTE   9               ; 9 of data field
                      82  199F                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                 52 42 00' 19A0                .ASCIC  "BR"    ; BR string
                      02  19A0
           00000007 00000004  19A3             .LONG   4,7     ; 4 , 7 limits on input
                      88  19AB                .BYTE   Pd$_Store       ; Indicate store operation
                    0036  19AC                .WORD   LPA11K$B_BR             ; Byte LPA11K$B_BR to data
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                      00  19AE                .BYTE   0                       ; 0 LPA11K$B_BR to data
                      08  19AF                .BYTE   8                       ; 8 of data field
                      81  19B0                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          19B1    318 LUA11:   $DS_LUA11                               ;                  [33]
                          19B1                .SAVE   LOCAL_BLOCK
                          19B1                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LUA11$B_BR,  LUA11$B_BR:
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,LUA11$L_CSR, LUA11$L_CSR:
                00000037  0033                .IIF    NB,.BLKL,       .BLKL   1
                          0037                .IIF    NB,LUA11$K_LEN, LUA11$K_LEN:
                      000019B1                .RESTORE
          31 31 41 55 4C 00' 19B1             .ASCIC  "LUA11" ; LUA11 name
                      05  19B1
                      37  19B7                .BYTE   LUA11$K_LEN             ; LUA11$K_LEN of resultant P-table
                      08  19B8                .BYTE   8                       ; Maximum unit number                    ;G:65
                    0000  19B9                .WORD   ^A""    ; Two character mnemonic for QIO LUA11
                      80  19BB                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  19BC                .Byte   Pd$_Name                ; Directive op-code
                      03  19BD                .Byte   PTD$M_DEVICE            ; Enforced XE codes
                45 58 00' 19BE                .Ascic  "XE"    ; Enforced device name prefix
                      02  19BE
                      83  19C1                .BYTE   Pd$_Octal               ; Indicate scan octal
             52 53 43 00' 19C2                .ASCIC  "CSR"   ; CSR string
                      03  19C2
          0003FFFE 0003E000  19C6             .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  19CE                .BYTE   Pd$_Store               ; Indicate store operation
                    0033  19CF                .WORD   LUA11$L_CSR                     ; Byte LUA11$L_CSR to data
                      00  19D1                .BYTE   0                       ; 0 LUA11$L_CSR to data
                      20  19D2                .BYTE   32                      ; 32 of data field
                      88  19D3                .BYTE   Pd$_Store               ; Indicate store operation
                    0018  19D4                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                      00  19D6                .BYTE   0                       ; 0 HP$A_DEVICE to data
                      12  19D7                .BYTE   18                      ; 18 of data field
                      83  19D8                .BYTE   Pd$_Octal               ; Indicate scan octal
    52 4F 54 43 45 56 00' 19D9                .ASCIC  "VECTOR"                ; VECTOR string
                      06  19D9
          000001FE 00000002  19E0             .LONG   ^O2,^O776               ; 2 , 776 limits on input
                      88  19E8                .BYTE   Pd$_Store               ; Indicate store operation
                    0024  19E9                .WORD   HP$W_VECTOR                     ; Byte HP$W_VECTOR to data
                      00  19EB                .BYTE   0                       ; 0 HP$W_VECTOR to data
                      09  19EC                .BYTE   9                       ; 9 of data field
                      82  19ED                .BYTE   Pd$_Decimal             ; Indicate scan decimal
                52 42 00' 19EE                .ASCIC  "BR"    ; BR string
                      02  19EE
          00000007 00000004  19F1             .LONG   4,7     ; 4 , 7 limits on input
                      88  19F9                .BYTE   Pd$_Store               ; Indicate store operation
                    0032  19FA                .WORD   LUA11$B_BR                      ; Byte LUA11$B_BR to data
                      00  19FC                .BYTE   0                       ; 0 LUA11$B_BR to data
                      08  19FD                .BYTE   8                       ; 8 of data field
                      81  19FE                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          19FF    319 NBIA:    $DS_NBIA
                          19FF                .SAVE   LOCAL_BLOCK
                          19FF                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$B_NBIA_COMMON,    HP$B_NBIA_COMMON:
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                    00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                              0033                .IIF    NB,HP$L_NBIA_CSR,       HP$L_NBIA_CSR:
                    00000037  0033                .IIF    NB,.BLKL,       .BLKL   1
                              0037                .IIF    NB,HP$B_BR,     HP$B_BR:
                    00000038  0037                .IIF    NB,.BLKB,       .BLKB   1
                              0038                .IIF    NB,HP$K_NBIA_LEN,       HP$K_NBIA_LEN:
                       000019FF                   .RESTORE
                41 49 42 4E 00' 19FF               .ASCIC  "NBIA"  ; NBIA name
                          04    19FF
                          38    1A04               .BYTE   HP$K_NBIA_LEN           ; HP$K_NBIA_LEN of resultant P-table
                          02    1A05               .BYTE   2                       ; Maximum unit number                   ;G:65
                        0000    1A06               .WORD   ^A""    ; Two character mnemonic for QIO NBIA
                          80    1A08               .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D    1A09               .Byte   Pd$_Name        ; Directive op-code
                          01    1A0A               .Byte   PTD$M_UNIT              ; Enforced NBIA codes
                41 49 42 4E 00' 1A0B               .Ascic  "NBIA"  ; Enforced device name prefix
                          04    1A0B
                          86    1A10               .BYTE   Pd$_Literal     ; Indicate literal
                    60080000    1A11               .LONG   ^X60080000              ; Constant
                          88    1A15               .BYTE   Pd$_Store       ; Indicate store operation
                        0018    1A16               .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                          00    1A18               .BYTE   0                       ; 0 HP$A_DEVICE to data
                          20    1A19               .BYTE   32                      ; 32 of data field
                          82    1A1A               .BYTE   Pd$_Decimal     ; Indicate scan decimal
41 44 41 20 4C 41 47 49 47 4F 4C 00' 1A1B          .ASCIC  "LOGIGAL ADAPTER # "    ; LOGIGAL ADAPTER #  string
      20 23 20 52 45 54 50    1A27
                          12    1A1B
            00000001 00000000   1A2E               .LONG   0,1     ; 0 , 1 limits on input
                          88    1A36               .BYTE   Pd$_Store       ; Indicate store operation
                        0018    1A37               .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                          1A    1A39               .BYTE   26                      ; 26 HP$A_DEVICE to data
                          01    1A3A               .BYTE   1                       ; 1 of data field
                          8C    1A3B               .BYTE   Pd$_Case        ; Indicate case operation
                          02    1A3C               .BYTE   $$_$            ; Count of pairs
            00000120 00000000   1A3D               .LONG   0,^X120         ; Store the pair
            00000130 00000001   1A45               .LONG   1,^X130         ; Store the pair
                          88    1A4D               .BYTE   Pd$_Store       ; Indicate store operation
                        0024    1A4E               .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                          00    1A50               .BYTE   0                       ; 0 HP$W_VECTOR to data
                          10    1A51               .BYTE   16                      ; 16 of data field
                          87    1A52               .BYTE   Pd$_Fetch       ; Indicate fetch operation
                        0018    1A53               .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                          1A    1A55               .BYTE   26                      ; 26 HP$A_DEVICE to data
                          01    1A56               .BYTE   1                       ; 1 of data field
                          8C    1A57               .BYTE   Pd$_Case        ; Indicate case operation
                          02    1A58               .BYTE   $$_$            ; Count of pairs
            60000000 00000000   1A59               .LONG   0,^X60000000            ; Store the pair
            64000000 00000001   1A61               .LONG   1,^X64000000            ; Store the pair
                          88    1A69               .BYTE   Pd$_Store       ; Indicate store operation
                        001C    1A6A               .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                          00    1A6C               .BYTE   0                       ; 0 HP$A_DVA to data
                          20    1A6D               .BYTE   32                      ; 32 of data field
                          81    1A6E               .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                              1A6F    320 NBIB:     $DS_NBIB
                              1A6F                .SAVE   LOCAL_BLOCK
                              1A6F                .PSECT  $ABS$,ABS
                    00000032  0050                .=HP$A_DEPENDENT
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                        0032                .IIF    NB,HP$B_NBIB_COMMON,    HP$B_NBIB_COMMON:
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                        0033                .IIF    NB,HP$B_BI_NODE,        HP$B_BI_NODE:
                00000034  0033                .IIF    NB,.BLKB,       .BLKB   1
                        0034                .IIF    NB,HP$L_NBIB_CSR,       HP$L_NBIB_CSR:
                00000038  0034                .IIF    NB,.BLKL,       .BLKL   1
                        0038                .IIF    NB,HP$B_BI_NUM, HP$B_BI_NUM:
                00000039  0038                .IIF    NB,.BLKB,       .BLKB   1
                        0039                .IIF    NB,HP$K_NBIB_LEN,       HP$K_NBIB_LEN:
                    00001A6F                .RESTORE
          42 49 42 4E 00' 1A6F              .ASCIC  "NBIB"  ; NBIB name
                      04  1A6F
                      39  1A74              .BYTE   HP$K_NBIB_LEN           ; HP$K_NBIB_LEN of resultant P-table
                      06  1A75              .BYTE   6               ; Maximum unit number                   ;G:65
                    0000  1A76              .WORD   ^A""    ; Two character mnemonic for QIO NBIB
                      80  1A78              .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1A79              .Byte   Pd$_Name        ; Directive op-code
                      01  1A7A              .Byte   PTD$M_UNIT              ; Enforced NBIB codes
          42 49 42 4E 00' 1A7B              .Ascic  "NBIB"  ; Enforced device name prefix
                      04  1A7B
                      82  1A80              .BYTE   Pd$_Decimal     ; Indicate scan decimal
       20 23 20 49 42 00' 1A81              .ASCIC  "BI # " ; BI #  string
                      05  1A81
    00000001 00000000     1A87              .LONG   0,1     ; 0 , 1 limits on input
                      88  1A8F              .BYTE   Pd$_Store       ; Indicate store operation
                    0038  1A90              .WORD   HP$B_BI_NUM             ; Byte HP$B_BI_NUM to data
                      00  1A92              .BYTE   0               ; 0 HP$B_BI_NUM to data
                      02  1A93              .BYTE   2               ; 2 of data field
                      88  1A94              .BYTE   Pd$_Store       ; Indicate store operation
                    0018  1A95              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      19  1A97              .BYTE   25              ; 25 HP$A_DEVICE to data
                      01  1A98              .BYTE   1               ; 1 of data field
                      87  1A99              .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  1A9A              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  1A9C              .BYTE   0               ; 0 HP$A_DEVICE to data
                      20  1A9D              .BYTE   32              ; 32 of data field
                      88  1A9E              .BYTE   Pd$_Store       ; Indicate store operation
                    001C  1A9F              .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      00  1AA1              .BYTE   0               ; 0 HP$A_DVA to data
                      20  1AA2              .BYTE   32              ; 32 of data field
                      84  1AA3              .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00' 1AA4   .ASCIC  "BI Node Number (HEX) "  ; BI Node Number (HEX)  string
      20 29 58 45 48 28 20 72 65 62  1AB0
                      15  1AA4
                0000000F 00000000     1ABA  .LONG   ^X0,^XF ; 0 , F limits on input
                      88  1AC2              .BYTE   Pd$_Store       ; Indicate store operation
                    0033  1AC3              .WORD   HP$B_BI_NODE             ; Byte HP$B_BI_NODE to data
                      00  1AC5              .BYTE   0               ; 0 HP$B_BI_NODE to data
                      08  1AC6              .BYTE   8               ; 8 of data field
                      87  1AC7              .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0033  1AC8              .WORD   HP$B_BI_NODE             ; Byte HP$B_BI_NODE to data
                      00  1ACA              .BYTE   0               ; 0 HP$B_BI_NODE to data
                      08  1ACB              .BYTE   8               ; 8 of data field
                      88  1ACC              .BYTE   Pd$_Store       ; Indicate store operation
                    0018  1ACD              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      0D  1ACF              .BYTE   13              ; 13 HP$A_DEVICE to data
                      04  1AD0              .BYTE   4               ; 4 of data field
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                      81  1AD1                        .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1AD2   321 MA780:           $DS_MA780
                          1AD2                        .SAVE   LOCAL_BLOCK
                          1AD2                        .PSECT  $ABS$,ABS
                00000032  0050                        .=HP$A_DEPENDENT
                          0032                        .IIF    NB,MA780$B_TR,  MA780$B_TR:
                00000033  0032                        .IIF    NB,.BLKB,       .BLKB   1
                          0033                        .IIF    NB,MA780$B_BR,  MA780$B_BR:
                00000034  0033                        .IIF    NB,.BLKB,       .BLKB   1
                          0034                        .IIF    NB,MA780$B_MPM, MA780$B_MPM:
                00000035  0034                        .IIF    NB,.BLKB,       .BLKB   1
                          0035                        .IIF    NB,MA780$B_PORT,        MA780$B_PORT:
                00000036  0035                        .IIF    NB,.BLKB,       .BLKB   1
                          0036                        .IIF    NB,MA780$K_LEN, MA780$K_LEN:
                    00001AD2                        .RESTORE
          30 38 37 41 4D 00' 1AD2                   .ASCIC  "MA780" ; MA780 name
                      05  1AD2
                      36  1AD8                      .BYTE   MA780$K_LEN             ; MA780$K_LEN of resultant P-table
                      08  1AD9                      .BYTE   8                       ; Maximum unit number                   ;G:65
                    0000  1ADA                      .WORD   ^A""    ; Two character mnemonic for QIO MA780
                      80  1ADC                      .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1ADD                      .Byte   Pd$_Name        ; Directive op-code
                      01  1ADE                      .Byte   Ptd$M_Unit              ; Enforced MA codes
                41 4D 00' 1ADF                      .Ascic  "MA"    ; Enforced device name prefix
                      02  1ADF
                      82  1AE2                      .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 54 00' 1AE3                      .ASCIC  "TR"    ; TR string
                      02  1AE3
          0000000F 00000001 1AE6                    .LONG   1,15    ; 1 , 15 limits on input
                      88  1AEE                      .BYTE   Pd$_Store       ; Indicate store operation
                    0032  1AEF                      .WORD   MA780$B_TR              ; Byte MA780$B_TR to data
                      00  1AF1                      .BYTE   0               ; 0 MA780$B_TR to data
                      08  1AF2                      .BYTE   8               ; 8 of data field
                      88  1AF3                      .BYTE   Pd$_Store       ; Indicate store operation
                    0018  1AF4                      .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      0D  1AF6                      .BYTE   13              ; 13 HP$A_DEVICE to data
                      04  1AF7                      .BYTE   4               ; 4 of data field
                      88  1AF8                      .BYTE   Pd$_Store       ; Indicate store operation
                    0024  1AF9                      .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      02  1AFB                      .BYTE   2               ; 2 HP$W_VECTOR to data
                      04  1AFC                      .BYTE   4               ; 4 of data field
                      82  1AFD                      .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 42 00' 1AFE                      .ASCIC  "BR"    ; BR string
                      02  1AFE
          00000007 00000004 1B01                    .LONG   4,7     ; 4 , 7 limits on input
                      88  1B09                      .BYTE   Pd$_Store       ; Indicate store operation
                    0033  1B0A                      .WORD   MA780$B_BR              ; Byte MA780$B_BR to data
                      00  1B0C                      .BYTE   0               ; 0 MA780$B_BR to data
                      08  1B0D                      .BYTE   8               ; 8 of data field
                      88  1B0E                      .BYTE   Pd$_Store       ; Indicate store operation
                    0024  1B0F                      .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      06  1B11                      .BYTE   6               ; 6 HP$W_VECTOR to data
                      02  1B12                      .BYTE   2               ; 2 of data field
                      86  1B13                      .BYTE   Pd$_Literal     ; Indicate literal
                00000001  1B14                      .LONG   1               ; Constant
                      88  1B18                      .BYTE   Pd$_Store       ; Indicate store operation
                    0024  1B19                      .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
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                      08  1B1B                .BYTE   8                   ; 8 HP$W_VECTOR to data
                      01  1B1C                .BYTE   1                   ; 1 of data field
                      86  1B1D                .BYTE   Pd$_Literal          ; Indicate literal
                00000006  1B1E                .LONG   6                   ; Constant
                      88  1B22                .BYTE   Pd$_Store           ; Indicate store operation
                    0018  1B23                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                      1C  1B25                .BYTE   28                  ; 28 HP$A_DEVICE to data
                      04  1B26                .BYTE   4                   ; 4 of data field
                      82  1B27                .BYTE   Pd$_Decimal         ; Indicate scan decimal
             4D 50 4D 00' 1B28                .ASCIC  "MPM"    ; MPM string
                      03  1B28
            00000003 00000000  1B2C           .LONG   0,3      ; 0 , 3 limits on input
                      88  1B34                .BYTE   Pd$_Store           ; Indicate store operation
                    0034  1B35                .WORD   MA780$B_MPM                 ; Byte MA780$B_MPM to data
                      00  1B37                .BYTE   0                   ; 0 MA780$B_MPM to data
                      08  1B38                .BYTE   8                   ; 8 of data field
                      82  1B39                .BYTE   Pd$_Decimal         ; Indicate scan decimal
          54 52 4F 50 00' 1B3A                .ASCIC  "PORT"   ; PORT string
                      04  1B3A
            00000003 00000000  1B3F           .LONG   0,3      ; 0 , 3 limits on input
                      88  1B47                .BYTE   Pd$_Store           ; Indicate store operation
                    0035  1B48                .WORD   MA780$B_PORT                ; Byte MA780$B_PORT to data
                      00  1B4A                .BYTE   0                   ; 0 MA780$B_PORT to data
                      08  1B4B                .BYTE   8                   ; 8 of data field
                      81  1B4C                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                          1B4D    322 MBE:    $DS_MBE
                          1B4D                .SAVE   LOCAL_BLOCK
                          1B4D                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,MBE$K_LEN,   MBE$K_LEN:
                    00001B4D                  .RESTORE
             45 42 4D 00' 1B4D                .ASCIC  "MBE"    ; MBE name
                      03  1B4D
                      32  1B51                .BYTE   MBE$K_LEN                   ; MBE$K_LEN of resultant P-table
                      08  1B52                .BYTE   8                   ; Maximum unit number                   ;G:65
                    0000  1B53                .WORD   ^A""     ; Two character mnemonic for QIO MBE
                      80  1B55                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                      87  1B56                .BYTE   Pd$_Fetch           ; Indicate fetch operation
                    000B  1B57                .WORD   HP$B_DRIVE                  ; Byte HP$B_DRIVE to data
                      00  1B59                .BYTE   0                   ; 0 HP$B_DRIVE to data
                      08  1B5A                .BYTE   8                   ; 8 of data field
                      88  1B5B                .BYTE   Pd$_Store           ; Indicate store operation
                    0018  1B5C                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                      07  1B5E                .BYTE   7                   ; 7 HP$A_DEVICE to data
                      03  1B5F                .BYTE   3                   ; 3 of data field
                      81  1B60                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                          1B61    323 ML11:   $DS_ML11                            ;                       [01]
                          1B61                .SAVE   LOCAL_BLOCK
                          1B61                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,ML11$B_ARRAY,        ML11$B_ARRAY:
                00000033  0032                .IIF    NB,..BLKB,      .BLKB   1
                          0033                .IIF    NB,ML11$B_CHIP, ML11$B_CHIP:
                00000034  0033                .IIF    NB,..BLKB,      .BLKB   1
                          0034                .IIF    NB,ML11$K_LEN,  ML11$K_LEN:
                    00001B61                  .RESTORE
          31 31 4C 4D 00' 1B61                .ASCIC  "ML11"   ; ML11 name
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                                04  1B61
                                34  1B66                .BYTE   ML11$K_LEN              ; ML11$K_LEN of resultant P-table
                                08  1B67                .BYTE   8                       ; Maximum unit number                   ;G:65
                              4D45  1B68                .WORD   ^A"EM"  ; Two character mnemonic for QIO ML11 EM
                                80  1B6A                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                8D  1B6B                .Byte   Pd$_Name        ; Directive op-code
                                03  1B6C                .Byte   Ptd$M_Device            ; Enforced EM codes
                          4D 45 00' 1B6D                .Ascic  "EM"    ; Enforced device name prefix
                                02  1B6D
                                86  1B70                .BYTE   Pd$_Literal     ; Indicate literal
                          00000001  1B71                .LONG   HP$M_ALLOC              ; Constant
                                88  1B75                .BYTE   Pd$_Store       ; Indicate store operation
                              000A  1B76                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                                00  1B78                .BYTE   0               ; 0 HP$B_FLAGS to data
                                08  1B79                .BYTE   8               ; 8 of data field
                                87  1B7A                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                              000B  1B7B                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                                00  1B7D                .BYTE   0               ; 0 HP$B_DRIVE to data
                                08  1B7E                .BYTE   8               ; 8 of data field
                                88  1B7F                .BYTE   Pd$_Store       ; Indicate store operation
                              0018  1B80                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                07  1B82                .BYTE   7               ; 7 HP$A_DEVICE to data
                                03  1B83                .BYTE   3               ; 3 of data field
                                82  1B84                .BYTE   Pd$_Decimal     ; Indicate scan decimal
61 20 66 6F 20 72 65 62 6D 75 4E 00' 1B85                .ASCIC  "Number of array boards"        ; Number of array boards string
   73 64 72 61 6F 62 20 79 61 72 72  1B91
                                16  1B85
                  00000010 00000001  1B9C                .LONG   1,16    ; 1 , 16 limits on input
                                88  1BA4                .BYTE   Pd$_Store       ; Indicate store operation
                              0032  1BA5                .WORD   ML11$B_ARRAY            ; Byte ML11$B_ARRAY to data
                                00  1BA7                .BYTE   0               ; 0 ML11$B_ARRAY to data
                                08  1BA8                .BYTE   8               ; 8 of data field
                                85  1BA9                .BYTE   Pd$_String      ; Indicate scan and verify string
    65 7A 69 73 20 70 69 68 43 00' 1BAA                .ASCIC  "Chip size"     ; Chip size string
                                09  1BAA
                       4B 36 31 00' 1BB4                .ASCIC  "16K"
                                03  1BB4
                       4B 34 36 00' 1BB8                .ASCIC  "64K"
                                03  1BB8
                                00  1BBC                .BYTE   0               ; Null length is end of valid 16K,64K
                                88  1BBD                .BYTE   Pd$_Store       ; Indicate store operation
                              0033  1BBE                .WORD   ML11$B_CHIP             ; Byte ML11$B_CHIP to data
                                00  1BC0                .BYTE   0               ; 0 ML11$B_CHIP to data
                                08  1BC1                .BYTE   8               ; 8 of data field
                                81  1BC2                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                    1BC3    324 MS750:  $DS_MS750
                                    1BC3                .SAVE   LOCAL_BLOCK
                                    1BC3                .PSECT  $ABS$,ABS
                          00000032  0050                .=HP$A_DEPENDENT
                                    0032                .IIF    NB,MS750$K_LEN, MS750$K_LEN:
                                0000  1BC3                .RESTORE
                  30 35 37 53 4D 00' 1BC3                .ASCIC  "MS750" ; MS750 name
                                05  1BC3
                                32  1BC9                .BYTE   MS750$K_LEN             ; MS750$K_LEN of resultant P-table
                                08  1BCA                .BYTE   8                       ; Maximum unit number                   ;G:65
                              0000  1BCB                .WORD   ^A""    ; Two character mnemonic for QIO MS750
                                80  1BCD                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
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                          8D  1BCE                .Byte   Pd$_Name         ; Directive op-code
                          01  1BCF                .Byte   Ptd$M_Unit                ; Enforced MS codes
                    53 4D 00' 1BD0                .Asci   "MS"     ; Enforced device name prefix
                          02  1BD0
                          81  1BD3                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                              1BD4    325 MS780:  $DS_MS780
                              1BD4                .SAVE   LOCAL_BLOCK
                              1BD4                .PSECT  $ABS$,ABS
                    00000032  0050                .=HP$A_DEPENDENT
                              0032                .IIF    NB,MS780$B_TR,  MS780$B_TR:
                    00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                              0033                .IIF    NB,ms780$b_arrays,      ms780$b_arrays:
                    00000034  0033                .IIF    NB,.blkb,       .blkb   1
                              0034                .IIF    NB,MS780$K_LEN, MS780$K_LEN:
                          0001BD4                 .RESTORE
                30 38 37 53 4D 00' 1BD4           .ASCIC  "MS780" ; MS780 name
                          05  1BD4
                          34  1BDA                .BYTE   MS780$K_LEN              ; MS780$K_LEN of resultant P-table
                          08  1BDB                .BYTE   8                ; Maximum unit number                          ;G:65
                        0000  1BDC                .WORD   ^A""     ; Two character mnemonic for QIO MS780
                          80  1BDE                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                          8D  1BDF                .Byte   Pd$_Name         ; Directive op-code
                          01  1BE0                .Byte   Ptd$M_Unit                ; Enforced MS codes
                    53 4D 00' 1BE1                .Asci   "MS"     ; Enforced device name prefix
                          02  1BE1
                          82  1BE4                .BYTE   Pd$_Decimal      ; Indicate scan decimal
                    52 54 00' 1BE5                .ASCIC  "TR"     ; TR string
                          02  1BE5
                    0000000F  1BE8                .LONG   1,15     ; 1 , 15 limits on input
                          88  1BF0                .BYTE   Pd$_Store        ; Indicate store operation
                        0032  1BF1                .WORD   MS780$B_TR               ; Byte MS780$B_TR to data
                          00  1BF3                .BYTE   0                ; 0 MS780$B_TR to data
                          08  1BF4                .BYTE   8                ; 8 of data field
                          88  1BF5                .BYTE   Pd$_Store        ; Indicate store operation
                        0018  1BF6                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                          0D  1BF8                .BYTE   13               ; 13 HP$A_DEVICE to data
                          04  1BF9                .BYTE   4                ; 4 of data field
                          86  1BFA                .BYTE   Pd$_Literal      ; Indicate literal
                    00000006  1BFB                .LONG   6                ; Constant
                          88  1BFF                .BYTE   Pd$_Store        ; Indicate store operation
                        0018  1C00                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                          1C  1C02                .BYTE   28               ; 28 HP$A_DEVICE to data
                          04  1C03                .BYTE   4                ; 4 of data field
                          82  1C04                .BYTE   Pd$_Decimal      ; Indicate scan decimal
61 20 66 6F 20 72 65 62 6D 75 4E 00' 1C05         .ASCIC  "Number of arrays"       ; Number of arrays string
                73 79 61 72 72  1C11
                          10  1C05
                    00000010  1C16                .LONG   0,16     ; 0 , 16 limits on input
                          88  1C1E                .BYTE   Pd$_Store        ; Indicate store operation
                        0033  1C1F                .WORD   ms780$b_arrays           ; Byte ms780$b_arrays to data
                          00  1C21                .BYTE   0                ; 0 ms780$b_arrays to data
                          08  1C22                .BYTE   8                ; 8 of data field
                          81  1C23                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                              1C24    326 PCL11:  $DS_PCL11
                              1C24                .SAVE   LOCAL_BLOCK
                              1C24                .PSECT  $ABS$,ABS
                    00000032  0050                .=HP$A_DEPENDENT
```

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                          0032                  .IIF    NB,PCL11$L_CSR, PCL11$L_CSR:
                00000036  0032                  .IIF    NB,,.BLKL,        .BLKL   1
                          0036                  .IIF    NB,PCL11$B_BR,  PCL11$B_BR:
                00000037  0036                  .IIF    NB,,.BLKB,        .BLKB   1
                          0037                  .IIF    NB,PCL11$K_LEN, PCL11$K_LEN:
                      0000 1C24                 .RESTORE
          31 31 4C 43 50 00' 1C24               .ASCIC  "PCL11" ; PCL11 name
                      05  1C24
                      37  1C2A                  .BYTE   PCL11$K_LEN             ; PCL11$K_LEN of resultant P-table
                      20  1C2B                  .BYTE   32                      ; Maximum unit number                   ;G:65
                    0000  1C2C                  .WORD   ^A""    ; Two character mnemonic for QIO PCL11
                      80  1C2E                  .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      83  1C2F                  .BYTE   Pd$_Octal       ; Indicate scan octal
                52 53 43 00' 1C30               .ASCIC  "CSR"   ; CSR string
                      03  1C30
            0003FFFE 0003E000 1C34              .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  1C3C                  .BYTE   Pd$_Store       ; Indicate store operation
                    0032  1C3D                  .WORD   PCL11$L_CSR             ; Byte PCL11$L_CSR to data
                      00  1C3F                  .BYTE   0                       ; 0 PCL11$L_CSR to data
                      20  1C40                  .BYTE   32                      ; 32 of data field
                      88  1C41                  .BYTE   Pd$_Store       ; Indicate store operation
                    0018  1C42                  .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  1C44                  .BYTE   0                       ; 0 HP$A_DEVICE to data
                      12  1C45                  .BYTE   18                      ; 18 of data field
                      83  1C46                  .BYTE   Pd$_Octal       ; Indicate scan octal
       52 4F 54 43 45 56 00' 1C47               .ASCIC  "VECTOR"        ; VECTOR string
                      06  1C47
            000001FE 00000002 1C4E              .LONG   ^O2,^O776       ; 2 , 776 limits on input
                      88  1C56                  .BYTE   Pd$_Store       ; Indicate store operation
                    0024  1C57                  .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  1C59                  .BYTE   0                       ; 0 HP$W_VECTOR to data
                      09  1C5A                  .BYTE   9                       ; 9 of data field
                      82  1C5B                  .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 42 00' 1C5C                  .ASCIC  "BR"    ; BR string
                      02  1C5C
            00000007 00000004 1C5F              .LONG   4,7     ; 4 , 7 limits on input
                      88  1C67                  .BYTE   Pd$_Store       ; Indicate store operation
                    0036  1C68                  .WORD   PCL11$B_BR              ; Byte PCL11$B_BR to data
                      00  1C6A                  .BYTE   0                       ; 0 PCL11$B_BR to data
                      08  1C6B                  .BYTE   8                       ; 8 of data field
                      81  1C6C                  .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1C6D      327 PX780:  $DS_PX780
                          1C6D                  .SAVE   LOCAL_BLOCK
                          1C6D                  .PSECT  $ABS$,ABS
                00000032  0050                  .=HP$A_DEPENDENT
                          0032                  .IIF    NB,PX780$B_TR,  PX780$B_TR:
                00000033  0032                  .IIF    NB,,.BLKB,        .BLKB   1
                          0033                  .IIF    NB,PX780$B_BR,  PX780$B_BR:
                00000034  0033                  .IIF    NB,,.BLKB,        .BLKB   1
                          0034                  .IIF    NB,PX780$B_NODE,        PX780$B_NODE:
                00000035  0034                  .IIF    NB,,.BLKB,        .BLKB   1
                          0035                  .IIF    NB,PX780$K_LEN, PX780$K_LEN:
                      0000 1C6D                 .RESTORE
          30 38 37 58 50 00' 1C6D               .ASCIC  "PX780" ; PX780 name
                      05  1C6D
                      35  1C73                  .BYTE   PX780$K_LEN             ; PX780$K_LEN of resultant P-table
                      01  1C74                  .BYTE   1                       ; Maximum unit number                   ;G:65
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                      5850  1C75                .WORD   ^A"PX"  ; Two character mnemonic for QIO PX780 PX
                        80  1C77                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                        8D  1C78                .Byte   Pd$_Name        ; Directive op-code
                        03  1C79                .Byte   Ptd$M_Device            ; Enforced PX codes
                58 50 00'   1C7A                .Ascic  "PX"    ; Enforced device name prefix
                        02  1C7A
                        82  1C7D                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 54 00'   1C7E                .ASCIC  "TR"    ; TR string
                        02  1C7E
            0000000F 00000001   1C81            .LONG   1,15    ; 1 , 15 limits on input
                        88  1C89                .BYTE   Pd$_Store       ; Indicate store operation
                      0032  1C8A                .WORD   PX780$B_TR                ; Byte PX780$B_TR to data
                        00  1C8C                .BYTE   0               ; 0 PX780$B_TR to data
                        08  1C8D                .BYTE   8               ; 8 of data field
                        88  1C8E                .BYTE   Pd$_Store       ; Indicate store operation
                      0018  1C8F                .WORD   HP$A_DEVICE               ; Byte HP$A_DEVICE to data
                        0D  1C91                .BYTE   13              ; 13 HP$A_DEVICE to data
                        04  1C92                .BYTE   4               ; 4 of data field
                        88  1C93                .BYTE   Pd$_Store       ; Indicate store operation
                      0024  1C94                .WORD   HP$W_VECTOR               ; Byte HP$W_VECTOR to data
                        02  1C96                .BYTE   2               ; 2 HP$W_VECTOR to data
                        04  1C97                .BYTE   4               ; 4 of data field
                        82  1C98                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 42 00'   1C99                .ASCIC  "BR"    ; BR string
                        02  1C99
            00000007 00000004   1C9C            .LONG   4,7     ; 4 , 7 limits on input
                        88  1CA4                .BYTE   Pd$_Store       ; Indicate store operation
                      0033  1CA5                .WORD   PX780$B_BR                ; Byte PX780$B_BR to data
                        00  1CA7                .BYTE   0               ; 0 PX780$B_BR to data
                        08  1CA8                .BYTE   8               ; 8 of data field
                        88  1CA9                .BYTE   Pd$_Store       ; Indicate store operation
                      0024  1CAA                .WORD   HP$W_VECTOR               ; Byte HP$W_VECTOR to data
                        06  1CAC                .BYTE   6               ; 6 HP$W_VECTOR to data
                        02  1CAD                .BYTE   2               ; 2 of data field
                        82  1CAE                .BYTE   Pd$_Decimal     ; Indicate scan decimal
             65 64 6F 4E 00'   1CAF             .ASCIC  "Node"  ; Node string
                        04  1CAF
            000000FF 00000000   1CB4            .LONG   0,255   ; 0 , 255 limits on input
                        88  1CBC                .BYTE   Pd$_Store       ; Indicate store operation
                      0034  1CBD                .WORD   PX780$B_NODE               ; Byte PX780$B_NODE to data
                        00  1CBF                .BYTE   0               ; 0 PX780$B_NODE to data
                        08  1CC0                .BYTE   8               ; 8 of data field
                        86  1CC1                .BYTE   Pd$_Literal     ; Indicate literal
                  00000006  1CC2                .LONG   6               ; Constant
                        88  1CC6                .BYTE   Pd$_Store       ; Indicate store operation
                      0018  1CC7                .WORD   HP$A_DEVICE               ; Byte HP$A_DEVICE to data
                        1C  1CC9                .BYTE   28              ; 28 HP$A_DEVICE to data
                        04  1CCA                .BYTE   4               ; 4 of data field
                        86  1CCB                .BYTE   Pd$_Literal     ; Indicate literal
                  00000001  1CCC                .LONG   1               ; Constant
                        88  1CD0                .BYTE   Pd$_Store       ; Indicate store operation
                      0024  1CD1                .WORD   HP$W_VECTOR               ; Byte HP$W_VECTOR to data
                        08  1CD3                .BYTE   8               ; 8 HP$W_VECTOR to data
                        01  1CD4                .BYTE   1               ; 1 of data field
                        81  1CD5                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                            1CD6    328 R80:    $DS_R80                         ;                       [02]
                            1CD6                .SAVE   LOCAL_BLOCK
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                    1CD6                .PSECT  $ABS$,ABS
         00000032   0050                .=HP$A_DEPENDENT
                    0032                .IIF    NB,R80$K_LEN,   R80$K_LEN:
               00001CD6                .RESTORE
      30 38 52 00' 1CD6                .ASCIC  "R80"   ; R80 name
               03   1CD6
               32   1CDA                .BYTE   R80$K_LEN                ; R80$K_LEN of resultant P-table
               08   1CDB                .BYTE   8                ; Maximum unit number                        ;G:65
             0000   1CDC                .WORD   ^A""    ; Two character mnemonic for QIO R80
               80   1CDE                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
               8D   1CDF                .Byte   Pd$_Name         ; Directive op-code
               1B   1CE0                .Byte   Ptd$M_EndDevice          ; Enforced DQ codes
         51 44 00' 1CE1                .Ascic  "DQ"    ; Enforced device name prefix
               02   1CE1
               86   1CE4                .BYTE   Pd$_Literal      ; Indicate literal
         00000001   1CE5                .LONG   HP$M_ALLOC               ; Constant
               88   1CE9                .BYTE   Pd$_Store        ; Indicate store operation
             000A   1CEA                .WORD   HP$B_FLAGS               ; Byte HP$B_FLAGS to data
               00   1CEC                .BYTE   0                ; 0 HP$B_FLAGS to data
               08   1CED                .BYTE   8                ; 8 of data field
               81   1CEE                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                    1CEF   329 RA60:    $DS_RA60
                    1CEF                .SAVE   LOCAL_BLOCK
                    1CEF                .PSECT  $ABS$,ABS
         00000032   0050                .=HP$A_DEPENDENT
                    0032                .IIF    NB,HP$K_RA60_LEN,       HP$K_RA60_LEN:
                    0032                .IIF    NB,RA60$K_LEN,  RA60$K_LEN:
               00001CEF                .RESTORE
   30 36 41 52 00' 1CEF                .ASCIC  "RA60"  ; RA60 name
               04   1CEF
               32   1CF4                .BYTE   RA60$K_LEN               ; RA60$K_LEN of resultant P-table
               FF   1CF5                .BYTE   255              ; Maximum unit number                        ;G:65
             0000   1CF6                .WORD   ^A""    ; Two character mnemonic for QIO RA60
               80   1CF8                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
               8D   1CF9                .Byte   Pd$_Name         ; Directive op-code
               13   1CFA                .Byte   Ptd$M_UNIT!PTD$M_CONTROLLER!PTD$M_INHERIT_CON            ; Enforced D
         4A 44 00' 1CFB                .Ascic  "DJ"    ; Enforced device name prefix
               02   1CFB
               86   1CFE                .BYTE   Pd$_Literal      ; Indicate literal
         00000001   1CFF                .LONG   HP$M_ALLOC               ; Constant
               88   1D03                .BYTE   Pd$_Store        ; Indicate store operation
             000A   1D04                .WORD   HP$B_FLAGS               ; Byte HP$B_FLAGS to data
               00   1D06                .BYTE   0                ; 0 HP$B_FLAGS to data
               08   1D07                .BYTE   8                ; 8 of data field
               81   1D08                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                    1D09   330 RA70:    $DS_RA70                         ;               [36]                 ;G:5
                    1D09                .SAVE   LOCAL_BLOCK
                    1D09                .PSECT  $ABS$,ABS
         00000032   0050                .=HP$A_DEPENDENT
                    0032                .IIF    NB,HP$K_RA70_LEN,       HP$K_RA70_LEN:
                    0032                .IIF    NB,RA70$K_LEN,  RA70$K_LEN:
               00001D09                .RESTORE
   30 37 41 52 00' 1D09                .ASCIC  "RA70"  ; RA70 name
               04   1D09
               32   1D0E                .BYTE   RA70$K_LEN               ; RA70$K_LEN of resultant P-table
               FF   1D0F                .BYTE   255              ; Maximum unit number                        ;G:65
             0000   1D10                .WORD   ^A""    ; Two character mnemonic for QIO RA70
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                      80  1D12                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                      8D  1D13                .Byte   Pd$_Name         ; Directive op-code
                      1B  1D14                .Byte   PTD$M_ENDDEVICE          ; Enforced DU codes
                55 44 00' 1D15                .Ascic  "DU"     ; Enforced device name prefix
                      02  1D15
                      86  1D18                .BYTE   Pd$_Literal      ; Indicate literal
                00000001  1D19                .LONG   HP$M_ALLOC               ; Constant
                      88  1D1D                .BYTE   Pd$_Store        ; Indicate store operation
                    000A  1D1E                .WORD   HP$B_FLAGS               ; Byte HP$B_FLAGS to data
                      00  1D20                .BYTE   0                ; 0 HP$B_FLAGS to data
                      08  1D21                .BYTE   8                ; 8 of data field
                      81  1D22                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          1D23    331 RA80:   $DS_RA80                         ;               [02]
                          1D23                .SAVE   LOCAL_BLOCK
                          1D23                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RA80_LEN,       HP$K_RA80_LEN:
                          0032                .IIF    NB,RA80$K_LEN,  RA80$K_LEN:
                      0000 1D23               .RESTORE
             30 38 41 52 00' 1D23             .ASCIC  "RA80"   ; RA80 name
                      04  1D23
                      32  1D28                .BYTE   RA80$K_LEN               ; RA80$K_LEN of resultant P-table
                      FF  1D29                .BYTE   255              ; Maximum unit number                          ;G:65
                    0000  1D2A                .WORD   ^A""     ; Two character mnemonic for QIO RA80
                      80  1D2C                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                      8D  1D2D                .Byte   Pd$_Name         ; Directive op-code
                      1B  1D2E                .Byte   PTD$M_ENDDEVICE          ; Enforced DU codes
                55 44 00' 1D2F                .Ascic  "DU"     ; Enforced device name prefix
                      02  1D2F
                      86  1D32                .BYTE   Pd$_Literal      ; Indicate literal
                00000001  1D33                .LONG   HP$M_ALLOC               ; Constant
                      88  1D37                .BYTE   Pd$_Store        ; Indicate store operation
                    000A  1D38                .WORD   HP$B_FLAGS               ; Byte HP$B_FLAGS to data
                      00  1D3A                .BYTE   0                ; 0 HP$B_FLAGS to data
                      08  1D3B                .BYTE   8                ; 8 of data field
                      81  1D3C                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          1D3D    332 RA81:   $DS_RA81
                          1D3D                .SAVE   LOCAL_BLOCK
                          1D3D                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RA81_LEN,       HP$K_RA81_LEN:
                          0032                .IIF    NB,RA81$K_LEN,  RA81$K_LEN:
                      0000 1D3D               .RESTORE
             31 38 41 52 00' 1D3D             .ASCIC  "RA81"   ; RA81 name
                      04  1D3D
                      32  1D42                .BYTE   RA81$K_LEN               ; RA81$K_LEN of resultant P-table
                      FF  1D43                .BYTE   255              ; Maximum unit number                          ;G:65
                    0000  1D44                .WORD   ^A""     ; Two character mnemonic for QIO RA81
                      80  1D46                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                      8D  1D47                .Byte   Pd$_Name         ; Directive op-code
                      1B  1D48                .Byte   PTD$M_ENDDEVICE          ; Enforced DU codes
                55 44 00' 1D49                .Ascic  "DU"     ; Enforced device name prefix
                      02  1D49
                      86  1D4C                .BYTE   Pd$_Literal      ; Indicate literal
                00000001  1D4D                .LONG   HP$M_ALLOC               ; Constant
                      88  1D51                .BYTE   Pd$_Store        ; Indicate store operation
                    000A  1D52                .WORD   HP$B_FLAGS               ; Byte HP$B_FLAGS to data
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                      00  1D54                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  1D55                .BYTE   8                       ; 8 of data field
                      81  1D56                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          1D57    333 RA82:    $DS_RA82                                ;                  [33]
                          1D57                .SAVE   LOCAL_BLOCK
                          1D57                .PSECT  $ABS$,ABS
                  00000032  0050                .=HP$A_DEPENDENT
                            0032                .IIF    NB,HP$K_RA82_LEN,       HP$K_RA82_LEN:
                            0032                .IIF    NB,RA82$K_LEN,  RA82$K_LEN:
                      0000D57                   .RESTORE
               32 38 41 52 00' 1D57             .ASCIC  "RA82"  ; RA82 name
                      04  1D57
                      32  1D5C                .BYTE   RA82$K_LEN              ; RA82$K_LEN of resultant P-table
                      FF  1D5D                .BYTE   255                     ; Maximum unit number                   ;G:65
                    0000  1D5E                .WORD   ^A""    ; Two character mnemonic for QIO RA82
                      80  1D60                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  1D61                .Byte   Pd$_Name                ; Directive op-code
                      1B  1D62                .Byte   PTD$M_ENDDEVICE         ; Enforced DU codes
                  55 44 00' 1D63                .Ascic  "DU"    ; Enforced device name prefix
                      02  1D63
                      86  1D66                .BYTE   Pd$_Literal             ; Indicate literal
                  00000001  1D67                .LONG   HP$M_ALLOC                      ; Constant
                      88  1D6B                .BYTE   Pd$_Store               ; Indicate store operation
                    000A  1D6C                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                      00  1D6E                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  1D6F                .BYTE   8                       ; 8 of data field
                      81  1D70                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          1D71    334 RA90:    $DS_RA90                                                        ;G:7
                          1D71                .SAVE   LOCAL_BLOCK
                          1D71                .PSECT  $ABS$,ABS
                  00000032  0050                .=HP$A_DEPENDENT
                            0032                .IIF    NB,HP$K_RA90_LEN,       HP$K_RA90_LEN:
                            0032                .IIF    NB,RA90$K_LEN,  RA90$K_LEN:
                      0000D71                   .RESTORE
               30 39 41 52 00' 1D71             .ASCIC  "RA90"  ; RA90 name
                      04  1D71
                      32  1D76                .BYTE   RA90$K_LEN              ; RA90$K_LEN of resultant P-table
                      FF  1D77                .BYTE   255             ; Maximum unit number                   ;G:65
                    0000  1D78                .WORD   ^A""    ; Two character mnemonic for QIO RA90
                      80  1D7A                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  1D7B                .Byte   Pd$_Name                ; Directive op-code
                      1B  1D7C                .Byte   PTD$M_ENDDEVICE         ; Enforced DU codes
                  55 44 00' 1D7D                .Ascic  "DU"    ; Enforced device name prefix
                      02  1D7D
                      86  1D80                .BYTE   Pd$_Literal             ; Indicate literal
                  00000001  1D81                .LONG   HP$M_ALLOC                      ; Constant
                      88  1D85                .BYTE   Pd$_Store               ; Indicate store operation
                    000A  1D86                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                      00  1D88                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  1D89                .BYTE   8                       ; 8 of data field
                      81  1D8A                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          1D8B    335 RB730:   $DS_RB730                               ;                  [02]
                          1D8B                .SAVE   LOCAL_BLOCK
                          1D8B                .PSECT  $ABS$,ABS
                  00000032  0050                .=HP$A_DEPENDENT
                            0032                .IIF    NB,HP$L_RB730_CSR,      HP$L_RB730_CSR:
                            0032                .IIF    NB,RB730$L_CSR, RB730$L_CSR:
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                    00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                              0036                .IIF    NB,HP$B_RB730_BR,       HP$B_RB730_BR:
                              0036                .IIF    NB,RB730$B_BR,  RB730$B_BR:
                    00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                              0037                .IIF    NB,HP$K_RB730_LEN,      HP$K_RB730_LEN:
                              0037                .IIF    NB,RB730$K_LEN, RB730$K_LEN:
                       00001D8B                   .RESTORE
                 30 33 37 42 52 00' 1D8B          .ASCIC  "RB730" ; RB730 name
                          05  1D8B
                          37  1D91                .BYTE   RB730$K_LEN             ; RB730$K_LEN of resultant P-table
                          00  1D92                .BYTE   0                       ; Maximum unit number                   ;G:65
                        5144  1D93                .WORD   ^A"DQ"  ; Two character mnemonic for QIO RB730 DQ
                          80  1D95                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  1D96                .Byte   Pd$_Name        ; Directive op-code
                          02  1D97                .Byte   Ptd$M_Controller                ; Enforced DQ codes
                    51 44 00' 1D98                .Ascic  "DQ"    ; Enforced device name prefix
                          02  1D98
                          86  1D9B                .BYTE   Pd$_Literal     ; Indicate literal
                    00F26200  1D9C                .LONG   ^xF26200                ; Constant
                          88  1DA0                .BYTE   Pd$_Store       ; Indicate store operation
                        0018  1DA1                .WORD   hp$a_device             ; Byte hp$a_device to data
                          00  1DA3                .BYTE   0                       ; 0 hp$a_device to data
                          1D  1DA4                .BYTE   29                      ; 29 of data field
                          86  1DA5                .BYTE   Pd$_Literal     ; Indicate literal
                    000000A8  1DA6                .LONG   ^o250           ; Constant
                          88  1DAA                .BYTE   Pd$_Store       ; Indicate store operation
                        0024  1DAB                .WORD   hp$w_vector             ; Byte hp$w_vector to data
                          00  1DAD                .BYTE   0                       ; 0 hp$w_vector to data
                          09  1DAE                .BYTE   9                       ; 9 of data field
                          86  1DAF                .BYTE   Pd$_Literal     ; Indicate literal
                    00000005  1DB0                .LONG   5                       ; Constant
                          88  1DB4                .BYTE   Pd$_Store       ; Indicate store operation
                        0036  1DB5                .WORD   rb730$b_br              ; Byte rb730$b_br to data
                          00  1DB7                .BYTE   0                       ; 0 rb730$b_br to data
                          08  1DB8                .BYTE   8                       ; 8 of data field
                          81  1DB9                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                              1DBA    336 RCF25:  $DS_RCF25                       ;                       [12][22]
                              1DBA                .SAVE   LOCAL_BLOCK
                              1DBA                .PSECT  $ABS$,ABS
                    00000032  0050                .=HP$A_DEPENDENT
                              0032                .IIF    NB,HP$K_RCF25_LEN,      HP$K_RCF25_LEN:
                              0032                .IIF    NB,RCF25$K_LEN, RCF25$K_LEN:
                       00001DBA                   .RESTORE
                 35 32 46 43 52 00' 1DBA          .ASCIC  "RCF25" ; RCF25 name
                          05  1DBA
                          32  1DC0                .BYTE   RCF25$K_LEN             ; RCF25$K_LEN of resultant P-table
                          FF  1DC1                .BYTE   255                     ; Maximum unit number                   ;G:65
                        0000  1DC2                .WORD   ^A""    ; Two character mnemonic for QIO RCF25
                          80  1DC4                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  1DC5                .Byte   Pd$_Name        ; Directive op-code
                          1B  1DC6                .Byte   Ptd$M_EndDevice         ; Enforced DA codes
                    41 44 00' 1DC7                .Ascic  "DA"    ; Enforced device name prefix
                          02  1DC7
                          86  1DCA                .BYTE   Pd$_Literal     ; Indicate literal
                    00000001  1DCB                .LONG   HP$M_ALLOC              ; Constant
                          88  1DCF                .BYTE   Pd$_Store       ; Indicate store operation
                        000A  1DD0                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
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                      00  1DD2                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  1DD3                .BYTE   8               ; 8 of data field
                      81  1DD4                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1DD5    337 RC25:    $DS_RC25                        ;               [11]
                          1DD5                .SAVE   LOCAL_BLOCK
                          1DD5                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RC25_LEN,       HP$K_RC25_LEN:
                          0032                .IIF    NB,RC25$K_LEN,  RC25$K_LEN:
                      00001DD5                .RESTORE
               35 32 43 52 00' 1DD5           .ASCIC  "RC25"  ; RC25 name
                      04  1DD5
                      32  1DDA                .BYTE   RC25$K_LEN              ; RC25$K_LEN of resultant P-table
                      FF  1DDB                .BYTE   255             ; Maximum unit number                   ;G:65
                    0000  1DDC                .WORD   ^A""    ; Two character mnemonic for QIO RC25
                      80  1DDE                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1DDF                .Byte   Pd$_Name        ; Directive op-code
                      1B  1DE0                .Byte   Ptd$M_EndDevice         ; Enforced DA codes
                  41 44 00' 1DE1              .Ascic  "DA"    ; Enforced device name prefix
                      02  1DE1
                      86  1DE4                .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  1DE5                .LONG   HP$M_ALLOC              ; Constant
                      88  1DE9                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  1DEA                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  1DEC                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  1DED                .BYTE   8               ; 8 of data field
                      81  1DEE                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1DEF    338 RD51:    $DS_RD51                        ;               [19]
                          1DEF                .SAVE   LOCAL_BLOCK
                          1DEF                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,RD51$K_LEN,  RD51$K_LEN:
                      00001DEF                .RESTORE
               31 35 44 52 00' 1DEF           .ASCIC  "RD51"  ; RD51 name
                      04  1DEF
                      32  1DF4                .BYTE   RD51$K_LEN              ; RD51$K_LEN of resultant P-table
                      FF  1DF5                .BYTE   255             ; Maximum unit number                   ;G:65
                    0000  1DF6                .WORD   ^A""    ; Two character mnemonic for QIO RD51
                      80  1DF8                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1DF9                .Byte   Pd$_Name        ; Directive op-code
                      1B  1DFA                .Byte   Ptd$M_EndDevice         ; Enforced DU codes
                  55 44 00' 1DFB              .Ascic  "DU"    ; Enforced device name prefix
                      02  1DFB
                      86  1DFE                .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  1DFF                .LONG   HP$M_ALLOC              ; Constant
                      88  1E03                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  1E04                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  1E06                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  1E07                .BYTE   8               ; 8 of data field
                      81  1E08                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1E09    339 RD52:    $DS_RD52                        ;               [19]
                          1E09                .SAVE   LOCAL_BLOCK
                          1E09                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,RD52$K_LEN,  RD52$K_LEN:
                      00001E09                .RESTORE
               32 35 44 52 00' 1E09           .ASCIC  "RD52"  ; RD52 name
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                      04  1E09
                      32  1E0E                .BYTE   RD52$K_LEN                ; RD52$K_LEN of resultant P-table
                      FF  1E0F                .BYTE   255             ; Maximum unit number                           ;G:65
                    0000  1E10                .WORD   ^A""    ; Two character mnemonic for QIO RD52
                      80  1E12                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1E13                .Byte   Pd$_Name        ; Directive op-code
                      1B  1E14                .Byte   Ptd$M_EndDevice         ; Enforced DU codes
               55 44 00'  1E15                .Ascic  "DU"    ; Enforced device name prefix
                      02  1E15
                      86  1E18                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  1E19                .LONG   HP$M_ALLOC              ; Constant
                      88  1E1D                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  1E1E                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  1E20                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  1E21                .BYTE   8               ; 8 of data field
                      81  1E22                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1E23    340 RH750:  $DS_RH750
                          1E23                .SAVE   LOCAL_BLOCK
                          1E23                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$B_RH750_BR,       HP$B_RH750_BR:
                          0032                .IIF    NB,RH750$B_BR,  RH750$B_BR:
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,HP$K_RH750_LEN,      HP$K_RH750_LEN:
                          0033                .IIF    NB,RH750$K_LEN, RH750$K_LEN:
                00001E23                      .RESTORE
         30 35 37 48 52 00' 1E23              .ASCIC  "RH750" ; RH750 name
                      05  1E23
                      33  1E29                .BYTE   RH750$K_LEN             ; RH750$K_LEN of resultant P-table
                      08  1E2A                .BYTE   8               ; Maximum unit number                           ;G:65
                    0000  1E2B                .WORD   ^A""    ; Two character mnemonic for QIO RH750
                      80  1E2D                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1E2E                .Byte   Pd$_Name        ; Directive op-code
                      01  1E2F                .Byte   Ptd$M_Unit              ; Enforced RH codes
               48 52 00'  1E30                .Ascic  "RH"    ; Enforced device name prefix
                      02  1E30
                      86  1E33                .BYTE   Pd$_Literal     ; Indicate literal
                40F28000  1E34                .LONG   ^X40F28000              ; Constant
                      88  1E38                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  1E39                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  1E3B                .BYTE   0               ; 0 HP$A_DEVICE to data
                      20  1E3C                .BYTE   32              ; 32 of data field
                      87  1E3D                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    000B  1E3E                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                      00  1E40                .BYTE   0               ; 0 HP$B_DRIVE to data
                      08  1E41                .BYTE   8               ; 8 of data field
                      88  1E42                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  1E43                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      0D  1E45                .BYTE   13              ; 13 HP$A_DEVICE to data
                      02  1E46                .BYTE   2               ; 2 of data field
                      87  1E47                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  1E48                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      0D  1E4A                .BYTE   13              ; 13 HP$A_DEVICE to data
                      04  1E4B                .BYTE   4               ; 4 of data field
                      88  1E4C                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  1E4D                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      02  1E4F                .BYTE   2               ; 2 HP$W_VECTOR to data
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                      04  1E50                .BYTE   4                   ; 4 of data field
                      82  1E51                .BYTE   Pd$_Decimal         ; Indicate scan decimal
                 52 42 00' 1E52                .ASCIC  "BR"        ; BR string
                      02  1E52
             00000007 00000004  1E55           .LONG   4,7         ; 4 , 7 limits on input
                      88  1E5D                .BYTE   Pd$_Store           ; Indicate store operation
                    0032  1E5E                .WORD   RH750$B_BR                  ; Byte RH750$B_BR to data
                      00  1E60                .BYTE   0                   ; 0 RH750$B_BR to data
                      08  1E61                .BYTE   8                   ; 8 of data field
                      88  1E62                .BYTE   Pd$_Store           ; Indicate store operation
                    0024  1E63                .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                      06  1E65                .BYTE   6                   ; 6 HP$W_VECTOR to data
                      03  1E66                .BYTE   3                   ; 3 of data field
                      87  1E67                .BYTE   Pd$_Fetch           ; Indicate fetch operation
                    0018  1E68                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                      00  1E6A                .BYTE   0                   ; 0 HP$A_DEVICE to data
                      20  1E6B                .BYTE   32                  ; 32 of data field
                      88  1E6C                .BYTE   Pd$_Store           ; Indicate store operation
                    001C  1E6D                .WORD   HP$A_DVA                    ; Byte HP$A_DVA to data
                      00  1E6F                .BYTE   0                   ; 0 HP$A_DVA to data
                      20  1E70                .BYTE   32                  ; 32 of data field
                      86  1E71                .BYTE   Pd$_Literal         ; Indicate literal
                00000001  1E72                .LONG   1                   ; Constant
                      88  1E76                .BYTE   Pd$_Store           ; Indicate store operation
                    001C  1E77                .WORD   HP$A_DVA                    ; Byte HP$A_DVA to data
                      0A  1E79                .BYTE   10                  ; 10 HP$A_DVA to data
                      01  1E7A                .BYTE   1                   ; 1 of data field
                      81  1E7B                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                          1E7C    341 RH780:  $DS_RH780
                          1E7C                .SAVE   LOCAL_BLOCK
                          1E7C                .PSECT  $ABS$,ABS
                    00000032  0050            .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$B_RH780_TR,       HP$B_RH780_TR:
                          0032                .IIF    NB,RH780$B_TR,  RH780$B_TR:
                    00000033  0032            .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,HP$B_RH780_BR,       HP$B_RH780_BR:
                          0033                .IIF    NB,RH780$B_BR,  RH780$B_BR:
                    00000034  0033            .IIF    NB,.BLKB,       .BLKB   1
                          0034                .IIF    NB,HP$K_RH780_LEN,      HP$K_RH780_LEN:
                          0034                .IIF    NB,RH780$K_LEN, RH780$K_LEN:
                      00001E7C                .RESTORE
          30 38 37 48 52 00' 1E7C             .ASCIC  "RH780" ; RH780 name
                      05  1E7C
                      34  1E82                .BYTE   RH780$K_LEN                 ; RH780$K_LEN of resultant P-table
                      08  1E83                .BYTE   8                   ; Maximum unit number                       ;G:65
                    0000  1E84                .WORD   ^A""        ; Two character mnemonic for QIO RH780
                      80  1E86                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                      8D  1E87                .Byte   Pd$_Name            ; Directive op-code
                      01  1E88                .Byte   Ptd$M_Unit                  ; Enforced RH codes
                 48 52 00' 1E89             .Ascic  "RH"        ; Enforced device name prefix
                      02  1E89
                      82  1E8C                .BYTE   Pd$_Decimal         ; Indicate scan decimal
                 52 54 00' 1E8D             .ASCIC  "TR"        ; TR string
                      02  1E8D
             0000000F 00000001  1E90           .LONG   1,15        ; 1 , 15 limits on input
                      88  1E98                .BYTE   Pd$_Store           ; Indicate store operation
                    0032  1E99                .WORD   RH780$B_TR                  ; Byte RH780$B_TR to data
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                      00  1E9B                .BYTE   0               ; 0 RH780$B_TR to data
                      08  1E9C                .BYTE   8               ; 8 of data field
                      88  1E9D                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  1E9E                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      0D  1EA0                .BYTE   13              ; 13 HP$A_DEVICE to data
                      04  1EA1                .BYTE   4               ; 4 of data field
                      88  1EA2                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  1EA3                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      02  1EA5                .BYTE   2               ; 2 HP$W_VECTOR to data
                      04  1EA6                .BYTE   4               ; 4 of data field
                      82  1EA7                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                 52 42 00' 1EA8                .ASCIC  "BR"    ; BR string
                      02  1EA8
             00000007 00000004  1EAB          .LONG   4,7     ; 4 , 7 limits on input
                      88  1EB3                .BYTE   Pd$_Store       ; Indicate store operation
                    0033  1EB4                .WORD   RH780$B_BR              ; Byte RH780$B_BR to data
                      00  1EB6                .BYTE   0               ; 0 RH780$B_BR to data
                      08  1EB7                .BYTE   8               ; 8 of data field
                      88  1EB8                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  1EB9                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      06  1EBB                .BYTE   6               ; 6 HP$W_VECTOR to data
                      02  1EBC                .BYTE   2               ; 2 of data field
                      86  1EBD                .BYTE   Pd$_Literal     ; Indicate literal
                00000006  1EBE                .LONG   6               ; Constant
                      88  1EC2                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  1EC3                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      1C  1EC5                .BYTE   28              ; 28 HP$A_DEVICE to data
                      04  1EC6                .BYTE   4               ; 4 of data field
                      87  1EC7                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  1EC8                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  1ECA                .BYTE   0               ; 0 HP$A_DEVICE to data
                      20  1ECB                .BYTE   32              ; 32 of data field
                      88  1ECC                .BYTE   Pd$_Store       ; Indicate store operation
                    001C  1ECD                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      00  1ECF                .BYTE   0               ; 0 HP$A_DVA to data
                      20  1ED0                .BYTE   32              ; 32 of data field
                      86  1ED1                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  1ED2                .LONG   1               ; Constant
                      88  1ED6                .BYTE   Pd$_Store       ; Indicate store operation
                    001C  1ED7                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      0A  1ED9                .BYTE   10              ; 10 HP$A_DVA to data
                      01  1EDA                .BYTE   1               ; 1 of data field
                      88  1EDB                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  1EDC                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      08  1EDE                .BYTE   8               ; 8 HP$W_VECTOR to data
                      01  1EDF                .BYTE   1               ; 1 of data field
                      81  1EE0                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1EE1    342 RL01:    $DS_RL01
                          1EE1                .SAVE   LOCAL_BLOCK
                          1EE1                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RL01_LEN,       HP$K_RL01_LEN:
                          0032                .IIF    NB,RL01$K_LEN,  RL01$K_LEN:
                      0000 1EE1               .RESTORE
           31 30 4C 52 00' 1EE1               .ASCIC  "RL01"  ; RL01 name
                      04  1EE1
                      32  1EE6                .BYTE   RL01$K_LEN              ; RL01$K_LEN of resultant P-table
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                08  1EE7                .BYTE   8                   ; Maximum unit number                        ;G:65
              0000  1EE8                .WORD   ^A""      ; Two character mnemonic for QIO RL01
                80  1EEA                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                8D  1EEB                .Byte   Pd$_Name            ; Directive op-code
                1B  1EEC                .Byte   Ptd$M_EndDevice             ; Enforced DL codes
          4C 44 00' 1EED                .Ascic  "DL"      ; Enforced device name prefix
                02  1EED
                86  1EF0                .BYTE   Pd$_Literal         ; Indicate literal
          00000001  1EF1                .LONG   HP$M_ALLOC                  ; Constant
                88  1EF5                .BYTE   Pd$_Store           ; Indicate store operation
              000A  1EF6                .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                00  1EF8                .BYTE   0                   ; 0 HP$B_FLAGS to data
                08  1EF9                .BYTE   8                   ; 8 of data field
                81  1EFA                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                    1EFB    343 RL02:   $DS_RL02
                    1EFB                .SAVE   LOCAL_BLOCK
                    1EFB                .PSECT  $ABS$,ABS
          00000032  0050                .=HP$A_DEPENDENT
                    0032                .IIF    NB,HP$K_RL02_LEN,       HP$K_RL02_LEN:
                    0032                .IIF    NB,RL02$K_LEN,  RL02$K_LEN:
                00001EFB                .RESTORE
    32 30 4C 52 00' 1EFB                .ASCIC  "RL02"  ; RL02 name
                04  1EFB
                32  1F00                .BYTE   RL02$K_LEN                  ; RL02$K_LEN of resultant P-table
                08  1F01                .BYTE   8                   ; Maximum unit number                        ;G:65
              0000  1F02                .WORD   ^A""      ; Two character mnemonic for QIO RL02
                80  1F04                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                8D  1F05                .Byte   Pd$_Name            ; Directive op-code
                1B  1F06                .Byte   Ptd$M_EndDevice             ; Enforced DL codes
          4C 44 00' 1F07                .Ascic  "DL"      ; Enforced device name prefix
                02  1F07
                86  1F0A                .BYTE   Pd$_Literal         ; Indicate literal
          00000001  1F0B                .LONG   HP$M_ALLOC                  ; Constant
                88  1F0F                .BYTE   Pd$_Store           ; Indicate store operation
              000A  1F10                .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                00  1F12                .BYTE   0                   ; 0 HP$B_FLAGS to data
                08  1F13                .BYTE   8                   ; 8 of data field
                81  1F14                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                    1F15    344 RL11:   $DS_RL11
                    1F15                .SAVE   LOCAL_BLOCK
                    1F15                .PSECT  $ABS$,ABS
          00000032  0050                .=HP$A_DEPENDENT
                    0032                .IIF    NB,HP$L_RL11_CSR,       HP$L_RL11_CSR:
                    0032                .IIF    NB,RL11$L_CSR,  RL11$L_CSR:
          00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                    0036                .IIF    NB,HP$B_RL11_BR,        HP$B_RL11_BR:
                    0036                .IIF    NB,RL11$B_BR,   RL11$B_BR:
          00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                    0037                .IIF    NB,HP$K_RL11_LEN,       HP$K_RL11_LEN:
                    0037                .IIF    NB,RL11$K_LEN,  RL11$K_LEN:
                00001F15                .RESTORE
    31 31 4C 52 00' 1F15                .ASCIC  "RL11"  ; RL11 name
                04  1F15
                37  1F1A                .BYTE   RL11$K_LEN                  ; RL11$K_LEN of resultant P-table
                00  1F1B                .BYTE   0                   ; Maximum unit number                        ;G:65
              4C44  1F1C                .WORD   ^A"DL"  ; Two character mnemonic for QIO RL11 DL
                80  1F1E                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
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                      8D  1F1F                .Byte   Pd$_Name         ; Directive op-code
                      02  1F20                .Byte   Ptd$M_Controller                  ; Enforced DL codes
                 4C 44 00' 1F21                .Ascic  "DL"     ; Enforced device name prefix
                      02  1F21
                      83  1F24                .BYTE   Pd$_Octal        ; Indicate scan octal
                52 53 43 00' 1F25             .ASCIC  "CSR"    ; CSR string
                      03  1F25
            0003FFFE 0003E000  1F29           .LONG   ^O760000,^O777776        ; 760000 , 777776 limits on input
                      88  1F31                .BYTE   Pd$_Store        ; Indicate store operation
                    0032  1F32                .WORD   RL11$L_CSR                ; Byte RL11$L_CSR to data
                      00  1F34                .BYTE   0                ; 0 RL11$L_CSR to data
                      20  1F35                .BYTE   32               ; 32 of data field
                      88  1F36                .BYTE   Pd$_Store        ; Indicate store operation
                    0018  1F37                .WORD   HP$A_DEVICE               ; Byte HP$A_DEVICE to data
                      00  1F39                .BYTE   0                ; 0 HP$A_DEVICE to data
                      12  1F3A                .BYTE   18               ; 18 of data field
                      83  1F3B                .BYTE   Pd$_Octal        ; Indicate scan octal
         52 4F 54 43 45 56 00' 1F3C           .ASCIC  "VECTOR"         ; VECTOR string
                      06  1F3C
            000001FE 00000002  1F43           .LONG   ^O2,^O776        ; 2 , 776 limits on input
                      88  1F4B                .BYTE   Pd$_Store        ; Indicate store operation
                    0024  1F4C                .WORD   HP$W_VECTOR               ; Byte HP$W_VECTOR to data
                      00  1F4E                .BYTE   0                ; 0 HP$W_VECTOR to data
                      09  1F4F                .BYTE   9                ; 9 of data field
                      82  1F50                .BYTE   Pd$_Decimal      ; Indicate scan decimal
                52 42 00' 1F51                .ASCIC  "BR"     ; BR string
                      02  1F51
         00000007 00000004  1F54              .LONG   4,7      ; 4 , 7 limits on input
                      88  1F5C                .BYTE   Pd$_Store        ; Indicate store operation
                    0036  1F5D                .WORD   RL11$B_BR                 ; Byte RL11$B_BR to data
                      00  1F5F                .BYTE   0                ; 0 RL11$B_BR to data
                      08  1F60                .BYTE   8                ; 8 of data field
                      81  1F61                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          1F62    345 RK06:    $DS_RK06
                          1F62                .SAVE   LOCAL_BLOCK
                          1F62                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RK06_LEN,        HP$K_RK06_LEN:
                          0032                .IIF    NB,RK06$K_LEN,  RK06$K_LEN:
                      0000 1F62                .RESTORE
            36 30 4B 52 00' 1F62              .ASCIC  "RK06"   ; RK06 name
                      04  1F62
                      32  1F67                .BYTE   RK06$K_LEN               ; RK06$K_LEN of resultant P-table
                      08  1F68                .BYTE   8                ; Maximum unit number                                  ;G:65
                    0000  1F69                .WORD   ^A""     ; Two character mnemonic for QIO RK06
                      80  1F6B                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                      8D  1F6C                .Byte   Pd$_Name         ; Directive op-code
                      1B  1F6D                .Byte   Ptd$M_EndDevice          ; Enforced DM codes
                 4D 44 00' 1F6E                .Ascic  "DM"     ; Enforced device name prefix
                      02  1F6E
                      86  1F71                .BYTE   Pd$_Literal      ; Indicate literal
                 00000001  1F72                .LONG   HP$M_ALLOC               ; Constant
                      88  1F76                .BYTE   Pd$_Store        ; Indicate store operation
                    000A  1F77                .WORD   HP$B_FLAGS                ; Byte HP$B_FLAGS to data
                      00  1F79                .BYTE   0                ; 0 HP$B_FLAGS to data
                      08  1F7A                .BYTE   8                ; 8 of data field
                      81  1F7B                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
```

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                          1F7C   346 RK07:   $DS_RK07
                          1F7C               .SAVE   LOCAL_BLOCK
                          1F7C               .PSECT  $ABS$,ABS
                 00000032 0050               .=HP$A_DEPENDENT
                          0032               .IIF    NB,HP$K_RK07_LEN,       HP$K_RK07_LEN:
                          0032               .IIF    NB,RK07$K_LEN,  RK07$K_LEN:
                 00001F7C                    .RESTORE
           37 30 4B 52 00' 1F7C               .ASCIC  "RK07"  ; RK07 name
                       04  1F7C
                       32  1F81               .BYTE   RK07$K_LEN              ; RK07$K_LEN of resultant P-table
                       08  1F82               .BYTE   8                       ; Maximum unit number                   ;G:65
                     0000  1F83               .WORD   ^A""    ; Two character mnemonic for QIO RK07
                       80  1F85               .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  1F86               .Byte   Pd$_Name        ; Directive op-code
                       1B  1F87               .Byte   Ptd$M_EndDevice         ; Enforced DM codes
                 4D 44 00' 1F88               .Ascic  "DM"    ; Enforced device name prefix
                       02  1F88
                       86  1F8B               .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  1F8C               .LONG   HP$M_ALLOC              ; Constant
                       88  1F90               .BYTE   Pd$_Store       ; Indicate store operation
                     000A  1F91               .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                       00  1F93               .BYTE   0                       ; 0 HP$B_FLAGS to data
                       08  1F94               .BYTE   8                       ; 8 of data field
                       81  1F95               .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1F96   347 RK611:   $DS_RK611
                          1F96               .SAVE   LOCAL_BLOCK
                          1F96               .PSECT  $ABS$,ABS
                 00000032 0050               .=HP$A_DEPENDENT
                          0032               .IIF    NB,HP$L_RK611_CSR,      HP$L_RK611_CSR:
                          0032               .IIF    NB,RK611$L_CSR, RK611$L_CSR:
                 00000036 0032               .IIF    NB,.BLKL,       .BLKL   1
                          0036               .IIF    NB,HP$B_RK611_BR,       HP$B_RK611_BR:
                          0036               .IIF    NB,RK611$B_BR,  RK611$B_BR:
                 00000037 0036               .IIF    NB,.BLKB,       .BLKB   1
                          0037               .IIF    NB,HP$K_RK611_LEN,      HP$K_RK611_LEN:
                          0037               .IIF    NB,RK611$K_LEN, RK611$K_LEN:
                 00001F96                    .RESTORE
     31 31 36 4B 52 00' 1F96               .ASCIC  "RK611" ; RK611 name
                       05  1F96
                       37  1F9C               .BYTE   RK611$K_LEN             ; RK611$K_LEN of resultant P-table
                       00  1F9D               .BYTE   0                       ; Maximum unit number                   ;G:65
                   4D44    1F9E               .WORD   ^A"DM"  ; Two character mnemonic for QIO RK611 DM
                       80  1FA0               .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  1FA1               .Byte   Pd$_Name        ; Directive op-code
                       02  1FA2               .Byte   Ptd$M_Controller                ; Enforced DM codes
                 4D 44 00' 1FA3               .Ascic  "DM"    ; Enforced device name prefix
                       02  1FA3
                       83  1FA6               .BYTE   Pd$_Octal       ; Indicate scan octal
           52 53 43 00' 1FA7               .ASCIC  "CSR"   ; CSR string
                       03  1FA7
     0003FFFE 0003E000  1FAB               .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                       88  1FB3               .BYTE   Pd$_Store       ; Indicate store operation
                   0032    1FB4               .WORD   RK611$L_CSR             ; Byte RK611$L_CSR to data
                       00  1FB6               .BYTE   0                       ; 0 RK611$L_CSR to data
                       20  1FB7               .BYTE   32                      ; 32 of data field
                       88  1FB8               .BYTE   Pd$_Store       ; Indicate store operation
                   0018    1FB9               .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
```

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                      00  1FBB                .BYTE   0               ; 0 HP$A_DEVICE to data
                      12  1FBC                .BYTE   18              ; 18 of data field
                      83  1FBD                .BYTE   Pd$_Octal       ; Indicate scan octal
          52 4F 54 43 45 56 00' 1FBE           .ASCIC  "VECTOR"        ; VECTOR string
                      06  1FBE
             000001FE 00000002  1FC5           .LONG   ^O2,^O776       ; 2 , 776 limits on input
                      88  1FCD                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  1FCE                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  1FD0                .BYTE   0               ; 0 HP$W_VECTOR to data
                      09  1FD1                .BYTE   9               ; 9 of data field
                      82  1FD2                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                 52 42 00' 1FD3               .ASCIC  "BR"    ; BR string
                      02  1FD3
             00000007 00000004  1FD6           .LONG   4,7     ; 4 , 7 limits on input
                      88  1FDE                .BYTE   Pd$_Store       ; Indicate store operation
                    0036  1FDF                .WORD   RK611$B_BR              ; Byte RK611$B_BR to data
                      00  1FE1                .BYTE   0               ; 0 RK611$B_BR to data
                      08  1FE2                .BYTE   8               ; 8 of data field
                      81  1FE3                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1FE4    348 RM03:    $DS_RM03
                          1FE4                .SAVE   LOCAL_BLOCK
                          1FE4                .PSECT  $ABS$,ABS
                 00000032  0050               .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RM03_LEN,       HP$K_RM03_LEN:
                          0032                .IIF    NB,RM03$K_LEN,  RM03$K_LEN:
                      00001FE4                .RESTORE
           33 30 4D 52 00' 1FE4               .ASCIC  "RM03"  ; RM03 name
                      04  1FE4
                      32  1FE9                .BYTE   RM03$K_LEN              ; RM03$K_LEN of resultant P-table
                      08  1FEA                .BYTE   8               ; Maximum unit number                   ;G:65
                    5244  1FEB                .WORD   ^A"DR"  ; Two character mnemonic for QIO RM03 DR
                      80  1FED                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1FEE                .Byte   Pd$_Name        ; Directive op-code
                      03  1FEF                .Byte   Ptd$M_Device            ; Enforced DR codes
                 52 44 00' 1FF0               .Ascic  "DR"    ; Enforced device name prefix
                      02  1FF0
                      86  1FF3                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  1FF4                .LONG   HP$M_ALLOC              ; Constant
                      88  1FF8                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  1FF9                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  1FFB                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  1FFC                .BYTE   8               ; 8 of data field
                      87  1FFD                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    000B  1FFE                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                      00  2000                .BYTE   0               ; 0 HP$B_DRIVE to data
                      08  2001                .BYTE   8               ; 8 of data field
                      88  2002                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  2003                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      07  2005                .BYTE   7               ; 7 HP$A_DEVICE to data
                      03  2006                .BYTE   3               ; 3 of data field
                      81  2007                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2008    349 RM05:    $DS_RM05
                          2008                .SAVE   LOCAL_BLOCK
                          2008                .PSECT  $ABS$,ABS
                 00000032  0050               .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RM05_LEN,       HP$K_RM05_LEN:
                          0032                .IIF    NB,RM05$K_LEN,  RM05$K_LEN:
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                    00002008                    .RESTORE
          35 30 4D 52 00' 2008                  .ASCIC  "RM05"  ; RM05 name
                      04  2008
                      32  200D                  .BYTE   RM05$K_LEN              ; RM05$K_LEN of resultant P-table
                      08  200E                  .BYTE   8               ; Maximum unit number                   ;G:65
                    5244  200F                  .WORD   ^A"DR"  ; Two character mnemonic for QIO RM05 DR
                      80  2011                  .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2012                  .Byte   Pd$_Name        ; Directive op-code
                      03  2013                  .Byte   Ptd$M_Device            ; Enforced DR codes
                52 44 00' 2014                  .Ascic  "DR"    ; Enforced device name prefix
                      02  2014
                      86  2017                  .BYTE   Pd$_Literal     ; Indicate literal
                00000001  2018                  .LONG   HP$M_ALLOC              ; Constant
                      88  201C                  .BYTE   Pd$_Store       ; Indicate store operation
                    000A  201D                  .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  201F                  .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  2020                  .BYTE   8               ; 8 of data field
                      87  2021                  .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    000B  2022                  .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                      00  2024                  .BYTE   0               ; 0 HP$B_DRIVE to data
                      08  2025                  .BYTE   8               ; 8 of data field
                      88  2026                  .BYTE   Pd$_Store       ; Indicate store operation
                    0018  2027                  .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      07  2029                  .BYTE   7               ; 7 HP$A_DEVICE to data
                      03  202A                  .BYTE   3               ; 3 of data field
                      81  202B                  .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          202C    350 RM80:     $DS_RM80
                          202C                  .SAVE   LOCAL_BLOCK
                          202C                  .PSECT  $ABS$,ABS
                00000032  0050                  .=HP$A_DEPENDENT
                          0032                  .IIF    NB,HP$K_RM80_LEN,       HP$K_RM80_LEN:
                          0032                  .IIF    NB,RM80$K_LEN,  RM80$K_LEN:
                        0000202C                .RESTORE
          30 38 4D 52 00' 202C                  .ASCIC  "RM80"  ; RM80 name
                      04  202C
                      32  2031                  .BYTE   RM80$K_LEN              ; RM80$K_LEN of resultant P-table
                      08  2032                  .BYTE   8               ; Maximum unit number                   ;G:65
                    5244  2033                  .WORD   ^A"DR"  ; Two character mnemonic for QIO RM80 DR
                      80  2035                  .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2036                  .Byte   Pd$_Name        ; Directive op-code
                      03  2037                  .Byte   Ptd$M_Device            ; Enforced DR codes
                52 44 00' 2038                  .Ascic  "DR"    ; Enforced device name prefix
                      02  2038
                      86  203B                  .BYTE   Pd$_Literal     ; Indicate literal
                00000001  203C                  .LONG   HP$M_ALLOC              ; Constant
                      88  2040                  .BYTE   Pd$_Store       ; Indicate store operation
                    000A  2041                  .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  2043                  .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  2044                  .BYTE   8               ; 8 of data field
                      87  2045                  .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    000B  2046                  .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                      00  2048                  .BYTE   0               ; 0 HP$B_DRIVE to data
                      08  2049                  .BYTE   8               ; 8 of data field
                      88  204A                  .BYTE   Pd$_Store       ; Indicate store operation
                    0018  204B                  .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      07  204D                  .BYTE   7               ; 7 HP$A_DEVICE to data
                      03  204E                  .BYTE   3               ; 3 of data field
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                      81  204F                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          2050   351 RP04:    $DS_RP04
                          2050                .SAVE   LOCAL_BLOCK
                          2050                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RP04_LEN,       HP$K_RP04_LEN:
                          0032                .IIF    NB,RP04$K_LEN,  RP04$K_LEN:
                      0000205O                .RESTORE
           34 30 50 52 00' 2050                .ASCIC  "RP04"  ; RP04 name
                      04  2050
                      32  2055                .BYTE   RP04$K_LEN              ; RP04$K_LEN of resultant P-table
                      08  2056                .BYTE   8                       ; Maximum unit number                   ;G:65
                    4244  2057                .WORD   ^A"DB"  ; Two character mnemonic for QIO RP04 DB
                      80  2059                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  205A                .Byte   Pd$_Name        ; Directive op-code
                      03  205B                .Byte   Ptd$M_Device            ; Enforced DB codes
                 42 44 00' 205C                .Ascic  "DB"    ; Enforced device name prefix
                      02  205C
                      86  205F                .BYTE   Pd$_Literal     ; Indicate literal
                 00000001 2060                .LONG   HP$M_ALLOC              ; Constant
                      88  2064                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  2065                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  2067                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  2068                .BYTE   8               ; 8 of data field
                      87  2069                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    000B  206A                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                      00  206C                .BYTE   0               ; 0 HP$B_DRIVE to data
                      08  206D                .BYTE   8               ; 8 of data field
                      88  206E                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  206F                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      07  2071                .BYTE   7               ; 7 HP$A_DEVICE to data
                      03  2072                .BYTE   3               ; 3 of data field
                      81  2073                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2074   352 RP05:    $DS_RP05
                          2074                .SAVE   LOCAL_BLOCK
                          2074                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RP05_LEN,       HP$K_RP05_LEN:
                          0032                .IIF    NB,RP05$K_LEN,  RP05$K_LEN:
                      0000207O                .RESTORE
           35 30 50 52 00' 2074                .ASCIC  "RP05"  ; RP05 name
                      04  2074
                      32  2079                .BYTE   RP05$K_LEN              ; RP05$K_LEN of resultant P-table
                      08  207A                .BYTE   8                       ; Maximum unit number                   ;G:65
                    4244  207B                .WORD   ^A"DB"  ; Two character mnemonic for QIO RP05 DB
                      80  207D                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  207E                .Byte   Pd$_Name        ; Directive op-code
                      03  207F                .Byte   Ptd$M_Device            ; Enforced DB codes
                 42 44 00' 2080                .Ascic  "DB"    ; Enforced device name prefix
                      02  2080
                      86  2083                .BYTE   Pd$_Literal     ; Indicate literal
                 00000001 2084                .LONG   HP$M_ALLOC              ; Constant
                      88  2088                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  2089                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  208B                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  208C                .BYTE   8               ; 8 of data field
                      87  208D                .BYTE   Pd$_Fetch       ; Indicate fetch operation
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                    000B  208E                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                      00  2090                .BYTE   0                   ; 0 HP$B_DRIVE to data
                      08  2091                .BYTE   8                   ; 8 of data field
                      88  2092                .BYTE   Pd$_Store           ; Indicate store operation
                    0018  2093                .WORD   HP$A_DEVICE                ; Byte HP$A_DEVICE to data
                      07  2095                .BYTE   7                   ; 7 HP$A_DEVICE to data
                      03  2096                .BYTE   3                   ; 3 of data field
                      81  2097                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                          2098    353 RP06:   $DS_RP06
                          2098                .SAVE   LOCAL_BLOCK
                          2098                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RP06_LEN,       HP$K_RP06_LEN:
                          0032                .IIF    NB,RP06$K_LEN,  RP06$K_LEN:
                          0000209B            .RESTORE
             36 30 50 52 00' 2098             .ASCIC  "RP06"  ; RP06 name
                      04  2098
                      32  209D                .BYTE   RP06$K_LEN              ; RP06$K_LEN of resultant P-table
                      08  209E                .BYTE   8                   ; Maximum unit number                   ;G:65
                    4244  209F                .WORD   ^A"DB"  ; Two character mnemonic for QIO RP06 DB
                      80  20A1                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                      8D  20A2                .Byte   Pd$_Name            ; Directive op-code
                      03  20A3                .Byte   Ptd$M_Device                ; Enforced DB codes
                42 44 00' 20A4                .Ascic  "DB"    ; Enforced device name prefix
                      02  20A4
                      86  20A7                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  20A8                .LONG   HP$M_ALLOC                 ; Constant
                      88  20AC                .BYTE   Pd$_Store           ; Indicate store operation
                    000A  20AD                .WORD   HP$B_FLAGS                 ; Byte HP$B_FLAGS to data
                      00  20AF                .BYTE   0                   ; 0 HP$B_FLAGS to data
                      08  20B0                .BYTE   8                   ; 8 of data field
                      87  20B1                .BYTE   Pd$_Fetch           ; Indicate fetch operation
                    000B  20B2                .WORD   HP$B_DRIVE                 ; Byte HP$B_DRIVE to data
                      00  20B4                .BYTE   0                   ; 0 HP$B_DRIVE to data
                      08  20B5                .BYTE   8                   ; 8 of data field
                      88  20B6                .BYTE   Pd$_Store           ; Indicate store operation
                    0018  20B7                .WORD   HP$A_DEVICE                ; Byte HP$A_DEVICE to data
                      07  20B9                .BYTE   7                   ; 7 HP$A_DEVICE to data
                      03  20BA                .BYTE   3                   ; 3 of data field
                      81  20BB                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                          20BC    354 RP07:   $DS_RP07
                          20BC                .SAVE   LOCAL_BLOCK
                          20BC                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RP07_LEN,       HP$K_RP07_LEN:
                          0032                .IIF    NB,RP07$K_LEN,  RP07$K_LEN:
                          000020BC            .RESTORE
             37 30 50 52 00' 20BC             .ASCIC  "RP07"  ; RP07 name
                      04  20BC
                      32  20C1                .BYTE   RP07$K_LEN              ; RP07$K_LEN of resultant P-table
                      08  20C2                .BYTE   8                   ; Maximum unit number                   ;G:65
                    5244  20C3                .WORD   ^A"DR"  ; Two character mnemonic for QIO RP07 DR
                      80  20C5                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                      8D  20C6                .Byte   Pd$_Name            ; Directive op-code
                      03  20C7                .Byte   Ptd$M_Device                ; Enforced DR codes
                52 44 00' 20C8                .Ascic  "DR"    ; Enforced device name prefix
                      02  20C8
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                  86  20CB                .BYTE   Pd$_Literal      ; Indicate literal
            00000001  20CC                .LONG   HP$M_ALLOC              ; Constant
                  88  20D0                .BYTE   Pd$_Store        ; Indicate store operation
                000A  20D1                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                  00  20D3                .BYTE   0                ; 0 HP$B_FLAGS to data
                  08  20D4                .BYTE   8                ; 8 of data field
                  87  20D5                .BYTE   Pd$_Fetch        ; Indicate fetch operation
                000B  20D6                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                  00  20D8                .BYTE   0                ; 0 HP$B_DRIVE to data
                  08  20D9                .BYTE   8                ; 8 of data field
                  88  20DA                .BYTE   Pd$_Store        ; Indicate store operation
                0018  20DB                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                  07  20DD                .BYTE   7                ; 7 HP$A_DEVICE to data
                  03  20DE                .BYTE   3                ; 3 of data field
                  81  20DF                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                      20E0   355 RQDX1:   $DS_RQDX1                       ;[19]                                  ;G:4
                      20E0                .SAVE   LOCAL_BLOCK
                      20E0                .PSECT  $ABS$,ABS
            00000032  0050                .=HP$A_DEPENDENT
                      0032                .IIF    NB,RQDX1$L_IP,  RQDX1$L_IP:
            00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                      0036                .IIF    NB,RQDX1$K_LEN, RQDX1$K_LEN:
                  000020E0                .RESTORE
   31 58 44 51 52 00' 20E0                .ASCIC  "RQDX1" ; RQDX1 name
                  05  20E0
                  36  20E6                .BYTE   RQDX1$K_LEN             ; RQDX1$K_LEN of resultant P-table
                  00  20E7                .BYTE   0                ; Maximum unit number                          ;G:65
                0000  20E8                .WORD   ^A""     ; Two character mnemonic for QIO RQDX1
                  80  20EA                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                  8D  20EB                .Byte   Pd$_Name         ; Directive op-code
                  02  20EC                .Byte   Ptd$M_Controller                ; Enforced DU codes
            55 44 00' 20ED                .Ascic  "DU"     ; Enforced device name prefix
                  02  20ED
                  83  20F0                .BYTE   Pd$_Octal        ; Indicate scan octal
            50 49 00' 20F1                .ASCIC  "IP"     ; IP string
                  02  20F1
   0003FFFC 0003E000  20F4                .LONG   ^O760000,^O777774       ; 760000 , 777774 limits on input
                  88  20FC                .BYTE   Pd$_Store        ; Indicate store operation
                0032  20FD                .WORD   RQDX1$L_IP              ; Byte RQDX1$L_IP to data
                  00  20FF                .BYTE   0                ; 0 RQDX1$L_IP to data
                  20  2100                .BYTE   32               ; 32 of data field
                  88  2101                .BYTE   Pd$_Store        ; Indicate store operation
                0018  2102                .WORD   Hp$A_Device             ; Byte Hp$A_Device to data
                  00  2104                .BYTE   0                ; 0 Hp$A_Device to data
                  12  2105                .BYTE   18               ; 18 of data field
                  81  2106                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                      2107   356 RRD50:   $DS_RRD50                       ;[35]                                  ;G:4
                      2107                .SAVE   LOCAL_BLOCK
                      2107                .PSECT  $ABS$,ABS
            00000032  0050                .=HP$A_DEPENDENT
                      0032                .IIF    NB,RRD50$L_CSR, RRD50$L_CSR::
            00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                      0036                .IIF    NB,RRD50$B_BR,  RRD50$B_BR::
            00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                      0037                .IIF    NB,RRD50$K_LEN, RRD50$K_LEN::
                  00002107                .RESTORE
   30 35 44 52 52 00' 2107                .ASCIC  "RRD50" ; RRD50 name
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                      05  2107
                      37  210D                .BYTE   RRD50$K_LEN             ; RRD50$K_LEN of resultant P-table
                      04  210E                .BYTE   4                       ; Maximum unit number                   ;G:65
                    0000  210F                .WORD   ^A""    ; Two character mnemonic for QIO RRD50
                      80  2111                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2112                .Byte   Pd$_Name        ; Directive op-code
                      03  2113                .Byte   PTD$M_DEVICE            ; Enforced DU codes
               55 44 00'  2114                .Ascic  "DU"    ; Enforced device name prefix
                      02  2114
                      86  2117                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  2118                .LONG   HP$M_ALLOC              ; Constant
                      88  211C                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  211D                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  211F                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  2120                .BYTE   8                       ; 8 of data field
                      83  2121                .BYTE   Pd$_Octal       ; Indicate scan octal
   53 53 45 52 44 44 41 00'  2122                .ASCIC  "ADDRESS"       ; ADDRESS string
                      07  2122
            0003FFFE 0003E008  212A                .LONG   ^O760010,^O777776       ; 760010 , 777776 limits on input
                      88  2132                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  2133                .WORD   RRD50$L_CSR             ; Byte RRD50$L_CSR to data
                      00  2135                .BYTE   0                       ; 0 RRD50$L_CSR to data
                      20  2136                .BYTE   32                      ; 32 of data field
                      88  2137                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  2138                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  213A                .BYTE   0                       ; 0 HP$A_DEVICE to data
                      12  213B                .BYTE   18                      ; 18 of data field
                      83  213C                .BYTE   Pd$_Octal       ; Indicate scan octal
   52 4F 54 43 45 56 00'  213D                .ASCIC  "VECTOR"        ; VECTOR string
                      06  213D
      000001FC 00000040  2144                .LONG   ^O100,^O774     ; 100 , 774 limits on input
                      88  214C                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  214D                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  214F                .BYTE   0                       ; 0 HP$W_VECTOR to data
                      10  2150                .BYTE   16                      ; 16 of data field
                      82  2151                .BYTE   Pd$_Decimal     ; Indicate scan decimal
               52 42 00'  2152                .ASCIC  "BR"    ; BR string
                      02  2152
      00000007 00000004  2155                .LONG   4,7     ; 4 , 7 limits on input
                      88  215D                .BYTE   Pd$_Store       ; Indicate store operation
                    0036  215E                .WORD   RRD50$B_BR              ; Byte RRD50$B_BR to data
                      00  2160                .BYTE   0                       ; 0 RRD50$B_BR to data
                      08  2161                .BYTE   8                       ; 8 of data field
                      81  2162                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2163    357 RUX50:  $DS_RUX50                       ;[26]                                   ;G:4
                          2163                .SAVE   LOCAL_BLOCK
                          2163                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$B_RUX50_BR,       HP$B_RUX50_BR:
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,HP$K_RUX50_LEN,      HP$K_RUX50_LEN:
                      0000216300              .RESTORE
      30 35 58 55 52 00'  2163                .ASCIC  "RUX50" ; RUX50 name
                      05  2163
                      33  2169                .BYTE   HP$K_RUX50_LEN          ; HP$K_RUX50_LEN of resultant P-table
                      04  216A                .BYTE   4                       ; Maximum unit number                   ;G:65
                    0000  216B                .WORD   ^A""    ; Two character mnemonic for QIO RUX50
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                         80  216D                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                         8D  216E                .Byte   Pd$_Name        ; Directive op-code
                         02  216F                .Byte   PTD$M_CONTROLLER                ; Enforced DU codes
                  55 44 00'  2170                .Ascic  "DU"    ; Enforced device name prefix
                         02  2170
                         83  2173                .BYTE   Pd$_Octal       ; Indicate scan octal
                  50 49 00'  2174                .ASCIC  "IP"    ; IP string
                         02  2174
             0003FFFC 0003E000  2177             .LONG   ^O760000,^O777774       ; 760000 , 777774 limits on input
                         88  217F                .BYTE   Pd$_Store       ; Indicate store operation
                       0018  2180                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                         00  2182                .BYTE   0               ; 0 HP$A_DEVICE to data
                         12  2183                .BYTE   18              ; 18 of data field
                         83  2184                .BYTE   Pd$_Octal       ; Indicate scan octal
          52 4F 54 43 45 56 00'  2185            .ASCIC  "VECTOR"        ; VECTOR string
                         06  2185
             000001FC 00000004  218C             .LONG   ^O4,^O774       ; 4 , 774 limits on input
                         88  2194                .BYTE   Pd$_Store       ; Indicate store operation
                       0024  2195                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                         00  2197                .BYTE   0               ; 0 HP$W_VECTOR to data
                         09  2198                .BYTE   9               ; 9 of data field
                         82  2199                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                  52 42 00'  219A                .ASCIC  "BR"    ; BR string
                         02  219A
             00000007 00000004  219D             .LONG   4,7     ; 4 , 7 limits on input
                         88  21A5                .BYTE   Pd$_Store       ; Indicate store operation
                       0032  21A6                .WORD   HP$B_RUX50_BR            ; Byte HP$B_RUX50_BR to data
                         00  21A8                .BYTE   0               ; 0 HP$B_RUX50_BR to data
                         08  21A9                .BYTE   8               ; 8 of data field
                         81  21AA                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                             21AB    358 RX02:   $DS_RX02
                             21AB                .SAVE   LOCAL_BLOCK
                             21AB                .PSECT  $ABS$,ABS
                    00000032 0050                .=HP$A_DEPENDENT
                             0032                .IIF    NB,HP$K_RX02_LEN,       HP$K_RX02_LEN:
                             0032                .IIF    NB,RX02$K_LEN,  RX02$K_LEN:
                             21AB                .RESTORE
                  32 30 58 52 00'  21AB          .ASCIC  "RX02"  ; RX02 name
                         04  21AB
                         32  21B0                .BYTE   RX02$K_LEN              ; RX02$K_LEN of resultant P-table
                         02  21B1                .BYTE   2               ; Maximum unit number                   ;G:65
                       0000  21B2                .WORD   ^A""    ; Two character mnemonic for QIO RX02
                         80  21B4                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                         8D  21B5                .Byte   Pd$_Name        ; Directive op-code
                         1B  21B6                .Byte   Ptd$M_EndDevice         ; Enforced DY codes
                  59 44 00'  21B7                .Ascic  "DY"    ; Enforced device name prefix
                         02  21B7
                         86  21BA                .BYTE   Pd$_Literal     ; Indicate literal
                    00000001 21BB                .LONG   HP$M_ALLOC              ; Constant
                         88  21BF                .BYTE   Pd$_Store       ; Indicate store operation
                       000A  21C0                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                         00  21C2                .BYTE   0               ; 0 HP$B_FLAGS to data
                         08  21C3                .BYTE   8               ; 8 of data field
                         81  21C4                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                             21C5    359 RX211:  $DS_RX211
                             21C5                .SAVE   LOCAL_BLOCK
                             21C5                .PSECT  $ABS$,ABS
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                    00000032  0050                .=HP$A_DEPENDENT
                              0032                .IIF    NB,HP$L_RX211_CSR,      HP$L_RX211_CSR:
                              0032                .IIF    NB,RX211$L_CSR, RX211$L_CSR:
                    00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                              0036                .IIF    NB,HP$B_RX211_BR,       HP$B_RX211_BR:
                              0036                .IIF    NB,RX211$B_BR,  RX211$B_BR:
                    00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                              0037                .IIF    NB,HP$K_RX211_LEN,      HP$K_RX211_LEN:
                              0037                .IIF    NB,RX211$K_LEN, RX211$K_LEN:
                       000021C5                   .RESTORE
                 31 31 32 58 52 00' 21C5          .ASCIC  "RX211" ; RX211 name
                              05    21C5
                              37    21CB          .BYTE   RX211$K_LEN             ; RX211$K_LEN of resultant P-table
                              00    21CC          .BYTE   0                       ; Maximum unit number                   ;G:65
                           5944     21CD          .WORD   ^A"DY"  ; Two character mnemonic for QIO RX211 DY
                              80    21CF          .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                              8D    21D0          .Byte   Pd$_Name        ; Directive op-code
                              02    21D1          .Byte   Ptd$M_Controller                ; Enforced DY codes
                           59 44 00' 21D2          .Ascic  "DY"    ; Enforced device name prefix
                              02    21D2
                              83    21D5          .BYTE   Pd$_Octal       ; Indicate scan octal
                        52 53 43 00' 21D6          .ASCIC  "CSR"   ; CSR string
                              03    21D6
                 0003FFFE 0003E000  21DA          .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                              88    21E2          .BYTE   Pd$_Store       ; Indicate store operation
                           0032     21E3          .WORD   RX211$L_CSR             ; Byte RX211$L_CSR to data
                              00    21E5          .BYTE   0                       ; 0 RX211$L_CSR to data
                              20    21E6          .BYTE   32                      ; 32 of data field
                              88    21E7          .BYTE   Pd$_Store       ; Indicate store operation
                           0018     21E8          .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                              00    21EA          .BYTE   0                       ; 0 HP$A_DEVICE to data
                              12    21EB          .BYTE   18                      ; 18 of data field
                              83    21EC          .BYTE   Pd$_Octal       ; Indicate scan octal
              52 4F 54 43 45 56 00' 21ED          .ASCIC  "VECTOR"        ; VECTOR string
                              06    21ED
                 000001FE 00000002  21F4          .LONG   ^O2,^O776       ; 2 , 776 limits on input
                              88    21FC          .BYTE   Pd$_Store       ; Indicate store operation
                           0024     21FD          .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                              00    21FF          .BYTE   0                       ; 0 HP$W_VECTOR to data
                              09    2200          .BYTE   9                       ; 9 of data field
                              82    2201          .BYTE   Pd$_Decimal     ; Indicate scan decimal
                        52 42 00' 2202          .ASCIC  "BR"    ; BR string
                              02    2202
                 00000007 00000004  2205          .LONG   4,7     ; 4 , 7 limits on input
                              88    220D          .BYTE   Pd$_Store       ; Indicate store operation
                           0036     220E          .WORD   RX211$B_BR              ; Byte RX211$B_BR to data
                              00    2210          .BYTE   0                       ; 0 RX211$B_BR to data
                              08    2211          .BYTE   8                       ; 8 of data field
                              81    2212          .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                    2213  360 RX31: $DS_RX31                      ;[26]                   ;G:4
                                    2213          .SAVE   LOCAL_BLOCK
                                    2213          .PSECT  $ABS$,ABS
                    00000032  0050                .=HP$A_DEPENDENT
                              0032                .IIF    NB,RX31$K_LEN,  RX31$K_LEN:
                       00002213                   .RESTORE
                    31 33 58 52 00' 2213          .ASCIC  "RX31"  ; RX31 name
                              04    2213
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                32  2218                .BYTE   RX31$K_LEN                ; RX31$K_LEN of resultant P-table
                FF  2219                .BYTE   255                ; Maximum unit number                        ;G:65
              0000  221A                .WORD   ^A""     ; Two character mnemonic for QIO RX31
                80  221C                .BYTE   Pd$_Start          ; Constant to identify start of descriptor
                8D  221D                .Byte   Pd$_Name           ; Directive op-code
                1B  221E                .Byte   Ptd$M_EndDevice           ; Enforced DU codes
          55 44 00' 221F                .Ascic  "DU"     ; Enforced device name prefix
                02  221F
                81  2222                .BYTE   Pd$_End            ; Indicate end of PT-descriptor
                    2223   361 RX32:    $DS_RX32                          ;[26]                                ;G:4
                    2223                .SAVE   LOCAL_BLOCK
                    2223                .PSECT  $ABS$,ABS
          00000032  0050                .=HP$A_DEPENDENT
                    0032                .IIF    NB,RX32$K_LEN,  RX32$K_LEN:
                00002223                .RESTORE
    32 33 58 52 00' 2223                .ASCIC  "RX32"   ; RX32 name
                04  2223
                32  2228                .BYTE   RX32$K_LEN                ; RX32$K_LEN of resultant P-table
                FF  2229                .BYTE   255                ; Maximum unit number                        ;G:65
              0000  222A                .WORD   ^A""     ; Two character mnemonic for QIO RX32
                80  222C                .BYTE   Pd$_Start          ; Constant to identify start of descriptor
                8D  222D                .Byte   Pd$_Name           ; Directive op-code
                1B  222E                .Byte   Ptd$M_EndDevice           ; Enforced DU codes
          55 44 00' 222F                .Ascic  "DU"     ; Enforced device name prefix
                02  222F
                81  2232                .BYTE   Pd$_End            ; Indicate end of PT-descriptor
                    2233   362 RX50:    $DS_RX50                          ;[19]                                ;G:4
                    2233                .SAVE   LOCAL_BLOCK
                    2233                .PSECT  $ABS$,ABS
          00000032  0050                .=HP$A_DEPENDENT
                    0032                .IIF    NB,RX50$K_LEN,  RX50$K_LEN:
                00002233                .RESTORE
    30 35 58 52 00' 2233                .ASCIC  "RX50"   ; RX50 name
                04  2233
                32  2238                .BYTE   RX50$K_LEN                ; RX50$K_LEN of resultant P-table
                FF  2239                .BYTE   255                ; Maximum unit number                        ;G:65
              0000  223A                .WORD   ^A""     ; Two character mnemonic for QIO RX50
                80  223C                .BYTE   Pd$_Start          ; Constant to identify start of descriptor
                86  223D                .BYTE   Pd$_Literal        ; Indicate literal
          00000001  223E                .LONG   HP$M_ALLOC                ; Constant
                88  2242                .BYTE   Pd$_Store          ; Indicate store operation
              000A  2243                .WORD   HP$B_FLAGS                ; Byte HP$B_FLAGS to data
                00  2245                .BYTE   0                  ; 0 HP$B_FLAGS to data
                08  2246                .BYTE   8                  ; 8 of data field
                81  2247                .BYTE   Pd$_End            ; Indicate end of PT-descriptor
                    2248   363 RX180:   $DS_RX180                         ;[26]                                ;G:4
                    2248                .SAVE   LOCAL_BLOCK
                    2248                .PSECT  $ABS$,ABS
          00000032  0050                .=HP$A_DEPENDENT
                    0032                .IIF    NB,RX180$K_LEN, RX180$K_LEN:
                00002248                .RESTORE
 30 38 31 58 52 00' 2248                .ASCIC  "RX180" ; RX180 name
                05  2248
                32  224E                .BYTE   RX180$K_LEN               ; RX180$K_LEN of resultant P-table
                FF  224F                .BYTE   255                ; Maximum unit number                        ;G:65
              0000  2250                .WORD   ^A""     ; Two character mnemonic for QIO RX180
                80  2252                .BYTE   Pd$_Start          ; Constant to identify start of descriptor
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                      8D  2253                .Byte   Pd$_Name        ; Directive op-code
                      1B  2254                .Byte   Ptd$M_EndDevice         ; Enforced DU codes
                55 44 00' 2255                .Ascic  "DU"    ; Enforced device name prefix
                      02  2255
                      81  2258                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2259   364 SBIA:     $DS_SBIA                        ;[15]                   ;G:4
                          2259                .SAVE   LOCAL_BLOCK
                          2259                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_SBIA_LEN,       HP$K_SBIA_LEN:
                          0032                .IIF    NB,SBIA$K_LEN,  SBIA$K_LEN:
                          0000225A            .RESTORE
             41 49 42 53 00' 2259             .ASCIC  "SBIA"  ; SBIA name
                      04  2259
                      32  225E                .BYTE   SBIA$K_LEN              ; SBIA$K_LEN of resultant P-table
                      02  225F                .BYTE   2               ; Maximum unit number                   ;G:65
                    0000  2260                .WORD   ^A""    ; Two character mnemonic for QIO SBIA
                      80  2262                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2263                .Byte   Pd$_Name        ; Directive op-code
                      01  2264                .Byte   Ptd$M_Unit              ; Enforced SI codes
                49 53 00' 2265                .Ascic  "SI"    ; Enforced device name prefix
                      02  2265
                      86  2268                .BYTE   Pd$_Literal     ; Indicate literal
                60000000  2269                .LONG   ^X60000000              ; Constant
                      88  226D                .BYTE   Pd$_Store       ; Indicate store operation
                    001C  226E                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      00  2270                .BYTE   0               ; 0 HP$A_DVA to data
                      20  2271                .BYTE   32              ; 32 of data field
                      86  2272                .BYTE   Pd$_Literal     ; Indicate literal
                60080000  2273                .LONG   ^X60080000              ; Constant
                      88  2277                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  2278                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  227A                .BYTE   0               ; 0 HP$A_DEVICE to data
                      20  227B                .BYTE   32              ; 32 of data field
                      86  227C                .BYTE   Pd$_Literal     ; Indicate literal
                00000000  227D                .LONG   ^X00            ; Constant
                      88  2281                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  2282                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  2284                .BYTE   0               ; 0 HP$W_VECTOR to data
                      10  2285                .BYTE   16              ; 16 of data field
                      87  2286                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    000B  2287                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                      00  2289                .BYTE   0               ; 0 HP$B_DRIVE to data
                      08  228A                .BYTE   8               ; 8 of data field
                      88  228B                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  228C                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      19  228E                .BYTE   25              ; 25 HP$A_DEVICE to data
                      03  228F                .BYTE   3               ; 3 of data field
                      88  2290                .BYTE   Pd$_Store       ; Indicate store operation
                    001C  2291                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      19  2293                .BYTE   25              ; 25 HP$A_DVA to data
                      03  2294                .BYTE   3               ; 3 of data field
                      8A  2295                .BYTE   Pd$_Add         ; Indicate add value to field operation
                    0024  2296                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      09  2298                .BYTE   9               ; 9 HP$W_VECTOR to data
                      07  2299                .BYTE   7               ; 7 of data field
                      81  229A                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
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                        229B   365 TE16:   $DS_TE16
                        229B               .SAVE   LOCAL_BLOCK
                        229B               .PSECT  $ABS$,ABS
                    00000032    0050       .=HP$A_DEPENDENT
                                0032       .IIF    NB,HP$K_TE16_LEN,       HP$K_TE16_LEN:
                                0032       .IIF    NB,TE16$K_LEN,  TE16$K_LEN:
                                0000229B   .RESTORE
                 36 31 45 54 00' 229B      .ASCIC  "TE16"  ; TE16 name
                          04    229B
                          32    22A0       .BYTE   TE16$K_LEN              ; TE16$K_LEN of resultant P-table
                          08    22A1       .BYTE   8                       ; Maximum unit number                   ;G:65
                        0000    22A2       .WORD   ^A""    ; Two character mnemonic for QIO TE16
                          80    22A4       .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D    22A5       .Byte   Pd$_Name        ; Directive op-code
                          1B    22A6       .Byte   Ptd$M_EndDevice         ; Enforced MT codes
                       54 4D 00' 22A7       .Ascic  "MT"    ; Enforced device name prefix
                          02    22A7
                          86    22AA       .BYTE   Pd$_Literal     ; Indicate literal
                    00000001    22AB       .LONG   HP$M_ALLOC              ; Constant
                          88    22AF       .BYTE   Pd$_Store       ; Indicate store operation
                        000A    22B0       .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                          00    22B2       .BYTE   0               ; 0 HP$B_FLAGS to data
                          08    22B3       .BYTE   8               ; 8 of data field
                          81    22B4       .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                22B5   366 TK50:   $DS_TK50                ;[25]                                   ;G:4
                                22B5               .SAVE   LOCAL_BLOCK
                                22B5               .PSECT  $ABS$,ABS
                    00000032    0050               .=HP$A_DEPENDENT
                                0032               .IIF    NB,HP$K_TK50_LEN,       HP$K_TK50_LEN:
                                000022B5           .RESTORE
                 30 35 4B 54 00' 22B5              .ASCIC  "TK50"  ; TK50 name
                          04    22B5
                          32    22BA               .BYTE   HP$K_TK50_LEN           ; HP$K_TK50_LEN of resultant P-table
                          10    22BB               .BYTE   16              ; Maximum unit number                   ;G:65
                        554D    22BC               .WORD   ^A"MU"  ; Two character mnemonic for QIO TK50 MU
                          80    22BE               .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D    22BF               .Byte   Pd$_Name        ; Directive op-code
                          03    22C0               .Byte   Ptd$M_Device            ; Enforced MU codes
                       55 4D 00' 22C1               .Ascic  "MU"    ; Enforced device name prefix
                          02    22C1
                          86    22C4               .BYTE   Pd$_Literal     ; Indicate literal
                    00000001    22C5               .LONG   HP$M_ALLOC              ; Constant
                          88    22C9               .BYTE   Pd$_Store       ; Indicate store operation
                        000A    22CA               .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                          00    22CC               .BYTE   0               ; 0 HP$B_FLAGS to data
                          08    22CD               .BYTE   8               ; 8 of data field
                          81    22CE               .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                22CF   367 TM03:   $DS_TM03                ;
                                22CF               .SAVE   LOCAL_BLOCK
                                22CF               .PSECT  $ABS$,ABS
                    00000032    0050               .=HP$A_DEPENDENT
                                0032               .IIF    NB,HP$B_TM03_DRIVE,     HP$B_TM03_DRIVE:
                                0032               .IIF    NB,TM03$B_DRIVE,        TM03$B_DRIVE:
                    00000033    0032               .IIF    NB,,BLKB        .BLKB   1
                                0033               .IIF    NB,HP$K_TM03_LEN,       HP$K_TM03_LEN:
                                0033               .IIF    NB,TM03$K_LEN,  TM03$K_LEN:
                                000022CF           .RESTORE
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                33 30 4D 54 00' 22CF                .ASCIC  "TM03"  ; TM03 name
                             04 22CF
                             33 22D4                .BYTE   TM03$K_LEN              ; TM03$K_LEN of resultant P-table
                             00 22D5                .BYTE   0                       ; Maximum unit number                   ;G:65
                           4D54 22D6                .WORD   ^A"TM"  ; Two character mnemonic for QIO TM03 TM
                             80 22D8                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                             8D 22D9                .Byte   Pd$_Name        ; Directive op-code
                             02 22DA                .Byte   Ptd$M_Controller                ; Enforced MT codes
                      54 4D 00' 22DB                .Ascic  "MT"    ; Enforced device name prefix
                             02 22DB
                             82 22DE                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                45 56 49 52 44 00' 22DF                .ASCIC  "DRIVE" ; DRIVE string
                             05 22DF
                00000007 00000000 22E5                .LONG   0,7     ; 0 , 7 limits on input
                             88 22ED                .BYTE   Pd$_Store       ; Indicate store operation
                           0032 22EE                .WORD   TM03$B_DRIVE            ; Byte TM03$B_DRIVE to data
                             00 22F0                .BYTE   0               ; 0 TM03$B_DRIVE to data
                             08 22F1                .BYTE   8               ; 8 of data field
                             88 22F2                .BYTE   Pd$_Store       ; Indicate store operation
                           000B 22F3                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                             00 22F5                .BYTE   0               ; 0 HP$B_DRIVE to data
                             08 22F6                .BYTE   8               ; 8 of data field
                             88 22F7                .BYTE   Pd$_Store       ; Indicate store operation
                           0018 22F8                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                             07 22FA                .BYTE   7               ; 7 HP$A_DEVICE to data
                             03 22FB                .BYTE   3               ; 3 of data field
                             81 22FC                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                22FD    368 TM78:   $DS_TM78                        ;[01]                                   ;G:4
                                22FD                .SAVE   LOCAL_BLOCK
                                22FD                .PSECT  $ABS$,ABS
                        00000032 0050               .=HP$A_DEPENDENT
                                 0032               .IIF    NB,HP$B_TM78_DRIVE,     HP$B_TM78_DRIVE:
                                 0032               .IIF    NB,TM78$B_DRIVE,        TM78$B_DRIVE:
                        00000033 0032               .IIF    NB,.BLKB,       .BLKB   1
                                 0033               .IIF    NB,HP$K_TM78_LEN,       HP$K_TM78_LEN:
                                 0033               .IIF    NB,TM78$K_LEN,  TM78$K_LEN:
                             000022FD               .RESTORE
                   38 37 4D 54 00' 22FD                .ASCIC  "TM78"  ; TM78 name
                             04 22FD
                             33 2302                .BYTE   TM78$K_LEN              ; TM78$K_LEN of resultant P-table
                             00 2303                .BYTE   0                       ; Maximum unit number                   ;G:65
                           4654 2304                .WORD   ^A"TF"  ; Two character mnemonic for QIO TM78 TF
                             80 2306                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                             8D 2307                .Byte   Pd$_Name        ; Directive op-code
                             02 2308                .Byte   Ptd$M_Controller                ; Enforced MF codes
                      46 4D 00' 2309                .Ascic  "MF"    ; Enforced device name prefix
                             02 2309
                             82 230C                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                45 56 49 52 44 00' 230D                .ASCIC  "DRIVE" ; DRIVE string
                             05 230D
                00000007 00000000 2313                .LONG   0,7     ; 0 , 7 limits on input
                             88 231B                .BYTE   Pd$_Store       ; Indicate store operation
                           0032 231C                .WORD   TM78$B_DRIVE            ; Byte TM78$B_DRIVE to data
                             00 231E                .BYTE   0               ; 0 TM78$B_DRIVE to data
                             08 231F                .BYTE   8               ; 8 of data field
                             88 2320                .BYTE   Pd$_Store       ; Indicate store operation
                           000B 2321                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
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                      00  2323                .BYTE   0                       ; 0 HP$B_DRIVE to data
                      08  2324                .BYTE   8                       ; 8 of data field
                      88  2325                .BYTE   Pd$_Store               ; Indicate store operation
                    0018  2326                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                      07  2328                .BYTE   7                       ; 7 HP$A_DEVICE to data
                      03  2329                .BYTE   3                       ; 3 of data field
                      81  232A                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          232B    369 TS04:     $DS_TS04
                          232B                .SAVE   LOCAL_BLOCK
                          232B                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$L_TS04_CSR,       HP$L_TS04_CSR:
                          0032                .IIF    NB,TS04$L_CSR,  TS04$L_CSR:
                00000036  0032                .IIF    NB,.BLKL,               .BLKL   1
                          0036                .IIF    NB,HP$B_TS04_BR,        HP$B_TS04_BR:
                          0036                .IIF    NB,TS04$B_BR,   TS04$B_BR:
                00000037  0036                .IIF    NB,.BLKB,               .BLKB   1
                          0037                .IIF    NB,HP$K_TS04_LEN,       HP$K_TS04_LEN:
                          0037                .IIF    NB,TS04$K_LEN,  TS04$K_LEN:
                      0000232B                .RESTORE
              34 30 53 54 00' 232B            .ASCIC  "TS04"  ; TS04 name
                      04  232B
                      37  2330                .BYTE   TS04$K_LEN                      ; TS04$K_LEN of resultant P-table
                      01  2331                .BYTE   1                       ; Maximum unit number                   ;G:65
                    5354  2332                .WORD   ^A"TS"  ; Two character mnemonic for QIO TS04 TS
                      80  2334                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  2335                .Byte   Pd$_Name                ; Directive op-code
                      03  2336                .Byte   Ptd$M_Device                    ; Enforced MS codes
                 53 4D 00' 2337                .Ascic  "MS"    ; Enforced device name prefix
                      02  2337
                      86  233A                .BYTE   Pd$_Literal             ; Indicate literal
                00000001  233B                .LONG   HP$M_ALLOC                      ; Constant
                      88  233F                .BYTE   Pd$_Store               ; Indicate store operation
                    000A  2340                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                      00  2342                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  2343                .BYTE   8                       ; 8 of data field
                      83  2344                .BYTE   Pd$_Octal               ; Indicate scan octal
              52 53 43 00' 2345                .ASCIC  "CSR"   ; CSR string
                      03  2345
            0003FFFE 0003E000  2349            .LONG   ^O760000,^O777776               ; 760000 , 777776 limits on input
                      88  2351                .BYTE   Pd$_Store               ; Indicate store operation
                    0032  2352                .WORD   TS04$L_CSR                      ; Byte TS04$L_CSR to data
                      00  2354                .BYTE   0                       ; 0 TS04$L_CSR to data
                      20  2355                .BYTE   32                      ; 32 of data field
                      88  2356                .BYTE   Pd$_Store               ; Indicate store operation
                    0018  2357                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                      00  2359                .BYTE   0                       ; 0 HP$A_DEVICE to data
                      12  235A                .BYTE   18                      ; 18 of data field
                      83  235B                .BYTE   Pd$_Octal               ; Indicate scan octal
        52 4F 54 43 45 56 00' 235C            .ASCIC  "VECTOR"                ; VECTOR string
                      06  235C
            000001FE 00000002  2363            .LONG   ^O2,^O776               ; 2 , 776 limits on input
                      88  236B                .BYTE   Pd$_Store               ; Indicate store operation
                    0024  236C                .WORD   HP$W_VECTOR                     ; Byte HP$W_VECTOR to data
                      00  236E                .BYTE   0                       ; 0 HP$W_VECTOR to data
                      09  236F                .BYTE   9                       ; 9 of data field
                      82  2370                .BYTE   Pd$_Decimal             ; Indicate scan decimal
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                    52 42 00' 2371                  .ASCIC  "BR"    ; BR string
                       02  2371
          00000007 00000004  2374                  .LONG   4,7     ; 4 , 7 limits on input
                       88  237C                  .BYTE   Pd$_Store       ; Indicate store operation
                     0036  237D                  .WORD   TS04$B_BR               ; Byte TS04$B_BR to data
                       00  237F                  .BYTE   0               ; 0 TS04$B_BR to data
                       08  2380                  .BYTE   8               ; 8 of data field
                       81  2381                  .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                           2382  370 TS05:       $DS_TS05                ;[18]                          ;G:4
                           2382                  .SAVE   LOCAL_BLOCK
                           2382                  .PSECT  $ABS$,ABS
                    00000032  0050               .=HP$A_DEPENDENT
                           0032                  .IIF    NB,TS05$B_BR,   TS05$B_BR:
                    00000033  0032               .IIF    NB,.BLKB,       .BLKB   1
                           0033                  .IIF    NB,HP$K_TS05_LEN,       HP$K_TS05_LEN:
                           0033                  .IIF    NB,TS05$K_LEN,  TS05$K_LEN:
                       00002382                  .RESTORE
                 35 30 53 54 00' 2382            .ASCIC  "TS05"  ; TS05 name
                       04  2382
                       33  2387                  .BYTE   TS05$K_LEN              ; TS05$K_LEN of resultant P-table
                       08  2388                  .BYTE   8               ; Maximum unit number          ;G:65
                     0000  2389                  .WORD   ^A""    ; Two character mnemonic for QIO TS05
                       80  238B                  .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  238C                  .Byte   Pd$_Name        ; Directive op-code
                       03  238D                  .Byte   Ptd$M_Device            ; Enforced MS codes
                    53 4D 00' 238E               .Ascic  "MS"    ; Enforced device name prefix
                       02  238E
                       86  2391                  .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  2392                  .LONG   HP$M_ALLOC              ; Constant
                       88  2396                  .BYTE   Pd$_Store       ; Indicate store operation
                     000A  2397                  .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                       00  2399                  .BYTE   0               ; 0 HP$B_FLAGS to data
                       08  239A                  .BYTE   8               ; 8 of data field
                       83  239B                  .BYTE   Pd$_Octal       ; Indicate scan octal
44 41 5F 52 53 43 5F 35 30 53 54 00' 239C        .ASCIC  "TS05_CSR_ADDRESS"      ; TS05_CSR_ADDRESS string
                  53 53 45 52 44  23A8
                       10  239C
                 0003FFFE 0003E000  23AD          .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                       88  23B5                  .BYTE   Pd$_Store       ; Indicate store operation
                     0018  23B6                  .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                       00  23B8                  .BYTE   0               ; 0 HP$A_DEVICE to data
                       12  23B9                  .BYTE   18              ; 18 of data field
                       83  23BA                  .BYTE   Pd$_Octal       ; Indicate scan octal
52 4F 54 43 45 56 5F 35 30 53 54 00' 23BB        .ASCIC  "TS05_VECTOR"   ; TS05_VECTOR string
                       0B  23BB
                 000001FE 00000002  23C7          .LONG   ^O2,^O776       ; 2 , 776 limits on input
                       88  23CF                  .BYTE   Pd$_Store       ; Indicate store operation
                     0024  23D0                  .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                       00  23D2                  .BYTE   0               ; 0 HP$W_VECTOR to data
                       10  23D3                  .BYTE   16              ; 16 of data field
                       82  23D4                  .BYTE   Pd$_Decimal     ; Indicate scan decimal
        4C 45 56 45 4C 5F 52 42 00' 23D5         .ASCIC  "BR_LEVEL"      ; BR_LEVEL string
                       08  23D5
                 00000007 00000004  23DE          .LONG   4,7     ; 4 , 7 limits on input
                       88  23E6                  .BYTE   Pd$_Store       ; Indicate store operation
                     0032  23E7                  .WORD   TS05$B_BR               ; Byte TS05$B_BR to data
                       00  23E9                  .BYTE   0               ; 0 TS05$B_BR to data
```

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                      08  23EA                .BYTE   8                       ; 8 of data field
                      81  23EB                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          23EC    371 TS11:    $DS_TS11
                          23EC                .SAVE   LOCAL_BLOCK
                          23EC                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$L_TS11_CSR,       HP$L_TS11_CSR:
                          0032                .IIF    NB,TS11$L_CSR,  TS11$L_CSR:
                00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                          0036                .IIF    NB,HP$B_TS11_BR,        HP$B_TS11_BR:
                          0036                .IIF    NB,TS11$B_BR,   TS11$B_BR:
                00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                          0037                .IIF    NB,HP$K_TS11_LEN,       HP$K_TS11_LEN:
                          0037                .IIF    NB,TS11$K_LEN,  TS11$K_LEN:
                000023EC                      .RESTORE
          31 31 53 54 00' 23EC                .ASCIC  "TS11"  ; TS11 name
                      04  23EC
                      37  23F1                .BYTE   TS11$K_LEN              ; TS11$K_LEN of resultant P-table
                      01  23F2                .BYTE   1                       ; Maximum unit number                   ;G:65
                    5354  23F3                .WORD   ^A"TS"  ; Two character mnemonic for QIO TS11 TS
                      80  23F5                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  23F6                .Byte   Pd$_Name                ; Directive op-code
                      03  23F7                .Byte   Ptd$M_Device            ; Enforced MS codes
                53 4D 00' 23F8                .Ascic  "MS"    ; Enforced device name prefix
                      02  23F8
                      86  23FB                .BYTE   Pd$_Literal             ; Indicate literal
                00000001  23FC                .LONG   HP$M_ALLOC              ; Constant
                      88  2400                .BYTE   Pd$_Store               ; Indicate store operation
                    000A  2401                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  2403                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  2404                .BYTE   8                       ; 8 of data field
                      83  2405                .BYTE   Pd$_Octal               ; Indicate scan octal
             52 53 43 00' 2406                .ASCIC  "CSR"   ; CSR string
                      03  2406
            0003FFFE 0003E000  240A            .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  2412                .BYTE   Pd$_Store               ; Indicate store operation
                    0032  2413                .WORD   TS11$L_CSR              ; Byte TS11$L_CSR to data
                      00  2415                .BYTE   0                       ; 0 TS11$L_CSR to data
                      20  2416                .BYTE   32                      ; 32 of data field
                      88  2417                .BYTE   Pd$_Store               ; Indicate store operation
                    0018  2418                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  241A                .BYTE   0                       ; 0 HP$A_DEVICE to data
                      12  241B                .BYTE   18                      ; 18 of data field
                      83  241C                .BYTE   Pd$_Octal               ; Indicate scan octal
    52 4F 54 43 45 56 00' 241D                .ASCIC  "VECTOR"                ; VECTOR string
                      06  241D
            000001FE 00000002  2424            .LONG   ^O2,^O776               ; 2 , 776 limits on input
                      88  242C                .BYTE   Pd$_Store               ; Indicate store operation
                    0024  242D                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  242F                .BYTE   0                       ; 0 HP$W_VECTOR to data
                      09  2430                .BYTE   9                       ; 9 of data field
                      82  2431                .BYTE   Pd$_Decimal             ; Indicate scan decimal
                52 42 00' 2432                .ASCIC  "BR"    ; BR string
                      02  2432
            00000007 00000004  2435            .LONG   4,7     ; 4 , 7 limits on input
                      88  243D                .BYTE   Pd$_Store               ; Indicate store operation
                    0036  243E                .WORD   TS11$B_BR               ; Byte TS11$B_BR to data
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                      00  2440                .BYTE   0               ; 0 TS11$B_BR to data
                      08  2441                .BYTE   8               ; 8 of data field
                      81  2442                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2443    372 TU45:    $DS_TU45
                          2443                .SAVE   LOCAL_BLOCK
                          2443                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_TU45_LEN,       HP$K_TU45_LEN:
                          0032                .IIF    NB,TU45$K_LEN,  TU45$K_LEN:
                      00002443                .RESTORE
               35 34 55 54 00' 2443                .ASCIC  "TU45"  ; TU45 name
                      04  2443
                      32  2448                .BYTE   TU45$K_LEN              ; TU45$K_LEN of resultant P-table
                      08  2449                .BYTE   8               ; Maximum unit number                   ;G:65
                    0000  244A                .WORD   ^A""    ; Two character mnemonic for QIO TU45
                      80  244C                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  244D                .Byte   Pd$_Name        ; Directive op-code
                      1B  244E                .Byte   Ptd$M_EndDevice         ; Enforced MT codes
                  54 4D 00' 244F                .Ascic  "MT"    ; Enforced device name prefix
                      02  244F
                      86  2452                .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  2453                .LONG   HP$M_ALLOC              ; Constant
                      88  2457                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  2458                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  245A                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  245B                .BYTE   8               ; 8 of data field
                      81  245C                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          245D    373 TU58:    $DS_TU58
                          245D                .SAVE   LOCAL_BLOCK
                          245D                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_TU58_LEN,       HP$K_TU58_LEN:
                          0032                .IIF    NB,TU58$K_LEN,  TU58$K_LEN:
                      0000245D                .RESTORE
               38 35 55 54 00' 245D                .ASCIC  "TU58"  ; TU58 name
                      04  245D
                      32  2462                .BYTE   TU58$K_LEN              ; TU58$K_LEN of resultant P-table
                      02  2463                .BYTE   2               ; Maximum unit number                   ;G:65
                    4444  2464                .WORD   ^A"DD"  ; Two character mnemonic for QIO TU58 DD
                      80  2466                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2467                .Byte   Pd$_Name        ; Directive op-code
                      03  2468                .Byte   Ptd$M_Device            ; Enforced DD codes
                  44 44 00' 2469                .Ascic  "DD"    ; Enforced device name prefix
                      02  2469
                      86  246C                .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  246D                .LONG   HP$M_ALLOC              ; Constant
                      88  2471                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  2472                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  2474                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  2475                .BYTE   8               ; 8 of data field
                      81  2476                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2477    374 TU70:    $DS_TU70                        ;[30]                   ;G:4
                          2477                .SAVE   LOCAL_BLOCK
                          2477                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_TU70_LEN,       HP$K_TU70_LEN::
                          0032                .IIF    NB,TU70$K_LEN,  TU70$K_LEN::
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                    00002477                .RESTORE
          30 37 55 54 00' 2477              .ASCIC  "TU70"  ; TU70 name
                      04  2477
                      32  247C              .BYTE   TU70$K_LEN              ; TU70$K_LEN of resultant P-table
                      10  247D              .BYTE   16              ; Maximum unit number                   ;G:65
                    0000  247E              .WORD   ^A""    ; Two character mnemonic for QIO TU70
                      80  2480              .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2481              .Byte   Pd$_Name        ; Directive op-code
                      1B  2482              .Byte   PTD$M_ENDDEVICE         ; Enforced MR codes
                   52 4D 00' 2483           .Ascic  "MR"    ; Enforced device name prefix
                      02  2483
                      86  2486              .BYTE   Pd$_Literal     ; Indicate literal
                00000001  2487              .LONG   HP$M_ALLOC              ; Constant
                      88  248B              .BYTE   Pd$_Store       ; Indicate store operation
                    000A  248C              .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  248E              .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  248F              .BYTE   8               ; 8 of data field
                      81  2490              .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2491  375 TU72:    $DS_TU72                        ;[30]                   ;G:4
                          2491              .SAVE   LOCAL_BLOCK
                          2491              .PSECT  $ABS$,ABS
                00000032  0050              .=HP$A_DEPENDENT
                          0032              .IIF    NB,HP$K_TU72_LEN,       HP$K_TU72_LEN::
                          0032              .IIF    NB,TU72$K_LEN,  TU72$K_LEN::
                    00002491                .RESTORE
          32 37 55 54 00' 2491              .ASCIC  "TU72"  ; TU72 name
                      04  2491
                      32  2496              .BYTE   TU72$K_LEN              ; TU72$K_LEN of resultant P-table
                      10  2497              .BYTE   16              ; Maximum unit number                   ;G:65
                    0000  2498              .WORD   ^A""    ; Two character mnemonic for QIO TU72
                      80  249A              .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  249B              .Byte   Pd$_Name        ; Directive op-code
                      1B  249C              .Byte   PTD$M_ENDDEVICE         ; Enforced MR codes
                   52 4D 00' 249D           .Ascic  "MR"    ; Enforced device name prefix
                      02  249D
                      86  24A0              .BYTE   Pd$_Literal     ; Indicate literal
                00000001  24A1              .LONG   HP$M_ALLOC              ; Constant
                      88  24A5              .BYTE   Pd$_Store       ; Indicate store operation
                    000A  24A6              .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  24A8              .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  24A9              .BYTE   8               ; 8 of data field
                      81  24AA              .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          24AB  376 TU77:    $DS_TU77
                          24AB              .SAVE   LOCAL_BLOCK
                          24AB              .PSECT  $ABS$,ABS
                00000032  0050              .=HP$A_DEPENDENT
                          0032              .IIF    NB,HP$K_TU77_LEN,       HP$K_TU77_LEN:
                          0032              .IIF    NB,TU77$K_LEN,  TU77$K_LEN:
                    000024AB                .RESTORE
          37 37 55 54 00' 24AB              .ASCIC  "TU77"  ; TU77 name
                      04  24AB
                      32  24B0              .BYTE   TU77$K_LEN              ; TU77$K_LEN of resultant P-table
                      08  24B1              .BYTE   8               ; Maximum unit number                   ;G:65
                    0000  24B2              .WORD   ^A""    ; Two character mnemonic for QIO TU77
                      80  24B4              .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  24B5              .Byte   Pd$_Name        ; Directive op-code
                      1B  24B6              .Byte   Ptd$M_EndDevice         ; Enforced MT codes
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                    54 4D 00' 24B7                  .Ascic  "MT"    ; Enforced device name prefix
                          02  24B7
                          86  24BA                  .BYTE   Pd$_Literal     ; Indicate literal
                    00000001  24BB                  .LONG   HP$M_ALLOC              ; Constant
                          88  24BF                  .BYTE   Pd$_Store       ; Indicate store operation
                        000A  24C0                  .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                          00  24C2                  .BYTE   0               ; 0 HP$B_FLAGS to data
                          08  24C3                  .BYTE   8               ; 8 of data field
                          81  24C4                  .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                              24C5    377 TU78:     $DS_TU78                        ;[01]                   ;G:4
                              24C5                  .SAVE   LOCAL_BLOCK
                              24C5                  .PSECT  $ABS$,ABS
                    00000032  0050                  .=HP$A_DEPENDENT
                              0032                  .IIF    NB,HP$K_TU78_LEN,       HP$K_TU78_LEN:
                              0032                  .IIF    NB,TU78$K_LEN,  TU78$K_LEN:
                                  000024C5          .RESTORE
                 38 37 55 54 00' 24C5               .ASCIC  "TU78"  ; TU78 name
                          04  24C5
                          32  24CA                  .BYTE   TU78$K_LEN              ; TU78$K_LEN of resultant P-table
                          08  24CB                  .BYTE   8               ; Maximum unit number           ;G:65
                        0000  24CC                  .WORD   ^A""    ; Two character mnemonic for QIO TU78
                          80  24CE                  .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  24CF                  .Byte   Pd$_Name        ; Directive op-code
                          1B  24D0                  .Byte   Ptd$M_EndDevice         ; Enforced MF codes
                    46 4D 00' 24D1                  .Ascic  "MF"    ; Enforced device name prefix
                          02  24D1
                          86  24D4                  .BYTE   Pd$_Literal     ; Indicate literal
                    00000001  24D5                  .LONG   HP$M_ALLOC              ; Constant
                          88  24D9                  .BYTE   Pd$_Store       ; Indicate store operation
                        000A  24DA                  .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                          00  24DC                  .BYTE   0               ; 0 HP$B_FLAGS to data
                          08  24DD                  .BYTE   8               ; 8 of data field
                          81  24DE                  .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                              24DF    378 TU80:     $DS_TU80                        ;[08]                   ;G:4
                              24DF                  .SAVE   LOCAL_BLOCK
                              24DF                  .PSECT  $ABS$,ABS
                    00000032  0050                  .=HP$A_DEPENDENT
                              0032                  .IIF    NB,HP$L_TU80_CSR,       HP$L_TU80_CSR:
                    00000036  0032                  .IIF    NB,.BLKL,       .BLKL   1
                              0036                  .IIF    NB,TU80$B_BR,   TU80$B_BR:
                              0036                  .IIF    NB,HP$B_TU80_BR,        HP$B_TU80_BR:
                    00000037  0036                  .IIF    NB,.BLKB,       .BLKB   1
                              0037                  .IIF    NB,HP$K_TU80_LEN,       HP$K_TU80_LEN:
                              0037                  .IIF    NB,TU80$K_LEN,  TU80$K_LEN:
                                  000024DF          .RESTORE
                 30 38 55 54 00' 24DF               .ASCIC  "TU80"  ; TU80 name
                          04  24DF
                          37  24E4                  .BYTE   TU80$K_LEN              ; TU80$K_LEN of resultant P-table
                          08  24E5                  .BYTE   8               ; Maximum unit number           ;G:65
                        0000  24E6                  .WORD   ^A""    ; Two character mnemonic for QIO TU80
                          80  24E8                  .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  24E9                  .Byte   Pd$_Name        ; Directive op-code
                          03  24EA                  .Byte   Ptd$M_Device            ; Enforced MS codes
                    53 4D 00' 24EB                  .Ascic  "MS"    ; Enforced device name prefix
                          02  24EB
                          86  24EE                  .BYTE   Pd$_Literal     ; Indicate literal
                    00000001  24EF                  .LONG   HP$M_ALLOC              ; Constant
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                                88  24F3                .BYTE   Pd$_Store       ; Indicate store operation
                              000A  24F4                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                                00  24F6                .BYTE   0               ; 0 HP$B_FLAGS to data
                                08  24F7                .BYTE   8               ; 8 of data field
                                83  24F8                .BYTE   Pd$_Octal       ; Indicate scan octal
44 41 5F 52 53 43 5F 30 38 55 54 00' 24F9                .ASCIC  "TU80_CSR_ADDRESS"      ; TU80_CSR_ADDRESS string
                     53 53 45 52 44  2505
                                10  24F9
                        0003FFFE 0003E000  250A          .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                                88  2512                .BYTE   Pd$_Store       ; Indicate store operation
                              0032  2513                .WORD   HP$L_TU80_CSR            ; Byte HP$L_TU80_CSR to data
                                00  2515                .BYTE   0               ; 0 HP$L_TU80_CSR to data
                                20  2516                .BYTE   32              ; 32 of data field
                                88  2517                .BYTE   Pd$_Store       ; Indicate store operation
                              0018  2518                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                00  251A                .BYTE   0               ; 0 HP$A_DEVICE to data
                                12  251B                .BYTE   18              ; 18 of data field
                                83  251C                .BYTE   Pd$_Octal       ; Indicate scan octal
52 4F 54 43 45 56 5F 30 38 55 54 00' 251D                .ASCIC  "TU80_VECTOR"   ; TU80_VECTOR string
                                0B  251D
                        000001FE 00000002  2529          .LONG   ^O2,^O776       ; 2 , 776 limits on input
                                88  2531                .BYTE   Pd$_Store       ; Indicate store operation
                              0024  2532                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                00  2534                .BYTE   0               ; 0 HP$W_VECTOR to data
                                10  2535                .BYTE   16              ; 16 of data field
                                82  2536                .BYTE   Pd$_Decimal     ; Indicate scan decimal
        4C 45 56 45 4C 5F 52 42 00' 2537                .ASCIC  "BR_LEVEL"      ; BR_LEVEL string
                                08  2537
                        00000007 00000004  2540          .LONG   4,7     ; 4 , 7 limits on input
                                88  2548                .BYTE   Pd$_Store       ; Indicate store operation
                              0036  2549                .WORD   HP$B_TU80_BR             ; Byte HP$B_TU80_BR to data
                                00  254B                .BYTE   0               ; 0 HP$B_TU80_BR to data
                                08  254C                .BYTE   8               ; 8 of data field
                                81  254D                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                    254E  379 TU81:     $DS_TU81                        ;[09]                           ;G:4
                                    254E                .SAVE   LOCAL_BLOCK
                                    254E                .PSECT  $ABS$,ABS
                          00000032  0050                .=HP$A_DEPENDENT
                                    0032                .IIF    NB,HP$L_TU81_CSR,       HP$L_TU81_CSR:
                                    0032                .IIF    NB,TU81$L_CSR,  TU81$L_CSR:
                          00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                                    0036                .IIF    NB,HP$B_TU81_BR,        HP$B_TU81_BR:
                                    0036                .IIF    NB,TU81$B_BR,   TU81$B_BR:
                          00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                                    0037                .IIF    NB,HP$K_TU81_LEN,       HP$K_TU81_LEN:
                                    0037                .IIF    NB,TU81$K_LEN,  TU81$K_LEN:
                                0000254E                .RESTORE
                     31 38 55 54 00' 254E                .ASCIC  "TU81"  ; TU81 name
                                04  254E
                                37  2553                .BYTE   TU81$K_LEN              ; TU81$K_LEN of resultant P-table
                                04  2554                .BYTE   4               ; Maximum unit number                   ;G:65
                              554D  2555                .WORD   ^A"MU"  ; Two character mnemonic for QIO TU81 MU
                                80  2557                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                8D  2558                .Byte   Pd$_Name        ; Directive op-code
                                03  2559                .Byte   Ptd$M_Device            ; Enforced MU codes
                           55 4D 00' 255A                .Ascic  "MU"    ; Enforced device name prefix
                                02  255A
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                      86  255D                .BYTE   Pd$_Literal      ; Indicate literal
                00000001  255E                .LONG   HP$M_ALLOC               ; Constant
                      88  2562                .BYTE   Pd$_Store        ; Indicate store operation
                    000A  2563                .WORD   HP$B_FLAGS               ; Byte HP$B_FLAGS to data
                      00  2565                .BYTE   0                ; 0 HP$B_FLAGS to data
                      08  2566                .BYTE   8                ; 8 of data field
                      83  2567                .BYTE   Pd$_Octal        ; Indicate scan octal
             52 53 43 00' 2568                .ASCIC  "CSR"    ; CSR string
                      03  2568
          0003FFFE 0003E000  256C                .LONG   ^O760000,^O777776        ; 760000 , 777776 limits on input
                      88  2574                .BYTE   Pd$_Store        ; Indicate store operation
                    0032  2575                .WORD   TU81$L_CSR               ; Byte TU81$L_CSR to data
                      00  2577                .BYTE   0                ; 0 TU81$L_CSR to data
                      20  2578                .BYTE   32               ; 32 of data field
                      88  2579                .BYTE   Pd$_Store        ; Indicate store operation
                    0018  257A                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                      00  257C                .BYTE   0                ; 0 HP$A_DEVICE to data
                      12  257D                .BYTE   18               ; 18 of data field
                      83  257E                .BYTE   Pd$_Octal        ; Indicate scan octal
       52 4F 54 43 45 56 00' 257F                .ASCIC  "VECTOR"         ; VECTOR string
                      06  257F
          000001FE 00000002  2586                .LONG   ^O2,^O776        ; 2 , 776 limits on input
                      88  258E                .BYTE   Pd$_Store        ; Indicate store operation
                    0024  258F                .WORD   HP$W_VECTOR              ; Byte HP$W_VECTOR to data
                      00  2591                .BYTE   0                ; 0 HP$W_VECTOR to data
                      09  2592                .BYTE   9                ; 9 of data field
                      82  2593                .BYTE   Pd$_Decimal      ; Indicate scan decimal
                52 42 00' 2594                .ASCIC  "BR"     ; BR string
                      02  2594
          00000007 00000004  2597                .LONG   4,7      ; 4 , 7 limits on input
                      88  259F                .BYTE   Pd$_Store        ; Indicate store operation
                    0036  25A0                .WORD   TU81$B_BR                ; Byte TU81$B_BR to data
                      00  25A2                .BYTE   0                ; 0 TU81$B_BR to data
                      08  25A3                .BYTE   8                ; 8 of data field
                      81  25A4                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          25A5    380 UBE:    $DS_UBE
                          25A5                .SAVE   LOCAL_BLOCK
                          25A5                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$L_UBE_CSR,         HP$L_UBE_CSR:
                          0032                .IIF    NB,UBE$L_CSR,    UBE$L_CSR:
                00000036  0032                .IIF    NB,.BLKL,        .BLKL   1
                          0036                .IIF    NB,HP$K_UBE_LEN,         HP$K_UBE_LEN:
                          0036                .IIF    NB,UBE$K_LEN,    UBE$K_LEN:
                      00025A5                .RESTORE
             45 42 55 00' 25A5                .ASCIC  "UBE"    ; UBE name
                      03  25A5
                      36  25A9                .BYTE   UBE$K_LEN                ; UBE$K_LEN of resultant P-table
                      08  25AA                .BYTE   8                ; Maximum unit number                          ;G:65
                    4555  25AB                .WORD   ^A"UE"   ; Two character mnemonic for QIO UBE UE
                      80  25AD                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                      8D  25AE                .Byte   Pd$_Name         ; Directive op-code
                      03  25AF                .Byte   Ptd$M_Device             ; Enforced UB codes
                42 55 00' 25B0                .Ascic  "UB"     ; Enforced device name prefix
                      02  25B0
                      83  25B3                .BYTE   Pd$_Octal        ; Indicate scan octal
             52 53 43 00' 25B4                .ASCIC  "CSR"    ; CSR string
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                    03  25B4
          0003FFFE 0003E000  25B8                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                    88  25C0                .BYTE   Pd$_Store       ; Indicate store operation
                  0032  25C1                .WORD   UBE$L_CSR               ; Byte UBE$L_CSR to data
                    00  25C3                .BYTE   0               ; 0 UBE$L_CSR to data
                    20  25C4                .BYTE   32              ; 32 of data field
                    88  25C5                .BYTE   Pd$_Store       ; Indicate store operation
                  0018  25C6                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                    00  25C8                .BYTE   0               ; 0 HP$A_DEVICE to data
                    12  25C9                .BYTE   18              ; 18 of data field
                    83  25CA                .BYTE   Pd$_Octal       ; Indicate scan octal
    52 4F 54 43 45 56 00' 25CB                .ASCIC  "VECTOR"        ; VECTOR string
                    06  25CB
          000001FE 00000002  25D2                .LONG   ^O2,^O776       ; 2 , 776 limits on input
                    88  25DA                .BYTE   Pd$_Store       ; Indicate store operation
                  0024  25DB                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                    00  25DD                .BYTE   0               ; 0 HP$W_VECTOR to data
                    09  25DE                .BYTE   9               ; 9 of data field
                    81  25DF                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                        25E0    381 UDA50:  $DS_UDA50
                        25E0                .SAVE   LOCAL_BLOCK
                        25E0                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$L_UDA50_UDAIP,    HP$L_UDA50_UDAIP:
                        0032                .IIF    NB,UDA50$L_UDAIP,       UDA50$L_UDAIP:
                00000036  0032                .IIF    NB,,BLKL,       .BLKL   1
                        0036                .IIF    NB,HP$B_UDA50_BR,       HP$B_UDA50_BR:
                        0036                .IIF    NB,UDA50$B_BR,  UDA50$B_BR:
                00000037  0036                .IIF    NB,,BLKB,       .BLKB   1
                        0037                .IIF    NB,HP$B_UDA50_BURST,    HP$B_UDA50_BURST:
                        0037                .IIF    NB,UDA50$B_BURST,       UDA50$B_BURST:
                00000038  0037                .IIF    NB,,BLKB,       .BLKB   1
                        0038                .IIF    NB,HP$K_UDA50_LEN,      HP$K_UDA50_LEN:
                        0038                .IIF    NB,UDA50$K_LEN, UDA50$K_LEN:
                    000025E0                .RESTORE
    30 35 41 44 55 00' 25E0                .ASCIC  "UDA50" ; UDA50 name
                    05  25E0
                    38  25E6                .BYTE   HP$K_UDA50_LEN          ; HP$K_UDA50_LEN of resultant P-table
                    00  25E7                .BYTE   0               ; Maximum unit number                                   ;G:65
                  0000  25E8                .WORD   ^A""    ; Two character mnemonic for QIO UDA50
                    80  25EA                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                    8D  25EB                .Byte   Pd$_Name        ; Directive op-code
                    02  25EC                .Byte   Ptd$M_Controller                ; Enforced DU codes
              55 44 00' 25ED                .Ascic  "DU"    ; Enforced device name prefix
                    02  25ED
                    83  25F0                .BYTE   Pd$_Octal       ; Indicate scan octal
    50 49 41 44 55 00' 25F1                .ASCIC  "UDAIP" ; UDAIP string
                    05  25F1
          0003FFFC 0003E000  25F7                .LONG   ^O760000,^O777774       ; 760000 , 777774 limits on input
                    88  25FF                .BYTE   Pd$_Store       ; Indicate store operation
                  0032  2600                .WORD   HP$L_UDA50_UDAIP                ; Byte HP$L_UDA50_UDAIP to data
                    00  2602                .BYTE   0               ; 0 HP$L_UDA50_UDAIP to data
                    20  2603                .BYTE   32              ; 32 of data field
                    88  2604                .BYTE   Pd$_Store       ; Indicate store operation
                  0018  2605                .WORD   Hp$A_Device             ; Byte Hp$A_Device to data
                    00  2607                .BYTE   0               ; 0 Hp$A_Device to data
                    12  2608                .BYTE   18              ; 18 of data field
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                                  83  2609                .BYTE   Pd$_Octal        ; Indicate scan octal
              72 6F 74 63 65 56 00'  260A                .ASCIC  "Vector"         ; Vector string
                                  06  260A
                 000001FC 00000004  2611                .LONG   ^O4,^O774        ; 4 , 774 limits on input
                                  88  2619                .BYTE   Pd$_Store        ; Indicate store operation
                                0024  261A                .WORD   HP$W_VECTOR              ; Byte HP$W_VECTOR to data
                                  00  261C                .BYTE   0                ; 0 HP$W_VECTOR to data
                                  08  261D                .BYTE   8                ; 8 of data field
                                  82  261E                .BYTE   Pd$_Decimal      ; Indicate scan decimal
                           52 42 00'  261F                .ASCIC  "BR"     ; BR string
                                  02  261F
                 00000007 00000004  2622                .LONG   4,7      ; 4 , 7 limits on input
                                  88  262A                .BYTE   Pd$_Store        ; Indicate store operation
                                0036  262B                .WORD   HP$B_UDA50_BR            ; Byte HP$B_UDA50_BR to data
                                  00  262D                .BYTE   0                ; 0 HP$B_UDA50_BR to data
                                  08  262E                .BYTE   8                ; 8 of data field
                                  82  262F                .BYTE   Pd$_Decimal      ; Indicate scan decimal
   65 74 61 52 5F 74 73 72 75 42 00'  2630                .ASCIC  "Burst_Rate"     ; Burst_Rate string
                                  0A  2630
                 0000003F 00000000  263B                .LONG   0,63     ; 0 , 63 limits on input
                                  88  2643                .BYTE   Pd$_Store        ; Indicate store operation
                                0037  2644                .WORD   HP$B_UDA50_BURST                 ; Byte HP$B_UDA50_BURST to data
                                  00  2646                .BYTE   0                ; 0 HP$B_UDA50_BURST to data
                                  06  2647                .BYTE   6                ; 6 of data field
                                  81  2648                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                                      2649   382 UNA11:   $DS_UNA11                        ;[06]                                  ;G:4
                                      2649                .SAVE   LOCAL_BLOCK
                                      2649                .PSECT  $ABS$,ABS
                           00000032  0050                .=HP$A_DEPENDENT
                                      0032                .IIF    NB,UNA11$B_BR,  UNA11$B_BR:
                           00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                                      0033                .IIF    NB,UNA11$L_CSR, UNA11$L_CSR:
                           00000037  0033                .IIF    NB,.BLKL,       .BLKL   1
                                      0037                .IIF    NB,UNA11$K_LEN, UNA11$K_LEN:
                                 00002649                .RESTORE
                 31 31 41 4E 55 00'  2649                .ASCIC  "UNA11" ; UNA11 name
                                  05  2649
                                  37  264F                .BYTE   UNA11$K_LEN              ; UNA11$K_LEN of resultant P-table
                                  08  2650                .BYTE   8                ; Maximum unit number                          ;G:65
                                0000  2651                .WORD   ^A""     ; Two character mnemonic for QIO UNA11
                                  80  2653                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                                  8D  2654                .Byte   Pd$_Name         ; Directive op-code
                                  03  2655                .Byte   PTD$M_DEVICE             ; Enforced XE codes
                           45 58 00'  2656                .Ascic  "XE"     ; Enforced device name prefix
                                  02  2656
                                  83  2659                .BYTE   Pd$_Octal        ; Indicate scan octal
                        52 53 43 00'  265A                .ASCIC  "CSR"    ; CSR string
                                  03  265A
                 0003FFFE 0003E000  265E                .LONG   ^O760000,^O777776        ; 760000 , 777776 limits on input
                                  88  2666                .BYTE   Pd$_Store        ; Indicate store operation
                                0033  2667                .WORD   UNA11$L_CSR              ; Byte UNA11$L_CSR to data
                                  00  2669                .BYTE   0                ; 0 UNA11$L_CSR to data
                                  20  266A                .BYTE   32               ; 32 of data field
                                  88  266B                .BYTE   Pd$_Store        ; Indicate store operation
                                0018  266C                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                                  00  266E                .BYTE   0                ; 0 HP$A_DEVICE to data
                                  12  266F                .BYTE   18               ; 18 of data field
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                      83  2670                .BYTE   Pd$_Octal       ; Indicate scan octal
          52 4F 54 43 45 56 00' 2671          .ASCIC  "VECTOR"        ; VECTOR string
                      06  2671
             000001FE 00000002  2678          .LONG   ^O2,^O776       ; 2 , 776 limits on input
                      88  2680                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  2681                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  2683                .BYTE   0               ; 0 HP$W_VECTOR to data
                      09  2684                .BYTE   9               ; 9 of data field
                      82  2685                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                   52 42 00' 2686             .ASCIC  "BR"    ; BR string
                      02  2686
             00000007 00000004  2689          .LONG   4,7     ; 4 , 7 limits on input
                      88  2691                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  2692                .WORD   UNA11$B_BR              ; Byte UNA11$B_BR to data
                      00  2694                .BYTE   0               ; 0 UNA11$B_BR to data
                      08  2695                .BYTE   8               ; 8 of data field
                      81  2696                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2697    383 VS100:  $DS_VS100                       ;[10]                   ;G:4
                          2697                .SAVE   LOCAL_BLOCK
                          2697                .PSECT  $ABS$,ABS
                   00000032  0050             .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$L_VS100_CSR,      HP$L_VS100_CSR:
                          0032                .IIF    NB,VS100$L_CSR, VS100$L_CSR:
                   00000036  0032             .IIF    NB,.BLKL,       .BLKL   1
                          0036                .IIF    NB,HP$B_VS100_BR,       HP$B_VS100_BR:
                          0036                .IIF    NB,VS100$B_BR,  VS100$B_BR:
                   00000037  0036             .IIF    NB,.BLKB,       .BLKB   1
                          0037                .IIF    NB,HP$K_VS100_LEN,      HP$K_VS100_LEN:
                          0037                .IIF    NB,VS100$K_LEN, VS100$K_LEN:
                      00002697                .RESTORE
          30 30 31 53 56 00' 2697             .ASCIC  "VS100" ; VS100 name
                      05  2697
                      37  269D                .BYTE   VS100$K_LEN             ; VS100$K_LEN of resultant P-table
                      01  269E                .BYTE   1               ; Maximum unit number                   ;G:65
                    5356  269F                .WORD   ^A"VS"  ; Two character mnemonic for QIO VS100 VS
                      80  26A1                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  26A2                .Byte   Pd$_Name        ; Directive op-code
                      1B  26A3                .Byte   Ptd$M_EndDevice         ; Enforced VB codes
                   42 56 00' 26A4             .Ascic  "VB"    ; Enforced device name prefix
                      02  26A4
                      86  26A7                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  26A8                .LONG   HP$M_ALLOC              ; Constant
                      88  26AC                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  26AD                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  26AF                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  26B0                .BYTE   8               ; 8 of data field
                      83  26B1                .BYTE   Pd$_Octal       ; Indicate scan octal
                   52 53 43 00' 26B2          .ASCIC  "CSR"   ; CSR string
                      03  26B2
             0003FFFE 0003E000  26B6          .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  26BE                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  26BF                .WORD   VS100$L_CSR             ; Byte VS100$L_CSR to data
                      00  26C1                .BYTE   0               ; 0 VS100$L_CSR to data
                      20  26C2                .BYTE   32              ; 32 of data field
                      88  26C3                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  26C4                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  26C6                .BYTE   0               ; 0 HP$A_DEVICE to data
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                    12  26C7                .BYTE   18                  ; 18 of data field
                    83  26C8                .BYTE   Pd$_Octal           ; Indicate scan octal
 52 4F 54 43 45 56 00' 26C9                .ASCIC  "VECTOR"            ; VECTOR string
                    06  26C9
   000001FE 00000002  26D0                .LONG   ^O2,^O776           ; 2 , 776 limits on input
                    88  26D8                .BYTE   Pd$_Store           ; Indicate store operation
                  0024  26D9                .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                    00  26DB                .BYTE   0                   ; 0 HP$W_VECTOR to data
                    09  26DC                .BYTE   9                   ; 9 of data field
                    82  26DD                .BYTE   Pd$_Decimal         ; Indicate scan decimal
              52 42 00' 26DE                .ASCIC  "BR"     ; BR string
                    02  26DE
   00000007 00000004  26E1                .LONG   4,7      ; 4 , 7 limits on input
                    88  26E9                .BYTE   Pd$_Store           ; Indicate store operation
                  0036  26EA                .WORD   VS100$B_BR                  ; Byte VS100$B_BR to data
                    00  26EC                .BYTE   0                   ; 0 VS100$B_BR to data
                    08  26ED                .BYTE   8                   ; 8 of data field
                    81  26EE                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                        26EF   384 VS125:   $DS_VS125                           ;[17]                                  ;G:4
                        26EF                .SAVE   LOCAL_BLOCK
                        26EF                .PSECT  $ABS$,ABS
              00000032  0050                .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$L_VS125_CSR,      HP$L_VS125_CSR:
                        0032                .IIF    NB,VS125$L_CSR, VS125$L_CSR:
              00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                        0036                .IIF    NB,HP$B_VS125_BR,       HP$B_VS125_BR:
                        0036                .IIF    NB,VS125$B_BR,  VS125$B_BR:
              00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                        0037                .IIF    NB,HP$K_VS125_LEN,      HP$K_VS125_LEN:
                        0037                .IIF    NB,VS125$K_LEN, VS125$K_LEN:
                    000026EF                .RESTORE
   35 32 31 53 56 00' 26EF                .ASCIC  "VS125" ; VS125 name
                    05  26EF
                    37  26F5                .BYTE   VS125$K_LEN                 ; VS125$K_LEN of resultant P-table
                    01  26F6                .BYTE   1                   ; Maximum unit number                          ;G:65
                  5356  26F7                .WORD   ^A"VS"   ; Two character mnemonic for QIO VS125 VS
                    80  26F9                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                    8D  26FA                .Byte   Pd$_Name            ; Directive op-code
                    1B  26FB                .Byte   Ptd$M_EndDevice             ; Enforced VB codes
              42 56 00' 26FC                .Ascic  "VB"     ; Enforced device name prefix
                    02  26FC
                    86  26FF                .BYTE   Pd$_Literal         ; Indicate literal
              00000001  2700                .LONG   HP$M_ALLOC                  ; Constant
                    88  2704                .BYTE   Pd$_Store           ; Indicate store operation
                  000A  2705                .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                    00  2707                .BYTE   0                   ; 0 HP$B_FLAGS to data
                    08  2708                .BYTE   8                   ; 8 of data field
                    83  2709                .BYTE   Pd$_Octal           ; Indicate scan octal
           52 53 43 00' 270A                .ASCIC  "CSR"    ; CSR string
                    03  270A
   0003FFFE 0003E000  270E                .LONG   ^O760000,^O777776           ; 760000 , 777776 limits on input
                    88  2716                .BYTE   Pd$_Store           ; Indicate store operation
                  0032  2717                .WORD   VS125$L_CSR                 ; Byte VS125$L_CSR to data
                    00  2719                .BYTE   0                   ; 0 VS125$L_CSR to data
                    20  271A                .BYTE   32                  ; 32 of data field
                    88  271B                .BYTE   Pd$_Store           ; Indicate store operation
                  0018  271C                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
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                      00  271E                .BYTE   0                       ; 0 HP$A_DEVICE to data
                      12  271F                .BYTE   18                      ; 18 of data field
                      83  2720                .BYTE   Pd$_Octal               ; Indicate scan octal
          52 4F 54 43 45 56 00' 2721          .ASCIC  "VECTOR"                ; VECTOR string
                      06  2721
             000001FE 00000002  2728          .LONG   ^O2,^O776               ; 2 , 776 limits on input
                      88  2730                .BYTE   Pd$_Store               ; Indicate store operation
                    0024  2731                .WORD   HP$W_VECTOR                     ; Byte HP$W_VECTOR to data
                      00  2733                .BYTE   0                       ; 0 HP$W_VECTOR to data
                      09  2734                .BYTE   9                       ; 9 of data field
                      82  2735                .BYTE   Pd$_Decimal             ; Indicate scan decimal
                   52 42 00' 2736             .ASCIC  "BR"    ; BR string
                      02  2736
             00000007 00000004  2739          .LONG   4,7     ; 4 , 7 limits on input
                      88  2741                .BYTE   Pd$_Store               ; Indicate store operation
                    0036  2742                .WORD   VS125$B_BR                      ; Byte VS125$B_BR to data
                      00  2744                .BYTE   0                       ; 0 VS125$B_BR to data
                      08  2745                .BYTE   8                       ; 8 of data field
                      81  2746                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          2747    385 VS300:  $DS_VS300                       ;[12]                          ;G:4
                          2747                .SAVE   LOCAL_BLOCK
                          2747                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$L_VS300_CSR,      HP$L_VS300_CSR:
                          0032                .IIF    NB,VS300$L_CSR, VS300$L_CSR:
                 00000036 0032                .IIF    NB,,BLKL,       .BLKL   1
                          0036                .IIF    NB,HP$B_VS300_BR,       HP$B_VS300_BR:
                          0036                .IIF    NB,VS300$B_BR,  VS300$B_BR:
                 00000037 0036                .IIF    NB,,BLKB,       .BLKB   1
                          0037                .IIF    NB,HP$K_VS300_LEN,      HP$K_VS300_LEN:
                          0037                .IIF    NB,VS300$K_LEN, VS300$K_LEN:
                      00002747                .RESTORE
          30 30 33 53 56 00' 2747             .ASCIC  "VS300" ; VS300 name
                      05  2747
                      37  274D                .BYTE   VS300$K_LEN             ; VS300$K_LEN of resultant P-table
                      01  274E                .BYTE   1                       ; Maximum unit number          ;G:65
                    5356  274F                .WORD   ^A"VS"  ; Two character mnemonic for QIO VS300 VS
                      80  2751                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  2752                .Byte   Pd$_Name                ; Directive op-code
                      1B  2753                .Byte   Ptd$M_EndDevice         ; Enforced VB codes
                   42 56 00' 2754             .Ascic  "VB"    ; Enforced device name prefix
                      02  2754
                      86  2757                .BYTE   Pd$_Literal             ; Indicate literal
                00000001  2758                .LONG   HP$M_ALLOC                      ; Constant
                      88  275C                .BYTE   Pd$_Store               ; Indicate store operation
                    000A  275D                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                      00  275F                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  2760                .BYTE   8                       ; 8 of data field
                      83  2761                .BYTE   Pd$_Octal               ; Indicate scan octal
                52 53 43 00' 2762             .ASCIC  "CSR"   ; CSR string
                      03  2762
          0003FFFE 0003E000  2766             .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  276E                .BYTE   Pd$_Store               ; Indicate store operation
                    0032  276F                .WORD   VS300$L_CSR                     ; Byte VS300$L_CSR to data
                      00  2771                .BYTE   0                       ; 0 VS300$L_CSR to data
                      20  2772                .BYTE   32                      ; 32 of data field
                      88  2773                .BYTE   Pd$_Store               ; Indicate store operation
```

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                     0018  2774                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                       00  2776                .BYTE   0                ; 0 HP$A_DEVICE to data
                       12  2777                .BYTE   18               ; 18 of data field
                       83  2778                .BYTE   Pd$_Octal        ; Indicate scan octal
           52 4F 54 43 45 56 00' 2779          .ASCIC  "VECTOR"         ; VECTOR string
                       06  2779
              000001FE 00000002  2780          .LONG   ^O2,^O776        ; 2 , 776 limits on input
                       88  2788                .BYTE   Pd$_Store        ; Indicate store operation
                     0024  2789                .WORD   HP$W_VECTOR              ; Byte HP$W_VECTOR to data
                       00  278B                .BYTE   0                ; 0 HP$W_VECTOR to data
                       09  278C                .BYTE   9                ; 9 of data field
                       82  278D                .BYTE   Pd$_Decimal      ; Indicate scan decimal
                 52 42 00' 278E                .ASCIC  "BR"     ; BR string
                       02  278E
              00000007 00000004  2791          .LONG   4,7      ; 4 , 7 limits on input
                       88  2799                .BYTE   Pd$_Store        ; Indicate store operation
                     0036  279A                .WORD   VS300$B_BR               ; Byte VS300$B_BR to data
                       00  279C                .BYTE   0                ; 0 VS300$B_BR to data
                       08  279D                .BYTE   8                ; 8 of data field
                       81  279E                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                           279F    386 VT50:   $DS_VT50
                           279F                .SAVE   LOCAL_BLOCK
                           279F                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,HP$K_VT50_LEN,       HP$K_VT50_LEN:
                           0032                .IIF    NB,VT50$K_LEN,  VT50$K_LEN:
                       0000279F                .RESTORE
           30 35 54 56 00' 279F                .ASCIC  "VT50"   ; VT50 name
                       04  279F
                       32  27A4                .BYTE   VT50$K_LEN               ; VT50$K_LEN of resultant P-table
                       FF  27A5                .BYTE   255              ; Maximum unit number                          ;G:65
                     0000  27A6                .WORD   ^A""     ; Two character mnemonic for QIO VT50
                       80  27A8                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                       8D  27A9                .Byte   Pd$_Name         ; Directive op-code
                       1B  27AA                .Byte   Ptd$M_EndDevice          ; Enforced TT codes
                 54 54 00' 27AB                .Ascic  "TT"     ; Enforced device name prefix
                       02  27AB
                       86  27AE                .BYTE   Pd$_Literal      ; Indicate literal
                 00000001  27AF                .LONG   HP$M_ALLOC               ; Constant
                       88  27B3                .BYTE   Pd$_Store        ; Indicate store operation
                     000A  27B4                .WORD   HP$B_FLAGS               ; Byte HP$B_FLAGS to data
                       00  27B6                .BYTE   0                ; 0 HP$B_FLAGS to data
                       08  27B7                .BYTE   8                ; 8 of data field
                       81  27B8                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                           27B9    387 VT52:   $DS_VT52
                           27B9                .SAVE   LOCAL_BLOCK
                           27B9                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,HP$K_VT52_LEN,       HP$K_VT52_LEN:
                           0032                .IIF    NB,VT52$K_LEN,  VT52$K_LEN:
                       000027B9                .RESTORE
           32 35 54 56 00' 27B9                .ASCIC  "VT52"   ; VT52 name
                       04  27B9
                       32  27BE                .BYTE   VT52$K_LEN               ; VT52$K_LEN of resultant P-table
                       FF  27BF                .BYTE   255              ; Maximum unit number                          ;G:65
                     0000  27C0                .WORD   ^A""     ; Two character mnemonic for QIO VT52
                       80  27C2                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
```

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                8D  27C3                .Byte   Pd$_Name        ; Directive op-code
                1B  27C4                .Byte   Ptd$M_EndDevice         ; Enforced TT codes
          54 54 00' 27C5                .Ascic  "TT"    ; Enforced device name prefix
                02  27C5
                86  27C8                .BYTE   Pd$_Literal     ; Indicate literal
          00000001  27C9                .LONG   HP$M_ALLOC              ; Constant
                88  27CD                .BYTE   Pd$_Store       ; Indicate store operation
              000A  27CE                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                00  27D0                .BYTE   0               ; 0 HP$B_FLAGS to data
                08  27D1                .BYTE   8               ; 8 of data field
                81  27D2                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                    27D3   388 VT55:    $DS_VT55
                    27D3                .SAVE   LOCAL_BLOCK
                    27D3                .PSECT  $ABS$,ABS
          00000032  0050                .=HP$A_DEPENDENT
                    0032                .IIF    NB,HP$K_VT55_LEN,       HP$K_VT55_LEN:
                    0032                .IIF    NB,VT55$K_LEN,  VT55$K_LEN:
                000027D3                .RESTORE
     35 35 54 56 00' 27D3                .ASCIC  "VT55"  ; VT55 name
                04  27D3
                32  27D8                .BYTE   VT55$K_LEN              ; VT55$K_LEN of resultant P-table
                FF  27D9                .BYTE   255             ; Maximum unit number                   ;G:65
              0000  27DA                .WORD   ^A""    ; Two character mnemonic for QIO VT55
                80  27DC                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                8D  27DD                .Byte   Pd$_Name        ; Directive op-code
                1B  27DE                .Byte   Ptd$M_EndDevice         ; Enforced TT codes
          54 54 00' 27DF                .Ascic  "TT"    ; Enforced device name prefix
                02  27DF
                86  27E2                .BYTE   Pd$_Literal     ; Indicate literal
          00000001  27E3                .LONG   HP$M_ALLOC              ; Constant
                88  27E7                .BYTE   Pd$_Store       ; Indicate store operation
              000A  27E8                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                00  27EA                .BYTE   0               ; 0 HP$B_FLAGS to data
                08  27EB                .BYTE   8               ; 8 of data field
                81  27EC                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                    27ED   389 VT61:    $DS_VT61                        ;[32]                           ;G:4
                    27ED                .SAVE   LOCAL_BLOCK
                    27ED                .PSECT  $ABS$,ABS
          00000032  0050                .=HP$A_DEPENDENT
                    0032                .IIF    NB,HP$K_VT61_LEN,       HP$K_VT61_LEN:
                    0032                .IIF    NB,VT61$K_LEN,  VT61$K_LEN:
                000027ED                .RESTORE
     31 36 54 56 00' 27ED                .ASCIC  "VT61"  ; VT61 name
                04  27ED
                32  27F2                .BYTE   VT61$K_LEN              ; VT61$K_LEN of resultant P-table
                08  27F3                .BYTE   8               ; Maximum unit number                   ;G:65
              0000  27F4                .WORD   ^A""    ; Two character mnemonic for QIO VT61
                80  27F6                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                8D  27F7                .Byte   Pd$_Name        ; Directive op-code
                1B  27F8                .Byte   Ptd$M_EndDevice         ; Enforced TT codes
          54 54 00' 27F9                .Ascic  "TT"    ; Enforced device name prefix
                02  27F9
                86  27FC                .BYTE   Pd$_Literal     ; Indicate literal
          00000001  27FD                .LONG   HP$M_ALLOC              ; Constant
                88  2801                .BYTE   Pd$_Store       ; Indicate store operation
              000A  2802                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                00  2804                .BYTE   0               ; 0 HP$B_FLAGS to data
```

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                  08  2805                .BYTE   8                   ; 8 of data field
                  81  2806                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                      2807   390 VT71:    $DS_VT71                          ;[32]                                  ;G:4
                      2807                .SAVE   LOCAL_BLOCK
                      2807                .PSECT  $ABS$,ABS
           00000032   0050                .=HP$A_DEPENDENT
                      0032                .IIF    NB,HP$K_VT71_LEN,       HP$K_VT71_LEN:
                      0032                .IIF    NB,VT71$K_LEN,  VT71$K_LEN:
                  00002807                .RESTORE
     31 37 54 56 00' 2807                .ASCIC  "VT71"  ; VT71 name
                  04  2807
                  32  280C                .BYTE   VT71$K_LEN                ; VT71$K_LEN of resultant P-table
                  08  280D                .BYTE   8                   ; Maximum unit number                          ;G:65
                0000  280E                .WORD   ^A""    ; Two character mnemonic for QIO VT71
                  80  2810                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                  8D  2811                .Byte   Pd$_Name            ; Directive op-code
                  1B  2812                .Byte   Ptd$M_EndDevice           ; Enforced TT codes
           54 54 00' 2813                .Ascic  "TT"    ; Enforced device name prefix
                  02  2813
                  86  2816                .BYTE   Pd$_Literal         ; Indicate literal
           00000001   2817                .LONG   HP$M_ALLOC                ; Constant
                  88  281B                .BYTE   Pd$_Store           ; Indicate store operation
                000A  281C                .WORD   HP$B_FLAGS                ; Byte HP$B_FLAGS to data
                  00  281E                .BYTE   0                   ; 0 HP$B_FLAGS to data
                  08  281F                .BYTE   8                   ; 8 of data field
                  81  2820                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                      2821   391 VT100:   $DS_VT100
                      2821                .SAVE   LOCAL_BLOCK
                      2821                .PSECT  $ABS$,ABS
           00000032   0050                .=HP$A_DEPENDENT
                      0032                .IIF    NB,HP$K_VT100_LEN,      HP$K_VT100_LEN:
                      0032                .IIF    NB,VT100$K_LEN, VT100$K_LEN:
                  00002821                .RESTORE
  30 30 31 54 56 00' 2821                .ASCIC  "VT100" ; VT100 name
                  05  2821
                  32  2827                .BYTE   VT100$K_LEN               ; VT100$K_LEN of resultant P-table
                  FF  2828                .BYTE   255                 ; Maximum unit number                          ;G:65
                0000  2829                .WORD   ^A""    ; Two character mnemonic for QIO VT100
                  80  282B                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                  8D  282C                .Byte   Pd$_Name            ; Directive op-code
                  1B  282D                .Byte   Ptd$M_EndDevice           ; Enforced TT codes
           54 54 00' 282E                .Ascic  "TT"    ; Enforced device name prefix
                  02  282E
                  86  2831                .BYTE   Pd$_Literal         ; Indicate literal
           00000001   2832                .LONG   HP$M_ALLOC                ; Constant
                  88  2836                .BYTE   Pd$_Store           ; Indicate store operation
                000A  2837                .WORD   HP$B_FLAGS                ; Byte HP$B_FLAGS to data
                  00  2839                .BYTE   0                   ; 0 HP$B_FLAGS to data
                  08  283A                .BYTE   8                   ; 8 of data field
                  81  283B                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                      283C   392 VT101:   $DS_VT101
                      283C                .SAVE   LOCAL_BLOCK
                      283C                .PSECT  $ABS$,ABS
           00000032   0050                .=HP$A_DEPENDENT
                      0032                .IIF    NB,HP$K_VT101_LEN,      HP$K_VT101_LEN:
                      0032                .IIF    NB,VT101$K_LEN, VT101$K_LEN:
                  0000283C                .RESTORE
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                31 30 31 54 56 00' 283C                 .ASCIC  "VT101" ; VT101 name
                                05  283C
                                32  2842                 .BYTE   VT101$K_LEN             ; VT101$K_LEN of resultant P-table
                                FF  2843                 .BYTE   255                     ; Maximum unit number                   ;G:65
                              0000  2844                 .WORD   ^A""    ; Two character mnemonic for QIO VT101
                                80  2846                 .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                8D  2847                 .Byte   Pd$_Name        ; Directive op-code
                                1B  2848                 .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                           54 54 00' 2849                 .Ascic  "TT"    ; Enforced device name prefix
                                02  2849
                                86  284C                 .BYTE   Pd$_Literal     ; Indicate literal
                          00000001  284D                 .LONG   HP$M_ALLOC              ; Constant
                                88  2851                 .BYTE   Pd$_Store       ; Indicate store operation
                              000A  2852                 .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                                00  2854                 .BYTE   0               ; 0 HP$B_FLAGS to data
                                08  2855                 .BYTE   8               ; 8 of data field
                                81  2856                 .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                    2857    393 VT102:  $DS_VT102
                                    2857                .SAVE   LOCAL_BLOCK
                                    2857                .PSECT  $ABS$,ABS
                          00000032  0050                .=HP$A_DEPENDENT
                                    0032                .IIF    NB,HP$K_VT102_LEN,      HP$K_VT102_LEN:
                                    0032                .IIF    NB,VT102$K_LEN, VT102$K_LEN:
                                00002857                .RESTORE
                32 30 31 54 56 00' 2857                 .ASCIC  "VT102" ; VT102 name
                                05  2857
                                32  285D                 .BYTE   VT102$K_LEN             ; VT102$K_LEN of resultant P-table
                                FF  285E                 .BYTE   255                     ; Maximum unit number                   ;G:65
                              0000  285F                 .WORD   ^A""    ; Two character mnemonic for QIO VT102
                                80  2861                 .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                8D  2862                 .Byte   Pd$_Name        ; Directive op-code
                                1B  2863                 .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                           54 54 00' 2864                 .Ascic  "TT"    ; Enforced device name prefix
                                02  2864
                                86  2867                 .BYTE   Pd$_Literal     ; Indicate literal
                          00000001  2868                 .LONG   HP$M_ALLOC              ; Constant
                                88  286C                 .BYTE   Pd$_Store       ; Indicate store operation
                              000A  286D                 .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                                00  286F                 .BYTE   0               ; 0 HP$B_FLAGS to data
                                08  2870                 .BYTE   8               ; 8 of data field
                                81  2871                 .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                    2872    394 VT125:  $DS_VT125
                                    2872                .SAVE   LOCAL_BLOCK
                                    2872                .PSECT  $ABS$,ABS
                          00000032  0050                .=HP$A_DEPENDENT
                                    0032                .IIF    NB,HP$K_VT125_LEN,      HP$K_VT125_LEN:
                                    0032                .IIF    NB,VT125$K_LEN, VT125$K_LEN:
                                00002872                .RESTORE
             35 32 31 54 56 00' 2872                    .ASCIC  "VT125" ; VT125 name
                                05  2872
                                32  2878                 .BYTE   VT125$K_LEN             ; VT125$K_LEN of resultant P-table
                                FF  2879                 .BYTE   255                     ; Maximum unit number                   ;G:65
                              0000  287A                 .WORD   ^A""    ; Two character mnemonic for QIO VT125
                                80  287C                 .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                8D  287D                 .Byte   Pd$_Name        ; Directive op-code
                                1B  287E                 .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                           54 54 00' 287F                 .Ascic  "TT"    ; Enforced device name prefix
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```
                      02  287F
                      86  2882                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  2883                .LONG   HP$M_ALLOC              ; Constant
                      88  2887                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  2888                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  288A                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  288B                .BYTE   8               ; 8 of data field
                      81  288C                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          288D   395 VT131:   $DS_VT131                       ;[32]                          ;G:4
                          288D                .SAVE   LOCAL_BLOCK
                          288D                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_VT131_LEN,      HP$K_VT131_LEN:
                          0032                .IIF    NB,VT131$K_LEN, VT131$K_LEN:
                0000288D  0000                .RESTORE
      31 33 31 54 56 00' 288D                .ASCIC  "VT131" ; VT131 name
                      05  288D
                      32  2893                .BYTE   VT131$K_LEN             ; VT131$K_LEN of resultant P-table
                      08  2894                .BYTE   8               ; Maximum unit number          ;G:65
                    0000  2895                .WORD   ^A""    ; Two character mnemonic for QIO VT131
                      80  2897                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2898                .Byte   Pd$_Name        ; Directive op-code
                      1B  2899                .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                54 54 00' 289A                .Ascic  "TT"    ; Enforced device name prefix
                      02  289A
                      86  289D                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  289E                .LONG   HP$M_ALLOC              ; Constant
                      88  28A2                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  28A3                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  28A5                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  28A6                .BYTE   8               ; 8 of data field
                      81  28A7                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          28A8   396 VT132:   $DS_VT132                       ;[32]                          ;G:4
                          28A8                .SAVE   LOCAL_BLOCK
                          28A8                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_VT132_LEN,      HP$K_VT132_LEN:
                          0032                .IIF    NB,VT132$K_LEN, VT132$K_LEN:
                000028A8  0000                .RESTORE
      32 33 31 54 56 00' 28A8                .ASCIC  "VT132" ; VT132 name
                      05  28A8
                      32  28AE                .BYTE   VT132$K_LEN             ; VT132$K_LEN of resultant P-table
                      08  28AF                .BYTE   8               ; Maximum unit number          ;G:65
                    0000  28B0                .WORD   ^A""    ; Two character mnemonic for QIO VT132
                      80  28B2                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  28B3                .Byte   Pd$_Name        ; Directive op-code
                      1B  28B4                .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                54 54 00' 28B5                .Ascic  "TT"    ; Enforced device name prefix
                      02  28B5
                      86  28B8                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  28B9                .LONG   HP$M_ALLOC              ; Constant
                      88  28BD                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  28BE                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  28C0                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  28C1                .BYTE   8               ; 8 of data field
                      81  28C2                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          28C3   397 VT220:   $DS_VT220                       ;[14]                          ;G:4
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                            28C3                .SAVE   LOCAL_BLOCK
                            28C3                .PSECT  $ABS$,ABS
                        00000032  0050            .=HP$A_DEPENDENT
                                  0032            .IIF    NB,HP$K_VT220_LEN,      HP$K_VT220_LEN:
                                  0032            .IIF    NB,VT220$K_LEN, VT220$K_LEN:
                             000028C3             .RESTORE
                  30 32 32 54 56 00' 28C3         .ASCIC  "VT220" ; VT220 name
                               05  28C3
                               32  28C9           .BYTE   VT220$K_LEN             ; VT220$K_LEN of resultant P-table
                               FF  28CA           .BYTE   255             ; Maximum unit number                   ;G:65
                             0000  28CB           .WORD   ^A""    ; Two character mnemonic for QIO VT220
                               80  28CD           .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                               8D  28CE           .Byte   Pd$_Name        ; Directive op-code
                               1B  28CF           .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                        54 54 00' 28D0           .Ascic  "TT"    ; Enforced device name prefix
                               02  28D0
                               86  28D3           .BYTE   Pd$_Literal     ; Indicate literal
                        00000001  28D4           .LONG   HP$M_ALLOC              ; Constant
                               88  28D8           .BYTE   Pd$_Store       ; Indicate store operation
                             000A  28D9           .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                               00  28DB           .BYTE   0               ; 0 HP$B_FLAGS to data
                               08  28DC           .BYTE   8               ; 8 of data field
                               81  28DD           .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                   28DE  398 VT240:  $DS_VT240                     ;[14]                   ;G:4
                                   28DE            .SAVE   LOCAL_BLOCK
                                   28DE            .PSECT  $ABS$,ABS
                        00000032   0050            .=HP$A_DEPENDENT
                                   0032            .IIF    NB,HP$K_VT240_LEN,      HP$K_VT240_LEN:
                                   0032            .IIF    NB,VT240$K_LEN, VT240$K_LEN:
                              000028DE             .RESTORE
                  30 34 32 54 56 00' 28DE         .ASCIC  "VT240" ; VT240 name
                               05  28DE
                               32  28E4           .BYTE   VT240$K_LEN             ; VT240$K_LEN of resultant P-table
                               FF  28E5           .BYTE   255             ; Maximum unit number                   ;G:65
                             0000  28E6           .WORD   ^A""    ; Two character mnemonic for QIO VT240
                               80  28E8           .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                               8D  28E9           .Byte   Pd$_Name        ; Directive op-code
                               1B  28EA           .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                        54 54 00' 28EB           .Ascic  "TT"    ; Enforced device name prefix
                               02  28EB
                               86  28EE           .BYTE   Pd$_Literal     ; Indicate literal
                        00000001  28EF           .LONG   HP$M_ALLOC              ; Constant
                               88  28F3           .BYTE   Pd$_Store       ; Indicate store operation
                             000A  28F4           .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                               00  28F6           .BYTE   0               ; 0 HP$B_FLAGS to data
                               08  28F7           .BYTE   8               ; 8 of data field
                               81  28F8           .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                   28F9    399     .END
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$$N                             = 00000094     D
$$_$                            = 00000002     D
AA11K                             00000254 R   D  01
AA11K$B_BR                        00000032     D
AA11K$K_LEN                       00000033     D
AD11K                             000002A5 R   D  01
AD11K$B_BR                        00000032     D
AD11K$K_LEN                       00000033     D
AL_DEVTYP                         00000000 R   D  01
BIT...                          = 00000005     D
CI$B_BI_ID                        00000032     D
CI$B_BR                           00000033     D
CI$B_NODE                         00000034     D
CI$B_TR                           00000032     D
CI$K_LEN                          00000041     D
CI$L_FUNC                         00000035     D
CI$L_INDEX                        0000003D     D
CI$L_MAINT_ID                     00000039     D
CI750                             00000412 R   D  01
CI780                             00000491 R   D  01
CI_NODE                           000002F6 R   D  01
CONSOLE                           00000518 R   D  01
CONSOLE$K_LEN                     00000032     D
CR11                              00000526 R   D  01
CR11$B_BR                         00000036     D
CR11$K_LEN                        00000037     D
CR11$L_CSR                        00000032     D
DEQNA                             0000057D R   D  01
DEQNA$K_LEN                       00000036     D
DEQNA$L_CSR                       00000032     D
DHU11                             000005A5 R   D  01
DHV11                             000005F3 R   D  01
DISK                              00000641 R   D  01
DISK$K_LEN                        00000032     D
DL11                              00000651 R   D  01
DL11$B_BR                         00000036     D
DL11$K_LEN                        00000037     D
DL11$L_CSR                        00000032     D
DLVJ1                             0000069E R   D  01
DLVJ1$B_FLAGS                     00000036     D
DLVJ1$K_LEN                       00000037     D
DLVJ1$L_CSR                       00000032     D
DLVJ1$V_EVEPAR                  = 00000003     D
DLVJ1$V_NDATA                   = 00000000     D
DLVJ1$V_NSTOP                   = 00000001     D
DLVJ1$V_PARITY                  = 00000002     D
DMC11                             00000752 R   D  01
DMC11$B_BR                        00000036     D
DMC11$K_LEN                       00000037     D
DMC11$L_CSR                       00000032     D
DMF32                             000007A0 R   D  01
DMF32$B_BR                        00000034     D
DMF32$B_COMMON                    00000032     D
DMF32$B_FLAGS                     00000033     D
DMF32$K_LEN                       00000039     D
DMF32$L_CSR                       00000035     D
DMF32A                            000007F3 R   D  01
DMF32A$B_ACTIV                    00000033     D
DMF32A$B_BR                       00000032     D
DMF32A$B_JUMP                     00000037     D
DMF32A$B_SPEED                    00000034     D
DMF32A$K_LEN                      00000038     D
DMF32A$W_FLAGS                    00000035     D
DMF32P                            00000915 R   D  01
DMF32P$B_BR                       00000034     D
DMF32P$B_COMMON                   00000032     D
DMF32P$B_FLAGS                    00000033     D
DMF32P$K_LEN                      00000039     D
DMF32P$L_CSR                      00000035     D
DMF32S                            0000098F R   D  01
DMF32S$B_BR                       00000034     D
DMF32S$B_COMMON                   00000032     D
DMF32S$B_FLAGS                    00000033     D
DMF32S$K_LEN                      00000039     D
DMF32S$L_CSR                      00000035     D
DMP11                             00000A03 R   D  01
DMP11$B_BR                        00000034     D
DMP11$B_COMMON                    00000032     D
DMP11$B_FLAGS                     00000033     D
DMP11$K_LEN                       00000039     D
DMP11$L_CSR                       00000035     D
DMR11                             00000ACC R   D  01
DMR11$B_BR                        00000036     D
DMR11$K_LEN                       00000037     D
DMR11$L_CSR                       00000032     D
DMZ32                             00000B1A R   D  01
DR11B                             00000C78 R   D  01
DR11B$B_BR                        00000036     D
DR11B$K_LEN                       00000037     D
DR11B$L_CSR                       00000032     D
DR11C                             00000CC6 R   D  01
DR11K                             00000D0F R   D  01
DR11K$B_BR                        00000032     D
DR11K$K_LEN                       00000033     D
DR11W                             00000D60 R   D  01
DR11W$B_BR                        00000036     D
DR11W$K_LEN                       00000037     D
DR11W$L_CSR                       00000032     D
DR750                             00000DAE R   D  01
DR750$B_BR                        00000033     D
DR750$B_CONFIG                    00000035     D
DR750$B_SELF                      00000034     D
DR750$B_SLOT                      00000032     D
DR750$B_UUT                       00000036     D
DR750$K_LEN                       00000037     D
DR780                             00000E39 R   D  01
DR780$B_BR                        00000033     D
DR780$B_CONFIG                    00000035     D
DR780$B_SELF                      00000034     D
DR780$B_TR                        00000032     D
DR780$B_UUT                       00000036     D
DR780$K_LEN                       00000037     D
DS$GA_PTDESC                      00000000 RG  D  01
DUP11                             00000ECC R   D  01
```

```
DUP11$B_BR                      00000036     D
DUP11$K_LEN                     00000037     D
DUP11$L_CSR                     00000032     D
DV11                            00000F1A R   D   01
DV11$B_BR                       00000036     D
DV11$K_LEN                      00000037     D
DV11$L_CSR                      00000032     D
DW730                           00000F67 R   D   01
DW730$K_LEN                     00000032     D
DW750                           00000F96 R   D   01
DW750$K_LEN                     00000032     D
DW780                           00000FDA R   D   01
DW780$B_BR                      00000033     D
DW780$B_TR                      00000032     D
DW780$K_LEN                     00000034     D
DX20                            0000104E R   D   01
DX20$B_DRIVE                    00000032   G D
DX20$K_LEN                      00000033   G D
DZ11                            0000107C R   D   01
DZ11$B_BR                       00000036     D
DZ11$B_MTYPE                    00000037     D
DZ11$K_LEN                      00000038     D
DZ11$L_CSR                      00000032     D
DZ32                            000010E5 R   D   01
DZ32$B_ACTIV                    00000033     D
DZ32$B_BRLVL                    00000032     D
DZ32$B_SPEED                    00000034     D
DZ32$W_FLAGS                    00000035     D
DZ32$_LEN                       00000037     D
DZV11                           000011D6 R   D   01
DZV11$K_LEN                     00000036     D
DZV11$L_CSR                     00000032     D
HP$A_DEPENDENT                  00000032     D
HP$A_DEVICE                     00000018     D
HP$A_DVA                        0000001C     D
HP$A_LINK                       00000020     D
HP$B_BI_NODE                    00000033     D
HP$B_BI_NUM                     00000038     D
HP$B_BR                         00000037     D
HP$B_CI_BR                      00000033     D
HP$B_CI_NODE                    00000034     D
HP$B_CI_TR                      00000032     D
HP$B_CPU_ID                     0000004F   G D
HP$B_DHUV_BR                    00000038     D
HP$B_DMF32A_ACTIV               00000033     D
HP$B_DMF32A_BR                  00000032     D
HP$B_DMF32A_JUMP                00000037     D
HP$B_DMF32A_SPEED               00000034     D
HP$B_DMF32P_BR                  00000034     D
HP$B_DMF32P_COMMON              00000032     D
HP$B_DMF32P_FLAGS               00000033     D
HP$B_DMF32S_BR                  00000034     D
HP$B_DMF32S_COMMON              00000032     D
HP$B_DMF32S_FLAGS               00000033     D
HP$B_DMF32_BR                   00000034     D
HP$B_DMF32_COMMON               00000032     D
HP$B_DMF32_FLAGS                00000033     D
HP$B_DMZ32_BR                   00000032     D
HP$B_DMZ32_MODEM                00000039     D
HP$B_DMZ32_OCTET0               00000033     D
HP$B_DMZ32_OCTET1               00000034     D
HP$B_DMZ32_OCTET2               00000035     D
HP$B_DMZ32_SPEED                00000036     D
HP$B_DR11C_BR                   00000032     D
HP$B_DRIVE                      0000000B     D
HP$B_DX20_DRIVE                 00000032   G D
HP$B_DZ32_ACTIV                 00000033     D
HP$B_DZ32_BRLVL                 00000032     D
HP$B_DZ32_SPEED                 00000034     D
HP$B_FLAGS                      0000000A     D
HP$B_IEU11A_BR                  00000032     D
HP$B_LESI_BR                    00000036     D
HP$B_NBIA_COMMON                00000032     D
HP$B_NBIB_COMMON                00000032     D
HP$B_RB730_BR                   00000036     D
HP$B_RH750_BR                   00000032     D
HP$B_RH780_BR                   00000033     D
HP$B_RH780_TR                   00000032     D
HP$B_RK611_BR                   00000036     D
HP$B_RL11_BR                    00000036     D
HP$B_RUX50_BR                   00000032     D
HP$B_RX211_BR                   00000036     D
HP$B_TM03_DRIVE                 00000032     D
HP$B_TM78_DRIVE                 00000032     D
HP$B_TS04_BR                    00000036     D
HP$B_TS11_BR                    00000036     D
HP$B_TU80_BR                    00000036     D
HP$B_TU81_BR                    00000036     D
HP$B_UDA50_BR                   00000036     D
HP$B_UDA50_BURST                00000037     D
HP$B_VS100_BR                   00000036     D
HP$B_VS125_BR                   00000036     D
HP$B_VS300_BR                   00000036     D
HP$K_CI_LEN                     00000041     D
HP$K_DHUV_LEN                   00000039     D
HP$K_DISK_LEN                   00000032     D
HP$K_DMF32A_LEN                 00000038     D
HP$K_DMF32P_LEN                 00000039     D
HP$K_DMF32S_LEN                 00000039     D
HP$K_DMF32_LEN                  00000039     D
HP$K_DMZ32_LEN                  0000003A     D
HP$K_DR11C_LEN                  00000033     D
HP$K_DX20_LEN                   00000033   G D
HP$K_IEU11A_LEN                 00000033     D
HP$K_LA100_LEN                  00000032     D
HP$K_LA12_LEN                   00000032     D
HP$K_LA210_LEN                  00000032     D
HP$K_LEN                        00000037     D
HP$K_LESI_LEN                   00000037     D
HP$K_NBIA_LEN                   00000038     D
HP$K_NBIB_LEN                   00000039     D
HP$K_RA60_LEN                   00000032     D
HP$K_RA70_LEN                   00000032     D
HP$K_RA80_LEN                   00000032     D
```

HP$K_RA81_LEN	00000032		D	HP$K_VT71_LEN		00000032			D	
HP$K_RA82_LEN	00000032		D	HP$L_CI_FUNC		00000035			D	
HP$K_RA90_LEN	00000032		D	HP$L_CI_INDEX		0000003D			D	
HP$K_RB730_LEN	00000037		D	HP$L_CI_MAINT_ID		00000039			D	
HP$K_RC25_LEN	00000032		D	HP$L_DHUV_CSR		00000032			D	
HP$K_RCF25_LEN	00000032		D	HP$L_DMF32P_CSR		00000035			D	
HP$K_RH750_LEN	00000033		D	HP$L_DMF32S_CSR		00000035			D	
HP$K_RH780_LEN	00000034		D	HP$L_DMF32_CSR		00000035			D	
HP$K_RK06_LEN	00000032		D	HP$L_KAA_SLOT		0000004B		G	D	
HP$K_RK07_LEN	00000032		D	HP$L_LESI_IP		00000032			D	
HP$K_RK611_LEN	00000037		D	HP$L_NBIA_CSR		00000033			D	
HP$K_RL01_LEN	00000032		D	HP$L_NBIB_CSR		00000034			D	
HP$K_RL02_LEN	00000032		D	HP$L_RB730_CSR		00000032			D	
HP$K_RL11_LEN	00000037		D	HP$L_RK611_CSR		00000032			D	
HP$K_RM03_LEN	00000032		D	HP$L_RL11_CSR		00000032			D	
HP$K_RM05_LEN	00000032		D	HP$L_RX211_CSR		00000032			D	
HP$K_RM80_LEN	00000032		D	HP$L_TS04_CSR		00000032			D	
HP$K_RP04_LEN	00000032		D	HP$L_TS11_CSR		00000032			D	
HP$K_RP05_LEN	00000032		D	HP$L_TU80_CSR		00000032			D	
HP$K_RP06_LEN	00000032		D	HP$L_TU81_CSR		00000032			D	
HP$K_RP07_LEN	00000032		D	HP$L_UBE_CSR		00000032			D	
HP$K_RUX50_LEN	00000033		D	HP$L_UDA50_UDAIP		00000032			D	
HP$K_RX02_LEN	00000032		D	HP$L_VS100_CSR		00000032			D	
HP$K_RX211_LEN	00000037		D	HP$L_VS125_CSR		00000032			D	
HP$K_SBIA_LEN	00000032		D	HP$L_VS300_CSR		00000032			D	
HP$K_TE16_LEN	00000032		D	HP$M_ALLOC	=	00000001			D	
HP$K_TK50_LEN	00000032		D	HP$Q_DEVICE		00000000			D	
HP$K_TM03_LEN	00000033		D	HP$T_DEVICE		0000000C			D	
HP$K_TM78_LEN	00000033		D	HP$T_TYPE		00000026			D	
HP$K_TS04_LEN	00000037		D	HP$W_DHUV_VEC		00000036			D	
HP$K_TS05_LEN	00000033		D	HP$W_DMF32A_FLAGS		00000035			D	
HP$K_TS11_LEN	00000037		D	HP$W_DMZ32_LOOP		00000037			D	
HP$K_TU45_LEN	00000032		D	HP$W_DZ32_FLAGS		00000035			D	
HP$K_TU58_LEN	00000032		D	HP$W_SIZE		00000008			D	
HP$K_TU70_LEN	00000032	G	D	HP$W_VECTOR		00000024			D	
HP$K_TU72_LEN	00000032	G	D	HPE$A_EPB		00000016			D	
HP$K_TU77_LEN	00000032		D	HPE$T_DEVICE		00000000			D	
HP$K_TU78_LEN	00000032		D	HPE$W_EXT_DRIVE		00000014			D	
HP$K_TU80_LEN	00000037		D	IEU11A		00001213	R		D	01
HP$K_TU81_LEN	00000037		D	IEU11A$B_BR		00000032			D	
HP$K_UBE_LEN	00000036		D	IEU11A$K_LEN		00000033			D	
HP$K_UDA50_LEN	00000038		D	KA$B_ACC_TYPE		00000042		G	D	
HP$K_VS100_LEN	00000037		D	KA$B_NODE_ID		00000046		G	D	
HP$K_VS125_LEN	00000037		D	KA$B_RESERVED		00000043		G	D	
HP$K_VS300_LEN	00000037		D	KA$B_SID_TYPE		0000003D		G	D	
HP$K_VT100_LEN	00000032		D	KA$K_LEN		00000050		G	D	
HP$K_VT101_LEN	00000032		D	KA$L_FLAGS		00000032		G	D	
HP$K_VT102_LEN	00000032		D	KA$L_MEM_SIZE		00000047		G	D	
HP$K_VT125_LEN	00000032		D	KA$L_SID		0000003A		G	D	
HP$K_VT131_LEN	00000032		D	KA$M_CHAR	=	00000100		G	D	
HP$K_VT132_LEN	00000032		D	KA$M_CRC	=	00000010		G	D	
HP$K_VT220_LEN	00000032		D	KA$M_D_FLOAT	=	00000002		G	D	
HP$K_VT240_LEN	00000032		D	KA$M_EDIT	=	00000080		G	D	
HP$K_VT50_LEN	00000032		D	KA$M_F_FLOAT	=	00000001		G	D	
HP$K_VT52_LEN	00000032		D	KA$M_G_FLOAT	=	00000004		G	D	
HP$K_VT55_LEN	00000032		D	KA$M_H_FLOAT	=	00000008		G	D	
HP$K_VT61_LEN	00000032		D	KA$M_PACKED	=	00000020		G	D	

```
KA$M_PACK_MUL                   = 00000040  G  D
KA$M_SB_ERR                     = 02000000  G  D
KA$M_TODR                       = 00010000  G  D
KA$M_WCS_LD                     = 01000000  G  D
KA$V_CHAR                       = 00000008  G  D
KA$V_CRC                        = 00000004  G  D
KA$V_D_FLOAT                    = 00000001  G  D
KA$V_EDIT                       = 00000007  G  D
KA$V_F_FLOAT                    = 00000000  G  D
KA$V_G_FLOAT                    = 00000002  G  D
KA$V_H_FLOAT                    = 00000003  G  D
KA$V_PACKED                     = 00000005  G  D
KA$V_PACK_MUL                   = 00000006  G  D
KA$V_SB_ERR                     = 00000019  G  D
KA$V_TODR                       = 00000010  G  D
KA$V_WCS_LD                     = 00000018  G  D
KA$W_LATENCY                      0000003E  G  D
KA$W_MEM_SIZE                     00000044  G  D
KA$W_PROGRESS                     00000040  G  D
KA$W_RESERVED                     00000038  G  D
KA$W_WCS                          00000036  G  D
KA730                             0000125E  R  D  01
KA750                             00001339  R  D  01
KA780                             00001405  R  D  01
KA785                             00001556  R  D  01
KA86                              000014AE  R  D  01
KMC11                             000015FF  R  D  01
KMC11$B_BR                        00000036     D
KMC11$K_LEN                       00000037     D
KMC11$L_CSR                       00000032     D
KW11K                             0000164D  R  D  01
KW11K$B_BR                        00000032     D
KW11K$K_LEN                       00000033     D
LA100                             000016B8  R  D  01
LA100$K_LEN                       00000032     D
LA12                              0000169E  R  D  01
LA12$K_LEN                        00000032     D
LA120                             000016D3  R  D  01
LA120$K_LEN                       00000032     D
LA180                             000016EE  R  D  01
LA180$K_LEN                       00000032     D
LA210                             00001757  R  D  01
LA210$K_LEN                       00000032     D
LA34                              00001709  R  D  01
LA34$K_LEN                        00000032     D
LA36                              00001723  R  D  01
LA36$K_LEN                        00000032     D
LA38                              0000173D  R  D  01
LA38$K_LEN                        00000032     D
LESI                              00001772  R  D  01
LESI$B_BR                         00000036     D
LESI$K_LEN                        00000037     D
LESI$L_IP                         00000032     D
LG01                              000017BE  R  D  01
LG01$K_LEN                        00000032     D
LG02                              000017D8  R  D  01
LG02$K_LEN                        00000032     D
LG03                              000017F2  R  D  01
LG03$K_LEN                        00000032     D
LN01                              0000180C  R  D  01
LN01$K_LEN                        00000032     D
LN03                              00001826  R  D  01
LN03$K_LEN                        00000032     D
LP04                              0000183B  R  D  01
LP04$K_LEN                        00000032     D
LP05                              00001855  R  D  01
LP05$K_LEN                        00000032     D
LP06                              0000186F  R  D  01
LP06$K_LEN                        00000032     D
LP07                              00001889  R  D  01
LP07$K_LEN                        00000032     D
LP11                              000018A3  R  D  01
LP11$B_BR                         00000036     D
LP11$K_LEN                        00000037     D
LP11$L_CSR                        00000032     D
LP14                              000018F0  R  D  01
LP14$K_LEN                        00000032     D
LP25                              0000190A  R  D  01
LP25$K_LEN                        00000032     D
LP26                              00001924  R  D  01
LP26$K_LEN                        00000032     D
LP27                              0000193E  R  D  01
LP27$K_LEN                        00000032     D
LPA11K                            00001958  R  D  01
LPA11K$B_BR                       00000036     D
LPA11K$K_LEN                      00000037     D
LPA11K$L_CSR                      00000032     D
LUA11                             000019B1  R  D  01
LUA11$B_BR                        00000032     D
LUA11$K_LEN                       00000037     D
LUA11$L_CSR                       00000033     D
MA780                             00001AD2  R  D  01
MA780$B_BR                        00000033     D
MA780$B_MPM                       00000034     D
MA780$B_PORT                      00000035     D
MA780$B_TR                        00000032     D
MA780$K_LEN                       00000036     D
MBE                               00001B4D  R  D  01
MBE$K_LEN                         00000032     D
ML11                              00001B61  R  D  01
ML11$B_ARRAY                      00000032     D
ML11$B_CHIP                       00000033     D
ML11$K_LEN                        00000034     D
MS750                             00001BC3  R  D  01
MS750$K_LEN                       00000032     D
MS780                             00001BD4  R  D  01
MS780$B_ARRAYS                    00000033     D
MS780$B_TR                        00000032     D
MS780$K_LEN                       00000034     D
NBIA                              000019FF  R  D  01
NBIB                              00001A6F  R  D  01
PCL11                             00001C24  R  D  01
PCL11$B_BR                        00000036     D
PCL11$K_LEN                       00000037     D
```

```
PCL11$L_CSR                     00000032    D
PD$_ADD                       = 0000008A    D
PD$_CASE                      = 0000008C    D
PD$_COMPLEMENT                = 00000089    D
PD$_DECIMAL                   = 00000082    D
PD$_END                       = 00000081    D
PD$_FETCH                     = 00000087    D
PD$_HEXADECIMAL               = 00000084    D
PD$_LITERAL                   = 00000086    D
PD$_LOGICAL                   = 0000008B    D
PD$_NAME                      = 0000008D    D
PD$_OCTAL                     = 00000083    D
PD$_START                     = 00000080    D
PD$_STORE                     = 00000088    D
PD$_STRING                    = 00000085    D
PTD$M_CONTROLLER              = 00000002    D
PTD$M_DEVICE                  = 00000003    D
PTD$M_ENDDEVICE               = 0000001B    D
PTD$M_INHERIT                 = 00000018    D
PTD$M_INHERIT_CON             = 00000010    D
PTD$M_INHERIT_PRE             = 00000008    D
PTD$M_UNIT                    = 00000001    D
PX780                           00001C6D R  D  01
PX780$B_BR                      00000033    D
PX780$B_NODE                    00000034    D
PX780$B_TR                      00000032    D
PX780$K_LEN                     00000035    D
R80                             00001CD6 R  D  01
R80$K_LEN                       00000032    D
RA60                            00001CEF R  D  01
RA60$K_LEN                      00000032    D
RA70                            00001D09 R  D  01
RA70$K_LEN                      00000032    D
RA80                            00001D23 R  D  01
RA80$K_LEN                      00000032    D
RA81                            00001D3D R  D  01
RA81$K_LEN                      00000032    D
RA82                            00001D57 R  D  01
RA82$K_LEN                      00000032    D
RA90                            00001D71 R  D  01
RA90$K_LEN                      00000032    D
RB730                           00001D8B R  D  01
RB730$B_BR                      00000036    D
RB730$K_LEN                     00000037    D
RB730$L_CSR                     00000032    D
RC25                            00001DD5 R  D  01
RC25$K_LEN                      00000032    D
RCF25                           00001DBA R  D  01
RCF25$K_LEN                     00000032    D
RD51                            00001DEF R  D  01
RD51$K_LEN                      00000032    D
RD52                            00001E09 R  D  01
RD52$K_LEN                      00000032    D
RH750                           00001E23 R  D  01
RH750$B_BR                      00000032    D
RH750$K_LEN                     00000033    D
RH780                           00001E7C R  D  01
RH780$B_BR                      00000033    D
RH780$B_TR                      00000032    D
RH780$K_LEN                     00000034    D
RK06                            00001F62 R  D  01
RK06$K_LEN                      00000032    D
RK07                            00001F7C R  D  01
RK07$K_LEN                      00000032    D
RK611                           00001F96 R  D  01
RK611$B_BR                      00000036    D
RK611$K_LEN                     00000037    D
RK611$L_CSR                     00000032    D
RL01                            00001EE1 R  D  01
RL01$K_LEN                      00000032    D
RL02                            00001EFB R  D  01
RL02$K_LEN                      00000032    D
RL11                            00001F15 R  D  01
RL11$B_BR                       00000036    D
RL11$K_LEN                      00000037    D
RL11$L_CSR                      00000032    D
RM03                            00001FE4 R  D  01
RM03$K_LEN                      00000032    D
RM05                            00002008 R  D  01
RM05$K_LEN                      00000032    D
RM80                            0000202C R  D  01
RM80$K_LEN                      00000032    D
RP04                            00002050 R  D  01
RP04$K_LEN                      00000032    D
RP05                            00002074 R  D  01
RP05$K_LEN                      00000032    D
RP06                            00002098 R  D  01
RP06$K_LEN                      00000032    D
RP07                            000020BC R  D  01
RP07$K_LEN                      00000032    D
RQDX1                           000020E0 R  D  01
RQDX1$K_LEN                     00000036    D
RQDX1$L_IP                      00000032    D
RRD50                           00002107 R  D  01
RRD50$B_BR                      00000036  G D
RRD50$K_LEN                     00000037  G D
RRD50$L_CSR                     00000032  G D
RUX50                           00002163 R  D  01
RX02                            000021AB R  D  01
RX02$K_LEN                      00000032    D
RX180                           00002248 R  D  01
RX180$K_LEN                     00000032    D
RX211                           000021C5 R  D  01
RX211$B_BR                      00000036    D
RX211$K_LEN                     00000037    D
RX211$L_CSR                     00000032    D
RX31                            00002213 R  D  01
RX31$K_LEN                      00000032    D
RX32                            00002223 R  D  01
RX32$K_LEN                      00000032    D
RX50                            00002233 R  D  01
RX50$K_LEN                      00000032    D
SBIA                            00002259 R  D  01
SBIA$K_LEN                      00000032    D
```

```
SIZ...                          = 00000001    D
TE16                              0000229B R  D  01
TE16$K_LEN                        00000032    D
TK50                              000022B5 R  D  01
TM03                              000022CF R  D  01
TM03$B_DRIVE                      00000032    D
TM03$K_LEN                        00000033    D
TM78                              000022FD R  D  01
TM78$B_DRIVE                      00000032    D
TM78$K_LEN                        00000033    D
TS04                              0000232B R  D  01
TS04$B_BR                         00000036    D
TS04$K_LEN                        00000037    D
TS04$L_CSR                        00000032    D
TS05                              00002382 R  D  01
TS05$B_BR                         00000032    D
TS05$K_LEN                        00000033    D
TS11                              000023EC R  D  01
TS11$B_BR                         00000036    D
TS11$K_LEN                        00000037    D
TS11$L_CSR                        00000032    D
TU45                              00002443 R  D  01
TU45$K_LEN                        00000032    D
TU58                              0000245D R  D  01
TU58$K_LEN                        00000032    D
TU70                              00002477 R  D  01
TU70$K_LEN                        00000032  G D
TU72                              00002491 R  D  01
TU72$K_LEN                        00000032  G D
TU77                              000024AB R  D  01
TU77$K_LEN                        00000032    D
TU78                              000024C5 R  D  01
TU78$K_LEN                        00000032    D
TU80                              000024DF R  D  01
TU80$B_BR                         00000036    D
TU80$K_LEN                        00000037    D
TU81                              0000254E R  D  01
TU81$B_BR                         00000036    D
TU81$K_LEN                        00000037    D
TU81$L_CSR                        00000032    D
UBE                               000025A5 R  D  01
UBE$K_LEN                         00000036    D
UBE$L_CSR                         00000032    D
UDA50                             000025E0 R  D  01
UDA50$B_BR                        00000036    D
UDA50$B_BURST                     00000037    D
UDA50$K_LEN                       00000038    D
UDA50$L_UDAIP                     00000032    D
UNA11                             00002649 R  D  01
UNA11$B_BR                        00000032    D
UNA11$K_LEN                       00000037    D
UNA11$L_CSR                       00000033    D
VS100                             00002697 R  D  01
VS100$B_BR                        00000036    D
VS100$K_LEN                       00000037    D
VS100$L_CSR                       00000032    D
VS125                             000026EF R  D  01
VS125$B_BR                        00000036    D
VS125$K_LEN                       00000037    D
VS125$L_CSR                       00000032    D
VS300                             00002747 R  D  01
VS300$B_BR                        00000036    D
VS300$K_LEN                       00000037    D
VS300$L_CSR                       00000032    D
VT100                             00002821 R  D  01
VT100$K_LEN                       00000032    D
VT101                             0000283C R  D  01
VT101$K_LEN                       00000032    D
VT102                             00002857 R  D  01
VT102$K_LEN                       00000032    D
VT125                             00002872 R  D  01
VT125$K_LEN                       00000032    D
VT131                             0000288D R  D  01
VT131$K_LEN                       00000032    D
VT132                             000028A8 R  D  01
VT132$K_LEN                       00000032    D
VT220                             000028C3 R  D  01
VT220$K_LEN                       00000032    D
VT240                             000028DE R  D  01
VT240$K_LEN                       00000032    D
VT50                              0000279F R  D  01
VT50$K_LEN                        00000032    D
VT52                              000027B9 R  D  01
VT52$K_LEN                        00000032    D
VT55                              000027D3 R  D  01
VT55$K_LEN                        00000032    D
VT61                              000027ED R  D  01
VT61$K_LEN                        00000032    D
VT71                              00002807 R  D  01
VT71$K_LEN                        00000032    D
```

```
                                    +----------------+
                                    ! Psect synopsis !
                                    +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
. BLANK .                       000028F9  (10489.)  01 (  1.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
$ABS$                           00000050  (   80.)  02 (  2.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
```

```
                                    +-------------------------+
                                    ! Symbol Cross Reference !
                                    +-------------------------+

SYMBOL                      VALUE        DEFINITION      REFERENCES...
------                      -----        ----------      -------------
$$N                        =00000094     245    (3)      245    (3)
$$_$                       =00000002     319    (4)      251    (4)      319    (4)
AA11K                       00000254-R   249    (4)      245    (3)
AA11K$B_BR                  00000032                     249    (4)
AA11K$K_LEN                 00000033                     249    (4)
AD11K                       000002A5-R   250    (4)      245    (3)
AD11K$B_BR                  00000032                     250    (4)
AD11K$K_LEN                 00000033                     250    (4)
AL_DEVTYP                   00000000-R   245    (3)
BIT...                     =00000005     398    (4)      249    (4)      250    (4)      251    (4)      252    (4)
                                                         253    (4)      254    (4)      255    (4)      256    (4)
                                                         257    (4)      258    (4)      259    (4)      260    (4)
                                                         261    (4)      262    (4)      263    (4)      264    (4)
                                                         265    (4)      266    (4)      267    (4)      268    (4)
                                                         269    (4)      270    (4)      271    (4)      272    (4)
                                                         273    (4)      274    (4)      275    (4)      276    (4)
                                                         277    (4)      278    (4)      279    (4)      280    (4)
                                                         281    (4)      282    (4)      283    (4)      284    (4)
                                                         285    (4)      287    (4)      288    (4)      289    (4)
                                                         290    (4)      291    (4)      292    (4)      293    (4)
                                                         294    (4)      295    (4)      296    (4)      297    (4)
                                                         298    (4)      299    (4)      300    (4)      301    (4)
                                                         302    (4)      303    (4)      304    (4)      305    (4)
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                                                         310    (4)      311    (4)      312    (4)      313    (4)
                                                         314    (4)      315    (4)      316    (4)      317    (4)
                                                         318    (4)      319    (4)      320    (4)      321    (4)
                                                         322    (4)      323    (4)      324    (4)      325    (4)
                                                         326    (4)      327    (4)      328    (4)      329    (4)
                                                         330    (4)      331    (4)      332    (4)      333    (4)
                                                         334    (4)      335    (4)      336    (4)      337    (4)
                                                         338    (4)      339    (4)      340    (4)      341    (4)
                                                         342    (4)      343    (4)      344    (4)      345    (4)
                                                         346    (4)      347    (4)      348    (4)      349    (4)
                                                         350    (4)      351    (4)      352    (4)      353    (4)
                                                         354    (4)      355    (4)      356    (4)      357    (4)
                                                         358    (4)      359    (4)      360    (4)      361    (4)
                                                         362    (4)      363    (4)      364    (4)      365    (4)
                                                         366    (4)      367    (4)      368    (4)      369    (4)
                                                         370    (4)      371    (4)      372    (4)      373    (4)
                                                         374    (4)      375    (4)      376    (4)      377    (4)
                                                         378    (4)      379    (4)      380    (4)      381    (4)
                                                         382    (4)      383    (4)      384    (4)      385    (4)
                                                         386    (4)      387    (4)      388    (4)      389    (4)
                                                         390    (4)      391    (4)      392    (4)      393    (4)
                                                         394    (4)      395    (4)      396    (4)      397    (4)
                                                         398    (4)
CI$B_BR                     00000033                     252    (4)      253    (4)
CI$B_NODE                   00000034                     251    (4)      252    (4)      253    (4)
CI$B_TR                     00000032                     252    (4)      253    (4)
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CI$K_LEN                        00000041                        251  (4)     252  (4)     253  (4)
CI$L_FUNC                       00000035                        251  (4)     252  (4)     253  (4)
CI$L_INDEX                      0000003D                        251  (4)
CI$L_MAINT_ID                   00000039                        251  (4)     252  (4)     253  (4)
CI750                           00000412-R  252     (4)         245  (3)
CI780                           00000491-R  253     (4)         245  (3)
CI_NODE                         000002F6-R  251     (4)         245  (3)
CONSOLE                         00000518-R  254     (4)         245  (3)
CONSOLE$K_LEN                   00000032                        254  (4)
CR11                            00000526-R  255     (4)         245  (3)
CR11$B_BR                       00000036                        255  (4)
CR11$K_LEN                      00000037                        255  (4)
CR11$L_CSR                      00000032                        255  (4)
DEQNA                           0000057D-R  256     (4)         245  (3)
DEQNA$K_LEN                     00000036                        256  (4)
DEQNA$L_CSR                     00000032                        256  (4)
DHU11                           000005A5-R  257     (4)         245  (3)
DHV11                           000005F3-R  258     (4)         245  (3)
DISK                            00000641-R  259     (4)         245  (3)
DISK$K_LEN                      00000032                        259  (4)
DL11                            00000651-R  260     (4)         245  (3)
DL11$B_BR                       00000036                        260  (4)
DL11$K_LEN                      00000037                        260  (4)
DL11$L_CSR                      00000032                        260  (4)
DLVJ1                           0000069E-R  261     (4)         245  (3)
DLVJ1$B_FLAGS                   00000036                        261  (4)
DLVJ1$K_LEN                     00000037                        261  (4)
DLVJ1$L_CSR                     00000032                        261  (4)
DLVJ1$K_LEN                     00000037                        261  (4)
DLVJ1$L_CSR                     00000032                        261  (4)
DLVJ1$V_EVEPAR                  =00000003                       261  (4)
DLVJ1$V_NDATA                   =00000000                       261  (4)
DLVJ1$V_NSTOP                   =00000001                       261  (4)
DLVJ1$V_PARITY                  =00000002                       261  (4)
DMC11                           00000752-R  262     (4)         245  (3)
DMC11$B_BR                      00000036                        262  (4)
DMC11$K_LEN                     00000037                        262  (4)
DMC11$L_CSR                     00000032                        262  (4)
DMF32                           000007A0-R  263     (4)         245  (3)
DMF32$B_BR                      00000034                        263  (4)
DMF32$B_COMMON                  00000032                        263  (4)
DMF32$K_LEN                     00000039                        263  (4)     266  (4)
DMF32$L_CSR                     00000035                        263  (4)
DMF32A                          000007F3-R  264     (4)         245  (3)
DMF32A$B_ACTIV                  00000033                        264  (4)
DMF32A$B_BR                     00000032                        264  (4)
DMF32A$B_JUMP                   00000037                        264  (4)
DMF32A$B_SPEED                  00000034                        264  (4)
DMF32A$K_LEN                    00000038                        264  (4)
DMF32A$W_FLAGS                  00000035                        264  (4)
DMF32P                          00000915-R  265     (4)         245  (3)
DMF32P$B_BR                     00000034                        265  (4)
DMF32P$B_COMMON                 00000032                        265  (4)
DMF32P$B_FLAGS                  00000033                        265  (4)
DMF32P$K_LEN                    00000039                        265  (4)
DMF32P$L_CSR                    00000035                        265  (4)
DMF32S                          0000098F-R  266     (4)         245  (3)
DMF32S$B_BR                     00000034                        266  (4)
DMF32S$B_FLAGS                  00000033                        266  (4)
```

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DMF32S$L_CSR                    00000035                            266     (4)
DMP11                           00000A03-R    267     (4)           245     (3)
DMP11$B_BR                      00000034                            267     (4)
DMP11$B_COMMON                  00000032                            267     (4)
DMP11$B_FLAGS                   00000033                            267     (4)
DMP11$K_LEN                     00000039                            267     (4)
DMP11$L_CSR                     00000035                            267     (4)
DMR11                           00000ACC-R    268     (4)           245     (3)
DMR11$B_BR                      00000036                            268     (4)
DMR11$K_LEN                     00000037                            268     (4)
DMR11$L_CSR                     00000032                            268     (4)
DMZ32                           00000B1A-R    269     (4)           245     (3)
DR11B                           00000C78-R    270     (4)           245     (3)
DR11B$B_BR                      00000036                            270     (4)
DR11B$K_LEN                     00000037                            270     (4)
DR11B$L_CSR                     00000032                            270     (4)
DR11C                           00000CC6-R    271     (4)           245     (3)
DR11K                           00000D0F-R    272     (4)           245     (3)
DR11K$B_BR                      00000032                            272     (4)
DR11K$K_LEN                     00000033                            272     (4)
DR11W                           00000D60-R    273     (4)           245     (3)
DR11W$B_BR                      00000036                            273     (4)
DR11W$K_LEN                     00000037                            273     (4)
DR11W$L_CSR                     00000032                            273     (4)
DR750                           00000DAE-R    274     (4)           245     (3)
DR750$B_BR                      00000033                            274     (4)
DR750$B_CONFIG                  00000035                            274     (4)
DR750$B_SELF                    00000034                            274     (4)
DR750$B_SLOT                    00000032                            274     (4)
DR750$B_UUT                     00000036                            274     (4)
DR750$K_LEN                     00000037                            274     (4)
DR780                           00000E39-R    275     (4)           245     (3)
DR780$B_BR                      00000033                            275     (4)
DR780$B_CONFIG                  00000035                            275     (4)
DR780$B_SELF                    00000034                            275     (4)
DR780$B_TR                      00000032                            275     (4)
DR780$B_UUT                     00000036                            275     (4)
DR780$K_LEN                     00000037                            275     (4)
DS$GA_PTDESC                    00000000-R    216     (3)
DUP11                           00000ECC-R    276     (4)           245     (3)
DUP11$B_BR                      00000036                            276     (4)
DUP11$K_LEN                     00000037                            276     (4)
DUP11$L_CSR                     00000032                            276     (4)
DV11                            00000F1A-R    277     (4)
DV11$B_BR                       00000036                            277     (4)
DV11$K_LEN                      00000037                            277     (4)
DV11$L_CSR                      00000032                            277     (4)
DW730                           00000F67-R    278     (4)           245     (3)
DW730$K_LEN                     00000032                            278     (4)
DW750                           00000F96-R    279     (4)           245     (3)
DW750$K_LEN                     00000032                            279     (4)
DW780                           00000FDA-R    280     (4)           245     (3)
DW780$B_BR                      00000033                            280     (4)
DW780$B_TR                      00000032                            280     (4)
DW780$K_LEN                     00000034                            280     (4)
DX20                            0000104E-R    281     (4)           245     (3)
DX20$B_DRIVE                    00000032                            281     (4)
```

```
DX20$K_LEN                  00000033                 281   (4)
DZ11                        0000107C-R   282   (4)   245   (3)
DZ11$B_BR                   00000036                 282   (4)
DZ11$B_MTYPE                00000037                 282   (4)
DZ11$K_LEN                  00000038                 282   (4)
DZ11$L_CSR                  00000032                 282   (4)
DZ32                        000010E5-R   283   (4)   245   (3)
DZ32$B_ACTIV                00000033                 283   (4)
DZ32$B_BRLVL                00000032                 283   (4)
DZ32$B_SPEED                00000034                 283   (4)
DZ32$W_FLAGS                00000035                 283   (4)
DZ32$_LEN                   00000037                 283   (4)
DZV11                       000011D6-R   284   (4)   245   (3)
DZV11$K_LEN                 00000036                 284   (4)
DZV11$L_CSR                 00000032                 284   (4)
HP$A_DEVICE                 00000018                 249   (4)   250   (4)   251   (4)   252   (4)
                                                     253   (4)   255   (4)   256   (4)   257   (4)
                                                     258   (4)   260   (4)   261   (4)   262   (4)
                                                     263   (4)   264   (4)   265   (4)   266   (4)
                                                     267   (4)   268   (4)   269   (4)   270   (4)
                                                     271   (4)   272   (4)   273   (4)   274   (4)
                                                     275   (4)   276   (4)   277   (4)   278   (4)
                                                     279   (4)   280   (4)   281   (4)   282   (4)
                                                     283   (4)   284   (4)   285   (4)   287   (4)
                                                     288   (4)   292   (4)   293   (4)   302   (4)
                                                     312   (4)   317   (4)   318   (4)   319   (4)
                                                     320   (4)   321   (4)   322   (4)   323   (4)
                                                     325   (4)   326   (4)   327   (4)   335   (4)
                                                     340   (4)   341   (4)   344   (4)   347   (4)
                                                     348   (4)   349   (4)   350   (4)   351   (4)
                                                     352   (4)   353   (4)   354   (4)   355   (4)
                                                     356   (4)   357   (4)   359   (4)   364   (4)
                                                     367   (4)   368   (4)   369   (4)   370   (4)
                                                     371   (4)   378   (4)   379   (4)   380   (4)
                                                     381   (4)   382   (4)   383   (4)   384   (4)
                                                     385   (4)
HP$A_DVA                    0000001C                 251   (4)   252   (4)   253   (4)   278   (4)
                                                     279   (4)   280   (4)   319   (4)   320   (4)
                                                     340   (4)   341   (4)   364   (4)
HP$B_BI_NODE                00000033                 320   (4)
HP$B_BI_NUM                 00000038                 320   (4)
HP$B_DHUV_BR                00000038                 257   (4)   258   (4)
HP$B_DMZ32_BR               00000032                 269   (4)
HP$B_DMZ32_MODEM            00000039                 269   (4)
HP$B_DMZ32_OCTET0           00000033                 269   (4)
HP$B_DMZ32_OCTET1           00000034                 269   (4)
HP$B_DMZ32_OCTET2           00000035                 269   (4)
HP$B_DMZ32_SPEED            00000036                 269   (4)
HP$B_DR11C_BR               00000032                 271   (4)
HP$B_DRIVE                  0000000B                 251   (4)   279   (4)   280   (4)   281   (4)
                                                     322   (4)   323   (4)   340   (4)   348   (4)
                                                     349   (4)   350   (4)   351   (4)   352   (4)
                                                     353   (4)   354   (4)   364   (4)   367   (4)
                                                     368   (4)
HP$B_FLAGS                  0000000A                 255   (4)   294   (4)   295   (4)   296   (4)
                                                     297   (4)   298   (4)   299   (4)   300   (4)
                                                     301   (4)   303   (4)   304   (4)   305   (4)
```

		306	(4)	307	(4)	308	(4)	309	(4)
		310	(4)	311	(4)	313	(4)	314	(4)
		315	(4)	316	(4)	317	(4)	323	(4)
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		370	(4)	371	(4)	372	(4)	373	(4)
		374	(4)	375	(4)	376	(4)	377	(4)
		378	(4)	379	(4)	383	(4)	384	(4)
		385	(4)	386	(4)	387	(4)	388	(4)
		389	(4)	390	(4)	391	(4)	392	(4)
		393	(4)	394	(4)	395	(4)	396	(4)
		397	(4)	398	(4)				
HP$B_LESI_BR	00000036	302	(4)						
HP$B_RUX50_BR	00000032	357	(4)						
HP$B_TU80_BR	00000036	378	(4)						
HP$B_UDA50_BR	00000036	381	(4)						
HP$B_UDA50_BURST	00000037	381	(4)						
HP$K_DHUV_LEN	00000039	257	(4)	258	(4)				
HP$K_DMZ32_LEN	0000003A	269	(4)						
HP$K_DR11C_LEN	00000033	271	(4)						
HP$K_LESI_LEN	00000037	302	(4)						
HP$K_NBIA_LEN	00000038	319	(4)						
HP$K_NBIB_LEN	00000039	320	(4)						
HP$K_RUX50_LEN	00000033	357	(4)						
HP$K_TK50_LEN	00000032	366	(4)						
HP$K_UDA50_LEN	00000038	381	(4)						
HP$L_DHUV_CSR	00000032	257	(4)	258	(4)				
HP$L_LESI_IP	00000032	302	(4)						
HP$L_TU80_CSR	00000032	378	(4)						
HP$L_UDA50_UDAIP	00000032	381	(4)						
HP$M_ALLOC	=00000001	255	(4)	294	(4)	295	(4)	296	(4)
		297	(4)	298	(4)	299	(4)	300	(4)
		301	(4)	303	(4)	304	(4)	305	(4)
		306	(4)	307	(4)	308	(4)	309	(4)
		310	(4)	311	(4)	313	(4)	314	(4)
		315	(4)	316	(4)	317	(4)	323	(4)
		328	(4)	329	(4)	330	(4)	331	(4)
		332	(4)	333	(4)	334	(4)	336	(4)
		337	(4)	338	(4)	339	(4)	342	(4)
		343	(4)	345	(4)	346	(4)	348	(4)
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		362	(4)	365	(4)	366	(4)	369	(4)
		370	(4)	371	(4)	372	(4)	373	(4)
		374	(4)	375	(4)	376	(4)	377	(4)
		378	(4)	379	(4)	383	(4)	384	(4)
		385	(4)	386	(4)	387	(4)	388	(4)
		389	(4)	390	(4)	391	(4)	392	(4)
		393	(4)	394	(4)	395	(4)	396	(4)
		397	(4)	398	(4)				
HP$W_DHUV_VEC	00000036	257	(4)	258	(4)				
HP$W_DMZ32_LOOP	00000037	269	(4)						

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HP$W_VECTOR                 00000024                 249   (4)   250   (4)   252   (4)   253   (4)
                                                     255   (4)   260   (4)   261   (4)   262   (4)
                                                     263   (4)   264   (4)   265   (4)   266   (4)
                                                     267   (4)   268   (4)   269   (4)   270   (4)
                                                     271   (4)   272   (4)   273   (4)   274   (4)
                                                     275   (4)   276   (4)   277   (4)   278   (4)
                                                     279   (4)   280   (4)   282   (4)   283   (4)
                                                     284   (4)   285   (4)   292   (4)   293   (4)
                                                     302   (4)   312   (4)   317   (4)   318   (4)
                                                     319   (4)   321   (4)   326   (4)   327   (4)
                                                     335   (4)   340   (4)   341   (4)   344   (4)
                                                     347   (4)   356   (4)   357   (4)   359   (4)
                                                     364   (4)   369   (4)   370   (4)   371   (4)
                                                     378   (4)   379   (4)   380   (4)   381   (4)
                                                     382   (4)   383   (4)   384   (4)   385   (4)
IEU11A                      00001213-R   285   (4)   245   (3)
IEU11A$B_BR                 00000032                 285   (4)
IEU11A$K_LEN                00000033                 285   (4)
KA$B_ACC_TYPE               00000042                 287   (4)   288   (4)   289   (4)   290   (4)
                                                     291   (4)
KA$K_LEN                    00000050                 287   (4)   288   (4)   289   (4)   290   (4)
                                                     291   (4)
KA$L_FLAGS                  00000032                 287   (4)   288   (4)   289   (4)   290   (4)
                                                     291   (4)
KA$M_CHAR                  =00000100                 287   (4)   288   (4)   289   (4)   290   (4)
                                                     291   (4)
KA$M_CRC                   =00000010                 287   (4)   288   (4)   289   (4)   290   (4)
                                                     291   (4)
KA$M_D_FLOAT               =00000002                 287   (4)   288   (4)   289   (4)   290   (4)
                                                     291   (4)
KA$M_EDIT                  =00000080                 287   (4)   288   (4)   289   (4)   290   (4)
                                                     291   (4)
KA$M_F_FLOAT               =00000001                 287   (4)   288   (4)   289   (4)   290   (4)
                                                     291   (4)
KA$M_G_FLOAT               =00000004                 287   (4)
KA$M_H_FLOAT               =00000008                 287   (4)
KA$M_PACKED                =00000020                 287   (4)   288   (4)   289   (4)   290   (4)
                                                     291   (4)
KA$M_PACK_MUL              =00000040                 287   (4)   288   (4)   289   (4)   290   (4)
                                                     291   (4)
KA$M_TODR                  =00010000                 289   (4)   290   (4)   291   (4)
KA$V_G_FLOAT               =00000002                 288   (4)   289   (4)   290   (4)   291   (4)
KA$V_H_FLOAT               =00000003                 288   (4)   289   (4)   290   (4)   291   (4)
KA$V_SB_ERR                =00000019                 287   (4)
KA$V_TODR                  =00000010                 287   (4)   288   (4)
KA$V_WCS_LD                =00000018                 287   (4)
KA$W_LATENCY                0000003E                 287   (4)   288   (4)   289   (4)   290   (4)
                                                     291   (4)
KA$W_MEM_SIZE               00000044                 287   (4)
KA$W_PROGRESS               00000040                 287   (4)   288   (4)   289   (4)   290   (4)
                                                     291   (4)
KA$W_WCS                    00000036                 287   (4)   288   (4)   289   (4)   290   (4)
                                                     291   (4)
KA730                       0000125E-R   287   (4)   245   (3)
KA750                       00001339-R   288   (4)   245   (3)
KA780                       00001405-R   289   (4)   245   (3)
KA785                       00001556-R   291   (4)   245   (3)
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KA86	000014AE-R	290	(4)	245	(3)
KMC11	000015FF-R	292	(4)	245	(3)
KMC11$B_BR	00000036			292	(4)
KMC11$K_LEN	00000037			292	(4)
KMC11$L_CSR	00000032			292	(4)
KW11K	0000164D-R	293	(4)	245	(3)
KW11K$B_BR	00000032			293	(4)
KW11K$K_LEN	00000033			293	(4)
LA100	000016B8-R	295	(4)	245	(3)
LA100$K_LEN	00000032			295	(4)
LA12	0000169E-R	294	(4)	245	(3)
LA12$K_LEN	00000032			294	(4)
LA120	000016D3-R	296	(4)	245	(3)
LA120$K_LEN	00000032			296	(4)
LA180	000016EE-R	297	(4)	245	(3)
LA180$K_LEN	00000032			297	(4)
LA210	00001757-R	301	(4)	245	(3)
LA210$K_LEN	00000032			301	(4)
LA34	00001709-R	298	(4)	245	(3)
LA34$K_LEN	00000032			298	(4)
LA36	00001723-R	299	(4)	245	(3)
LA36$K_LEN	00000032			299	(4)
LA38	0000173D-R	300	(4)	245	(3)
LA38$K_LEN	00000032			300	(4)
LESI	00001772-R	302	(4)	245	(3)
LG01	000017BE-R	303	(4)	245	(3)
LG01$K_LEN	00000032			303	(4)
LG02	000017D8-R	304	(4)	245	(3)
LG02$K_LEN	00000032			304	(4)
LG03	000017F2-R	305	(4)	245	(3)
LG03$K_LEN	00000032			305	(4)
LN01	0000180C-R	306	(4)	245	(3)
LN01$K_LEN	00000032			306	(4)
LN03	00001826-R	307	(4)	245	(3)
LN03$K_LEN	00000032			307	(4)
LP04	0000183B-R	308	(4)	245	(3)
LP04$K_LEN	00000032			308	(4)
LP05	00001855-R	309	(4)	245	(3)
LP05$K_LEN	00000032			309	(4)
LP06	0000186F-R	310	(4)	245	(3)
LP06$K_LEN	00000032			310	(4)
LP07	00001889-R	311	(4)	245	(3)
LP07$K_LEN	00000032			311	(4)
LP11	000018A3-R	312	(4)	245	(3)
LP11$B_BR	00000036			312	(4)
LP11$K_LEN	00000037			312	(4)
LP11$L_CSR	00000032			312	(4)
LP14	000018F0-R	313	(4)	245	(3)
LP14$K_LEN	00000032			313	(4)
LP25	0000190A-R	314	(4)	245	(3)
LP25$K_LEN	00000032			314	(4)
LP26	00001924-R	315	(4)	245	(3)
LP26$K_LEN	00000032			315	(4)
LP27	0000193E-R	316	(4)	245	(3)
LP27$K_LEN	00000032			316	(4)
LPA11K	00001958-R	317	(4)	245	(3)
LPA11K$B_BR	00000036			317	(4)

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LPA11K$K_LEN                    00000037                        317     (4)
LPA11K$L_CSR                    00000032                        317     (4)
LUA11                           000019B1-R      318     (4)     245     (3)
LUA11$B_BR                      00000032                        318     (4)
LUA11$K_LEN                     00000037                        318     (4)
LUA11$L_CSR                     00000033                        318     (4)
MA780                           00001AD2-R      321     (4)     245     (3)
MA780$B_BR                      00000033                        321     (4)
MA780$B_MPM                     00000034                        321     (4)
MA780$B_PORT                    00000035                        321     (4)
MA780$B_TR                      00000032                        321     (4)
MA780$K_LEN                     00000036                        321     (4)
MBE                             00001B4D-R      322     (4)     245     (3)
MBE$K_LEN                       00000032                        322     (4)
ML11                            00001B61-R      323     (4)     245     (3)
ML11$B_ARRAY                    00000032                        323     (4)
ML11$B_CHIP                     00000033                        323     (4)
ML11$K_LEN                      00000034                        323     (4)
MS750                           00001BC3-R      324     (4)     245     (3)
MS750$K_LEN                     00000032                        324     (4)
MS780                           00001BD4-R      325     (4)     245     (3)
MS780$B_ARRAYS                  00000033                        325     (4)
MS780$B_TR                      00000032                        325     (4)
MS780$K_LEN                     00000034                        325     (4)
NBIA                            000019FF-R      319     (4)     245     (3)
NBIB                            00001A6F-R      320     (4)     245     (3)
PCL11                           00001C24-R      326     (4)     245     (3)
PCL11$B_BR                      00000036                        326     (4)
PCL11$K_LEN                     00000037                        326     (4)
PCL11$L_CSR                     00000032                        326     (4)
PD$_ADD                         =0000008A       398     (4)     251     (4)     279     (4)     364     (4)
PD$_CASE                        =0000008C       398     (4)     251     (4)     319     (4)
PD$_COMPLEMENT                  =00000089       398     (4)     279     (4)
PD$_DECIMAL                     =00000082       398     (4)     249     (4)     250     (4)     251     (4)     252     (4)
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                                                                260     (4)     262     (4)     263     (4)     264     (4)
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                                                                273     (4)     274     (4)     275     (4)     276     (4)
                                                                277     (4)     280     (4)     281     (4)     282     (4)
                                                                285     (4)     287     (4)     288     (4)     289     (4)
                                                                290     (4)     291     (4)     292     (4)     293     (4)
                                                                302     (4)     312     (4)     317     (4)     318     (4)
                                                                319     (4)     320     (4)     321     (4)     323     (4)
                                                                325     (4)     326     (4)     327     (4)     340     (4)
                                                                341     (4)     344     (4)     347     (4)     356     (4)
                                                                357     (4)     359     (4)     367     (4)     368     (4)
                                                                369     (4)     370     (4)     371     (4)     378     (4)
                                                                379     (4)     381     (4)     382     (4)     383     (4)
                                                                384     (4)     385     (4)
PD$_END                         =00000081       398     (4)     249     (4)     250     (4)     251     (4)     252     (4)
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                                                                261     (4)     262     (4)     263     (4)     264     (4)
                                                                265     (4)     266     (4)     267     (4)     268     (4)
                                                                269     (4)     270     (4)     271     (4)     272     (4)
                                                                273     (4)     274     (4)     275     (4)     276     (4)
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                                                290     (4)     291     (4)     292     (4)     293     (4)
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                                                366     (4)     367     (4)     368     (4)     369     (4)
                                                370     (4)     371     (4)     372     (4)     373     (4)
                                                374     (4)     375     (4)     376     (4)     377     (4)
                                                378     (4)     379     (4)     380     (4)     381     (4)
                                                382     (4)     383     (4)     384     (4)     385     (4)
                                                386     (4)     387     (4)     388     (4)     389     (4)
                                                390     (4)     391     (4)     392     (4)     393     (4)
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                                                398     (4)

PD$_EPB                 =0000008E       398     (4)
PD$_FETCH               =00000087       398     (4)     251     (4)     252     (4)     253     (4)     279     (4)
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PD$_HEXADECIMAL         =00000084       398     (4)     287     (4)     288     (4)     289     (4)     290     (4)
                                                291     (4)     320     (4)

PD$_LITERAL             =00000086       398     (4)     251     (4)     252     (4)     253     (4)     255     (4)
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                                                280     (4)     287     (4)     288     (4)     289     (4)
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                                                314     (4)     315     (4)     316     (4)     317     (4)
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                                                339     (4)     340     (4)     341     (4)     342     (4)
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                                                353     (4)     354     (4)     356     (4)     358     (4)
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PD$_NAME	=0000008D	398	(4)	249 (4) 250 (4) 251 (4) 252 (4)
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PD$_OCTAL	=00000083	398	(4)	249 (4) 250 (4) 255 (4) 256 (4)
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PD$_START                       =00000080     398   (4)     249     (4)     250     (4)     251     (4)     252     (4)
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                                                    338     (4)     339     (4)     340     (4)     341     (4)
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                                                    374     (4)     375     (4)     376     (4)     377     (4)
                                                    378     (4)     379     (4)     380     (4)     381     (4)
                                                    382     (4)     383     (4)     384     (4)     385     (4)
                                                    386     (4)     387     (4)     388     (4)     389     (4)
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                                                    394     (4)     395     (4)     396     (4)     397     (4)
                                                    398     (4)

PD$_STORE                       =00000088     398   (4)     249     (4)     250     (4)     251     (4)     252     (4)
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                                                    263     (4)     264     (4)     265     (4)     266     (4)
                                                    267     (4)     268     (4)     269     (4)     270     (4)
                                                    271     (4)     272     (4)     273     (4)     274     (4)
                                                    275     (4)     276     (4)     277     (4)     278     (4)
                                                    279     (4)     280     (4)     281     (4)     282     (4)
                                                    283     (4)     284     (4)     285     (4)     287     (4)
                                                    288     (4)     289     (4)     290     (4)     291     (4)
                                                    292     (4)     293     (4)     294     (4)     295     (4)
                                                    296     (4)     297     (4)     298     (4)     299     (4)
                                                    300     (4)     301     (4)     302     (4)     303     (4)
                                                    304     (4)     305     (4)     306     (4)     307     (4)
                                                    308     (4)     309     (4)     310     (4)     311     (4)
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PX780$B_TR                       00000032                       327     (4)
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R80                              00001CD6-R     328     (4)     245     (3)
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RA60                             00001CEF-R     329     (4)     245     (3)
RA60$K_LEN                       00000032                       329     (4)
RA70                             00001D09-R     330     (4)     245     (3)
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RA80                             00001D23-R     331     (4)     245     (3)
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RA81                             00001D3D-R     332     (4)     245     (3)
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RA82                             00001D57-R     333     (4)     245     (3)
RA82$K_LEN                       00000032                       333     (4)
RA90                             00001D71-R     334     (4)     245     (3)
RA90$K_LEN                       00000032                       334     (4)
RB730                            00001D8B-R     335     (4)     245     (3)
RB730$B_BR                       00000036                       335     (4)
RB730$K_LEN                      00000037                       335     (4)
RC25                             00001DD5-R     337     (4)     245     (3)
RC25$K_LEN                       00000032                       337     (4)
RCF25                            00001DBA-R     336     (4)     245     (3)
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RH750$B_BR                       00000032                       340     (4)
RH750$K_LEN                      00000033                       340     (4)
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RH780$B_TR                       00000032                       341     (4)
RH780$K_LEN                      00000034                       341     (4)
RK06                             00001F62-R     345     (4)     245     (3)
RK06$K_LEN                       00000032                       345     (4)
RK07                             00001F7C-R     346     (4)     245     (3)
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RK611$K_LEN                     00000037                        347     (4)
RK611$L_CSR                     00000032                        347     (4)
RL01                            00001EE1-R      342     (4)     245     (3)
RL01$K_LEN                      00000032                        342     (4)
RL02                            00001EFB-R      343     (4)     245     (3)
RL02$K_LEN                      00000032                        343     (4)
RL11                            00001F15-R      344     (4)     245     (3)
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RL11$L_CSR                      00000032                        344     (4)
RM03                            00001FE4-R      348     (4)     245     (3)
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RM05                            00002008-R      349     (4)     245     (3)
RM05$K_LEN                      00000032                        349     (4)
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RP06                            00002098-R      353     (4)     245     (3)
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RP07                            000020BC-R      354     (4)     245     (3)
RP07$K_LEN                      00000032                        354     (4)
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RRD50                           00002107-R      356     (4)     245     (3)
RRD50$B_BR                      00000036                        356     (4)
RRD50$K_LEN                     00000037                        356     (4)
RRD50$L_CSR                     00000032                        356     (4)
RUX50                           00002163-R      357     (4)     245     (3)
RX02                            000021AB-R      358     (4)     245     (3)
RX02$K_LEN                      00000032                        358     (4)
RX180                           00002248-R      363     (4)     245     (3)
RX180$K_LEN                     00000032                        363     (4)
RX211                           000021C5-R      359     (4)     245     (3)
RX211$B_BR                      00000036                        359     (4)
RX211$K_LEN                     00000037                        359     (4)
RX211$L_CSR                     00000032                        359     (4)
RX31                            00002213-R      360     (4)     245     (3)
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RX32$K_LEN                      00000032                        361     (4)
RX50                            00002233-R      362     (4)     245     (3)
RX50$K_LEN                      00000032                        362     (4)
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                                                                 318    (4)    319    (4)    320    (4)    321    (4)
                                                                 322    (4)    323    (4)    324    (4)    325    (4)
                                                                 326    (4)    327    (4)    328    (4)    329    (4)
                                                                 330    (4)    331    (4)    332    (4)    333    (4)
                                                                 334    (4)    335    (4)    336    (4)    337    (4)
                                                                 338    (4)    339    (4)    340    (4)    341    (4)
                                                                 342    (4)    343    (4)    344    (4)    345    (4)
                                                                 346    (4)    347    (4)    348    (4)    349    (4)
                                                                 350    (4)    351    (4)    352    (4)    353    (4)
                                                                 354    (4)    355    (4)    356    (4)    357    (4)
                                                                 358    (4)    359    (4)    360    (4)    361    (4)
                                                                 362    (4)    363    (4)    364    (4)    365    (4)
                                                                 366    (4)    367    (4)    368    (4)    369    (4)
                                                                 370    (4)    371    (4)    372    (4)    373    (4)
                                                                 374    (4)    375    (4)    376    (4)    377    (4)
                                                                 378    (4)    379    (4)    380    (4)    381    (4)
                                                                 382    (4)    383    (4)    384    (4)    385    (4)
                                                                 386    (4)    387    (4)    388    (4)    389    (4)
                                                                 390    (4)    391    (4)    392    (4)    393    (4)
                                                                 394    (4)    395    (4)    396    (4)    397    (4)
                                                                 398    (4)
TE16                          0000229B-R   365    (4)           245    (3)
TE16$K_LEN                    00000032                          365    (4)
TK50                          000022B5-R   366    (4)           245    (3)
TM03                          000022CF-R   367    (4)           245    (3)
TM03$B_DRIVE                  00000032                          367    (4)
TM03$K_LEN                    00000033                          367    (4)
TM78                          000022FD-R   368    (4)           245    (3)
TM78$B_DRIVE                  00000032                          368    (4)
TM78$K_LEN                    00000033                          368    (4)
TS04                          0000232B-R   369    (4)           245    (3)
TS04$B_BR                     00000036                          369    (4)
TS04$K_LEN                    00000037                          369    (4)
TS04$L_CSR                    00000032                          369    (4)
TS05                          00002382-R   370    (4)           245    (3)
TS05$B_BR                     00000032                          370    (4)
TS05$K_LEN                    00000033                          370    (4)
TS11                          000023EC-R   371    (4)           245    (3)
TS11$B_BR                     00000036                          371    (4)
TS11$K_LEN                    00000037                          371    (4)
TS11$L_CSR                    00000032                          371    (4)
TU45                          00002443-R   372    (4)           245    (3)
TU45$K_LEN                    00000032                          372    (4)
TU58                          0000245D-R   373    (4)           245    (3)
TU58$K_LEN                    00000032                          373    (4)
TU70                          00002477-R   374    (4)           245    (3)
```

TU70$K_LEN	00000032			374	(4)
TU72	00002491-R	375	(4)	245	(3)
TU72$K_LEN	00000032			375	(4)
TU77	000024AB-R	376	(4)	245	(3)
TU77$K_LEN	00000032			376	(4)
TU78	000024C5-R	377	(4)	245	(3)
TU78$K_LEN	00000032			377	(4)
TU80	000024DF-R	378	(4)	245	(3)
TU80$K_LEN	00000037			378	(4)
TU81	0000254E-R	379	(4)	245	(3)
TU81$B_BR	00000036			379	(4)
TU81$K_LEN	00000037			379	(4)
TU81$L_CSR	00000032			379	(4)
UBE	000025A5-R	380	(4)	245	(3)
UBE$K_LEN	00000036			380	(4)
UBE$L_CSR	00000032			380	(4)
UDA50	000025E0-R	381	(4)	245	(3)
UNA11	00002649-R	382	(4)	245	(3)
UNA11$B_BR	00000032			382	(4)
UNA11$K_LEN	00000037			382	(4)
UNA11$L_CSR	00000033			382	(4)
VS100	00002697-R	383	(4)	245	(3)
VS100$B_BR	00000036			383	(4)
VS100$K_LEN	00000037			383	(4)
VS100$L_CSR	00000032			383	(4)
VS125	000026EF-R	384	(4)	245	(3)
VS125$B_BR	00000036			384	(4)
VS125$K_LEN	00000037			384	(4)
VS125$L_CSR	00000032			384	(4)
VS300	00002747-R	385	(4)	245	(3)
VS300$B_BR	00000036			385	(4)
VS300$K_LEN	00000037			385	(4)
VS300$L_CSR	00000032			385	(4)
VT100	00002821-R	391	(4)	245	(3)
VT100$K_LEN	00000032			391	(4)
VT101	0000283C-R	392	(4)	245	(3)
VT101$K_LEN	00000032			392	(4)
VT102	00002857-R	393	(4)	245	(3)
VT102$K_LEN	00000032			393	(4)
VT125	00002872-R	394	(4)	245	(3)
VT125$K_LEN	00000032			394	(4)
VT131	0000288D-R	395	(4)	245	(3)
VT131$K_LEN	00000032			395	(4)
VT132	000028A8-R	396	(4)	245	(3)
VT132$K_LEN	00000032			396	(4)
VT220	000028C3-R	397	(4)	245	(3)
VT220$K_LEN	00000032			397	(4)
VT240	000028DE-R	398	(4)	245	(3)
VT240$K_LEN	00000032			398	(4)
VT50	0000279F-R	386	(4)	245	(3)
VT50$K_LEN	00000032			386	(4)
VT52	000027B9-R	387	(4)	245	(3)
VT52$K_LEN	00000032			387	(4)
VT55	000027D3-R	388	(4)	245	(3)
VT55$K_LEN	00000032			388	(4)
VT61	000027ED-R	389	(4)	245	(3)
VT61$K_LEN	00000032			389	(4)

```
VT71                          00002807-R   390    (4)      245    (3)
VT71$K_LEN                    00000032                     390    (4)
```

```
                                        +-------------------------+
                                        ! Performance indicators !
                                        +-------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    35    00:00:00.17    00:00:00.51
Command processing               947    00:00:01.66    00:00:03.09
Pass 1                          5879    00:02:56.61    00:04:17.40
Symbol table sort                  0    00:00:00.94    00:00:01.60
Pass 2                          5138    00:00:32.20    00:01:05.20
Symbol table output               82    00:00:00.55    00:00:01.03
Psect synopsis output              5    00:00:00.00    00:00:00.04
Cross-reference output           298    00:00:06.27    00:00:08.87
Assembler run totals           12385    00:03:38.40    00:05:37.75

The working set limit was 4096 pages.
2258193 bytes (4411 pages) of virtual memory were used to buffer the intermediate code.
There were 40 pages of symbol table space allocated to hold 697 non-local and 0 local symbols.
399 source lines were read in Pass 1, producing 93 object records in Pass 2.
509 pages of virtual memory were used to define 462 macros.

                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;2             306
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                 0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;2               0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1              0
SYS$COMMON:[SYSLIB]LIB.MLB;2                            0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                        5
SYS$COMMON:[SYSLIB]STARLET.MLB;2                        0
TOTALS (all libraries)                              311

3118 GETS were required to define 311 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(2)   389   DECLARATIONS
(5)   459   Device description database

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element IOBASE.MAR
0000     2 ; *57   16-FEB-1988 09:19:39 MEIER "DWMUA should have been DWMBA"
0000     3 ; *56   12-FEB-1988 12:34:47 MEIER "added TBK50,KA62A and changed XBI to DWMUA"
0000     4 ; *55    9-DEC-1987 09:56:05 BARANSKI "merging 50a1"
0000     5 ;  50A1 11-NOV-1987 08:50:46 MEIER "FREEZE"
0000     6 ; *54   28-OCT-1987 09:07:20 GEARIN "CORRECT GENERATION"
0000     7 ; *53   27-OCT-1987 16:05:53 GEARIN "BACK UP GEN"
0000     8 ; *52   26-OCT-1987 12:50:35 GEARIN "FIX LIBRARY STATEMENT"
0000     9 ; *51   26-OCT-1987 12:30:17 GEARIN "ADDED RA90 PTABLE"
0000    10 ; *50   19-OCT-1987 08:52:00 MEIER "CHANGES TO DIAG"
0000    11 ; *49   14-OCT-1987 06:30:49 MEIER "RECOMPILED"
0000    12 ; *48    7-OCT-1987 20:10:01 MARTIN "ADDED A COMMENT FOR PREVIOUS FIX"
0000    13 ; *47    7-OCT-1987 19:49:43 MARTIN "REMOVED CALL TO $DS_DEVTYP"
0000    14 ; *46   29-SEP-1987 12:59:22 MEIER "CHANGES TO DIAG"
0000    15 ; *45   12-AUG-1987 10:00:54 BERGAZZI "CHANGED .LIB BACK TO $DIAG FROM WORK$:DIAG"
0000    16 ; *44   10-AUG-1987 16:52:16 BARANSKI "Merging Gen:43A1 and Gen:43B1 to Gen:44"
0000    17 ;  43B1 30-JUL-1987 16:58:33 MARTIN "KA888, AND DS_KA_DEF"
0000    18 ;  43A1 30-JUL-1987 01:13:50 MARTIN "KARRR TO KA888"
0000    19 ; *43   13-JUL-1987 09:13:10 GEARIN "ADDED RV20 PTABLE"
0000    20 ; *42    6-JUL-1987 11:04:52 GEARIN "ADDED RV20 P-TABLE"
0000    21 ; *41   22-MAY-1987 09:54:43 BERGAZZI "ADDED DEBNA, DEBNK PTABLES"
0000    22 ; *40    7-MAY-1987 14:46:14 MEIER "CHANGES TO DIAG"
0000    23 ; *39   10-APR-1987 16:18:44 BAGGETT "CHANGE FINISHED"
0000    24 ; *38   26-MAR-1987 11:05:48 MEIER "REMOVED REFERENCES TO CALYPSO"
0000    25 ; *37   19-MAR-1987 15:55:36 MARTIN "TOOK OUT DIRECT REFERENCES TO POLARSTAR"
0000    26 ; *36   19-MAR-1987 09:07:59 MEIER "RETRY"
0000    27 ; *35   18-MAR-1987 15:22:52 MEIER "RETRY"
0000    28 ; *34   18-MAR-1987 13:55:10 MEIER "CHANGES TO DIAG"
0000    29 ; *33   13-MAR-1987 13:54:17 MARTIN "TOO CONFUSING AND STUPID TO MENTION"
0000    30 ; *32   13-MAR-1987 13:45:06 MARTIN "FIXED MY LAST EDIT HISTORY"
0000    31 ; *31    4-MAR-1987 13:26:51 BERGAZZI "ADD RA70 PTABLE"
0000    32 ; *30   11-FEB-1987 09:10:26 GEARIN "ADDED PTABLE INFORMATION (DRB32)"
0000    33 ; *29    9-FEB-1987 16:07:04 MARTIN "RE-COMPILED"
0000    34 ; *28    4-FEB-1987 10:57:02 MARTIN "ADDED $DS_KARRR"
0000    35 ; *27   30-JAN-1987 09:03:40 GEARIN "ADDED PTABLE ENTRIES"
0000    36 ; *26   18-DEC-1986 17:27:36 BAGGETT "MODULE RECOMPILED FOR CIBCA CHANGES"
0000    37 ; *25   16-DEC-1986 16:55:11 BAGGETT "FINISHED"
0000    38 ; *24   14-NOV-1986 13:58:21 BAGGETT "<no reason given>"
0000    39 ; *23   14-NOV-1986 13:26:44 BAGGETT "INSERT NEW DEFINITION FOR CIBCA"
0000    40 ; *22   14-NOV-1986 12:14:14 BAGGETT "INSERT NEW P-TABLE DEFINITION FOR TU81"
0000    41 ; *21   31-OCT-1986 12:39:09 MEIER "CHANGES TO DIAG"
0000    42 ; *20   30-OCT-1986 10:30:32 MEIER "OOPS TRY AGAIN"
0000    43 ; *19   30-OCT-1986 09:01:28 MEIER "CHANGES TO DIAG"
0000    44 ; *18   10-OCT-1986 14:37:12 BAGGETT "RECOMPILE FOR NEW KA800 DEFINITIONS"
0000    45 ; *17   17-SEP-1986 15:06:24 BERGAZZI "FORMAT CHANGE FOR VSDP"
0000    46 ; *16   15-AUG-1986 10:57:54 BAGGETT "<no reason given>"
0000    47 ; *15   23-JUN-1986 09:11:27 MARTIN "DONE"
0000    48 ; *14   10-JUN-1986 14:19:39 BAGGETT "<no reason given>"
0000    49 ; *13   20-MAY-1986 10:43:52 MUSE "<no reason given>"
0000    50 ; *12    5-MAY-1986 16:56:44 BAGGETT "<no reason given>"
0000    51 ; *11   30-APR-1986 15:15:29 BERGAZZI "DEBNT FIX"
0000    52 ; *10   30-APR-1986 15:06:22 BAGGETT "FINISHED"
0000    53 ; *9    17-MAR-1986 11:05:48 MUSE "<no reason given>"
0000    54 ; *8    17-MAR-1986 10:05:48 BAGGETT "CHANGES FOR KFBTA AND DEBNT P-TABLES"
0000    55 ; *7    13-MAR-1986 14:02:12 MUSE "<no reason given>"
0000    56 ; *6    13-MAR-1986 13:29:58 MUSE "<no reason given>"
0000    57 ; *5    13-MAR-1986 13:22:17 MUSE "<no reason given>"
```

```
0000     58 ; *4    12-MAR-1986 16:52:14 BARANSKI "Add RRD50 PTable."
0000     59 ; *3    26-FEB-1986 16:39:32 MUSE "BECAUSE IT WAS THERE"
0000     60 ; *2    12-FEB-1986 16:59:26 BERGAZZI "CI FUNCTIONALITY CHANGE"
0000     61 ; *1     6-FEB-1986 15:18:54 DS ""
0000     62 ; DEC/CMS REPLACEMENT HISTORY, Element IOBASE.MAR
0000     63         .TITLE  IOBASE  *** IOBASE I/O data base
0000     64         .ident  "10.11-57"                                          ;G:57
0000     65         .LIST   MEB
0000     66         .DSABL  GBL
0000     67         .NLIST  CND
0000     68
0000     69 ;
0000     70 ;
0000     71 ; Copyright (c) 1977, 1982, 1983, 1984, 1985, 1986, 1987, 1988      ;G:56
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0000     87 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000     88 ;
0000     89 ; R.HEINEN 3-AUG-76
0000     90 ;
0000     91 ; MODIFICATION HISTORY:
0000     92 ;
0000     93 ;                   N. HOWGATE 3-FEB-78     VERSION 02 (ESSAA-4.00).
0000     94 ;          01       ALTERED TO REPRESENT A ONE (4) DBA: SYSTEM
0000     95 ;                   FOR INITIAL DIAGNOSTIC SUPERVISOR QIO DEBUG
0000     96 ;
0000     97 ;                   N. HOWGATE  20-APR-78  VERSION 03  (ESSAA-4.01).
0000     98 ;          02       ADDED DEVICE DATA FOR ONE DMA: SYSTEM (3 UNITS)
0000     99 ;
0000    100 ;                   TOM SOUTTER  12-MAY-78  VERSION 04  (ESSAA-4.02).
0000    101 ;          03       ADDED DEVICE DATA FOR ONE DRA: SYSTEM (4 UNITS)
0000    102 ;
0000    103 ;                   TOM SOUTTER  14-JUN-78  VERSION 05  (ESSAA-4.03).
0000    104 ;          04       ADDED DEVICE DATA FOR ONE MTA: SYSTEM (2 UNITS)
0000    105 ;
0000    106 ;                   NICK HOWGATE    22-JUN-78
0000    107 ;          05       ADD LONGWORD TO END OF RM03 UCB'S FOR ADDITIONAL STATUS
0000    108 ;
0000    109 ;                   NICK HOWGATE    11-JUL-78
0000    110 ;          06       ADD RK07 SUPPORT IN DM TYPE UCB
0000    111 ;
0000    112 ;                   NICK HOWGATE    13-JUL-78
0000    113 ;          07       ADD LONGWORD TO CRB FOR UNIT INIT CODE
0000    114 ;                   CRB$L_INTD+VEC$L_UNITINIT
```

```
0000    115 ;
0000    116 ;               NICK HOWGATE    24-AUG-78
0000    117 ;       08      INCLUDE NEW UCB ENTRIES (UCB$W_ERRCNT ,UCB$B_FEX, UCB$B_CEX)
0000    118 ;
0000    119 ;               Roger Riggs     30-SEP-78       VERSION 6 (ESSAA 5.00)
0000    120 ;       09      Major modifications to accomodate new QIO initialization
0000    121 ;               and loadable drivers.
0000    122 ;                                                                       ;G:40
0000    123 ;               Roger Riggs     1-OCT-1979
0000    124 ;       10      Added DMP11,DMR11,DV11,LA180,MS780
0000    125 ;
0000    126 ;       11      John Ciukaj     1-15-80
0000    127 ;               Added DL11,RX02,RX211,TU58,TS11
0000    128 ;
0000    129 ;       12      M. Baggett      18-MAR-80
0000    130 ;               Add TU78 magtape
0000    131 ;
0000    132 ;               Dave Butenhof, 15-dec-1980, V6.2
0000    133 ;       13      Add ML11 PTDESC.
0000    134 ;
0000    135 ;               Dave Butenhof, 19-mar-1981, version 6.3
0000    136 ;       14      Add DV11 PTdesc.
0000    137 ;       15      Add KA730 Ptdesc.
0000    138 ;
0000    139 ;       16      Dave butenhof, 4-sep-1981, version 6.5
0000    140 ;               add RB730 and R80 Ptable descriptors
0000    141 ;
0000    142 ;       17      Dave Butenhof, 26-Oct-1981, version 6.-
0000    143 ;               Add some missing devices
0000    144 ;
0000    145 ;       18      Dave Butenhof, 10-Nov-1981, version 6.-
0000    146 ;               Add the UDA50 and RA80 devices
0000    147 ;
0000    148 ;       19      Dave Butenhof, 15-Dec-1981, Version 6.6
0000    149 ;               Add PX780
0000    150 ;
0000    151 ;       20      Dave Butenhof, 23-Feb-1982, version 6.6
0000    152 ;               Add CI_NODE and CI750 Ptable descriptors
0000    153 ;
0000    154 ;       21      Dave Butenhof, 16-Apr-1982, verison 6.7
0000    155 ;               Add RA81 Ptable descriptor
0000    156 ;
0000    157 ;       22      Dave Butenhof, 29-Apr-1982, version 6.7
0000    158 ;               Add RA60 Ptable descriptor
0000    159 ;
0000    160 ;       23      Dave Butenhof, 05-May-1982, version 6.8
0000    161 ;               Activate the device name check feature which
0000    162 ;               was added (latent) in 6.7 macros.
0000    163 ;
0000    164 ;       24      Dave Butenhof, 11-May-1982, version 6.8
0000    165 ;               Add Lp07 and Lp26 Ptables for Dan Milleville
0000    166 ;
0000    167 ;       25      Dave Butenhof, 25-May-1982, version 6.8
0000    168 ;               Add "console" Ptable desc. to IOBASE.  This allows
0000    169 ;               new console Ptable to be displayed by SHOW
0000    170 ;               (DEVICE | SELECT) without the annoying "..." which
0000    171 ;               means it couldn't find the Ptable.  This device is
```

```
                        0000   172 ;               attached at DS startup by KERNEL, and as it has
                        0000   173 ;               a lower-case device type, CANNOT be attached manually!
                        0000   174 ;
                        0000   175 ;       26      M. Baggett, 20-Jul-1982 Ver 6.9
                        0000   176 ;               Added LP27 line printer.
                        0000   177 ;
                        0000   178 ;       27      Bob Bergazzi    1-Oct-82        Version 6.9
                        0000   179 ;               Added UNA11 (UNIBUS to NI Adapter)
                        0000   180 ;
                        0000   181 ;       28      M. Baggett      1-Dec-1982      Version 6.10
                        0000   182 ;               Added TU80 magtape and DZ32.
                        0000   183 ;
                        0000   184 ;       29      M. Baggett      8-Dec-1982      Version 6.10
                        0000   185 ;               Added TU81 magtape.
                        0000   186 ;
                        0000   187 ;       30      M. Baggett      10-Dec-1982     Version 6.10
                        0000   188 ;               Added VS100.
                        0000   189 ;
                        0000   190 ;       31      Bob Bergazzi    10-Jan-83       Version 6.11
                        0000   191 ;               Changed the comment before DS$GA_PTABLE.
                        0000   192 ;
                        0000   193 ;       32      M. Baggett      14-Jan-83       Version 6.11
                        0000   194 ;               Added RC25.
                        0000   195 ;
                        0000   196 ;       33      M. Baggett      15-Feb-83       Version 6.11
                        0000   197 ;               Added VS300 and RCF25.
                        0000   198 ;
                        0000   199 ;       34      M. Baggett      14-Mar-1983     Version 6.11
                        0000   200 ;               Added p-table for LESI controller.
                        0000   201 ;
                        0000   202 ;       35      M. Baggett      21-March-1983   Version 6.11
                        0000   203 ;               Added p-tables for LA12,LA100,LN01,VT220,VT240.
                        0000   204 ;
                        0000   205 ;       36      Bob Bergazzi    25-April-1983   Version 6.11
                        0000   206 ;               Added Ptable for KA785.
                        0000   207 ;
                        0000   208 ;       37      Richard Brown   2-May-1983      Version 6.11
                        0000   209 ;               Added SBIA and KAxxx.
                        0000   210 ;
                        0000   211 ;       38      Richard Brown   15-July-1983    Version 6-12
                        0000   212 ;               Added RC11.
                        0000   213 ;
                        0000   214 ;       39      M. Baggett      8-Aug-1983      Version 6.12
                        0000   215 ;               Added IEU11A
                        0000   216 ;
                        0000   217 ;       40      M. Baggett      7-Sep-1983      Version 6.13
                        0000   218 ;               Added VS125.
                        0000   219 ;
                        0000   220 ;       41      M. Baggett      21-Sep-1983     Version 6.13
                        0000   221 ;               Added DISK p-table.
                        0000   222 ;
                        0000   223 ;       42      M. Baggett      11-Oct-1983     Version 6.13
                        0000   224 ;               Added TAPE p-table.
                        0000   225 ;
                        0000   226 ;       43      M. Baggett      13-Oct-1983     Version 6.13
                        0000   227 ;               Added TS05 p-table.
                        0000   228 ;
```

```
0000    229 ;       44      Bob Bergazzi    Jan 23, 1984    Version 6.14
0000    230 ;               Added KAZZZ Ptable.
0000    231 ;
0000    232 ;       45      M. Baggett      Feb 6, 1984     Version 6.14
0000    233 ;               Added DMZ32 p-table.
0000    234 ;
0000    235 ;       46      Richard Brown   July 7, 1984    Version 7.0
0000    236 ;               Removed RC11, since it is really LESI.
0000    237 ;
0000    238 ;       47      Bob Bergazzi    Aug. 6, 1984    Version 7.1
0000    239 ;               Added DW000 ptable for BUA.
0000    240 ;
0000    241 ;       48      Bob Bergazzi    Sep. 4, 1984    Version 7.1
0000    242 ;               Changed BUA device name from DW000 to DWBUA.
0000    243 ;
0000    244 ;       49      Amy Iorio       Oct. 1, 1984    Version 7.1
0000    245 ;               Change KAXXX to KA86.
0000    246 ;
0000    247 ;       50      Amy Iorio       Oct. 11, 1984   Version 7.1
0000    248 ;               Added KAXXX.
0000    249 ;
0000    250 ;       51      M. Baggett      2-NOV-1984      Version 7.1
0000    251 ;               Added TK50.
0000    252 ;
0000    253 ;       52      Bob Bergazzi    Nov. 12, 1984   Version 7.1
0000    254 ;               Added BCI750.
0000    255 ;
0000    256 ;       53      M. Baggett      15-Nov-1984     Version 7.1
0000    257 ;               Added RX31,RX32,RX50,RX180,RUX50.
0000    258 ;
0000    259 ;       54      Bob Bergazzi    Nov. 29,1984    Version 8.0
0000    260 ;               Added KA810. Removed KAXXX.
0000    261 ;
0000    262 ;       55      M. Bagggett     18-Dec-1984     Version 8.0
0000    263 ;               Added VT101, VT102, VT125.
0000    264 ;
0000    265 ;       56      A. Iorio        18-Jan-1985     Version 8.1
0000    266 ;               Added DHU11, DR11C
0000    267 ;
0000    268 ;       57      A. Iorio        5-Mar-1985      Version 8.1
0000    269 ;               Added DX20, TU70, TU72
0000    270 ;
0000    271 ;       58      A. Iorio        12-Mar-1985     Version 8.1
0000    272 ;               Added DHV11
0000    273 ;
0000    274 ;       59      Bob Bergazzi    24-Apr-1985     Version 8.1
0000    275 ;               Added KA820, remove KA810 later.
0000    276 ;
0000    277 ;       60      Bob Bergazzi    16-May-1985     Version 8.2
0000    278 ;               Added BLA ptable.
0000    279 ;
0000    280 ;       61      Bob Bergazzi    23-May-1985     Version 8.2
0000    281 ;               Added KDB50 ptable (BDA).
0000    282 ;
0000    283 ;       62      Bob Bergazzi    30-May-1985     Version 8.3
0000    284 ;               Added SLU, NI ptables.
0000    285 ;
```

```
0000   286 ;        63      Bob Bergazzi    11-June-1985    Version 8.3
0000   287 ;                Changed BCI750 to CIBCI.
0000   288 ;
0000   289 ;        64      Bob Bergazzi    18-June-1985    Version 8.3
0000   290 ;                Removed KAZZZ ptable.
0000   291 ;
0000   292 ;        65      M. Baggett      7-Aug-1985      Version 8.3
0000   293 ;                Added RDBX1 p-table.
0000   294 ;
0000   295 ;        66      Amy Iorio       12-Aug-1985     Version 8.3
0000   296 ;                Added LN03, LA210, VT61, VT71, VT131, and VT132 ptables.
0000   297 ;
0000   298 ;        67      M. Baggett      19-Aug-1985     Version 9.1
0000   299 ;                Added RD52,RD53.
0000   300 ;
0000   301 ;        68      M. Baggett      11-Sep-1985     VDS Ver 9.0
0000   302 ;                Added p-tables for DEBNT(AIE),KA800,KFBTA(AIO),LANCE
0000   303 ;
0000   304 ;        69      Bob Bergazzi    20-Sep-1985     Version 9.0
0000   305 ;                Removed KA810 ptable since KA820 supersedes it.
0000   306 ;
0000   307 ;        70      Jim Baranski    09-Oct-1985     Version 9.0
0000   308 ;                Added RA82 disk Ptable descriptor.
0000   309 ;
0000   310 ;        71      Jim Baranski    10-Oct-1985     Version 9.0
0000   311 ;                Added LUA11 Ptable descriptor.
0000   312 ;
0000   313 ;        72      M. Baggett      22-Oct-1985     Version 9.0
0000   314 ;                Removed RDBX1 p-table.
0000   315 ;                                                                        ;G:4
0000   316 ;        73      J. Baranski     11-Mar-1986     Version 10.0            ;G:4
0000   317 ;                Added RRD50 PTable descriptor.                          ;G:4
0000   318 ;                                                                        ;G:12
0000   319 ;        74      M. Baggett      5-May-1986      Version 10.0            ;G:12
0000   320 ;                Added RD54.                                             ;G:12
0000   321 ;                                                                        ;G:13
0000   322 ;        75      Richard E. Muse   19-may-1986   version 10.1            ;G:13
0000   323 ;                added CIBCA                                             ;G:13
0000   324 ;                                                                        ;G:14
0000   325 ;        76      M. Baggett      10-Jun-1986     Version 10.1            ;G:17
0000   326 ;                Added DRB32.                                            ;G:14
0000   327 ;                                                                        ;G:17
0000   328 ;        77      Bob Bergazzi    2-Sep-1986      Version 10.3            ;G:17
0000   329 ;                Arranged the table of ptable descriptors so that there is one ;G:17
0000   330 ;                device listed per line of code.  Added the symbol       ;G:17
0000   331 ;                PTABLE_DESCRIPTORS to identify the beginning of this list.  ;G:17
0000   332 ;                This was done so that the release group can more easily parse ;G:17
0000   333 ;                the source to obtain a list of supported devices.       ;G:17
0000   334 ;                                                                        ;G:17
0000   335 ;                ********************************************************** ;G:17
0000   336 ;                                    IMPORTANT!!                         ;G:17
0000   337 ;                ********************************************************** ;G:17
0000   338 ;                Please follow this convention when adding new devices   ;G:17
0000   339 ;                ********************************************************** ;G:17
0000   340 ;                                                                        ;G:17
0000   341 ;                Also removed $DS_RRD50_DEF call because it was moved into the ;G:17
0000   342 ;                $DS_RRD50 ptable descriptor in DIAG.MAR.                ;G:17
```

```
0000   ;                                                                                  ;G:19
0000   ;      78     Stephen Meier   30-Oct-1986     Version 10.4                        ;G:40
0000   ;             Added XBI .                                                         ;G:19
0000   ;                                                                                  ;G:27
0000   ;      79     David Gearin    30-Jan-1987     Version 10.5                        ;G:28
0000   ;             Added p-table for LG01, LG02, LG03.                                 ;G:27
0000   ;                                                                                  ;G:27
0000   ;      80     Ingrid Martin   4-Feb-1987      Version 10.5                        ;G:28
0000   ;             Added KA888.                                                        ;G:55
0000   ;                                                                                  ;G:33
0000   ;      81     David Gearin    11-Feb-1987     Version 10.5                        ;G:33
0000   ;             Added P-table data for drb32.                                       ;G:33
0000   ;                                                                                  ;G:33
0000   ;      82     Bob Bergazzi    4-Mar-1987      Version 10.7                        ;G:33
0000   ;             Added RA70.                                                         ;G:33
0000   ;      83     Stephen Meier   18-Mar-1987     Version 10.7                        ;G:36
0000   ;             Added KA9CC     (VAX 6200 processor)                                ;G:56
0000   ;                                                                                  ;G:40
0000   ;      84     M. Baggett      10-Apr-1987     Version 10.7                        ;G:39
0000   ;             Added p-table for TK70,DHB32.                                       ;G:39
0000   ;                                                                                  ;G:41
0000   ;             Bob Bergazzi    22-may-1987     Version 10.8                        ;G:41
0000   ;             Added DEBNA, DEBNK ptables.                                         ;G:41
0000   ;                                                                                  ; ;G:4
0000   ;             David Gearin    01-July-1987    Version 10.9                        ; ;G:4
0000   ;             Added RV20 ptable                                                   ;G:42
0000   ;                                                                                  ;G:43
0000   ;             Bob Bergazzi    12-aug-1987     Version 10.9                        ;G:45
0000   ;             Changed .LIB back to $DIAG.                                         ;G:45
0000   ;                                                                                  ;G:46
0000   ;      46     Stephen Meier   29-Sep-1987     Version 10.10                       ;G:46
0000   ;             Version 70 of Diag... support for > 4 BI's.                         ;G:46
0000   ;                                                                                  ;G:47
0000   ;             Ingrid Martin   6-oct-87        version 10.10                       ;G:47
0000   ;             Permently changed KA888 to KA884.                                   ;G:47
0000   ;             Added DS_PBIA to device list.                                       ;G:47
0000   ;             Removed call to $DS_DEVTYP for DS$GA_PTDESC because there           ;G:47
0000   ;             are now too many devices.                                           ;G:47
0000   ;                                                                                  ;G:54
0000   ;             David Gearin    20-Oct-1987     Version 10.10                       ;G:54
0000   ;             Added support for RA90 ptables.                                     ;G:54
0000   ;                                                                                  ;G:56
0000   ;             Stephen Meier   12-Feb-1988     Version 10.11                       ;G:56
0000   ;             Changed XBI to DWMBA, added KA62A, and added TBK50.                 ;G:57
0000   ;--
```

```
                        0000   389          .SBTTL  DECLARATIONS
                        0000   390 ;
                        0000   391 ; MACRO LIBRARY CALLS
                        0000   392 ;
                        0000   393                                                          ;G:40
                        0000   394 .library         /$diag/                                ;G:52
                        0000   395
                        0000   396          $DS_HPODEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .IIF    NB,HP$Q_DEVICE, HP$Q_DEVICE:
              00000008  0000                .IIF    NB,.BLKQ,       .BLKQ   1
                        0008                .IIF    NB,HP$W_SIZE,   HP$W_SIZE:
              0000000A  0008                .IIF    NB,.BLKW,       .BLKW   1
                        000A                .IIF    NB,HP$B_FLAGS,  HP$B_FLAGS:
              0000000B  000A                .IIF    NB,.BLKB,       .BLKB   1
                        000B                .IIF    NB,HP$B_DRIVE,  HP$B_DRIVE:
              0000000C  000B                .IIF    NB,.BLKB,       .BLKB   1
                        000C                .IIF    NB,HP$T_DEVICE, HP$T_DEVICE:
              00000018  000C                .IIF    NB,.BLKB,       .BLKB   12
                        0018                .IIF    NB,HP$A_DEVICE, HP$A_DEVICE:
              0000001C  0018                .IIF    NB,.BLKL,       .BLKL   1
                        001C                .IIF    NB,HP$A_DVA,    HP$A_DVA:
              00000020  001C                .IIF    NB,.BLKL,       .BLKL   1
                        0020                .IIF    NB,HP$A_LINK,   HP$A_LINK:
              00000024  0020                .IIF    NB,.BLKL,       .BLKL   1
                        0024                .IIF    NB,HP$W_VECTOR, HP$W_VECTOR:
              00000026  0024                .IIF    NB,.BLKW,       .BLKW   1
                        0026                .IIF    NB,HP$T_TYPE,   HP$T_TYPE:
              00000032  0026                .IIF    NB,.BLKB,       .BLKB   12
                        0032                .IIF    NB,HP$A_DEPENDENT,      HP$A_DEPENDENT:
                        0000                .RESTORE
                        0000   397
```

```
                                 0000   399                                                                                  ;G:40
                                 0000   400 ;
                                 0000   401 ; GLOBAL DATA
                                 0000   402 ;
                                 0000   403 ; SYSTEM BOOT UCB TABLES
                                 0000   404 ;
                                 0000   405
                          00000000   406          .PSECT  SEP,    SHR,    EXE,    WRT,    LONG
                                 0000   407 IOC$AL_SYSUCB::                          ; SYSTEM DEVICE UCB TABLE
                   00000000      0000   408          .LONG   0                       ; RP06 UCB TABLE
                   00000000      0004   409          .LONG   0
                                 0008   410
                                 0008   411 IOC$GL_DEVLIST::
                   00000000      0008   412          .LONG   0                       ; START OF DEVICE LIST
                                 000C   413 IOC$GL_ADPLIST::
                   00000000      000C   414          .LONG   0                       ; START OF ADAPTER CONTROL BLOCK LIST
                                 0010   415 IOC$GL_DPTLIST::                         ; QUEUE OF DRIVER PROLOGUE BLOCKS
        00000010'00000010'       0010   416          .LONG   IOC$GL_DPTLIST,IOC$GL_DPTLIST
```

```
                    00000000   418          .PSECT  WORK, NOSHR, NOEXE, WRT, LONG
                        0000   419 ;+
                        0000   420 ; The following table contains a select bit corresonding to the
                        0000   421 ; entries in DS$GA_PTABLE.
                        0000   422 ;-
                    00000080    0000   423 MAXPT=128
                        0000   424 DS$GA_SELECTS::
                    00000014    0000   425          .BLKL   MAXPT/32+1
                        0014   426
                        0014   427 ;+
                        0014   428 ; The following table contains an allocate bit corresponding to the
                        0014   429 ; to entries in DS$GA_TABLE
                        0014   430 ;-
                        0014   431 DS$GA_ALLOCATES::                                    ;                [48]
                    00000028    0014   432          .BLKL   MAXPT/32+1                  ;                [48]
                        0028   433
                        0028   434 ;+
                        0028   435 ; This table contains the addresses of each P-table actually to be tested.
                        0028   436 ; It is built at program start time by matching the device types in the
                        0028   437 ; program DEVTYP list with the type field in each P-table.
                        0028   438 ; DSP$GEN_PTABLES in DEVICE actually performs this.
                        0028   439 ;-
                        0028   440 DS$GA_SELECTED::
                    00000080    0028   441          .LONG   MAXPT
00000000'00000000'00000000'00000000'    002C   442          .LONG   0[MAXPT]
00000000'00000000'00000000'00000000'    003C
00000000'00000000'00000000'00000000'    004C
00000000'00000000'00000000'00000000'    005C
00000000'00000000'00000000'00000000'    006C
00000000'00000000'00000000'00000000'    007C
00000000'00000000'00000000'00000000'    008C
00000000'00000000'00000000'00000000'    009C
00000000'00000000'00000000'00000000'    00AC
00000000'00000000'00000000'00000000'    00BC
00000000'00000000'00000000'00000000'    00CC
00000000'00000000'00000000'00000000'    00DC
00000000'00000000'00000000'00000000'    00EC
00000000'00000000'00000000'00000000'    00FC
00000000'00000000'00000000'00000000'    010C
00000000'00000000'00000000'00000000'    011C
00000000'00000000'00000000'00000000'    012C
00000000'00000000'00000000'00000000'    013C
00000000'00000000'00000000'00000000'    014C
00000000'00000000'00000000'00000000'    015C
00000000'00000000'00000000'00000000'    016C
00000000'00000000'00000000'00000000'    017C
00000000'00000000'00000000'00000000'    018C
00000000'00000000'00000000'00000000'    019C
00000000'00000000'00000000'00000000'    01AC
00000000'00000000'00000000'00000000'    01BC
00000000'00000000'00000000'00000000'    01CC
00000000'00000000'00000000'00000000'    01DC
00000000'00000000'00000000'00000000'    01EC
00000000'00000000'00000000'00000000'    01FC
00000000'00000000'00000000'00000000'    020C
00000000'00000000'00000000'00000000'    021C
                                        022C    443 DS$GA_ALLOCATED::
```

```
                                00000080  022C   444          .LONG   MAXPT
00000000'00000000'00000000'00000000' 0230   445          .LONG   0[MAXPT]
00000000'00000000'00000000'00000000' 0240
00000000'00000000'00000000'00000000' 0250
00000000'00000000'00000000'00000000' 0260
00000000'00000000'00000000'00000000' 0270
00000000'00000000'00000000'00000000' 0280
00000000'00000000'00000000'00000000' 0290
00000000'00000000'00000000'00000000' 02A0
00000000'00000000'00000000'00000000' 02B0
00000000'00000000'00000000'00000000' 02C0
00000000'00000000'00000000'00000000' 02D0
00000000'00000000'00000000'00000000' 02E0
00000000'00000000'00000000'00000000' 02F0
00000000'00000000'00000000'00000000' 0300
00000000'00000000'00000000'00000000' 0310
00000000'00000000'00000000'00000000' 0320
00000000'00000000'00000000'00000000' 0330
00000000'00000000'00000000'00000000' 0340
00000000'00000000'00000000'00000000' 0350
00000000'00000000'00000000'00000000' 0360
00000000'00000000'00000000'00000000' 0370
00000000'00000000'00000000'00000000' 0380
00000000'00000000'00000000'00000000' 0390
00000000'00000000'00000000'00000000' 03A0
00000000'00000000'00000000'00000000' 03B0
00000000'00000000'00000000'00000000' 03C0
00000000'00000000'00000000'00000000' 03D0
00000000'00000000'00000000'00000000' 03E0
00000000'00000000'00000000'00000000' 03F0
00000000'00000000'00000000'00000000' 0400
00000000'00000000'00000000'00000000' 0410
00000000'00000000'00000000'00000000' 0420
                                      0430   446 ;+
                                      0430   447 ; This table contains the address of each known device.  It is ordered.
                                      0430   448 ; The most recently attached device has the lowest index in the table because ;G:17
                                      0430   449 ; entries are allocated from the bottom up. In addition, as a byproduct of    ;G:17
                                      0430   450 ; the SELECT command, the specified devices are moved to the end of the list. ;G:17
                                      0430   451 ; This results in the most recently selected device is the last (in a series)
                                      0430   452 ; to be tested.
                                      0430   453 ;-
                                      0430   454
                                      0430   455 DS$GA_PTABLE::
                                00000080  0430   456          .LONG   MAXPT
00000000'00000000'00000000'00000000' 0434   457          .LONG   0[MAXPT]
00000000'00000000'00000000'00000000' 0444
00000000'00000000'00000000'00000000' 0454
00000000'00000000'00000000'00000000' 0464
00000000'00000000'00000000'00000000' 0474
00000000'00000000'00000000'00000000' 0484
00000000'00000000'00000000'00000000' 0494
00000000'00000000'00000000'00000000' 04A4
00000000'00000000'00000000'00000000' 04B4
00000000'00000000'00000000'00000000' 04C4
00000000'00000000'00000000'00000000' 04D4
00000000'00000000'00000000'00000000' 04E4
00000000'00000000'00000000'00000000' 04F4
```

```
00000000'00000000'00000000'00000000' 0504
00000000'00000000'00000000'00000000' 0514
00000000'00000000'00000000'00000000' 0524
00000000'00000000'00000000'00000000' 0534
00000000'00000000'00000000'00000000' 0544
00000000'00000000'00000000'00000000' 0554
00000000'00000000'00000000'00000000' 0564
00000000'00000000'00000000'00000000' 0574
00000000'00000000'00000000'00000000' 0584
00000000'00000000'00000000'00000000' 0594
00000000'00000000'00000000'00000000' 05A4
00000000'00000000'00000000'00000000' 05B4
00000000'00000000'00000000'00000000' 05C4
00000000'00000000'00000000'00000000' 05D4
00000000'00000000'00000000'00000000' 05E4
00000000'00000000'00000000'00000000' 05F4
00000000'00000000'00000000'00000000' 0604
00000000'00000000'00000000'00000000' 0614
00000000'00000000'00000000'00000000' 0624
```

```
                        0634   459          .SBTTL  Device description database
                    00000000   460          .PSECT  DATA, SHR, NOWRT, NOEXE, BYTE
                        0000   461 ;
                        0000   462 ;       The following list contains the descriptor for each type
                        0000   463 ;       of device the supervisor knows about.                          ;G:47
                        0000   464 ;
                        0000   465
                        0000   466 DS$GA_PTDESC::                    ; Note:  always update the first longword; this ;G:4
                        0000   467                                    ; is the number of devices in the list.       ;G:49
                000000AC  0000   468          .LONG   172                                                    ;G:54
                000002BC' 0004   469          .LONG   AA11K                                                  ;G:47
                0000030D' 0008   470          .LONG   AD11K                                                  ;G:47
                000003FA' 000C   471          .LONG   CIBCA                                                  ;G:47
                0000035E' 0010   472          .LONG   CIBCI                                                  ;G:47
                00000515' 0014   473          .LONG   CI780                                                  ;G:47
                00000496' 0018   474          .LONG   CI750                                                  ;G:47
                0000059C' 001C   475          .LONG   CI_NODE                                                ;G:47
                000006B8' 0020   476          .LONG   Console                                                ;G:47
                000006C6' 0024   477          .LONG   CR11                                                   ;G:47
                0000071D' 0028   478          .LONG   DEBNA                                                  ;G:47
                00000788' 002C   479          .LONG   DEBNK                                                  ;G:47
                000007F3' 0030   480          .LONG   DEBNT                                                  ;G:47
                0000085E' 0034   481          .LONG   DHB32                                                  ;G:47
                000008C5' 0038   482          .LONG   DHU11                                                  ;G:47
                00000913' 003C   483          .LONG   DHV11                                                  ;G:47
                00000961' 0040   484          .LONG   DISK                                                   ;G:47
                00000974' 0044   485          .LONG   DL11                                                   ;G:47
                000009C1' 0048   486          .LONG   DMB32                                                  ;G:47
                00000A28' 004C   487          .LONG   DMC11                                                  ;G:47
                00000A76' 0050   488          .LONG   DMF32                                                  ;G:47
                00000AC9' 0054   489          .LONG   DMF32A                                                 ;G:47
                00000BEB' 0058   490          .LONG   DMF32P                                                 ;G:47
                00000C65' 005C   491          .LONG   DMF32S                                                 ;G:47
                00000CD9' 0060   492          .LONG   DMP11                                                  ;G:47
                00000DA2' 0064   493          .LONG   DMR11                                                  ;G:47
                00000DF0' 0068   494          .LONG   DMZ32                                                  ;G:47
                00000F4E' 006C   495          .LONG   DRB32                                                  ;G:47
                00000FB6' 0070   496          .LONG   DR11B                                                  ;G:47
                00001004' 0074   497          .LONG   DR11C                                                  ;G:47
                0000104D' 0078   498          .LONG   DR11K                                                  ;G:47
                0000109E' 007C   499          .LONG   DR11W                                                  ;G:47
                000010EC' 0080   500          .LONG   DR750                                                  ;G:47
                00001177' 0084   501          .LONG   DR780                                                  ;G:47
                0000120A' 0088   502          .LONG   DUP11                                                  ;G:47
                00001258' 008C   503          .LONG   DW730                                                  ;G:47
                00001287' 0090   504          .LONG   DW750                                                  ;G:47
                000012CB' 0094   505          .LONG   DW780                                                  ;G:47
                0000133F' 0098   506          .LONG   DWBLA                                                  ;G:47
                000013AF' 009C   507          .LONG   DWBUA                                                  ;G:47
                00001426' 00A0   508          .LONG   DWMBA                                                  ;G:57
                000014CA' 00A4   509          .LONG   DX20                                                   ;G:47
                000014F8' 00A8   510          .LONG   DZ11                                                   ;G:47
                00001561' 00AC   511          .LONG   DZ32                                                   ;G:47
                00001652' 00B0   512          .LONG   IEU11A                                                 ;G:47
                0000169D' 00B4   513          .LONG   KA62A                                                  ;G:56
                0000170C' 00B8   514          .LONG   KA730                                                  ;G:47
                000017E7' 00BC   515          .LONG   KA750                                                  ;G:47
```

```
000018B3' 00C0   516        .LONG   KA780                                   ;G:47
0000195C' 00C4   517        .LONG   KA785                                   ;G:47
00001A05' 00C8   518        .LONG   KA800                                   ;G:47
00001A77' 00CC   519        .LONG   KA820                                   ;G:47
00001B02' 00D0   520        .LONG   KA86                                    ;G:47
00001BAA' 00D4   521        .LONG   KA850                                   ;G:47
00001BE3' 00D8   522        .LONG   KA880                                   ;G:47
00001C20' 00DC   523        .LONG   KA884                                   ;G:47
00001C75' 00E0   524        .LONG   KA9CC                                   ;G:47
00001D77' 00E4   525        .LONG   KFBTA                                   ;G:47
00001CE4' 00E8   526        .LONG   KDB50                                   ;G:47
00001DDD' 00EC   527        .LONG   KMC11                                   ;G:47
00001E2B' 00F0   528        .LONG   KW11K                                   ;G:47
00001E7C' 00F4   529        .LONG   LA12                                    ;G:47
00001E96' 00F8   530        .LONG   LA34                                    ;G:47
00001EB0' 00FC   531        .LONG   LA36                                    ;G:47
00001ECA' 0100   532        .LONG   LA38                                    ;G:47
00001EE4' 0104   533        .LONG   LA100                                   ;G:47
00001EFF' 0108   534        .LONG   LA120                                   ;G:47
00001F1A' 010C   535        .LONG   LA180                                   ;G:47
00001F35' 0110   536        .LONG   LA210                                   ;G:47
00001F50' 0114   537        .LONG   LANCE                                   ;G:47
00001F61' 0118   538        .LONG   LESI                                    ;G:47
00001FAD' 011C   539        .LONG   LG01                                    ;G:47
00001FC7' 0120   540        .LONG   LG02                                    ;G:47
00001FE1' 0124   541        .LONG   LG03                                    ;G:47
00001FFB' 0128   542        .LONG   LN01                                    ;G:47
00002015' 012C   543        .LONG   LN03                                    ;G:47
0000202A' 0130   544        .LONG   LP04                                    ;G:47
00002044' 0134   545        .LONG   LP05                                    ;G:47
0000205E' 0138   546        .LONG   LP06                                    ;G:47
00002078' 013C   547        .LONG   LP07                                    ;G:47
00002092' 0140   548        .LONG   LP11                                    ;G:47
000020DF' 0144   549        .LONG   LP14                                    ;G:47
000020F9' 0148   550        .LONG   LP25                                    ;G:47
00002113' 014C   551        .LONG   LP26                                    ;G:47
0000212D' 0150   552        .LONG   LP27                                    ;G:47
00002147' 0154   553        .LONG   LPA11K                                  ;G:47
000021A0' 0158   554        .LONG   LUA11                                   ;G:47
000021EE' 015C   555        .LONG   MA780                                   ;G:47
00002269' 0160   556        .LONG   MBE                                     ;G:47
0000227D' 0164   557        .LONG   ML11                                    ;G:47
000022DF' 0168   558        .LONG   MS750                                   ;G:47
000022F0' 016C   559        .LONG   MS780                                   ;G:47
00002340' 0170   560        .LONG   MSAAA                                   ;G:47
00002351' 0174   561        .LONG   NBIA                                    ;G:47
000023C1' 0178   562        .LONG   NBIB                                    ;G:47
00002424' 017C   563        .LONG   NI                                      ;G:47
0000245A' 0180   564        .LONG   PBIA                                    ;G:47
000024DA' 0184   565        .LONG   PCL11                                   ;G:47
00002523' 0188   566        .LONG   PX780                                   ;G:47
0000258C' 018C   567        .LONG   R80                                     ;G:47
000025A5' 0190   568        .LONG   RA60                                    ;G:47
000025BF' 0194   569        .LONG   RA70                                    ;G:47
000025D9' 0198   570        .LONG   RA80                                    ;G:47
000025F3' 019C   571        .LONG   RA81                                    ;G:47
00002627' 01A0   572        .LONG   RA90                                    ;G:54
```

```
0000260D' 01A4   573        .LONG   RA82                                    ;G:47
00002644' 01A8   574        .LONG   RB730                                   ;G:47
00002673' 01AC   575        .LONG   RCF25                                   ;G:47
0000268E' 01B0   576        .LONG   RC25                                    ;G:47
000026A8' 01B4   577        .LONG   RD52                                    ;G:47
000026C2' 01B8   578        .LONG   RD53                                    ;G:47
000026DC' 01BC   579        .LONG   RD54                                    ;G:47
000026F6' 01C0   580        .LONG   RH750                                   ;G:47
0000274F' 01C4   581        .LONG   RH780                                   ;G:47
000027B4' 01C8   582        .LONG   RL01                                    ;G:47
000027CE' 01CC   583        .LONG   RL02                                    ;G:47
000027E8' 01D0   584        .LONG   RL11                                    ;G:47
00002835' 01D4   585        .LONG   RK06                                    ;G:47
0000284F' 01D8   586        .LONG   RK07                                    ;G:47
00002869' 01DC   587        .LONG   RK611                                   ;G:47
000028B7' 01E0   588        .LONG   RM03                                    ;G:47
000028DB' 01E4   589        .LONG   RM05                                    ;G:47
000028FF' 01E8   590        .LONG   RM80                                    ;G:47
000029B3' 01EC   591        .LONG   RRD50                                   ;G:47
00002923' 01F0   592        .LONG   RP04                                    ;G:47
00002947' 01F4   593        .LONG   RP05                                    ;G:47
0000296B' 01F8   594        .LONG   RP06                                    ;G:47
0000298F' 01FC   595        .LONG   RP07                                    ;G:47
00002A0F' 0200   596        .LONG   RV20                                    ;G:47
00002A6A' 0204   597        .LONG   RUX50                                   ;G:47
00002AB2' 0208   598        .LONG   RX02                                    ;G:47
00002ACC' 020C   599        .LONG   RX31                                    ;G:47
00002ADC' 0210   600        .LONG   RX32                                    ;G:47
00002AEC' 0214   601        .LONG   RX50                                    ;G:47
00002B01' 0218   602        .LONG   RX180                                   ;G:47
00002B12' 021C   603        .LONG   RX211                                   ;G:47
00002B60' 0220   604        .LONG   SBIA                                    ;G:47
00002BA2' 0224   605        .LONG   SLU                                     ;G:47
00002C17' 0228   606        .LONG   TAPE                                    ;G:47
00002C27' 022C   607        .LONG   TBK50                                   ;G:56
00002C92' 0230   608        .LONG   TE16                                    ;G:47
00002CAC' 0234   609        .LONG   TK50                                    ;G:47
00002CC6' 0238   610        .LONG   TK70                                    ;G:47
00002CE0' 023C   611        .LONG   TM03                                    ;G:47
00002D0E' 0240   612        .LONG   TM78                                    ;G:47
00002D3C' 0244   613        .LONG   TS04                                    ;G:47
00002D93' 0248   614        .LONG   TS05                                    ;G:47
00002DFD' 024C   615        .LONG   TS11                                    ;G:47
00002E54' 0250   616        .LONG   TU45                                    ;G:47
00002E6E' 0254   617        .LONG   TU58                                    ;G:47
00002E88' 0258   618        .LONG   TU70                                    ;G:47
00002EA2' 025C   619        .LONG   TU72                                    ;G:47
00002EBC' 0260   620        .LONG   TU77                                    ;G:47
00002ED6' 0264   621        .LONG   TU78                                    ;G:47
00002EF0' 0268   622        .LONG   TU80                                    ;G:47
00002F5F' 026C   623        .LONG   TU81                                    ;G:47
00002FB6' 0270   624        .LONG   UBE                                     ;G:47
00002FF1' 0274   625        .LONG   UDA50                                   ;G:47
0000305A' 0278   626        .LONG   UNA11                                   ;G:47
000030A8' 027C   627        .LONG   VS100                                   ;G:47
00003100' 0280   628        .LONG   VS125                                   ;G:47
00003158' 0284   629        .LONG   VS300                                   ;G:47
```

```
000031B0' 0288   630        .LONG   VT50                                    ;G:47
000031CA' 028C   631        .LONG   VT52                                    ;G:47
000031E4' 0290   632        .LONG   VT55                                    ;G:47
000031FE' 0294   633        .LONG   VT61                                    ;G:47
00003218' 0298   634        .LONG   VT71                                    ;G:47
00003232' 029C   635        .LONG   VT100                                   ;G:47
0000324D' 02A0   636        .LONG   VT101                                   ;G:47
00003268' 02A4   637        .LONG   VT102                                   ;G:47
00003283' 02A8   638        .LONG   VT125                                   ;G:47
0000329E' 02AC   639        .LONG   VT131                                   ;G:47
000032B9' 02B0   640        .LONG   VT132                                   ;G:47
000032D4' 02B4   641        .LONG   VT220                                   ;G:47
000032EF' 02B8   642        .LONG   VT240                                   ;G:47
          02BC   643
```

```
                    000002BC   645          .PSECT  DATA, SHR, NOWRT, NOEXE, BYTE
                        02BC   646          .NLIST  ME,MEB
                        02BC   647          .LIST   MC
                        02BC   648 ;                                                                                    ;G:17
                        02BC   649 ; Device dependent field definitions which apply to more than one        [77]       ;G:17
                        02BC   650 ; ptable, and thus are not called from the devices' ptable descriptor    [77]       ;G:17
                        02BC   651 ; because multiply defined symbols would result.                         [77]       ;G:17
                        02BC   652 ;                                                                                    ;G:17
                        02BC   653          $DS_CI_DEF                                  ;                   [20]       ;G:17
                        02BC               .SAVE   LOCAL_BLOCK
                        02BC               .PSECT  $ABS$,ABS
                        0032               .IIF    NB,HP$B_CI_TR,  HP$B_CI_TR:
                        0032               .IIF    NB,CI$B_BI_ID,  CI$B_BI_ID:
                        0032               .IIF    NB,CI$B_TR,     CI$B_TR:
              00000033  0032               .IIF    NB,,BLKB,       .BLKB   1
                        0033               .IIF    NB,HP$B_CI_BR,  HP$B_CI_BR:
                        0033               .IIF    NB,CI$B_BR,     CI$B_BR:
              00000034  0033               .IIF    NB,,BLKB,       .BLKB   1
                        0034               .IIF    NB,HP$B_CI_NODE,        HP$B_CI_NODE:
                        0034               .IIF    NB,CI$B_NODE,   CI$B_NODE:
              00000035  0034               .IIF    NB,,BLKB,       .BLKB   1
                        0035               .IIF    NB,HP$L_CI_FUNC,        HP$L_CI_FUNC:
                        0035               .IIF    NB,Ci$L_Func,   Ci$L_Func:
              00000039  0035               .IIF    NB,,BlkL,       .BlkL   1
                        0039               .IIF    NB,HP$L_CI_MAINT_ID,    HP$L_CI_MAINT_ID:
                        0039               .IIF    NB,Ci$L_Maint_Id,       Ci$L_Maint_Id:
              0000003D  0039               .IIF    NB,,BlkL,       .BlkL   1
                        003D               .IIF    NB,HP$L_CI_INDEX,       HP$L_CI_INDEX:
                        003D               .IIF    NB,Ci$L_Index,  Ci$L_Index:
              00000041  003D               .IIF    NB,,BlkL,       .BlkL   1
                        0041               .IIF    NB,HP$K_CI_LEN, HP$K_CI_LEN:
                        0041               .IIF    NB,CI$K_LEN,    CI$K_LEN:
                    000002BC               .RESTORE
                        02BC   654          $DS_DHUV_DEF
                        02BC               .SAVE   LOCAL_BLOCK
                        02BC               .PSECT  $ABS$,ABS
              00000032  0041               .=HP$A_DEPENDENT
                        0032               .IIF    NB,HP$L_DHUV_CSR,       HP$L_DHUV_CSR:
              00000036  0032               .IIF    NB,,BLKL,       .BLKL   1
                        0036               .IIF    NB,HP$W_DHUV_VEC,       HP$W_DHUV_VEC:
              00000038  0036               .IIF    NB,,BLKW,       .BLKW   1
                        0038               .IIF    NB,HP$B_DHUV_BR,        HP$B_DHUV_BR:
              00000039  0038               .IIF    NB,,BLKB,       .BLKB   1
                        0039               .IIF    NB,HP$K_DHUV_LEN,       HP$K_DHUV_LEN:
                    000002BC               .RESTORE
                        02BC   655          $DS_KA_DEF                                                              ;G:17
                        02BC               .SAVE   LOCAL_BLOCK
                        02BC               .PSECT  $ABS$,ABS
              00000032  0041               .=HP$A_Dependent
                        0032               .IIF    NB,KA$L_Flags,  KA$L_Flags::
              00000036  0032               .IIF    NB,,Blkl,       .Blkl   1
                        0036               .IIF    NB,KA$W_WCS,    KA$W_WCS::
              00000038  0036               .IIF    NB,,Blkw,       .Blkw   1
                        0038               .IIF    NB,KA$W_Reserved,       KA$W_Reserved::
              0000003A  0038               .IIF    NB,,Blkw,       .Blkw   1
                        003A               .IIF    NB,KA$L_SID,    KA$L_SID::
              0000003D  003A               .IIF    NB,,Blkb,       .Blkb   3
```

```
                    003D            .IIF    NB,KA$B_SID_Type,       KA$B_SID_Type::
         0000003E   003D            .IIF    NB,.Blkb,       .Blkb   1
                    003E            .IIF    NB,KA$W_Latency,        KA$W_Latency::
         00000040   003E            .IIF    NB,.Blkw,       .Blkw   1
                    0040            .IIF    NB,KA$W_Progress,       KA$W_Progress::
         00000042   0040            .IIF    NB,.Blkw,       .Blkw   1
                    0042            .IIF    NB,KA$B_Acc_Type,       KA$B_Acc_Type::
         00000043   0042            .IIF    NB,.Blkb,       .Blkb   1
                    0043            .IIF    NB,KA$B_Reserved,       KA$B_Reserved::
         00000044   0043            .IIF    NB,.Blkb,       .Blkb   1
                    0044            .IIF    NB,KA$W_Mem_Size,       KA$W_Mem_Size::
         00000046   0044            .IIF    NB,.Blkw,       .Blkw   1
                    0046            .IIF    NB,KA$B_Node_ID,        KA$B_Node_ID::
         00000047   0046            .IIF    NB,.Blkb,       .Blkb   1
                    0047            .IIF    NB,KA$L_Mem_Size,       KA$L_Mem_Size::
         0000004B   0047            .IIF    NB,.Blkl,       .Blkl   1
                    004B            .IIF    NB,HP$L_KAA_Slot,       HP$L_KAA_Slot::
         0000004F   004B            .IIF    NB,.Blkl,       .Blkl   1
                    004F            .IIF    NB,HP$B_Cpu_ID, HP$B_Cpu_ID::
         00000050   004F            .IIF    NB,.Blkb,       .Blkb   1
                    0050            .IIF    NB,KA$K_Len,    KA$K_Len::
               000002BC            .RESTORE
                    02BC    656                                                                     ;G:17
                    02BC    657 ;                                                                   ;G:17
                    02BC    658 ;       ***************************************************  [77]  ;G:17
                    02BC    659 ;                          IMPORTANT!!                      [77]  ;G:17
                    02BC    660 ;       ***************************************************  [77]  ;G:17
                    02BC    661 ;       When adding devices to this list, place each new        [77]  ;G:17
                    02BC    662 ;       device on one line with no spaces between lines.  There should [77]  ;G:17
                    02BC    663 ;       be no spaces between the colon and the symbol, and the symbol [77]  ;G:17
                    02BC    664 ;       must begin in column 1. This is done so that the release group [77]  ;G:17
                    02BC    665 ;       can parse this source module at release time in order to obtain [77]  ;G:17
                    02BC    666 ;       a list of supported devices.  They assume that the list is [77]  ;G:17
                    02BC    667 ;       delimited by the symbol PTABLE_DESCRIPTORS at the       [77]  ;G:17
                    02BC    668 ;       beginning, and .END at the end.                         [77]  ;G:17
                    02BC    669 ;       ***************************************************  [77]  ;G:17
                    02BC    670                                                                     ;G:17
                    02BC    671 PTABLE_DESCRIPTORS:                         ;                [77]  ;G:17
                    02BC    672 AA11K:  $DS_AA11K                                                   ;G:40
                    02BC            .SAVE   LOCAL_BLOCK
                    02BC            .PSECT  $ABS$,ABS
         00000032   0050            .=HP$A_DEPENDENT
                    0032            .IIF    NB,AA11K$B_BR,  AA11K$B_BR:
         00000033   0032            .IIF    NB,.BLKB,       .BLKB   1
                    0033            .IIF    NB,AA11K$K_LEN, AA11K$K_LEN:
               000002BC            .RESTORE
4B 31 31 41 41 00'  02BC            .ASCIC  "AA11K" ; AA11K name
                05  02BC
                33  02C2            .BYTE   AA11K$K_LEN             ; AA11K$K_LEN of resultant P-table
                04  02C3            .BYTE   4               ; Maximum unit number                   ;G:65
              0000  02C4            .WORD   ^A""    ; Two character mnemonic for QIO AA11K
                80  02C6            .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                8D  02C7            .Byte   Pd$_Name        ; Directive op-code
                03  02C8            .Byte   Ptd$M_Device            ; Enforced AA codes
         41 41 00'  02C9            .Ascic  "AA"    ; Enforced device name prefix
                02  02C9
                83  02CC            .BYTE   Pd$_Octal       ; Indicate scan octal
```

```
52 53 43 20 53 55 42 20 4F 2F 49 00' 02CD                .ASCIC  "I/O BUS CSR"   ; I/O BUS CSR string
                   0B  02CD
            0003FFFE 0003E000  02D9                      .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                   88  02E1                      .BYTE   Pd$_Store       ; Indicate store operation
                 0018  02E2                      .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                   00  02E4                      .BYTE   0               ; 0 HP$A_DEVICE to data
                   12  02E5                      .BYTE   18              ; 18 of data field
                   83  02E6                      .BYTE   Pd$_Octal       ; Indicate scan octal
         52 4F 54 43 45 56 00' 02E7                .ASCIC  "VECTOR"        ; VECTOR string
                   06  02E7
            000001FE 00000002  02EE                      .LONG   ^O2,^O776       ; 2 , 776 limits on input
                   88  02F6                      .BYTE   Pd$_Store       ; Indicate store operation
                 0024  02F7                      .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                   00  02F9                      .BYTE   0               ; 0 HP$W_VECTOR to data
                   09  02FA                      .BYTE   9               ; 9 of data field
                   82  02FB                      .BYTE   Pd$_Decimal     ; Indicate scan decimal
                 52 42 00' 02FC                .ASCIC  "BR"    ; BR string
                   02  02FC
            00000007 00000004  02FF                      .LONG   4,7     ; 4 , 7 limits on input
                   88  0307                      .BYTE   Pd$_Store       ; Indicate store operation
                 0032  0308                      .WORD   AA11K$B_BR              ; Byte AA11K$B_BR to data
                   00  030A                      .BYTE   0               ; 0 AA11K$B_BR to data
                   08  030B                      .BYTE   8               ; 8 of data field
                   81  030C                      .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                       030D  673 AD11K:  $DS_AD11K                                                     ;G:40
                       030D              .SAVE   LOCAL_BLOCK
                       030D              .PSECT  $ABS$,ABS
                 00000032  0050          .=HP$A_DEPENDENT
                       0032              .IIF    NB,AD11K$B_BR,  AD11K$B_BR:
                 00000033  0032          .IIF    NB,.BLKB,       .BLKB   1
                       0033              .IIF    NB,AD11K$K_LEN, AD11K$K_LEN:
                   0000030D              .RESTORE
            4B 31 31 44 41 00' 030D      .ASCIC  "AD11K" ; AD11K name
                   05  030D
                   33  0313              .BYTE   AD11K$K_LEN             ; AD11K$K_LEN of resultant P-table
                   04  0314              .BYTE   4               ; Maximum unit number                   ;G:65
                 0000  0315              .WORD   ^A""    ; Two character mnemonic for QIO AD11K
                   80  0317              .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                   8D  0318              .Byte   Pd$_Name        ; Directive op-code
                   03  0319              .Byte   Ptd$M_Device            ; Enforced AD codes
                 44 41 00' 031A          .Ascic  "AD"    ; Enforced device name prefix
                   02  031A
                   83  031D              .BYTE   Pd$_Octal       ; Indicate scan octal
52 53 43 20 53 55 42 20 4F 2F 49 00' 031E        .ASCIC  "I/O BUS CSR"   ; I/O BUS CSR string
                   0B  031E
            0003FFFE 0003E000  032A              .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                   88  0332              .BYTE   Pd$_Store       ; Indicate store operation
                 0018  0333              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                   00  0335              .BYTE   0               ; 0 HP$A_DEVICE to data
                   12  0336              .BYTE   18              ; 18 of data field
                   83  0337              .BYTE   Pd$_Octal       ; Indicate scan octal
         52 4F 54 43 45 56 00' 0338        .ASCIC  "VECTOR"        ; VECTOR string
                   06  0338
            000001FE 00000002  033F              .LONG   ^O2,^O776       ; 2 , 776 limits on input
                   88  0347              .BYTE   Pd$_Store       ; Indicate store operation
                 0024  0348              .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                   00  034A              .BYTE   0               ; 0 HP$W_VECTOR to data
```

```
                      09  034B                .BYTE   9                       ; 9 of data field
                      82  034C                .BYTE   Pd$_Decimal          ; Indicate scan decimal
                52 42 00' 034D                .ASCIC  "BR"     ; BR string
                      02  034D
          00000007 00000004  0350             .LONG   4,7      ; 4 , 7 limits on input
                      88  0358                .BYTE   Pd$_Store            ; Indicate store operation
                    0032  0359                .WORD   AD11K$B_BR                  ; Byte AD11K$B_BR to data
                      00  035B                .BYTE   0                    ; 0 AD11K$B_BR to data
                      08  035C                .BYTE   8                    ; 8 of data field
                      81  035D                .BYTE   Pd$_End              ; Indicate end of PT-descriptor
                          035E    674 CIBCI:  $DS_CIBCI                                ;       [51][63]          ;G:17
             49 43 42 49 43 00' 035E          .ASCIC  "CIBCI" ; CIBCI name
                      05  035E
                      41  0364                .BYTE   CI$K_LEN                    ; CI$K_LEN of resultant P-table
                      10  0365                .BYTE   16                   ; Maximum unit number                  ;G:65
                    0000  0366                .WORD   ^A""     ; Two character mnemonic for QIO CIBCI
                      80  0368                .BYTE   Pd$_Start            ; Constant to identify start of descriptor
                      8D  0369                .Byte   Pd$_Name             ; Directive op-code
                      03  036A                .Byte   Ptd$M_Device                ; Enforced PA codes
                41 50 00' 036B                .Ascic  "PA"     ; Enforced device name prefix
                      02  036B
                      87  036E                .BYTE   Pd$_Fetch            ; Indicate fetch operation
                    0018  036F                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                      19  0371                .BYTE   25                   ; 25 HP$A_DEVICE to data
                      07  0372                .BYTE   7                    ; 7 of data field
                      8C  0373                .BYTE   Pd$_Case             ; Indicate case operation
                      01  0374                .BYTE   $$_$                 ; Count of pairs
          00000030 00000000  0375             .LONG   0,^X30               ; Store the pair
                      88  037D                .BYTE   Pd$_Store            ; Indicate store operation
                    0018  037E                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                      19  0380                .BYTE   25                   ; 25 HP$A_DEVICE to data
                      07  0381                .BYTE   7                    ; 7 of data field
                      84  0382                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00' 0383     .ASCIC  "BI Node Number (HEX)"  ; BI Node Number (HEX) string
         29 58 45 48 28 20 72 65 62  038F
                      14  0383
                0000000F 00000000  0398       .LONG   ^X0,^XF ; 0 , F limits on input
                      88  03A0                .BYTE   Pd$_Store            ; Indicate store operation
                    0032  03A1                .WORD   CI$B_BI_ID                  ; Byte CI$B_BI_ID to data
                      00  03A3                .BYTE   0                    ; 0 CI$B_BI_ID to data
                      08  03A4                .BYTE   8                    ; 8 of data field
                      88  03A5                .BYTE   Pd$_Store            ; Indicate store operation
                    0018  03A6                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                      0D  03A8                .BYTE   13                   ; 13 HP$A_DEVICE to data
                      04  03A9                .BYTE   4                    ; 4 of data field
                      88  03AA                .BYTE   Pd$_Store            ; Indicate store operation
                    0024  03AB                .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                      02  03AD                .BYTE   2                    ; 2 HP$W_VECTOR to data
                      04  03AE                .BYTE   4                    ; 4 of data field
                      87  03AF                .BYTE   Pd$_Fetch            ; Indicate fetch operation
                    0018  03B0                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                      00  03B2                .BYTE   0                    ; 0 HP$A_DEVICE to data
                      20  03B3                .BYTE   32                   ; 32 of data field
                      88  03B4                .BYTE   Pd$_Store            ; Indicate store operation
                    001C  03B5                .WORD   HP$A_DVA                    ; Byte HP$A_DVA to data
                      00  03B7                .BYTE   0                    ; 0 HP$A_DVA to data
                      20  03B8                .BYTE   32                   ; 32 of data field
```

```
                      82  03B9                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 42 00' 03BA                .ASCIC  "BR"     ; BR string
                      02  03BA
          00000007 00000004  03BD               .LONG   4,7     ; 4 , 7 limits on input
                      88  03C5                .BYTE   Pd$_Store       ; Indicate store operation
                    0033  03C6                .WORD   CI$B_BR         ; Byte CI$B_BR to data
                      00  03C8                .BYTE   0               ; 0 CI$B_BR to data
                      08  03C9                .BYTE   8               ; 8 of data field
                      88  03CA                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  03CB                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      06  03CD                .BYTE   6               ; 6 HP$W_VECTOR to data
                      03  03CE                .BYTE   3               ; 3 of data field
                      82  03CF                .BYTE   Pd$_Decimal     ; Indicate scan decimal
    65 64 6F 4E 20 49 43 00' 03D0             .ASCIC  "CI Node"       ; CI Node string
                      07  03D0
          000000E0 00000000  03D8               .LONG   0,224   ; 0 , 224 limits on input
                      88  03E0                .BYTE   Pd$_Store       ; Indicate store operation
                    0034  03E1                .WORD   CI$B_NODE               ; Byte CI$B_NODE to data
                      00  03E3                .BYTE   0               ; 0 CI$B_NODE to data
                      08  03E4                .BYTE   8               ; 8 of data field
                      86  03E5                .BYTE   Pd$_Literal     ; Indicate literal
                FFFF0F00  03E6                .LONG   ^XFFFF0F00              ; Constant
                      88  03EA                .BYTE   Pd$_Store       ; Indicate store operation
                    0035  03EB                .WORD   Ci$L_Func               ; Byte Ci$L_Func to data
                      00  03ED                .BYTE   0               ; 0 Ci$L_Func to data
                      20  03EE                .BYTE   32              ; 32 of data field
                      86  03EF                .BYTE   Pd$_Literal     ; Indicate literal
                80000002  03F0                .LONG   ^X80000002              ; Constant
                      88  03F4                .BYTE   Pd$_Store       ; Indicate store operation
                    0039  03F5                .WORD   Ci$L_Maint_Id           ; Byte Ci$L_Maint_Id to data
                      00  03F7                .BYTE   0               ; 0 Ci$L_Maint_Id to data
                      20  03F8                .BYTE   32              ; 32 of data field
                      81  03F9                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          03FA  675 CIBCA:      $DS_CIBCA                       ;       [75]                    ;G:17
                41 43 42 49 43 00' 03FA       .ASCIC  "CIBCA" ; CIBCA name
                      05  03FA
                      41  0400                .BYTE   CI$K_LEN                ; CI$K_LEN of resultant P-table
                      10  0401                .BYTE   16              ; Maximum unit number                   ;G:65
                    0000  0402                .WORD   ^A""     ; Two character mnemonic for QIO CIBCA
                      80  0404                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  0405                .Byte   Pd$_Name        ; Directive op-code
                      03  0406                .Byte   Ptd$M_Device            ; Enforced PA codes
                   41 50 00' 0407             .Ascic  "PA"     ; Enforced device name prefix
                      02  0407
                      87  040A                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  040B                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      19  040D                .BYTE   25              ; 25 HP$A_DEVICE to data
                      07  040E                .BYTE   7               ; 7 of data field
                      8C  040F                .BYTE   Pd$_Case        ; Indicate case operation
                      01  0410                .BYTE   $$_$            ; Count of pairs
                00000030 00000000  0411       .LONG   0,^X30          ; Store the pair
                      88  0419                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  041A                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      19  041C                .BYTE   25              ; 25 HP$A_DEVICE to data
                      07  041D                .BYTE   7               ; 7 of data field
                      84  041E                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00' 041F     .ASCIC  "BI Node Number (HEX)"  ; BI Node Number (HEX) string
```

```
                29 58 45 48 28 20 72 65 62  042B
                                        14  041F
                        0000000F 00000000  0434                .LONG   ^X0,^XF ; 0 , F limits on input
                                        88  043C                .BYTE   Pd$_Store       ; Indicate store operation
                                      0032  043D                .WORD   CI$B_BI_ID              ; Byte CI$B_BI_ID to data
                                        00  043F                .BYTE   0               ; 0 CI$B_BI_ID to data
                                        08  0440                .BYTE   8               ; 8 of data field
                                        88  0441                .BYTE   Pd$_Store       ; Indicate store operation
                                      0018  0442                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                        0D  0444                .BYTE   13              ; 13 HP$A_DEVICE to data
                                        04  0445                .BYTE   4               ; 4 of data field
                                        88  0446                .BYTE   Pd$_Store       ; Indicate store operation
                                      0024  0447                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                        02  0449                .BYTE   2               ; 2 HP$W_VECTOR to data
                                        04  044A                .BYTE   4               ; 4 of data field
                                        87  044B                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                                      0018  044C                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                        00  044E                .BYTE   0               ; 0 HP$A_DEVICE to data
                                        20  044F                .BYTE   32              ; 32 of data field
                                        88  0450                .BYTE   Pd$_Store       ; Indicate store operation
                                      001C  0451                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                                        00  0453                .BYTE   0               ; 0 HP$A_DVA to data
                                        20  0454                .BYTE   32              ; 32 of data field
                                        82  0455                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                            52 42 00'       0456                .ASCIC  "BR"    ; BR string
                                        02  0456
                        00000007 00000004  0459                .LONG   4,7     ; 4 , 7 limits on input
                                        88  0461                .BYTE   Pd$_Store       ; Indicate store operation
                                      0033  0462                .WORD   CI$B_BR         ; Byte CI$B_BR to data
                                        00  0464                .BYTE   0               ; 0 CI$B_BR to data
                                        08  0465                .BYTE   8               ; 8 of data field
                                        88  0466                .BYTE   Pd$_Store       ; Indicate store operation
                                      0024  0467                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                        06  0469                .BYTE   6               ; 6 HP$W_VECTOR to data
                                        03  046A                .BYTE   3               ; 3 of data field
                                        82  046B                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                65 64 6F 4E 20 49 43 00'    046C                .ASCIC  "CI Node"       ; CI Node string
                                        07  046C
                        000000E0 00000000  0474                .LONG   0,224   ; 0 , 224 limits on input
                                        88  047C                .BYTE   Pd$_Store       ; Indicate store operation
                                      0034  047D                .WORD   CI$B_NODE               ; Byte CI$B_NODE to data
                                        00  047F                .BYTE   0               ; 0 CI$B_NODE to data
                                        08  0480                .BYTE   8               ; 8 of data field
                                        86  0481                .BYTE   Pd$_Literal     ; Indicate literal
                                  FFFF0F00  0482                .LONG   ^XFFFF0F00              ; Constant
                                        88  0486                .BYTE   Pd$_Store       ; Indicate store operation
                                      0035  0487                .WORD   Ci$L_Func               ; Byte Ci$L_Func to data
                                        00  0489                .BYTE   0               ; 0 Ci$L_Func to data
                                        20  048A                .BYTE   32              ; 32 of data field
                                        86  048B                .BYTE   Pd$_Literal     ; Indicate literal
                                  8000000B  048C                .LONG   ^X8000000B              ; Constant
                                        88  0490                .BYTE   Pd$_Store       ; Indicate store operation
                                      0039  0491                .WORD   Ci$L_Maint_Id           ; Byte Ci$L_Maint_Id to data
                                        00  0493                .BYTE   0               ; 0 Ci$L_Maint_Id to data
                                        20  0494                .BYTE   32              ; 32 of data field
                                        81  0495                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                            0496    676 CI750:  $DS_CI750                               ;       [20]                    ;G:17
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```
                30 35 37 49 43 00' 0496          .ASCIC  "CI750" ; CI750 name
                                05 0496
                                41 049C          .BYTE   CI$K_LEN                ; CI$K_LEN of resultant P-table
                                08 049D          .BYTE   8               ; Maximum unit number                   ;G:65
                              0000 049E          .WORD   ^A""    ; Two character mnemonic for QIO CI750
                                80 04A0          .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                8D 04A1          .Byte   Pd$_Name        ; Directive op-code
                                03 04A2          .Byte   Ptd$M_Device            ; Enforced PA codes
                        41 50 00' 04A3          .Ascic  "PA"    ; Enforced device name prefix
                                02 04A3
                                86 04A6          .BYTE   Pd$_Literal     ; Indicate literal
                          40F30000 04A7          .LONG   ^X40F30000              ; Constant
                                88 04AB          .BYTE   Pd$_Store       ; Indicate store operation
                              0018 04AC          .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                00 04AE          .BYTE   0               ; 0 HP$A_DEVICE to data
                                20 04AF          .BYTE   32              ; 32 of data field
                                82 04B0          .BYTE   Pd$_Decimal     ; Indicate scan decimal
                   74 6F 6C 53 00' 04B1          .ASCIC  "Slot"  ; Slot string
                                04 04B1
                0000000F 0000000A 04B6          .LONG   10,15   ; 10 , 15 limits on input
                                88 04BE          .BYTE   Pd$_Store       ; Indicate store operation
                              0032 04BF          .WORD   CI$B_TR         ; Byte CI$B_TR to data
                                00 04C1          .BYTE   0               ; 0 CI$B_TR to data
                                08 04C2          .BYTE   8               ; 8 of data field
                                88 04C3          .BYTE   Pd$_Store       ; Indicate store operation
                              0018 04C4          .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                0D 04C6          .BYTE   13              ; 13 HP$A_DEVICE to data
                                04 04C7          .BYTE   4               ; 4 of data field
                                88 04C8          .BYTE   Pd$_Store       ; Indicate store operation
                              0024 04C9          .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                02 04CB          .BYTE   2               ; 2 HP$W_VECTOR to data
                                04 04CC          .BYTE   4               ; 4 of data field
                                87 04CD          .BYTE   Pd$_Fetch       ; Indicate fetch operation
                              0018 04CE          .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                00 04D0          .BYTE   0               ; 0 HP$A_DEVICE to data
                                20 04D1          .BYTE   32              ; 32 of data field
                                88 04D2          .BYTE   Pd$_Store       ; Indicate store operation
                              001C 04D3          .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                                00 04D5          .BYTE   0               ; 0 HP$A_DVA to data
                                20 04D6          .BYTE   32              ; 32 of data field
                                82 04D7          .BYTE   Pd$_Decimal     ; Indicate scan decimal
                        52 42 00' 04D8          .ASCIC  "BR"    ; BR string
                                02 04D8
                00000007 00000004 04DB          .LONG   4,7     ; 4 , 7 limits on input
                                88 04E3          .BYTE   Pd$_Store       ; Indicate store operation
                              0033 04E4          .WORD   CI$B_BR         ; Byte CI$B_BR to data
                                00 04E6          .BYTE   0               ; 0 CI$B_BR to data
                                08 04E7          .BYTE   8               ; 8 of data field
                                88 04E8          .BYTE   Pd$_Store       ; Indicate store operation
                              0024 04E9          .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                06 04EB          .BYTE   6               ; 6 HP$W_VECTOR to data
                                03 04EC          .BYTE   3               ; 3 of data field
                                82 04ED          .BYTE   Pd$_Decimal     ; Indicate scan decimal
                   65 64 6F 4E 00' 04EE          .ASCIC  "Node"  ; Node string
                                04 04EE
                000000FF 00000000 04F3          .LONG   0,255   ; 0 , 255 limits on input
                                88 04FB          .BYTE   Pd$_Store       ; Indicate store operation
```

```
                      0034  04FC                .WORD   CI$B_NODE                  ; Byte CI$B_NODE to data
                        00  04FE                .BYTE   0                   ; 0 CI$B_NODE to data
                        08  04FF                .BYTE   8                   ; 8 of data field
                        86  0500                .BYTE   Pd$_Literal          ; Indicate literal
                FFFF0F00    0501                .LONG   ^XFFFF0F00                  ; Constant
                        88  0505                .BYTE   Pd$_Store           ; Indicate store operation
                      0035  0506                .WORD   Ci$L_Func                   ; Byte Ci$L_Func to data
                        00  0508                .BYTE   0                   ; 0 Ci$L_Func to data
                        20  0509                .BYTE   32                  ; 32 of data field
                        86  050A                .BYTE   Pd$_Literal          ; Indicate literal
                80000002    050B                .LONG   ^X80000002                  ; Constant
                        88  050F                .BYTE   Pd$_Store           ; Indicate store operation
                      0039  0510                .WORD   Ci$L_Maint_Id               ; Byte Ci$L_Maint_Id to data
                        00  0512                .BYTE   0                   ; 0 Ci$L_Maint_Id to data
                        20  0513                .BYTE   32                  ; 32 of data field
                        81  0514                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                            0515    677 CI780:  $DS_CI780                                                   ;G:17
      30 38 37 49 43 00'    0515                .ASCIC  "CI780" ; CI780 name
                        05  0515
                        41  051B                .BYTE   CI$K_LEN                    ; CI$K_LEN of resultant P-table
                        08  051C                .BYTE   8                   ; Maximum unit number           ;G:65
                      0000  051D                .WORD   ^A""        ; Two character mnemonic for QIO CI780
                        80  051F                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                        8D  0520                .Byte   Pd$_Name            ; Directive op-code
                        03  0521                .Byte   Ptd$M_Device                ; Enforced PA codes
                  41 50 00' 0522                .Ascic  "PA"        ; Enforced device name prefix
                        02  0522
                        82  0525                .BYTE   Pd$_Decimal         ; Indicate scan decimal
                  52 54 00' 0526                .ASCIC  "TR"        ; TR string
                        02  0526
                0000000F 00000001   0529        .LONG   1,15        ; 1 , 15 limits on input
                        88  0531                .BYTE   Pd$_Store           ; Indicate store operation
                      0032  0532                .WORD   CI$B_TR             ; Byte CI$B_TR to data
                        00  0534                .BYTE   0                   ; 0 CI$B_TR to data
                        08  0535                .BYTE   8                   ; 8 of data field
                        88  0536                .BYTE   Pd$_Store           ; Indicate store operation
                      0018  0537                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                        0D  0539                .BYTE   13                  ; 13 HP$A_DEVICE to data
                        04  053A                .BYTE   4                   ; 4 of data field
                        88  053B                .BYTE   Pd$_Store           ; Indicate store operation
                      0024  053C                .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                        02  053E                .BYTE   2                   ; 2 HP$W_VECTOR to data
                        04  053F                .BYTE   4                   ; 4 of data field
                        82  0540                .BYTE   Pd$_Decimal         ; Indicate scan decimal
                  52 42 00' 0541                .ASCIC  "BR"        ; BR string
                        02  0541
                00000007 00000004   0544        .LONG   4,7         ; 4 , 7 limits on input
                        88  054C                .BYTE   Pd$_Store           ; Indicate store operation
                      0033  054D                .WORD   CI$B_BR             ; Byte CI$B_BR to data
                        00  054F                .BYTE   0                   ; 0 CI$B_BR to data
                        08  0550                .BYTE   8                   ; 8 of data field
                        88  0551                .BYTE   Pd$_Store           ; Indicate store operation
                      0024  0552                .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                        06  0554                .BYTE   6                   ; 6 HP$W_VECTOR to data
                        02  0555                .BYTE   2                   ; 2 of data field
                        86  0556                .BYTE   Pd$_Literal          ; Indicate literal
                00000006    0557                .LONG   6                   ; Constant
```

```
                      88  055B                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  055C                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      1C  055E                .BYTE   28              ; 28 HP$A_DEVICE to data
                      04  055F                .BYTE   4               ; 4 of data field
                      87  0560                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  0561                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  0563                .BYTE   0               ; 0 HP$A_DEVICE to data
                      20  0564                .BYTE   32              ; 32 of data field
                      88  0565                .BYTE   Pd$_Store       ; Indicate store operation
                    001C  0566                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      00  0568                .BYTE   0               ; 0 HP$A_DVA to data
                      20  0569                .BYTE   32              ; 32 of data field
                      86  056A                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  056B                .LONG   1               ; Constant
                      88  056F                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  0570                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      08  0572                .BYTE   8               ; 8 HP$W_VECTOR to data
                      01  0573                .BYTE   1               ; 1 of data field
                      82  0574                .BYTE   Pd$_Decimal     ; Indicate scan decimal
             65 64 6F 4E 00' 0575             .ASCIC  "Node"  ; Node string
                      04  0575
            000000FF 00000000  057A           .LONG   0,255   ; 0 , 255 limits on input
                      88  0582                .BYTE   Pd$_Store       ; Indicate store operation
                    0034  0583                .WORD   CI$B_NODE               ; Byte CI$B_NODE to data
                      00  0585                .BYTE   0               ; 0 CI$B_NODE to data
                      08  0586                .BYTE   8               ; 8 of data field
                      86  0587                .BYTE   Pd$_Literal     ; Indicate literal
                FFFF0F00  0588                .LONG   ^XFFFF0F00              ; Constant
                      88  058C                .BYTE   Pd$_Store       ; Indicate store operation
                    0035  058D                .WORD   Ci$L_Func               ; Byte Ci$L_Func to data
                      00  058F                .BYTE   0               ; 0 Ci$L_Func to data
                      20  0590                .BYTE   32              ; 32 of data field
                      86  0591                .BYTE   Pd$_Literal     ; Indicate literal
                80000002  0592                .LONG   ^X80000002              ; Constant
                      88  0596                .BYTE   Pd$_Store       ; Indicate store operation
                    0039  0597                .WORD   Ci$L_Maint_Id           ; Byte Ci$L_Maint_Id to data
                      00  0599                .BYTE   0               ; 0 Ci$L_Maint_Id to data
                      20  059A                .BYTE   32              ; 32 of data field
                      81  059B                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          059C  678 CI_NODE:$DS_CI_NODE                         ;       [20]                    ;G:17
45 44 4F 4E 5F 49 43 00' 059C                .ASCIC  "CI_NODE"       ; CI_NODE name
                      07  059C
                      41  05A4                .BYTE   CI$K_LEN                ; CI$K_LEN of resultant P-table
                      00  05A5                .BYTE   0               ; Maximum unit number                   ;G:65
                    0000  05A6                .WORD   ^A""    ; Two character mnemonic for QIO CI_NODE
                      80  05A8                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  05A9                .Byte   Pd$_Name        ; Directive op-code
                      04  05AA                .Byte   Ptd$M_NAME              ; Enforced  codes
                      00' 05AB                .Ascic  ""      ; Enforced device name prefix
                      00  05AB
                      87  05AC                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  05AD                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  05AF                .BYTE   0               ; 0 HP$A_DEVICE to data
                      20  05B0                .BYTE   32              ; 32 of data field
                      88  05B1                .BYTE   Pd$_Store       ; Indicate store operation
                    001C  05B2                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      00  05B4                .BYTE   0               ; 0 HP$A_DVA to data
```

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                                  20  05B5          .BYTE   32              ; 32 of data field
                                  85  05B6          .BYTE   Pd$_String      ; Indicate scan and verify string
     65 70 79 74 5F 65 64 6F 4E 00' 05B7          .ASCIC  "Node_type"     ; Node_type string
                                  09  05B7
                              00 01  05C1          .BYTE   1, 0
                              00 01  05C3          .BYTE   1, 0
              30 38 37 58 41 56 00' 05C5          .ASCIC  "VAX780"
                                  06  05C5
              30 35 37 58 41 56 00' 05CC          .ASCIC  "VAX750"
                                  06  05CC
                 30 35 43 53 48 00' 05D3          .ASCIC  "HSC50"
                                  05  05D3
                              00 01  05D9          .BYTE   1, 0
                    30 31 4C 4B 00' 05DB          .ASCIC  "KL10"
                                  04  05DB
                    54 4E 49 43 00' 05E0          .ASCIC  "CINT"
                                  04  05E0
              35 38 37 58 41 56 00' 05E5          .ASCIC  "VAX785"
                                  06  05E5
           30 30 36 38 58 41 56 00' 05EC          .ASCIC  "VAX8600"
                                  07  05EC
           30 30 32 38 58 41 56 00' 05F4          .ASCIC  "VAX8200"
                                  07  05F4
           30 30 38 38 58 41 56 00' 05FC          .ASCIC  "VAX8800"
                                  07  05FC
                                  00  0604          .BYTE   0               ; Null length is end of valid ,,
                                  88  0605          .BYTE   Pd$_Store       ; Indicate store operation
                               003D  0606          .WORD   Ci$L_Index              ; Byte Ci$L_Index to data
                                  00  0608          .BYTE   0               ; 0 Ci$L_Index to data
                                  20  0609          .BYTE   32              ; 32 of data field
                                  8C  060A          .BYTE   Pd$_Case        ; Indicate case operation
                                  05  060B          .BYTE   $$_$            ; Count of pairs
                 00000002 00000003  060C          .LONG   ^X3,                    ^X2             ; Store the pair
                 00000002 00000008  0614          .LONG   ^X8,                    ^X2             ; Store the pair
                 00000002 00000009  061C          .LONG   ^X9,                    ^X2             ; Store the pair
                 00000002 0000000A  0624          .LONG   ^XA,                    ^X2             ; Store the pair
                 00000002 0000000B  062C          .LONG   ^XB,                    ^X2             ; Store the pair
                                  88  0634          .BYTE   Pd$_Store       ; Indicate store operation
                               0039  0635          .WORD   Ci$L_Maint_Id           ; Byte Ci$L_Maint_Id to data
                                  00  0637          .BYTE   0               ; 0 Ci$L_Maint_Id to data
                                  20  0638          .BYTE   32              ; 32 of data field
                                  87  0639          .BYTE   Pd$_Fetch       ; Indicate fetch operation
                               003D  063A          .WORD   Ci$L_index              ; Byte Ci$L_index to data
                                  00  063C          .BYTE   0               ; 0 Ci$L_index to data
                                  20  063D          .BYTE   32              ; 32 of data field
                                  8C  063E          .BYTE   Pd$_Case        ; Indicate case operation
                                  09  063F          .BYTE   $$_$            ; Count of pairs
                 FFFF0F00 00000002  0640          .LONG   ^X2,                    ^XFFFF0F00              ; Store the pair
                 FFFF0F00 00000003  0648          .LONG   ^X3,                    ^XFFFF0F00              ; Store the pair
                 4F710200 00000004  0650          .LONG   ^X4,                    ^X4F710200              ; Store the pair
                 A3FFAD00 00000006  0658          .LONG   ^X6,                    ^XA3FFAD00              ; Store the pair
                 FFFFFF00 00000007  0660          .LONG   ^X7,                    ^XFFFFFF00              ; Store the pair
                 FFFF0F00 00000008  0668          .LONG   ^X8,                    ^XFFFF0F00              ; Store the pair
                 FFFF0F00 00000009  0670          .LONG   ^X9,                    ^XFFFF0F00              ; Store the pair
                 FFFF0F00 0000000A  0678          .LONG   ^XA,                    ^XFFFF0F00              ; Store the pair
                 FFFF0F00 0000000B  0680          .LONG   ^XB,                    ^XFFFF0F00              ; Store the pair
                                  88  0688          .BYTE   Pd$_Store       ; Indicate store operation
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                          0035  0689                .WORD   Ci$L_Func               ; Byte Ci$L_Func to data
                            00  068B                .BYTE   0                   ; 0 Ci$L_Func to data
                            20  068C                .BYTE   32                  ; 32 of data field
                            82  068D                .BYTE   Pd$_Decimal         ; Indicate scan decimal
73 65 72 64 64 61 5F 65 64 6F 4E 00' 068E           .ASCIC  "Node_address"      ; Node_address string
                            73  069A
                            0C  068E
                  000000FF 00000000  069B           .LONG   0,255   ; 0 , 255 limits on input
                            88  06A3                .BYTE   Pd$_Store           ; Indicate store operation
                          0034  06A4                .WORD   CI$B_NODE                   ; Byte CI$B_NODE to data
                            00  06A6                .BYTE   0                   ; 0 CI$B_NODE to data
                            08  06A7                .BYTE   8                   ; 8 of data field
                            88  06A8                .BYTE   Pd$_Store           ; Indicate store operation
                          000B  06A9                .WORD   HP$B_DRIVE                  ; Byte HP$B_DRIVE to data
                            00  06AB                .BYTE   0                   ; 0 HP$B_DRIVE to data
                            08  06AC                .BYTE   8                   ; 8 of data field
                            86  06AD                .BYTE   Pd$_Literal         ; Indicate literal
                      80000000  06AE                .LONG   ^X80000000                  ; Constant
                            8A  06B2                .BYTE   Pd$_Add             ; Indicate add value to field operation
                          0039  06B3                .WORD   CI$L_MAINT_ID               ; Byte CI$L_MAINT_ID to data
                            00  06B5                .BYTE   0                   ; 0 CI$L_MAINT_ID to data
                            20  06B6                .BYTE   32                  ; 32 of data field
                            81  06B7                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                                06B8    679 CONSOLE:$DS_CONSOLE                                                 ;G:40
                                06B8                .SAVE   LOCAL_BLOCK
                                06B8                .PSECT  $ABS$,ABS
                      00000032  0050                .=Hp$A_Dependent
                                0032                .IIF    NB,Console$K_Len,       Console$K_Len:
                                06B8                .RESTORE
          65 6C 6F 73 6E 6F 63 00' 06B8             .ASCIC  "console"           ; console name
                            07  06B8
                            32  06C0                .BYTE   Console$K_Len               ; Console$K_Len of resultant P-table
                            01  06C1                .BYTE   1                   ; Maximum unit number                   ;G:65
                          0000  06C2                .WORD   ^A""    ; Two character mnemonic for QIO console
                            80  06C4                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                            81  06C5                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                                06C6    680 CR11:   $DS_CR11                                                    ;G:17
                                06C6                .SAVE   LOCAL_BLOCK
                                06C6                .PSECT  $ABS$,ABS
                      00000032  0050                .=HP$A_DEPENDENT
                                0032                .IIF    NB,CR11$L_CSR,  CR11$L_CSR:
                      00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                                0036                .IIF    NB,CR11$B_BR,   CR11$B_BR:
                      00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                                0037                .IIF    NB,CR11$K_LEN,  CR11$K_LEN:
                                06C6                .RESTORE
                31 31 52 43 00' 06C6                .ASCIC  "CR11"  ; CR11 name
                            04  06C6
                            37  06CB                .BYTE   CR11$K_LEN                  ; CR11$K_LEN of resultant P-table
                            01  06CC                .BYTE   1                   ; Maximum unit number                   ;G:65
                          0000  06CD                .WORD   ^A""    ; Two character mnemonic for QIO CR11
                            80  06CF                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                            8D  06D0                .Byte   Pd$_Name            ; Directive op-code
                            03  06D1                .Byte   Ptd$M_Device                ; Enforced CR codes
                    52 43 00' 06D2                .Ascic  "CR"    ; Enforced device name prefix
                            02  06D2
                            86  06D5                .BYTE   Pd$_Literal         ; Indicate literal
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                00000001  06D6                .LONG   HP$M_ALLOC                      ; Constant
                      88  06DA                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  06DB                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                      00  06DD                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  06DE                .BYTE   8               ; 8 of data field
                      83  06DF                .BYTE   Pd$_Octal       ; Indicate scan octal
             52 53 43 00' 06E0                .ASCIC  "CSR"   ; CSR string
                      03  06E0
            0003FFFE 0003E000  06E4             .LONG   ^O760000,^O777776               ; 760000 , 777776 limits on input
                      88  06EC                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  06ED                .WORD   CR11$L_CSR                      ; Byte CR11$L_CSR to data
                      00  06EF                .BYTE   0               ; 0 CR11$L_CSR to data
                      20  06F0                .BYTE   32              ; 32 of data field
                      88  06F1                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  06F2                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                      00  06F4                .BYTE   0               ; 0 HP$A_DEVICE to data
                      12  06F5                .BYTE   18              ; 18 of data field
                      83  06F6                .BYTE   Pd$_Octal       ; Indicate scan octal
      52 4F 54 43 45 56 00' 06F7                .ASCIC  "VECTOR"        ; VECTOR string
                      06  06F7
            000001FE 00000002  06FE             .LONG   ^O2,^O776       ; 2 , 776 limits on input
                      88  0706                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  0707                .WORD   HP$W_VECTOR                     ; Byte HP$W_VECTOR to data
                      00  0709                .BYTE   0               ; 0 HP$W_VECTOR to data
                      09  070A                .BYTE   9               ; 9 of data field
                      82  070B                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 42 00' 070C                .ASCIC  "BR"    ; BR string
                      02  070C
            00000007 00000004  070F             .LONG   4,7     ; 4 , 7 limits on input
                      88  0717                .BYTE   Pd$_Store       ; Indicate store operation
                    0036  0718                .WORD   CR11$B_BR                       ; Byte CR11$B_BR to data
                      00  071A                .BYTE   0               ; 0 CR11$B_BR to data
                      08  071B                .BYTE   8               ; 8 of data field
                      81  071C                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          071D    681 DEBNA:  $DS_DEBNA                                                       ;G:41
                          071D                .SAVE   LOCAL_BLOCK
                          071D                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,DEBNA$B_node_id,     DEBNA$B_node_id:
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,DEBNA$K_LEN, DEBNA$K_LEN:
                          0000071D            .RESTORE
      41 4E 42 45 44 00' 071D                .ASCIC  "DEBNA" ; DEBNA name
                      05  071D
                      33  0723                .BYTE   DEBNA$K_LEN                     ; DEBNA$K_LEN of resultant P-table
                      0F  0724                .BYTE   15              ; Maximum unit number                   ;G:65
                    0000  0725                .WORD   ^A""    ; Two character mnemonic for QIO DEBNA
                      80  0727                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  0728                .Byte   Pd$_Name        ; Directive op-code
                      02  0729                .Byte   PTD$M_CONTROLLER                ; Enforced ET codes
                54 45 00' 072A                .Ascic  "ET"    ; Enforced device name prefix
                      02  072A
                      87  072D                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  072E                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                      19  0730                .BYTE   25              ; 25 HP$A_DEVICE to data
                      07  0731                .BYTE   7               ; 7 of data field
                      8C  0732                .BYTE   Pd$_Case        ; Indicate case operation
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                      01  0733                .BYTE   $$_$             ; Count of pairs
            00000030 00000000  0734            .LONG   0,^X30           ; Store the pair
                      88  073C                .BYTE   Pd$_Store        ; Indicate store operation
                    0018  073D                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                      19  073F                .BYTE   25               ; 25 HP$A_DEVICE to data
                      07  0740                .BYTE   7                ; 7 of data field
                      88  0741                .BYTE   Pd$_Store        ; Indicate store operation
                    001C  0742                .WORD   HP$A_DVA                 ; Byte HP$A_DVA to data
                      19  0744                .BYTE   25               ; 25 HP$A_DVA to data
                      07  0745                .BYTE   7                ; 7 of data field
                      86  0746                .BYTE   Pd$_Literal      ; Indicate literal
                00000001  0747                .LONG   ^X1              ; Constant
                      88  074B                .BYTE   Pd$_Store        ; Indicate store operation
                    001C  074C                .WORD   HP$A_DVA                 ; Byte HP$A_DVA to data
                      16  074E                .BYTE   22               ; 22 HP$A_DVA to data
                      01  074F                .BYTE   1                ; 1 of data field
                      84  0750                .BYTE   Pd$_Hexadecimal  ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00'  0751    .ASCIC  "BI Node Number (HEX)"   ; BI Node Number (HEX) string
      29 58 45 48 28 20 72 65 62      075D
                      14  0751
            0000000F 00000000  0766            .LONG   ^X0,^XF ; 0 , F limits on input
                      88  076E                .BYTE   Pd$_Store        ; Indicate store operation
                    0032  076F                .WORD   DEBNA$B_node_id          ; Byte DEBNA$B_node_id to data
                      00  0771                .BYTE   0                ; 0 DEBNA$B_node_id to data
                      08  0772                .BYTE   8                ; 8 of data field
                      88  0773                .BYTE   Pd$_Store        ; Indicate store operation
                    000B  0774                .WORD   HP$B_DRIVE               ; Byte HP$B_DRIVE to data
                      00  0776                .BYTE   0                ; 0 HP$B_DRIVE to data
                      08  0777                .BYTE   8                ; 8 of data field
                      88  0778                .BYTE   Pd$_Store        ; Indicate store operation
                    0018  0779                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                      0D  077B                .BYTE   13               ; 13 HP$A_DEVICE to data
                      04  077C                .BYTE   4                ; 4 of data field
                      88  077D                .BYTE   Pd$_Store        ; Indicate store operation
                    001C  077E                .WORD   HP$A_DVA                 ; Byte HP$A_DVA to data
                      12  0780                .BYTE   18               ; 18 HP$A_DVA to data
                      04  0781                .BYTE   4                ; 4 of data field
                      88  0782                .BYTE   Pd$_Store        ; Indicate store operation
                    0024  0783                .WORD   HP$W_VECTOR              ; Byte HP$W_VECTOR to data
                      02  0785                .BYTE   2                ; 2 HP$W_VECTOR to data
                      04  0786                .BYTE   4                ; 4 of data field
                      81  0787                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          0788    682 DEBNK:  $DS_DEBNK                                                   ;G:41
                          0788                .SAVE   LOCAL_BLOCK
                          0788                .PSECT  $ABS$,ABS
                    00000032  0050            .=HP$A_DEPENDENT
                          0032                .IIF    NB,DEBNK$B_node_id,     DEBNK$B_node_id:
                    00000033  0032            .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,DEBNK$K_LEN, DEBNK$K_LEN:
                      00000788                .RESTORE
                4B 4E 42 45 44 00'  0788      .ASCIC  "DEBNK" ; DEBNK name
                      05  0788
                      33  078E                .BYTE   DEBNK$K_LEN              ; DEBNK$K_LEN of resultant P-table
                      0F  078F                .BYTE   15               ; Maximum unit number                  ;G:65
                    0000  0790                .WORD   ^A""     ; Two character mnemonic for QIO DEBNK
                      80  0792                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                      8D  0793                .Byte   Pd$_Name         ; Directive op-code
```

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                        02  0794                .Byte   PTD$M_CONTROLLER                ; Enforced ET codes
                 54 45 00'  0795                .Ascic  "ET"    ; Enforced device name prefix
                        02  0795
                        87  0798                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                      0018  0799                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                        19  079B                .BYTE   25              ; 25 HP$A_DEVICE to data
                        07  079C                .BYTE   7               ; 7 of data field
                        8C  079D                .BYTE   Pd$_Case        ; Indicate case operation
                        01  079E                .BYTE   $$_$            ; Count of pairs
           00000030 00000000  079F                .LONG   0,^X30          ; Store the pair
                        88  07A7                .BYTE   Pd$_Store       ; Indicate store operation
                      0018  07A8                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                        19  07AA                .BYTE   25              ; 25 HP$A_DEVICE to data
                        07  07AB                .BYTE   7               ; 7 of data field
                        88  07AC                .BYTE   Pd$_Store       ; Indicate store operation
                      001C  07AD                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                        19  07AF                .BYTE   25              ; 25 HP$A_DVA to data
                        07  07B0                .BYTE   7               ; 7 of data field
                        86  07B1                .BYTE   Pd$_Literal     ; Indicate literal
                  00000001  07B2                .LONG   ^X1             ; Constant
                        88  07B6                .BYTE   Pd$_Store       ; Indicate store operation
                      001C  07B7                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                        16  07B9                .BYTE   22              ; 22 HP$A_DVA to data
                        01  07BA                .BYTE   1               ; 1 of data field
                        84  07BB                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00'  07BC      .ASCIC  "BI Node Number (HEX)"  ; BI Node Number (HEX) string
      29 58 45 48 28 20 72 65 62      07C8
                        14  07BC
           0000000F 00000000  07D1              .LONG   ^X0,^XF ; 0 , F limits on input
                        88  07D9              .BYTE   Pd$_Store       ; Indicate store operation
                      0032  07DA              .WORD   DEBNK$B_node_id         ; Byte DEBNK$B_node_id to data
                        00  07DC              .BYTE   0               ; 0 DEBNK$B_node_id to data
                        08  07DD              .BYTE   8               ; 8 of data field
                        88  07DE              .BYTE   Pd$_Store       ; Indicate store operation
                      000B  07DF              .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                        00  07E1              .BYTE   0               ; 0 HP$B_DRIVE to data
                        08  07E2              .BYTE   8               ; 8 of data field
                        88  07E3              .BYTE   Pd$_Store       ; Indicate store operation
                      0018  07E4              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                        0D  07E6              .BYTE   13              ; 13 HP$A_DEVICE to data
                        04  07E7              .BYTE   4               ; 4 of data field
                        88  07E8              .BYTE   Pd$_Store       ; Indicate store operation
                      001C  07E9              .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                        12  07EB              .BYTE   18              ; 18 HP$A_DVA to data
                        04  07EC              .BYTE   4               ; 4 of data field
                        88  07ED              .BYTE   Pd$_Store       ; Indicate store operation
                      0024  07EE              .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                        02  07F0              .BYTE   2               ; 2 HP$W_VECTOR to data
                        04  07F1              .BYTE   4               ; 4 of data field
                        81  07F2              .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                            07F3  683 DEBNT:    $DS_DEBNT                               ;       [68]            ;G:17
                            07F3                .SAVE   LOCAL_BLOCK
                            07F3                .PSECT  $ABS$,ABS
                  00000032  0050                .=HP$A_DEPENDENT
                            0032                .IIF    NB,DEBNT$B_node_id,     DEBNT$B_node_id:
                  00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                            0033                .IIF    NB,DEBNT$K_LEN, DEBNT$K_LEN:
```

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                    000007F3                .RESTORE
          54 4E 42 45 44 00' 07F3           .ASCIC  "DEBNT" ; DEBNT name
                      05  07F3
                      33  07F9              .BYTE   DEBNT$K_LEN             ; DEBNT$K_LEN of resultant P-table
                      0F  07FA              .BYTE   15              ; Maximum unit number                   ;G:65
                    0000  07FB              .WORD   ^A""    ; Two character mnemonic for QIO DEBNT
                      80  07FD              .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  07FE              .Byte   Pd$_Name        ; Directive op-code
                      02  07FF              .Byte   PTD$M_CONTROLLER                ; Enforced ET codes
                 54 45 00' 0800             .Ascic  "ET"    ; Enforced device name prefix
                      02  0800
                      87  0803              .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  0804              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      19  0806              .BYTE   25              ; 25 HP$A_DEVICE to data
                      07  0807              .BYTE   7               ; 7 of data field
                      8C  0808              .BYTE   Pd$_Case        ; Indicate case operation
                      01  0809              .BYTE   $$_$            ; Count of pairs
          00000030 00000000  080A           .LONG   0,^X30          ; Store the pair
                      88  0812              .BYTE   Pd$_Store       ; Indicate store operation
                    0018  0813              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      19  0815              .BYTE   25              ; 25 HP$A_DEVICE to data
                      07  0816              .BYTE   7               ; 7 of data field
                      88  0817              .BYTE   Pd$_Store       ; Indicate store operation
                    001C  0818              .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      19  081A              .BYTE   25              ; 25 HP$A_DVA to data
                      07  081B              .BYTE   7               ; 7 of data field
                      86  081C              .BYTE   Pd$_Literal     ; Indicate literal
                00000001  081D              .LONG   ^X1             ; Constant
                      88  0821              .BYTE   Pd$_Store       ; Indicate store operation
                    001C  0822              .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      16  0824              .BYTE   22              ; 22 HP$A_DVA to data
                      01  0825              .BYTE   1               ; 1 of data field
                      84  0826              .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00' 0827   .ASCIC  "BI Node Number (HEX)"   ; BI Node Number (HEX) string
        29 58 45 48 28 20 72 65 62  0833
                      14  0827
                0000000F 00000000  083C     .LONG   ^X0,^XF ; 0 , F limits on input
                      88  0844              .BYTE   Pd$_Store       ; Indicate store operation
                    0032  0845              .WORD   DEBNT$B_node_id          ; Byte DEBNT$B_node_id to data
                      00  0847              .BYTE   0               ; 0 DEBNT$B_node_id to data
                      08  0848              .BYTE   8               ; 8 of data field
                      88  0849              .BYTE   Pd$_Store       ; Indicate store operation
                    000B  084A              .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                      00  084C              .BYTE   0               ; 0 HP$B_DRIVE to data
                      08  084D              .BYTE   8               ; 8 of data field
                      88  084E              .BYTE   Pd$_Store       ; Indicate store operation
                    0018  084F              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      0D  0851              .BYTE   13              ; 13 HP$A_DEVICE to data
                      04  0852              .BYTE   4               ; 4 of data field
                      88  0853              .BYTE   Pd$_Store       ; Indicate store operation
                    001C  0854              .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      12  0856              .BYTE   18              ; 18 HP$A_DVA to data
                      04  0857              .BYTE   4               ; 4 of data field
                      88  0858              .BYTE   Pd$_Store       ; Indicate store operation
                    0024  0859              .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      02  085B              .BYTE   2               ; 2 HP$W_VECTOR to data
                      04  085C              .BYTE   4               ; 4 of data field
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                      81  085D                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          085E   684 DHB32:    $DS_DHB32                       ;       [84]                    ;G:39
                          085E                .SAVE   LOCAL_BLOCK
                          085E                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$B_DHB32_NODE_ID,  HP$B_DHB32_NODE_ID::
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,HP$K_DHB32_LEN,      HP$K_DHB32_LEN::
                 0000085E  0050                .RESTORE
          32 33 42 48 44 00' 085E             .ASCIC  "DHB32" ; DHB32 name
                      05  085E
                      33  0864                .BYTE   HP$K_DHB32_LEN          ; HP$K_DHB32_LEN of resultant P-table
                      00  0865                .BYTE   0                       ; Maximum unit number                   ;G:65
                    0000  0866                .WORD   ^A""    ; Two character mnemonic for QIO DHB32
                      80  0868                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      87  0869                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  086A                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      19  086C                .BYTE   25                      ; 25 HP$A_DEVICE to data
                      07  086D                .BYTE   7                       ; 7 of data field
                      8C  086E                .BYTE   Pd$_Case        ; Indicate case operation
                      01  086F                .BYTE   $$_$            ; Count of pairs
          00000030 00000000  0870             .LONG   0,^X30          ; Store the pair
                      88  0878                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  0879                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      19  087B                .BYTE   25                      ; 25 HP$A_DEVICE to data
                      07  087C                .BYTE   7                       ; 7 of data field
                      88  087D                .BYTE   Pd$_Store       ; Indicate store operation
                    001C  087E                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      19  0880                .BYTE   25                      ; 25 HP$A_DVA to data
                      07  0881                .BYTE   7                       ; 7 of data field
                      86  0882                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  0883                .LONG   ^X1             ; Constant
                      88  0887                .BYTE   Pd$_Store       ; Indicate store operation
                    001C  0888                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      16  088A                .BYTE   22                      ; 22 HP$A_DVA to data
                      01  088B                .BYTE   1                       ; 1 of data field
                      88  088C                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  088D                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      08  088F                .BYTE   8                       ; 8 HP$W_VECTOR to data
                      01  0890                .BYTE   1                       ; 1 of data field
                      84  0891                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00' 0892     .ASCIC  "BI Node Number (HEX) " ; BI Node Number (HEX)  string
      20 29 58 45 48 28 20 72 65 62  089E
                      15  0892
                0000000F 00000000  08A8     .LONG   ^X0,^XF ; 0 , F limits on input
                      88  08B0                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  08B1                .WORD   HP$B_DHB32_NODE_ID              ; Byte HP$B_DHB32_NODE_ID to data
                      00  08B3                .BYTE   0                       ; 0 HP$B_DHB32_NODE_ID to data
                      08  08B4                .BYTE   8                       ; 8 of data field
                      88  08B5                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  08B6                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      0D  08B8                .BYTE   13                      ; 13 HP$A_DEVICE to data
                      04  08B9                .BYTE   4                       ; 4 of data field
                      88  08BA                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  08BB                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      02  08BD                .BYTE   2                       ; 2 HP$W_VECTOR to data
                      04  08BE                .BYTE   4                       ; 4 of data field
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                    88  08BF                .BYTE   Pd$_Store        ; Indicate store operation
                  001C  08C0                .WORD   HP$A_DVA                  ; Byte HP$A_DVA to data
                    12  08C2                .BYTE   18                ; 18 HP$A_DVA to data
                    04  08C3                .BYTE   4                 ; 4 of data field
                    81  08C4                .BYTE   Pd$_End           ; Indicate end of PT-descriptor
                        08C5   685 DHU11:   $DS_DHU11                          ;       [56]                    ;G:17
     31 31 55 48 44 00' 08C5                .ASCIC  "DHU11" ; DHU11 name
                    05  08C5
                    39  08CB                .BYTE   HP$K_DHUV_LEN             ; HP$K_DHUV_LEN of resultant P-table
                    08  08CC                .BYTE   8                 ; Maximum unit number                   ;G:65
                  5854  08CD                .WORD   ^A"TX"  ; Two character mnemonic for QIO DHU11 TX
                    80  08CF                .BYTE   Pd$_Start         ; Constant to identify start of descriptor
                    8D  08D0                .Byte   Pd$_Name          ; Directive op-code
                    02  08D1                .Byte   Ptd$M_Controller                ; Enforced TX codes
              58 54 00' 08D2                .Ascic  "TX"    ; Enforced device name prefix
                    02  08D2
                    83  08D5                .BYTE   Pd$_Octal         ; Indicate scan octal
           52 53 43 00' 08D6                .ASCIC  "CSR"   ; CSR string
                    03  08D6
     0003FFFE 0003E000  08DA                .LONG   ^O760000,^O777776         ; 760000 , 777776 limits on input
                    88  08E2                .BYTE   Pd$_Store         ; Indicate store operation
                  0032  08E3                .WORD   HP$L_DHUV_CSR             ; Byte HP$L_DHUV_CSR to data
                    00  08E5                .BYTE   0                 ; 0 HP$L_DHUV_CSR to data
                    20  08E6                .BYTE   32                ; 32 of data field
                    88  08E7                .BYTE   Pd$_Store         ; Indicate store operation
                  0018  08E8                .WORD   HP$A_DEVICE               ; Byte HP$A_DEVICE to data
                    00  08EA                .BYTE   0                 ; 0 HP$A_DEVICE to data
                    12  08EB                .BYTE   18                ; 18 of data field
                    83  08EC                .BYTE   Pd$_Octal         ; Indicate scan octal
  52 4F 54 43 45 56 00' 08ED                .ASCIC  "VECTOR"          ; VECTOR string
                    06  08ED
     000001FE 00000000  08F4                .LONG   ^O0,^O776         ; 0 , 776 limits on input
                    88  08FC                .BYTE   Pd$_Store         ; Indicate store operation
                  0036  08FD                .WORD   HP$W_DHUV_VEC             ; Byte HP$W_DHUV_VEC to data
                    00  08FF                .BYTE   0                 ; 0 HP$W_DHUV_VEC to data
                    10  0900                .BYTE   16                ; 16 of data field
                    82  0901                .BYTE   Pd$_Decimal       ; Indicate scan decimal
              52 42 00' 0902                .ASCIC  "BR"    ; BR string
                    02  0902
     00000007 00000004  0905                .LONG   4,7     ; 4 , 7 limits on input
                    88  090D                .BYTE   Pd$_Store         ; Indicate store operation
                  0038  090E                .WORD   HP$B_DHUV_BR              ; Byte HP$B_DHUV_BR to data
                    00  0910                .BYTE   0                 ; 0 HP$B_DHUV_BR to data
                    08  0911                .BYTE   8                 ; 8 of data field
                    81  0912                .BYTE   Pd$_End           ; Indicate end of PT-descriptor
                        0913   686 DHV11:   $DS_DHV11                          ;       [58]
     31 31 56 48 44 00' 0913                .ASCIC  "DHV11" ; DHV11 name
                    05  0913
                    39  0919                .BYTE   HP$K_DHUV_LEN             ; HP$K_DHUV_LEN of resultant P-table
                    08  091A                .BYTE   8                 ; Maximum unit number                   ;G:65
                  5854  091B                .WORD   ^A"TX"  ; Two character mnemonic for QIO DHV11 TX
                    80  091D                .BYTE   Pd$_Start         ; Constant to identify start of descriptor
                    8D  091E                .Byte   Pd$_Name          ; Directive op-code
                    02  091F                .Byte   Ptd$M_Controller                ; Enforced TX codes
              58 54 00' 0920                .Ascic  "TX"    ; Enforced device name prefix
                    02  0920
                    83  0923                .BYTE   Pd$_Octal         ; Indicate scan octal
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                    52 53 43 00' 0924                .ASCIC  "CSR"   ; CSR string
                       03  0924
                0003FFFE 0003E000  0928                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  0930                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  0931                .WORD   HP$L_DHUV_CSR           ; Byte HP$L_DHUV_CSR to data
                      00  0933                .BYTE   0               ; 0 HP$L_DHUV_CSR to data
                      20  0934                .BYTE   32              ; 32 of data field
                      88  0935                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  0936                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  0938                .BYTE   0               ; 0 HP$A_DEVICE to data
                      12  0939                .BYTE   18              ; 18 of data field
                      83  093A                .BYTE   Pd$_Octal       ; Indicate scan octal
             52 4F 54 43 45 56 00' 093B                .ASCIC  "VECTOR"        ; VECTOR string
                      06  093B
                000001FE 00000000  0942                .LONG   ^O0,^O776       ; 0 , 776 limits on input
                      88  094A                .BYTE   Pd$_Store       ; Indicate store operation
                    0036  094B                .WORD   HP$W_DHUV_VEC           ; Byte HP$W_DHUV_VEC to data
                      00  094D                .BYTE   0               ; 0 HP$W_DHUV_VEC to data
                      10  094E                .BYTE   16              ; 16 of data field
                      82  094F                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                    52 42 00' 0950                .ASCIC  "BR"    ; BR string
                       02  0950
                00000007 00000004  0953                .LONG   4,7     ; 4 , 7 limits on input
                      88  095B                .BYTE   Pd$_Store       ; Indicate store operation
                    0038  095C                .WORD   HP$B_DHUV_BR            ; Byte HP$B_DHUV_BR to data
                      00  095E                .BYTE   0               ; 0 HP$B_DHUV_BR to data
                      08  095F                .BYTE   8               ; 8 of data field
                      81  0960                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          0961    687 DISK:   $DS_DISK                                ;       [41]
                          0961                .SAVE   LOCAL_BLOCK
                          0961                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_DISK_LEN,       HP$K_DISK_LEN:
                          0032                .IIF    NB,DISK$K_LEN,  DISK$K_LEN:
                00000961  0961                .RESTORE
             4B 53 49 44 00' 0961                .ASCIC  "DISK"  ; DISK name
                      04  0961
                      32  0966                .BYTE   DISK$K_LEN              ; DISK$K_LEN of resultant P-table
                      00  0967                .BYTE   0                                                       ;G:77
                    0000  0968                .WORD   ^A""    ; Two character mnemonic for QIO DISK
                      80  096A                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8E  096B                .BYTE   PD$_EPB         ; EXTENDED P-TABLE BLOCK                ;G:77
                    0FFF  096C                .WORD   4095                                                    ;G:77
                      8D  096E                .Byte   Pd$_Name        ; Directive op-code
                      03  096F                .Byte   Ptd$M_DEVICE            ; Enforced DU codes
                    55 44 00' 0970                .Ascic  "DU"    ; Enforced device name prefix
                      02  0970
                      81  0973                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          0974    688 DL11:   $DS_DL11
                          0974                .SAVE   LOCAL_BLOCK
                          0974                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,DL11$L_CSR,  DL11$L_CSR:
                00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                          0036                .IIF    NB,DL11$B_BR,   DL11$B_BR:
                00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                          0037                .IIF    NB,DL11$K_LEN,  DL11$K_LEN:
```

```
                    00000974                    .RESTORE
          31 31 4C 44 00' 0974                  .ASCIC  "DL11"  ; DL11 name
                      04  0974
                      37  0979                  .BYTE   DL11$K_LEN              ; DL11$K_LEN of resultant P-table
                      00  097A                  .BYTE   0               ; Maximum unit number                   ;G:65
                    0000  097B                  .WORD   ^A""    ; Two character mnemonic for QIO DL11
                      80  097D                  .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  097E                  .Byte   Pd$_Name        ; Directive op-code
                      02  097F                  .Byte   Ptd$M_Controller                ; Enforced TT codes
                54 54 00' 0980                  .Ascic  "TT"    ; Enforced device name prefix
                      02  0980
                      83  0983                  .BYTE   Pd$_Octal       ; Indicate scan octal
             52 53 43 00' 0984                  .ASCIC  "CSR"   ; CSR string
                      03  0984
        0003FFFE 0003E000  0988                 .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  0990                  .BYTE   Pd$_Store       ; Indicate store operation
                    0032  0991                  .WORD   DL11$L_CSR              ; Byte DL11$L_CSR to data
                      00  0993                  .BYTE   0               ; 0 DL11$L_CSR to data
                      20  0994                  .BYTE   32              ; 32 of data field
                      88  0995                  .BYTE   Pd$_Store       ; Indicate store operation
                    0018  0996                  .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  0998                  .BYTE   0               ; 0 HP$A_DEVICE to data
                      12  0999                  .BYTE   18              ; 18 of data field
                      83  099A                  .BYTE   Pd$_Octal       ; Indicate scan octal
     52 4F 54 43 45 56 00' 099B                 .ASCIC  "VECTOR"        ; VECTOR string
                      06  099B
        000001FE 00000002  09A2                 .LONG   ^O2,^O776       ; 2 , 776 limits on input
                      88  09AA                  .BYTE   Pd$_Store       ; Indicate store operation
                    0024  09AB                  .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  09AD                  .BYTE   0               ; 0 HP$W_VECTOR to data
                      09  09AE                  .BYTE   9               ; 9 of data field
                      82  09AF                  .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 42 00' 09B0                  .ASCIC  "BR"    ; BR string
                      02  09B0
        00000007 00000004  09B3                 .LONG   4,7     ; 4 , 7 limits on input
                      88  09BB                  .BYTE   Pd$_Store       ; Indicate store operation
                    0036  09BC                  .WORD   DL11$B_BR               ; Byte DL11$B_BR to data
                      00  09BE                  .BYTE   0               ; 0 DL11$B_BR to data
                      08  09BF                  .BYTE   8               ; 8 of data field
                      81  09C0                  .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          09C1    689 DMB32:    $DS_DMB32                                               ;G:3
                          09C1                  .SAVE   LOCAL_BLOCK
                          09C1                  .PSECT  $ABS$,ABS
                00000032  0050                  .=HP$A_DEPENDENT
                          0032                  .IIF    NB,HP$B_DMB32_NODE_ID,  HP$B_DMB32_NODE_ID::
                00000033  0032                  .IIF    NB,.BLKB,       .BLKB   1
                          0033                  .IIF    NB,HP$K_DMB32_LEN,      HP$K_DMB32_LEN::
                          000009C1              .RESTORE
     32 33 42 4D 44 00' 09C1                    .ASCIC  "DMB32" ; DMB32 name
                      05  09C1
                      33  09C7                  .BYTE   HP$K_DMB32_LEN          ; HP$K_DMB32_LEN of resultant P-table
                      00  09C8                  .BYTE   0               ; Maximum unit number                   ;G:65
                    0000  09C9                  .WORD   ^A""    ; Two character mnemonic for QIO DMB32
                      80  09CB                  .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      87  09CC                  .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  09CD                  .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      19  09CF                  .BYTE   25              ; 25 HP$A_DEVICE to data
```

```
                                07  09D0                .BYTE   7                   ; 7 of data field
                                8C  09D1                .BYTE   Pd$_Case            ; Indicate case operation
                                01  09D2                .BYTE   $$_$                ; Count of pairs
                  00000030 00000000  09D3                .LONG   0,^X30              ; Store the pair
                                88  09DB                .BYTE   Pd$_Store           ; Indicate store operation
                              0018  09DC                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                                19  09DE                .BYTE   25                  ; 25 HP$A_DEVICE to data
                                07  09DF                .BYTE   7                   ; 7 of data field
                                88  09E0                .BYTE   Pd$_Store           ; Indicate store operation
                              001C  09E1                .WORD   HP$A_DVA                    ; Byte HP$A_DVA to data
                                19  09E3                .BYTE   25                  ; 25 HP$A_DVA to data
                                07  09E4                .BYTE   7                   ; 7 of data field
                                86  09E5                .BYTE   Pd$_Literal         ; Indicate literal
                          00000001  09E6                .LONG   ^X1                 ; Constant
                                88  09EA                .BYTE   Pd$_Store           ; Indicate store operation
                              001C  09EB                .WORD   HP$A_DVA                    ; Byte HP$A_DVA to data
                                16  09ED                .BYTE   22                  ; 22 HP$A_DVA to data
                                01  09EE                .BYTE   1                   ; 1 of data field
                                88  09EF                .BYTE   Pd$_Store           ; Indicate store operation
                              0024  09F0                .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                                08  09F2                .BYTE   8                   ; 8 HP$W_VECTOR to data
                                01  09F3                .BYTE   1                   ; 1 of data field
                                84  09F4                .BYTE   Pd$_Hexadecimal     ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00'  09F5                .ASCIC  "BI Node Number (HEX) " ; BI Node Number (HEX)  string
      20 29 58 45 48 28 20 72 65 62  0A01
                                15  09F5
                  0000000F 00000000  0A0B                .LONG   ^X0,^XF ; 0 , F limits on input
                                88  0A13                .BYTE   Pd$_Store           ; Indicate store operation
                              0032  0A14                .WORD   HP$B_DMB32_NODE_ID                  ; Byte HP$B_DMB32_NODE_ID to data
                                00  0A16                .BYTE   0                   ; 0 HP$B_DMB32_NODE_ID to data
                                08  0A17                .BYTE   8                   ; 8 of data field
                                88  0A18                .BYTE   Pd$_Store           ; Indicate store operation
                              0018  0A19                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                                0D  0A1B                .BYTE   13                  ; 13 HP$A_DEVICE to data
                                04  0A1C                .BYTE   4                   ; 4 of data field
                                88  0A1D                .BYTE   Pd$_Store           ; Indicate store operation
                              0024  0A1E                .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                                02  0A20                .BYTE   2                   ; 2 HP$W_VECTOR to data
                                04  0A21                .BYTE   4                   ; 4 of data field
                                88  0A22                .BYTE   Pd$_Store           ; Indicate store operation
                              001C  0A23                .WORD   HP$A_DVA                    ; Byte HP$A_DVA to data
                                12  0A25                .BYTE   18                  ; 18 HP$A_DVA to data
                                04  0A26                .BYTE   4                   ; 4 of data field
                                81  0A27                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                                    0A28    690 DMC11:  $DS_DMC11
                                    0A28                .SAVE   LOCAL_BLOCK
                                    0A28                .PSECT  $ABS$,ABS
                          00000032  0050                .=HP$A_DEPENDENT
                                    0032                .IIF    NB,DMC11$L_CSR, DMC11$L_CSR:
                          00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                                    0036                .IIF    NB,DMC11$B_BR,  DMC11$B_BR:
                          00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                                    0037                .IIF    NB,DMC11$K_LEN, DMC11$K_LEN:
                                00000A28                .RESTORE
                  31 31 43 4D 44 00'  0A28                .ASCIC  "DMC11" ; DMC11 name
                                05  0A28
                                37  0A2E                .BYTE   DMC11$K_LEN                 ; DMC11$K_LEN of resultant P-table
```

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                    00  0A2F          .BYTE   0                   ; Maximum unit number                          ;G:65
                  4D58  0A30          .WORD   ^A"XM"   ; Two character mnemonic for QIO DMC11 XM
                    80  0A32          .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                    8D  0A33          .Byte   Pd$_Name            ; Directive op-code
                    03  0A34          .Byte   Ptd$M_Device                ; Enforced XM codes
              4D 58 00' 0A35          .Ascic  "XM"     ; Enforced device name prefix
                    02  0A35
                    83  0A38          .BYTE   Pd$_Octal           ; Indicate scan octal
           52 53 43 00' 0A39          .ASCIC  "CSR"    ; CSR string
                    03  0A39
      0003FFFE 0003E000  0A3D          .LONG   ^O760000,^O777776           ; 760000 , 777776 limits on input
                    88  0A45          .BYTE   Pd$_Store           ; Indicate store operation
                  0032  0A46          .WORD   DMC11$L_CSR                 ; Byte DMC11$L_CSR to data
                    00  0A48          .BYTE   0                   ; 0 DMC11$L_CSR to data
                    20  0A49          .BYTE   32                  ; 32 of data field
                    88  0A4A          .BYTE   Pd$_Store           ; Indicate store operation
                  0018  0A4B          .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                    00  0A4D          .BYTE   0                   ; 0 HP$A_DEVICE to data
                    12  0A4E          .BYTE   18                  ; 18 of data field
                    83  0A4F          .BYTE   Pd$_Octal           ; Indicate scan octal
   52 4F 54 43 45 56 00' 0A50          .ASCIC  "VECTOR"            ; VECTOR string
                    06  0A50
      000001FE 00000002  0A57          .LONG   ^O2,^O776           ; 2 , 776 limits on input
                    88  0A5F          .BYTE   Pd$_Store           ; Indicate store operation
                  0024  0A60          .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                    00  0A62          .BYTE   0                   ; 0 HP$W_VECTOR to data
                    09  0A63          .BYTE   9                   ; 9 of data field
                    82  0A64          .BYTE   Pd$_Decimal         ; Indicate scan decimal
              52 42 00' 0A65          .ASCIC  "BR"     ; BR string
                    02  0A65
      00000007 00000004  0A68          .LONG   4,7      ; 4 , 7 limits on input
                    88  0A70          .BYTE   Pd$_Store           ; Indicate store operation
                  0036  0A71          .WORD   DMC11$B_BR                  ; Byte DMC11$B_BR to data
                    00  0A73          .BYTE   0                   ; 0 DMC11$B_BR to data
                    08  0A74          .BYTE   8                   ; 8 of data field
                    81  0A75          .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                        0A76  691 DMF32:  $DS_DMF32
                        0A76          .SAVE   LOCAL_BLOCK
                        0A76          .PSECT  $ABS$,ABS
              00000032  0050          .=HP$A_DEPENDENT
                        0032          .IIF    NB,HP$B_DMF32_COMMON,   HP$B_DMF32_COMMON:
                        0032          .IIF    NB,DMF32$B_COMMON,      DMF32$B_COMMON:
              00000033  0032          .IIF    NB,.BLKB,       .BLKB   1
                        0033          .IIF    NB,HP$B_DMF32_FLAGS,    HP$B_DMF32_FLAGS:
                        0033          .IIF    NB,DMF32$B_FLAGS,       DMF32$B_FLAGS:
              00000034  0033          .IIF    NB,.BLKB,       .BLKB   1
                        0034          .IIF    NB,HP$B_DMF32_BR,       HP$B_DMF32_BR:
                        0034          .IIF    NB,DMF32$B_BR,  DMF32$B_BR:
              00000035  0034          .IIF    NB,.BLKB,       .BLKB   1
                        0035          .IIF    NB,HP$L_DMF32_CSR,      HP$L_DMF32_CSR:
                        0035          .IIF    NB,DMF32$L_CSR, DMF32$L_CSR:
              00000039  0035          .IIF    NB,.BLKL,       .BLKL   1
                        0039          .IIF    NB,HP$K_DMF32_LEN,      HP$K_DMF32_LEN:
                        0039          .IIF    NB,DMF32$K_LEN, DMF32$K_LEN:
                  00000A76            .RESTORE
      32 33 46 4D 44 00' 0A76          .ASCIC  "DMF32" ; DMF32 name
                    05  0A76
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                      39  0A7C                .BYTE   DMF32$K_LEN             ; DMF32$K_LEN of resultant P-table
                      05  0A7D                .BYTE   5                       ; Maximum unit number                   ;G:65
                    434C  0A7E                .WORD   ^A"LC"  ; Two character mnemonic for QIO DMF32 LC
                      80  0A80                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      83  0A81                .BYTE   Pd$_Octal       ; Indicate scan octal
                52 53 43 00' 0A82             .ASCIC  "CSR"   ; CSR string
                      03  0A82
            0003FFFE 0003E000  0A86           .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  0A8E                .BYTE   Pd$_Store       ; Indicate store operation
                    0035  0A8F                .WORD   DMF32$L_CSR             ; Byte DMF32$L_CSR to data
                      00  0A91                .BYTE   0                       ; 0 DMF32$L_CSR to data
                      20  0A92                .BYTE   32                      ; 32 of data field
                      88  0A93                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  0A94                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  0A96                .BYTE   0                       ; 0 HP$A_DEVICE to data
                      12  0A97                .BYTE   18                      ; 18 of data field
                      83  0A98                .BYTE   Pd$_Octal       ; Indicate scan octal
         72 6F 74 63 65 56 00' 0A99           .ASCIC  "Vector"        ; Vector string
                      06  0A99
            000001FE 000000C0  0AA0           .LONG   ^O300,^O776     ; 300 , 776 limits on input
                      88  0AA8                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  0AA9                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  0AAB                .BYTE   0                       ; 0 HP$W_VECTOR to data
                      09  0AAC                .BYTE   9                       ; 9 of data field
                      82  0AAD                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 42 00' 0AAE                .ASCIC  "BR"    ; BR string
                      02  0AAE
            00000007 00000004  0AB1           .LONG   4,7     ; 4 , 7 limits on input
                      88  0AB9                .BYTE   Pd$_Store       ; Indicate store operation
                    0034  0ABA                .WORD   DMF32$B_BR              ; Byte DMF32$B_BR to data
                      00  0ABC                .BYTE   0                       ; 0 DMF32$B_BR to data
                      08  0ABD                .BYTE   8                       ; 8 of data field
                      86  0ABE                .BYTE   Pd$_Literal      ; Indicate literal
                00000001  0ABF                .LONG   1                       ; Constant
                      88  0AC3                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  0AC4                .WORD   DMF32$B_COMMON          ; Byte DMF32$B_COMMON to data
                      00  0AC6                .BYTE   0                       ; 0 DMF32$B_COMMON to data
                      08  0AC7                .BYTE   8                       ; 8 of data field
                      81  0AC8                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          0AC9    692 DMF32A: $DS_DMF32A
                          0AC9                .SAVE   LOCAL_BLOCK
                          0AC9                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$B_DMF32A_BR,      HP$B_DMF32A_BR:
                          0032                .IIF    NB,DMF32A$B_BR, DMF32A$B_BR:
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,HP$B_DMF32A_ACTIV,   HP$B_DMF32A_ACTIV:
                          0033                .IIF    NB,DMF32A$B_ACTIV,      DMF32A$B_ACTIV:
                00000034  0033                .IIF    NB,.BLKB,       .BLKB   1
                          0034                .IIF    NB,HP$B_DMF32A_SPEED,   HP$B_DMF32A_SPEED:
                          0034                .IIF    NB,DMF32A$B_SPEED,      DMF32A$B_SPEED:
                00000035  0034                .IIF    NB,.BLKB,       .BLKB   1
                          0035                .IIF    NB,HP$W_DMF32A_FLAGS,   HP$W_DMF32A_FLAGS:
                          0035                .IIF    NB,DMF32A$W_FLAGS,      DMF32A$W_FLAGS:
                00000037  0035                .IIF    NB,.BLKW,       .BLKW   1
                          0037                .IIF    NB,HP$B_DMF32A_JUMP,    HP$B_DMF32A_JUMP:
                          0037                .IIF    NB,DMF32A$B_JUMP,       DMF32A$B_JUMP:
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                    00000038  0037              .IIF    NB,.BLKB,       .BLKB   1
                              0038              .IIF    NB,HP$K_DMF32A_LEN,     HP$K_DMF32A_LEN:
                              0038              .IIF    NB,DMF32A$K_LEN,        DMF32A$K_LEN:
                          00000AC9              .RESTORE
                41 32 33 46 4D 44 00' 0AC9      .ASCIC  "DMF32A"        ; DMF32A name
                                06  0AC9
                                38  0AD0      .BYTE   DMF32A$K_LEN            ; DMF32A$K_LEN of resultant P-table
                                00  0AD1      .BYTE   0                       ; Maximum unit number                   ;G:65
                              5854  0AD2      .WORD   ^A"TX"  ; Two character mnemonic for QIO DMF32A TX
                                80  0AD4      .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                8D  0AD5      .Byte   Pd$_Name        ; Directive op-code
                                02  0AD6      .Byte   Ptd$M_Controller                ; Enforced TX codes
                             58 54 00' 0AD7     .Ascic  "TX"    ; Enforced device name prefix
                                02  0AD7
                                83  0ADA      .BYTE   Pd$_Octal       ; Indicate scan octal
                          52 53 43 00' 0ADB     .ASCIC  "CSR"   ; CSR string
                                03  0ADB
                    0003FFFE 0003E000  0ADF     .LONG   ^O00760000,^O00777776     ; 0760000 , 0777776 limits on input
                                88  0AE7      .BYTE   Pd$_Store       ; Indicate store operation
                              0018  0AE8      .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                00  0AEA      .BYTE   0                       ; 0 HP$A_DEVICE to data
                                12  0AEB      .BYTE   18                      ; 18 of data field
                                83  0AEC      .BYTE   Pd$_Octal       ; Indicate scan octal
                72 6F 74 63 65 56 00' 0AED      .ASCIC  "Vector"        ; Vector string
                                06  0AED
                    000001FE 000000C0  0AF4     .LONG   ^O300,^O776     ; 300 , 776 limits on input
                                88  0AFC      .BYTE   Pd$_Store       ; Indicate store operation
                              0024  0AFD      .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                00  0AFF      .BYTE   0                       ; 0 HP$W_VECTOR to data
                                09  0B00      .BYTE   9                       ; 9 of data field
                                82  0B01      .BYTE   Pd$_Decimal     ; Indicate scan decimal
                             52 42 00' 0B02     .ASCIC  "BR"    ; BR string
                                02  0B02
                    00000007 00000004  0B05     .LONG   4,7     ; 4 , 7 limits on input
                                88  0B0D      .BYTE   Pd$_Store       ; Indicate store operation
                              0032  0B0E      .WORD   DMF32A$B_BR             ; Byte DMF32A$B_BR to data
                                00  0B10      .BYTE   0                       ; 0 DMF32A$B_BR to data
                                08  0B11      .BYTE   8                       ; 8 of data field
                                83  0B12      .BYTE   Pd$_Octal       ; Indicate scan octal
65 6E 69 4C 20 65 76 69 74 63 41 00' 0B13      .ASCIC  "Active Lines"  ; Active Lines string
                                73  0B1F
                                0C  0B13
                    000000FF 00000001  0B20     .LONG   ^O1,^O377       ; 1 , 377 limits on input
                                88  0B28      .BYTE   Pd$_Store       ; Indicate store operation
                              0033  0B29      .WORD   DMF32A$B_ACTIV          ; Byte DMF32A$B_ACTIV to data
                                00  0B2B      .BYTE   0                       ; 0 DMF32A$B_ACTIV to data
                                08  0B2C      .BYTE   8                       ; 8 of data field
                                85  0B2D      .BYTE   Pd$_String      ; Indicate scan and verify string
          65 74 61 52 20 64 75 61 42 00' 0B2E      .ASCIC  "Baud Rate"     ; Baud Rate string
                                09  0B2E
                             30 35 00' 0B38     .ASCIC  "50"
                                02  0B38
                             35 37 00' 0B3B     .ASCIC  "75"
                                02  0B3B
                          30 31 31 00' 0B3E     .ASCIC  "110"
                                03  0B3E
                    35 2E 34 33 31 00' 0B42     .ASCIC  "134.5"
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                        05  0B42
                30 35 31 00' 0B48               .ASCIC  "150"
                        03  0B48
                30 30 33 00' 0B4C               .ASCIC  "300"
                        03  0B4C
                30 30 36 00' 0B50               .ASCIC  "600"
                        03  0B50
             30 30 32 31 00' 0B54               .ASCIC  "1200"
                        04  0B54
             30 30 38 31 00' 0B59               .ASCIC  "1800"
                        04  0B59
             30 30 30 32 00' 0B5E               .ASCIC  "2000"
                        04  0B5E
             30 30 34 32 00' 0B63               .ASCIC  "2400"
                        04  0B63
             30 30 36 33 00' 0B68               .ASCIC  "3600"
                        04  0B68
             30 30 38 34 00' 0B6D               .ASCIC  "4800"
                        04  0B6D
             30 30 32 37 00' 0B72               .ASCIC  "7200"
                        04  0B72
             30 30 36 39 00' 0B77               .ASCIC  "9600"
                        04  0B77
          30 30 32 39 31 00' 0B7C               .ASCIC  "19200"
                        05  0B7C
                        00  0B82                .BYTE   0               ; Null length is end of valid 50,75,110,134.5,150,30
                        88  0B83                .BYTE   Pd$_Store       ; Indicate store operation
                      0034  0B84                .WORD   DMF32A$B_SPEED          ; Byte DMF32A$B_SPEED to data
                        00  0B86                .BYTE   0               ; 0 DMF32A$B_SPEED to data
                        08  0B87                .BYTE   8               ; 8 of data field
                        85  0B88                .BYTE   Pd$_String      ; Indicate scan and verify string
79 54 20 6B 63 61 62 70 6F 6F 4C 00' 0B89       .ASCIC  "Loopback Type" ; Loopback Type string
                     65 70  0B95
                        0D  0B89
          4C 41 4E 52 45 54 4E 49 00' 0B97       .ASCIC  "INTERNAL"
                        08  0B97
                38 34 32 33 48 00' 0BA0         .ASCIC  "H3248"
                        05  0BA0
4D 45 44 4F 4D 5F 4C 41 43 4F 4C 00' 0BA6       .ASCIC  "LOCAL_MODEM"
                        0B  0BA6
4C 42 41 4D 4D 41 52 47 4F 52 50 00' 0BB2       .ASCIC  "PROGRAMMABLE_MODEM"
                4D 45 44 4F 4D 5F 45  0BBE
                        12  0BB2
                39 34 32 33 48 00' 0BC5         .ASCIC  "H3249"
                        05  0BC5
                        00  0BCB                .BYTE   0               ; Null length is end of valid INTERNAL,<H3248>,LOCAL
                        88  0BCC                .BYTE   Pd$_Store       ; Indicate store operation
                      0035  0BCD                .WORD   DMF32A$W_FLAGS          ; Byte DMF32A$W_FLAGS to data
                        00  0BCF                .BYTE   0               ; 0 DMF32A$W_FLAGS to data
                        05  0BD0                .BYTE   5               ; 5 of data field
                        8B  0BD1                .BYTE   Pd$_Logical     ; Indicate logical value operation
74 69 6E 49 20 73 75 62 69 6E 55 00' 0BD2       .ASCIC  \Unibus Init Jumper\    ; Unibus Init Jumper string
                72 65 70 6D 75 4A 20  0BDE
                        12  0BD2
                        88  0BE5                .BYTE   Pd$_Store       ; Indicate store operation
                      0037  0BE6                .WORD   DMF32A$B_JUMP           ; Byte DMF32A$B_JUMP to data
                        00  0BE8                .BYTE   0               ; 0 DMF32A$B_JUMP to data
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                      01  0BE9                .BYTE   1                       ; 1 of data field
                      81  0BEA                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          0BEB    693 DMF32P: $DS_DMF32P
                          0BEB                .SAVE   LOCAL_BLOCK
                          0BEB                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$B_DMF32P_COMMON,  HP$B_DMF32P_COMMON:
                          0032                .IIF    NB,DMF32P$B_COMMON,     DMF32P$B_COMMON:
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,HP$B_DMF32P_FLAGS,   HP$B_DMF32P_FLAGS:
                          0033                .IIF    NB,DMF32P$B_FLAGS,      DMF32P$B_FLAGS:
                00000034  0033                .IIF    NB,.BLKB,       .BLKB   1
                          0034                .IIF    NB,HP$B_DMF32P_BR,      HP$B_DMF32P_BR:
                          0034                .IIF    NB,DMF32P$B_BR, DMF32P$B_BR:
                00000035  0034                .IIF    NB,.BLKB,       .BLKB   1
                          0035                .IIF    NB,HP$L_DMF32P_CSR,     HP$L_DMF32P_CSR:
                          0035                .IIF    NB,DMF32P$L_CSR,        DMF32P$L_CSR:
                00000039  0035                .IIF    NB,.BLKL,       .BLKL   1
                          0039                .IIF    NB,HP$K_DMF32P_LEN,     HP$K_DMF32P_LEN:
                          0039                .IIF    NB,DMF32P$K_LEN,        DMF32P$K_LEN:
                      00000BEB                .RESTORE
      50 32 33 46 4D 44 00' 0BEB                .ASCIC  "DMF32P"                ; DMF32P name
                      06  0BEB
                      39  0BF2                .BYTE   DMF32P$K_LEN                    ; DMF32P$K_LEN of resultant P-table
                      00  0BF3                .BYTE   0                       ; Maximum unit number                   ;G:65
                    434C  0BF4                .WORD   ^A"LC"  ; Two character mnemonic for QIO DMF32P LC
                      80  0BF6                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  0BF7                .Byte   Pd$_Name                ; Directive op-code
                      02  0BF8                .Byte   Ptd$M_Controller                ; Enforced LC codes
                  43 4C 00' 0BF9                .Ascic  "LC"    ; Enforced device name prefix
                      02  0BF9
                      83  0BFC                .BYTE   Pd$_Octal               ; Indicate scan octal
                52 53 43 00' 0BFD                .ASCIC  "CSR"   ; CSR string
                      03  0BFD
          0003FFFE 0003E000  0C01                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  0C09                .BYTE   Pd$_Store               ; Indicate store operation
                    0035  0C0A                .WORD   DMF32P$L_CSR                    ; Byte DMF32P$L_CSR to data
                      00  0C0C                .BYTE   0                       ; 0 DMF32P$L_CSR to data
                      20  0C0D                .BYTE   32                      ; 32 of data field
                      88  0C0E                .BYTE   Pd$_Store               ; Indicate store operation
                    0018  0C0F                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                      00  0C11                .BYTE   0                       ; 0 HP$A_DEVICE to data
                      12  0C12                .BYTE   18                      ; 18 of data field
                      83  0C13                .BYTE   Pd$_Octal               ; Indicate scan octal
      72 6F 74 63 65 56 00' 0C14                .ASCIC  "Vector"                ; Vector string
                      06  0C14
          000001FE 000000C0  0C1B                .LONG   ^O300,^O776             ; 300 , 776 limits on input
                      88  0C23                .BYTE   Pd$_Store               ; Indicate store operation
                    0024  0C24                .WORD   HP$W_VECTOR                     ; Byte HP$W_VECTOR to data
                      00  0C26                .BYTE   0                       ; 0 HP$W_VECTOR to data
                      09  0C27                .BYTE   9                       ; 9 of data field
                      82  0C28                .BYTE   Pd$_Decimal             ; Indicate scan decimal
                52 42 00' 0C29                .ASCIC  "BR"    ; BR string
                      02  0C29
          00000007 C0000004  0C2C                .LONG   4,7     ; 4 , 7 limits on input
                      88  0C34                .BYTE   Pd$_Store               ; Indicate store operation
                    0034  0C35                .WORD   DMF32P$B_BR                     ; Byte DMF32P$B_BR to data
```

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                                00  0C37                .BYTE   0                   ; 0 DMF32P$B_BR to data
                                08  0C38                .BYTE   8                   ; 8 of data field
                                85  0C39                .BYTE   Pd$_String          ; Indicate scan and verify string
65 63 69 76 65 44 20 74 72 6F 50 00' 0C3A               .ASCIC  "Port Device"       ; Port Device string
                                0B  0C3A
                          52 45 48 54 4F 00' 0C46       .ASCIC  "OTHER"
                                05  0C46
                             50 4C 00' 0C4C             .ASCIC  "LP"
                                02  0C4C
                          50 41 52 57 00' 0C4F          .ASCIC  "WRAP"
                                04  0C4F
                                00  0C54                .BYTE   0                   ; Null length is end of valid OTHER,LP,WRAP
                                88  0C55                .BYTE   Pd$_Store           ; Indicate store operation
                              0033  0C56                .WORD   DMF32P$B_FLAGS              ; Byte DMF32P$B_FLAGS to data
                                00  0C58                .BYTE   0                   ; 0 DMF32P$B_FLAGS to data
                                08  0C59                .BYTE   8                   ; 8 of data field
                                86  0C5A                .BYTE   Pd$_Literal         ; Indicate literal
                          00000001  0C5B                .LONG   1                   ; Constant
                                88  0C5F                .BYTE   Pd$_Store           ; Indicate store operation
                              0032  0C60                .WORD   DMF32P$B_COMMON             ; Byte DMF32P$B_COMMON to data
                                00  0C62                .BYTE   0                   ; 0 DMF32P$B_COMMON to data
                                08  0C63                .BYTE   8                   ; 8 of data field
                                81  0C64                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                                    0C65    694 DMF32S: $DS_DMF32S
                                    0C65                .SAVE   LOCAL_BLOCK
                                    0C65                .PSECT  $ABS$,ABS
                          00000032  0050                .=HP$A_DEPENDENT
                                    0032                .IIF    NB,HP$B_DMF32S_COMMON,  HP$B_DMF32S_COMMON:
                                    0032                .IIF    NB,DMF32S$B_COMMON,     DMF32S$B_COMMON:
                          00000033  0032                .IIF    NB,,BLKB,       .BLKB   1
                                    0033                .IIF    NB,HP$B_DMF32S_FLAGS,   HP$B_DMF32S_FLAGS:
                                    0033                .IIF    NB,DMF32S$B_FLAGS,      DMF32S$B_FLAGS:
                          00000034  0033                .IIF    NB,,BLKB,       .BLKB   1
                                    0034                .IIF    NB,HP$B_DMF32S_BR,      HP$B_DMF32S_BR:
                                    0034                .IIF    NB,DMF32S$B_BR, DMF32S$B_BR:
                          00000035  0034                .IIF    NB,,BLKB,       .BLKB   1
                                    0035                .IIF    NB,HP$L_DMF32S_CSR,     HP$L_DMF32S_CSR:
                                    0035                .IIF    NB,DMF32S$L_CSR,        DMF32S$L_CSR:
                          00000039  0035                .IIF    NB,,BLKL,       .BLKL   1
                                    0039                .IIF    NB,HP$K_DMF32S_LEN,     HP$K_DMF32S_LEN:
                                    0039                .IIF    NB,DMF32S$K_LEN,        DMF32S$K_LEN:
                                00000C65                .RESTORE
                       53 32 33 46 4D 44 00' 0C65       .ASCIC  "DMF32S"            ; DMF32S name
                                06  0C65
                                39  0C6C                .BYTE   DMF32$K_LEN                 ; DMF32$K_LEN of resultant P-table
                                01  0C6D                .BYTE   1                   ; Maximum unit number                       ;G:65
                              4758  0C6E                .WORD   ^A"XG"  ; Two character mnemonic for QIO DMF32S XG
                                80  0C70                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                                8D  0C71                .Byte   Pd$_Name            ; Directive op-code
                                03  0C72                .Byte   Ptd$M_Device                ; Enforced XG codes
                             47 58 00' 0C73             .Ascic  "XG"    ; Enforced device name prefix
                                02  0C73
                                83  0C76                .BYTE   Pd$_Octal           ; Indicate scan octal
                          52 53 43 00' 0C77             .ASCIC  "CSR"   ; CSR string
                                03  0C77
                    0003FFFE 0003E000  0C7B             .LONG   ^O760000,^O777776           ; 760000 , 777776 limits on input
                                88  0C83                .BYTE   Pd$_Store           ; Indicate store operation
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                          0035  0C84                .WORD   DMF32S$L_CSR            ; Byte DMF32S$L_CSR to data
                            00  0C86                .BYTE   0                       ; 0 DMF32S$L_CSR to data
                            20  0C87                .BYTE   32                      ; 32 of data field
                            88  0C88                .BYTE   Pd$_Store               ; Indicate store operation
                          0018  0C89                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                            00  0C8B                .BYTE   0                       ; 0 HP$A_DEVICE to data
                            12  0C8C                .BYTE   18                      ; 18 of data field
                            83  0C8D                .BYTE   Pd$_Octal               ; Indicate scan octal
            72 6F 74 63 65 56 00' 0C8E              .ASCIC  "Vector"                ; Vector string
                            06  0C8E
               000001FE 00000002  0C95              .LONG   ^O2,^O776               ; 2 , 776 limits on input
                            88  0C9D                .BYTE   Pd$_Store               ; Indicate store operation
                          0024  0C9E                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                            00  0CA0                .BYTE   0                       ; 0 HP$W_VECTOR to data
                            09  0CA1                .BYTE   9                       ; 9 of data field
                            82  0CA2                .BYTE   Pd$_Decimal             ; Indicate scan decimal
                     52 42 00'  0CA3                .ASCIC  "BR"    ; BR string
                            02  0CA3
               00000007 00000004  0CA6              .LONG   4,7     ; 4 , 7 limits on input
                            88  0CAE                .BYTE   Pd$_Store               ; Indicate store operation
                          0034  0CAF                .WORD   DMF32S$B_BR             ; Byte DMF32S$B_BR to data
                            00  0CB1                .BYTE   0                       ; 0 DMF32S$B_BR to data
                            08  0CB2                .BYTE   8                       ; 8 of data field
                            85  0CB3                .BYTE   Pd$_String              ; Indicate scan and verify string
72 57 20 6C 61 6E 72 65 74 78 45 00' 0CB4           .ASCIC  "External Wrap" ; External Wrap string
                         70 61  0CC0
                            0D  0CB4
                  45 4E 4F 4E 00' 0CC2              .ASCIC  "NONE"
                            04  0CC2
               4D 45 44 4F 4D 00' 0CC7              .ASCIC  "MODEM"
                            05  0CC7
                  50 41 52 57 00' 0CCD              .ASCIC  "WRAP"
                            04  0CCD
                            00  0CD2                .BYTE   0                       ; Null length is end of valid NONE,MODEM,WRAP
                            88  0CD3                .BYTE   Pd$_Store               ; Indicate store operation
                          0033  0CD4                .WORD   DMF32S$B_FLAGS          ; Byte DMF32S$B_FLAGS to data
                            00  0CD6                .BYTE   0                       ; 0 DMF32S$B_FLAGS to data
                            02  0CD7                .BYTE   2                       ; 2 of data field
                            81  0CD8                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                                0CD9    695 DMP11:  $DS_DMP11
                                0CD9                .SAVE   LOCAL_BLOCK
                                0CD9                .PSECT  $ABS$,ABS
                      00000032  0050                .=HP$A_DEPENDENT
                                0032                .IIF    NB,DMP11$B_COMMON,      DMP11$B_COMMON:
                      00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                                0033                .IIF    NB,DMP11$B_FLAGS,       DMP11$B_FLAGS:
                      00000034  0033                .IIF    NB,.BLKB,       .BLKB   1
                                0034                .IIF    NB,DMP11$B_BR,  DMP11$B_BR:
                      00000035  0034                .IIF    NB,.BLKB,       .BLKB   1
                                0035                .IIF    NB,DMP11$L_CSR, DMP11$L_CSR:
                      00000039  0035                .IIF    NB,.BLKL,       .BLKL   1
                                0039                .IIF    NB,DMP11$K_LEN, DMP11$K_LEN:
                            0000CD9                 .RESTORE
            31 31 50 4D 44 00' 0CD9                 .ASCIC  "DMP11" ; DMP11 name
                            05  0CD9
                            39  0CDF                .BYTE   DMP11$K_LEN             ; DMP11$K_LEN of resultant P-table
                            00  0CE0                .BYTE   0                       ; Maximum unit number                   ;G:65
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                        4458  0CE1                .WORD   ^A"XD"  ; Two character mnemonic for QIO DMP11 XD
                          80  0CE3                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  0CE4                .Byte   Pd$_Name        ; Directive op-code
                          03  0CE5                .Byte   Ptd$M_Device            ; Enforced XD codes
                  44 58 00'   0CE6                .Ascic  "XD"    ; Enforced device name prefix
                          02  0CE6
                          83  0CE9                .BYTE   Pd$_Octal       ; Indicate scan octal
                52 53 43 00'  0CEA                .ASCIC  "CSR"   ; CSR string
                          03  0CEA
             0003FFFE 0003E000  0CEE                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                          88  0CF6                .BYTE   Pd$_Store       ; Indicate store operation
                        0035  0CF7                .WORD   DMP11$L_CSR             ; Byte DMP11$L_CSR to data
                          00  0CF9                .BYTE   0               ; 0 DMP11$L_CSR to data
                          20  0CFA                .BYTE   32              ; 32 of data field
                          88  0CFB                .BYTE   Pd$_Store       ; Indicate store operation
                        0018  0CFC                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                          00  0CFE                .BYTE   0               ; 0 HP$A_DEVICE to data
                          12  0CFF                .BYTE   18              ; 18 of data field
                          83  0D00                .BYTE   Pd$_Octal       ; Indicate scan octal
          52 4F 54 43 45 56 00' 0D01                .ASCIC  "VECTOR"        ; VECTOR string
                          06  0D01
             000001FE 00000002  0D08                .LONG   ^O2,^O776       ; 2 , 776 limits on input
                          88  0D10                .BYTE   Pd$_Store       ; Indicate store operation
                        0024  0D11                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                          00  0D13                .BYTE   0               ; 0 HP$W_VECTOR to data
                          09  0D14                .BYTE   9               ; 9 of data field
                          82  0D15                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                    52 42 00' 0D16                .ASCIC  "BR"    ; BR string
                          02  0D16
                 00000007 00000004  0D19                .LONG   4,7     ; 4 , 7 limits on input
                          88  0D21                .BYTE   Pd$_Store       ; Indicate store operation
                        0034  0D22                .WORD   DMP11$B_BR              ; Byte DMP11$B_BR to data
                          00  0D24                .BYTE   0               ; 0 DMP11$B_BR to data
                          08  0D25                .BYTE   8               ; 8 of data field
                          85  0D26                .BYTE   Pd$_String      ; Indicate scan and verify string
61 74 53 20 6C 6F 72 74 6E 6F 43 00' 0D27                .ASCIC  "Control Station"       ; Control Station string
                   6E 6F 69 74  0D33
                          0F  0D27
                       4F 4E 00' 0D37                .ASCIC  "NO"
                          02  0D37
                    53 45 59 00' 0D3A                .ASCIC  "YES"
                          03  0D3A
                          00  0D3E                .BYTE   0               ; Null length is end of valid NO,YES
                          88  0D3F                .BYTE   Pd$_Store       ; Indicate store operation
                        0033  0D40                .WORD   DMP11$B_FLAGS           ; Byte DMP11$B_FLAGS to data
                          00  0D42                .BYTE   0               ; 0 DMP11$B_FLAGS to data
                          01  0D43                .BYTE   1               ; 1 of data field
                          85  0D44                .BYTE   Pd$_String      ; Indicate scan and verify string
   79 72 61 74 75 62 69 72 54 00' 0D45                .ASCIC  "Tributary"     ; Tributary string
                          09  0D45
                       4F 4E 00' 0D4F                .ASCIC  "NO"
                          02  0D4F
                    53 45 59 00' 0D52                .ASCIC  "YES"
                          03  0D52
                          00  0D56                .BYTE   0               ; Null length is end of valid NO,YES
                          88  0D57                .BYTE   Pd$_Store       ; Indicate store operation
                        0033  0D58                .WORD   DMP11$B_FLAGS           ; Byte DMP11$B_FLAGS to data
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                                  01  0D5A          .BYTE   1                 ; 1 DMP11$B_FLAGS to data
                                  01  0D5B          .BYTE   1                 ; 1 of data field
                                  85  0D5C          .BYTE   Pd$_String        ; Indicate scan and verify string
69 6C 69 62 61 74 61 70 6D 6F 43 00' 0D5D          .ASCIC  "Compatability Mode"    ; Compatability Mode string
              65 64 6F 4D 20 79 74  0D69
                                  12  0D5D
                          4F 4E 00' 0D70          .ASCIC  "NO"
                                  02  0D70
                       53 45 59 00' 0D73          .ASCIC  "YES"
                                  03  0D73
                                  00  0D77          .BYTE   0                 ; Null length is end of valid NO,YES
                                  88  0D78          .BYTE   Pd$_Store         ; Indicate store operation
                                0033  0D79          .WORD   DMP11$B_FLAGS             ; Byte DMP11$B_FLAGS to data
                                  02  0D7B          .BYTE   2                 ; 2 DMP11$B_FLAGS to data
                                  01  0D7C          .BYTE   1                 ; 1 of data field
                                  85  0D7D          .BYTE   Pd$_String        ; Indicate scan and verify string
78 65 6C 70 75 44 20 66 6C 61 48 00' 0D7E          .ASCIC  "Half Duplex"     ; Half Duplex string
                                  0B  0D7E
                          4F 4E 00' 0D8A          .ASCIC  "NO"
                                  02  0D8A
                       53 45 59 00' 0D8D          .ASCIC  "YES"
                                  03  0D8D
                                  00  0D91          .BYTE   0                 ; Null length is end of valid NO,YES
                                  88  0D92          .BYTE   Pd$_Store         ; Indicate store operation
                                0033  0D93          .WORD   DMP11$B_FLAGS             ; Byte DMP11$B_FLAGS to data
                                  03  0D95          .BYTE   3                 ; 3 DMP11$B_FLAGS to data
                                  01  0D96          .BYTE   1                 ; 1 of data field
                                  86  0D97          .BYTE   Pd$_Literal       ; Indicate literal
                          00000001  0D98          .LONG   1                 ; Constant
                                  88  0D9C          .BYTE   Pd$_Store         ; Indicate store operation
                                0032  0D9D          .WORD   DMP11$B_COMMON            ; Byte DMP11$B_COMMON to data
                                  00  0D9F          .BYTE   0                 ; 0 DMP11$B_COMMON to data
                                  08  0DA0          .BYTE   8                 ; 8 of data field
                                  81  0DA1          .BYTE   Pd$_End           ; Indicate end of PT-descriptor
                                      0DA2   696 DMR11:  $DS_DMR11
                                      0DA2          .SAVE   LOCAL_BLOCK
                                      0DA2          .PSECT  $ABS$,ABS
                          00000032  0050          .=HP$A_DEPENDENT
                                      0032          .IIF    NB,DMR11$L_CSR, DMR11$L_CSR:
                          00000036  0032          .IIF    NB,.BLKL,       .BLKL   1
                                      0036          .IIF    NB,DMR11$B_BR,  DMR11$B_BR:
                          00000037  0036          .IIF    NB,.BLKB,       .BLKB   1
                                      0037          .IIF    NB,DMR11$K_LEN, DMR11$K_LEN:
                                00000DA2          .RESTORE
              31 31 52 4D 44 00' 0DA2          .ASCIC  "DMR11" ; DMR11 name
                                  05  0DA2
                                  37  0DA8          .BYTE   DMR11$K_LEN               ; DMR11$K_LEN of resultant P-table
                                  00  0DA9          .BYTE   0                 ; Maximum unit number                    ;G:65
                                4D58  0DAA          .WORD   ^A"XM"  ; Two character mnemonic for QIO DMR11 XM
                                  80  0DAC          .BYTE   Pd$_Start         ; Constant to identify start of descriptor
                                  8D  0DAD          .Byte   Pd$_Name          ; Directive op-code
                                  03  0DAE          .Byte   Ptd$M_Device              ; Enforced XM codes
                          4D 58 00' 0DAF          .Ascic  "XM"    ; Enforced device name prefix
                                  02  0DAF
                                  83  0DB2          .BYTE   Pd$_Octal         ; Indicate scan octal
                       52 53 43 00' 0DB3          .ASCIC  "CSR"   ; CSR string
                                  03  0DB3
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                0003FFFE 0003E000  0DB7                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                              88   0DBF                .BYTE   Pd$_Store        ; Indicate store operation
                            0032   0DC0                .WORD   DMR11$L_CSR                ; Byte DMR11$L_CSR to data
                              00   0DC2                .BYTE   0                ; 0 DMR11$L_CSR to data
                              20   0DC3                .BYTE   32               ; 32 of data field
                              88   0DC4                .BYTE   Pd$_Store        ; Indicate store operation
                            0018   0DC5                .WORD   HP$A_DEVICE                ; Byte HP$A_DEVICE to data
                              00   0DC7                .BYTE   0                ; 0 HP$A_DEVICE to data
                              12   0DC8                .BYTE   18               ; 18 of data field
                              83   0DC9                .BYTE   Pd$_Octal        ; Indicate scan octal
             52 4F 54 43 45 56 00'  0DCA                .ASCIC  "VECTOR"         ; VECTOR string
                              06   0DCA
                000001FE 00000002  0DD1                .LONG   ^O2,^O776        ; 2 , 776 limits on input
                              88   0DD9                .BYTE   Pd$_Store        ; Indicate store operation
                            0024   0DDA                .WORD   HP$W_VECTOR                ; Byte HP$W_VECTOR to data
                              00   0DDC                .BYTE   0                ; 0 HP$W_VECTOR to data
                              09   0DDD                .BYTE   9                ; 9 of data field
                              82   0DDE                .BYTE   Pd$_Decimal      ; Indicate scan decimal
                       52 42 00'  0DDF                .ASCIC  "BR"     ; BR string
                              02   0DDF
                00000007 00000004  0DE2                .LONG   4,7      ; 4 , 7 limits on input
                              88   0DEA                .BYTE   Pd$_Store        ; Indicate store operation
                            0036   0DEB                .WORD   DMR11$B_BR                 ; Byte DMR11$B_BR to data
                              00   0DED                .BYTE   0                ; 0 DMR11$B_BR to data
                              08   0DEE                .BYTE   8                ; 8 of data field
                              81   0DEF                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                                   0DF0    697 DMZ32:   $DS_DMZ32                                  ;       [45]
                                   0DF0                .SAVE   LOCAL_BLOCK
                                   0DF0                .PSECT  $ABS$,ABS
                           00000032  0050               .=HP$A_DEPENDENT
                                     0032               .IIF    NB,HP$B_DMZ32_BR,       HP$B_DMZ32_BR:
                           00000033  0032               .IIF    NB,.BLKB,       .BLKB   1
                                     0033               .IIF    NB,HP$B_DMZ32_OCTET0,   HP$B_DMZ32_OCTET0:
                           00000034  0033               .IIF    NB,.BLKB,       .BLKB   1
                                     0034               .IIF    NB,HP$B_DMZ32_OCTET1,   HP$B_DMZ32_OCTET1:
                           00000035  0034               .IIF    NB,.BLKB,       .BLKB   1
                                     0035               .IIF    NB,HP$B_DMZ32_OCTET2,   HP$B_DMZ32_OCTET2:
                           00000036  0035               .IIF    NB,.BLKB,       .BLKB   1
                                     0036               .IIF    NB,HP$B_DMZ32_SPEED,    HP$B_DMZ32_SPEED:
                           00000037  0036               .IIF    NB,.BLKB,       .BLKB   1
                                     0037               .IIF    NB,HP$W_DMZ32_LOOP,     HP$W_DMZ32_LOOP:
                           00000039  0037               .IIF    NB,.BLKW,       .BLKW   1
                                     0039               .IIF    NB,HP$B_DMZ32_MODEM,    HP$B_DMZ32_MODEM:
                           0000003A  0039               .IIF    NB,.BLKB,       .BLKB   1
                                     003A               .IIF    NB,HP$K_DMZ32_LEN,      HP$K_DMZ32_LEN:
                                00000DF0               .RESTORE
          32 33 5A 4D 44 00'  0DF0               .ASCIC  "DMZ32" ; DMZ32 name
                              05   0DF0
                              3A   0DF6               .BYTE   HP$K_DMZ32_LEN           ; HP$K_DMZ32_LEN of resultant P-table
                              00   0DF7               .BYTE   0                ; Maximum unit number                          ;G:65
                            0000   0DF8               .WORD   ^A""     ; Two character mnemonic for QIO DMZ32
                              80   0DFA               .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                              8D   0DFB               .Byte   Pd$_Name         ; Directive op-code
                              02   0DFC               .Byte   PTD$M_CONTROLLER                 ; Enforced TX codes
                       58 54 00'  0DFD               .Ascic  "TX"     ; Enforced device name prefix
                              02   0DFD
                              83   0E00               .BYTE   Pd$_Octal        ; Indicate scan octal
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                        52 53 43 00'  0E01                .ASCIC  "CSR"    ; CSR string
                                  03  0E01
                    0003FFFE 0003E000  0E05                .LONG   ^O760000,^O00777776      ; 760000 , 0777776 limits on input
                                  88  0E0D                .BYTE   Pd$_Store        ; Indicate store operation
                                0018  0E0E                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                                  00  0E10                .BYTE   0                ; 0 HP$A_DEVICE to data
                                  12  0E11                .BYTE   18               ; 18 of data field
                                  83  0E12                .BYTE   Pd$_Octal        ; Indicate scan octal
                  72 6F 74 63 65 56 00' 0E13              .ASCIC  "Vector"         ; Vector string
                                  06  0E13
                    000001FE 000000C0  0E1A               .LONG   ^O300,^O776      ; 300 , 776 limits on input
                                  88  0E22                .BYTE   Pd$_Store        ; Indicate store operation
                                0024  0E23                .WORD   HP$W_VECTOR              ; Byte HP$W_VECTOR to data
                                  00  0E25                .BYTE   0                ; 0 HP$W_VECTOR to data
                                  09  0E26                .BYTE   9                ; 9 of data field
                                  82  0E27                .BYTE   Pd$_Decimal      ; Indicate scan decimal
                              52 42 00' 0E28              .ASCIC  "BR"     ; BR string
                                  02  0E28
                    00000006 00000005  0E2B               .LONG   5,6      ; 5 , 6 limits on input
                                  88  0E33                .BYTE   Pd$_Store        ; Indicate store operation
                                0032  0E34                .WORD   HP$B_DMZ32_BR            ; Byte HP$B_DMZ32_BR to data
                                  00  0E36                .BYTE   0                ; 0 HP$B_DMZ32_BR to data
                                  08  0E37                .BYTE   8                ; 8 of data field
                                  83  0E38                .BYTE   Pd$_Octal        ; Indicate scan octal
20 53 45 4E 49 4C 20 54 53 45 54 00'  0E39               .ASCIC  "TEST LINES (OCTET0)"    ; TEST LINES (OCTET0) string
         29 30 54 45 54 43 4F 28  0E45
                                  13  0E39
                    000000FF 00000000  0E4D               .LONG   ^O00,^O0377      ; 0 , 377 limits on input
                                  88  0E55                .BYTE   Pd$_Store        ; Indicate store operation
                                0033  0E56                .WORD   HP$B_DMZ32_OCTET0                ; Byte HP$B_DMZ32_OCTET0 to data
                                  00  0E58                .BYTE   0                ; 0 HP$B_DMZ32_OCTET0 to data
                                  08  0E59                .BYTE   8                ; 8 of data field
                                  83  0E5A                .BYTE   Pd$_Octal        ; Indicate scan octal
4C 4E 4F 20 33 20 4C 45 56 45 4C 00'  0E5B               .ASCIC  "LEVEL 3 ONLY - TEST LINES (OCTET1)"     ; LEVEL 3 ONLY - TEST LINES
4E 49 4C 20 54 53 45 54 20 2D 20 59   0E67
   29 31 54 45 54 43 4F 28 20 53 45   0E73
                                  22  0E5B
                    000000FF 00000000  0E7E               .LONG   ^O00,^O0377      ; 0 , 377 limits on input
                                  88  0E86                .BYTE   Pd$_Store        ; Indicate store operation
                                0034  0E87                .WORD   HP$B_DMZ32_OCTET1                ; Byte HP$B_DMZ32_OCTET1 to data
                                  00  0E89                .BYTE   0                ; 0 HP$B_DMZ32_OCTET1 to data
                                  08  0E8A                .BYTE   8                ; 8 of data field
                                  83  0E8B                .BYTE   Pd$_Octal        ; Indicate scan octal
4C 4E 4F 20 33 20 4C 45 56 45 4C 00'  0E8C               .ASCIC  "LEVEL 3 ONLY - TEST LINES (OCTET2)"     ; LEVEL 3 ONLY - TEST LINES
4E 49 4C 20 54 53 45 54 20 2D 20 59   0E98
   29 32 54 45 54 43 4F 28 20 53 45   0EA4
                                  22  0E8C
                    000000FF 00000000  0EAF               .LONG   ^O00,^O0377      ; 0 , 377 limits on input
                                  88  0EB7                .BYTE   Pd$_Store        ; Indicate store operation
                                0035  0EB8                .WORD   HP$B_DMZ32_OCTET2                ; Byte HP$B_DMZ32_OCTET2 to data
                                  00  0EBA                .BYTE   0                ; 0 HP$B_DMZ32_OCTET2 to data
                                  08  0EBB                .BYTE   8                ; 8 of data field
                                  85  0EBC                .BYTE   Pd$_String       ; Indicate scan and verify string
                  65 74 61 52 20 64 75 61 42 00'  0EBD    .ASCIC  "Baud Rate"      ; Baud Rate string
                                  09  0EBD
                              30 35 00' 0EC7              .ASCIC  "50"
                                  02  0EC7
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                     35 37 00' 0ECA                .ASCIC  "75"
                           02  0ECA
                  30 31 31 00' 0ECD                .ASCIC  "110"
                           03  0ECD
               35 2E 34 33 31 00' 0ED1             .ASCIC  "134.5"
                           05  0ED1
                  30 35 31 00' 0ED7                .ASCIC  "150"
                           03  0ED7
                  30 30 33 00' 0EDB                .ASCIC  "300"
                           03  0EDB
                  30 30 36 00' 0EDF                .ASCIC  "600"
                           03  0EDF
               30 30 32 31 00' 0EE3                .ASCIC  "1200"
                           04  0EE3
               30 30 38 31 00' 0EE8                .ASCIC  "1800"
                           04  0EE8
               30 30 30 32 00' 0EED                .ASCIC  "2000"
                           04  0EED
               30 30 34 32 00' 0EF2                .ASCIC  "2400"
                           04  0EF2
               30 30 38 34 00' 0EF7                .ASCIC  "4800"
                           04  0EF7
               30 30 36 39 00' 0EFC                .ASCIC  "9600"
                           04  0EFC
            30 30 32 39 31 00' 0F01                .ASCIC  "19200"
                           05  0F01
                           00  0F07                .BYTE   0               ; Null length is end of valid 50,75,110,134.5,150,30
                           88  0F08                .BYTE   Pd$_Store       ; Indicate store operation
                         0036  0F09                .WORD   HP$B_DMZ32_SPEED                ; Byte HP$B_DMZ32_SPEED to data
                           00  0F0B                .BYTE   0               ; 0 HP$B_DMZ32_SPEED to data
                           08  0F0C                .BYTE   8               ; 8 of data field
                           85  0F0D                .BYTE   Pd$_String      ; Indicate scan and verify string
79 54 20 6B 63 61 62 70 6F 6F 4C 00' 0F0E          .ASCIC  "Loopback Type" ; Loopback Type string
                        65 70  0F1A
                           0D  0F0E
                        30 00' 0F1C                .ASCIC  "0"
                           01  0F1C
                        31 00' 0F1E                .ASCIC  "1"
                           01  0F1E
                        32 00' 0F20                .ASCIC  "2"
                           01  0F20
                        33 00' 0F22                .ASCIC  "3"
                           01  0F22
                        34 00' 0F24                .ASCIC  "4"
                           01  0F24
                        35 00' 0F26                .ASCIC  "5"
                           01  0F26
                        36 00' 0F28                .ASCIC  "6"
                           01  0F28
                        37 00' 0F2A                .ASCIC  "7"
                           01  0F2A
                        38 00' 0F2C                .ASCIC  "8"
                           01  0F2C
                           00  0F2E                .BYTE   0               ; Null length is end of valid 0,1,2,3,4,5,6,7,8
                           88  0F2F                .BYTE   Pd$_Store       ; Indicate store operation
                         0037  0F30                .WORD   HP$W_DMZ32_LOOP         ; Byte HP$W_DMZ32_LOOP to data
                           00  0F32                .BYTE   0               ; 0 HP$W_DMZ32_LOOP to data
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                                05  0F33                .BYTE   5                   ; 5 of data field
                                8B  0F34                .BYTE   Pd$_Logical         ; Indicate logical value operation
72 74 6E 6F 43 20 6D 65 64 6F 4D 00' 0F35               .ASCIC  \Modem Control\     ; Modem Control string
                              6C 6F  0F41
                                0D  0F35
                                88  0F43                .BYTE   Pd$_Store           ; Indicate store operation
                              0039  0F44                .WORD   HP$B_DMZ32_MODEM                    ; Byte HP$B_DMZ32_MODEM to data
                                00  0F46                .BYTE   0                   ; 0 HP$B_DMZ32_MODEM to data
                                02  0F47                .BYTE   2                   ; 2 of data field
                                86  0F48                .BYTE   Pd$_Literal         ; Indicate literal
                          00000001  0F49                .LONG   1                   ; Constant
                                81  0F4D                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                                    0F4E    698 DRB32:  $DS_DRB32                                   ;       [74][81]                ;G:33
                                    0F4E                .SAVE   LOCAL_BLOCK
                                    0F4E                .PSECT  $ABS$,ABS
                          00000032  0050                .=HP$A_DEPENDENT
                                    0032                .IIF    NB,DRB32$B_node_id,     DRB32$B_node_id:
                          00000033  0032                .IIF    NB,.BLKB,           .BLKB   1
                                    0033                .IIF    NB,DRB32$B_BR,  DRB32$B_BR:
                          00000034  0033                .IIF    NB,.BLKB,           .BLKB   1
                                    0034                .IIF    NB,DRB32$K_LEN, DRB32$K_LEN:
                                00000F4E                .RESTORE
                  32 33 42 52 44 00' 0F4E               .ASCIC  "DRB32" ; DRB32 name
                                05  0F4E
                                34  0F54                .BYTE   DRB32$K_LEN                 ; DRB32$K_LEN of resultant P-table
                                10  0F55                .BYTE   16                  ; Maximum unit number                           ;G:65
                              0000  0F56                .WORD   ^A""    ; Two character mnemonic for QIO DRB32
                                80  0F58                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                                8D  0F59                .Byte   Pd$_Name            ; Directive op-code
                                01  0F5A                .Byte   PTD$M_UNIT                  ; Enforced UQ codes
                          51 55 00' 0F5B                .Ascic  "UQ"    ; Enforced device name prefix
                                02  0F5B
                                87  0F5E                .BYTE   Pd$_Fetch           ; Indicate fetch operation
                              0018  0F5F                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                                19  0F61                .BYTE   25                  ; 25 HP$A_DEVICE to data
                                07  0F62                .BYTE   7                   ; 7 of data field
                                8C  0F63                .BYTE   Pd$_Case            ; Indicate case operation
                                01  0F64                .BYTE   $$_$                ; Count of pairs
                  00000030 00000000  0F65                .LONG   0,^X30              ; Store the pair
                                88  0F6D                .BYTE   Pd$_Store           ; Indicate store operation
                              0018  0F6E                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                                19  0F70                .BYTE   25                  ; 25 HP$A_DEVICE to data
                                07  0F71                .BYTE   7                   ; 7 of data field
                                84  0F72                .BYTE   Pd$_Hexadecimal     ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00' 0F73               .ASCIC  "BI Node Number (HEX)"  ; BI Node Number (HEX) string
         29 58 45 48 28 20 72 65 62  0F7F
                                14  0F73
                  0000000F 00000000  0F88                .LONG   ^X0,^XF ; 0 , F limits on input
                                88  0F90                .BYTE   Pd$_Store           ; Indicate store operation
                              0032  0F91                .WORD   DRB32$B_NODE_ID             ; Byte DRB32$B_NODE_ID to data
                                00  0F93                .BYTE   0                   ; 0 DRB32$B_NODE_ID to data
                                08  0F94                .BYTE   8                   ; 8 of data field
                                88  0F95                .BYTE   Pd$_Store           ; Indicate store operation
                              0018  0F96                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                                0D  0F98                .BYTE   13                  ; 13 HP$A_DEVICE to data
                                04  0F99                .BYTE   4                   ; 4 of data field
                                88  0F9A                .BYTE   Pd$_Store           ; Indicate store operation
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                      0024  0F9B                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                        02  0F9D                .BYTE   2                 ; 2 HP$W_VECTOR to data
                        04  0F9E                .BYTE   4                 ; 4 of data field
                        82  0F9F                .BYTE   Pd$_Decimal       ; Indicate scan decimal
                 52 42 00'  0FA0                .ASCIC  "BR"      ; BR string
                        02  0FA0
            00000007 00000004  0FA3             .LONG   4,7       ; 4 , 7 limits on input
                        88  0FAB                .BYTE   Pd$_Store         ; Indicate store operation
                      0033  0FAC                .WORD   DRB32$B_BR                ; Byte DRB32$B_BR to data
                        00  0FAE                .BYTE   0                 ; 0 DRB32$B_BR to data
                        08  0FAF                .BYTE   8                 ; 8 of data field
                        88  0FB0                .BYTE   Pd$_Store         ; Indicate store operation
                      0024  0FB1                .WORD   HP$W_VECTOR               ; Byte HP$W_VECTOR to data
                        06  0FB3                .BYTE   6                 ; 6 HP$W_VECTOR to data
                        03  0FB4                .BYTE   3                 ; 3 of data field
                        81  0FB5                .BYTE   Pd$_End           ; Indicate end of PT-descriptor
                            0FB6    699 DR11B:  $DS_DR11B
                            0FB6                .SAVE   LOCAL_BLOCK
                            0FB6                .PSECT  $ABS$,ABS
                      00000032  0050            .=HP$A_DEPENDENT
                            0032                .IIF    NB,DR11B$L_CSR, DR11B$L_CSR:
                      00000036  0032            .IIF    NB,.BLKL,       .BLKL   1
                            0036                .IIF    NB,DR11B$B_BR,  DR11B$B_BR:
                      00000037  0036            .IIF    NB,.BLKB,       .BLKB   1
                            0037                .IIF    NB,DR11B$K_LEN, DR11B$K_LEN:
                        00000FB6                .RESTORE
                 42 31 31 52 44 00' 0FB6        .ASCIC  "DR11B" ; DR11B name
                        05  0FB6
                        37  0FBC                .BYTE   DR11B$K_LEN               ; DR11B$K_LEN of resultant P-table
                        00  0FBD                .BYTE   0                 ; Maximum unit number                          ;G:65
                      0000  0FBE                .WORD   ^A""      ; Two character mnemonic for QIO DR11B
                        80  0FC0                .BYTE   Pd$_Start         ; Constant to identify start of descriptor
                        8D  0FC1                .Byte   Pd$_Name          ; Directive op-code
                        03  0FC2                .Byte   Ptd$M_Device              ; Enforced XB codes
                 42 58 00'  0FC3                .Ascic  "XB"      ; Enforced device name prefix
                        02  0FC3
                        83  0FC6                .BYTE   Pd$_Octal         ; Indicate scan octal
              52 53 43 00'  0FC7                .ASCIC  "CSR"     ; CSR string
                        03  0FC7
            0003FFFE 0003E000  0FCB             .LONG   ^O760000,^O777776         ; 760000 , 777776 limits on input
                        88  0FD3                .BYTE   Pd$_Store         ; Indicate store operation
                      0032  0FD4                .WORD   DR11B$L_CSR               ; Byte DR11B$L_CSR to data
                        00  0FD6                .BYTE   0                 ; 0 DR11B$L_CSR to data
                        20  0FD7                .BYTE   32                ; 32 of data field
                        88  0FD8                .BYTE   Pd$_Store         ; Indicate store operation
                      0018  0FD9                .WORD   HP$A_DEVICE               ; Byte HP$A_DEVICE to data
                        00  0FDB                .BYTE   0                 ; 0 HP$A_DEVICE to data
                        12  0FDC                .BYTE   18                ; 18 of data field
                        83  0FDD                .BYTE   Pd$_Octal         ; Indicate scan octal
        52 4F 54 43 45 56 00'  0FDE             .ASCIC  "VECTOR"          ; VECTOR string
                        06  0FDE
            000001FE 00000002  0FE5             .LONG   ^O2,^O776         ; 2 , 776 limits on input
                        88  0FED                .BYTE   Pd$_Store         ; Indicate store operation
                      0024  0FEE                .WORD   HP$W_VECTOR               ; Byte HP$W_VECTOR to data
                        00  0FF0                .BYTE   0                 ; 0 HP$W_VECTOR to data
                        09  0FF1                .BYTE   9                 ; 9 of data field
                        82  0FF2                .BYTE   Pd$_Decimal       ; Indicate scan decimal
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                    52 42 00' 0FF3                  .ASCIC  "BR"    ; BR string
                       02  0FF3
              00000007 00000004  0FF6                .LONG   4,7     ; 4 , 7 limits on input
                       88  0FFE                     .BYTE   Pd$_Store       ; Indicate store operation
                     0036  0FFF                     .WORD   DR11B$B_BR              ; Byte DR11B$B_BR to data
                       00  1001                     .BYTE   0               ; 0 DR11B$B_BR to data
                       08  1002                     .BYTE   8               ; 8 of data field
                       81  1003                     .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                           1004   700 DR11C:  $DS_DR11C                                ;       [56]
                           1004               .SAVE   LOCAL_BLOCK
                           1004               .PSECT  $ABS$,ABS
                  00000032  0050               .=HP$A_DEPENDENT
                            0032               .IIF    NB,HP$B_DR11C_BR,       HP$B_DR11C_BR:
                  00000033  0032               .IIF    NB,.BLKB,       .BLKB   1
                            0033               .IIF    NB,HP$K_DR11C_LEN,      HP$K_DR11C_LEN:
                      00001004                 .RESTORE
              43 31 31 52 44 00' 1004          .ASCIC  "DR11C" ; DR11C name
                       05  1004
                       33  100A                .BYTE   HP$K_DR11C_LEN          ; HP$K_DR11C_LEN of resultant P-table
                       00  100B                .BYTE   0               ; Maximum unit number                   ;G:65
                     414F  100C                .WORD   ^A"OA"  ; Two character mnemonic for QIO DR11C OA
                       80  100E                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  100F                .Byte   Pd$_Name        ; Directive op-code
                       02  1010                .Byte   Ptd$M_Controller                ; Enforced OA codes
                    41 4F 00' 1011             .Ascic  "OA"    ; Enforced device name prefix
                       02  1011
                       83  1014                .BYTE   Pd$_Octal       ; Indicate scan octal
                 52 53 43 00' 1015             .ASCIC  "CSR"   ; CSR string
                       03  1015
              0003FFFE 0003E000  1019           .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                       88  1021                .BYTE   Pd$_Store       ; Indicate store operation
                     0018  1022                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                       00  1024                .BYTE   0               ; 0 HP$A_DEVICE to data
                       12  1025                .BYTE   18              ; 18 of data field
                       83  1026                .BYTE   Pd$_Octal       ; Indicate scan octal
        52 4F 54 43 45 56 00' 1027             .ASCIC  "VECTOR"        ; VECTOR string
                       06  1027
              000001FE 00000000  102E           .LONG   ^O0,^O776       ; 0 , 776 limits on input
                       88  1036                .BYTE   Pd$_Store       ; Indicate store operation
                     0024  1037                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                       00  1039                .BYTE   0               ; 0 HP$W_VECTOR to data
                       10  103A                .BYTE   16              ; 16 of data field
                       82  103B                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                    52 42 00' 103C             .ASCIC  "BR"    ; BR string
                       02  103C
              00000007 00000004  103F           .LONG   4,7     ; 4 , 7 limits on input
                       88  1047                .BYTE   Pd$_Store       ; Indicate store operation
                     0032  1048                .WORD   HP$B_DR11C_BR            ; Byte HP$B_DR11C_BR to data
                       00  104A                .BYTE   0               ; 0 HP$B_DR11C_BR to data
                       08  104B                .BYTE   8               ; 8 of data field
                       81  104C                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                           104D   701 DR11K:  $DS_DR11K
                           104D               .SAVE   LOCAL_BLOCK
                           104D               .PSECT  $ABS$,ABS
                  00000032  0050               .=HP$A_DEPENDENT
                            0032               .IIF    NB,DR11K$B_BR,  DR11K$B_BR:
                  00000033  0032               .IIF    NB,.BLKB,       .BLKB   1
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                            0033                .IIF    NB,DR11K$K_LEN, DR11K$K_LEN:
                        0000104D                .RESTORE
                4B 31 31 52 44 00' 104D         .ASCIC  "DR11K" ; DR11K name
                            05  104D
                            33  1053            .BYTE   DR11K$K_LEN             ; DR11K$K_LEN of resultant P-table
                            06  1054            .BYTE   6                       ; Maximum unit number                       ;G:65
                          0000  1055            .WORD   ^A""    ; Two character mnemonic for QIO DR11K
                            80  1057            .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                            8D  1058            .Byte   Pd$_Name        ; Directive op-code
                            03  1059            .Byte   Ptd$M_Device            ; Enforced XR codes
                       52 58 00' 105A           .Ascic  "XR"    ; Enforced device name prefix
                            02  105A
                            83  105D            .BYTE   Pd$_Octal       ; Indicate scan octal
52 53 43 20 53 55 42 20 4F 2F 49 00' 105E       .ASCIC  "I/O BUS CSR"   ; I/O BUS CSR string
                            0B  105E
                0003FFFE 0003E000   106A        .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                            88  1072            .BYTE   Pd$_Store       ; Indicate store operation
                          0018  1073            .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                            00  1075            .BYTE   0               ; 0 HP$A_DEVICE to data
                            12  1076            .BYTE   18              ; 18 of data field
                            83  1077            .BYTE   Pd$_Octal       ; Indicate scan octal
             52 4F 54 43 45 56 00' 1078         .ASCIC  "VECTOR"        ; VECTOR string
                            06  1078
                000001FE 00000002   107F        .LONG   ^O2,^O776       ; 2 , 776 limits on input
                            88  1087            .BYTE   Pd$_Store       ; Indicate store operation
                          0024  1088            .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                            00  108A            .BYTE   0               ; 0 HP$W_VECTOR to data
                            09  108B            .BYTE   9               ; 9 of data field
                            82  108C            .BYTE   Pd$_Decimal     ; Indicate scan decimal
                       52 42 00' 108D           .ASCIC  "BR"    ; BR string
                            02  108D
                00000007 00000004   1090        .LONG   4,7     ; 4 , 7 limits on input
                            88  1098            .BYTE   Pd$_Store       ; Indicate store operation
                          0032  1099            .WORD   DR11K$B_BR              ; Byte DR11K$B_BR to data
                            00  109B            .BYTE   0               ; 0 DR11K$B_BR to data
                            08  109C            .BYTE   8               ; 8 of data field
                            81  109D            .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                109E    702 DR11W:  $DS_DR11W
                                109E            .SAVE   LOCAL_BLOCK
                                109E            .PSECT  $ABS$,ABS
                        00000032    0050        .=HP$A_DEPENDENT
                                0032            .IIF    NB,DR11W$L_CSR, DR11W$L_CSR:
                        00000036    0032        .IIF    NB,.BLKL,       .BLKL   1
                                0036            .IIF    NB,DR11W$B_BR,  DR11W$B_BR:
                        00000037    0036        .IIF    NB,.BLKB,       .BLKB   1
                                0037            .IIF    NB,DR11W$K_LEN, DR11W$K_LEN:
                            0000109E            .RESTORE
                57 31 31 52 44 00' 109E         .ASCIC  "DR11W" ; DR11W name
                            05  109E
                            37  10A4            .BYTE   DR11W$K_LEN             ; DR11W$K_LEN of resultant P-table
                            00  10A5            .BYTE   0                       ; Maximum unit number                       ;G:65
                          4158  10A6            .WORD   ^A"XA"  ; Two character mnemonic for QIO DR11W XA
                            80  10A8            .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                            8D  10A9            .Byte   Pd$_Name        ; Directive op-code
                            03  10AA            .Byte   Ptd$M_Device            ; Enforced XA codes
                       41 58 00' 10AB           .Ascic  "XA"    ; Enforced device name prefix
                            02  10AB
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                      83  10AE                .BYTE   Pd$_Octal       ; Indicate scan octal
                52 53 43 00' 10AF             .ASCIC  "CSR"    ; CSR string
                      03  10AF
            0003FFFE 0003E000  10B3             .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  10BB                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  10BC                .WORD   DR11W$L_CSR             ; Byte DR11W$L_CSR to data
                      00  10BE                .BYTE   0               ; 0 DR11W$L_CSR to data
                      20  10BF                .BYTE   32              ; 32 of data field
                      88  10C0                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  10C1                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  10C3                .BYTE   0               ; 0 HP$A_DEVICE to data
                      12  10C4                .BYTE   18              ; 18 of data field
                      83  10C5                .BYTE   Pd$_Octal       ; Indicate scan octal
         52 4F 54 43 45 56 00' 10C6           .ASCIC  "VECTOR"        ; VECTOR string
                      06  10C6
            000001FE 00000002  10CD             .LONG   ^O2,^O776       ; 2 , 776 limits on input
                      88  10D5                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  10D6                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  10D8                .BYTE   0               ; 0 HP$W_VECTOR to data
                      09  10D9                .BYTE   9               ; 9 of data field
                      82  10DA                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 42 00' 10DB                .ASCIC  "BR"     ; BR string
                      02  10DB
            00000007 00000004  10DE             .LONG   4,7     ; 4 , 7 limits on input
                      88  10E6                .BYTE   Pd$_Store       ; Indicate store operation
                    0036  10E7                .WORD   DR11W$B_BR              ; Byte DR11W$B_BR to data
                      00  10E9                .BYTE   0               ; 0 DR11W$B_BR to data
                      08  10EA                .BYTE   8               ; 8 of data field
                      81  10EB                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          10EC    703 DR750:    $DS_DR750
                          10EC                .SAVE   LOCAL_BLOCK
                          10EC                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,DR750$B_SLOT,        DR750$B_SLOT:
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,DR750$B_BR,  DR750$B_BR:
                00000034  0033                .IIF    NB,.BLKB,       .BLKB   1
                          0034                .IIF    NB,DR750$B_SELF,        DR750$B_SELF:
                00000035  0034                .IIF    NB,.BLKB,       .BLKB   1
                          0035                .IIF    NB,DR750$B_CONFIG,      DR750$B_CONFIG:
                00000036  0035                .IIF    NB,.BLKB,       .BLKB   1
                          0036                .IIF    NB,DR750$B_UUT, DR750$B_UUT:
                00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                          0037                .IIF    NB,DR750$K_LEN, DR750$K_LEN:
                      000010EC                .RESTORE
      30 35 37 52 44 00' 10EC                .ASCIC  "DR750" ; DR750 name
                      05  10EC
                      37  10F2                .BYTE   DR750$K_LEN             ; DR750$K_LEN of resultant P-table
                      FF  10F3                .BYTE   255             ; Maximum unit number                   ;G:65
                    4658  10F4                .WORD   ^A"XF"  ; Two character mnemonic for QIO DR750 XF
                      80  10F6                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  10F7                .Byte   Pd$_Name        ; Directive op-code
                      03  10F8                .Byte   Ptd$M_Device            ; Enforced XF codes
                46 58 00' 10F9                .Ascic  "XF"    ; Enforced device name prefix
                      02  10F9
                      86  10FC                .BYTE   Pd$_Literal     ; Indicate literal
                40F30000  10FD                .LONG   ^X40F30000              ; Constant
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                      88  1101                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  1102                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                      00  1104                .BYTE   0                ; 0 HP$A_DEVICE to data
                      20  1105                .BYTE   32               ; 32 of data field
                      82  1106                .BYTE   Pd$_Decimal      ; Indicate scan decimal
           54 4F 4C 53 00' 1107                .ASCIC  "SLOT"  ; SLOT string
                      04  1107
         0000000F 0000000A  110C                .LONG   10,15    ; 10 , 15 limits on input
                      88  1114                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  1115                .WORD   DR750$B_SLOT             ; Byte DR750$B_SLOT to data
                      00  1117                .BYTE   0                ; 0 DR750$B_SLOT to data
                      08  1118                .BYTE   8                ; 8 of data field
                      88  1119                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  111A                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                      0D  111C                .BYTE   13               ; 13 HP$A_DEVICE to data
                      04  111D                .BYTE   4                ; 4 of data field
                      88  111E                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  111F                .WORD   HP$W_VECTOR              ; Byte HP$W_VECTOR to data
                      02  1121                .BYTE   2                ; 2 HP$W_VECTOR to data
                      04  1122                .BYTE   4                ; 4 of data field
                      82  1123                .BYTE   Pd$_Decimal      ; Indicate scan decimal
                 52 42 00' 1124                .ASCIC  "BR"     ; BR string
                      02  1124
         00000007 00000004  1127                .LONG   4,7      ; 4 , 7 limits on input
                      88  112F                .BYTE   Pd$_Store       ; Indicate store operation
                    0033  1130                .WORD   DR750$B_BR               ; Byte DR750$B_BR to data
                      00  1132                .BYTE   0                ; 0 DR750$B_BR to data
                      08  1133                .BYTE   8                ; 8 of data field
                      88  1134                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  1135                .WORD   HP$W_VECTOR              ; Byte HP$W_VECTOR to data
                      06  1137                .BYTE   6                ; 6 HP$W_VECTOR to data
                      03  1138                .BYTE   3                ; 3 of data field
                      8B  1139                .BYTE   Pd$_Logical      ; Indicate logical value operation
   54 53 45 54 20 46 4C 45 53 00' 113A                .ASCIC  \SELF TEST\      ; SELF TEST string
                      09  113A
                      88  1144                .BYTE   Pd$_Store       ; Indicate store operation
                    0034  1145                .WORD   DR750$B_SELF             ; Byte DR750$B_SELF to data
                      00  1147                .BYTE   0                ; 0 DR750$B_SELF to data
                      08  1148                .BYTE   8                ; 8 of data field
                      85  1149                .BYTE   Pd$_String       ; Indicate scan and verify string
47 49 46 4E 4F 43 20 54 53 45 54 00' 114A                .ASCIC  "TEST CONFIG"    ; TEST CONFIG string
                      0B  114A
                55 50 43 31 00' 1156                .ASCIC  "1CPU"
                      04  1156
                55 50 43 32 00' 115B                .ASCIC  "2CPU"
                      04  115B
                      00  1160                .BYTE   0                ; Null length is end of valid 1CPU,2CPU
                      88  1161                .BYTE   Pd$_Store       ; Indicate store operation
                    0035  1162                .WORD   DR750$B_CONFIG            ; Byte DR750$B_CONFIG to data
                      00  1164                .BYTE   0                ; 0 DR750$B_CONFIG to data
                      08  1165                .BYTE   8                ; 8 of data field
                      8B  1166                .BYTE   Pd$_Logical      ; Indicate logical value operation
   54 49 4E 55 20 54 53 45 54 00' 1167                .ASCIC  \TEST UNIT\      ; TEST UNIT string
                      09  1167
                      88  1171                .BYTE   Pd$_Store       ; Indicate store operation
                    0036  1172                .WORD   DR750$B_UUT              ; Byte DR750$B_UUT to data
                      00  1174                .BYTE   0                ; 0 DR750$B_UUT to data
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                      08  1175                .BYTE   8                       ; 8 of data field
                      81  1176                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          1177    704 DR780:  $DS_DR780
                          1177                .SAVE   LOCAL_BLOCK
                          1177                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,DR780$B_TR,  DR780$B_TR:
                 00000033 0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,DR780$B_BR,  DR780$B_BR:
                 00000034 0033                .IIF    NB,.BLKB,       .BLKB   1
                          0034                .IIF    NB,DR780$B_SELF,        DR780$B_SELF:
                 00000035 0034                .IIF    NB,.BLKB,       .BLKB   1
                          0035                .IIF    NB,DR780$B_CONFIG,      DR780$B_CONFIG:
                 00000036 0035                .IIF    NB,.BLKB,       .BLKB   1
                          0036                .IIF    NB,DR780$B_UUT, DR780$B_UUT:
                 00000037 0036                .IIF    NB,.BLKB,       .BLKB   1
                          0037                .IIF    NB,DR780$K_LEN, DR780$K_LEN:
                       00001177               .RESTORE
           30 38 37 52 44 00' 1177             .ASCIC  "DR780" ; DR780 name
                      05  1177
                      37  117D                .BYTE   DR780$K_LEN             ; DR780$K_LEN of resultant P-table
                      FF  117E                .BYTE   255             ; Maximum unit number                   ;G:65
                    4658  117F                .WORD   ^A"XF"  ; Two character mnemonic for QIO DR780 XF
                      80  1181                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1182                .Byte   Pd$_Name        ; Directive op-code
                      03  1183                .Byte   Ptd$M_Device            ; Enforced XF codes
                 46 58 00' 1184               .Ascic  "XF"    ; Enforced device name prefix
                      02  1184
                      82  1187                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                 52 54 00' 1188               .ASCIC  "TR"    ; TR string
                      02  1188
           0000000F 00000001  118B            .LONG   1,15    ; 1 , 15 limits on input
                      88  1193                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  1194                .WORD   DR780$B_TR              ; Byte DR780$B_TR to data
                      00  1196                .BYTE   0               ; 0 DR780$B_TR to data
                      08  1197                .BYTE   8               ; 8 of data field
                      88  1198                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  1199                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      0D  119B                .BYTE   13              ; 13 HP$A_DEVICE to data
                      04  119C                .BYTE   4               ; 4 of data field
                      88  119D                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  119E                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      02  11A0                .BYTE   2               ; 2 HP$W_VECTOR to data
                      04  11A1                .BYTE   4               ; 4 of data field
                      82  11A2                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                 52 42 00' 11A3               .ASCIC  "BR"    ; BR string
                      02  11A3
           00000007 00000004  11A6            .LONG   4,7     ; 4 , 7 limits on input
                      88  11AE                .BYTE   Pd$_Store       ; Indicate store operation
                    0033  11AF                .WORD   DR780$B_BR              ; Byte DR780$B_BR to data
                      00  11B1                .BYTE   0               ; 0 DR780$B_BR to data
                      08  11B2                .BYTE   8               ; 8 of data field
                      88  11B3                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  11B4                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      06  11B6                .BYTE   6               ; 6 HP$W_VECTOR to data
                      02  11B7                .BYTE   2               ; 2 of data field
                      86  11B8                .BYTE   Pd$_Literal     ; Indicate literal
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                    00000006  11B9                .LONG   6                       ; Constant
                          88  11BD                .BYTE   Pd$_Store               ; Indicate store operation
                        0018  11BE                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                          1C  11C0                .BYTE   28                      ; 28 HP$A_DEVICE to data
                          04  11C1                .BYTE   4                       ; 4 of data field
                          86  11C2                .BYTE   Pd$_Literal             ; Indicate literal
                    00000001  11C3                .LONG   1                       ; Constant
                          88  11C7                .BYTE   Pd$_Store               ; Indicate store operation
                        0024  11C8                .WORD   HP$W_VECTOR                     ; Byte HP$W_VECTOR to data
                          08  11CA                .BYTE   8                       ; 8 HP$W_VECTOR to data
                          01  11CB                .BYTE   1                       ; 1 of data field
                          8B  11CC                .BYTE   Pd$_Logical             ; Indicate logical value operation
 54 53 45 54 20 46 4C 45 53 00' 11CD                .ASCIC  \SELF TEST\             ; SELF TEST string
                          09  11CD
                          88  11D7                .BYTE   Pd$_Store               ; Indicate store operation
                        0034  11D8                .WORD   DR780$B_SELF                    ; Byte DR780$B_SELF to data
                          00  11DA                .BYTE   0                       ; 0 DR780$B_SELF to data
                          08  11DB                .BYTE   8                       ; 8 of data field
                          85  11DC                .BYTE   Pd$_String              ; Indicate scan and verify string
47 49 46 4E 4F 43 20 54 53 45 54 00' 11DD          .ASCIC  "TEST CONFIG"           ; TEST CONFIG string
                          0B  11DD
                55 50 43 31 00' 11E9          .ASCIC  "1CPU"
                          04  11E9
                55 50 43 32 00' 11EE          .ASCIC  "2CPU"
                          04  11EE
                          00  11F3                .BYTE   0                       ; Null length is end of valid 1CPU,2CPU
                          88  11F4                .BYTE   Pd$_Store               ; Indicate store operation
                        0035  11F5                .WORD   DR780$B_CONFIG                  ; Byte DR780$B_CONFIG to data
                          00  11F7                .BYTE   0                       ; 0 DR780$B_CONFIG to data
                          08  11F8                .BYTE   8                       ; 8 of data field
                          8B  11F9                .BYTE   Pd$_Logical             ; Indicate logical value operation
 54 49 4E 55 20 54 53 45 54 00' 11FA                .ASCIC  \TEST UNIT\             ; TEST UNIT string
                          09  11FA
                          88  1204                .BYTE   Pd$_Store               ; Indicate store operation
                        0036  1205                .WORD   DR780$B_UUT                     ; Byte DR780$B_UUT to data
                          00  1207                .BYTE   0                       ; 0 DR780$B_UUT to data
                          08  1208                .BYTE   8                       ; 8 of data field
                          81  1209                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                              120A    705 DUP11:  $DS_DUP11
                              120A                .SAVE   LOCAL_BLOCK
                              120A                .PSECT  $ABS$,ABS
                    00000032  0050                .=HP$A_DEPENDENT
                              0032                .IIF    NB,DUP11$L_CSR, DUP11$L_CSR:
                    00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                              0036                .IIF    NB,DUP11$B_BR,  DUP11$B_BR:
                    00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                              0037                .IIF    NB,DUP11$K_LEN, DUP11$K_LEN:
                          0000120A                .RESTORE
              31 31 50 55 44 00' 120A             .ASCIC  "DUP11" ; DUP11 name
                          05  120A
                          37  1210                .BYTE   DUP11$K_LEN             ; DUP11$K_LEN of resultant P-table
                          00  1211                .BYTE   0                       ; Maximum unit number                   ;G:65
                        0000  1212                .WORD   ^A""    ; Two character mnemonic for QIO DUP11
                          80  1214                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                          8D  1215                .Byte   Pd$_Name                ; Directive op-code
                          03  1216                .Byte   Ptd$M_Device                    ; Enforced XW codes
                    57 58 00' 1217                .Ascic  "XW"    ; Enforced device name prefix
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                      02  1217
                      83  121A                .BYTE   Pd$_Octal       ; Indicate scan octal
                52 53 43 00' 121B             .ASCIC  "CSR"    ; CSR string
                      03  121B
           0003FFFE 0003E000  121F             .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  1227                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  1228                .WORD   DUP11$L_CSR             ; Byte DUP11$L_CSR to data
                      00  122A                .BYTE   0               ; 0 DUP11$L_CSR to data
                      20  122B                .BYTE   32              ; 32 of data field
                      88  122C                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  122D                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  122F                .BYTE   0               ; 0 HP$A_DEVICE to data
                      12  1230                .BYTE   18              ; 18 of data field
                      83  1231                .BYTE   Pd$_Octal       ; Indicate scan octal
          52 4F 54 43 45 56 00' 1232          .ASCIC  "VECTOR"        ; VECTOR string
                      06  1232
           000001FE 00000002  1239            .LONG   ^O2,^O776       ; 2 , 776 limits on input
                      88  1241                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  1242                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  1244                .BYTE   0               ; 0 HP$W_VECTOR to data
                      09  1245                .BYTE   9               ; 9 of data field
                      82  1246                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 42 00' 1247                .ASCIC  "BR"     ; BR string
                      02  1247
           00000007 00000004  124A            .LONG   4,7     ; 4 , 7 limits on input
                      88  1252                .BYTE   Pd$_Store       ; Indicate store operation
                    0036  1253                .WORD   DUP11$B_BR              ; Byte DUP11$B_BR to data
                      00  1255                .BYTE   0               ; 0 DUP11$B_BR to data
                      08  1256                .BYTE   8               ; 8 of data field
                      81  1257                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1258    706 DW730:  $DS_DW730                               ;       [16]
                          1258                .SAVE   LOCAL_BLOCK
                          1258                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,DW730$K_LEN, DW730$K_LEN:
                      0000125B                .RESTORE
          30 33 37 57 44 00' 1258             .ASCIC  "DW730" ; DW730 name
                      05  1258
                      32  125E                .BYTE   DW730$K_LEN             ; DW730$K_LEN of resultant P-table
                      01  125F                .BYTE   1               ; Maximum unit number                   ;G:65
                    0000  1260                .WORD   ^A""    ; Two character mnemonic for QIO DW730
                      80  1262                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1263                .Byte   Pd$_Name        ; Directive op-code
                      01  1264                .Byte   Ptd$M_Unit              ; Enforced DW codes
                57 44 00' 1265                .Ascic  "DW"    ; Enforced device name prefix
                      02  1265
                      86  1268                .BYTE   Pd$_Literal     ; Indicate literal
                40F26000  1269                .LONG   ^X40F26000              ; Constant
                      88  126D                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  126E                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  1270                .BYTE   0               ; 0 HP$A_DEVICE to data
                      20  1271                .BYTE   32              ; 32 of data field
                      86  1272                .BYTE   Pd$_Literal     ; Indicate literal
                40FC0000  1273                .LONG   ^X40FC0000              ; Constant
                      88  1277                .BYTE   Pd$_Store       ; Indicate store operation
                    001C  1278                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      00  127A                .BYTE   0               ; 0 HP$A_DVA to data
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                      20  127B                .BYTE   32                  ; 32 of data field
                      86  127C                .BYTE   Pd$_Literal        ; Indicate literal
                00000200  127D                .LONG   ^X200             ; Constant
                      88  1281                .BYTE   Pd$_Store         ; Indicate store operation
                    0024  1282                .WORD   HP$W_VECTOR               ; Byte HP$W_VECTOR to data
                      00  1284                .BYTE   0                 ; 0 HP$W_VECTOR to data
                      10  1285                .BYTE   16                ; 16 of data field
                      81  1286                .BYTE   Pd$_End           ; Indicate end of PT-descriptor
                          1287    707 DW750:  $DS_DW750
                          1287                .SAVE   LOCAL_BLOCK
                          1287                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,DW750$K_LEN, DW750$K_LEN:
                          1287                .RESTORE
          30 35 37 57 44 00' 1287             .ASCIC  "DW750" ; DW750 name
                      05  1287
                      32  128D                .BYTE   DW750$K_LEN               ; DW750$K_LEN of resultant P-table
                      04  128E                .BYTE   4                 ; Maximum unit number                          ;G:65
                    0000  128F                .WORD   ^A""      ; Two character mnemonic for QIO DW750
                      80  1291                .BYTE   Pd$_Start         ; Constant to identify start of descriptor
                      8D  1292                .Byte   Pd$_Name          ; Directive op-code
                      01  1293                .Byte   Ptd$M_Unit                ; Enforced DW codes
                57 44 00' 1294                .Asic   "DW"      ; Enforced device name prefix
                      02  1294
                      86  1297                .BYTE   Pd$_Literal        ; Indicate literal
                40F30000  1298                .LONG   ^X40F30000                ; Constant
                      88  129C                .BYTE   Pd$_Store         ; Indicate store operation
                    0018  129D                .WORD   HP$A_DEVICE               ; Byte HP$A_DEVICE to data
                      00  129F                .BYTE   0                 ; 0 HP$A_DEVICE to data
                      20  12A0                .BYTE   32                ; 32 of data field
                      86  12A1                .BYTE   Pd$_Literal        ; Indicate literal
                40F80000  12A2                .LONG   ^X40F80000                ; Constant
                      88  12A6                .BYTE   Pd$_Store         ; Indicate store operation
                    001C  12A7                .WORD   HP$A_DVA                  ; Byte HP$A_DVA to data
                      00  12A9                .BYTE   0                 ; 0 HP$A_DVA to data
                      20  12AA                .BYTE   32                ; 32 of data field
                      86  12AB                .BYTE   Pd$_Literal        ; Indicate literal
                00000200  12AC                .LONG   ^X200             ; Constant
                      88  12B0                .BYTE   Pd$_Store         ; Indicate store operation
                    0024  12B1                .WORD   HP$W_VECTOR               ; Byte HP$W_VECTOR to data
                      00  12B3                .BYTE   0                 ; 0 HP$W_VECTOR to data
                      10  12B4                .BYTE   16                ; 16 of data field
                      87  12B5                .BYTE   Pd$_Fetch         ; Indicate fetch operation
                    000B  12B6                .WORD   HP$B_DRIVE                ; Byte HP$B_DRIVE to data
                      00  12B8                .BYTE   0                 ; 0 HP$B_DRIVE to data
                      08  12B9                .BYTE   8                 ; 8 of data field
                      88  12BA                .BYTE   Pd$_Store         ; Indicate store operation
                    0018  12BB                .WORD   HP$A_DEVICE               ; Byte HP$A_DEVICE to data
                      0D  12BD                .BYTE   13                ; 13 HP$A_DEVICE to data
                      01  12BE                .BYTE   1                 ; 1 of data field
                      8A  12BF                .BYTE   Pd$_Add           ; Indicate add value to field operation
                    0024  12C0                .WORD   HP$W_VECTOR               ; Byte HP$W_VECTOR to data
                      09  12C2                .BYTE   9                 ; 9 HP$W_VECTOR to data
                      02  12C3                .BYTE   2                 ; 2 of data field
                      89  12C4                .BYTE   Pd$_Complement    ; Indicate complement value operation
                      88  12C5                .BYTE   Pd$_Store         ; Indicate store operation
                    001C  12C6                .WORD   HP$A_DVA                  ; Byte HP$A_DVA to data
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                      12  12C8                .BYTE   18              ; 18 HP$A_DVA to data
                      01  12C9                .BYTE   1               ; 1 of data field
                      81  12CA                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          12CB    708 DW780:  $DS_DW780
                          12CB                .SAVE   LOCAL_BLOCK
                          12CB                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,DW780$B_TR,  DW780$B_TR:
                00000033  0032                .IIF    NB,,BLKB,       .BLKB   1
                          0033                .IIF    NB,DW780$B_BR,  DW780$B_BR:
                00000034  0033                .IIF    NB,,BLKB,       .BLKB   1
                          0034                .IIF    NB,DW780$K_LEN, DW780$K_LEN:
                    000012CB                .RESTORE
          30 38 37 57 44 00' 12CB             .ASCIC  "DW780" ; DW780 name
                      05  12CB
                      34  12D1                .BYTE   DW780$K_LEN             ; DW780$K_LEN of resultant P-table
                      08  12D2                .BYTE   8                       ; Maximum unit number                   ;G:65
                    0000  12D3                .WORD   ^A""    ; Two character mnemonic for QIO DW780
                      80  12D5                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  12D6                .Byte   Pd$_Name        ; Directive op-code
                      01  12D7                .Byte   Ptd$M_Unit              ; Enforced DW codes
                57 44 00' 12D8                .Asci   "DW"    ; Enforced device name prefix
                      02  12D8
                      82  12DB                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 54 00' 12DC                .ASCIC  "TR"    ; TR string
                      02  12DC
          0000000F 00000001  12DF             .LONG   1,15    ; 1 , 15 limits on input
                      88  12E7                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  12E8                .WORD   DW780$B_TR              ; Byte DW780$B_TR to data
                      00  12EA                .BYTE   0               ; 0 DW780$B_TR to data
                      08  12EB                .BYTE   8               ; 8 of data field
                      88  12EC                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  12ED                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      0D  12EF                .BYTE   13              ; 13 HP$A_DEVICE to data
                      04  12F0                .BYTE   4               ; 4 of data field
                      88  12F1                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  12F2                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      02  12F4                .BYTE   2               ; 2 HP$W_VECTOR to data
                      04  12F5                .BYTE   4               ; 4 of data field
                      82  12F6                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 42 00' 12F7                .ASCIC  "BR"    ; BR string
                      02  12F7
          00000007 00000004  12FA             .LONG   4,7     ; 4 , 7 limits on input
                      88  1302                .BYTE   Pd$_Store       ; Indicate store operation
                    0033  1303                .WORD   DW780$B_BR              ; Byte DW780$B_BR to data
                      00  1305                .BYTE   0               ; 0 DW780$B_BR to data
                      08  1306                .BYTE   8               ; 8 of data field
                      88  1307                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  1308                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      06  130A                .BYTE   6               ; 6 HP$W_VECTOR to data
                      02  130B                .BYTE   2               ; 2 of data field
                      87  130C                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    000B  130D                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                      00  130F                .BYTE   0               ; 0 HP$B_DRIVE to data
                      08  1310                .BYTE   8               ; 8 of data field
                      88  1311                .BYTE   Pd$_Store       ; Indicate store operation
                    001C  1312                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
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                      12  1314                .BYTE   18              ; 18 HP$A_DVA to data
                      02  1315                .BYTE   2               ; 2 of data field
                      86  1316                .BYTE   Pd$_Literal     ; Indicate literal
                00000006  1317                .LONG   6               ; Constant
                      88  131B                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  131C                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      1C  131E                .BYTE   28              ; 28 HP$A_DEVICE to data
                      04  131F                .BYTE   4               ; 4 of data field
                      88  1320                .BYTE   Pd$_Store       ; Indicate store operation
                    001C  1321                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      1C  1323                .BYTE   28              ; 28 HP$A_DVA to data
                      04  1324                .BYTE   4               ; 4 of data field
                      87  1325                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  1326                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      19  1328                .BYTE   25              ; 25 HP$A_DEVICE to data
                      02  1329                .BYTE   2               ; 2 of data field
                      88  132A                .BYTE   Pd$_Store       ; Indicate store operation
                    001C  132B                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      19  132D                .BYTE   25              ; 25 HP$A_DVA to data
                      02  132E                .BYTE   2               ; 2 of data field
                      86  132F                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  1330                .LONG   1               ; Constant
                      88  1334                .BYTE   Pd$_Store       ; Indicate store operation
                    001C  1335                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      14  1337                .BYTE   20              ; 20 HP$A_DVA to data
                      01  1338                .BYTE   1               ; 1 of data field
                      88  1339                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  133A                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      08  133C                .BYTE   8               ; 8 HP$W_VECTOR to data
                      01  133D                .BYTE   1               ; 1 of data field
                      81  133E                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          133F    709 DWBLA:    $DS_DWBLA                       ;       [60]                    ;G:40
                          133F                .SAVE   LOCAL_BLOCK
                          133F                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,DWBLA$B_NODE_ID,     DWBLA$B_NODE_ID:
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,DWBLA$B_BR,  DWBLA$B_BR:
                00000034  0033                .IIF    NB,.BLKB,       .BLKB   1
                          0034                .IIF    NB,DWBLA$W_VECTOR,      DWBLA$W_VECTOR:
                00000036  0034                .IIF    NB,.BLKW,       .BLKW   1
                          0036                .IIF    NB,DWBLA$K_LEN, DWBLA$K_LEN:
                      0000133F                .RESTORE
          41 4C 42 57 44 00'  133F            .ASCIC  "DWBLA" ; DWBLA name
                      05  133F
                      36  1345                .BYTE   DWBLA$K_LEN             ; DWBLA$K_LEN of resultant P-table
                      10  1346                .BYTE   16              ; Maximum unit number                   ;G:65
                    0000  1347                .WORD   ^A""    ; Two character mnemonic for QIO DWBLA
                      80  1349                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      87  134A                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  134B                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      19  134D                .BYTE   25              ; 25 HP$A_DEVICE to data
                      07  134E                .BYTE   7               ; 7 of data field
                      8C  134F                .BYTE   Pd$_Case        ; Indicate case operation
                      01  1350                .BYTE   $$_$            ; Count of pairs
          00000030 00000000  1351             .LONG   0,^X30          ; Store the pair
                      88  1359                .BYTE   Pd$_Store       ; Indicate store operation
```

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                        0018  135A                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                          19  135C                .BYTE   25                  ; 25 HP$A_DEVICE to data
                          07  135D                .BYTE   7                   ; 7 of data field
                          88  135E                .BYTE   Pd$_Store           ; Indicate store operation
                        001C  135F                .WORD   HP$A_DVA                    ; Byte HP$A_DVA to data
                          19  1361                .BYTE   25                  ; 25 HP$A_DVA to data
                          07  1362                .BYTE   7                   ; 7 of data field
                          86  1363                .BYTE   Pd$_Literal         ; Indicate literal
                    00000001  1364                .LONG   ^X1                 ; Constant
                          88  1368                .BYTE   Pd$_Store           ; Indicate store operation
                        001C  1369                .WORD   HP$A_DVA                    ; Byte HP$A_DVA to data
                          16  136B                .BYTE   22                  ; 22 HP$A_DVA to data
                          01  136C                .BYTE   1                   ; 1 of data field
                          84  136D                .BYTE   Pd$_Hexadecimal     ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00'  136E        .ASCIC  "BI Node Number (HEX)"  ; BI Node Number (HEX) string
      29 58 45 48 28 20 72 65 62      137A
                          14  136E
                    0000000F 00000000 1383        .LONG   ^X0,^XF ; 0 , F limits on input
                          88  138B                .BYTE   Pd$_Store           ; Indicate store operation
                        0032  138C                .WORD   DWBLA$B_NODE_ID             ; Byte DWBLA$B_NODE_ID to data
                          00  138E                .BYTE   0                   ; 0 DWBLA$B_NODE_ID to data
                          08  138F                .BYTE   8                   ; 8 of data field
                          88  1390                .BYTE   Pd$_Store           ; Indicate store operation
                        0018  1391                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                          0D  1393                .BYTE   13                  ; 13 HP$A_DEVICE to data
                          04  1394                .BYTE   4                   ; 4 of data field
                          88  1395                .BYTE   Pd$_Store           ; Indicate store operation
                        001C  1396                .WORD   HP$A_DVA                    ; Byte HP$A_DVA to data
                          12  1398                .BYTE   18                  ; 18 HP$A_DVA to data
                          04  1399                .BYTE   4                   ; 4 of data field
                          88  139A                .BYTE   Pd$_Store           ; Indicate store operation
                      0024  139B                .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                          02  139D                .BYTE   2                   ; 2 HP$W_VECTOR to data
                          04  139E                .BYTE   4                   ; 4 of data field
                          86  139F                .BYTE   Pd$_Literal         ; Indicate literal
                    00000005  13A0                .LONG   ^X5                 ; Constant
                          88  13A4                .BYTE   Pd$_Store           ; Indicate store operation
                      0024  13A5                .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                          06  13A7                .BYTE   6                   ; 6 HP$W_VECTOR to data
                          03  13A8                .BYTE   3                   ; 3 of data field
                          88  13A9                .BYTE   Pd$_Store           ; Indicate store operation
                      0033  13AA                .WORD   DWBLA$B_BR                  ; Byte DWBLA$B_BR to data
                          00  13AC                .BYTE   0                   ; 0 DWBLA$B_BR to data
                          08  13AD                .BYTE   8                   ; 8 of data field
                          81  13AE                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                              13AF    710 DWBUA:  $DS_DWBUA                                   ;       [48]
                              13AF                .SAVE   LOCAL_BLOCK
                              13AF                .PSECT  $ABS$,ABS
                    00000032  0050                .=HP$A_DEPENDENT
                              0032                .IIF    NB,DWBUA$B_NODE_ID,     DWBUA$B_NODE_ID:
                    00000033  0032                .IIF    NB,,BLKB,       .BLKB   1
                              0033                .IIF    NB,DWBUA$B_BR,  DWBUA$B_BR:
                    00000034  0033                .IIF    NB,,BLKB,       .BLKB   1
                              0034                .IIF    NB,DWBUA$W_VECTOR,      DWBUA$W_VECTOR:
                    00000036  0034                .IIF    NB,,BLKW,       .BLKW   1
                              0036                .IIF    NB,DWBUA$K_LEN, DWBUA$K_LEN:
                         000013AF                 .RESTORE
```

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                41 55 42 57 44 00'  13AF            .ASCIC  "DWBUA" ; DWBUA name
                                05  13AF
                                36  13B5            .BYTE   DWBUA$K_LEN             ; DWBUA$K_LEN of resultant P-table
                                10  13B6            .BYTE   16                      ; Maximum unit number                   ;G:65
                              0000  13B7            .WORD   ^A""    ; Two character mnemonic for QIO DWBUA
                                80  13B9            .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                87  13BA            .BYTE   Pd$_Fetch       ; Indicate fetch operation
                              0018  13BB            .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                19  13BD            .BYTE   25                      ; 25 HP$A_DEVICE to data
                                07  13BE            .BYTE   7                       ; 7 of data field
                                8C  13BF            .BYTE   Pd$_Case        ; Indicate case operation
                                01  13C0            .BYTE   $$_$            ; Count of pairs
                  00000030 00000000  13C1            .LONG   0,^X30          ; Store the pair
                                88  13C9            .BYTE   Pd$_Store       ; Indicate store operation
                              0018  13CA            .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                19  13CC            .BYTE   25                      ; 25 HP$A_DEVICE to data
                                07  13CD            .BYTE   7                       ; 7 of data field
                                88  13CE            .BYTE   Pd$_Store       ; Indicate store operation
                              001C  13CF            .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                                19  13D1            .BYTE   25                      ; 25 HP$A_DVA to data
                                07  13D2            .BYTE   7                       ; 7 of data field
                                86  13D3            .BYTE   Pd$_Literal     ; Indicate literal
                          00000001  13D4            .LONG   ^X1             ; Constant
                                88  13D8            .BYTE   Pd$_Store       ; Indicate store operation
                              001C  13D9            .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                                16  13DB            .BYTE   22                      ; 22 HP$A_DVA to data
                                01  13DC            .BYTE   1                       ; 1 of data field
                                84  13DD            .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00'  13DE          .ASCIC  "BI Node Number (HEX)"  ; BI Node Number (HEX) string
      29 58 45 48 28 20 72 65 62  13EA
                                14  13DE
                  0000000F 00000000  13F3            .LONG   ^X0,^XF ; 0 , F limits on input
                                88  13FB            .BYTE   Pd$_Store       ; Indicate store operation
                              0032  13FC            .WORD   DWBUA$B_NODE_ID         ; Byte DWBUA$B_NODE_ID to data
                                00  13FE            .BYTE   0                       ; 0 DWBUA$B_NODE_ID to data
                                08  13FF            .BYTE   8                       ; 8 of data field
                                88  1400            .BYTE   Pd$_Store       ; Indicate store operation
                              0018  1401            .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                0D  1403            .BYTE   13                      ; 13 HP$A_DEVICE to data
                                04  1404            .BYTE   4                       ; 4 of data field
                                88  1405            .BYTE   Pd$_Store       ; Indicate store operation
                              001C  1406            .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                                12  1408            .BYTE   18                      ; 18 HP$A_DVA to data
                                04  1409            .BYTE   4                       ; 4 of data field
                                88  140A            .BYTE   Pd$_Store       ; Indicate store operation
                              0024  140B            .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                02  140D            .BYTE   2                       ; 2 HP$W_VECTOR to data
                                04  140E            .BYTE   4                       ; 4 of data field
                                82  140F            .BYTE   Pd$_Decimal     ; Indicate scan decimal
                        52 42 00'  1410            .ASCIC  "BR"    ; BR string
                                02  1410
                  00000007 00000004  1413            .LONG   4,7     ; 4 , 7 limits on input
                                88  141B            .BYTE   Pd$_Store       ; Indicate store operation
                              0024  141C            .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                06  141E            .BYTE   6                       ; 6 HP$W_VECTOR to data
                                03  141F            .BYTE   3                       ; 3 of data field
                                88  1420            .BYTE   Pd$_Store       ; Indicate store operation
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                          0033  1421                .WORD   DWBUA$B_BR                ; Byte DWBUA$B_BR to data
                            00  1423                .BYTE   0                   ; 0 DWBUA$B_BR to data
                            08  1424                .BYTE   8                   ; 8 of data field
                            81  1425                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                                1426    711 DWMBA:  $DS_DWMBA                           ;       [78]                    ;G:57
                                1426                .SAVE   LOCAL_BLOCK
                                1426                .PSECT  $ABS$,ABS
                    00000032    0050                .=HP$A_DEPENDENT
                                0032                .IIF    NB,HP$B_DWMBA_BI_NODE,  HP$B_DWMBA_BI_NODE:
                    00000033    0032                .IIF    NB,.BLKB,       .BLKB   1
                                0033                .IIF    NB,HP$B_XMI_NODE,       HP$B_XMI_NODE:
                    00000034    0033                .IIF    NB,.BLKB,       .BLKB   1
                                0034                .IIF    NB,HP$A_BIIC,   HP$A_BIIC:
                    00000038    0034                .IIF    NB,.BLKL,       .BLKL   1
                                0038                .IIF    NB,HP$K_DWMBA_LEN,      HP$K_DWMBA_LEN:
                              00001426              .RESTORE
                 41 42 4D 57 44 00' 1426            .ASCIC  "DWMBA" ; DWMBA name
                            05  1426
                            38  142C                .BYTE   HP$K_DWMBA_LEN          ; HP$K_DWMBA_LEN of resultant P-table
                            08  142D                .BYTE   8                   ; Maximum unit number                   ;G:65
                          0000  142E                .WORD   ^A""        ; Two character mnemonic for QIO DWMBA
                            80  1430                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                            8D  1431                .Byte   Pd$_Name            ; Directive op-code
                            01  1432                .Byte   PTD$M_UNIT              ; Enforced DWMBA codes
                 41 42 4D 57 44 00' 1433            .Ascic  "DWMBA" ; Enforced device name prefix
                            05  1433
                            84  1439                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
20 23 20 65 64 6F 6E 20 49 4D 58 00' 143A           .ASCIC  "XMI node # (1,2,3,4,B,C,D,E) " ; XMI node # (1,2,3,4,B,C,D,E)  stri
43 2C 42 2C 34 2C 33 2C 32 2C 31 28  1446
                  20 29 45 2C 44 2C  1452
                            1D  143A
                    0000000E 00000001   1458        .LONG   ^X1,^XE ; 1 , E limits on input
                            88  1460                .BYTE   Pd$_Store           ; Indicate store operation
                          0033  1461                .WORD   HP$B_XMI_NODE               ; Byte HP$B_XMI_NODE to data
                            00  1463                .BYTE   0                   ; 0 HP$B_XMI_NODE to data
                            08  1464                .BYTE   8                   ; 8 of data field
                            88  1465                .BYTE   Pd$_Store           ; Indicate store operation
                          0018  1466                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                            13  1468                .BYTE   19                  ; 19 HP$A_DEVICE to data
                            04  1469                .BYTE   4                   ; 4 of data field
                            86  146A                .BYTE   Pd$_Literal         ; Indicate literal
                    61800000    146B                .LONG   ^X61800000                  ; Constant
                            8A  146F                .BYTE   Pd$_Add             ; Indicate add value to field operation
                          0018  1470                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                            00  1472                .BYTE   0                   ; 0 HP$A_DEVICE to data
                            20  1473                .BYTE   32                  ; 32 of data field
                            84  1474                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00' 1475           .ASCIC  "BI Node Number (HEX)"  ; BI Node Number (HEX) string
         29 58 45 48 28 20 72 65 62  1481
                            14  1475
                    0000000F 00000000   148A        .LONG   ^X0,^XF ; 0 , F limits on input
                            88  1492                .BYTE   Pd$_Store           ; Indicate store operation
                          0032  1493                .WORD   HP$B_DWMBA_BI_NODE                  ; Byte HP$B_DWMBA_BI_NODE to data
                            00  1495                .BYTE   0                   ; 0 HP$B_DWMBA_BI_NODE to data
                            08  1496                .BYTE   8                   ; 8 of data field
                            88  1497                .BYTE   Pd$_Store           ; Indicate store operation
                          0034  1498                .WORD   HP$A_BIIC                   ; Byte HP$A_BIIC to data
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                      0D  149A                .BYTE   13                      ; 13 HP$A_BIIC to data
                      04  149B                .BYTE   4                       ; 4 of data field
                      87  149C                .BYTE   Pd$_Fetch               ; Indicate fetch operation
                    0033  149D                .WORD   HP$B_XMI_NODE                   ; Byte HP$B_XMI_NODE to data
                      00  149F                .BYTE   0                       ; 0 HP$B_XMI_NODE to data
                      08  14A0                .BYTE   8                       ; 8 of data field
                      8A  14A1                .BYTE   Pd$_Add                 ; Indicate add value to field operation
                    0034  14A2                .WORD   HP$A_BIIC                       ; Byte HP$A_BIIC to data
                      19  14A4                .BYTE   25                      ; 25 HP$A_BIIC to data
                      04  14A5                .BYTE   4                       ; 4 of data field
                      88  14A6                .BYTE   Pd$_Store               ; Indicate store operation
                    0024  14A7                .WORD   HP$W_VECTOR                     ; Byte HP$W_VECTOR to data
                      04  14A9                .BYTE   4                       ; 4 HP$W_VECTOR to data
                      04  14AA                .BYTE   4                       ; 4 of data field
                      86  14AB                .BYTE   Pd$_Literal             ; Indicate literal
                00000001  14AC                .LONG   1                       ; Constant
                      88  14B0                .BYTE   Pd$_Store               ; Indicate store operation
                    0024  14B1                .WORD   HP$W_VECTOR                     ; Byte HP$W_VECTOR to data
                      08  14B3                .BYTE   8                       ; 8 HP$W_VECTOR to data
                      01  14B4                .BYTE   1                       ; 1 of data field
                      86  14B5                .BYTE   Pd$_Literal             ; Indicate literal
                60000000  14B6                .LONG   ^X60000000                      ; Constant
                      8A  14BA                .BYTE   Pd$_Add                 ; Indicate add value to field operation
                    0034  14BB                .WORD   HP$A_BIIC                       ; Byte HP$A_BIIC to data
                      00  14BD                .BYTE   0                       ; 0 HP$A_BIIC to data
                      20  14BE                .BYTE   32                      ; 32 of data field
                      87  14BF                .BYTE   Pd$_Fetch               ; Indicate fetch operation
                    0034  14C0                .WORD   HP$A_BIIC                       ; Byte HP$A_BIIC to data
                      19  14C2                .BYTE   25                      ; 25 HP$A_BIIC to data
                      07  14C3                .BYTE   7                       ; 7 of data field
                      88  14C4                .BYTE   Pd$_Store               ; Indicate store operation
                    001C  14C5                .WORD   HP$A_DVA                        ; Byte HP$A_DVA to data
                      19  14C7                .BYTE   25                      ; 25 HP$A_DVA to data
                      07  14C8                .BYTE   7                       ; 7 of data field
                      81  14C9                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          14CA    712 DX20:     $DS_DX20                                  ;       [57]
                          14CA                .SAVE   LOCAL_BLOCK
                          14CA                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$B_DX20_DRIVE,     HP$B_DX20_DRIVE::
                          0032                .IIF    NB,DX20$B_DRIVE,        DX20$B_DRIVE::
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,HP$K_DX20_LEN,       HP$K_DX20_LEN::
                          0033                .IIF    NB,DX20$K_LEN,  DX20$K_LEN::
                      000014CA                .RESTORE
             30 32 58 44 00'  14CA            .ASCIC  "DX20"  ; DX20 name
                      04  14CA
                      33  14CF                .BYTE   DX20$K_LEN                      ; DX20$K_LEN of resultant P-table
                      08  14D0                .BYTE   8                       ; Maximum unit number                   ;G:65
                    0000  14D1                .WORD   ^A""    ; Two character mnemonic for QIO DX20
                      80  14D3                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  14D4                .Byte   Pd$_Name                ; Directive op-code
                      02  14D5                .Byte   PTD$M_CONTROLLER                ; Enforced MR codes
                52 4D 00'  14D6               .Ascic  "MR"    ; Enforced device name prefix
                      02  14D6
                      82  14D9                .BYTE   Pd$_Decimal     ; Indicate scan decimal
          45 56 49 52 44 00'  14DA            .ASCIC  "DRIVE" ; DRIVE string
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                      05  14DA
            00000007 00000000  14E0                .LONG   0,7     ; 0 , 7 limits on input
                      88  14E8                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  14E9                .WORD   DX20$B_DRIVE            ; Byte DX20$B_DRIVE to data
                      00  14EB                .BYTE   0               ; 0 DX20$B_DRIVE to data
                      08  14EC                .BYTE   8               ; 8 of data field
                      88  14ED                .BYTE   Pd$_Store       ; Indicate store operation
                    000B  14EE                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                      00  14F0                .BYTE   0               ; 0 HP$B_DRIVE to data
                      08  14F1                .BYTE   8               ; 8 of data field
                      88  14F2                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  14F3                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      07  14F5                .BYTE   7               ; 7 HP$A_DEVICE to data
                      03  14F6                .BYTE   3               ; 3 of data field
                      81  14F7                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          14F8    713 DZ11:     $DS_DZ11
                          14F8                .SAVE   LOCAL_BLOCK
                          14F8                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,DZ11$L_CSR,  DZ11$L_CSR:
                00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                          0036                .IIF    NB,DZ11$B_BR,   DZ11$B_BR:
                00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                          0037                .IIF    NB,DZ11$B_MTYPE,        DZ11$B_MTYPE:
                00000038  0037                .IIF    NB,.BLKB,       .BLKB   1
                          0038                .IIF    NB,DZ11$K_LEN,  DZ11$K_LEN:
                          000014F8            .RESTORE
             31 31 5A 44 00'  14F8            .ASCIC  "DZ11"  ; DZ11 name
                      04  14F8
                      38  14FD                .BYTE   DZ11$K_LEN              ; DZ11$K_LEN of resultant P-table
                      00  14FE                .BYTE   0               ; Maximum unit number                   ;G:65
                    5454  14FF                .WORD   ^A"TT"  ; Two character mnemonic for QIO DZ11 TT
                      80  1501                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1502                .Byte   Pd$_Name        ; Directive op-code
                      02  1503                .Byte   Ptd$M_Controller                ; Enforced TT codes
                54 54 00'  1504                .Ascic  "TT"    ; Enforced device name prefix
                      02  1504
                      83  1507                .BYTE   Pd$_Octal       ; Indicate scan octal
                52 53 43 00'  1508             .ASCIC  "CSR"   ; CSR string
                      03  1508
            0003FFFE 0003E000  150C            .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  1514                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  1515                .WORD   DZ11$L_CSR              ; Byte DZ11$L_CSR to data
                      00  1517                .BYTE   0               ; 0 DZ11$L_CSR to data
                      20  1518                .BYTE   32              ; 32 of data field
                      88  1519                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  151A                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  151C                .BYTE   0               ; 0 HP$A_DEVICE to data
                      12  151D                .BYTE   18              ; 18 of data field
                      83  151E                .BYTE   Pd$_Octal       ; Indicate scan octal
          52 4F 54 43 45 56 00'  151F        .ASCIC  "VECTOR"        ; VECTOR string
                      06  151F
            000001FE 00000002  1526            .LONG   ^O2,^O776       ; 2 , 776 limits on input
                      88  152E                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  152F                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  1531                .BYTE   0               ; 0 HP$W_VECTOR to data
                      09  1532                .BYTE   9               ; 9 of data field
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                            82  1533                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                     52 42 00'  1534                .ASCIC  "BR"     ; BR string
                            02  1534
                00000007 00000004  1537             .LONG   4,7      ; 4 , 7 limits on input
                            88  153F                .BYTE   Pd$_Store        ; Indicate store operation
                          0036  1540                .WORD   DZ11$B_BR                ; Byte DZ11$B_BR to data
                            00  1542                .BYTE   0                ; 0 DZ11$B_BR to data
                            08  1543                .BYTE   8                ; 8 of data field
                            85  1544                .BYTE   Pd$_String       ; Indicate scan and verify string
45 50 59 54 20 45 4C 55 44 4F 4D 00'  1545          .ASCIC  "MODULE TYPE"    ; MODULE TYPE string
                            0B  1545
                  41 49 45 00'  1551                .ASCIC  "EIA"
                            03  1551
               41 4D 30 32 00'  1555                .ASCIC  "20MA"
                            04  1555
                            00  155A                .BYTE   0                ; Null length is end of valid EIA,20MA
                            88  155B                .BYTE   Pd$_Store        ; Indicate store operation
                          0037  155C                .WORD   DZ11$B_MTYPE             ; Byte DZ11$B_MTYPE to data
                            00  155E                .BYTE   0                ; 0 DZ11$B_MTYPE to data
                            08  155F                .BYTE   8                ; 8 of data field
                            81  1560                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                                1561    714 DZ32:   $DS_DZ32                                ;       [28]
                                1561                .SAVE   LOCAL_BLOCK
                                1561                .PSECT  $ABS$,ABS
                      00000032  0050                .=HP$A_DEPENDENT
                                0032                .IIF    NB,HP$B_DZ32_BRLVL,     HP$B_DZ32_BRLVL:
                                0032                .IIF    NB,DZ32$B_BRLVL,        DZ32$B_BRLVL:
                      00000033  0032                .IIF    NB,,.BLKB,      .BLKB   1
                                0033                .IIF    NB,HP$B_DZ32_ACTIV,     HP$B_DZ32_ACTIV:
                                0033                .IIF    NB,DZ32$B_ACTIV,        DZ32$B_ACTIV:
                      00000034  0033                .IIF    NB,,.BLKB,      .BLKB   1
                                0034                .IIF    NB,HP$B_DZ32_SPEED,     HP$B_DZ32_SPEED:
                                0034                .IIF    NB,DZ32$B_SPEED,        DZ32$B_SPEED:
                      00000035  0034                .IIF    NB,,.BLKB,      .BLKB   1
                                0035                .IIF    NB,HP$W_DZ32_FLAGS,     HP$W_DZ32_FLAGS:
                                0035                .IIF    NB,DZ32$W_FLAGS,        DZ32$W_FLAGS:
                      00000037  0035                .IIF    NB,,.BLKW,      .BLKW   1
                                0037                .IIF    NB,HP$K_LEN,    HP$K_LEN:
                                0037                .IIF    NB,DZ32$_LEN,   DZ32$_LEN:
                          00001561                  .RESTORE
                  32 33 5A 44 00'  1561             .ASCIC  "DZ32"   ; DZ32 name
                            04  1561
                            37  1566                .BYTE   DZ32$_LEN                ; DZ32$_LEN of resultant P-table
                            00  1567                .BYTE   0                ; Maximum unit number                          ;G:65
                          0000  1568                .WORD   ^A""     ; Two character mnemonic for QIO DZ32
                            80  156A                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                            8D  156B                .Byte   Pd$_Name         ; Directive op-code
                            02  156C                .Byte   Ptd$M_Controller                 ; Enforced TT codes
                     54 54 00'  156D                .Ascic  "TT"     ; Enforced device name prefix
                            02  156D
                            83  1570                .BYTE   Pd$_Octal        ; Indicate scan octal
                  52 53 43 00'  1571                .ASCIC  "CSR"    ; CSR string
                            03  1571
              0003FFFE 0003E000  1575               .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                            88  157D                .BYTE   Pd$_Store        ; Indicate store operation
                          0018  157E                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                            00  1580                .BYTE   0                ; 0 HP$A_DEVICE to data
```

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                            12  1581                .BYTE   18                  ; 18 of data field
                            83  1582                .BYTE   Pd$_Octal           ; Indicate scan octal
                52 4F 54 43 45 56 00' 1583          .ASCIC  "VECTOR"            ; VECTOR string
                            06  1583
                   000001FE 00000002  158A          .LONG   ^O2,^O776           ; 2 , 776 limits on input
                            88  1592                .BYTE   Pd$_Store           ; Indicate store operation
                          0024  1593                .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                            00  1595                .BYTE   0                   ; 0 HP$W_VECTOR to data
                            10  1596                .BYTE   16                  ; 16 of data field
                            83  1597                .BYTE   Pd$_Octal           ; Indicate scan octal
                      52 42 00' 1598                .ASCIC  "BR"     ; BR string
                            02  1598
                   00000007 00000004  159B          .LONG   ^O4,^O7 ; 4 , 7 limits on input
                            88  15A3                .BYTE   Pd$_Store           ; Indicate store operation
                          0032  15A4                .WORD   DZ32$B_BRLVL                ; Byte DZ32$B_BRLVL to data
                            00  15A6                .BYTE   0                   ; 0 DZ32$B_BRLVL to data
                            08  15A7                .BYTE   8                   ; 8 of data field
                            83  15A8                .BYTE   Pd$_Octal           ; Indicate scan octal
45 4E 49 4C 20 45 56 49 54 43 41 00' 15A9          .ASCIC  "ACTIVE LINES"      ; ACTIVE LINES string
                            53  15B5
                            0C  15A9
                   000000FF 00000000  15B6          .LONG   ^O0,^O377           ; 0 , 377 limits on input
                            88  15BE                .BYTE   Pd$_Store           ; Indicate store operation
                          0033  15BF                .WORD   DZ32$B_ACTIV                ; Byte DZ32$B_ACTIV to data
                            00  15C1                .BYTE   0                   ; 0 DZ32$B_ACTIV to data
                            08  15C2                .BYTE   8                   ; 8 of data field
                            83  15C3                .BYTE   Pd$_Octal           ; Indicate scan octal
      45 54 41 52 20 44 55 41 42 00' 15C4          .ASCIC  "BAUD RATE"         ; BAUD RATE string
                            09  15C4
                   0000000E 00000000  15CE          .LONG   ^O0,^O16            ; 0 , 16 limits on input
                            88  15D6                .BYTE   Pd$_Store           ; Indicate store operation
                          0034  15D7                .WORD   DZ32$B_SPEED                ; Byte DZ32$B_SPEED to data
                            00  15D9                .BYTE   0                   ; 0 DZ32$B_SPEED to data
                            08  15DA                .BYTE   8                   ; 8 of data field
                            83  15DB                .BYTE   Pd$_Octal           ; Indicate scan octal
59 54 20 4B 43 41 42 50 4F 4F 4C 00' 15DC          .ASCIC  "LOOPBACK TYPE"     ; LOOPBACK TYPE string
                         45 50  15E8
                            0D  15DC
                   00000004 00000000  15EA          .LONG   ^O0,^O4 ; 0 , 4 limits on input
                            88  15F2                .BYTE   Pd$_Store           ; Indicate store operation
                          0035  15F3                .WORD   DZ32$W_FLAGS                ; Byte DZ32$W_FLAGS to data
                            00  15F5                .BYTE   0                   ; 0 DZ32$W_FLAGS to data
                            03  15F6                .BYTE   3                   ; 3 of data field
                            83  15F7                .BYTE   Pd$_Octal           ; Indicate scan octal
53 20 54 45 53 45 52 20 48 4E 49 00' 15F8          .ASCIC  "INH RESET SWITCH"          ; INH RESET SWITCH string
                      48 43 54 49 57  1604
                            10  15F8
                   00000001 00000000  1609          .LONG   ^O0,^O1 ; 0 , 1 limits on input
                            88  1611                .BYTE   Pd$_Store           ; Indicate store operation
                          0035  1612                .WORD   DZ32$W_FLAGS                ; Byte DZ32$W_FLAGS to data
                            03  1614                .BYTE   3                   ; 3 DZ32$W_FLAGS to data
                            01  1615                .BYTE   1                   ; 1 of data field
                            83  1616                .BYTE   Pd$_Octal           ; Indicate scan octal
48 43 54 49 57 53 20 45 44 4F 4D 00' 1617          .ASCIC  "MODE SWITCH"       ; MODE SWITCH string
                            0B  1617
                   00000001 00000000  1623          .LONG   ^O0,^O1 ; 0 , 1 limits on input
                            88  162B                .BYTE   Pd$_Store           ; Indicate store operation
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                          0035  162C                .WORD   DZ32$W_FLAGS             ; Byte DZ32$W_FLAGS to data
                            04  162E                .BYTE   4                   ; 4 DZ32$W_FLAGS to data
                            01  162F                .BYTE   1                   ; 1 of data field
                            83  1630                .BYTE   Pd$_Octal           ; Indicate scan octal
44 45 45 50 53 20 54 49 4C 50 53 00' 1631           .ASCIC  "SPLIT SPEED JUMPER"    ; SPLIT SPEED JUMPER string
            52 45 50 4D 55 4A 20     163D
                            12  1631
                00000002 00000000   1644            .LONG   ^O0,^O2 ; 0 , 2 limits on input
                            88  164C                .BYTE   Pd$_Store           ; Indicate store operation
                          0035  164D                .WORD   DZ32$W_FLAGS             ; Byte DZ32$W_FLAGS to data
                            05  164F                .BYTE   5                   ; 5 DZ32$W_FLAGS to data
                            02  1650                .BYTE   2                   ; 2 of data field
                            81  1651                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                                1652    715 IEU11A: $DS_IEU11A                                  ;       [39]
                                1652                .SAVE   LOCAL_BLOCK
                                1652                .PSECT  $ABS$,ABS
                        00000032  0050                .=HP$A_DEPENDENT
                                0032                .IIF    NB,HP$B_IEU11A_BR,      HP$B_IEU11A_BR:
                                0032                .IIF    NB,IEU11A$B_BR, IEU11A$B_BR:
                        00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                                0033                .IIF    NB,HP$K_IEU11A_LEN,     HP$K_IEU11A_LEN:
                                0033                .IIF    NB,IEU11A$K_LEN,        IEU11A$K_LEN:
                            00001652                .RESTORE
            41 31 31 55 45 49 00' 1652              .ASCIC  "IEU11A"            ; IEU11A name
                            06  1652
                            33  1659                .BYTE   IEU11A$K_LEN            ; IEU11A$K_LEN of resultant P-table
                            01  165A                .BYTE   1                   ; Maximum unit number                   ;G:65
                          0000  165B                .WORD   ^A""    ; Two character mnemonic for QIO IEU11A
                            80  165D                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                            8D  165E                .Byte   Pd$_Name            ; Directive op-code
                            02  165F                .Byte   PTD$M_CONTROLLER                ; Enforced IX codes
                     58 49 00'  1660                .Ascic  "IX"    ; Enforced device name prefix
                            02  1660
                            83  1663                .BYTE   Pd$_Octal           ; Indicate scan octal
                  65 73 61 42 00' 1664              .ASCIC  "Base"  ; Base string
                            04  1664
                0003FFF0 0003E000   1669            .LONG   ^O760000,^O777760       ; 760000 , 777760 limits on input
                            88  1671                .BYTE   Pd$_Store           ; Indicate store operation
                          0018  1672                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                            00  1674                .BYTE   0                   ; 0 HP$A_DEVICE to data
                            12  1675                .BYTE   18                  ; 18 of data field
                            83  1676                .BYTE   Pd$_Octal           ; Indicate scan octal
      72 6F 74 63 65 56 00' 1677                    .ASCIC  "Vector"            ; Vector string
                            06  1677
                000001FC 00000000   167E            .LONG   ^O0,^O774       ; 0 , 774 limits on input
                            88  1686                .BYTE   Pd$_Store           ; Indicate store operation
                          0024  1687                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                            00  1689                .BYTE   0                   ; 0 HP$W_VECTOR to data
                            10  168A                .BYTE   16                  ; 16 of data field
                            82  168B                .BYTE   Pd$_Decimal         ; Indicate scan decimal
                     52 42 00'  168C                .ASCIC  "BR"    ; BR string
                            02  168C
                00000007 00000004   168F            .LONG   4,7     ; 4 , 7 limits on input
                            88  1697                .BYTE   Pd$_Store           ; Indicate store operation
                          0032  1698                .WORD   IEU11A$B_BR             ; Byte IEU11A$B_BR to data
                            00  169A                .BYTE   0                   ; 0 IEU11A$B_BR to data
                            08  169B                .BYTE   8                   ; 8 of data field
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                                  81  169C                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                                      169D   716 KA62A:   $DS_KA62A                                ;       [83]                    ;G:56
                  41 32 36 41 4B 00'  169D                .ASCIC  "KA62A" ; KA62A name
                                  05  169D
                                  50  16A3                .BYTE   KA$K_LEN                  ; KA$K_LEN of resultant P-table
                                  08  16A4                .BYTE   8                ; Maximum unit number                          ;G:65
                                0000  16A5                .WORD   ^A""     ; Two character mnemonic for QIO KA62A
                                  80  16A7                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                                  84  16A8                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
44 49 20 65 64 6F 4E 20 49 4D 58 00'  16A9                .ASCIC  "XMI Node ID"    ; XMI Node ID string
                                  0B  16A9
                  0000000F 00000000  16B5                .LONG   ^X0,^XF ; 0 , F limits on input
                                  88  16BD                .BYTE   Pd$_Store        ; Indicate store operation
                                0046  16BE                .WORD   KA$B_NODE_ID              ; Byte KA$B_NODE_ID to data
                                  00  16C0                .BYTE   0                ; 0 KA$B_NODE_ID to data
                                  08  16C1                .BYTE   8                ; 8 of data field
                                  88  16C2                .BYTE   Pd$_Store        ; Indicate store operation
                                0018  16C3                .WORD   HP$A_DEVICE               ; Byte HP$A_DEVICE to data
                                  13  16C5                .BYTE   19               ; 19 HP$A_DEVICE to data
                                  04  16C6                .BYTE   4                ; 4 of data field
                                  86  16C7                .BYTE   Pd$_Literal      ; Indicate literal
                          61800000  16C8                .LONG   ^X61800000                ; Constant
                                  8A  16CC                .BYTE   Pd$_Add          ; Indicate add value to field operation
                                0018  16CD                .WORD   HP$A_DEVICE               ; Byte HP$A_DEVICE to data
                                  00  16CF                .BYTE   0                ; 0 HP$A_DEVICE to data
                                  20  16D0                .BYTE   32               ; 32 of data field
                                  86  16D1                .BYTE   Pd$_Literal      ; Indicate literal
                          00010000  16D2                .LONG   KA$M_TODR                 ; Constant
                                  88  16D6                .BYTE   Pd$_Store        ; Indicate store operation
                                0032  16D7                .WORD   KA$L_FLAGS                ; Byte KA$L_FLAGS to data
                                  00  16D9                .BYTE   0                ; 0 KA$L_FLAGS to data
                                  20  16DA                .BYTE   32               ; 32 of data field
                                  8B  16DB                .BYTE   Pd$_Logical      ; Indicate logical value operation
74 6E 65 73 65 72 50 20 55 50 46 00'  16DC                .ASCIC  \FPU Present\    ; FPU Present string
                                  0B  16DC
                                  88  16E8                .BYTE   Pd$_Store        ; Indicate store operation
                                0032  16E9                .WORD   KA$L_FLAGS                ; Byte KA$L_FLAGS to data
                                  00  16EB                .BYTE   KA$V_F_FLOAT              ; KA$V_F_FLOAT KA$L_FLAGS to data
                                  01  16EC                .BYTE   1                ; 1 of data field
                                  88  16ED                .BYTE   Pd$_Store        ; Indicate store operation
                                0032  16EE                .WORD   KA$L_FLAGS                ; Byte KA$L_FLAGS to data
                                  01  16F0                .BYTE   KA$V_D_FLOAT              ; KA$V_D_FLOAT KA$L_FLAGS to data
                                  01  16F1                .BYTE   1                ; 1 of data field
                                  88  16F2                .BYTE   Pd$_Store        ; Indicate store operation
                                0032  16F3                .WORD   KA$L_FLAGS                ; Byte KA$L_FLAGS to data
                                  02  16F5                .BYTE   KA$V_G_FLOAT              ; KA$V_G_FLOAT KA$L_FLAGS to data
                                  01  16F6                .BYTE   1                ; 1 of data field
                                  86  16F7                .BYTE   Pd$_Literal      ; Indicate literal
                          00002710  16F8                .LONG   10000            ; Constant
                                  88  16FC                .BYTE   Pd$_Store        ; Indicate store operation
                                003E  16FD                .WORD   KA$W_LATENCY              ; Byte KA$W_LATENCY to data
                                  00  16FF                .BYTE   0                ; 0 KA$W_LATENCY to data
                                  20  1700                .BYTE   32               ; 32 of data field
                                  86  1701                .BYTE   Pd$_Literal      ; Indicate literal
                          000003E8  1702                .LONG   1000             ; Constant
                                  88  1706                .BYTE   Pd$_Store        ; Indicate store operation
                                0040  1707                .WORD   KA$W_PROGRESS             ; Byte KA$W_PROGRESS to data
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                                  00  1709                .BYTE   0                   ; 0 KA$W_PROGRESS to data
                                  20  170A                .BYTE   32                  ; 32 of data field
                                  81  170B                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                                      170C   717 KA730:   $DS_KA730                                  ;       [15]
                 30 33 37 41 4B 00'  170C                .ASCIC  "KA730" ; KA730 name
                                  05  170C
                                  50  1712                .BYTE   KA$K_LEN                    ; KA$K_LEN of resultant P-table
                                  04  1713                .BYTE   4                   ; Maximum unit number                          ;G:65
                                0000  1714                .WORD   ^A""    ; Two character mnemonic for QIO KA730
                                  80  1716                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                                  8D  1717                .Byte   Pd$_Name            ; Directive op-code
                                  01  1718                .Byte   Ptd$M_Unit                  ; Enforced KA codes
                           41 4B 00'  1719                .Ascic  "KA"    ; Enforced device name prefix
                                  02  1719
                                  86  171C                .BYTE   Pd$_Literal         ; Indicate literal
                           40F30000  171D                .LONG   ^X40F30000                  ; Constant
                                  88  1721                .BYTE   Pd$_Store           ; Indicate store operation
                                0018  1722                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                                  00  1724                .BYTE   0                   ; 0 HP$A_DEVICE to data
                                  20  1725                .BYTE   32                  ; 32 of data field
                                  86  1726                .BYTE   Pd$_Literal         ; Indicate literal
                           000001FF  1727                .LONG   KA$M_F_FLOAT + KA$M_D_FLOAT +                  KA$M_CRC +
                                  88  172B                .BYTE   Pd$_Store           ; Indicate store operation
                                0032  172C                .WORD   KA$L_FLAGS                  ; Byte KA$L_FLAGS to data
                                  00  172E                .BYTE   0                   ; 0 KA$L_FLAGS to data
                                  20  172F                .BYTE   32                  ; 32 of data field
                                  8B  1730                .BYTE   Pd$_Logical         ; Indicate logical value operation
61 65 79 2D 66 6F 2D 65 6D 69 54 00'  1731                .ASCIC  \Time-of-year clock\    ; Time-of-year clock string
              6B 63 6F 6C 63 20 72  173D
                                  12  1731
                                  88  1744                .BYTE   Pd$_Store           ; Indicate store operation
                                0032  1745                .WORD   KA$L_FLAGS                  ; Byte KA$L_FLAGS to data
                                  10  1747                .BYTE   KA$V_TODR                   ; KA$V_TODR KA$L_FLAGS to data
                                  01  1748                .BYTE   1                   ; 1 of data field
                                  84  1749                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
64 61 20 74 73 61 6C 20 53 43 57 00'  174A                .ASCIC  "WCS last address"      ; WCS last address string
                     73 73 65 72 64  1756
                                  10  174A
                 0000FFFF 00000000  175B                .LONG   ^X0,^X1@16-1        ; 0 , 1@16-1 limits on input
                                  88  1763                .BYTE   Pd$_Store           ; Indicate store operation
                                0036  1764                .WORD   KA$W_WCS                    ; Byte KA$W_WCS to data
                                  00  1766                .BYTE   0                   ; 0 KA$W_WCS to data
                                  10  1767                .BYTE   16                  ; 16 of data field
                                  86  1768                .BYTE   Pd$_Literal         ; Indicate literal
                           00002710  1769                .LONG   10000               ; Constant
                                  88  176D                .BYTE   Pd$_Store           ; Indicate store operation
                                003E  176E                .WORD   KA$W_LATENCY                ; Byte KA$W_LATENCY to data
                                  00  1770                .BYTE   0                   ; 0 KA$W_LATENCY to data
                                  20  1771                .BYTE   32                  ; 32 of data field
                                  86  1772                .BYTE   Pd$_Literal         ; Indicate literal
                           000003E8  1773                .LONG   1000                ; Constant
                                  88  1777                .BYTE   Pd$_Store           ; Indicate store operation
                                0040  1778                .WORD   KA$W_PROGRESS               ; Byte KA$W_PROGRESS to data
                                  00  177A                .BYTE   0                   ; 0 KA$W_PROGRESS to data
                                  20  177B                .BYTE   32                  ; 32 of data field
                                  82  177C                .BYTE   Pd$_Decimal         ; Indicate scan decimal
72 6F 74 61 72 65 6C 65 63 63 41 00'  177D                .ASCIC  "Accelerator type"      ; Accelerator type string
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                    65 70 79 74 20  1789
                                 10  177D
                 000000FF 00000000  178E                .LONG   0,255   ; 0 , 255 limits on input
                                 88  1796                .BYTE   Pd$_Store       ; Indicate store operation
                               0042  1797                .WORD   KA$B_ACC_TYPE           ; Byte KA$B_ACC_TYPE to data
                                 00  1799                .BYTE   0               ; 0 KA$B_ACC_TYPE to data
                                 08  179A                .BYTE   8               ; 8 of data field
                                 82  179B                .BYTE   Pd$_Decimal     ; Indicate scan decimal
20 66 6F 20 73 65 74 79 62 2D 4B 00'  179C                .ASCIC  "K-bytes of Main Memory"        ; K-bytes of Main Memory string
   79 72 6F 6D 65 4D 20 6E 69 61 4D  17A8
                                 16  179C
                 00001400 00000000  17B3                .LONG   0,5120  ; 0 , 5120 limits on input
                                 88  17BB                .BYTE   Pd$_Store       ; Indicate store operation
                               0044  17BC                .WORD   KA$W_MEM_SIZE           ; Byte KA$W_MEM_SIZE to data
                                 00  17BE                .BYTE   0               ; 0 KA$W_MEM_SIZE to data
                                 10  17BF                .BYTE   16              ; 16 of data field
                                 8B  17C0                .BYTE   Pd$_Logical     ; Indicate logical value operation
6F 6C 20 53 43 57 20 72 65 73 55 00'  17C1                .ASCIC  \User WCS loaded\       ; User WCS loaded string
                        64 65 64 61  17CD
                                 0F  17C1
                                 88  17D1                .BYTE   Pd$_Store       ; Indicate store operation
                               0032  17D2                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                                 18  17D4                .BYTE   KA$V_WCS_LD             ; KA$V_WCS_LD KA$L_FLAGS to data
                                 01  17D5                .BYTE   1               ; 1 of data field
                                 8B  17D6                .BYTE   Pd$_Logical     ; Indicate logical value operation
      73 72 6F 72 72 65 20 42 53 00'  17D7                .ASCIC  \SB errors\     ; SB errors string
                                 09  17D7
                                 88  17E1                .BYTE   Pd$_Store       ; Indicate store operation
                               0032  17E2                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                                 19  17E4                .BYTE   KA$V_SB_ERR             ; KA$V_SB_ERR KA$L_FLAGS to data
                                 01  17E5                .BYTE   1               ; 1 of data field
                                 81  17E6                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                     17E7   718 KA750:   $DS_KA750
                 30 35 37 41 4B 00'  17E7                .ASCIC  "KA750" ; KA750 name
                                 05  17E7
                                 50  17ED                .BYTE   KA$K_LEN                ; KA$K_LEN of resultant P-table
                                 04  17EE                .BYTE   4               ; Maximum unit number                   ;G:65
                               0000  17EF                .WORD   ^A""    ; Two character mnemonic for QIO KA750
                                 80  17F1                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                 8D  17F2                .Byte   Pd$_Name        ; Directive op-code
                                 01  17F3                .Byte   Ptd$M_Unit              ; Enforced KA codes
                          41 4B 00'  17F4                .Ascic  "KA"    ; Enforced device name prefix
                                 02  17F4
                                 86  17F7                .BYTE   Pd$_Literal     ; Indicate literal
                          40F30000  17F8                .LONG   ^X40F30000              ; Constant
                                 88  17FC                .BYTE   Pd$_Store       ; Indicate store operation
                               0018  17FD                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                 00  17FF                .BYTE   0               ; 0 HP$A_DEVICE to data
                                 20  1800                .BYTE   32              ; 32 of data field
                                 86  1801                .BYTE   Pd$_Literal     ; Indicate literal
                          000001F3  1802                .LONG   KA$M_F_FLOAT + KA$M_D_FLOAT +                   KA$M_CRC +
                                 88  1806                .BYTE   Pd$_Store       ; Indicate store operation
                               0032  1807                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                                 00  1809                .BYTE   0               ; 0 KA$L_FLAGS to data
                                 20  180A                .BYTE   32              ; 32 of data field
                                 8B  180B                .BYTE   Pd$_Logical     ; Indicate logical value operation
20 67 6E 69 74 61 6F 6C 66 2D 47 00'  180C                .ASCIC  \G-floating instructions\       ; G-floating instructions string
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73 6E 6F 69 74 63 75 72 74 73 6E 69  1818
                               17  180C
                               88  1824                .BYTE   Pd$_Store       ; Indicate store operation
                             0032  1825                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                               02  1827                .BYTE   KA$V_G_FLOAT            ; KA$V_G_FLOAT KA$L_FLAGS to data
                               01  1828                .BYTE   1               ; 1 of data field
                               8B  1829                .BYTE   Pd$_Logical     ; Indicate logical value operation
20 67 6E 69 74 61 6F 6C 66 2D 48 00' 182A                .ASCIC  \H-floating instructions\       ; H-floating instructions string
73 6E 6F 69 74 63 75 72 74 73 6E 69  1836
                               17  182A
                               88  1842                .BYTE   Pd$_Store       ; Indicate store operation
                             0032  1843                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                               03  1845                .BYTE   KA$V_H_FLOAT            ; KA$V_H_FLOAT KA$L_FLAGS to data
                               01  1846                .BYTE   1               ; 1 of data field
                               8B  1847                .BYTE   Pd$_Logical     ; Indicate logical value operation
61 65 79 2D 66 6F 2D 65 6D 69 54 00' 1848                .ASCIC  \Time-of-year clock\    ; Time-of-year clock string
                  6B 63 6F 6C 63 20 72  1854
                               12  1848
                               88  185B                .BYTE   Pd$_Store       ; Indicate store operation
                             0032  185C                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                               10  185E                .BYTE   KA$V_TODR               ; KA$V_TODR KA$L_FLAGS to data
                               01  185F                .BYTE   1               ; 1 of data field
                               84  1860                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
64 61 20 74 73 61 6C 20 53 43 57 00' 1861                .ASCIC  "WCS last address"      ; WCS last address string
                     73 73 65 72 64  186D
                               10  1861
                   0000FFFF 00000000  1872                .LONG   ^X0,^X1a16-1    ; 0 , 1a16-1 limits on input
                               88  187A                .BYTE   Pd$_Store       ; Indicate store operation
                             0036  187B                .WORD   KA$W_WCS                ; Byte KA$W_WCS to data
                               00  187D                .BYTE   0               ; 0 KA$W_WCS to data
                               10  187E                .BYTE   16              ; 16 of data field
                               86  187F                .BYTE   Pd$_Literal     ; Indicate literal
                         00002710  1880                .LONG   10000           ; Constant
                               88  1884                .BYTE   Pd$_Store       ; Indicate store operation
                             003E  1885                .WORD   KA$W_LATENCY            ; Byte KA$W_LATENCY to data
                               00  1887                .BYTE   0               ; 0 KA$W_LATENCY to data
                               20  1888                .BYTE   32              ; 32 of data field
                               86  1889                .BYTE   Pd$_Literal     ; Indicate literal
                         000003E8  188A                .LONG   1000            ; Constant
                               88  188E                .BYTE   Pd$_Store       ; Indicate store operation
                             0040  188F                .WORD   KA$W_PROGRESS           ; Byte KA$W_PROGRESS to data
                               00  1891                .BYTE   0               ; 0 KA$W_PROGRESS to data
                               20  1892                .BYTE   32              ; 32 of data field
                               82  1893                .BYTE   Pd$_Decimal     ; Indicate scan decimal
72 6F 74 61 72 65 6C 65 63 63 41 00' 1894                .ASCIC  "Accelerator type"      ; Accelerator type string
                     65 70 79 74 20  18A0
                               10  1894
                   000000FF 00000000  18A5                .LONG   0,255   ; 0 , 255 limits on input
                               88  18AD                .BYTE   Pd$_Store       ; Indicate store operation
                             0042  18AE                .WORD   KA$B_ACC_TYPE           ; Byte KA$B_ACC_TYPE to data
                               00  18B0                .BYTE   0               ; 0 KA$B_ACC_TYPE to data
                               08  18B1                .BYTE   8               ; 8 of data field
                               81  18B2                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                   18B3    719 KA780:  $DS_KA780
                   30 38 37 41 4B 00' 18B3                .ASCIC  "KA780" ; KA780 name
                               05  18B3
                               50  18B9                .BYTE   KA$K_LEN                ; KA$K_LEN of resultant P-table
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                                  04  18BA          .BYTE   4                  ; Maximum unit number                          ;G:65
                                0000  18BB          .WORD   ^A""     ; Two character mnemonic for QIO KA780
                                  80  18BD          .BYTE   Pd$_Start          ; Constant to identify start of descriptor
                                  8D  18BE          .Byte   Pd$_Name           ; Directive op-code
                                  01  18BF          .Byte   Ptd$M_Unit                 ; Enforced KA codes
                          41 4B 00'  18C0          .Ascic  "KA"     ; Enforced device name prefix
                                  02  18C0
                                  86  18C3          .BYTE   Pd$_Literal        ; Indicate literal
                          000101F3  18C4          .LONG   KA$M_F_FLOAT + KA$M_D_FLOAT +                    KA$M_CRC +
                                  88  18C8          .BYTE   Pd$_Store          ; Indicate store operation
                                0032  18C9          .WORD   KA$L_FLAGS                 ; Byte KA$L_FLAGS to data
                                  00  18CB          .BYTE   0                  ; 0 KA$L_FLAGS to data
                                  20  18CC          .BYTE   32                 ; 32 of data field
                                  8B  18CD          .BYTE   Pd$_Logical        ; Indicate logical value operation
20 67 6E 69 74 61 6F 6C 66 2D 47 00'  18CE          .ASCIC  \G-floating instructions\        ; G-floating instructions string
73 6E 6F 69 74 63 75 72 74 73 6E 69  18DA
                                  17  18CE
                                  88  18E6          .BYTE   Pd$_Store          ; Indicate store operation
                                0032  18E7          .WORD   KA$L_FLAGS                 ; Byte KA$L_FLAGS to data
                                  02  18E9          .BYTE   KA$V_G_FLOAT               ; KA$V_G_FLOAT KA$L_FLAGS to data
                                  01  18EA          .BYTE   1                  ; 1 of data field
                                  8B  18EB          .BYTE   Pd$_Logical        ; Indicate logical value operation
20 67 6E 69 74 61 6F 6C 66 2D 48 00'  18EC          .ASCIC  \H-floating instructions\        ; H-floating instructions string
73 6E 6F 69 74 63 75 72 74 73 6E 69  18F8
                                  17  18EC
                                  88  1904          .BYTE   Pd$_Store          ; Indicate store operation
                                0032  1905          .WORD   KA$L_FLAGS                 ; Byte KA$L_FLAGS to data
                                  03  1907          .BYTE   KA$V_H_FLOAT               ; KA$V_H_FLOAT KA$L_FLAGS to data
                                  01  1908          .BYTE   1                  ; 1 of data field
                                  84  1909          .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
64 61 20 74 73 61 6C 20 53 43 57 00'  190A          .ASCIC  "WCS last address"        ; WCS last address string
                     73 73 65 72 64  1916
                                  10  190A
                  0000FFFF 00000000  191B          .LONG   ^X0,^X1a16-1       ; 0 , 1a16-1 limits on input
                                  88  1923          .BYTE   Pd$_Store          ; Indicate store operation
                                0036  1924          .WORD   KA$W_WCS                   ; Byte KA$W_WCS to data
                                  00  1926          .BYTE   0                  ; 0 KA$W_WCS to data
                                  10  1927          .BYTE   16                 ; 16 of data field
                                  86  1928          .BYTE   Pd$_Literal        ; Indicate literal
                          00002710  1929          .LONG   10000              ; Constant
                                  88  192D          .BYTE   Pd$_Store          ; Indicate store operation
                                003E  192E          .WORD   KA$W_LATENCY               ; Byte KA$W_LATENCY to data
                                  00  1930          .BYTE   0                  ; 0 KA$W_LATENCY to data
                                  20  1931          .BYTE   32                 ; 32 of data field
                                  86  1932          .BYTE   Pd$_Literal        ; Indicate literal
                          000003E8  1933          .LONG   1000               ; Constant
                                  88  1937          .BYTE   Pd$_Store          ; Indicate store operation
                                0040  1938          .WORD   KA$W_PROGRESS              ; Byte KA$W_PROGRESS to data
                                  00  193A          .BYTE   0                  ; 0 KA$W_PROGRESS to data
                                  20  193B          .BYTE   32                 ; 32 of data field
                                  82  193C          .BYTE   Pd$_Decimal        ; Indicate scan decimal
72 6F 74 61 72 65 6C 65 63 63 41 00'  193D          .ASCIC  "Accelerator type"        ; Accelerator type string
                     65 70 79 74 20  1949
                                  10  193D
                  000000FF 00000000  194E          .LONG   0,255    ; 0 , 255 limits on input
                                  88  1956          .BYTE   Pd$_Store          ; Indicate store operation
                                0042  1957          .WORD   KA$B_ACC_TYPE              ; Byte KA$B_ACC_TYPE to data
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                                 00  1959                .BYTE   0                   ; 0 KA$B_ACC_TYPE to data
                                 08  195A                .BYTE   8                   ; 8 of data field
                                 81  195B                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                                     195C   720 KA785:   $DS_KA785                                  ;       [36]
                  35 38 37 41 4B 00' 195C                .ASCIC  "KA785" ; KA785 name
                                 05  195C
                                 50  1962                .BYTE   KA$K_LEN                    ; KA$K_LEN of resultant P-table
                                 04  1963                .BYTE   4                   ; Maximum unit number                          ;G:65
                               0000  1964                .WORD   ^A""    ; Two character mnemonic for QIO KA785
                                 80  1966                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                                 8D  1967                .Byte   Pd$_Name            ; Directive op-code
                                 01  1968                .Byte   Ptd$M_Unit                  ; Enforced KA codes
                          41 4B 00' 1969                .Ascic  "KA"    ; Enforced device name prefix
                                 02  1969
                                 86  196C                .BYTE   Pd$_Literal         ; Indicate literal
                          000101F3  196D                .LONG   KA$M_F_FLOAT + KA$M_D_FLOAT +                  KA$M_CRC +
                                 88  1971                .BYTE   Pd$_Store           ; Indicate store operation
                               0032  1972                .WORD   KA$L_FLAGS                  ; Byte KA$L_FLAGS to data
                                 00  1974                .BYTE   0                   ; 0 KA$L_FLAGS to data
                                 20  1975                .BYTE   32                  ; 32 of data field
                                 8B  1976                .BYTE   Pd$_Logical         ; Indicate logical value operation
20 67 6E 69 74 61 6F 6C 66 2D 47 00' 1977                .ASCIC  \G-floating instructions\       ; G-floating instructions string
73 6E 6F 69 74 63 75 72 74 73 6E 69  1983
                                 17  1977
                                 88  198F                .BYTE   Pd$_Store           ; Indicate store operation
                               0032  1990                .WORD   KA$L_FLAGS                  ; Byte KA$L_FLAGS to data
                                 02  1992                .BYTE   KA$V_G_FLOAT                ; KA$V_G_FLOAT KA$L_FLAGS to data
                                 01  1993                .BYTE   1                   ; 1 of data field
                                 8B  1994                .BYTE   Pd$_Logical         ; Indicate logical value operation
20 67 6E 69 74 61 6F 6C 66 2D 48 00' 1995                .ASCIC  \H-floating instructions\       ; H-floating instructions string
73 6E 6F 69 74 63 75 72 74 73 6E 69  19A1
                                 17  1995
                                 88  19AD                .BYTE   Pd$_Store           ; Indicate store operation
                               0032  19AE                .WORD   KA$L_FLAGS                  ; Byte KA$L_FLAGS to data
                                 03  19B0                .BYTE   KA$V_H_FLOAT                ; KA$V_H_FLOAT KA$L_FLAGS to data
                                 01  19B1                .BYTE   1                   ; 1 of data field
                                 84  19B2                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
64 61 20 74 73 61 6C 20 53 43 4A 00' 19B3                .ASCIC  "JCS last address"          ; JCS last address string
                     73 73 65 72 64  19BF
                                 10  19B3
                  0000FFFF 00000000  19C4                .LONG   ^X0,^X1@16-1        ; 0 , 1@16-1 limits on input
                                 88  19CC                .BYTE   Pd$_Store           ; Indicate store operation
                               0036  19CD                .WORD   KA$W_WCS                    ; Byte KA$W_WCS to data
                                 00  19CF                .BYTE   0                   ; 0 KA$W_WCS to data
                                 10  19D0                .BYTE   16                  ; 16 of data field
                                 86  19D1                .BYTE   Pd$_Literal         ; Indicate literal
                          00002710  19D2                .LONG   10000               ; Constant
                                 88  19D6                .BYTE   Pd$_Store           ; Indicate store operation
                               003E  19D7                .WORD   KA$W_LATENCY                ; Byte KA$W_LATENCY to data
                                 00  19D9                .BYTE   0                   ; 0 KA$W_LATENCY to data
                                 20  19DA                .BYTE   32                  ; 32 of data field
                                 86  19DB                .BYTE   Pd$_Literal         ; Indicate literal
                          000003E8  19DC                .LONG   1000                ; Constant
                                 88  19E0                .BYTE   Pd$_Store           ; Indicate store operation
                               0040  19E1                .WORD   KA$W_PROGRESS               ; Byte KA$W_PROGRESS to data
                                 00  19E3                .BYTE   0                   ; 0 KA$W_PROGRESS to data
                                 20  19E4                .BYTE   32                  ; 32 of data field
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                                82  19E5                .BYTE   Pd$_Decimal     ; Indicate scan decimal
72 6F 74 61 72 65 6C 65 63 63 41 00' 19E6                .ASCIC  "Accelerator type"      ; Accelerator type string
                   65 70 79 74 20  19F2
                                10  19E6
                  000000FF 00000000  19F7                .LONG   0,255   ; 0 , 255 limits on input
                                88  19FF                .BYTE   Pd$_Store       ; Indicate store operation
                              0042  1A00                .WORD   KA$B_ACC_TYPE           ; Byte KA$B_ACC_TYPE to data
                                00  1A02                .BYTE   0               ; 0 KA$B_ACC_TYPE to data
                                08  1A03                .BYTE   8               ; 8 of data field
                                81  1A04                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                    1A05    721 KA800:  $DS_KA800                               ;       [68]
                                    1A05                .SAVE   LOCAL_BLOCK
                                    1A05                .PSECT  $ABS$,ABS
                              00000032  0050                .=HP$A_DEPENDENT
                                    0032                .IIF    NB,KA800$B_Float,       KA800$B_Float:
                              00000033  0032                .IIF    NB,..blkb,      .blkb   1
                                    0033                .IIF    NB,KA800$B_MEM, KA800$B_MEM:
                              00000034  0033                .IIF    NB,..BLKB,      .BLKB   1
                                    0034                .IIF    NB,KA800$B_ID,  KA800$B_ID:
                              00000035  0034                .IIF    NB,..BLKB,      .BLKB   1
                                    0035                .IIF    NB,KA800$K_LEN, KA800$K_LEN:
                                00001A05                .RESTORE
                  30 30 38 41 4B 00' 1A05                .ASCIC  "KA800" ; KA800 name
                                05  1A05
                                35  1A0B                .BYTE   KA800$K_LEN             ; KA800$K_LEN of resultant P-table
                                06  1A0C                .BYTE   6               ; Maximum unit number                   ;G:65
                              0000  1A0D                .WORD   ^A""    ; Two character mnemonic for QIO KA800
                                80  1A0F                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                8D  1A10                .Byte   Pd$_Name        ; Directive op-code
                                03  1A11                .Byte   PTD$M_DEVICE            ; Enforced K codes
                              4B 00' 1A12               .Ascic  "K"     ; Enforced device name prefix
                                01  1A12
                                86  1A14                .BYTE   Pd$_Literal     ; Indicate literal
                          00000001  1A15                .LONG   1               ; Constant
                                88  1A19                .BYTE   Pd$_Store       ; Indicate store operation
                              0032  1A1A                .WORD   KA800$B_Float           ; Byte KA800$B_Float to data
                                00  1A1C                .BYTE   0               ; 0 KA800$B_Float to data
                                08  1A1D                .BYTE   8               ; 8 of data field
                                82  1A1E                .BYTE   Pd$_Decimal     ; Indicate scan decimal
72 6F 6D 65 4D 20 6C 61 63 6F 4C 00' 1A1F                .ASCIC  "Local Memory Size in MB"       ; Local Memory Size in MB string
42 4D 20 6E 69 20 65 7A 69 53 20 79  1A2B
                                17  1A1F
                  00000015 00000001  1A37                .LONG   1,21    ; 1 , 21 limits on input
                                88  1A3F                .BYTE   Pd$_Store       ; Indicate store operation
                              0033  1A40                .WORD   KA800$B_MEM             ; Byte KA800$B_MEM to data
                                00  1A42                .BYTE   0               ; 0 KA800$B_MEM to data
                                08  1A43                .BYTE   8               ; 8 of data field
                                86  1A44                .BYTE   Pd$_Literal     ; Indicate literal
                          00000006  1A45                .LONG   ^X6             ; Constant
                                88  1A49                .BYTE   Pd$_Store       ; Indicate store operation
                              0018  1A4A                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                1C  1A4C                .BYTE   28              ; 28 HP$A_DEVICE to data
                                04  1A4D                .BYTE   4               ; 4 of data field
                                84  1A4E                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00' 1A4F                .ASCIC  "BI Node Number (HEX)"  ; BI Node Number (HEX) string
         29 58 45 48 28 20 72 65 62  1A5B
                                14  1A4F
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                0000000F 00000000  1A64                  .LONG   ^X0,^XF ; 0 , F limits on input
                              88   1A6C                  .BYTE   Pd$_Store       ; Indicate store operation
                            0034   1A6D                  .WORD   KA800$B_ID              ; Byte KA800$B_ID to data
                              00   1A6F                  .BYTE   0               ; 0 KA800$B_ID to data
                              08   1A70                  .BYTE   8               ; 8 of data field
                              88   1A71                  .BYTE   Pd$_Store       ; Indicate store operation
                            0018   1A72                  .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                              0D   1A74                  .BYTE   13              ; 13 HP$A_DEVICE to data
                              04   1A75                  .BYTE   4               ; 4 of data field
                              81   1A76                  .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                   1A77          722 KA820:  $DS_KA820                                 ;       [59]
                30 32 38 41 4B 00' 1A77                  .ASCIC  "KA820" ; KA820 name
                              05   1A77
                              50   1A7D                  .BYTE   KA$K_Len                ; KA$K_Len of resultant P-table
                              0F   1A7E                  .BYTE   15              ; Maximum unit number                         ;G:65
                            0000   1A7F                  .WORD   ^A""    ; Two character mnemonic for QIO KA820
                              80   1A81                  .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                              8D   1A82                  .Byte   Pd$_Name        ; Directive op-code
                              04   1A83                  .Byte   Ptd$M_Name              ; Enforced KA codes
                       41 4B 00' 1A84                  .Ascic  "KA"    ; Enforced device name prefix
                              02   1A84
                              86   1A87                  .BYTE   Pd$_Literal     ; Indicate literal
                        000101FF   1A88                  .LONG   KA$M_F_Float!KA$M_D_Float!KA$M_CRC!KA$M_Packed!                KA$
                              88   1A8C                  .BYTE   Pd$_Store       ; Indicate store operation
                            0032   1A8D                  .WORD   KA$L_Flags              ; Byte KA$L_Flags to data
                              00   1A8F                  .BYTE   0               ; 0 KA$L_Flags to data
                              20   1A90                  .BYTE   32              ; 32 of data field
                              86   1A91                  .BYTE   Pd$_Literal     ; Indicate literal
                        00000000   1A92                  .LONG   0               ; Constant
                              88   1A96                  .BYTE   Pd$_Store       ; Indicate store operation
                            0036   1A97                  .WORD   KA$W_Wcs                ; Byte KA$W_Wcs to data
                              00   1A99                  .BYTE   0               ; 0 KA$W_Wcs to data
                              10   1A9A                  .BYTE   16              ; 16 of data field
                              86   1A9B                  .BYTE   Pd$_Literal     ; Indicate literal
                        00002710   1A9C                  .LONG   10000           ; Constant
                              88   1AA0                  .BYTE   Pd$_Store       ; Indicate store operation
                            003E   1AA1                  .WORD   KA$W_Latency            ; Byte KA$W_Latency to data
                              00   1AA3                  .BYTE   0               ; 0 KA$W_Latency to data
                              10   1AA4                  .BYTE   16              ; 16 of data field
                              86   1AA5                  .BYTE   Pd$_Literal     ; Indicate literal
                        000003E8   1AA6                  .LONG   1000            ; Constant
                              88   1AAA                  .BYTE   Pd$_Store       ; Indicate store operation
                            0040   1AAB                  .WORD   KA$W_Progress           ; Byte KA$W_Progress to data
                              00   1AAD                  .BYTE   0               ; 0 KA$W_Progress to data
                              10   1AAE                  .BYTE   16              ; 16 of data field
                              86   1AAF                  .BYTE   Pd$_Literal     ; Indicate literal
                        00000001   1AB0                  .LONG   1               ; Constant
                              88   1AB4                  .BYTE   Pd$_Store       ; Indicate store operation
                            0042   1AB5                  .WORD   KA$B_Acc_Type           ; Byte KA$B_Acc_Type to data
                              00   1AB7                  .BYTE   0               ; 0 KA$B_Acc_Type to data
                              08   1AB8                  .BYTE   8               ; 8 of data field
                              82   1AB9                  .BYTE   Pd$_Decimal     ; Indicate scan decimal
20 66 6F 20 73 65 74 79 62 2D 4B 00' 1ABA                  .ASCIC  "K-bytes of Main Memory"        ; K-bytes of Main Memory string
   79 72 6F 6D 65 4D 20 6E 69 61 4D  1AC6
                              16   1ABA
                00080000 00000000  1AD1                  .LONG   0,524288        ; 0 , 524288 limits on input
                              88   1AD9                  .BYTE   Pd$_Store       ; Indicate store operation
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                          0047  1ADA                .WORD   KA$L_Mem_Size           ; Byte KA$L_Mem_Size to data
                            00  1ADC                .BYTE   0                   ; 0 KA$L_Mem_Size to data
                            20  1ADD                .BYTE   32                  ; 32 of data field
                            84  1ADE                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00' 1ADF           .ASCIC  "BI Node Number (HEX)"  ; BI Node Number (HEX) string
      29 58 45 48 28 20 72 65 62     1AEB
                            14  1ADF
                0000000F 00000000  1AF4             .LONG   ^X0,^XF ; 0 , F limits on input
                            88  1AFC                .BYTE   Pd$_Store           ; Indicate store operation
                          0046  1AFD                .WORD   KA$B_Node_ID                ; Byte KA$B_Node_ID to data
                            00  1AFF                .BYTE   0                   ; 0 KA$B_Node_ID to data
                            08  1B00                .BYTE   8                   ; 8 of data field
                            81  1B01                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                                1B02    723 KA86:   $DS_KA86                                    ;       [49]
                   36 38 41 4B 00' 1B02             .ASCIC  "KA86"  ; KA86 name
                            04  1B02
                            50  1B07                .BYTE   KA$K_LEN                    ; KA$K_LEN of resultant P-table
                            04  1B08                .BYTE   4                   ; Maximum unit number                       ;G:65
                          0000  1B09                .WORD   ^A""    ; Two character mnemonic for QIO KA86
                            80  1B0B                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                            8D  1B0C                .Byte   Pd$_Name            ; Directive op-code
                            01  1B0D                .Byte   Ptd$M_Unit                  ; Enforced KA codes
                      41 4B 00' 1B0E                .Ascic  "KA"    ; Enforced device name prefix
                            02  1B0E
                            86  1B11                .BYTE   Pd$_Literal     ; Indicate literal
                      000101F3  1B12                .LONG   KA$M_F_FLOAT + KA$M_D_FLOAT +                   KA$M_CRC +
                            88  1B16                .BYTE   Pd$_Store           ; Indicate store operation
                          0032  1B17                .WORD   KA$L_FLAGS                  ; Byte KA$L_FLAGS to data
                            00  1B19                .BYTE   0                   ; 0 KA$L_FLAGS to data
                            20  1B1A                .BYTE   32                  ; 32 of data field
                            8B  1B1B                .BYTE   Pd$_Logical     ; Indicate logical value operation
20 67 6E 69 74 61 6F 6C 66 2D 47 00' 1B1C           .ASCIC  \G-floating instructions\       ; G-floating instructions string
73 6E 6F 69 74 63 75 72 74 73 6E 69  1B28
                            17  1B1C
                            88  1B34                .BYTE   Pd$_Store           ; Indicate store operation
                          0032  1B35                .WORD   KA$L_FLAGS                  ; Byte KA$L_FLAGS to data
                            02  1B37                .BYTE   KA$V_G_FLOAT                ; KA$V_G_FLOAT KA$L_FLAGS to data
                            01  1B38                .BYTE   1                   ; 1 of data field
                            8B  1B39                .BYTE   Pd$_Logical     ; Indicate logical value operation
20 67 6E 69 74 61 6F 6C 66 2D 48 00' 1B3A           .ASCIC  \H-floating instructions\       ; H-floating instructions string
73 6E 6F 69 74 63 75 72 74 73 6E 69  1B46
                            17  1B3A
                            88  1B52                .BYTE   Pd$_Store           ; Indicate store operation
                          0032  1B53                .WORD   KA$L_FLAGS                  ; Byte KA$L_FLAGS to data
                            03  1B55                .BYTE   KA$V_H_FLOAT                ; KA$V_H_FLOAT KA$L_FLAGS to data
                            01  1B56                .BYTE   1                   ; 1 of data field
                            84  1B57                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
64 61 20 74 73 61 6C 20 53 43 57 00' 1B58           .ASCIC  "WCS last address"      ; WCS last address string
                      73 73 65 72 64  1B64
                            10  1B58
                0000FFFF 00000000  1B69             .LONG   ^X0,^X1a16-1    ; 0 , 1a16-1 limits on input
                            88  1B71                .BYTE   Pd$_Store           ; Indicate store operation
                          0036  1B72                .WORD   KA$W_WCS                    ; Byte KA$W_WCS to data
                            00  1B74                .BYTE   0                   ; 0 KA$W_WCS to data
                            10  1B75                .BYTE   16                  ; 16 of data field
                            86  1B76                .BYTE   Pd$_Literal     ; Indicate literal
                      00002710  1B77                .LONG   10000               ; Constant
```

```
                                  88  1B7B                .BYTE   Pd$_Store       ; Indicate store operation
                                003E  1B7C                .WORD   KA$W_LATENCY            ; Byte KA$W_LATENCY to data
                                  00  1B7E                .BYTE   0               ; 0 KA$W_LATENCY to data
                                  20  1B7F                .BYTE   32              ; 32 of data field
                                  86  1B80                .BYTE   Pd$_Literal     ; Indicate literal
                            000003E8  1B81                .LONG   1000            ; Constant
                                  88  1B85                .BYTE   Pd$_Store       ; Indicate store operation
                                0040  1B86                .WORD   KA$W_PROGRESS           ; Byte KA$W_PROGRESS to data
                                  00  1B88                .BYTE   0               ; 0 KA$W_PROGRESS to data
                                  20  1B89                .BYTE   32              ; 32 of data field
                                  82  1B8A                .BYTE   Pd$_Decimal     ; Indicate scan decimal
72 6F 74 61 72 65 6C 65 63 63 41 00'  1B8B                .ASCIC  "Accelerator type"      ; Accelerator type string
                     65 70 79 74 20  1B97
                                  10  1B8B
                  000000FF 00000000  1B9C                .LONG   0,255   ; 0 , 255 limits on input
                                  88  1BA4                .BYTE   Pd$_Store       ; Indicate store operation
                                0042  1BA5                .WORD   KA$B_ACC_TYPE           ; Byte KA$B_ACC_TYPE to data
                                  00  1BA7                .BYTE   0               ; 0 KA$B_ACC_TYPE to data
                                  08  1BA8                .BYTE   8               ; 8 of data field
                                  81  1BA9                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                      1BAA   724 KA850:   $DS_KA850                           ;                                   ;G:9
                  30 35 38 41 4B 00'  1BAA                .ASCIC  "KA850" ; KA850 name
                                  05  1BAA
                                  37  1BB0                .BYTE   HP$K_LEN                ; HP$K_LEN of resultant P-table
                                  02  1BB1                .BYTE   2               ; Maximum unit number                       ;G:65
                                0000  1BB2                .WORD   ^A""    ; Two character mnemonic for QIO KA850
                                  80  1BB4                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                  8D  1BB5                .Byte   Pd$_Name        ; Directive op-code
                                  01  1BB6                .Byte   PTD$M_UNIT              ; Enforced KA codes
                           41 4B 00'  1BB7                .Ascic  "KA"    ; Enforced device name prefix
                                  02  1BB7
                                  86  1BBA                .BYTE   Pd$_Literal     ; Indicate literal
                            00000001  1BBB                .LONG   1               ; Constant
                                  88  1BBF                .BYTE   Pd$_Store       ; Indicate store operation
                                004B  1BC0                .WORD   HP$L_KAA_SLOT           ; Byte HP$L_KAA_SLOT to data
                                  00  1BC2                .BYTE   0               ; 0 HP$L_KAA_SLOT to data
                                  20  1BC3                .BYTE   32              ; 32 of data field
                                  86  1BC4                .BYTE   Pd$_Literal     ; Indicate literal
                            000001FF  1BC5                .LONG   KA$M_F_FLOAT + KA$M_D_FLOAT +                   KA$M_CRC +
                                  88  1BC9                .BYTE   Pd$_Store       ; Indicate store operation
                                0032  1BCA                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                                  00  1BCC                .BYTE   0               ; 0 KA$L_FLAGS to data
                                  20  1BCD                .BYTE   32              ; 32 of data field
                                  86  1BCE                .BYTE   Pd$_Literal     ; Indicate literal
                            00002710  1BCF                .LONG   10000           ; Constant
                                  88  1BD3                .BYTE   Pd$_Store       ; Indicate store operation
                                003E  1BD4                .WORD   KA$W_LATENCY            ; Byte KA$W_LATENCY to data
                                  00  1BD6                .BYTE   0               ; 0 KA$W_LATENCY to data
                                  20  1BD7                .BYTE   32              ; 32 of data field
                                  86  1BD8                .BYTE   Pd$_Literal     ; Indicate literal
                            000003E8  1BD9                .LONG   1000            ; Constant
                                  88  1BDD                .BYTE   Pd$_Store       ; Indicate store operation
                                0040  1BDE                .WORD   KA$W_PROGRESS           ; Byte KA$W_PROGRESS to data
                                  00  1BE0                .BYTE   0               ; 0 KA$W_PROGRESS to data
                                  20  1BE1                .BYTE   32              ; 32 of data field
                                  81  1BE2                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                      1BE3   725 KA880:   $DS_KA880                           ;
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```
                30 38 38 41 4B 00'  1BE3                .ASCIC  "KA880" ; KA880 name
                                05  1BE3
                                37  1BE9                .BYTE   HP$K_LEN                ; HP$K_LEN of resultant P-table
                                02  1BEA                .BYTE   2               ; Maximum unit number                   ;G:65
                              0000  1BEB                .WORD   ^A""    ; Two character mnemonic for QIO KA880
                                80  1BED                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                8D  1BEE                .Byte   Pd$_Name        ; Directive op-code
                                01  1BEF                .Byte   PTD$M_UNIT              ; Enforced KA codes
                           41 4B 00'  1BF0              .Ascic  "KA"    ; Enforced device name prefix
                                02  1BF0
                                8B  1BF3                .BYTE   Pd$_Logical     ; Indicate logical value operation
             79 72 61 6D 69 72 50 00'  1BF4             .ASCIC  \Primary\       ; Primary string
                                07  1BF4
                                88  1BFC                .BYTE   Pd$_Store       ; Indicate store operation
                              004B  1BFD                .WORD   HP$L_KAA_SLOT           ; Byte HP$L_KAA_SLOT to data
                                00  1BFF                .BYTE   0               ; 0 HP$L_KAA_SLOT to data
                                20  1C00                .BYTE   32              ; 32 of data field
                                86  1C01                .BYTE   Pd$_Literal     ; Indicate literal
                          000001FF  1C02                .LONG   KA$M_F_FLOAT ! KA$M_D_FLOAT !                   KA$M_CRC !
                                88  1C06                .BYTE   Pd$_Store       ; Indicate store operation
                              0032  1C07                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                                00  1C09                .BYTE   0               ; 0 KA$L_FLAGS to data
                                20  1C0A                .BYTE   32              ; 32 of data field
                                86  1C0B                .BYTE   Pd$_Literal     ; Indicate literal
                          00002710  1C0C                .LONG   10000           ; Constant
                                88  1C10                .BYTE   Pd$_Store       ; Indicate store operation
                              003E  1C11                .WORD   KA$W_LATENCY            ; Byte KA$W_LATENCY to data
                                00  1C13                .BYTE   0               ; 0 KA$W_LATENCY to data
                                20  1C14                .BYTE   32              ; 32 of data field
                                86  1C15                .BYTE   Pd$_Literal     ; Indicate literal
                          000003E8  1C16                .LONG   1000            ; Constant
                                88  1C1A                .BYTE   Pd$_Store       ; Indicate store operation
                              0040  1C1B                .WORD   KA$W_PROGRESS           ; Byte KA$W_PROGRESS to data
                                00  1C1D                .BYTE   0               ; 0 KA$W_PROGRESS to data
                                20  1C1E                .BYTE   32              ; 32 of data field
                                81  1C1F                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                    1C20    726 KA884:  $DS_KA884                               ;       [80]            ;G:55
                34 38 38 41 4B 00'  1C20                .ASCIC  "KA884" ; KA884 name
                                05  1C20
                                37  1C26                .BYTE   HP$K_LEN                ; HP$K_LEN of resultant P-table
                                04  1C27                .BYTE   4               ; Maximum unit number                   ;G:65
                              0000  1C28                .WORD   ^A""    ; Two character mnemonic for QIO KA884
                                80  1C2A                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                8D  1C2B                .Byte   Pd$_Name        ; Directive op-code
                                01  1C2C                .Byte   PTD$M_UNIT              ; Enforced KA codes
                           41 4B 00'  1C2D              .Ascic  "KA"    ; Enforced device name prefix
                                02  1C2D
                                8B  1C30                .BYTE   Pd$_Logical     ; Indicate logical value operation
             79 72 61 6D 69 72 50 00'  1C31             .ASCIC  \Primary\       ; Primary string
                                07  1C31
                                88  1C39                .BYTE   Pd$_Store       ; Indicate store operation
                              004B  1C3A                .WORD   HP$L_KAA_SLOT           ; Byte HP$L_KAA_SLOT to data
                                00  1C3C                .BYTE   0               ; 0 HP$L_KAA_SLOT to data
                                20  1C3D                .BYTE   32              ; 32 of data field
                                82  1C3E                .BYTE   Pd$_Decimal     ; Indicate scan decimal
20 23 20 44 49 20 55 50 43 00'  1C3F                    .ASCIC  "CPU ID #  "    ; CPU ID #  string
                                09  1C3F
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                00000003 00000000  1C49                .LONG   0,3     ; 0 , 3 limits on input
                              88   1C51                .BYTE   Pd$_Store       ; Indicate store operation
                            004F   1C52                .WORD   HP$B_CPU_ID             ; Byte HP$B_CPU_ID to data
                              00   1C54                .BYTE   0               ; 0 HP$B_CPU_ID to data
                              08   1C55                .BYTE   8               ; 8 of data field
                              86   1C56                .BYTE   Pd$_Literal     ; Indicate literal
                        000001FF   1C57                .LONG   KA$M_F_FLOAT + KA$M_D_FLOAT +                   KA$M_CRC +
                              88   1C5B                .BYTE   Pd$_Store       ; Indicate store operation
                            0032   1C5C                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                              00   1C5E                .BYTE   0               ; 0 KA$L_FLAGS to data
                              20   1C5F                .BYTE   32              ; 32 of data field
                              86   1C60                .BYTE   Pd$_Literal     ; Indicate literal
                        00002710   1C61                .LONG   10000           ; Constant
                              88   1C65                .BYTE   Pd$_Store       ; Indicate store operation
                            003E   1C66                .WORD   KA$W_LATENCY             ; Byte KA$W_LATENCY to data
                              00   1C68                .BYTE   0               ; 0 KA$W_LATENCY to data
                              20   1C69                .BYTE   32              ; 32 of data field
                              86   1C6A                .BYTE   Pd$_Literal     ; Indicate literal
                        000003E8   1C6B                .LONG   1000            ; Constant
                              88   1C6F                .BYTE   Pd$_Store       ; Indicate store operation
                            0040   1C70                .WORD   KA$W_PROGRESS            ; Byte KA$W_PROGRESS to data
                              00   1C72                .BYTE   0               ; 0 KA$W_PROGRESS to data
                              20   1C73                .BYTE   32              ; 32 of data field
                              81   1C74                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                   1C75  727 KA9CC:     $DS_KA9CC                       ;       [83]                    ;G:37
          43 43 39 41 4B 00'       1C75                .ASCIC  "KA9CC" ; KA9CC name
                              05   1C75
                              50   1C7B                .BYTE   KA$K_LEN                ; KA$K_LEN of resultant P-table
                              08   1C7C                .BYTE   8               ; Maximum unit number                   ;G:65
                            0000   1C7D                .WORD   ^A""    ; Two character mnemonic for QIO KA9CC
                              80   1C7F                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                              84   1C80                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
 44 49 20 65 64 6F 4E 20 49 4D 58 00'  1C81           .ASCIC  "XMI Node ID"   ; XMI Node ID string
                              0B   1C81
                        0000000F 00000000  1C8D      .LONG   ^X0,^XF ; 0 , F limits on input
                              88   1C95                .BYTE   Pd$_Store       ; Indicate store operation
                            0046   1C96                .WORD   KA$B_NODE_ID             ; Byte KA$B_NODE_ID to data
                              00   1C98                .BYTE   0               ; 0 KA$B_NODE_ID to data
                              08   1C99                .BYTE   8               ; 8 of data field
                              88   1C9A                .BYTE   Pd$_Store       ; Indicate store operation
                            0018   1C9B                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                              13   1C9D                .BYTE   19              ; 19 HP$A_DEVICE to data
                              04   1C9E                .BYTE   4               ; 4 of data field
                              86   1C9F                .BYTE   Pd$_Literal     ; Indicate literal
                        61800000   1CA0                .LONG   ^X61800000              ; Constant
                              8A   1CA4                .BYTE   Pd$_Add         ; Indicate add value to field operation
                            0018   1CA5                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                              00   1CA7                .BYTE   0               ; 0 HP$A_DEVICE to data
                              20   1CA8                .BYTE   32              ; 32 of data field
                              86   1CA9                .BYTE   Pd$_Literal     ; Indicate literal
                        00010000   1CAA                .LONG   KA$M_TODR               ; Constant
                              88   1CAE                .BYTE   Pd$_Store       ; Indicate store operation
                            0032   1CAF                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                              00   1CB1                .BYTE   0               ; 0 KA$L_FLAGS to data
                              20   1CB2                .BYTE   32              ; 32 of data field
                              8B   1CB3                .BYTE   Pd$_Logical     ; Indicate logical value operation
74 6E 65 73 65 72 50 20 55 50 46 00'  1CB4           .ASCIC  \FPU Present\   ; FPU Present string
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                      0B  1CB4
                      88  1CC0                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  1CC1                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                      00  1CC3                .BYTE   KA$V_F_FLOAT            ; KA$V_F_FLOAT KA$L_FLAGS to data
                      01  1CC4                .BYTE   1                ; 1 of data field
                      88  1CC5                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  1CC6                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                      01  1CC8                .BYTE   KA$V_D_FLOAT            ; KA$V_D_FLOAT KA$L_FLAGS to data
                      01  1CC9                .BYTE   1                ; 1 of data field
                      88  1CCA                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  1CCB                .WORD   KA$L_FLAGS              ; Byte KA$L_FLAGS to data
                      02  1CCD                .BYTE   KA$V_G_FLOAT            ; KA$V_G_FLOAT KA$L_FLAGS to data
                      01  1CCE                .BYTE   1                ; 1 of data field
                      86  1CCF                .BYTE   Pd$_Literal      ; Indicate literal
                00002710  1CD0                .LONG   10000           ; Constant
                      88  1CD4                .BYTE   Pd$_Store       ; Indicate store operation
                    003E  1CD5                .WORD   KA$W_LATENCY             ; Byte KA$W_LATENCY to data
                      00  1CD7                .BYTE   0                ; 0 KA$W_LATENCY to data
                      20  1CD8                .BYTE   32               ; 32 of data field
                      86  1CD9                .BYTE   Pd$_Literal      ; Indicate literal
                000003E8  1CDA                .LONG   1000            ; Constant
                      88  1CDE                .BYTE   Pd$_Store       ; Indicate store operation
                    0040  1CDF                .WORD   KA$W_PROGRESS            ; Byte KA$W_PROGRESS to data
                      00  1CE1                .BYTE   0                ; 0 KA$W_PROGRESS to data
                      20  1CE2                .BYTE   32               ; 32 of data field
                      81  1CE3                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          1CE4    728 KDB50:  $DS_KDB50                                ; BDA   [61]
                          1CE4                .SAVE   LOCAL_BLOCK
                          1CE4                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$L_KDB50_IP,       HP$L_KDB50_IP:
                          0032                .IIF    NB,KDB50$L_IP,  KDB50$L_IP:
                00000036  0032                .IIF    NB,,BLKL,       .BLKL   1
                          0036                .IIF    NB,HP$B_KDB50_BR,       HP$B_KDB50_BR:
                          0036                .IIF    NB,KDB50$B_BR,  KDB50$B_BR:
                00000037  0036                .IIF    NB,,BLKB,       .BLKB   1
                          0037                .IIF    NB,HP$B_KDB50_NODE_ID,  HP$B_KDB50_NODE_ID:
                          0037                .IIF    NB,KDB50$B_NODE_ID,     KDB50$B_NODE_ID:
                00000038  0037                .IIF    NB,,BLKB,       .BLKB   1
                          0038                .IIF    NB,HP$B_KDB50_BURST,    HP$B_KDB50_BURST:
                          0038                .IIF    NB,KDB50$B_BURST,       KDB50$B_BURST:
                00000039  0038                .IIF    NB,,BLKB,       .BLKB   1
                          0039                .IIF    NB,HP$K_KDB50_LEN,      HP$K_KDB50_LEN:
                          0039                .IIF    NB,KDB50$K_LEN, KDB50$K_LEN:
                      00001CE4                .RESTORE
30 35 42 44 4B 00'        1CE4                .ASCIC  "KDB50" ; KDB50 name
                      05  1CE4
                      39  1CEA                .BYTE   HP$K_KDB50_LEN          ; HP$K_KDB50_LEN of resultant P-table
                      00  1CEB                .BYTE   0                ; Maximum unit number                          ;G:65
                    0000  1CEC                .WORD   ^A""     ; Two character mnemonic for QIO KDB50
                      80  1CEE                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1CEF                .Byte   Pd$_Name        ; Directive op-code
                      02  1CF0                .Byte   Ptd$M_Controller                ; Enforced DU codes
                55 44 00' 1CF1                .Ascic  "DU"     ; Enforred device name prefix
                      02  1CF1
                      87  1CF4                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  1CF5                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
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                                 19  1CF7          .BYTE   25                  ; 25 HP$A_DEVICE to data
                                 07  1CF8          .BYTE   7                   ; 7 of data field
                                 8C  1CF9          .BYTE   Pd$_Case            ; Indicate case operation
                                 01  1CFA          .BYTE   $$_$                ; Count of pairs
                   00000030 00000000  1CFB          .LONG   0,^X30              ; Store the pair
                                 88  1D03          .BYTE   Pd$_Store           ; Indicate store operation
                               0018  1D04          .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                                 19  1D06          .BYTE   25                  ; 25 HP$A_DEVICE to data
                                 07  1D07          .BYTE   7                   ; 7 of data field
                                 88  1D08          .BYTE   Pd$_Store           ; Indicate store operation
                               001C  1D09          .WORD   HP$A_DVA                    ; Byte HP$A_DVA to data
                                 19  1D0B          .BYTE   25                  ; 25 HP$A_DVA to data
                                 07  1D0C          .BYTE   7                   ; 7 of data field
                                 86  1D0D          .BYTE   Pd$_Literal         ; Indicate literal
                           00000001  1D0E          .LONG   ^X1                 ; Constant
                                 88  1D12          .BYTE   Pd$_Store           ; Indicate store operation
                               001C  1D13          .WORD   HP$A_DVA                    ; Byte HP$A_DVA to data
                                 16  1D15          .BYTE   22                  ; 22 HP$A_DVA to data
                                 01  1D16          .BYTE   1                   ; 1 of data field
                                 84  1D17          .BYTE   Pd$_Hexadecimal     ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00'  1D18          .ASCIC  "BI Node Number (HEX)"  ; BI Node Number (HEX) string
         29 58 45 48 28 20 72 65 62  1D24
                                 14  1D18
                   0000000F 00000000  1D2D          .LONG   ^X0,^XF ; 0 , F limits on input
                                 88  1D35          .BYTE   Pd$_Store           ; Indicate store operation
                               0037  1D36          .WORD   KDB50$B_NODE_ID             ; Byte KDB50$B_NODE_ID to data
                                 00  1D38          .BYTE   0                   ; 0 KDB50$B_NODE_ID to data
                                 08  1D39          .BYTE   8                   ; 8 of data field
                                 88  1D3A          .BYTE   Pd$_Store           ; Indicate store operation
                               0018  1D3B          .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                                 0D  1D3D          .BYTE   13                  ; 13 HP$A_DEVICE to data
                                 04  1D3E          .BYTE   4                   ; 4 of data field
                                 88  1D3F          .BYTE   Pd$_Store           ; Indicate store operation
                               001C  1D40          .WORD   HP$A_DVA                    ; Byte HP$A_DVA to data
                                 12  1D42          .BYTE   18                  ; 18 HP$A_DVA to data
                                 04  1D43          .BYTE   4                   ; 4 of data field
                                 88  1D44          .BYTE   Pd$_Store           ; Indicate store operation
                               0024  1D45          .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                                 02  1D47          .BYTE   2                   ; 2 HP$W_VECTOR to data
                                 04  1D48          .BYTE   4                   ; 4 of data field
                                 86  1D49          .BYTE   Pd$_Literal         ; Indicate literal
                           00000005  1D4A          .LONG   ^X5                 ; Constant
                                 88  1D4E          .BYTE   Pd$_Store           ; Indicate store operation
                               0024  1D4F          .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                                 06  1D51          .BYTE   6                   ; 6 HP$W_VECTOR to data
                                 03  1D52          .BYTE   3                   ; 3 of data field
                                 88  1D53          .BYTE   Pd$_Store           ; Indicate store operation
                               0036  1D54          .WORD   KDB50$B_BR                  ; Byte KDB50$B_BR to data
                                 00  1D56          .BYTE   0                   ; 0 KDB50$B_BR to data
                                 08  1D57          .BYTE   8                   ; 8 of data field
                                 87  1D58          .BYTE   Pd$_Fetch           ; Indicate fetch operation
                               0018  1D59          .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                                 00  1D5B          .BYTE   0                   ; 0 HP$A_DEVICE to data
                                 20  1D5C          .BYTE   32                  ; 32 of data field
                                 88  1D5D          .BYTE   Pd$_Store           ; Indicate store operation
                               0032  1D5E          .WORD   HP$L_KDB50_IP               ; Byte HP$L_KDB50_IP to data
                                 00  1D60          .BYTE   0                   ; 0 HP$L_KDB50_IP to data
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                      20  1D61                .BYTE   32                  ; 32 of data field
                      86  1D62                .BYTE   Pd$_Literal        ; Indicate literal
                000000F2  1D63                .LONG   ^XF2               ; Constant
                      88  1D67                .BYTE   Pd$_Store          ; Indicate store operation
                    0032  1D68                .WORD   HP$L_KDB50_IP              ; Byte HP$L_KDB50_IP to data
                      00  1D6A                .BYTE   0                  ; 0 HP$L_KDB50_IP to data
                      08  1D6B                .BYTE   8                  ; 8 of data field
                      86  1D6C                .BYTE   Pd$_Literal        ; Indicate literal
                00000000  1D6D                .LONG   ^X0                ; Constant
                      88  1D71                .BYTE   Pd$_Store          ; Indicate store operation
                    0038  1D72                .WORD   HP$B_KDB50_BURST                    ; Byte HP$B_KDB50_BURST to data
                      00  1D74                .BYTE   0                  ; 0 HP$B_KDB50_BURST to data
                      08  1D75                .BYTE   8                  ; 8 of data field
                      81  1D76                .BYTE   Pd$_End            ; Indicate end of PT-descriptor
                          1D77    729 KFBTA:  $DS_KFBTA                                  ;       [68]
                          1D77                .SAVE   LOCAL_BLOCK
                          1D77                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,KFBTA$B_ID,  KFBTA$B_ID:
                00000033  0032                .IIF    NB,,.BLKB,      .BLKB   1
                          0033                .IIF    NB,KFBTA$K_LEN, KFBTA$K_LEN:
                      0001D77                 .RESTORE
           41 54 42 46 4B 00' 1D77            .ASCIC  "KFBTA" ; KFBTA name
                      05  1D77
                      33  1D7D                .BYTE   KFBTA$K_LEN                ; KFBTA$K_LEN of resultant P-table
                      00  1D7E                .BYTE   0                  ; Maximum unit number                                ;G:65
                    0000  1D7F                .WORD   ^A""       ; Two character mnemonic for QIO KFBTA
                      80  1D81                .BYTE   Pd$_Start          ; Constant to identify start of descriptor
                      8D  1D82                .Byte   Pd$_Name           ; Directive op-code
                      02  1D83                .Byte   Ptd$M_Controller                   ; Enforced DU codes
                55 44 00' 1D84                .Ascic  "DU"       ; Enforced device name prefix
                      02  1D84
                      87  1D87                .BYTE   Pd$_Fetch          ; Indicate fetch operation
                    0018  1D88                .WORD   HP$A_DEVICE                ; Byte HP$A_DEVICE to data
                      19  1D8A                .BYTE   25                 ; 25 HP$A_DEVICE to data
                      07  1D8B                .BYTE   7                  ; 7 of data field
                      8C  1D8C                .BYTE   Pd$_Case           ; Indicate case operation
                      01  1D8D                .BYTE   $$_$               ; Count of pairs
            00000030 00000000  1D8E           .LONG   0,^X30             ; Store the pair
                      88  1D96                .BYTE   Pd$_Store          ; Indicate store operation
                    0018  1D97                .WORD   HP$A_DEVICE                ; Byte HP$A_DEVICE to data
                      19  1D99                .BYTE   25                 ; 25 HP$A_DEVICE to data
                      07  1D9A                .BYTE   7                  ; 7 of data field
                      88  1D9B                .BYTE   Pd$_Store          ; Indicate store operation
                    001C  1D9C                .WORD   HP$A_DVA                   ; Byte HP$A_DVA to data
                      19  1D9E                .BYTE   25                 ; 25 HP$A_DVA to data
                      07  1D9F                .BYTE   7                  ; 7 of data field
                      86  1DA0                .BYTE   Pd$_Literal        ; Indicate literal
                00000001  1DA1                .LONG   ^X1                ; Constant
                      88  1DA5                .BYTE   Pd$_Store          ; Indicate store operation
                    001C  1DA6                .WORD   HP$A_DVA                   ; Byte HP$A_DVA to data
                      16  1DA8                .BYTE   22                 ; 22 HP$A_DVA to data
                      01  1DA9                .BYTE   1                  ; 1 of data field
                      84  1DAA                .BYTE   Pd$_Hexadecimal    ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00' 1DAB     .ASCIC  "BI Node Number (HEX)"   ; BI Node Number (HEX) string
      29 58 45 48 28 20 72 65 [illegible] 1DB7
                      14  1DAB
```

```
                0000000F 00000000  1DC0              .LONG   ^X0,^XF ; 0 , F limits on input
                              88   1DC8              .BYTE   Pd$_Store       ; Indicate store operation
                            000B   1DC9              .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                              00   1DCB              .BYTE   0               ; 0 HP$B_DRIVE to data
                              08   1DCC              .BYTE   8               ; 8 of data field
                              88   1DCD              .BYTE   Pd$_Store       ; Indicate store operation
                            0032   1DCE              .WORD   KFBTA$B_ID              ; Byte KFBTA$B_ID to data
                              00   1DD0              .BYTE   0               ; 0 KFBTA$B_ID to data
                              08   1DD1              .BYTE   8               ; 8 of data field
                              88   1DD2              .BYTE   Pd$_Store       ; Indicate store operation
                            0018   1DD3              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                              0D   1DD5              .BYTE   13              ; 13 HP$A_DEVICE to data
                              04   1DD6              .BYTE   4               ; 4 of data field
                              88   1DD7              .BYTE   Pd$_Store       ; Indicate store operation
                            001C   1DD8              .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                              12   1DDA              .BYTE   18              ; 18 HP$A_DVA to data
                              04   1DDB              .BYTE   4               ; 4 of data field
                              81   1DDC              .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                   1DDD    730 KMC11:  $DS_KMC11
                                   1DDD              .SAVE   LOCAL_BLOCK
                                   1DDD              .PSECT  $ABS$,ABS
                        00000032   0050              .=HP$A_DEPENDENT
                                   0032              .IIF    NB,KMC11$L_CSR, KMC11$L_CSR:
                        00000036   0032              .IIF    NB,.BLKL,       .BLKL   1
                                   0036              .IIF    NB,KMC11$B_BR,  KMC11$B_BR:
                        00000037   0036              .IIF    NB,.BLKB,       .BLKB   1
                                   0037              .IIF    NB,KMC11$K_LEN, KMC11$K_LEN:
                                00001DDD             .RESTORE
                     31 31 43 4D 4B 00' 1DDD         .ASCIC  "KMC11" ; KMC11 name
                              05   1DDD
                              37   1DE3              .BYTE   KMC11$K_LEN             ; KMC11$K_LEN of resultant P-table
                              00   1DE4              .BYTE   0               ; Maximum unit number                   ;G:65
                            0000   1DE5              .WORD   ^A""    ; Two character mnemonic for QIO KMC11
                              80   1DE7              .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                              8D   1DE8              .Byte   Pd$_Name        ; Directive op-code
                              03   1DE9              .Byte   Ptd$M_Device            ; Enforced XK codes
                        4B 58 00'  1DEA              .Ascic  "XK"    ; Enforced device name prefix
                              02   1DEA
                              83   1DED              .BYTE   Pd$_Octal       ; Indicate scan octal
                     52 53 43 00'  1DEE              .ASCIC  "CSR"   ; CSR string
                              03   1DEE
                0003FFFE 0003E000  1DF2              .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                              88   1DFA              .BYTE   Pd$_Store       ; Indicate store operation
                            0032   1DFB              .WORD   KMC11$L_CSR             ; Byte KMC11$L_CSR to data
                              00   1DFD              .BYTE   0               ; 0 KMC11$L_CSR to data
                              20   1DFE              .BYTE   32              ; 32 of data field
                              88   1DFF              .BYTE   Pd$_Store       ; Indicate store operation
                            0018   1E00              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                              00   1E02              .BYTE   0               ; 0 HP$A_DEVICE to data
                              12   1E03              .BYTE   18              ; 18 of data field
                              83   1E04              .BYTE   Pd$_Octal       ; Indicate scan octal
           52 4F 54 43 45 56 00'   1E05              .ASCIC  "VECTOR"        ; VECTOR string
                              06   1E05
                000001FE 00000002  1E0C              .LONG   ^O2,^O776       ; 2 , 776 limits on input
                              88   1E14              .BYTE   Pd$_Store       ; Indicate store operation
                            0024   1E15              .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                              00   1E17              .BYTE   0               ; 0 HP$W_VECTOR to data
```

```
                      09  1E18                .BYTE   9                       ; 9 of data field
                      82  1E19                .BYTE   Pd$_Decimal             ; Indicate scan decimal
                52 42 00' 1E1A                .ASCIC  "BR"    ; BR string
                      02  1E1A
          00000007 00000004  1E1D                .LONG   4,7     ; 4 , 7 limits on input
                      88  1E25                .BYTE   Pd$_Store               ; Indicate store operation
                    0036  1E26                .WORD   KMC11$B_BR                      ; Byte KMC11$B_BR to data
                      00  1E28                .BYTE   0                       ; 0 KMC11$B_BR to data
                      08  1E29                .BYTE   8                       ; 8 of data field
                      81  1E2A                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          1E2B    731 KW11K:  $DS_KW11K
                          1E2B                .SAVE   LOCAL_BLOCK
                          1E2B                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,KW11K$B_BR,  KW11K$B_BR:
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,KW11K$K_LEN, KW11K$K_LEN:
                      00001E2B                .RESTORE
          4B 31 31 57 4B 00' 1E2B                .ASCIC  "KW11K" ; KW11K name
                      05  1E2B
                      33  1E31                .BYTE   KW11K$K_LEN                     ; KW11K$K_LEN of resultant P-table
                      02  1E32                .BYTE   2                       ; Maximum unit number                   ;G:65
                    0000  1E33                .WORD   ^A""    ; Two character mnemonic for QIO KW11K
                      80  1E35                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  1E36                .Byte   Pd$_Name                ; Directive op-code
                      03  1E37                .Byte   Ptd$M_Device                    ; Enforced KW codes
                57 4B 00' 1E38                .Ascic  "KW"    ; Enforced device name prefix
                      02  1E38
                      83  1E3B                .BYTE   Pd$_Octal               ; Indicate scan octal
52 53 43 20 53 55 42 20 4F 2F 49 00' 1E3C                .ASCIC  "I/O BUS CSR"   ; I/O BUS CSR string
                      0B  1E3C
                0003FFFE 0003E000  1E48                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  1E50                .BYTE   Pd$_Store               ; Indicate store operation
                    0018  1E51                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                      00  1E53                .BYTE   0                       ; 0 HP$A_DEVICE to data
                      12  1E54                .BYTE   18                      ; 18 of data field
                      83  1E55                .BYTE   Pd$_Octal               ; Indicate scan octal
             52 4F 54 43 45 56 00' 1E56                .ASCIC  "VECTOR"                ; VECTOR string
                      06  1E56
                000001FE 00000002  1E5D                .LONG   ^O2,^O776               ; 2 , 776 limits on input
                      88  1E65                .BYTE   Pd$_Store               ; Indicate store operation
                    0024  1E66                .WORD   HP$W_VECTOR                     ; Byte HP$W_VECTOR to data
                      00  1E68                .BYTE   0                       ; 0 HP$W_VECTOR to data
                      09  1E69                .BYTE   9                       ; 9 of data field
                      82  1E6A                .BYTE   Pd$_Decimal             ; Indicate scan decimal
                52 42 00' 1E6B                .ASCIC  "BR"    ; BR string
                      02  1E6B
                00000007 00000004  1E6E                .LONG   4,7     ; 4 , 7 limits on input
                      88  1E76                .BYTE   Pd$_Store               ; Indicate store operation
                    0032  1E77                .WORD   KW11K$B_BR                      ; Byte KW11K$B_BR to data
                      00  1E79                .BYTE   0                       ; 0 KW11K$B_BR to data
                      08  1E7A                .BYTE   8                       ; 8 of data field
                      81  1E7B                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          1E7C    732 LA12:   $DS_LA12                                        ;       [35]
                          1E7C                .SAVE   LOCAL_BLOCK
                          1E7C                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
```

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                        0032                .IIF    NB,HP$K_LA12_LEN,       HP$K_LA12_LEN:
                        0032                .IIF    NB,LA12$K_LEN,  LA12$K_LEN:
                    00001E7C                .RESTORE
           32 31 41 4C 00' 1E7C             .ASCIC  "LA12"  ; LA12 name
                          04  1E7C
                          32  1E81          .BYTE   LA12$K_LEN              ; LA12$K_LEN of resultant P-table
                          FF  1E82          .BYTE   255             ; Maximum unit number                   ;G:65
                        0000  1E83          .WORD   ^A""    ; Two character mnemonic for QIO LA12
                          80  1E85          .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  1E86          .Byte   Pd$_Name        ; Directive op-code
                          1B  1E87          .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                     54 54 00' 1E88         .Ascic  "TT"    ; Enforced device name prefix
                          02  1E88
                          86  1E8B          .BYTE   Pd$_Literal     ; Indicate literal
                    00000001  1E8C          .LONG   HP$M_ALLOC              ; Constant
                          88  1E90          .BYTE   Pd$_Store       ; Indicate store operation
                        000A  1E91          .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                          00  1E93          .BYTE   0               ; 0 HP$B_FLAGS to data
                          08  1E94          .BYTE   8               ; 8 of data field
                          81  1E95          .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                              1E96  733 LA34:   $DS_LA34
                              1E96          .SAVE   LOCAL_BLOCK
                              1E96          .PSECT  $ABS$,ABS
                    00000032  0050          .=HP$A_DEPENDENT
                              0032          .IIF    NB,LA34$K_LEN,  LA34$K_LEN:
                    00001E96                .RESTORE
           34 33 41 4C 00' 1E96             .ASCIC  "LA34"  ; LA34 name
                          04  1E96
                          32  1E9B          .BYTE   LA34$K_LEN              ; LA34$K_LEN of resultant P-table
                          FF  1E9C          .BYTE   255             ; Maximum unit number                   ;G:65
                        0000  1E9D          .WORD   ^A""    ; Two character mnemonic for QIO LA34
                          80  1E9F          .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  1EA0          .Byte   Pd$_Name        ; Directive op-code
                          1B  1EA1          .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                     54 54 00' 1EA2         .Ascic  "TT"    ; Enforced device name prefix
                          02  1EA2
                          86  1EA5          .BYTE   Pd$_Literal     ; Indicate literal
                    00000001  1EA6          .LONG   HP$M_ALLOC              ; Constant
                          88  1EAA          .BYTE   Pd$_Store       ; Indicate store operation
                        000A  1EAB          .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                          00  1EAD          .BYTE   0               ; 0 HP$B_FLAGS to data
                          08  1EAE          .BYTE   8               ; 8 of data field
                          81  1EAF          .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                              1EB0  734 LA36:   $DS_LA36
                              1EB0          .SAVE   LOCAL_BLOCK
                              1EB0          .PSECT  $ABS$,ABS
                    00000032  0050          .=HP$A_DEPENDENT
                              0032          .IIF    NB,LA36$K_LEN,  LA36$K_LEN:
                    00001EB0                .RESTORE
           36 33 41 4C 00' 1EB0             .ASCIC  "LA36"  ; LA36 name
                          04  1EB0
                          32  1EB5          .BYTE   LA36$K_LEN              ; LA36$K_LEN of resultant P-table
                          FF  1EB6          .BYTE   255             ; Maximum unit number                   ;G:65
                        0000  1EB7          .WORD   ^A""    ; Two character mnemonic for QIO LA36
                          80  1EB9          .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  1EBA          .Byte   Pd$_Name        ; Directive op-code
                          1B  1EBB          .Byte   Ptd$M_EndDevice         ; Enforced TT codes
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                    54 54 00' 1EBC                  .Ascic  "TT"    ; Enforced device name prefix
                       02  1EBC
                       86  1EBF                    .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  1EC0                    .LONG   HP$M_ALLOC              ; Constant
                       88  1EC4                    .BYTE   Pd$_Store       ; Indicate store operation
                     000A  1EC5                    .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                       00  1EC7                    .BYTE   0               ; 0 HP$B_FLAGS to data
                       08  1EC8                    .BYTE   8               ; 8 of data field
                       81  1EC9                    .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                           1ECA    735 LA38:       $DS_LA38
                           1ECA                    .SAVE   LOCAL_BLOCK
                           1ECA                    .PSECT  $ABS$,ABS
                 00000032  0050                    .=HP$A_DEPENDENT
                           0032                    .IIF    NB,LA38$K_LEN,  LA38$K_LEN:
                       0000 1ECA                   .RESTORE
              38 33 41 4C 00' 1ECA                 .ASCIC  "LA38"  ; LA38 name
                       04  1ECA
                       32  1ECF                    .BYTE   LA38$K_LEN              ; LA38$K_LEN of resultant P-table
                       FF  1ED0                    .BYTE   255             ; Maximum unit number                   ;G:65
                     0000  1ED1                    .WORD   ^A""    ; Two character mnemonic for QIO LA38
                       80  1ED3                    .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  1ED4                    .Byte   Pd$_Name        ; Directive op-code
                       1B  1ED5                    .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                    54 54 00' 1ED6                 .Ascic  "TT"    ; Enforced device name prefix
                       02  1ED6
                       86  1ED9                    .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  1EDA                    .LONG   HP$M_ALLOC              ; Constant
                       88  1EDE                    .BYTE   Pd$_Store       ; Indicate store operation
                     000A  1EDF                    .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                       00  1EE1                    .BYTE   0               ; 0 HP$B_FLAGS to data
                       08  1EE2                    .BYTE   8               ; 8 of data field
                       81  1EE3                    .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                           1EE4    736 LA100:      $DS_LA100                       ;       [35]
                           1EE4                    .SAVE   LOCAL_BLOCK
                           1EE4                    .PSECT  $ABS$,ABS
                 00000032  0050                    .=HP$A_DEPENDENT
                           0032                    .IIF    NB,HP$K_LA100_LEN,      HP$K_LA100_LEN:
                           0032                    .IIF    NB,LA100$K_LEN, LA100$K_LEN:
                       0000 1EE4                   .RESTORE
           30 30 31 41 4C 00' 1EE4                 .ASCIC  "LA100" ; LA100 name
                       05  1EE4
                       32  1EEA                    .BYTE   LA100$K_LEN             ; LA100$K_LEN of resultant P-table
                       FF  1EEB                    .BYTE   255             ; Maximum unit number                   ;G:65
                     0000  1EEC                    .WORD   ^A""    ; Two character mnemonic for QIO LA100
                       80  1EEE                    .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  1EEF                    .Byte   Pd$_Name        ; Directive op-code
                       1B  1EF0                    .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                    54 54 00' 1EF1                 .Ascic  "TT"    ; Enforced device name prefix
                       02  1EF1
                       86  1EF4                    .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  1EF5                    .LONG   HP$M_ALLOC              ; Constant
                       88  1EF9                    .BYTE   Pd$_Store       ; Indicate store operation
                     000A  1EFA                    .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                       00  1EFC                    .BYTE   0               ; 0 HP$B_FLAGS to data
                       08  1EFD                    .BYTE   8               ; 8 of data field
                       81  1EFE                    .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                           1EFF    737 LA120:      $DS_LA120
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                          1EFF                .SAVE   LOCAL_BLOCK
                          1EFF                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LA120$K_LEN, LA120$K_LEN:
                          1EFF                .RESTORE
          30 32 31 41 4C 00' 1EFF             .ASCIC  "LA120" ; LA120 name
                            05  1EFF
                            32  1F05          .BYTE   LA120$K_LEN             ; LA120$K_LEN of resultant P-table
                            FF  1F06          .BYTE   255                     ; Maximum unit number                   ;G:65
                          0000  1F07          .WORD   ^A""    ; Two character mnemonic for QIO LA120
                            80  1F09          .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                            8D  1F0A          .Byte   Pd$_Name        ; Directive op-code
                            1B  1F0B          .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                     54 54 00'  1F0C          .Ascic  "TT"    ; Enforced device name prefix
                            02  1F0C
                            86  1F0F          .BYTE   Pd$_Literal     ; Indicate literal
                    00000001    1F10          .LONG   HP$M_ALLOC              ; Constant
                            88  1F14          .BYTE   Pd$_Store       ; Indicate store operation
                          000A  1F15          .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                            00  1F17          .BYTE   0               ; 0 HP$B_FLAGS to data
                            08  1F18          .BYTE   8               ; 8 of data field
                            81  1F19          .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1F1A    738 LA180:  $DS_LA180
                          1F1A                .SAVE   LOCAL_BLOCK
                          1F1A                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LA180$K_LEN, LA180$K_LEN:
                          1F1A                .RESTORE
          30 38 31 41 4C 00' 1F1A             .ASCIC  "LA180" ; LA180 name
                            05  1F1A
                            32  1F20          .BYTE   LA180$K_LEN             ; LA180$K_LEN of resultant P-table
                            FF  1F21          .BYTE   255             ; Maximum unit number                   ;G:65
                          2000  1F22          .WORD   ^A""    ; Two character mnemonic for QIO LA180
                            80  1F24          .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                            8D  1F25          .Byte   Pd$_Name        ; Directive op-code
                            1B  1F26          .Byte   Ptd$M_EndDevice         ; Enforced LP codes
                     50 4C 00'  1F27          .Ascic  "LP"    ; Enforced device name prefix
                            02  1F27
                            86  1F2A          .BYTE   Pd$_Literal     ; Indicate literal
                    00000001    1F2B          .LONG   HP$M_ALLOC              ; Constant
                            88  1F2F          .BYTE   Pd$_Store       ; Indicate store operation
                          000A  1F30          .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                            00  1F32          .BYTE   0               ; 0 HP$B_FLAGS to data
                            08  1F33          .BYTE   8               ; 8 of data field
                            81  1F34          .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1F35    739 LA210:  $DS_LA210                       ;       [66]
                          1F35                .SAVE   LOCAL_BLOCK
                          1F35                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_LA210_LEN,      HP$K_LA210_LEN:
                          0032                .IIF    NB,LA210$K_LEN, LA210$K_LEN:
                          1F35                .RESTORE
          30 31 32 41 4C 00' 1F35             .ASCIC  "LA210" ; LA210 name
                            05  1F35
                            32  1F3B          .BYTE   LA210$K_LEN             ; LA210$K_LEN of resultant P-table
                            08  1F3C          .BYTE   8               ; Maximum unit number                   ;G:65
                          0000  1F3D          .WORD   ^A""    ; Two character mnemonic for QIO LA210
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                      80  1F3F                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1F40                .Byte   Pd$_Name        ; Directive op-code
                      1B  1F41                .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                 54 54 00' 1F42               .Ascic  "TT"    ; Enforced device name prefix
                      02  1F42
                      86  1F45                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  1F46                .LONG   HP$M_ALLOC              ; Constant
                      88  1F4A                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  1F4B                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  1F4D                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  1F4E                .BYTE   8               ; 8 of data field
                      81  1F4F                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1F50    740 LANCE:  $DS_LANCE                       ;       [68]
                          1F50                .SAVE   LOCAL_BLOCK
                          1F50                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LANCE$K_LEN, LANCE$K_LEN:
                      0000 1F50               .RESTORE
             45 43 4E 41 4C 00' 1F50          .ASCIC  "LANCE" ; LANCE name
                      05  1F50
                      32  1F56                .BYTE   LANCE$K_LEN             ; LANCE$K_LEN of resultant P-table
                      01  1F57                .BYTE   1               ; Maximum unit number                   ;G:65
                    0000  1F58                .WORD   ^A""    ; Two character mnemonic for QIO LANCE
                      80  1F5A                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1F5B                .Byte   Pd$_Name        ; Directive op-code
                      03  1F5C                .Byte   PTD$M_Device            ; Enforced ET codes
                 54 45 00' 1F5D               .Ascic  "ET"    ; Enforced device name prefix
                      02  1F5D
                      81  1F60                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          1F61    741 LESI:   $DS_LESI                        ;       [34]
                          1F61                .SAVE   LOCAL_BLOCK
                          1F61                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$L_LESI_IP,        HP$L_LESI_IP:
                          0032                .IIF    NB,LESI$L_IP,   LESI$L_IP:
                00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                          0036                .IIF    NB,HP$B_LESI_BR,        HP$B_LESI_BR:
                          0036                .IIF    NB,LESI$B_BR,   LESI$B_BR:
                00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                          0037                .IIF    NB,HP$K_LESI_LEN,       HP$K_LESI_LEN:
                          0037                .IIF    NB,LESI$K_LEN,  LESI$K_LEN:
                      0000 1F61               .RESTORE
             49 53 45 4C 00' 1F61             .ASCIC  "LESI"  ; LESI name
                      04  1F61
                      37  1F66                .BYTE   HP$K_LESI_LEN           ; HP$K_LESI_LEN of resultant P-table
                      00  1F67                .BYTE   0               ; Maximum unit number                   ;G:65
                    0000  1F68                .WORD   ^A""    ; Two character mnemonic for QIO LESI
                      80  1F6A                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  1F6B                .Byte   Pd$_Name        ; Directive op-code
                      02  1F6C                .Byte   Ptd$M_Controller                ; Enforced DA codes
                 41 44 00' 1F6D               .Ascic  "DA"    ; Enforced device name prefix
                      02  1F6D
                      83  1F70                .BYTE   Pd$_Octal       ; Indicate scan octal
                 50 49 00' 1F71               .ASCIC  "IP"    ; IP string
                      02  1F71
            0003FFFC 0003E000  1F74           .LONG   ^O760000,^O777774       ; 760000 , 777774 limits on input
                      88  1F7C                .BYTE   Pd$_Store       ; Indicate store operation
```

```
                     0032  1F7D                .WORD   HP$L_LESI_IP            ; Byte HP$L_LESI_IP to data
                       00  1F7F                .BYTE   0                ; 0 HP$L_LESI_IP to data
                       20  1F80                .BYTE   32               ; 32 of data field
                       88  1F81                .BYTE   Pd$_Store        ; Indicate store operation
                     0018  1F82                .WORD   Hp$A_Device              ; Byte Hp$A_Device to data
                       00  1F84                .BYTE   0                ; 0 Hp$A_Device to data
                       12  1F85                .BYTE   18               ; 18 of data field
                       83  1F86                .BYTE   Pd$_Octal        ; Indicate scan octal
           72 6F 74 63 65 56 00' 1F87          .ASCIC  "Vector"         ; Vector string
                       06  1F87
              000001FC 00000004  1F8E          .LONG   ^O4,^O774        ; 4 , 774 limits on input
                       88  1F96                .BYTE   Pd$_Store        ; Indicate store operation
                     0024  1F97                .WORD   HP$W_VECTOR              ; Byte HP$W_VECTOR to data
                       00  1F99                .BYTE   0                ; 0 HP$W_VECTOR to data
                       08  1F9A                .BYTE   8                ; 8 of data field
                       82  1F9B                .BYTE   Pd$_Decimal      ; Indicate scan decimal
                  52 42 00' 1F9C          .ASCIC  "BR"     ; BR string
                       02  1F9C
              00000007 00000004  1F9F          .LONG   4,7      ; 4 , 7 limits on input
                       88  1FA7                .BYTE   Pd$_Store        ; Indicate store operation
                     0036  1FA8                .WORD   HP$B_LESI_BR             ; Byte HP$B_LESI_BR to data
                       00  1FAA                .BYTE   0                ; 0 HP$B_LESI_BR to data
                       08  1FAB                .BYTE   8                ; 8 of data field
                       81  1FAC                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                           1FAD    742 LG01:    $DS_LG01                                ;       [79]                    ;G:27
                           1FAD                .SAVE   LOCAL_BLOCK
                           1FAD                .PSECT  $ABS$,ABS
                  00000032 0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,LG01$K_LEN,  LG01$K_LEN:
                           1FAD                .RESTORE
           31 30 47 4C 00' 1FAD                .ASCIC  "LG01"   ; LG01 name
                       04  1FAD
                       32  1FB2                .BYTE   LG01$K_LEN               ; LG01$K_LEN of resultant P-table
                       01  1FB3                .BYTE   1                ; Maximum unit number                   ;G:65
                     0000  1FB4                .WORD   ^A""     ; Two character mnemonic for QIO LG01
                       80  1FB6                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                       8D  1FB7                .Byte   Pd$_Name         ; Directive op-code
                       1B  1FB8                .Byte   Ptd$M_EndDevice          ; Enforced LG codes
                  47 4C 00' 1FB9          .Ascic  "LG"     ; Enforced device name prefix
                       02  1FB9
                       86  1FBC                .BYTE   Pd$_Literal      ; Indicate literal
                 00000001  1FBD                .LONG   HP$M_ALLOC               ; Constant
                       88  1FC1                .BYTE   Pd$_Store        ; Indicate store operation
                     000A  1FC2                .WORD   HP$B_FLAGS               ; Byte HP$B_FLAGS to data
                       00  1FC4                .BYTE   0                ; 0 HP$B_FLAGS to data
                       08  1FC5                .BYTE   8                ; 8 of data field
                       81  1FC6                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                           1FC7    743 LG02:    $DS_LG02                                ;       [79]                    ;G:27
                           1FC7                .SAVE   LOCAL_BLOCK
                           1FC7                .PSECT  $ABS$,ABS
                  00000032 0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,LG02$K_LEN,  LG02$K_LEN:
                           1FC7                .RESTORE
           32 30 47 4C 00' 1FC7                .ASCIC  "LG02"   ; LG02 name
                       04  1FC7
                       32  1FCC                .BYTE   LG02$K_LEN               ; LG02$K_LEN of resultant P-table
                       01  1FCD                .BYTE   1                ; Maximum unit number                   ;G:65
```

```
                     0000  1FCE                .WORD   ^A""    ; Two character mnemonic for QIO LG02
                       80  1FD0                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  1FD1                .Byte   Pd$_Name        ; Directive op-code
                       1B  1FD2                .Byte   Ptd$M_EndDevice         ; Enforced LG codes
                  47 4C 00' 1FD3                .Ascic  "LG"    ; Enforced device name prefix
                       02  1FD3
                       86  1FD6                .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  1FD7                .LONG   HP$M_ALLOC              ; Constant
                       88  1FDB                .BYTE   Pd$_Store       ; Indicate store operation
                     000A  1FDC                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                       00  1FDE                .BYTE   0               ; 0 HP$B_FLAGS to data
                       08  1FDF                .BYTE   8               ; 8 of data field
                       81  1FE0                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                           1FE1    744 LG03:   $DS_LG03                                ;       [79]                    ;G:27
                           1FE1                .SAVE   LOCAL_BLOCK
                           1FE1                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,LG03$K_LEN,  LG03$K_LEN:
                       00001FE1                .RESTORE
              33 30 47 4C 00' 1FE1                .ASCIC  "LG03"  ; LG03 name
                       04  1FE1
                       32  1FE6                .BYTE   LG03$K_LEN              ; LG03$K_LEN of resultant P-table
                       01  1FE7                .BYTE   1               ; Maximum unit number                   ;G:65
                     0000  1FE8                .WORD   ^A""    ; Two character mnemonic for QIO LG03
                       80  1FEA                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  1FEB                .Byte   Pd$_Name        ; Directive op-code
                       1B  1FEC                .Byte   Ptd$M_EndDevice         ; Enforced LG codes
                  47 4C 00' 1FED                .Ascic  "LG"    ; Enforced device name prefix
                       02  1FED
                       86  1FF0                .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  1FF1                .LONG   HP$M_ALLOC              ; Constant
                       88  1FF5                .BYTE   Pd$_Store       ; Indicate store operation
                     000A  1FF6                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                       00  1FF8                .BYTE   0               ; 0 HP$B_FLAGS to data
                       08  1FF9                .BYTE   8               ; 8 of data field
                       81  1FFA                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                           1FFB    745 LN01:   $DS_LN01                                ;       [35]
                           1FFB                .SAVE   LOCAL_BLOCK
                           1FFB                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,LN01$K_LEN,  LN01$K_LEN:
                       00001FFB                .RESTORE
              31 30 4E 4C 00' 1FFB                .ASCIC  "LN01"  ; LN01 name
                       04  1FFB
                       32  2000                .BYTE   LN01$K_LEN              ; LN01$K_LEN of resultant P-table
                       FF  2001                .BYTE   255             ; Maximum unit number                   ;G:65
                     0000  2002                .WORD   ^A""    ; Two character mnemonic for QIO LN01
                       80  2004                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  2005                .Byte   Pd$_Name        ; Directive op-code
                       1B  2006                .Byte   Ptd$M_EndDevice         ; Enforced LP codes
                  50 4C 00' 2007                .Ascic  "LP"    ; Enforced device name prefix
                       02  2007
                       86  200A                .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  200B                .LONG   HP$M_ALLOC              ; Constant
                       88  200F                .BYTE   Pd$_Store       ; Indicate store operation
                     000A  2010                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                       00  2012                .BYTE   0               ; 0 HP$B_FLAGS to data
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                  08  2013                .BYTE   8                   ; 8 of data field
                  81  2014                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                      2015   746 LN03:    $DS_LN03                                  ;       [66]
                      2015                .SAVE   LOCAL_BLOCK
                      2015                .PSECT  $ABS$,ABS
            00000032  0050                .=HP$A_DEPENDENT
                      0032                .IIF    NB,LN03$K_LEN,  LN03$K_LEN:
                  00002015                .RESTORE
      33 30 4E 4C 00' 2015                .ASCIC  "LN03"  ; LN03 name
                  04  2015
                  32  201A                .BYTE   LN03$K_LEN                  ; LN03$K_LEN of resultant P-table
                  FF  201B                .BYTE   255                 ; Maximum unit number                        ;G:65
                0000  201C                .WORD   ^A""    ; Two character mnemonic for QIO LN03
                  80  201E                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                  86  201F                .BYTE   Pd$_Literal         ; Indicate literal
            00000001  2020                .LONG   HP$M_ALLOC                  ; Constant
                  88  2024                .BYTE   Pd$_Store           ; Indicate store operation
                000A  2025                .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                  00  2027                .BYTE   0                   ; 0 HP$B_FLAGS to data
                  08  2028                .BYTE   8                   ; 8 of data field
                  81  2029                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                      202A   747 LP04:    $DS_LP04
                      202A                .SAVE   LOCAL_BLOCK
                      202A                .PSECT  $ABS$,ABS
            00000032  0050                .=HP$A_DEPENDENT
                      0032                .IIF    NB,LP04$K_LEN,  LP04$K_LEN:
                  0000202A                .RESTORE
      34 30 50 4C 00' 202A                .ASCIC  "LP04"  ; LP04 name
                  04  202A
                  32  202F                .BYTE   LP04$K_LEN                  ; LP04$K_LEN of resultant P-table
                  01  2030                .BYTE   1                   ; Maximum unit number                        ;G:65
                0000  2031                .WORD   ^A""    ; Two character mnemonic for QIO LP04
                  80  2033                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                  8D  2034                .Byte   Pd$_Name            ; Directive op-code
                  1B  2035                .Byte   Ptd$M_EndDevice             ; Enforced LP codes
            50 4C 00' 2036                .Ascic  "LP"    ; Enforced device name prefix
                  02  2036
                  86  2039                .BYTE   Pd$_Literal         ; Indicate literal
            00000001  203A                .LONG   HP$M_ALLOC                  ; Constant
                  88  203E                .BYTE   Pd$_Store           ; Indicate store operation
                000A  203F                .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                  00  2041                .BYTE   0                   ; 0 HP$B_FLAGS to data
                  08  2042                .BYTE   8                   ; 8 of data field
                  81  2043                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                      2044   748 LP05:    $DS_LP05
                      2044                .SAVE   LOCAL_BLOCK
                      2044                .PSECT  $ABS$,ABS
            00000032  0050                .=HP$A_DEPENDENT
                      0032                .IIF    NB,LP05$K_LEN,  LP05$K_LEN:
                  00002044                .RESTORE
      35 30 50 4C 00' 2044                .ASCIC  "LP05"  ; LP05 name
                  04  2044
                  32  2049                .BYTE   LP05$K_LEN                  ; LP05$K_LEN of resultant P-table
                  01  204A                .BYTE   1                   ; Maximum unit number                        ;G:65
                0000  204B                .WORD   ^A""    ; Two character mnemonic for QIO LP05
                  80  204D                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                  8D  204E                .Byte   Pd$_Name            ; Directive op-code
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                      1B  204F                .Byte   Ptd$M_EndDevice         ; Enforced LP codes
                50 4C 00' 2050                .Ascic  "LP"    ; Enforced device name prefix
                      02  2050
                      86  2053                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  2054                .LONG   HP$M_ALLOC              ; Constant
                      88  2058                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  2059                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  205B                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  205C                .BYTE   8               ; 8 of data field
                      81  205D                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          205E    749 LP06:   $DS_LP06
                          205E                .SAVE   LOCAL_BLOCK
                          205E                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LP06$K_LEN,  LP06$K_LEN:
                      0000205E                .RESTORE
             36 30 50 4C 00' 205E             .ASCIC  "LP06"  ; LP06 name
                      04  205E
                      32  2063                .BYTE   LP06$K_LEN              ; LP06$K_LEN of resultant P-table
                      01  2064                .BYTE   1               ; Maximum unit number                   ;G:65
                    0000  2065                .WORD   ^A""    ; Two character mnemonic for QIO LP06
                      80  2067                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2068                .Byte   Pd$_Name        ; Directive op-code
                      1B  2069                .Byte   Ptd$M_EndDevice         ; Enforced LP codes
                50 4C 00' 206A                .Ascic  "LP"    ; Enforced device name prefix
                      02  206A
                      86  206D                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  206E                .LONG   HP$M_ALLOC              ; Constant
                      88  2072                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  2073                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  2075                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  2076                .BYTE   8               ; 8 of data field
                      81  2077                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2078    750 LP07:   $DS_LP07
                          2078                .SAVE   LOCAL_BLOCK
                          2078                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,LP07$K_LEN,  LP07$K_LEN:
                      00002078                .RESTORE
             37 30 50 4C 00' 2078             .ASCIC  "LP07"  ; LP07 name
                      04  2078
                      32  207D                .BYTE   LP07$K_LEN              ; LP07$K_LEN of resultant P-table
                      01  207E                .BYTE   1               ; Maximum unit number                   ;G:65
                    0000  207F                .WORD   ^A""    ; Two character mnemonic for QIO LP07
                      80  2081                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2082                .Byte   Pd$_Name        ; Directive op-code
                      1B  2083                .Byte   Ptd$M_EndDevice         ; Enforced LP codes
                50 4C 00' 2084                .Ascic  "LP"    ; Enforced device name prefix
                      02  2084
                      86  2087                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  2088                .LONG   HP$M_ALLOC              ; Constant
                      88  208C                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  208D                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  208F                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  2090                .BYTE   8               ; 8 of data field
                      81  2091                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2092    751 LP11:   $DS_LP11
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                        2092                .SAVE   LOCAL_BLOCK
                        2092                .PSECT  $ABS$,ABS
                00000032  0050              .=HP$A_DEPENDENT
                          0032              .IIF    NB,LP11$L_CSR,  LP11$L_CSR:
                00000036  0032              .IIF    NB,.BLKL,       .BLKL   1
                          0036              .IIF    NB,LP11$B_BR,   LP11$B_BR:
                00000037  0036              .IIF    NB,.BLKB,       .BLKB   1
                          0037              .IIF    NB,LP11$K_LEN,  LP11$K_LEN:
                      00002092              .RESTORE
             31 31 50 4C 00' 2092             .ASCIC  "LP11"  ; LP11 name
                          04  2092
                          37  2097          .BYTE   LP11$K_LEN              ; LP11$K_LEN of resultant P-table
                          00  2098          .BYTE   0                       ; Maximum unit number                   ;G:65
                        504C  2099          .WORD   ^A"LP"  ; Two character mnemonic for QIO LP11 LP
                          80  209B          .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  209C          .Byte   Pd$_Name        ; Directive op-code
                          02  209D          .Byte   Ptd$M_Controller                ; Enforced LP codes
                     50 4C 00' 209E         .Ascic  "LP"    ; Enforced device name prefix
                          02  209E
                          83  20A1          .BYTE   Pd$_Octal       ; Indicate scan octal
                  52 53 43 00' 20A2         .ASCIC  "CSR"   ; CSR string
                          03  20A2
                8003FFFE 0003E000  20A6     .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                          88  20AE          .BYTE   Pd$_Store       ; Indicate store operation
                        0032  20AF          .WORD   LP11$L_CSR              ; Byte LP11$L_CSR to data
                          00  20B1          .BYTE   0               ; 0 LP11$L_CSR to data
                          20  20B2          .BYTE   32              ; 32 of data field
                          88  20B3          .BYTE   Pd$_Store       ; Indicate store operation
                        0018  20B4          .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                          00  20B6          .BYTE   0               ; 0 HP$A_DEVICE to data
                          12  20B7          .BYTE   18              ; 18 of data field
                          83  20B8          .BYTE   Pd$_Octal       ; Indicate scan octal
        52 4F 54 43 45 56 00' 20B9          .ASCIC  "VECTOR"        ; VECTOR string
                          06  20B9
           000001FE 00000002  20C0          .LONG   ^O2,^O776       ; 2 , 776 limits on input
                          88  20C8          .BYTE   Pd$_Store       ; Indicate store operation
                        0024  20C9          .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                          00  20CB          .BYTE   0               ; 0 HP$W_VECTOR to data
                          09  20CC          .BYTE   9               ; 9 of data field
                          82  20CD          .BYTE   Pd$_Decimal     ; Indicate scan decimal
                     52 42 00' 20CE         .ASCIC  "BR"    ; BR string
                          02  20CE
           00000007 00000004  20D1          .LONG   4,7     ; 4 , 7 limits on input
                          88  20D9          .BYTE   Pd$_Store       ; Indicate store operation
                        0036  20DA          .WORD   LP11$B_BR               ; Byte LP11$B_BR to data
                          00  20DC          .BYTE   0               ; 0 LP11$B_BR to data
                          08  20DD          .BYTE   8               ; 8 of data field
                          81  20DE          .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                              20DF  752 LP14: $DS_LP14
                              20DF          .SAVE   LOCAL_BLOCK
                              20DF          .PSECT  $ABS$,ABS
                00000032  0050              .=HP$A_DEPENDENT
                          0032              .IIF    NB,LP14$K_LEN,  LP14$K_LEN:
                      000020DF              .RESTORE
             34 31 50 4C 00' 20DF             .ASCIC  "LP14"  ; LP14 name
                          04  20DF
                          32  20E4          .BYTE   LP14$K_LEN              ; LP14$K_LEN of resultant P-table
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                 01  20E5                .BYTE   1                   ; Maximum unit number                        ;G:65
               0000  20E6                .WORD   ^A""      ; Two character mnemonic for QIO LP14
                 80  20E8                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                 8D  20E9                .Byte   Pd$_Name            ; Directive op-code
                 1B  20EA                .Byte   Ptd$M_EndDevice             ; Enforced LP codes
          50 4C 00'  20EB                .Ascic  "LP"      ; Enforced device name prefix
                 02  20EB
                 86  20EE                .BYTE   Pd$_Literal         ; Indicate literal
          00000001  20EF                .LONG   HP$M_ALLOC                  ; Constant
                 88  20F3                .BYTE   Pd$_Store           ; Indicate store operation
               000A  20F4                .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                 00  20F6                .BYTE   0                   ; 0 HP$B_FLAGS to data
                 08  20F7                .BYTE   8                   ; 8 of data field
                 81  20F8                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                     20F9   753 LP25:    $DS_LP25
                     20F9                .SAVE   LOCAL_BLOCK
                     20F9                .PSECT  $ABS$,ABS
          00000032  0050                .=HP$A_DEPENDENT
                     0032                .IIF    NB,LP25$K_LEN,  LP25$K_LEN:
                 00020F9                .RESTORE
     35 32 50 4C 00' 20F9                .ASCIC  "LP25"  ; LP25 name
                 04  20F9
                 32  20FE                .BYTE   LP25$K_LEN                  ; LP25$K_LEN of resultant P-table
                 01  20FF                .BYTE   1                   ; Maximum unit number                        ;G:65
               0000  2100                .WORD   ^A""      ; Two character mnemonic for QIO LP25
                 80  2102                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                 8D  2103                .Byte   Pd$_Name            ; Directive op-code
                 1B  2104                .Byte   Ptd$M_EndDevice             ; Enforced LP codes
          50 4C 00'  2105                .Ascic  "LP"      ; Enforced device name prefix
                 02  2105
                 86  2108                .BYTE   Pd$_Literal         ; Indicate literal
          00000001  2109                .LONG   HP$M_ALLOC                  ; Constant
                 88  210D                .BYTE   Pd$_Store           ; Indicate store operation
               000A  210E                .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                 00  2110                .BYTE   0                   ; 0 HP$B_FLAGS to data
                 08  2111                .BYTE   8                   ; 8 of data field
                 81  2112                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                     2113   754 LP26:    $DS_LP26
                     2113                .SAVE   LOCAL_BLOCK
                     2113                .PSECT  $ABS$,ABS
          00000032  0050                .=HP$A_DEPENDENT
                     0032                .IIF    NB,LP26$K_LEN,  LP26$K_LEN:
                 00002113                .RESTORE
     36 32 50 4C 00' 2113                .ASCIC  "LP26"  ; LP26 name
                 04  2113
                 32  2118                .BYTE   LP26$K_LEN                  ; LP26$K_LEN of resultant P-table
                 01  2119                .BYTE   1                   ; Maximum unit number                        ;G:65
               0000  211A                .WORD   ^A""      ; Two character mnemonic for QIO LP26
                 80  211C                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                 8D  211D                .Byte   Pd$_Name            ; Directive op-code
                 1B  211E                .Byte   Ptd$M_EndDevice             ; Enforced LP codes
          50 4C 00'  211F                .Ascic  "LP"      ; Enforced device name prefix
                 02  211F
                 86  2122                .BYTE   Pd$_Literal         ; Indicate literal
          00000001  2123                .LONG   HP$M_ALLOC                  ; Constant
                 88  2127                .BYTE   Pd$_Store           ; Indicate store operation
               000A  2128                .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
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                    00  212A                .BYTE   0                   ; 0 HP$B_FLAGS to data
                    08  212B                .BYTE   8                   ; 8 of data field
                    81  212C                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                        212D   755 LP27:    $DS_LP27
                        212D                .SAVE   LOCAL_BLOCK
                        212D                .PSECT  $ABS$,ABS
              00000032  0050                .=HP$A_DEPENDENT
                        0032                .IIF    NB,LP27$K_LEN,  LP27$K_LEN:
                    0000212D                .RESTORE
        37 32 50 4C 00' 212D                .ASCIC  "LP27"  ; LP27 name
                    04  212D
                    32  2132                .BYTE   LP27$K_LEN                  ; LP27$K_LEN of resultant P-table
                    01  2133                .BYTE   1                   ; Maximum unit number                       ;G:65
                  0000  2134                .WORD   ^A""    ; Two character mnemonic for QIO LP27
                    80  2136                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                    8D  2137                .Byte   Pd$_Name            ; Directive op-code
                    1B  2138                .Byte   Ptd$M_EndDevice             ; Enforced LP codes
              50 4C 00' 2139                .Ascic  "LP"    ; Enforced device name prefix
                    02  2139
                    86  213C                .BYTE   Pd$_Literal         ; Indicate literal
              00000001  213D                .LONG   HP$M_ALLOC                  ; Constant
                    88  2141                .BYTE   Pd$_Store           ; Indicate store operation
                  000A  2142                .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                    00  2144                .BYTE   0                   ; 0 HP$B_FLAGS to data
                    08  2145                .BYTE   8                   ; 8 of data field
                    81  2146                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                        2147   756 LPA11K:  $DS_LPA11K
                        2147                .SAVE   LOCAL_BLOCK
                        2147                .PSECT  $ABS$,ABS
              00000032  0050                .=HP$A_DEPENDENT
                        0032                .IIF    NB,LPA11K$L_CSR,            LPA11K$L_CSR:
              00000036  0032                .IIF    NB,.BLKL,           .BLKL   1
                        0036                .IIF    NB,LPA11K$B_BR, LPA11K$B_BR:
              00000037  0036                .IIF    NB,.BLKB,           .BLKB   1
                        0037                .IIF    NB,LPA11K$K_LEN,            LPA11K$K_LEN:
                    00002147                .RESTORE
     4B 31 31 41 50 4C 00' 2147             .ASCIC  "LPA11K"            ; LPA11K name
                    06  2147
                    37  214E                .BYTE   LPA11K$K_LEN                ; LPA11K$K_LEN of resultant P-table
                    01  214F                .BYTE   1                   ; Maximum unit number                       ;G:65
                  414C  2150                .WORD   ^A"LA"  ; Two character mnemonic for QIO LPA11K LA
                    80  2152                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                    8D  2153                .Byte   Pd$_Name            ; Directive op-code
                    03  2154                .Byte   Ptd$M_Device                ; Enforced LA codes
              41 4C 00' 2155                .Ascic  "LA"    ; Enforced device name prefix
                    02  2155
                    86  2158                .BYTE   Pd$_Literal         ; Indicate literal
              00000001  2159                .LONG   HP$M_ALLOC                  ; Constant
                    88  215D                .BYTE   Pd$_Store           ; Indicate store operation
                  000A  215E                .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                    00  2160                .BYTE   0                   ; 0 HP$B_FLAGS to data
                    08  2161                .BYTE   8                   ; 8 of data field
                    83  2162                .BYTE   Pd$_Octal           ; Indicate scan octal
           52 53 43 00' 2163                .ASCIC  "CSR"   ; CSR string
                    03  2163
     0003FFFE 0003E000  2167                .LONG   ^O760000,^O777776           ; 760000 , 777776 limits on input
                    88  216F                .BYTE   Pd$_Store           ; Indicate store operation
```

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                     0018  2170                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                       00  2172                .BYTE   0                       ; 0 HP$A_DEVICE to data
                       12  2173                .BYTE   18                      ; 18 of data field
                       88  2174                .BYTE   Pd$_Store               ; Indicate store operation
                     0032  2175                .WORD   LPA11K$L_CSR                    ; Byte LPA11K$L_CSR to data
                       00  2177                .BYTE   0                       ; 0 LPA11K$L_CSR to data
                       20  2178                .BYTE   32                      ; 32 of data field
                       83  2179                .BYTE   Pd$_Octal               ; Indicate scan octal
           52 4F 54 43 45 56 00' 217A          .ASCIC  "VECTOR"                ; VECTOR string
                       06  217A
              000001FE 00000002  2181          .LONG   ^O2,^O776               ; 2 , 776 limits on input
                       88  2189                .BYTE   Pd$_Store               ; Indicate store operation
                     0024  218A                .WORD   HP$W_VECTOR                     ; Byte HP$W_VECTOR to data
                       00  218C                .BYTE   0                       ; 0 HP$W_VECTOR to data
                       09  218D                .BYTE   9                       ; 9 of data field
                       82  218E                .BYTE   Pd$_Decimal             ; Indicate scan decimal
                  52 42 00' 218F          .ASCIC  "BR"    ; BR string
                       02  218F
              00000007 00000004  2192          .LONG   4,7     ; 4 , 7 limits on input
                       88  219A                .BYTE   Pd$_Store               ; Indicate store operation
                     0036  219B                .WORD   LPA11K$B_BR                     ; Byte LPA11K$B_BR to data
                       00  219D                .BYTE   0                       ; 0 LPA11K$B_BR to data
                       08  219E                .BYTE   8                       ; 8 of data field
                       81  219F                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                           21A0    757 LUA11:  $DS_LUA11                               ;       [71]
                           21A0                .SAVE   LOCAL_BLOCK
                           21A0                .PSECT  $ABS$,ABS
                   00000032  0050              .=HP$A_DEPENDENT
                           0032                .IIF    NB,LUA11$B_BR,  LUA11$B_BR:
                   00000033  0032              .IIF    NB,,BLKB,       .BLKB   1
                           0033                .IIF    NB,LUA11$L_CSR, LUA11$L_CSR:
                   00000037  0033              .IIF    NB,,BLKL,       .BLKL   1
                           0037                .IIF    NB,LUA11$K_LEN, LUA11$K_LEN:
                      000021A0                 .RESTORE
        31 31 41 55 4C 00' 21A0                .ASCIC  "LUA11" ; LUA11 name
                       05  21A0
                       37  21A6                .BYTE   LUA11$K_LEN             ; LUA11$K_LEN of resultant P-table
                       08  21A7                .BYTE   8                       ; Maximum unit number                   ;G:65
                     0000  21A8                .WORD   ^A""    ; Two character mnemonic for QIO LUA11
                       80  21AA                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                       8D  21AB                .Byte   Pd$_Name                ; Directive op-code
                       03  21AC                .Byte   PTD$M_DEVICE            ; Enforced XE codes
                  45 58 00' 21AD          .Asci   "XE"    ; Enforced device name prefix
                       02  21AD
                       83  21B0                .BYTE   Pd$_Octal               ; Indicate scan octal
                52 53 43 00' 21B1          .ASCIC  "CSR"   ; CSR string
                       03  21B1
              0003FFFE 0003E000  21B5          .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                       88  21BD                .BYTE   Pd$_Store               ; Indicate store operation
                     0033  21BE                .WORD   LUA11$L_CSR                     ; Byte LUA11$L_CSR to data
                       00  21C0                .BYTE   0                       ; 0 LUA11$L_CSR to data
                       20  21C1                .BYTE   32                      ; 32 of data field
                       88  21C2                .BYTE   Pd$_Store               ; Indicate store operation
                     0018  21C3                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                       00  21C5                .BYTE   0                       ; 0 HP$A_DEVICE to data
                       12  21C6                .BYTE   18                      ; 18 of data field
                       83  21C7                .BYTE   Pd$_Octal               ; Indicate scan octal
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                52 4F 54 43 45 56 00' 21C8                      .ASCIC  "VECTOR"        ; VECTOR string
                                06  21C8
                   000001FE 00000002  21CF                      .LONG   ^O2,^O776       ; 2 , 776 limits on input
                                88  21D7                      .BYTE   Pd$_Store       ; Indicate store operation
                              0024  21D8                      .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                00  21DA                      .BYTE   0               ; 0 HP$W_VECTOR to data
                                09  21DB                      .BYTE   9               ; 9 of data field
                                82  21DC                      .BYTE   Pd$_Decimal     ; Indicate scan decimal
                             52 42 00' 21DD                     .ASCIC  "BR"    ; BR string
                                02  21DD
                   00000007 00000004  21E0                      .LONG   4,7     ; 4 , 7 limits on input
                                88  21E8                      .BYTE   Pd$_Store       ; Indicate store operation
                              0032  21E9                      .WORD   LUA11$B_BR              ; Byte LUA11$B_BR to data
                                00  21EB                      .BYTE   0               ; 0 LUA11$B_BR to data
                                08  21EC                      .BYTE   8               ; 8 of data field
                                81  21ED                      .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                    21EE    758 MA780:  $DS_MA780
                                    21EE                .SAVE   LOCAL_BLOCK
                                    21EE                .PSECT  $ABS$,ABS
                              00000032  0050                .=HP$A_DEPENDENT
                                    0032                .IIF    NB,MA780$B_TR,  MA780$B_TR:
                              00000033  0032                .IIF    NB,..BLKB,      .BLKB   1
                                    0033                .IIF    NB,MA780$B_BR,  MA780$B_BR:
                              00000034  0033                .IIF    NB,..BLKB,      .BLKB   1
                                    0034                .IIF    NB,MA780$B_MPM, MA780$B_MPM:
                              00000035  0034                .IIF    NB,..BLKB,      .BLKB   1
                                    0035                .IIF    NB,MA780$B_PORT,        MA780$B_PORT:
                              00000036  0035                .IIF    NB,..BLKB,      .BLKB   1
                                    0036                .IIF    NB,MA780$K_LEN, MA780$K_LEN:
                                 000021EE               .RESTORE
                30 38 37 41 4D 00' 21EE                 .ASCIC  "MA780" ; MA780 name
                                05  21EE
                                36  21F4                .BYTE   MA780$K_LEN             ; MA780$K_LEN of resultant P-table
                                08  21F5                .BYTE   8               ; Maximum unit number                   ;G:65
                              0000  21F6                .WORD   ^A""    ; Two character mnemonic for QIO MA780
                                80  21F8                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                8D  21F9                .Byte   Pd$_Name        ; Directive op-code
                                01  21FA                .Byte   Ptd$M_Unit              ; Enforced MA codes
                             41 4D 00' 21FB             .Ascic  "MA"    ; Enforced device name prefix
                                02  21FB
                                82  21FE                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                             52 54 00' 21FF             .ASCIC  "TR"    ; TR string
                                02  21FF
                   0000000F 00000001  2202                      .LONG   1,15    ; 1 , 15 limits on input
                                88  220A                      .BYTE   Pd$_Store       ; Indicate store operation
                              0032  220B                      .WORD   MA780$B_TR              ; Byte MA780$B_TR to data
                                00  220D                      .BYTE   0               ; 0 MA780$B_TR to data
                                08  220E                      .BYTE   8               ; 8 of data field
                                88  220F                      .BYTE   Pd$_Store       ; Indicate store operation
                              0018  2210                      .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                0D  2212                      .BYTE   13              ; 13 HP$A_DEVICE to data
                                04  2213                      .BYTE   4               ; 4 of data field
                                88  2214                      .BYTE   Pd$_Store       ; Indicate store operation
                              0024  2215                      .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                02  2217                      .BYTE   2               ; 2 HP$W_VECTOR to data
                                04  2218                      .BYTE   4               ; 4 of data field
                                82  2219                      .BYTE   Pd$_Decimal     ; Indicate scan decimal
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                    52 42 00' 221A                  .ASCIC  "BR"    ; BR string
                       02  221A
          00000007 00000004  221D                  .LONG   4,7     ; 4 , 7 limits on input
                       88  2225                  .BYTE   Pd$_Store       ; Indicate store operation
                     0033  2226                  .WORD   MA780$B_BR              ; Byte MA780$B_BR to data
                       00  2228                  .BYTE   0               ; 0 MA780$B_BR to data
                       08  2229                  .BYTE   8               ; 8 of data field
                       88  222A                  .BYTE   Pd$_Store       ; Indicate store operation
                     0024  222B                  .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                       06  222D                  .BYTE   6               ; 6 HP$W_VECTOR to data
                       02  222E                  .BYTE   2               ; 2 of data field
                       86  222F                  .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  2230                  .LONG   1               ; Constant
                       88  2234                  .BYTE   Pd$_Store       ; Indicate store operation
                     0024  2235                  .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                       08  2237                  .BYTE   8               ; 8 HP$W_VECTOR to data
                       01  2238                  .BYTE   1               ; 1 of data field
                       86  2239                  .BYTE   Pd$_Literal     ; Indicate literal
                 00000006  223A                  .LONG   6               ; Constant
                       88  223E                  .BYTE   Pd$_Store       ; Indicate store operation
                     0018  223F                  .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                       1C  2241                  .BYTE   28              ; 28 HP$A_DEVICE to data
                       04  2242                  .BYTE   4               ; 4 of data field
                       82  2243                  .BYTE   Pd$_Decimal     ; Indicate scan decimal
                 4D 50 4D 00' 2244               .ASCIC  "MPM"   ; MPM string
                       03  2244
          00000003 00000000  2248                  .LONG   0,3     ; 0 , 3 limits on input
                       88  2250                  .BYTE   Pd$_Store       ; Indicate store operation
                     0034  2251                  .WORD   MA780$B_MPM             ; Byte MA780$B_MPM to data
                       00  2253                  .BYTE   0               ; 0 MA780$B_MPM to data
                       08  2254                  .BYTE   8               ; 8 of data field
                       82  2255                  .BYTE   Pd$_Decimal     ; Indicate scan decimal
              54 52 4F 50 00' 2256               .ASCIC  "PORT"  ; PORT string
                       04  2256
          00000003 00000000  225B                  .LONG   0,3     ; 0 , 3 limits on input
                       88  2263                  .BYTE   Pd$_Store       ; Indicate store operation
                     0035  2264                  .WORD   MA780$B_PORT            ; Byte MA780$B_PORT to data
                       00  2266                  .BYTE   0               ; 0 MA780$B_PORT to data
                       08  2267                  .BYTE   8               ; 8 of data field
                       81  2268                  .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                           2269  759 MBE:         $DS_MBE
                           2269                  .SAVE   LOCAL_BLOCK
                           2269                  .PSECT  $ABS$,ABS
                  00000032  0050                  .=HP$A_DEPENDENT
                           0032                  .IIF    NB,MBE$K_LEN,   MBE$K_LEN:
                       00002269                  .RESTORE
                 45 42 4D 00' 2269               .ASCIC  "MBE"   ; MBE name
                       03  2269
                       32  226D                  .BYTE   MBE$K_LEN               ; MBE$K_LEN of resultant P-table
                       08  226E                  .BYTE   8               ; Maximum unit number                   ;G:65
                     0000  226F                  .WORD   ^A""    ; Two character mnemonic for QIO MBE
                       80  2271                  .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       87  2272                  .BYTE   Pd$_Fetch       ; Indicate fetch operation
                     000B  2273                  .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                       00  2275                  .BYTE   0               ; 0 HP$B_DRIVE to data
                       08  2276                  .BYTE   8               ; 8 of data field
                       88  2277                  .BYTE   Pd$_Store       ; Indicate store operation
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                     0018  2278                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                       07  227A                .BYTE   7                       ; 7 HP$A_DEVICE to data
                       03  227B                .BYTE   3                       ; 3 of data field
                       81  227C                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                           227D    760 ML11:    $DS_ML11
                           227D                .SAVE   LOCAL_BLOCK
                           227D                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,ML11$B_ARRAY,        ML11$B_ARRAY:
                 00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                           0033                .IIF    NB,ML11$B_CHIP, ML11$B_CHIP:
                 00000034  0033                .IIF    NB,.BLKB,       .BLKB   1
                           0034                .IIF    NB,ML11$K_LEN,  ML11$K_LEN:
                      0000227D                 .RESTORE
           31 31 4C 4D 00' 227D                .ASCIC  "ML11"  ; ML11 name
                       04  227D
                       34  2282                .BYTE   ML11$K_LEN              ; ML11$K_LEN of resultant P-table
                       08  2283                .BYTE   8                       ; Maximum unit number                   ;G:65
                     4D45  2284                .WORD   ^A"EM"  ; Two character mnemonic for QIO ML11 EM
                       80  2286                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                       8D  2287                .Byte   Pd$_Name                ; Directive op-code
                       03  2288                .Byte   Ptd$M_Device            ; Enforced EM codes
                 4D 45 00' 2289                .Ascic  "EM"    ; Enforced device name prefix
                       02  2289
                       86  228C                .BYTE   Pd$_Literal             ; Indicate literal
                 00000001  228D                .LONG   HP$M_ALLOC              ; Constant
                       88  2291                .BYTE   Pd$_Store               ; Indicate store operation
                     000A  2292                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                       00  2294                .BYTE   0                       ; 0 HP$B_FLAGS to data
                       08  2295                .BYTE   8                       ; 8 of data field
                       87  2296                .BYTE   Pd$_Fetch               ; Indicate fetch operation
                     000B  2297                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                       00  2299                .BYTE   0                       ; 0 HP$B_DRIVE to data
                       08  229A                .BYTE   8                       ; 8 of data field
                       88  229B                .BYTE   Pd$_Store               ; Indicate store operation
                     0018  229C                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                       07  229E                .BYTE   7                       ; 7 HP$A_DEVICE to data
                       03  229F                .BYTE   3                       ; 3 of data field
                       82  22A0                .BYTE   Pd$_Decimal             ; Indicate scan decimal
61 20 66 6F 20 72 65 62 6D 75 4E 00' 22A1       .ASCIC  "Number of array boards"        ; Number of array boards string
   73 64 72 61 6F 62 20 79 61 72 72  22AD
                       16  22A1
                 00000010 00000001   22B8       .LONG   1,16    ; 1 , 16 limits on input
                       88  22C0                .BYTE   Pd$_Store               ; Indicate store operation
                     0032  22C1                .WORD   ML11$B_ARRAY            ; Byte ML11$B_ARRAY to data
                       00  22C3                .BYTE   0                       ; 0 ML11$B_ARRAY to data
                       08  22C4                .BYTE   8                       ; 8 of data field
                       85  22C5                .BYTE   Pd$_String              ; Indicate scan and verify string
     65 7A 69 73 20 70 69 68 43 00' 22C6       .ASCIC  "Chip size"     ; Chip size string
                       09  22C6
                  4B 36 31 00' 22D0            .ASCIC  "16K"
                       03  22D0
                  4B 34 36 00' 22D4            .ASCIC  "64K"
                       03  22D4
                       00  22D8                .BYTE   0                       ; Null length is end of valid 16K,64K
                       88  22D9                .BYTE   Pd$_Store               ; Indicate store operation
                     0033  22DA                .WORD   ML11$B_CHIP             ; Byte ML11$B_CHIP to data
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                      00  22DC                .BYTE   0                       ; 0 ML11$B_CHIP to data
                      08  22DD                .BYTE   8                       ; 8 of data field
                      81  22DE                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          22DF    761 MS750:   $DS_MS750
                          22DF                .SAVE   LOCAL_BLOCK
                          22DF                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,MS750$K_LEN, MS750$K_LEN:
                      000022DF                .RESTORE
           30 35 37 53 4D 00' 22DF            .ASCIC  "MS750" ; MS750 name
                      05  22DF
                      32  22E5                .BYTE   MS750$K_LEN             ; MS750$K_LEN of resultant P-table
                      08  22E6                .BYTE   8                       ; Maximum unit number                   ;G:65
                    0000  22E7                .WORD   ^A""    ; Two character mnemonic for QIO MS750
                      80  22E9                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  22EA                .Byte   Pd$_Name                ; Directive op-code
                      01  22EB                .Byte   Ptd$M_Unit              ; Enforced MS codes
                 53 4D 00' 22EC              .Ascic  "MS"    ; Enforced device name prefix
                      02  22EC
                      81  22EF                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          22F0    762 MS780:   $DS_MS780
                          22F0                .SAVE   LOCAL_BLOCK
                          22F0                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,MS780$B_TR,  MS780$B_TR:
                 00000033 0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,ms780$b_arrays,      ms780$b_arrays:
                 00000034 0033                .IIF    NB,.blkb,       .blkb   1
                          0034                .IIF    NB,MS780$K_LEN, MS780$K_LEN:
                      000022F0                .RESTORE
           30 38 37 53 4D 00' 22F0            .ASCIC  "MS780" ; MS780 name
                      05  22F0
                      34  22F6                .BYTE   MS780$K_LEN             ; MS780$K_LEN of resultant P-table
                      08  22F7                .BYTE   8                       ; Maximum unit number                   ;G:65
                    0000  22F8                .WORD   ^A""    ; Two character mnemonic for QIO MS780
                      80  22FA                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  22FB                .Byte   Pd$_Name                ; Directive op-code
                      01  22FC                .Byte   Ptd$M_Unit              ; Enforced MS codes
                 53 4D 00' 22FD              .Ascic  "MS"    ; Enforced device name prefix
                      02  22FD
                      82  2300                .BYTE   Pd$_Decimal             ; Indicate scan decimal
                 52 54 00' 2301              .ASCIC  "TR"    ; TR string
                      02  2301
                0000000F 00000001 2304        .LONG   1,15    ; 1 , 15 limits on input
                      88  230C                .BYTE   Pd$_Store               ; Indicate store operation
                    0032  230D                .WORD   MS780$B_TR              ; Byte MS780$B_TR to data
                      00  230F                .BYTE   0                       ; 0 MS780$B_TR to data
                      08  2310                .BYTE   8                       ; 8 of data field
                      88  2311                .BYTE   Pd$_Store               ; Indicate store operation
                    0018  2312                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      0D  2314                .BYTE   13                      ; 13 HP$A_DEVICE to data
                      04  2315                .BYTE   4                       ; 4 of data field
                      86  2316                .BYTE   Pd$_Literal             ; Indicate literal
                 00000006 2317                .LONG   6                       ; Constant
                      88  231B                .BYTE   Pd$_Store               ; Indicate store operation
                    0018  231C                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      1C  231E                .BYTE   28                      ; 28 HP$A_DEVICE to data
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                            04  231F                .BYTE   4                   ; 4 of data field
                            82  2320                .BYTE   Pd$_Decimal      ; Indicate scan decimal
61 20 66 6F 20 72 65 62 6D 75 4E 00' 2321           .ASCIC  "Number of arrays"      ; Number of arrays string
                      73 79 61 72 72  232D
                            10  2321
                  00000010 00000000  2332           .LONG   0,16    ; 0 , 16 limits on input
                            88  233A                .BYTE   Pd$_Store       ; Indicate store operation
                          0033  233B                .WORD   ms780$b_arrays          ; Byte ms780$b_arrays to data
                            00  233D                .BYTE   0                   ; 0 ms780$b_arrays to data
                            08  233E                .BYTE   8                   ; 8 of data field
                            81  233F                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2340    763 MSAAA:    $DS_MSAAA
                          2340                    .SAVE   LOCAL_BLOCK
                          2340                    .PSECT  $ABS$,ABS
                      00000032  0050                .=HP$A_DEPENDENT
                          0032                    .IIF    NB,HP$K_MSA_LEN,        HP$K_MSA_LEN:
                      00002340  0032                .RESTORE
                  41 41 41 53 4D 00' 2340           .ASCIC  "MSAAA" ; MSAAA name
                            05  2340
                            32  2346                .BYTE   HP$K_MSA_LEN            ; HP$K_MSA_LEN of resultant P-table
                            02  2347                .BYTE   2                   ; Maximum unit number                   ;G:65
                          0000  2348                .WORD   ^A""    ; Two character mnemonic for QIO MSAAA
                            80  234A                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                            8D  234B                .Byte   Pd$_Name        ; Directive op-code
                            01  234C                .Byte   PTD$M_UNIT              ; Enforced MS codes
                        53 4D 00' 234D              .Asic   "MS"    ; Enforced device name prefix
                            02  234D
                            81  2350                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2351    764 NBIA:     $DS_NBIA
                          2351                    .SAVE   LOCAL_BLOCK
                          2351                    .PSECT  $ABS$,ABS
                      00000032  0050                .=HP$A_DEPENDENT
                          0032                    .IIF    NB,HP$B_NBIA_COMMON,    HP$B_NBIA_COMMON:
                      00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                    .IIF    NB,HP$L_NBIA_CSR,       HP$L_NBIA_CSR:
                      00000037  0033                .IIF    NB,.BLKL,       .BLKL   1
                          0037                    .IIF    NB,HP$B_BR,     HP$B_BR:
                      00000038  0037                .IIF    NB,.BLKB,       .BLKB   1
                          0038                    .IIF    NB,HP$K_NBIA_LEN,       HP$K_NBIA_LEN:
                      00002351  0038                .RESTORE
                  41 49 42 4E 00' 2351              .ASCIC  "NBIA"  ; NBIA name
                            04  2351
                            38  2356                .BYTE   HP$K_NBIA_LEN           ; HP$K_NBIA_LEN of resultant P-table
                            02  2357                .BYTE   2                   ; Maximum unit number                   ;G:65
                          0000  2358                .WORD   ^A""    ; Two character mnemonic for QIO NBIA
                            80  235A                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                            8D  235B                .Byte   Pd$_Name        ; Directive op-code
                            01  235C                .Byte   PTD$M_UNIT              ; Enforced NBIA codes
                  41 49 42 4E 00' 235D              .Ascic  "NBIA"  ; Enforced device name prefix
                            04  235D
                            86  2362                .BYTE   Pd$_Literal      ; Indicate literal
                      60080000  2363                .LONG   ^X60080000              ; Constant
                            88  2367                .BYTE   Pd$_Store       ; Indicate store operation
                          0018  2368                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                            00  236A                .BYTE   0                   ; 0 HP$A_DEVICE to data
                            20  236B                .BYTE   32                  ; 32 of data field
                            82  236C                .BYTE   Pd$_Decimal      ; Indicate scan decimal
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41 44 41 20 4C 41 47 49 47 4F 4C 00' 236D                .ASCIC  "LOGIGAL ADAPTER # "    ; LOGIGAL ADAPTER #  string
               20 23 20 52 45 54 50  2379
                                  12  236D
                     00000001 00000000  2380             .LONG   0,1     ; 0 , 1 limits on input
                                  88  2388             .BYTE   Pd$_Store       ; Indicate store operation
                                0018  2389             .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                  1A  238B             .BYTE   26              ; 26 HP$A_DEVICE to data
                                  01  238C             .BYTE   1               ; 1 of data field
                                  8C  238D             .BYTE   Pd$_Case        ; Indicate case operation
                                  02  238E             .BYTE   $$_$            ; Count of pairs
                     00000120 00000000  238F             .LONG   0,^X120         ; Store the pair
                     00000130 00000001  2397             .LONG   1,^X130         ; Store the pair
                                  88  239F             .BYTE   Pd$_Store       ; Indicate store operation
                                0024  23A0             .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                                  00  23A2             .BYTE   0               ; 0 HP$W_VECTOR to data
                                  10  23A3             .BYTE   16              ; 16 of data field
                                  87  23A4             .BYTE   Pd$_Fetch       ; Indicate fetch operation
                                0018  23A5             .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                  1A  23A7             .BYTE   26              ; 26 HP$A_DEVICE to data
                                  01  23A8             .BYTE   1               ; 1 of data field
                                  8C  23A9             .BYTE   Pd$_Case        ; Indicate case operation
                                  02  23AA             .BYTE   $$_$            ; Count of pairs
                     60000000 00000000  23AB             .LONG   0,^X60000000            ; Store the pair
                     64000000 00000001  23B3             .LONG   1,^X64000000            ; Store the pair
                                  88  23BB             .BYTE   Pd$_Store       ; Indicate store operation
                                001C  23BC             .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                                  00  23BE             .BYTE   0               ; 0 HP$A_DVA to data
                                  20  23BF             .BYTE   32              ; 32 of data field
                                  81  23C0             .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                      23C1  765 NBIB:    $DS_NBIB
                                      23C1               .SAVE   LOCAL_BLOCK
                                      23C1               .PSECT  $ABS$,ABS
                           00000032   0050               .=HP$A_DEPENDENT
                                      0032               .IIF    NB,HP$B_NBIB_COMMON,    HP$B_NBIB_COMMON:
                           00000033   0032               .IIF    NB,,BLKB,       .BLKB   1
                                      0033               .IIF    NB,HP$B_BI_NODE,        HP$B_BI_NODE:
                           00000034   0033               .IIF    NB,,BLKB,       .BLKB   1
                                      0034               .IIF    NB,HP$L_NBIB_CSR,       HP$L_NBIB_CSR:
                           00000038   0034               .IIF    NB,,BLKL,       .BLKL   1
                                      0038               .IIF    NB,HP$B_BI_NUM, HP$B_BI_NUM:
                           00000039   0038               .IIF    NB,,BLKB,       .BLKB   1
                                      0039               .IIF    NB,HP$K_NBIB_LEN,       HP$K_NBIB_LEN:
                                 000023C1                .RESTORE
                        42 49 42 4E 00' 23C1             .ASCIC  "NBIB"  ; NBIB name
                                  04  23C1
                                  39  23C6             .BYTE   HP$K_NBIB_LEN           ; HP$K_NBIB_LEN of resultant P-table
                                  06  23C7             .BYTE   6               ; Maximum unit number                   ;G:65
                                0000  23C8             .WORD   ^A""    ; Two character mnemonic for QIO NBIB
                                  80  23CA             .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                  8D  23CB             .Byte   Pd$_Name        ; Directive op-code
                                  01  23CC             .Byte   PTD$M_UNIT              ; Enforced NBIB codes
                        42 49 42 4E 00' 23CD             .Ascic  "NBIB"  ; Enforced device name prefix
                                  04  23CD
                                  82  23D2             .BYTE   Pd$_Decimal     ; Indicate scan decimal
                     20 23 20 49 42 00' 23D3             .ASCIC  "BI # "  ; BI #  string
                                  05  23D3
                     00000001 00000000  23D9             .LONG   0,1     ; 0 , 1 limits on input
```

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                                88  23E1                .BYTE   Pd$_Store       ; Indicate store operation
                              0038  23E2                .WORD   HP$B_BI_NUM             ; Byte HP$B_BI_NUM to data
                                00  23E4                .BYTE   0               ; 0 HP$B_BI_NUM to data
                                02  23E5                .BYTE   2               ; 2 of data field
                                88  23E6                .BYTE   Pd$_Store       ; Indicate store operation
                              0018  23E7                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                19  23E9                .BYTE   25              ; 25 HP$A_DEVICE to data
                                01  23EA                .BYTE   1               ; 1 of data field
                                87  23EB                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                              0018  23EC                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                00  23EE                .BYTE   0               ; 0 HP$A_DEVICE to data
                                20  23EF                .BYTE   32              ; 32 of data field
                                88  23F0                .BYTE   Pd$_Store       ; Indicate store operation
                              001C  23F1                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                                00  23F3                .BYTE   0               ; 0 HP$A_DVA to data
                                20  23F4                .BYTE   32              ; 32 of data field
                                84  23F5                .BYTE   Pd$_Hexadecimal ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00' 23F6                .ASCIC  "BI Node Number (HEX) " ; BI Node Number (HEX)  string
      20 29 58 45 48 28 20 72 65 62  2402
                                15  23F6
                  0000000F 00000000  240C                .LONG   ^X0,^XF ; 0 , F limits on input
                                88  2414                .BYTE   Pd$_Store       ; Indicate store operation
                              0033  2415                .WORD   HP$B_BI_NODE             ; Byte HP$B_BI_NODE to data
                                00  2417                .BYTE   0               ; 0 HP$B_BI_NODE to data
                                08  2418                .BYTE   8               ; 8 of data field
                                87  2419                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                              0033  241A                .WORD   HP$B_BI_NODE             ; Byte HP$B_BI_NODE to data
                                00  241C                .BYTE   0               ; 0 HP$B_BI_NODE to data
                                08  241D                .BYTE   8               ; 8 of data field
                                88  241E                .BYTE   Pd$_Store       ; Indicate store operation
                              0018  241F                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                                0D  2421                .BYTE   13              ; 13 HP$A_DEVICE to data
                                04  2422                .BYTE   4               ; 4 of data field
                                81  2423                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                    2424  766 NI:       $DS_NI                                ;       [62]
                                    2424                .SAVE   LOCAL_BLOCK
                                    2424                .PSECT  $ABS$,ABS
                          00000032  0050                .=HP$A_Dependent
                                    0032                .IIF    NB,NI$B_Loopback,       NI$B_Loopback::
                          00000033  0032                .IIF    NB,..Blkb,      .Blkb   1
                                    0033                .IIF    NB,NI$K_Len,    NI$K_Len::
                                00002424                .RESTORE
                             49 4E 00' 2424             .ASCIC  "NI"    ; NI name
                                02  2424
                                33  2427                .BYTE   NI$K_Len                ; NI$K_Len of resultant P-table
                                00  2428                .BYTE   0               ; Maximum unit number                           ;G:65
                              0000  2429                .WORD   ^A""    ; Two character mnemonic for QIO NI
                                80  242B                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                                8D  242C                .Byte   Pd$_Name        ; Directive op-code
                                04  242D                .Byte   Ptd$M_Name              ; Enforced XEA0 codes
                       30 41 45 58 00' 242E             .Ascic  "XEA0"  ; Enforced device name prefix
                                04  242E
                                8B  2433                .BYTE   Pd$_Logical     ; Indicate logical value operation
6B 63 61 62 70 6F 6F 4C 20 49 4E 00' 2434                .ASCIC  \NI Loopback Connector Installed\       ; NI Loopback Connector Inst
49 20 72 6F 74 63 65 6E 6E 6F 43 20  2440
            64 65 6C 6C 61 74 73 6E  244C
                                1F  2434
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                          88  2454                .BYTE   Pd$_Store        ; Indicate store operation
                        0032  2455                .WORD   NI$B_Loopback            ; Byte NI$B_Loopback to data
                          00  2457                .BYTE   0                ; 0 NI$B_Loopback to data
                          01  2458                .BYTE   1                ; 1 of data field
                          81  2459                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                              245A   767 PBIA:    $DS_PBIA                          ;                                    ;G:48
                              245A                .SAVE   LOCAL_BLOCK
                              245A                .PSECT  $ABS$,ABS
                    00000032  0050                .=HP$A_DEPENDENT
                              0032                .IIF    NB,HP$B_PBIA_COMMON,    HP$B_PBIA_COMMON:
                    00000033  0032                .IIF    NB,.BLKB,        .BLKB   1
                              0033                .IIF    NB,HP$L_PBIA_CSR,       HP$L_PBIA_CSR:
                    00000037  0033                .IIF    NB,.BLKL,        .BLKL   1
                              0037                .IIF    NB,HP$B_PBR,    HP$B_PBR:
                    00000038  0037                .IIF    NB,.BLKB,        .BLKB   1
                              0038                .IIF    NB,HP$K_PBIA_LEN,       HP$K_PBIA_LEN:
                          0000245A                .RESTORE
                41 49 42 50 00' 245A              .ASCIC  "PBIA"  ; PBIA name
                          04  245A
                          38  245F                .BYTE   HP$K_PBIA_LEN            ; HP$K_PBIA_LEN of resultant P-table
                          03  2460                .BYTE   3                ; Maximum unit number                        ;G:65
                        0000  2461                .WORD   ^A""    ; Two character mnemonic for QIO PBIA
                          80  2463                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                          8D  2464                .Byte   Pd$_Name         ; Directive op-code
                          01  2465                .Byte   PTD$M_UNIT               ; Enforced PBIA codes
                41 49 42 50 00' 2466              .Ascic  "PBIA"  ; Enforced device name prefix
                          04  2466
                          86  246B                .BYTE   Pd$_Literal      ; Indicate literal
                    60080000  246C                .LONG   ^X60080000               ; Constant
                          88  2470                .BYTE   Pd$_Store        ; Indicate store operation
                        0018  2471                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                          00  2473                .BYTE   0                ; 0 HP$A_DEVICE to data
                          20  2474                .BYTE   32               ; 32 of data field
                          82  2475                .BYTE   Pd$_Decimal      ; Indicate scan decimal
41 44 41 20 4C 41 47 49 47 4F 4C 00' 2476         .ASCIC  "LOGIGAL ADAPTER # "    ; LOGIGAL ADAPTER #  string
             20 23 20 52 45 54 50  2482
                          12  2476
              00000002 00000000  2489                .LONG   0,2     ; 0 , 2 limits on input
                          88  2491                .BYTE   Pd$_Store        ; Indicate store operation
                        0018  2492                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                          1A  2494                .BYTE   26               ; 26 HP$A_DEVICE to data
                          02  2495                .BYTE   2                ; 2 of data field
                          8C  2496                .BYTE   Pd$_Case         ; Indicate case operation
                          03  2497                .BYTE   $$_$             ; Count of pairs
              00000120 00000000  2498                .LONG   0,^X120          ; Store the pair
              00000130 00000001  24A0                .LONG   1,^X130          ; Store the pair
              00000140 00000002  24A8                .LONG   2,^X140          ; Store the pair
                          88  24B0                .BYTE   Pd$_Store        ; Indicate store operation
                        0024  24B1                .WORD   HP$W_VECTOR              ; Byte HP$W_VECTOR to data
                          00  24B3                .BYTE   0                ; 0 HP$W_VECTOR to data
                          10  24B4                .BYTE   16               ; 16 of data field
                          87  24B5                .BYTE   Pd$_Fetch        ; Indicate fetch operation
                        0018  24B6                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                          1A  24B8                .BYTE   26               ; 26 HP$A_DEVICE to data
                          02  24B9                .BYTE   2                ; 2 of data field
                          8C  24BA                .BYTE   Pd$_Case         ; Indicate case operation
                          03  24BB                .BYTE   $$_$             ; Count of pairs
```

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                60000000 00000000  24BC                .LONG   0,^X60000000            ; Store the pair
                64000000 00000001  24C4                .LONG   1,^X64000000            ; Store the pair
                68000000 00000002  24CC                .LONG   2,^X68000000            ; Store the pair
                              88   24D4                .BYTE   Pd$_Store       ; Indicate store operation
                            001C   24D5                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                              00   24D7                .BYTE   0               ; 0 HP$A_DVA to data
                              20   24D8                .BYTE   32              ; 32 of data field
                              81   24D9                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                   24DA    768 PCL11:   $DS_PCL11
                                   24DA                .SAVE   LOCAL_BLOCK
                                   24DA                .PSECT  $ABS$,ABS
                        00000032   0050                .=HP$A_DEPENDENT
                                   0032                .IIF    NB,PCL11$L_CSR, PCL11$L_CSR:
                        00000036   0032                .IIF    NB,.BLKL,       .BLKL   1
                                   0036                .IIF    NB,PCL11$B_BR,  PCL11$B_BR:
                        00000037   0036                .IIF    NB,.BLKB,       .BLKB   1
                                   0037                .IIF    NB,PCL11$K_LEN, PCL11$K_LEN:
                                000024DA                .RESTORE
                     31 31 4C 43 50 00' 24DA            .ASCIC  "PCL11" ; PCL11 name
                              05   24DA
                              37   24E0                .BYTE   PCL11$K_LEN             ; PCL11$K_LEN of resultant P-table
                              20   24E1                .BYTE   32              ; Maximum unit number                   ;G:65
                            0000   24E2                .WORD   ^A""    ; Two character mnemonic for QIO PCL11
                              80   24E4                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                              83   24E5                .BYTE   Pd$_Octal       ; Indicate scan octal
                        52 53 43 00' 24E6               .ASCIC  "CSR"   ; CSR string
                              03   24E6
                0003FFFE 0003E000  24EA                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                              88   24F2                .BYTE   Pd$_Store       ; Indicate store operation
                            0032   24F3                .WORD   PCL11$L_CSR             ; Byte PCL11$L_CSR to data
                              00   24F5                .BYTE   0               ; 0 PCL11$L_CSR to data
                              20   24F6                .BYTE   32              ; 32 of data field
                              88   24F7                .BYTE   Pd$_Store       ; Indicate store operation
                            0018   24F8                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                              00   24FA                .BYTE   0               ; 0 HP$A_DEVICE to data
                              12   24FB                .BYTE   18              ; 18 of data field
                              83   24FC                .BYTE   Pd$_Octal       ; Indicate scan octal
                  52 4F 54 43 45 56 00' 24FD           .ASCIC  "VECTOR"        ; VECTOR string
                              06   24FD
                000001FE 00000002  2504                .LONG   ^O2,^O776       ; 2 , 776 limits on input
                              88   250C                .BYTE   Pd$_Store       ; Indicate store operation
                            0024   250D                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                              00   250F                .BYTE   0               ; 0 HP$W_VECTOR to data
                              09   2510                .BYTE   9               ; 9 of data field
                              82   2511                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                        52 42 00'  2512                .ASCIC  "BR"    ; BR string
                              02   2512
                00000007 00000004  2515                .LONG   4,7     ; 4 , 7 limits on input
                              88   251D                .BYTE   Pd$_Store       ; Indicate store operation
                            0036   251E                .WORD   PCL11$B_BR              ; Byte PCL11$B_BR to data
                              00   2520                .BYTE   0               ; 0 PCL11$B_BR to data
                              08   2521                .BYTE   8               ; 8 of data field
                              81   2522                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                                   2523    769 PX780:   $DS_PX780                                       ;       [19]
                                   2523                .SAVE   LOCAL_BLOCK
                                   2523                .PSECT  $ABS$,ABS
                        00000032   0050                .=HP$A_DEPENDENT
```

```
                        0032                .IIF    NB,PX780$B_TR,  PX780$B_TR:
                00000033  0032                .IIF    NB,..BLKB,      .BLKB   1
                        0033                .IIF    NB,PX780$B_BR,  PX780$B_BR:
                00000034  0033                .IIF    NB,..BLKB,      .BLKB   1
                        0034                .IIF    NB,PX780$B_NODE,        PX780$B_NODE:
                00000035  0034                .IIF    NB,..BLKB,      .BLKB   1
                        0035                .IIF    NB,PX780$K_LEN, PX780$K_LEN:
                    00002523                .RESTORE
          30 38 37 58 50 00' 2523           .ASCIC  "PX780" ; PX780 name
                      05  2523
                      35  2529              .BYTE   PX780$K_LEN             ; PX780$K_LEN of resultant P-table
                      01  252A              .BYTE   1                       ; Maximum unit number                   ;G:65
                    5850  252B              .WORD   ^A"PX"  ; Two character mnemonic for QIO PX780 PX
                      80  252D              .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  252E              .Byte   Pd$_Name        ; Directive op-code
                      03  252F              .Byte   Ptd$M_Device            ; Enforced PX codes
                   58 50 00' 2530           .Ascic  "PX"    ; Enforced device name prefix
                      02  2530
                      82  2533              .BYTE   Pd$_Decimal     ; Indicate scan decimal
                   52 54 00' 2534           .ASCIC  "TR"    ; TR string
                      02  2534
                0000000F 00000001  2537     .LONG   1,15    ; 1 , 15 limits on input
                      88  253F              .BYTE   Pd$_Store       ; Indicate store operation
                    0032  2540              .WORD   PX780$B_TR              ; Byte PX780$B_TR to data
                      00  2542              .BYTE   0                       ; 0 PX780$B_TR to data
                      08  2543              .BYTE   8                       ; 8 of data field
                      88  2544              .BYTE   Pd$_Store       ; Indicate store operation
                    0018  2545              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      0D  2547              .BYTE   13                      ; 13 HP$A_DEVICE to data
                      04  2548              .BYTE   4                       ; 4 of data field
                      88  2549              .BYTE   Pd$_Store       ; Indicate store operation
                    0024  254A              .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      02  254C              .BYTE   2                       ; 2 HP$W_VECTOR to data
                      04  254D              .BYTE   4                       ; 4 of data field
                      82  254E              .BYTE   Pd$_Decimal     ; Indicate scan decimal
                   52 42 00' 254F           .ASCIC  "BR"    ; BR string
                      02  254F
                00000007 00000004  2552     .LONG   4,7     ; 4 , 7 limits on input
                      88  255A              .BYTE   Pd$_Store       ; Indicate store operation
                    0033  255B              .WORD   PX780$B_BR              ; Byte PX780$B_BR to data
                      00  255D              .BYTE   0                       ; 0 PX780$B_BR to data
                      08  255E              .BYTE   8                       ; 8 of data field
                      88  255F              .BYTE   Pd$_Store       ; Indicate store operation
                    0024  2560              .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      06  2562              .BYTE   6                       ; 6 HP$W_VECTOR to data
                      02  2563              .BYTE   2                       ; 2 of data field
                      82  2564              .BYTE   Pd$_Decimal     ; Indicate scan decimal
                65 64 6F 4E 00' 2565        .ASCIC  "Node"  ; Node string
                      04  2565
                000000FF 00000000  256A     .LONG   0,255   ; 0 , 255 limits on input
                      88  2572              .BYTE   Pd$_Store       ; Indicate store operation
                    0034  2573              .WORD   PX780$B_NODE            ; Byte PX780$B_NODE to data
                      00  2575              .BYTE   0                       ; 0 PX780$B_NODE to data
                      08  2576              .BYTE   8                       ; 8 of data field
                      86  2577              .BYTE   Pd$_Literal     ; Indicate literal
                00000006  2578              .LONG   6                       ; Constant
                      88  257C              .BYTE   Pd$_Store       ; Indicate store operation
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                0018  257D                .WORD   HP$A_DEVICE                ; Byte HP$A_DEVICE to data
                  1C  257F                .BYTE   28                  ; 28 HP$A_DEVICE to data
                  04  2580                .BYTE   4                   ; 4 of data field
                  86  2581                .BYTE   Pd$_Literal         ; Indicate literal
            00000001  2582                .LONG   1                   ; Constant
                  88  2586                .BYTE   Pd$_Store           ; Indicate store operation
                0024  2587                .WORD   HP$W_VECTOR                ; Byte HP$W_VECTOR to data
                  08  2589                .BYTE   8                   ; 8 HP$W_VECTOR to data
                  01  258A                .BYTE   1                   ; 1 of data field
                  81  258B                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                      258C    770 R80:    $DS_R80                                  ;       [16]
                      258C                .SAVE   LOCAL_BLOCK
                      258C                .PSECT  $ABS$,ABS
            00000032  0050                .=HP$A_DEPENDENT
                      0032                .IIF    NB,R80$K_LEN,   R80$K_LEN:
                  0000258C                .RESTORE
         30 38 52 00' 258C                .ASCIC  "R80"   ; R80 name
                  03  258C
                  32  2590                .BYTE   R80$K_LEN                  ; R80$K_LEN of resultant P-table
                  08  2591                .BYTE   8                   ; Maximum unit number                        ;G:65
                0000  2592                .WORD   ^A""    ; Two character mnemonic for QIO R80
                  80  2594                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                  8D  2595                .Byte   Pd$_Name            ; Directive op-code
                  1B  2596                .Byte   Ptd$M_EndDevice            ; Enforced DQ codes
            51 44 00' 2597                .Ascic  "DQ"    ; Enforced device name prefix
                  02  2597
                  86  259A                .BYTE   Pd$_Literal         ; Indicate literal
            00000001  259B                .LONG   HP$M_ALLOC                 ; Constant
                  88  259F                .BYTE   Pd$_Store           ; Indicate store operation
                000A  25A0                .WORD   HP$B_FLAGS                 ; Byte HP$B_FLAGS to data
                  00  25A2                .BYTE   0                   ; 0 HP$B_FLAGS to data
                  08  25A3                .BYTE   8                   ; 8 of data field
                  81  25A4                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                      25A5    771 RA60:   $DS_RA60
                      25A5                .SAVE   LOCAL_BLOCK
                      25A5                .PSECT  $ABS$,ABS
            00000032  0050                .=HP$A_DEPENDENT
                      0032                .IIF    NB,HP$K_RA60_LEN,       HP$K_RA60_LEN:
                      0032                .IIF    NB,RA60$K_LEN,  RA60$K_LEN:
                  000025A5                .RESTORE
      30 36 41 52 00' 25A5                .ASCIC  "RA60"  ; RA60 name
                  04  25A5
                  32  25AA                .BYTE   RA60$K_LEN                 ; RA60$K_LEN of resultant P-table
                  FF  25AB                .BYTE   255                 ; Maximum unit number                        ;G:65
                0000  25AC                .WORD   ^A""    ; Two character mnemonic for QIO RA60
                  80  25AE                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                  8D  25AF                .Byte   Pd$_Name            ; Directive op-code
                  13  25B0                .Byte   Ptd$M_UNIT!PTD$M_CONTROLLER!PTD$M_INHERIT_CON          ; Enforced D
            4A 44 00' 25B1                .Ascic  "DJ"    ; Enforced device name prefix
                  02  25B1
                  86  25B4                .BYTE   Pd$_Literal         ; Indicate literal
            00000001  25B5                .LONG   HP$M_ALLOC                 ; Constant
                  88  25B9                .BYTE   Pd$_Store           ; Indicate store operation
                000A  25BA                .WORD   HP$B_FLAGS                 ; Byte HP$B_FLAGS to data
                  00  25BC                .BYTE   0                   ; 0 HP$B_FLAGS to data
                  08  25BD                .BYTE   8                   ; 8 of data field
                  81  25BE                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
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                    25BF   772 RA70:   $DS_RA70                                  ;       [82]                    ;G:33
                    25BF               .SAVE   LOCAL_BLOCK
                    25BF               .PSECT  $ABS$,ABS
          00000032  0050               .=HP$A_DEPENDENT
                    0032               .IIF    NB,HP$K_RA70_LEN,       HP$K_RA70_LEN:
                    0032               .IIF    NB,RA70$K_LEN,  RA70$K_LEN:
                000025BF               .RESTORE
    30 37 41 52 00' 25BF               .ASCIC  "RA70"  ; RA70 name
                04  25BF
                32  25C4               .BYTE   RA70$K_LEN                  ; RA70$K_LEN of resultant P-table
                FF  25C5               .BYTE   255                 ; Maximum unit number                       ;G:65
              0000  25C6               .WORD   ^A""    ; Two character mnemonic for QIO RA70
                80  25C8               .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                8D  25C9               .Byte   Pd$_Name            ; Directive op-code
                1B  25CA               .Byte   PTD$M_ENDDEVICE             ; Enforced DU codes
          55 44 00' 25CB               .Ascic  "DU"    ; Enforced device name prefix
                02  25CB
                86  25CE               .BYTE   Pd$_Literal         ; Indicate literal
          00000001  25CF               .LONG   HP$M_ALLOC                  ; Constant
                88  25D3               .BYTE   Pd$_Store           ; Indicate store operation
              000A  25D4               .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                00  25D6               .BYTE   0                   ; 0 HP$B_FLAGS to data
                08  25D7               .BYTE   8                   ; 8 of data field
                81  25D8               .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                    25D9   773 RA80:   $DS_RA80                                  ;       [17]
                    25D9               .SAVE   LOCAL_BLOCK
                    25D9               .PSECT  $ABS$,ABS
          00000032  0050               .=HP$A_DEPENDENT
                    0032               .IIF    NB,HP$K_RA80_LEN,       HP$K_RA80_LEN:
                    0032               .IIF    NB,RA80$K_LEN,  RA80$K_LEN:
                000025D9               .RESTORE
    30 38 41 52 00' 25D9               .ASCIC  "RA80"  ; RA80 name
                04  25D9
                32  25DE               .BYTE   RA80$K_LEN                  ; RA80$K_LEN of resultant P-table
                FF  25DF               .BYTE   255                 ; Maximum unit number                       ;G:65
              0000  25E0               .WORD   ^A""    ; Two character mnemonic for QIO RA80
                80  25E2               .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                8D  25E3               .Byte   Pd$_Name            ; Directive op-code
                1B  25E4               .Byte   PTD$M_ENDDEVICE             ; Enforced DU codes
          55 44 00' 25E5               .Ascic  "DU"    ; Enforced device name prefix
                02  25E5
                86  25E8               .BYTE   Pd$_Literal         ; Indicate literal
          00000001  25E9               .LONG   HP$M_ALLOC                  ; Constant
                88  25ED               .BYTE   Pd$_Store           ; Indicate store operation
              000A  25EE               .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                00  25F0               .BYTE   0                   ; 0 HP$B_FLAGS to data
                08  25F1               .BYTE   8                   ; 8 of data field
                81  25F2               .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                    25F3   774 RA81:   $DS_RA81                                  ;       [21]
                    25F3               .SAVE   LOCAL_BLOCK
                    25F3               .PSECT  $ABS$,ABS
          00000032  0050               .=HP$A_DEPENDENT
                    0032               .IIF    NB,HP$K_RA81_LEN,       HP$K_RA81_LEN:
                    0032               .IIF    NB,RA81$K_LEN,  RA81$K_LEN:
                000025F3               .RESTORE
    31 38 41 52 00' 25F3               .ASCIC  "RA81"  ; RA81 name
                04  25F3
```

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                      32  25F8                .BYTE   RA81$K_LEN                 ; RA81$K_LEN of resultant P-table
                      FF  25F9                .BYTE   255                 ; Maximum unit number                       ;G:65
                    0000  25FA                .WORD   ^A""    ; Two character mnemonic for QIO RA81
                      80  25FC                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                      8D  25FD                .Byte   Pd$_Name            ; Directive op-code
                      1B  25FE                .Byte   PTD$M_ENDDEVICE             ; Enforced DU codes
                55 44 00' 25FF                .Ascic  "DU"    ; Enforced device name prefix
                      02  25FF
                      86  2602                .BYTE   Pd$_Literal         ; Indicate literal
                00000001  2603                .LONG   HP$M_ALLOC                  ; Constant
                      88  2607                .BYTE   Pd$_Store           ; Indicate store operation
                    000A  2608                .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                      00  260A                .BYTE   0                   ; 0 HP$B_FLAGS to data
                      08  260B                .BYTE   8                   ; 8 of data field
                      81  260C                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                          260D    775 RA82:     $DS_RA82                                  ;       [70]
                          260D                .SAVE   LOCAL_BLOCK
                          260D                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RA82_LEN,       HP$K_RA82_LEN:
                          0032                .IIF    NB,RA82$K_LEN,  RA82$K_LEN:
                          0000260D            .RESTORE
             32 38 41 52 00' 260D             .ASCIC  "RA82"  ; RA82 name
                      04  260D
                      32  2612                .BYTE   RA82$K_LEN                  ; RA82$K_LEN of resultant P-table
                      FF  2613                .BYTE   255                 ; Maximum unit number                       ;G:65
                    0000  2614                .WORD   ^A""    ; Two character mnemonic for QIO RA82
                      80  2616                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                      8D  2617                .Byte   Pd$_Name            ; Directive op-code
                      1B  2618                .Byte   PTD$M_ENDDEVICE             ; Enforced DU codes
                55 44 00' 2619                .Ascic  "DU"    ; Enforced device name prefix
                      02  2619
                      86  261C                .BYTE   Pd$_Literal         ; Indicate literal
                00000001  261D                .LONG   HP$M_ALLOC                  ; Constant
                      88  2621                .BYTE   Pd$_Store           ; Indicate store operation
                    000A  2622                .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                      00  2624                .BYTE   0                   ; 0 HP$B_FLAGS to data
                      08  2625                .BYTE   8                   ; 8 of data field
                      81  2626                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                          2627    776 RA90:     $DS_RA90                                  ;G:54
                          2627                .SAVE   LOCAL_BLOCK
                          2627                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RA90_LEN,       HP$K_RA90_LEN:
                          0032                .IIF    NB,RA90$K_LEN,  RA90$K_LEN:
                          00002627            .RESTORE
             30 39 41 52 00' 2627             .ASCIC  "RA90"  ; RA90 name
                      04  2627
                      32  262C                .BYTE   RA90$K_LEN                  ; RA90$K_LEN of resultant P-table
                      00  262D                .BYTE   0                                 ;G:77
                    0000  262E                .WORD   ^A""    ; Two character mnemonic for QIO RA90
                      80  2630                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                      8E  2631                .BYTE   PD$_EPB             ; EXTENDED P-TABLE BLOCK                    ;G:77
                    0FFF  2632                .WORD   4095                                ;G:77
                      8D  2634                .Byte   Pd$_Name            ; Directive op-code
                      1B  2635                .Byte   PTD$M_ENDDEVICE             ; Enforced DU codes
                55 44 00' 2636                .Ascic  "DU"    ; Enforced device name prefix
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                    02  2636
                    86  2639                .BYTE   Pd$_Literal     ; Indicate literal
              00000001  263A                .LONG   HP$M_ALLOC              ; Constant
                    88  263E                .BYTE   Pd$_Store       ; Indicate store operation
                  000A  263F                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                    00  2641                .BYTE   0               ; 0 HP$B_FLAGS to data
                    08  2642                .BYTE   8               ; 8 of data field
                    81  2643                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                        2644    777 RB730:  $DS_RB730                               ;       [16]
                        2644                .SAVE   LOCAL_BLOCK
                        2644                .PSECT  $ABS$,ABS
              00000032  0050                .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$L_RB730_CSR,      HP$L_RB730_CSR:
                        0032                .IIF    NB,RB730$L_CSR, RB730$L_CSR:
              00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                        0036                .IIF    NB,HP$B_RB730_BR,       HP$B_RB730_BR:
                        0036                .IIF    NB,RB730$B_BR,  RB730$B_BR:
              00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                        0037                .IIF    NB,HP$K_RB730_LEN,      HP$K_RB730_LEN:
                        0037                .IIF    NB,RB730$K_LEN, RB730$K_LEN:
                    00002644                .RESTORE
           30 33 37 42 52 00' 2644          .ASCIC  "RB730" ; RB730 name
                    05  2644
                    37  264A                .BYTE   RB730$K_LEN             ; RB730$K_LEN of resultant P-table
                    00  264B                .BYTE   0               ; Maximum unit number                   ;G:65
                  5144  264C                .WORD   ^A"DQ"  ; Two character mnemonic for QIO RB730 DQ
                    80  264E                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                    8D  264F                .Byte   Pd$_Name        ; Directive op-code
                    02  2650                .Byte   Ptd$M_Controller                ; Enforced DQ codes
              51 44 00' 2651                .Ascic  "DQ"    ; Enforced device name prefix
                    02  2651
                    86  2654                .BYTE   Pd$_Literal     ; Indicate literal
              00F26200  2655                .LONG   ^xF26200                ; Constant
                    88  2659                .BYTE   Pd$_Store       ; Indicate store operation
                  0018  265A                .WORD   hp$a_device             ; Byte hp$a_device to data
                    00  265C                .BYTE   0               ; 0 hp$a_device to data
                    1D  265D                .BYTE   29              ; 29 of data field
                    86  265E                .BYTE   Pd$_Literal     ; Indicate literal
              000000A8  265F                .LONG   ^o250           ; Constant
                    88  2663                .BYTE   Pd$_Store       ; Indicate store operation
                  0024  2664                .WORD   hp$w_vector             ; Byte hp$w_vector to data
                    00  2666                .BYTE   0               ; 0 hp$w_vector to data
                    09  2667                .BYTE   9               ; 9 of data field
                    86  2668                .BYTE   Pd$_Literal     ; Indicate literal
              00000005  2669                .LONG   5               ; Constant
                    88  266D                .BYTE   Pd$_Store       ; Indicate store operation
                  0036  266E                .WORD   rb730$b_br              ; Byte rb730$b_br to data
                    00  2670                .BYTE   0               ; 0 rb730$b_br to data
                    08  2671                .BYTE   8               ; 8 of data field
                    81  2672                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                        2673    778 RCF25:  $DS_RCF25                               ;       [33]
                        2673                .SAVE   LOCAL_BLOCK
                        2673                .PSECT  $ABS$,ABS
              00000032  0050                .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$K_RCF25_LEN,      HP$K_RCF25_LEN:
                        0032                .IIF    NB,RCF25$K_LEN, RCF25$K_LEN:
                    00002673                .RESTORE
```

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                35 32 46 43 52 00' 2673                 .ASCIC  "RCF25" ; RCF25 name
                                05  2673
                                32  2679                 .BYTE   RCF25$K_LEN                 ; RCF25$K_LEN of resultant P-table
                                FF  267A                 .BYTE   255                 ; Maximum unit number                                   ;G:65
                              0000  267B                 .WORD   ^A""        ; Two character mnemonic for QIO RCF25
                                80  267D                 .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                                8D  267E                 .Byte   Pd$_Name            ; Directive op-code
                                1B  267F                 .Byte   Ptd$M_EndDevice             ; Enforced DA codes
                           41 44 00' 2680                .Ascic  "DA"        ; Enforced device name prefix
                                02  2680
                                86  2683                 .BYTE   Pd$_Literal         ; Indicate literal
                          00000001  2684                 .LONG   HP$M_ALLOC                  ; Constant
                                88  2688                 .BYTE   Pd$_Store           ; Indicate store operation
                              000A  2689                 .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                                00  268B                 .BYTE   0                   ; 0 HP$B_FLAGS to data
                                08  268C                 .BYTE   8                   ; 8 of data field
                                81  268D                 .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                                    268E    779 RC25:    $DS_RC25                                ;       [32]
                                    268E                 .SAVE   LOCAL_BLOCK
                                    268E                 .PSECT  $ABS$,ABS
                          00000032  0050                 .=HP$A_DEPENDENT
                                    0032                 .IIF    NB,HP$K_RC25_LEN,       HP$K_RC25_LEN:
                                    0032                 .IIF    NB,RC25$K_LEN,  RC25$K_LEN:
                                0000268E                 .RESTORE
                     35 32 43 52 00' 268E                .ASCIC  "RC25"  ; RC25 name
                                04  268E
                                32  2693                 .BYTE   RC25$K_LEN                  ; RC25$K_LEN of resultant P-table
                                FF  2694                 .BYTE   255                 ; Maximum unit number                                   ;G:65
                              0000  2695                 .WORD   ^A""        ; Two character mnemonic for QIO RC25
                                80  2697                 .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                                8D  2698                 .Byte   Pd$_Name            ; Directive op-code
                                1B  2699                 .Byte   Ptd$M_EndDevice             ; Enforced DA codes
                           41 44 00' 269A                .Ascic  "DA"        ; Enforced device name prefix
                                02  269A
                                86  269D                 .BYTE   Pd$_Literal         ; Indicate literal
                          00000001  269E                 .LONG   HP$M_ALLOC                  ; Constant
                                88  26A2                 .BYTE   Pd$_Store           ; Indicate store operation
                              000A  26A3                 .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                                00  26A5                 .BYTE   0                   ; 0 HP$B_FLAGS to data
                                08  26A6                 .BYTE   8                   ; 8 of data field
                                81  26A7                 .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                                    26A8    780 RD52:    $DS_RD52                                ;       [67]
                                    26A8                 .SAVE   LOCAL_BLOCK
                                    26A8                 .PSECT  $ABS$,ABS
                          00000032  0050                 .=HP$A_DEPENDENT
                                    0032                 .IIF    NB,RD52$K_LEN,  RD52$K_LEN:
                                000026A8                 .RESTORE
                  32 35 44 52 00' 26A8                  .ASCIC  "RD52"  ; RD52 name
                                04  26A8
                                32  26AD                 .BYTE   RD52$K_LEN                  ; RD52$K_LEN of resultant P-table
                                FF  26AE                 .BYTE   255                 ; Maximum unit number                                   ;G:65
                              0000  26AF                 .WORD   ^A""        ; Two character mnemonic for QIO RD52
                                80  26B1                 .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                                8D  26B2                 .Byte   Pd$_Name            ; Directive op-code
                                1B  26B3                 .Byte   Ptd$M_EndDevice             ; Enforced DU codes
                           55 44 00' 26B4                .Ascic  "DU"        ; Enforced device name prefix
                                02  26B4
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                      86  26B7                .BYTE   Pd$_Literal      ; Indicate literal
                00000001  26B8                .LONG   HP$M_ALLOC              ; Constant
                      88  26BC                .BYTE   Pd$_Store        ; Indicate store operation
                    000A  26BD                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  26BF                .BYTE   0                ; 0 HP$B_FLAGS to data
                      08  26C0                .BYTE   8                ; 8 of data field
                      81  26C1                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          26C2    781 RD53:     $DS_RD53                          ;       [67]
                          26C2                .SAVE   LOCAL_BLOCK
                          26C2                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,RD53$K_LEN,  RD53$K_LEN:
                          26C2                .RESTORE
             33 35 44 52 00' 26C2             .ASCIC  "RD53"   ; RD53 name
                      04  26C2
                      32  26C7                .BYTE   RD53$K_LEN              ; RD53$K_LEN of resultant P-table
                      FF  26C8                .BYTE   255              ; Maximum unit number                  ;G:65
                    0000  26C9                .WORD   ^A""     ; Two character mnemonic for QIO RD53
                      80  26CB                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                      8D  26CC                .Byte   Pd$_Name         ; Directive op-code
                      1B  26CD                .Byte   Ptd$M_EndDevice          ; Enforced DU codes
                55 44 00' 26CE                .Ascic  "DU"     ; Enforced device name prefix
                      02  26CE
                      86  26D1                .BYTE   Pd$_Literal      ; Indicate literal
                00000001  26D2                .LONG   HP$M_ALLOC              ; Constant
                      88  26D6                .BYTE   Pd$_Store        ; Indicate store operation
                    000A  26D7                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  26D9                .BYTE   0                ; 0 HP$B_FLAGS to data
                      08  26DA                .BYTE   8                ; 8 of data field
                      81  26DB                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          26DC    782 RD54:     $DS_RD54                          ;       [74]           ;G:12
                          26DC                .SAVE   LOCAL_BLOCK
                          26DC                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,RD54$K_LEN,  RD54$K_LEN:
                          26DC                .RESTORE
             34 35 44 52 00' 26DC             .ASCIC  "RD54"   ; RD54 name
                      04  26DC
                      32  26E1                .BYTE   RD54$K_LEN              ; RD54$K_LEN of resultant P-table
                      FF  26E2                .BYTE   255              ; Maximum unit number                  ;G:65
                    0000  26E3                .WORD   ^A""     ; Two character mnemonic for QIO RD54
                      80  26E5                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                      8D  26E6                .Byte   Pd$_Name         ; Directive op-code
                      1B  26E7                .Byte   Ptd$M_EndDevice          ; Enforced DU codes
                55 44 00' 26E8                .Ascic  "DU"     ; Enforced device name prefix
                      02  26E8
                      86  26EB                .BYTE   Pd$_Literal      ; Indicate literal
                00000001  26EC                .LONG   HP$M_ALLOC              ; Constant
                      88  26F0                .BYTE   Pd$_Store        ; Indicate store operation
                    000A  26F1                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  26F3                .BYTE   0                ; 0 HP$B_FLAGS to data
                      08  26F4                .BYTE   8                ; 8 of data field
                      81  26F5                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          26F6    783 RH750:    $DS_RH750
                          26F6                .SAVE   LOCAL_BLOCK
                          26F6                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
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                        0032                .IIF    NB,HP$B_RH750_BR,       HP$B_RH750_BR:
                        0032                .IIF    NB,RH750$B_BR,  RH750$B_BR:
                    00000033  0032          .IIF    NB,.BLKB,       .BLKB   1
                        0033                .IIF    NB,HP$K_RH750_LEN,      HP$K_RH750_LEN:
                        0033                .IIF    NB,RH750$K_LEN, RH750$K_LEN:
                    000026F6                .RESTORE
          30 35 37 48 52 00' 26F6           .ASCIC  "RH750" ; RH750 name
                      05  26F6
                      33  26FC              .BYTE   RH750$K_LEN             ; RH750$K_LEN of resultant P-table
                      08  26FD              .BYTE   8                       ; Maximum unit number                   ;G:65
                    0000  26FE              .WORD   ^A""    ; Two character mnemonic for QIO RH750
                      80  2700              .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2701              .Byte   Pd$_Name        ; Directive op-code
                      01  2702              .Byte   Ptd$M_Unit              ; Enforced RH codes
                   48 52 00' 2703           .Ascic  "RH"    ; Enforced device name prefix
                      02  2703
                      86  2706              .BYTE   Pd$_Literal     ; Indicate literal
                  40F28000  2707              .LONG   ^X40F28000              ; Constant
                      88  270B              .BYTE   Pd$_Store       ; Indicate store operation
                    0018  270C              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  270E              .BYTE   0               ; 0 HP$A_DEVICE to data
                      20  270F              .BYTE   32              ; 32 of data field
                      87  2710              .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    000B  2711              .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                      00  2713              .BYTE   0               ; 0 HP$B_DRIVE to data
                      08  2714              .BYTE   8               ; 8 of data field
                      88  2715              .BYTE   Pd$_Store       ; Indicate store operation
                    0018  2716              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      0D  2718              .BYTE   13              ; 13 HP$A_DEVICE to data
                      02  2719              .BYTE   2               ; 2 of data field
                      87  271A              .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  271B              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      0D  271D              .BYTE   13              ; 13 HP$A_DEVICE to data
                      04  271E              .BYTE   4               ; 4 of data field
                      88  271F              .BYTE   Pd$_Store       ; Indicate store operation
                    0024  2720              .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      02  2722              .BYTE   2               ; 2 HP$W_VECTOR to data
                      04  2723              .BYTE   4               ; 4 of data field
                      82  2724              .BYTE   Pd$_Decimal     ; Indicate scan decimal
                   52 42 00' 2725           .ASCIC  "BR"    ; BR string
                      02  2725
          00000007 00000004  2728           .LONG   4,7     ; 4 , 7 limits on input
                      88  2730              .BYTE   Pd$_Store       ; Indicate store operation
                    0032  2731              .WORD   RH750$B_BR              ; Byte RH750$B_BR to data
                      00  2733              .BYTE   0               ; 0 RH750$B_BR to data
                      08  2734              .BYTE   8               ; 8 of data field
                      88  2735              .BYTE   Pd$_Store       ; Indicate store operation
                    0024  2736              .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      06  2738              .BYTE   6               ; 6 HP$W_VECTOR to data
                      03  2739              .BYTE   3               ; 3 of data field
                      87  273A              .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    0018  273B              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  273D              .BYTE   0               ; 0 HP$A_DEVICE to data
                      20  273E              .BYTE   32              ; 32 of data field
                      88  273F              .BYTE   Pd$_Store       ; Indicate store operation
                    001C  2740              .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                      00  2742              .BYTE   0               ; 0 HP$A_DVA to data
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                      20  2743                .BYTE   32                  ; 32 of data field
                      86  2744                .BYTE   Pd$_Literal        ; Indicate literal
                00000001  2745                .LONG   1                   ; Constant
                      88  2749                .BYTE   Pd$_Store           ; Indicate store operation
                    001C  274A                .WORD   HP$A_DVA                    ; Byte HP$A_DVA to data
                      0A  274C                .BYTE   10                  ; 10 HP$A_DVA to data
                      01  274D                .BYTE   1                   ; 1 of data field
                      81  274E                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                          274F    784 RH780:  $DS_RH780
                          274F                .SAVE   LOCAL_BLOCK
                          274F                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$B_RH780_TR,       HP$B_RH780_TR:
                          0032                .IIF    NB,RH780$B_TR,  RH780$B_TR:
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,HP$B_RH780_BR,       HP$B_RH780_BR:
                          0033                .IIF    NB,RH780$B_BR,  RH780$B_BR:
                00000034  0033                .IIF    NB,.BLKB,       .BLKB   1
                          0034                .IIF    NB,HP$K_RH780_LEN,      HP$K_RH780_LEN:
                          0034                .IIF    NB,RH780$K_LEN, RH780$K_LEN:
                      0000274F                .RESTORE
          30 38 37 48 52 00' 274F             .ASCIC  "RH780" ; RH780 name
                      05  274F
                      34  2755                .BYTE   RH780$K_LEN                 ; RH780$K_LEN of resultant P-table
                      08  2756                .BYTE   8                   ; Maximum unit number                   ;G:65
                    0000  2757                .WORD   ^A""    ; Two character mnemonic for QIO RH780
                      80  2759                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                      8D  275A                .Byte   Pd$_Name            ; Directive op-code
                      01  275B                .Byte   Ptd$M_Unit                  ; Enforced RH codes
                48 52 00' 275C                .Ascic  "RH"    ; Enforced device name prefix
                      02  275C
                      82  275F                .BYTE   Pd$_Decimal         ; Indicate scan decimal
                52 54 00' 2760                .ASCIC  "TR"    ; TR string
                      02  2760
            0000000F 00000001  2763           .LONG   1,15    ; 1 , 15 limits on input
                      88  276B                .BYTE   Pd$_Store           ; Indicate store operation
                    0032  276C                .WORD   RH780$B_TR                  ; Byte RH780$B_TR to data
                      00  276E                .BYTE   0                   ; 0 RH780$B_TR to data
                      08  276F                .BYTE   8                   ; 8 of data field
                      88  2770                .BYTE   Pd$_Store           ; Indicate store operation
                    0018  2771                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                      0D  2773                .BYTE   13                  ; 13 HP$A_DEVICE to data
                      04  2774                .BYTE   4                   ; 4 of data field
                      88  2775                .BYTE   Pd$_Store           ; Indicate store operation
                    0024  2776                .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                      02  2778                .BYTE   2                   ; 2 HP$W_VECTOR to data
                      04  2779                .BYTE   4                   ; 4 of data field
                      82  277A                .BYTE   Pd$_Decimal         ; Indicate scan decimal
                52 42 00' 277B                .ASCIC  "BR"    ; BR string
                      02  277B
            00000007 00000004  277E           .LONG   4,7     ; 4 , 7 limits on input
                      88  2786                .BYTE   Pd$_Store           ; Indicate store operation
                    0033  2787                .WORD   RH780$B_BR                  ; Byte RH780$B_BR to data
                      00  2789                .BYTE   0                   ; 0 RH780$B_BR to data
                      08  278A                .BYTE   8                   ; 8 of data field
                      88  278B                .BYTE   Pd$_Store           ; Indicate store operation
                    0024  278C                .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
```

```
                    06  278E                .BYTE   6                       ; 6 HP$W_VECTOR to data
                    02  278F                .BYTE   2                       ; 2 of data field
                    86  2790                .BYTE   Pd$_Literal             ; Indicate literal
              00000006  2791                .LONG   6                       ; Constant
                    88  2795                .BYTE   Pd$_Store               ; Indicate store operation
                  0018  2796                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                    1C  2798                .BYTE   28                      ; 28 HP$A_DEVICE to data
                    04  2799                .BYTE   4                       ; 4 of data field
                    87  279A                .BYTE   Pd$_Fetch               ; Indicate fetch operation
                  0018  279B                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                    00  279D                .BYTE   0                       ; 0 HP$A_DEVICE to data
                    20  279E                .BYTE   32                      ; 32 of data field
                    88  279F                .BYTE   Pd$_Store               ; Indicate store operation
                  001C  27A0                .WORD   HP$A_DVA                        ; Byte HP$A_DVA to data
                    00  27A2                .BYTE   0                       ; 0 HP$A_DVA to data
                    20  27A3                .BYTE   32                      ; 32 of data field
                    86  27A4                .BYTE   Pd$_Literal             ; Indicate literal
              00000001  27A5                .LONG   1                       ; Constant
                    88  27A9                .BYTE   Pd$_Store               ; Indicate store operation
                  001C  27AA                .WORD   HP$A_DVA                        ; Byte HP$A_DVA to data
                    0A  27AC                .BYTE   10                      ; 10 HP$A_DVA to data
                    01  27AD                .BYTE   1                       ; 1 of data field
                    88  27AE                .BYTE   Pd$_Store               ; Indicate store operation
                  0024  27AF                .WORD   HP$W_VECTOR                     ; Byte HP$W_VECTOR to data
                    08  27B1                .BYTE   8                       ; 8 HP$W_VECTOR to data
                    01  27B2                .BYTE   1                       ; 1 of data field
                    81  27B3                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                        27B4    785 RL01:   $DS_RL01
                        27B4                .SAVE   LOCAL_BLOCK
                        27B4                .PSECT  $ABS$,ABS
              00000032  0050                .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$K_RL01_LEN,       HP$K_RL01_LEN:
                        0032                .IIF    NB,RL01$K_LEN,  RL01$K_LEN:
                    000027B4                .RESTORE
           31 30 4C 52 00' 27B4             .ASCIC  "RL01"  ; RL01 name
                    04  27B4
                    32  27B9                .BYTE   RL01$K_LEN              ; RL01$K_LEN of resultant P-table
                    08  27BA                .BYTE   8               ; Maximum unit number                           ;G:65
                  0000  27BB                .WORD   ^A""    ; Two character mnemonic for QIO RL01
                    80  27BD                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                    8D  27BE                .Byte   Pd$_Name        ; Directive op-code
                    1B  27BF                .Byte   Ptd$M_EndDevice         ; Enforced DL codes
                 4C 44 00' 27C0             .Ascic  "DL"    ; Enforced device name prefix
                    02  27C0
                    86  27C3                .BYTE   Pd$_Literal             ; Indicate literal
              00000001  27C4                .LONG   HP$M_ALLOC                      ; Constant
                    88  27C8                .BYTE   Pd$_Store               ; Indicate store operation
                  000A  27C9                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                    00  27CB                .BYTE   0                       ; 0 HP$B_FLAGS to data
                    08  27CC                .BYTE   8                       ; 8 of data field
                    81  27CD                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                        27CE    786 RL02:   $DS_RL02
                        27CE                .SAVE   LOCAL_BLOCK
                        27CE                .PSECT  $ABS$,ABS
              00000032  0050                .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$K_RL02_LEN,       HP$K_RL02_LEN:
                        0032                .IIF    NB,RL02$K_LEN,  RL02$K_LEN:
```

```
                    000027CE                .RESTORE
          32 30 4C 52 00' 27CE              .ASCIC  "RL02"  ; RL02 name
                      04  27CE
                      32  27D3              .BYTE   RL02$K_LEN                  ; RL02$K_LEN of resultant P-table
                      08  27D4              .BYTE   8                   ; Maximum unit number                       ;G:65
                    0000  27D5              .WORD   ^A""    ; Two character mnemonic for QIO RL02
                      80  27D7              .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                      8D  27D8              .Byte   Pd$_Name            ; Directive op-code
                      1B  27D9              .Byte   Ptd$M_EndDevice             ; Enforced DL codes
                 4C 44 00' 27DA             .Ascic  "DL"    ; Enforced device name prefix
                      02  27DA
                      86  27DD              .BYTE   Pd$_Literal         ; Indicate literal
                00000001  27DE              .LONG   HP$M_ALLOC                  ; Constant
                      88  27E2              .BYTE   Pd$_Store           ; Indicate store operation
                    000A  27E3              .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                      00  27E5              .BYTE   0                   ; 0 HP$B_FLAGS to data
                      08  27E6              .BYTE   8                   ; 8 of data field
                      81  27E7              .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                          27E8  787 RL11:     $DS_RL11
                          27E8              .SAVE   LOCAL_BLOCK
                          27E8              .PSECT  $ABS$,ABS
                00000032  0050              .=HP$A_DEPENDENT
                          0032              .IIF    NB,HP$L_RL11_CSR,       HP$L_RL11_CSR:
                          0032              .IIF    NB,RL11$L_CSR,  RL11$L_CSR:
                00000036  0032              .IIF    NB,.BLKL,       .BLKL   1
                          0036              .IIF    NB,HP$B_RL11_BR,        HP$B_RL11_BR:
                          0036              .IIF    NB,RL11$B_BR,   RL11$B_BR:
                00000037  0036              .IIF    NB,.BLKB,       .BLKB   1
                          0037              .IIF    NB,HP$K_RL11_LEN,       HP$K_RL11_LEN:
                          0037              .IIF    NB,RL11$K_LEN,  RL11$K_LEN:
                    000027E8                .RESTORE
          31 31 4C 52 00' 27E8              .ASCIC  "RL11"  ; RL11 name
                      04  27E8
                      37  27ED              .BYTE   RL11$K_LEN                  ; RL11$K_LEN of resultant P-table
                      00  27EE              .BYTE   0                   ; Maximum unit number                       ;G:65
                    4C44  27EF              .WORD   ^A"DL"  ; Two character mnemonic for QIO RL11 DL
                      80  27F1              .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                      8D  27F2              .Byte   Pd$_Name            ; Directive op-code
                      02  27F3              .Byte   Ptd$M_Controller                ; Enforced DL codes
                 4C 44 00' 27F4             .Ascic  "DL"    ; Enforced device name prefix
                      02  27F4
                      83  27F7              .BYTE   Pd$_Octal           ; Indicate scan octal
                   52 53 43 00' 27F8        .ASCIC  "CSR"   ; CSR string
                      03  27F8
             0003FFFE 0003E000  27FC        .LONG   ^O760000,^O777776           ; 760000 , 777776 limits on input
                      88  2804              .BYTE   Pd$_Store           ; Indicate store operation
                    0032  2805              .WORD   RL11$L_CSR                  ; Byte RL11$L_CSR to data
                      00  2807              .BYTE   0                   ; 0 RL11$L_CSR to data
                      20  2808              .BYTE   32                  ; 32 of data field
                      88  2809              .BYTE   Pd$_Store           ; Indicate store operation
                    0018  280A              .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                      00  280C              .BYTE   0                   ; 0 HP$A_DEVICE to data
                      12  280D              .BYTE   18                  ; 18 of data field
                      83  280E              .BYTE   Pd$_Octal           ; Indicate scan octal
       52 4F 54 43 45 56 00' 280F           .ASCIC  "VECTOR"            ; VECTOR string
                      06  280F
             000001FE 00000002  2816        .LONG   ^O2,^O776           ; 2 , 776 limits on input
```

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                      88  281E                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  281F                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  2821                .BYTE   0               ; 0 HP$W_VECTOR to data
                      09  2822                .BYTE   9               ; 9 of data field
                      82  2823                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 42 00' 2824                .ASCIC  "BR"    ; BR string
                      02  2824
            00000007 00000004  2827           .LONG   4,7     ; 4 , 7 limits on input
                      88  282F                .BYTE   Pd$_Store       ; Indicate store operation
                    0036  2830                .WORD   RL11$B_BR               ; Byte RL11$B_BR to data
                      00  2832                .BYTE   0               ; 0 RL11$B_BR to data
                      08  2833                .BYTE   8               ; 8 of data field
                      81  2834                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2835    788 RK06:   $DS_RK06
                          2835                .SAVE   LOCAL_BLOCK
                          2835                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RK06_LEN,       HP$K_RK06_LEN:
                          0032                .IIF    NB,RK06$K_LEN,  RK06$K_LEN:
                      0000283[5]              .RESTORE
             36 30 4B 52 00' 2835             .ASCIC  "RK06"  ; RK06 name
                      04  2835
                      32  283A                .BYTE   RK06$K_LEN              ; RK06$K_LEN of resultant P-table
                      08  283B                .BYTE   8               ; Maximum unit number                   ;G:65
                    0000  283C                .WORD   ^A""    ; Two character mnemonic for QIO RK06
                      80  283E                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  283F                .Byte   Pd$_Name        ; Directive op-code
                      1B  2840                .Byte   Ptd$M_EndDevice         ; Enforced DM codes
                4D 44 00' 2841                .Ascic  "DM"    ; Enforced device name prefix
                      02  2841
                      86  2844                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  2845                .LONG   HP$M_ALLOC              ; Constant
                      88  2849                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  284A                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  284C                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  284D                .BYTE   8               ; 8 of data field
                      81  284E                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          284F    789 RK07:   $DS_RK07
                          284F                .SAVE   LOCAL_BLOCK
                          284F                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RK07_LEN,       HP$K_RK07_LEN:
                          0032                .IIF    NB,RK07$K_LEN,  RK07$K_LEN:
                      0000284[F]              .RESTORE
             37 30 4B 52 00' 284F             .ASCIC  "RK07"  ; RK07 name
                      04  284F
                      32  2854                .BYTE   RK07$K_LEN              ; RK07$K_LEN of resultant P-table
                      08  2855                .BYTE   8               ; Maximum unit number                   ;G:65
                    0000  2856                .WORD   ^A""    ; Two character mnemonic for QIO RK07
                      80  2858                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2859                .Byte   Pd$_Name        ; Directive op-code
                      1B  285A                .Byte   Ptd$M_EndDevice         ; Enforced DM codes
                4D 44 00' 285B                .Ascic  "DM"    ; Enforced device name prefix
                      02  285B
                      86  285E                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  285F                .LONG   HP$M_ALLOC              ; Constant
                      88  2863                .BYTE   Pd$_Store       ; Indicate store operation
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                     000A  2864                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                       00  2866                .BYTE   0                   ; 0 HP$B_FLAGS to data
                       08  2867                .BYTE   8                   ; 8 of data field
                       81  2868                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                           2869    790 RK611:  $DS_RK611
                           2869                .SAVE   LOCAL_BLOCK
                           2869                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,HP$L_RK611_CSR,      HP$L_RK611_CSR:
                           0032                .IIF    NB,RK611$L_CSR, RK611$L_CSR:
                 00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                           0036                .IIF    NB,HP$B_RK611_BR,       HP$B_RK611_BR:
                           0036                .IIF    NB,RK611$B_BR,  RK611$B_BR:
                 00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                           0037                .IIF    NB,HP$K_RK611_LEN,      HP$K_RK611_LEN:
                           0037                .IIF    NB,RK611$K_LEN, RK611$K_LEN:
                       00002869                .RESTORE
           31 31 36 4B 52 00' 2869             .ASCIC  "RK611" ; RK611 name
                       05  2869
                       37  286F                .BYTE   RK611$K_LEN             ; RK611$K_LEN of resultant P-table
                       00  2870                .BYTE   0                   ; Maximum unit number                   ;G:65
                     4D44  2871                .WORD   ^A"DM"  ; Two character mnemonic for QIO RK611 DM
                       80  2873                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                       8D  2874                .Byte   Pd$_Name            ; Directive op-code
                       02  2875                .Byte   Ptd$M_Controller                ; Enforced DM codes
                  4D 44 00' 2876                .Ascic  "DM"    ; Enforced device name prefix
                       02  2876
                       83  2879                .BYTE   Pd$_Octal           ; Indicate scan octal
                  52 53 43 00' 287A             .ASCIC  "CSR"   ; CSR string
                       03  287A
              0003FFFE 0003E000  287E           .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                       88  2886                .BYTE   Pd$_Store           ; Indicate store operation
                     0032  2887                .WORD   RK611$L_CSR             ; Byte RK611$L_CSR to data
                       00  2889                .BYTE   0                   ; 0 RK611$L_CSR to data
                       20  288A                .BYTE   32                  ; 32 of data field
                       88  288B                .BYTE   Pd$_Store           ; Indicate store operation
                     0018  288C                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                       00  288E                .BYTE   0                   ; 0 HP$A_DEVICE to data
                       12  288F                .BYTE   18                  ; 18 of data field
                       83  2890                .BYTE   Pd$_Octal           ; Indicate scan octal
        52 4F 54 43 45 56 00' 2891             .ASCIC  "VECTOR"            ; VECTOR string
                       06  2891
              000001FE 00000002  2898           .LONG   ^O2,^O776           ; 2 , 776 limits on input
                       88  28A0                .BYTE   Pd$_Store           ; Indicate store operation
                     0024  28A1                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                       00  28A3                .BYTE   0                   ; 0 HP$W_VECTOR to data
                       09  28A4                .BYTE   9                   ; 9 of data field
                       82  28A5                .BYTE   Pd$_Decimal         ; Indicate scan decimal
                  52 42 00' 28A6                .ASCIC  "BR"    ; BR string
                       02  28A6
              00000007 00000004  28A9           .LONG   4,7     ; 4 , 7 limits on input
                       88  28B1                .BYTE   Pd$_Store           ; Indicate store operation
                     0036  28B2                .WORD   RK611$B_BR              ; Byte RK611$B_BR to data
                       00  28B4                .BYTE   0                   ; 0 RK611$B_BR to data
                       08  28B5                .BYTE   8                   ; 8 of data field
                       81  28B6                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                           28B7    791 RM03:   $DS_RM03
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                        28B7                .SAVE   LOCAL_BLOCK
                        28B7                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RM03_LEN,       HP$K_RM03_LEN:
                          0032                .IIF    NB,RM03$K_LEN,  RM03$K_LEN:
                        000028B7              .RESTORE
            33 30 4D 52 00' 28B7              .ASCIC  "RM03"  ; RM03 name
                          04  28B7
                          32  28BC              .BYTE   RM03$K_LEN                ; RM03$K_LEN of resultant P-table
                          08  28BD              .BYTE   8                 ; Maximum unit number                          ;G:65
                        5244  28BE              .WORD   ^A"DR"  ; Two character mnemonic for QIO RM03 DR
                          80  28C0              .BYTE   Pd$_Start         ; Constant to identify start of descriptor
                          8D  28C1              .Byte   Pd$_Name          ; Directive op-code
                          03  28C2              .Byte   Ptd$M_Device              ; Enforced DR codes
                    52 44 00' 28C3              .Ascic  "DR"    ; Enforced device name prefix
                          02  28C3
                          86  28C6              .BYTE   Pd$_Literal       ; Indicate literal
                    00000001  28C7              .LONG   HP$M_ALLOC                ; Constant
                          88  28CB              .BYTE   Pd$_Store         ; Indicate store operation
                        000A  28CC              .WORD   HP$B_FLAGS                ; Byte HP$B_FLAGS to data
                          00  28CE              .BYTE   0                 ; 0 HP$B_FLAGS to data
                          08  28CF              .BYTE   8                 ; 8 of data field
                          87  28D0              .BYTE   Pd$_Fetch         ; Indicate fetch operation
                        000B  28D1              .WORD   HP$B_DRIVE                ; Byte HP$B_DRIVE to data
                          00  28D3              .BYTE   0                 ; 0 HP$B_DRIVE to data
                          08  28D4              .BYTE   8                 ; 8 of data field
                          88  28D5              .BYTE   Pd$_Store         ; Indicate store operation
                        0018  28D6              .WORD   HP$A_DEVICE               ; Byte HP$A_DEVICE to data
                          07  28D8              .BYTE   7                 ; 7 HP$A_DEVICE to data
                          03  28D9              .BYTE   3                 ; 3 of data field
                          81  28DA              .BYTE   Pd$_End           ; Indicate end of PT-descriptor
                              28DB    792 RM05: $DS_RM05
                              28DB              .SAVE   LOCAL_BLOCK
                              28DB              .PSECT  $ABS$,ABS
                    00000032  0050              .=HP$A_DEPENDENT
                              0032              .IIF    NB,HP$K_RM05_LEN,       HP$K_RM05_LEN:
                              0032              .IIF    NB,RM05$K_LEN,  RM05$K_LEN:
                            000028DB            .RESTORE
                35 30 4D 52 00' 28DB            .ASCIC  "RM05"  ; RM05 name
                              04  28DB
                              32  28E0              .BYTE   RM05$K_LEN                ; RM05$K_LEN of resultant P-table
                              08  28E1              .BYTE   8                 ; Maximum unit number                          ;G:65
                            5244  28E2              .WORD   ^A"DR"  ; Two character mnemonic for QIO RM05 DR
                              80  28E4              .BYTE   Pd$_Start         ; Constant to identify start of descriptor
                              8D  28E5              .Byte   Pd$_Name          ; Directive op-code
                              03  28E6              .Byte   Ptd$M_Device              ; Enforced DR codes
                        52 44 00' 28E7              .Ascic  "DR"    ; Enforced device name prefix
                              02  28E7
                              86  28EA              .BYTE   Pd$_Literal       ; Indicate literal
                        00000001  28EB              .LONG   HP$M_ALLOC                ; Constant
                              88  28EF              .BYTE   Pd$_Store         ; Indicate store operation
                            000A  28F0              .WORD   HP$B_FLAGS                ; Byte HP$B_FLAGS to data
                              00  28F2              .BYTE   0                 ; 0 HP$B_FLAGS to data
                              08  28F3              .BYTE   8                 ; 8 of data field
                              87  28F4              .BYTE   Pd$_Fetch         ; Indicate fetch operation
                            000B  28F5              .WORD   HP$B_DRIVE                ; Byte HP$B_DRIVE to data
                              00  28F7              .BYTE   0                 ; 0 HP$B_DRIVE to data
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                      08  28F8                .BYTE   8                       ; 8 of data field
                      88  28F9                .BYTE   Pd$_Store               ; Indicate store operation
                    0018  28FA                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                      07  28FC                .BYTE   7                       ; 7 HP$A_DEVICE to data
                      03  28FD                .BYTE   3                       ; 3 of data field
                      81  28FE                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          28FF    793 RM80:    $DS_RM80
                          28FF                .SAVE   LOCAL_BLOCK
                          28FF                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RM80_LEN,       HP$K_RM80_LEN:
                          0032                .IIF    NB,RM80$K_LEN,  RM80$K_LEN:
                      000028FF                .RESTORE
               30 38 4D 52 00' 28FF                .ASCIC  "RM80"  ; RM80 name
                      04  28FF
                      32  2904                .BYTE   RM80$K_LEN                      ; RM80$K_LEN of resultant P-table
                      08  2905                .BYTE   8                       ; Maximum unit number                   ;G:65
                    5244  2906                .WORD   ^A"DR"  ; Two character mnemonic for QIO RM80 DR
                      80  2908                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  2909                .Byte   Pd$_Name                ; Directive op-code
                      03  290A                .Byte   Ptd$M_Device                    ; Enforced DR codes
                  52 44 00' 290B                .Ascic  "DR"    ; Enforced device name prefix
                      02  290B
                      86  290E                .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  290F                .LONG   HP$M_ALLOC                      ; Constant
                      88  2913                .BYTE   Pd$_Store               ; Indicate store operation
                    000A  2914                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                      00  2916                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  2917                .BYTE   8                       ; 8 of data field
                      87  2918                .BYTE   Pd$_Fetch               ; Indicate fetch operation
                    000B  2919                .WORD   HP$B_DRIVE                      ; Byte HP$B_DRIVE to data
                      00  291B                .BYTE   0                       ; 0 HP$B_DRIVE to data
                      08  291C                .BYTE   8                       ; 8 of data field
                      88  291D                .BYTE   Pd$_Store               ; Indicate store operation
                    0018  291E                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                      07  2920                .BYTE   7                       ; 7 HP$A_DEVICE to data
                      03  2921                .BYTE   3                       ; 3 of data field
                      81  2922                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          2923    794 RP04:    $DS_RP04
                          2923                .SAVE   LOCAL_BLOCK
                          2923                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RP04_LEN,       HP$K_RP04_LEN:
                          0032                .IIF    NB,RP04$K_LEN,  RP04$K_LEN:
                      00002923                .RESTORE
               34 30 50 52 00' 2923                .ASCIC  "RP04"  ; RP04 name
                      04  2923
                      32  2928                .BYTE   RP04$K_LEN                      ; RP04$K_LEN of resultant P-table
                      08  2929                .BYTE   8                       ; Maximum unit number                   ;G:65
                    4244  292A                .WORD   ^A"DB"  ; Two character mnemonic for QIO RP04 DB
                      80  292C                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  292D                .Byte   Pd$_Name                ; Directive op-code
                      03  292E                .Byte   Ptd$M_Device                    ; Enforced DB codes
                  42 44 00' 292F                .Ascic  "DB"    ; Enforced device name prefix
                      02  292F
                      86  2932                .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  2933                .LONG   HP$M_ALLOC                      ; Constant
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                 88  2937                .BYTE   Pd$_Store        ; Indicate store operation
               000A  2938                .WORD   HP$B_FLAGS                ; Byte HP$B_FLAGS to data
                 00  293A                .BYTE   0                ; 0 HP$B_FLAGS to data
                 08  293B                .BYTE   8                ; 8 of data field
                 87  293C                .BYTE   Pd$_Fetch        ; Indicate fetch operation
               000B  293D                .WORD   HP$B_DRIVE                ; Byte HP$B_DRIVE to data
                 00  293F                .BYTE   0                ; 0 HP$B_DRIVE to data
                 08  2940                .BYTE   8                ; 8 of data field
                 88  2941                .BYTE   Pd$_Store        ; Indicate store operation
               0018  2942                .WORD   HP$A_DEVICE               ; Byte HP$A_DEVICE to data
                 07  2944                .BYTE   7                ; 7 HP$A_DEVICE to data
                 03  2945                .BYTE   3                ; 3 of data field
                 81  2946                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                     2947   795 RP05:    $DS_RP05                                                          ;G:43
                     2947                .SAVE   LOCAL_BLOCK
                     2947                .PSECT  $ABS$,ABS
           00000032  0050                .=HP$A_DEPENDENT
                     0032                .IIF    NB,HP$K_RP05_LEN,       HP$K_RP05_LEN:
                     0032                .IIF    NB,RP05$K_LEN,  RP05$K_LEN:
                 00002947                .RESTORE
     35 30 50 52 00' 2947                .ASCIC  "RP05"  ; RP05 name
                 04  2947
                 32  294C                .BYTE   RP05$K_LEN                ; RP05$K_LEN of resultant P-table
                 08  294D                .BYTE   8                ; Maximum unit number                    ;G:65
               4244  294E                .WORD   ^A"DB"  ; Two character mnemonic for QIO RP05 DB
                 80  2950                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                 8D  2951                .Byte   Pd$_Name         ; Directive op-code
                 03  2952                .Byte   Ptd$M_Device              ; Enforced DB codes
           42 44 00' 2953                .Ascic  "DB"    ; Enforced device name prefix
                 02  2953
                 86  2956                .BYTE   Pd$_Literal      ; Indicate literal
           00000001  2957                .LONG   HP$M_ALLOC                ; Constant
                 88  295B                .BYTE   Pd$_Store        ; Indicate store operation
               000A  295C                .WORD   HP$B_FLAGS                ; Byte HP$B_FLAGS to data
                 00  295E                .BYTE   0                ; 0 HP$B_FLAGS to data
                 08  295F                .BYTE   8                ; 8 of data field
                 87  2960                .BYTE   Pd$_Fetch        ; Indicate fetch operation
               000B  2961                .WORD   HP$B_DRIVE                ; Byte HP$B_DRIVE to data
                 00  2963                .BYTE   0                ; 0 HP$B_DRIVE to data
                 08  2964                .BYTE   8                ; 8 of data field
                 88  2965                .BYTE   Pd$_Store        ; Indicate store operation
               0018  2966                .WORD   HP$A_DEVICE               ; Byte HP$A_DEVICE to data
                 07  2968                .BYTE   7                ; 7 HP$A_DEVICE to data
                 03  2969                .BYTE   3                ; 3 of data field
                 81  296A                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                     296B   796 RP06:    $DS_RP06
                     296B                .SAVE   LOCAL_BLOCK
                     296B                .PSECT  $ABS$,ABS
           00000032  0050                .=HP$A_DEPENDENT
                     0032                .IIF    NB,HP$K_RP06_LEN,       HP$K_RP06_LEN:
                     0032                .IIF    NB,RP06$K_LEN,  RP06$K_LEN:
                 0000296B                .RESTORE
     36 30 50 52 00' 296B                .ASCIC  "RP06"  ; RP06 name
                 04  296B
                 32  2970                .BYTE   RP06$K_LEN                ; RP06$K_LEN of resultant P-table
                 08  2971                .BYTE   8                ; Maximum unit number                    ;G:65
               4244  2972                .WORD   ^A"DB"  ; Two character mnemonic for QIO RP06 DB
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                      80  2974                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2975                .Byte   Pd$_Name        ; Directive op-code
                      03  2976                .Byte   Ptd$M_Device            ; Enforced DB codes
                 42 44 00' 2977                .Ascic  "DB"    ; Enforced device name prefix
                      02  2977
                      86  297A                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  297B                .LONG   HP$M_ALLOC              ; Constant
                      88  297F                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  2980                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  2982                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  2983                .BYTE   8               ; 8 of data field
                      87  2984                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    000B  2985                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                      00  2987                .BYTE   0               ; 0 HP$B_DRIVE to data
                      08  2988                .BYTE   8               ; 8 of data field
                      88  2989                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  298A                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      07  298C                .BYTE   7               ; 7 HP$A_DEVICE to data
                      03  298D                .BYTE   3               ; 3 of data field
                      81  298E                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          298F    797 RP07:   $DS_RP07
                          298F                .SAVE   LOCAL_BLOCK
                          298F                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_RP07_LEN,       HP$K_RP07_LEN:
                          0032                .IIF    NB,RP07$K_LEN,  RP07$K_LEN:
                          0000298F            .RESTORE
             37 30 50 52 00' 298F             .ASCIC  "RP07"  ; RP07 name
                      04  298F
                      32  2994                .BYTE   RP07$K_LEN              ; RP07$K_LEN of resultant P-table
                      08  2995                .BYTE   8               ; Maximum unit number                   ;G:65
                    5244  2996                .WORD   ^A"DR"  ; Two character mnemonic for QIO RP07 DR
                      80  2998                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2999                .Byte   Pd$_Name        ; Directive op-code
                      03  299A                .Byte   Ptd$M_Device            ; Enforced DR codes
                 52 44 00' 299B                .Ascic  "DR"    ; Enforced device name prefix
                      02  299B
                      86  299E                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  299F                .LONG   HP$M_ALLOC              ; Constant
                      88  29A3                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  29A4                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  29A6                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  29A7                .BYTE   8               ; 8 of data field
                      87  29A8                .BYTE   Pd$_Fetch       ; Indicate fetch operation
                    000B  29A9                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                      00  29AB                .BYTE   0               ; 0 HP$B_DRIVE to data
                      08  29AC                .BYTE   8               ; 8 of data field
                      88  29AD                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  29AE                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      07  29B0                .BYTE   7               ; 7 HP$A_DEVICE to data
                      03  29B1                .BYTE   3               ; 3 of data field
                      81  29B2                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          29B3    798 RRD50:  $DS_RRD50                       ;       [73]                    ;G:4
                          29B3                .SAVE   LOCAL_BLOCK
                          29B3                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,RRD50$L_CSR, RRD50$L_CSR::
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                    00000036  0032                .IIF    NB,..BLKL,        .BLKL   1
                              0036                .IIF    NB,RRD50$B_BR,  RRD50$B_BR::
                    00000037  0036                .IIF    NB,..BLKB,        .BLKB   1
                              0037                .IIF    NB,RRD50$K_LEN, RRD50$K_LEN::
                         000029B3                 .RESTORE
              30 35 44 52 52 00' 29B3             .ASCIC  "RRD50" ; RRD50 name
                           05  29B3
                           37  29B9             .BYTE   RRD50$K_LEN             ; RRD50$K_LEN of resultant P-table
                           04  29BA             .BYTE   4                       ; Maximum unit number                   ;G:65
                         0000  29BB             .WORD   ^A""    ; Two character mnemonic for QIO RRD50
                           80  29BD             .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                           8D  29BE             .Byte   Pd$_Name        ; Directive op-code
                           03  29BF             .Byte   PTD$M_DEVICE            ; Enforced DU codes
                    55 44 00' 29C0             .Ascic  "DU"    ; Enforced device name prefix
                           02  29C0
                           86  29C3             .BYTE   Pd$_Literal     ; Indicate literal
                    00000001  29C4             .LONG   HP$M_ALLOC              ; Constant
                           88  29C8             .BYTE   Pd$_Store       ; Indicate store operation
                         000A  29C9             .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                           00  29CB             .BYTE   0                       ; 0 HP$B_FLAGS to data
                           08  29CC             .BYTE   8                       ; 8 of data field
                           83  29CD             .BYTE   Pd$_Octal       ; Indicate scan octal
        53 53 45 52 44 44 41 00' 29CE             .ASCIC  "ADDRESS"       ; ADDRESS string
                           07  29CE
                 0003FFFE 0003E008  29D6             .LONG   ^O760010,^O777776       ; 760010 , 777776 limits on input
                           88  29DE             .BYTE   Pd$_Store       ; Indicate store operation
                         0032  29DF             .WORD   RRD50$L_CSR             ; Byte RRD50$L_CSR to data
                           00  29E1             .BYTE   0                       ; 0 RRD50$L_CSR to data
                           20  29E2             .BYTE   32                      ; 32 of data field
                           88  29E3             .BYTE   Pd$_Store       ; Indicate store operation
                         0018  29E4             .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                           00  29E6             .BYTE   0                       ; 0 HP$A_DEVICE to data
                           12  29E7             .BYTE   18                      ; 18 of data field
                           83  29E8             .BYTE   Pd$_Octal       ; Indicate scan octal
        52 4F 54 43 45 56 00' 29E9             .ASCIC  "VECTOR"        ; VECTOR string
                           06  29E9
              000001FC 00000040  29F0             .LONG   ^O100,^O774     ; 100 , 774 limits on input
                           88  29F8             .BYTE   Pd$_Store       ; Indicate store operation
                         0024  29F9             .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                           00  29FB             .BYTE   0                       ; 0 HP$W_VECTOR to data
                           10  29FC             .BYTE   16                      ; 16 of data field
                           82  29FD             .BYTE   Pd$_Decimal     ; Indicate scan decimal
                    52 42 00' 29FE             .ASCIC  "BR"    ; BR string
                           02  29FE
              00000007 00000004  2A01             .LONG   4,7     ; 4 , 7 limits on input
                           88  2A09             .BYTE   Pd$_Store       ; Indicate store operation
                         0036  2A0A             .WORD   RRD50$B_BR              ; Byte RRD50$B_BR to data
                           00  2A0C             .BYTE   0                       ; 0 RRD50$B_BR to data
                           08  2A0D             .BYTE   8                       ; 8 of data field
                           81  2A0E             .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                               2A0F  799 RV20:     $DS_RV20                                                        ;G:42
                               2A0F                .SAVE   LOCAL_BLOCK
                               2A0F                .PSECT  $ABS$,ABS
                    00000032   0050                .=HP$A_DEPENDENT
                               0032                .IIF    NB,RV20$L_CSR,  RV20$L_CSR:
                    00000036   0032                .IIF    NB,..BLKL,        .BLKL   1
                               0036                .IIF    NB,RV20$B_BR,   RV20$B_BR:
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                00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                          0037                .IIF    NB,RV20$K_LEN,  RV20$K_LEN:
                          00002A0F            .RESTORE
              30 32 56 52 00' 2A0F            .ASCIC  "RV20"  ; RV20 name
                          04  2A0F
                          37  2A14            .BYTE   RV20$K_LEN              ; RV20$K_LEN of resultant P-table
                          04  2A15            .BYTE   4                       ; Maximum unit number                   ;G:65
                        0000  2A16            .WORD   ^A""    ; Two character mnemonic for QIO RV20
                          80  2A18            .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                          8D  2A19            .Byte   Pd$_Name                ; Directive op-code
                          03  2A1A            .Byte   PTD$M_DEVICE            ; Enforced MU codes
                       55 4D 00' 2A1B         .Ascic  "MU"    ; Enforced device name prefix
                          02  2A1B
                          86  2A1E            .BYTE   Pd$_Literal             ; Indicate literal
                  00000001  2A1F            .LONG   HP$M_ALLOC              ; Constant
                          88  2A23            .BYTE   Pd$_Store               ; Indicate store operation
                      000A  2A24            .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                          00  2A26            .BYTE   0                       ; 0 HP$B_FLAGS to data
                          08  2A27            .BYTE   8                       ; 8 of data field
                          83  2A28            .BYTE   Pd$_Octal               ; Indicate scan octal
    53 53 45 52 44 44 41 00' 2A29            .ASCIC  "ADDRESS"               ; ADDRESS string
                          07  2A29
            0003FFFE 0003E008  2A31            .LONG   ^O760010,^O777776       ; 760010 , 777776 limits on input
                          88  2A39            .BYTE   Pd$_Store               ; Indicate store operation
                        0032  2A3A            .WORD   RV20$L_CSR              ; Byte RV20$L_CSR to data
                          00  2A3C            .BYTE   0                       ; 0 RV20$L_CSR to data
                          20  2A3D            .BYTE   32                      ; 32 of data field
                          88  2A3E            .BYTE   Pd$_Store               ; Indicate store operation
                        0018  2A3F            .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                          00  2A41            .BYTE   0                       ; 0 HP$A_DEVICE to data
                          12  2A42            .BYTE   18                      ; 18 of data field
                          83  2A43            .BYTE   Pd$_Octal               ; Indicate scan octal
        52 4F 54 43 45 56 00' 2A44            .ASCIC  "VECTOR"                ; VECTOR string
                          06  2A44
        000001FC 00000040  2A4B            .LONG   ^O100,^O774             ; 100 , 774 limits on input
                          88  2A53            .BYTE   Pd$_Store               ; Indicate store operation
                        0024  2A54            .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                          00  2A56            .BYTE   0                       ; 0 HP$W_VECTOR to data
                          10  2A57            .BYTE   16                      ; 16 of data field
                          82  2A58            .BYTE   Pd$_Decimal             ; Indicate scan decimal
                    52 42 00' 2A59            .ASCIC  "BR"    ; BR string
                          02  2A59
        00000007 00000004  2A5C            .LONG   4,7     ; 4 , 7 limits on input
                          88  2A64            .BYTE   Pd$_Store               ; Indicate store operation
                        0036  2A65            .WORD   RV20$B_BR               ; Byte RV20$B_BR to data
                          00  2A67            .BYTE   0                       ; 0 RV20$B_BR to data
                          08  2A68            .BYTE   8                       ; 8 of data field
                          81  2A69            .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                              2A6A  800 RUX50:  $DS_RUX50                                       ;       [53]
                              2A6A            .SAVE   LOCAL_BLOCK
                              2A6A            .PSECT  $ABS$,ABS
                  00000032  0050              .=HP$A_DEPENDENT
                            0032              .IIF    NB,HP$B_RUX50_BR,       HP$B_RUX50_BR:
                  00000033  0032              .IIF    NB,.BLKB,       .BLKB   1
                            0033              .IIF    NB,HP$K_RUX50_LEN,      HP$K_RUX50_LEN:
                          00002A6A            .RESTORE
        30 35 58 55 52 00' 2A6A            .ASCIC  "RUX50" ; RUX50 name
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                      05  2A6A
                      33  2A70                .BYTE   HP$K_RUX50_LEN          ; HP$K_RUX50_LEN of resultant P-table
                      04  2A71                .BYTE   4                       ; Maximum unit number                          ;G:65
                    0000  2A72                .WORD   ^A""    ; Two character mnemonic for QIO RUX50
                      80  2A74                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  2A75                .Byte   Pd$_Name                ; Directive op-code
                      02  2A76                .Byte   PTD$M_CONTROLLER                ; Enforced DU codes
               55 44 00'  2A77                .Ascic  "DU"    ; Enforced device name prefix
                      02  2A77
                      83  2A7A                .BYTE   Pd$_Octal               ; Indicate scan octal
               50 49 00'  2A7B                .ASCIC  "IP"    ; IP string
                      02  2A7B
          0003FFFC 0003E000  2A7E                .LONG   ^O760000,^O777774       ; 760000 , 777774 limits on input
                      88  2A86                .BYTE   Pd$_Store               ; Indicate store operation
                    0018  2A87                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                      00  2A89                .BYTE   0                       ; 0 HP$A_DEVICE to data
                      12  2A8A                .BYTE   18                      ; 18 of data field
                      83  2A8B                .BYTE   Pd$_Octal               ; Indicate scan octal
   52 4F 54 43 45 56 00'  2A8C                .ASCIC  "VECTOR"                ; VECTOR string
                      06  2A8C
          000001FC 00000004  2A93                .LONG   ^O4,^O774               ; 4 , 774 limits on input
                      88  2A9B                .BYTE   Pd$_Store               ; Indicate store operation
                    0024  2A9C                .WORD   HP$W_VECTOR                     ; Byte HP$W_VECTOR to data
                      00  2A9E                .BYTE   0                       ; 0 HP$W_VECTOR to data
                      09  2A9F                .BYTE   9                       ; 9 of data field
                      82  2AA0                .BYTE   Pd$_Decimal             ; Indicate scan decimal
               52 42 00'  2AA1                .ASCIC  "BR"    ; BR string
                      02  2AA1
          00000007 00000004  2AA4                .LONG   4,7     ; 4 , 7 limits on input
                      88  2AAC                .BYTE   Pd$_Store               ; Indicate store operation
                    0032  2AAD                .WORD   HP$B_RUX50_BR                   ; Byte HP$B_RUX50_BR to data
                      00  2AAF                .BYTE   0                       ; 0 HP$B_RUX50_BR to data
                      08  2AB0                .BYTE   8                       ; 8 of data field
                      81  2AB1                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          2AB2    801 RX02:   $DS_RX02
                          2AB2                .SAVE   LOCAL_BLOCK
                          2AB2                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,HP$K_RX02_LEN,       HP$K_RX02_LEN:
                           0032                .IIF    NB,RX02$K_LEN,  RX02$K_LEN:
                       00002AB2                .RESTORE
            32 30 58 52 00' 2AB2                .ASCIC  "RX02"  ; RX02 name
                      04  2AB2
                      32  2AB7                .BYTE   RX02$K_LEN                      ; RX02$K_LEN of resultant P-table
                      02  2AB8                .BYTE   2                       ; Maximum unit number                          ;G:65
                    0000  2AB9                .WORD   ^A""    ; Two character mnemonic for QIO RX02
                      80  2ABB                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  2ABC                .Byte   Pd$_Name                ; Directive op-code
                      1B  2ABD                .Byte   Ptd$M_EndDevice                 ; Enforced DY codes
               59 44 00'  2ABE                .Ascic  "DY"    ; Enforced device name prefix
                      02  2ABE
                      86  2AC1                .BYTE   Pd$_Literal             ; Indicate literal
                00000001  2AC2                .LONG   HP$M_ALLOC                      ; Constant
                      88  2AC6                .BYTE   Pd$_Store               ; Indicate store operation
                    000A  2AC7                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                      00  2AC9                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  2ACA                .BYTE   8                       ; 8 of data field
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                      81  2ACB                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          2ACC    802 RX31:    $DS_RX31                                ;       [53]
                          2ACC                .SAVE   LOCAL_BLOCK
                          2ACC                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,RX31$K_LEN,  RX31$K_LEN:
                 00002ACC                     .RESTORE
          31 33 58 52 00' 2ACC                .ASCIC  "RX31"  ; RX31 name
                      04  2ACC
                      32  2AD1                .BYTE   RX31$K_LEN              ; RX31$K_LEN of resultant P-table
                      FF  2AD2                .BYTE   255             ; Maximum unit number                   ;G:65
                    0000  2AD3                .WORD   ^A""    ; Two character mnemonic for QIO RX31
                      80  2AD5                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2AD6                .Byte   Pd$_Name        ; Directive op-code
                      1B  2AD7                .Byte   Ptd$M_EndDevice         ; Enforced DU codes
                55 44 00' 2AD8                .Ascic  "DU"    ; Enforced device name prefix
                      02  2AD8
                      81  2ADB                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          2ADC    803 RX32:    $DS_RX32                                ;       [53]
                          2ADC                .SAVE   LOCAL_BLOCK
                          2ADC                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,RX32$K_LEN,  RX32$K_LEN:
                 00002ADC                     .RESTORE
          32 33 58 52 00' 2ADC                .ASCIC  "RX32"  ; RX32 name
                      04  2ADC
                      32  2AE1                .BYTE   RX32$K_LEN              ; RX32$K_LEN of resultant P-table
                      FF  2AE2                .BYTE   255             ; Maximum unit number                   ;G:65
                    0000  2AE3                .WORD   ^A""    ; Two character mnemonic for QIO RX32
                      80  2AE5                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2AE6                .Byte   Pd$_Name        ; Directive op-code
                      1B  2AE7                .Byte   Ptd$M_EndDevice         ; Enforced DU codes
                55 44 00' 2AE8                .Ascic  "DU"    ; Enforced device name prefix
                      02  2AE8
                      81  2AEB                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          2AEC    804 RX50:    $DS_RX50                                ;       [53]
                          2AEC                .SAVE   LOCAL_BLOCK
                          2AEC                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,RX50$K_LEN,  RX50$K_LEN:
                 00002AEC                     .RESTORE
          30 35 58 52 00' 2AEC                .ASCIC  "RX50"  ; RX50 name
                      04  2AEC
                      32  2AF1                .BYTE   RX50$K_LEN              ; RX50$K_LEN of resultant P-table
                      FF  2AF2                .BYTE   255             ; Maximum unit number                   ;G:65
                    0000  2AF3                .WORD   ^A""    ; Two character mnemonic for QIO RX50
                      80  2AF5                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      86  2AF6                .BYTE   Pd$_Literal      ; Indicate literal
                00000001  2AF7                .LONG   HP$M_ALLOC              ; Constant
                      88  2AFB                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  2AFC                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  2AFE                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  2AFF                .BYTE   8               ; 8 of data field
                      81  2B00                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          2B01    805 RX180:   $DS_RX180                               ;       [53]
                          2B01                .SAVE   LOCAL_BLOCK
                          2B01                .PSECT  $ABS$,ABS
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                 00000032  0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,RX180$K_LEN, RX180$K_LEN:
                       00002B01                .RESTORE
        30 38 31 58 52 00' 2B01                .ASCIC  "RX180" ; RX180 name
                       05  2B01
                       32  2B07                .BYTE   RX180$K_LEN             ; RX180$K_LEN of resultant P-table
                       FF  2B08                .BYTE   255             ; Maximum unit number                          ;G:65
                     0000  2B09                .WORD   ^A""    ; Two character mnemonic for QIO RX180
                       80  2B0B                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  2B0C                .Byte   Pd$_Name        ; Directive op-code
                       1B  2B0D                .Byte   Ptd$M_EndDevice         ; Enforced DU codes
                 55 44 00' 2B0E                .Ascic  "DU"    ; Enforced device name prefix
                       02  2B0E
                       81  2B11                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                           2B12   806 RX211:   $DS_RX211
                           2B12                .SAVE   LOCAL_BLOCK
                           2B12                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,HP$L_RX211_CSR,      HP$L_RX211_CSR:
                           0032                .IIF    NB,RX211$L_CSR, RX211$L_CSR:
                 00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                           0036                .IIF    NB,HP$B_RX211_BR,       HP$B_RX211_BR:
                           0036                .IIF    NB,RX211$B_BR,  RX211$B_BR:
                 00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                           0037                .IIF    NB,HP$K_RX211_LEN,      HP$K_RX211_LEN:
                           0037                .IIF    NB,RX211$K_LEN, RX211$K_LEN:
                       00002B12                .RESTORE
        31 31 32 58 52 00' 2B12                .ASCIC  "RX211" ; RX211 name
                       05  2B12
                       37  2B18                .BYTE   RX211$K_LEN             ; RX211$K_LEN of resultant P-table
                       00  2B19                .BYTE   0               ; Maximum unit number                          ;G:65
                     5944  2B1A                .WORD   ^A"DY"  ; Two character mnemonic for QIO RX211 DY
                       80  2B1C                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  2B1D                .Byte   Pd$_Name        ; Directive op-code
                       02  2B1E                .Byte   Ptd$M_Controller                ; Enforced DY codes
                 59 44 00' 2B1F                .Ascic  "DY"    ; Enforced device name prefix
                       02  2B1F
                       83  2B22                .BYTE   Pd$_Octal       ; Indicate scan octal
              52 53 43 00' 2B23                .ASCIC  "CSR"   ; CSR string
                       03  2B23
        0003FFFE 0003E000  2B27                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                       88  2B2F                .BYTE   Pd$_Store       ; Indicate store operation
                     0032  2B30                .WORD   RX211$L_CSR             ; Byte RX211$L_CSR to data
                       00  2B32                .BYTE   0               ; 0 RX211$L_CSR to data
                       20  2B33                .BYTE   32              ; 32 of data field
                       88  2B34                .BYTE   Pd$_Store       ; Indicate store operation
                     0018  2B35                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                       00  2B37                .BYTE   0               ; 0 HP$A_DEVICE to data
                       12  2B38                .BYTE   18              ; 18 of data field
                       83  2B39                .BYTE   Pd$_Octal       ; Indicate scan octal
     52 4F 54 43 45 56 00' 2B3A                .ASCIC  "VECTOR"        ; VECTOR string
                       06  2B3A
        000001FE 00000002  2B41                .LONG   ^O2,^O776       ; 2 , 776 limits on input
                       88  2B49                .BYTE   Pd$_Store       ; Indicate store operation
                     0024  2B4A                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                       00  2B4C                .BYTE   0               ; 0 HP$W_VECTOR to data
                       09  2B4D                .BYTE   9               ; 9 of data field
```

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                      82  2B4E                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                52 42 00' 2B4F                .ASCIC  "BR"     ; BR string
                      02  2B4F
          00000007 00000004  2B52               .LONG   4,7      ; 4 , 7 limits on input
                      88  2B5A                .BYTE   Pd$_Store        ; Indicate store operation
                    0036  2B5B                .WORD   RX211$B_BR               ; Byte RX211$B_BR to data
                      00  2B5D                .BYTE   0                ; 0 RX211$B_BR to data
                      08  2B5E                .BYTE   8                ; 8 of data field
                      81  2B5F                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          2B60    807 SBIA:   $DS_SBIA                                ;       [37]
                          2B60                .SAVE   LOCAL_BLOCK
                          2B60                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_SBIA_LEN,       HP$K_SBIA_LEN:
                          0032                .IIF    NB,SBIA$K_LEN,  SBIA$K_LEN:
                      00002B60                .RESTORE
             41 49 42 53 00' 2B60             .ASCIC  "SBIA"  ; SBIA name
                      04  2B60
                      32  2B65                .BYTE   SBIA$K_LEN               ; SBIA$K_LEN of resultant P-table
                      02  2B66                .BYTE   2                ; Maximum unit number                          ;G:65
                    0000  2B67                .WORD   ^A""     ; Two character mnemonic for QIO SBIA
                      80  2B69                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                      8D  2B6A                .Byte   Pd$_Name         ; Directive op-code
                      01  2B6B                .Byte   Ptd$M_Unit               ; Enforced SI codes
                49 53 00' 2B6C                .Ascic  "SI"     ; Enforced device name prefix
                      02  2B6C
                      86  2B6F                .BYTE   Pd$_Literal      ; Indicate literal
                60000000  2B70                .LONG   ^X60000000               ; Constant
                      88  2B74                .BYTE   Pd$_Store        ; Indicate store operation
                    001C  2B75                .WORD   HP$A_DVA                 ; Byte HP$A_DVA to data
                      00  2B77                .BYTE   0                ; 0 HP$A_DVA to data
                      20  2B78                .BYTE   32               ; 32 of data field
                      86  2B79                .BYTE   Pd$_Literal      ; Indicate literal
                60080000  2B7A                .LONG   ^X60080000               ; Constant
                      88  2B7E                .BYTE   Pd$_Store        ; Indicate store operation
                    0018  2B7F                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                      00  2B81                .BYTE   0                ; 0 HP$A_DEVICE to data
                      20  2B82                .BYTE   32               ; 32 of data field
                      86  2B83                .BYTE   Pd$_Literal      ; Indicate literal
                00000000  2B84                .LONG   ^X000            ; Constant
                      88  2B88                .BYTE   Pd$_Store        ; Indicate store operation
                    0024  2B89                .WORD   HP$W_VECTOR              ; Byte HP$W_VECTOR to data
                      00  2B8B                .BYTE   0                ; 0 HP$W_VECTOR to data
                      10  2B8C                .BYTE   16               ; 16 of data field
                      87  2B8D                .BYTE   Pd$_Fetch        ; Indicate fetch operation
                    000B  2B8E                .WORD   HP$B_DRIVE               ; Byte HP$B_DRIVE to data
                      00  2B90                .BYTE   0                ; 0 HP$B_DRIVE to data
                      08  2B91                .BYTE   8                ; 8 of data field
                      88  2B92                .BYTE   Pd$_Store        ; Indicate store operation
                    0018  2B93                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                      19  2B95                .BYTE   25               ; 25 HP$A_DEVICE to data
                      03  2B96                .BYTE   3                ; 3 of data field
                      88  2B97                .BYTE   Pd$_Store        ; Indicate store operation
                    001C  2B98                .WORD   HP$A_DVA                 ; Byte HP$A_DVA to data
                      19  2B9A                .BYTE   25               ; 25 HP$A_DVA to data
                      03  2B9B                .BYTE   3                ; 3 of data field
                      8A  2B9C                .BYTE   Pd$_Add          ; Indicate add value to field operation
```

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                        0024  2B9D                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                          09  2B9F                .BYTE   9                 ; 9 HP$W_VECTOR to data
                          07  2BA0                .BYTE   7                 ; 7 of data field
                          81  2BA1                .BYTE   Pd$_End           ; Indicate end of PT-descriptor
                              2BA2    808 SLU:    $DS_SLU                             ;       [62]
                              2BA2                .SAVE   LOCAL_BLOCK
                              2BA2                .PSECT  $ABS$,ABS
                    00000032  0050                .=HP$A_DEPENDENT
                              0032                .IIF    NB,SLU$B_EXT,   SLU$B_EXT::
                    00000033  0032                .IIF    NB,,BLKB,       .BLKB   1
                              0033                .IIF    NB,SLU$B_ACTIV, SLU$B_ACTIV::
                    00000034  0033                .IIF    NB,,BLKB,       .BLKB   1
                              0034                .IIF    NB,SLU$B_SPEED, SLU$B_SPEED::
                    00000035  0034                .IIF    NB,,BLKB,       .BLKB   1
                              0035                .IIF    NB,SLU$K_LEN,   SLU$K_LEN::
                        00002BA2                  .RESTORE
                 55 4C 53 00' 2BA2                .ASCIC  "SLU"    ; SLU name
                          03  2BA2
                          35  2BA6                .BYTE   SLU$K_LEN               ; SLU$K_LEN of resultant P-table
                          01  2BA7                .BYTE   1                 ; Maximum unit number                 ;G:65
                        0000  2BA8                .WORD   ^A""     ; Two character mnemonic for QIO SLU
                          80  2BAA                .BYTE   Pd$_Start         ; Constant to identify start of descriptor
                          8D  2BAB                .Byte   Pd$_Name          ; Directive op-code
                          03  2BAC                .Byte   Ptd$M_Device              ; Enforced TC codes
                 43 54 00' 2BAD                .Ascic  "TC"     ; Enforced device name prefix
                          02  2BAD
                          8B  2BB0                .BYTE   Pd$_Logical       ; Indicate logical value operation
65 6E 69 4C 20 6C 61 69 72 65 53 00' 2BB1        .ASCIC  \Serial Line Externally Wrapped\        ; Serial Line Externally Wra
20 79 6C 6C 61 6E 72 65 74 78 45 20  2BBD
                    64 65 70 70 61 72 57  2BC9
                              1E  2BB1
                              88  2BD0                .BYTE   Pd$_Store         ; Indicate store operation
                            0032  2BD1                .WORD   SLU$B_EXT               ; Byte SLU$B_EXT to data
                              00  2BD3                .BYTE   0                 ; 0 SLU$B_EXT to data
                              08  2BD4                .BYTE   8                 ; 8 of data field
                              86  2BD5                .BYTE   Pd$_Literal       ; Indicate literal
                        00000001  2BD6                .LONG   1                 ; Constant
                              88  2BDA                .BYTE   Pd$_Store         ; Indicate store operation
                            0033  2BDB                .WORD   SLU$B_ACTIV             ; Byte SLU$B_ACTIV to data
                              00  2BDD                .BYTE   0                 ; 0 SLU$B_ACTIV to data
                              08  2BDE                .BYTE   8                 ; 8 of data field
                              85  2BDF                .BYTE   Pd$_String        ; Indicate scan and verify string
        65 74 61 52 20 64 75 61 42 00' 2BE0          .ASCIC  "Baud Rate"       ; Baud Rate string
                              09  2BE0
                    30 35 31 00' 2BEA                .ASCIC  "150"
                              03  2BEA
                    30 30 33 00' 2BEE                .ASCIC  "300"
                              03  2BEE
                    30 30 36 00' 2BF2                .ASCIC  "600"
                              03  2BF2
                 30 30 32 31 00' 2BF6                .ASCIC  "1200"
                              04  2BF6
                 30 30 34 32 00' 2BFB                .ASCIC  "2400"
                              04  2BFB
                 30 30 38 34 00' 2C00                .ASCIC  "4800"
                              04  2C00
                 30 30 36 39 00' 2C05                .ASCIC  "9600"
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                    04  2C05
30 30 32 39 31 00'  2C0A                .ASCIC  "19200"
                    05  2C0A
                    00  2C10                .BYTE   0                   ; Null length is end of valid 150,300,600,1200,2400,
                    88  2C11                .BYTE   Pd$_Store           ; Indicate store operation
                  0034  2C12                .WORD   SLU$B_SPEED                 ; Byte SLU$B_SPEED to data
                    00  2C14                .BYTE   0                   ; 0 SLU$B_SPEED to data
                    08  2C15                .BYTE   8                   ; 8 of data field
                    81  2C16                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                        2C17   809 TAPE:    $DS_TAPE                                    ;       [42]
                        2C17                .SAVE   LOCAL_BLOCK
                        2C17                .PSECT  $ABS$,ABS
              00000032  0050                .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$K_TAPE_LEN,       HP$K_TAPE_LEN:
                        0032                .IIF    NB,TAPE$K_LEN,  TAPE$K_LEN:
                    00002C17                .RESTORE
      45 50 41 54 00'  2C17                .ASCIC  "TAPE"  ; TAPE name
                    04  2C17
                    32  2C1C                .BYTE   TAPE$K_LEN                  ; TAPE$K_LEN of resultant P-table
                    FF  2C1D                .BYTE   255                 ; Maximum unit number                       ;G:65
                  0000  2C1E                .WORD   ^A""    ; Two character mnemonic for QIO TAPE
                    80  2C20                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                    8D  2C21                .Byte   Pd$_Name            ; Directive op-code
                    03  2C22                .Byte   Ptd$M_DEVICE                ; Enforced MU codes
              55 4D 00'  2C23                .Ascic  "MU"    ; Enforced device name prefix
                    02  2C23
                    81  2C26                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                        2C27   810 TBK50:   $DS_TBK50                                   ;       [42]                ;G:56
                        2C27                .SAVE   LOCAL_BLOCK
                        2C27                .PSECT  $ABS$,ABS
              00000032  0050                .=HP$A_DEPENDENT
                        0032                .IIF    NB,TBK50$B_node_id,     TBK50$B_node_id:
              00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                        0033                .IIF    NB,TBK50$K_LEN, TBK50$K_LEN:
                    00002C27                .RESTORE
30 35 4B 42 54 00'  2C27                .ASCIC  "TBK50" ; TBK50 name
                    05  2C27
                    33  2C2D                .BYTE   TBK50$K_LEN                 ; TBK50$K_LEN of resultant P-table
                    0F  2C2E                .BYTE   15                  ; Maximum unit number                       ;G:65
                  0000  2C2F                .WORD   ^A""    ; Two character mnemonic for QIO TBK50
                    80  2C31                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                    8D  2C32                .Byte   Pd$_Name            ; Directive op-code
                    02  2C33                .Byte   PTD$M_CONTROLLER                    ; Enforced ET codes
              54 45 00'  2C34                .Ascic  "ET"    ; Enforced device name prefix
                    02  2C34
                    87  2C37                .BYTE   Pd$_Fetch           ; Indicate fetch operation
                  0018  2C38                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                    19  2C3A                .BYTE   25                  ; 25 HP$A_DEVICE to data
                    07  2C3B                .BYTE   7                   ; 7 of data field
                    8C  2C3C                .BYTE   Pd$_Case            ; Indicate case operation
                    01  2C3D                .BYTE   $$_$                ; Count of pairs
00000030 00000000       2C3E                .LONG   0,^X30              ; Store the pair
                    88  2C46                .BYTE   Pd$_Store           ; Indicate store operation
                  0018  2C47                .WORD   HP$A_DEVICE                 ; Byte HP$A_DEVICE to data
                    19  2C49                .BYTE   25                  ; 25 HP$A_DEVICE to data
                    07  2C4A                .BYTE   7                   ; 7 of data field
                    88  2C4B                .BYTE   Pd$_Store           ; Indicate store operation
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                        001C  2C4C                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                          19  2C4E                .BYTE   25                      ; 25 HP$A_DVA to data
                          07  2C4F                .BYTE   7                       ; 7 of data field
                          86  2C50                .BYTE   Pd$_Literal             ; Indicate literal
                    00000001  2C51                .LONG   ^X1                     ; Constant
                          88  2C55                .BYTE   Pd$_Store               ; Indicate store operation
                        001C  2C56                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                          16  2C58                .BYTE   22                      ; 22 HP$A_DVA to data
                          01  2C59                .BYTE   1                       ; 1 of data field
                          84  2C5A                .BYTE   Pd$_Hexadecimal         ; Indicate scan hexadecimal
6D 75 4E 20 65 64 6F 4E 20 49 42 00'  2C5B        .ASCIC  "BI Node Number (HEX)"  ; BI Node Number (HEX) string
      29 58 45 48 28 20 72 65 62      2C67
                          14  2C5B
                    0000000F 00000000 2C70        .LONG   ^X0,^XF ; 0 , F limits on input
                          88  2C78                .BYTE   Pd$_Store               ; Indicate store operation
                        0032  2C79                .WORD   TBK50$B_node_id         ; Byte TBK50$B_node_id to data
                          00  2C7B                .BYTE   0                       ; 0 TBK50$B_node_id to data
                          08  2C7C                .BYTE   8                       ; 8 of data field
                          88  2C7D                .BYTE   Pd$_Store               ; Indicate store operation
                        000B  2C7E                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                          00  2C80                .BYTE   0                       ; 0 HP$B_DRIVE to data
                          08  2C81                .BYTE   8                       ; 8 of data field
                          88  2C82                .BYTE   Pd$_Store               ; Indicate store operation
                        0018  2C83                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                          0D  2C85                .BYTE   13                      ; 13 HP$A_DEVICE to data
                          04  2C86                .BYTE   4                       ; 4 of data field
                          88  2C87                .BYTE   Pd$_Store               ; Indicate store operation
                        001C  2C88                .WORD   HP$A_DVA                ; Byte HP$A_DVA to data
                          12  2C8A                .BYTE   18                      ; 18 HP$A_DVA to data
                          04  2C8B                .BYTE   4                       ; 4 of data field
                          88  2C8C                .BYTE   Pd$_Store               ; Indicate store operation
                        0024  2C8D                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                          02  2C8F                .BYTE   2                       ; 2 HP$W_VECTOR to data
                          04  2C90                .BYTE   4                       ; 4 of data field
                          81  2C91                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                              2C92    811 TE16:   $DS_TE16
                              2C92                .SAVE   LOCAL_BLOCK
                              2C92                .PSECT  $ABS$,ABS
                    00000032  0050                .=HP$A_DEPENDENT
                              0032                .IIF    NB,HP$K_TE16_LEN,       HP$K_TE16_LEN:
                              0032                .IIF    NB,TE16$K_LEN,  TE16$K_LEN:
                              0002C92             .RESTORE
                36 31 45 54 00' 2C92              .ASCIC  "TE16"  ; TE16 name
                          04  2C92
                          32  2C97                .BYTE   TE16$K_LEN              ; TE16$K_LEN of resultant P-table
                          08  2C98                .BYTE   8                       ; Maximum unit number                   ;G:65
                        0000  2C99                .WORD   ^A""    ; Two character mnemonic for QIO TE16
                          80  2C9B                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                          8D  2C9C                .Byte   Pd$_Name                ; Directive op-code
                          1B  2C9D                .Byte   Ptd$M_EndDevice         ; Enforced MT codes
                    54 4D 00' 2C9E                .Ascic  "MT"    ; Enforced device name prefix
                          02  2C9E
                          86  2CA1                .BYTE   Pd$_Literal             ; Indicate literal
                    00000001  2CA2                .LONG   HP$M_ALLOC              ; Constant
                          88  2CA6                .BYTE   Pd$_Store               ; Indicate store operation
                        000A  2CA7                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                          00  2CA9                .BYTE   0                       ; 0 HP$B_FLAGS to data
```

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                      08  2CAA                .BYTE   8                       ; 8 of data field
                      81  2CAB                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          2CAC    812 TK50:    $DS_TK50                                ;       [50]
                          2CAC                .SAVE   LOCAL_BLOCK
                          2CAC                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_TK50_LEN,       HP$K_TK50_LEN:
                          2CAC                .RESTORE
              30 35 4B 54 00' 2CAC            .ASCIC  "TK50"  ; TK50 name
                      04  2CAC
                      32  2CB1                .BYTE   HP$K_TK50_LEN           ; HP$K_TK50_LEN of resultant P-table
                      10  2CB2                .BYTE   16                      ; Maximum unit number                   ;G:65
                    554D  2CB3                .WORD   ^A"MU"  ; Two character mnemonic for QIO TK50 MU
                      80  2CB5                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  2CB6                .Byte   Pd$_Name                ; Directive op-code
                      03  2CB7                .Byte   Ptd$M_Device            ; Enforced MU codes
                   55 4D 00' 2CB8             .Ascic  "MU"    ; Enforced device name prefix
                      02  2CB8
                      86  2CBB                .BYTE   Pd$_Literal             ; Indicate literal
                 00000001 2CBC                .LONG   HP$M_ALLOC              ; Constant
                      88  2CC0                .BYTE   Pd$_Store               ; Indicate store operation
                    000A  2CC1                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  2CC3                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  2CC4                .BYTE   8                       ; 8 of data field
                      81  2CC5                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          2CC6    813 TK70:    $DS_TK70                                ;       [84]                    ;G:39
                          2CC6                .SAVE   LOCAL_BLOCK
                          2CC6                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_TK70_LEN,       HP$K_TK70_LEN:
                          2CC6                .RESTORE
              30 37 4B 54 00' 2CC6            .ASCIC  "TK70"  ; TK70 name
                      04  2CC6
                      32  2CCB                .BYTE   HP$K_TK70_LEN           ; HP$K_TK70_LEN of resultant P-table
                      10  2CCC                .BYTE   16                      ; Maximum unit number                   ;G:65
                    554D  2CCD                .WORD   ^A"MU"  ; Two character mnemonic for QIO TK70 MU
                      80  2CCF                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  2CD0                .Byte   Pd$_Name                ; Directive op-code
                      03  2CD1                .Byte   Ptd$M_Device            ; Enforced MU codes
                   55 4D 00' 2CD2             .Ascic  "MU"    ; Enforced device name prefix
                      02  2CD2
                      86  2CD5                .BYTE   Pd$_Literal             ; Indicate literal
                 00000001 2CD6                .LONG   HP$M_ALLOC              ; Constant
                      88  2CDA                .BYTE   Pd$_Store               ; Indicate store operation
                    000A  2CDB                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  2CDD                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  2CDE                .BYTE   8                       ; 8 of data field
                      81  2CDF                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          2CE0    814 TM03:    $DS_TM03
                          2CE0                .SAVE   LOCAL_BLOCK
                          2CE0                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$B_TM03_DRIVE,     HP$B_TM03_DRIVE:
                          0032                .IIF    NB,TM03$B_DRIVE,        TM03$B_DRIVE:
                 00000033 0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,HP$K_TM03_LEN,       HP$K_TM03_LEN:
                          0033                .IIF    NB,TM03$K_LEN,  TM03$K_LEN:
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                    00002CE0                .RESTORE
          33 30 4D 54 00' 2CE0              .ASCIC  "TM03"  ; TM03 name
                      04  2CE0
                      33  2CE5              .BYTE   TM03$K_LEN              ; TM03$K_LEN of resultant P-table
                      00  2CE6              .BYTE   0                       ; Maximum unit number                   ;G:65
                    4D54  2CE7              .WORD   ^A"TM"  ; Two character mnemonic for QIO TM03 TM
                      80  2CE9              .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2CEA              .Byte   Pd$_Name        ; Directive op-code
                      02  2CEB              .Byte   Ptd$M_Controller                ; Enforced MT codes
                 54 4D 00' 2CEC             .Ascic  "MT"    ; Enforced device name prefix
                      02  2CEC
                      82  2CEF              .BYTE   Pd$_Decimal     ; Indicate scan decimal
       45 56 49 52 44 00' 2CF0              .ASCIC  "DRIVE" ; DRIVE string
                      05  2CF0
          00000007 00000000  2CF6           .LONG   0,7     ; 0 , 7 limits on input
                      88  2CFE              .BYTE   Pd$_Store       ; Indicate store operation
                    0032  2CFF              .WORD   TM03$B_DRIVE            ; Byte TM03$B_DRIVE to data
                      00  2D01              .BYTE   0                       ; 0 TM03$B_DRIVE to data
                      08  2D02              .BYTE   8                       ; 8 of data field
                      88  2D03              .BYTE   Pd$_Store       ; Indicate store operation
                    000B  2D04              .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                      00  2D06              .BYTE   0                       ; 0 HP$B_DRIVE to data
                      08  2D07              .BYTE   8                       ; 8 of data field
                      88  2D08              .BYTE   Pd$_Store       ; Indicate store operation
                    0018  2D09              .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      07  2D0B              .BYTE   7                       ; 7 HP$A_DEVICE to data
                      03  2D0C              .BYTE   3                       ; 3 of data field
                      81  2D0D              .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2D0E    815 TM78:   $DS_TM78
                          2D0E              .SAVE   LOCAL_BLOCK
                          2D0E              .PSECT  $ABS$,ABS
                00000032  0050              .=HP$A_DEPENDENT
                          0032              .IIF    NB,HP$B_TM78_DRIVE,     HP$B_TM78_DRIVE:
                          0032              .IIF    NB,TM78$B_DRIVE,        TM78$B_DRIVE:
                00000033  0032              .IIF    NB,.BLKB,       .BLKB   1
                          0033              .IIF    NB,HP$K_TM78_LEN,       HP$K_TM78_LEN:
                          0033              .IIF    NB,TM78$K_LEN,  TM78$K_LEN:
                    00002D0E                .RESTORE
          38 37 4D 54 00' 2D0E              .ASCIC  "TM78"  ; TM78 name
                      04  2D0E
                      33  2D13              .BYTE   TM78$K_LEN              ; TM78$K_LEN of resultant P-table
                      00  2D14              .BYTE   0                       ; Maximum unit number                   ;G:65
                    4654  2D15              .WORD   ^A"TF"  ; Two character mnemonic for QIO TM78 TF
                      80  2D17              .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2D18              .Byte   Pd$_Name        ; Directive op-code
                      02  2D19              .Byte   Ptd$M_Controller                ; Enforced MF codes
                 46 4D 00' 2D1A             .Ascic  "MF"    ; Enforced device name prefix
                      02  2D1A
                      82  2D1D              .BYTE   Pd$_Decimal     ; Indicate scan decimal
       45 56 49 52 44 00' 2D1E              .ASCIC  "DRIVE" ; DRIVE string
                      05  2D1E
          00000007 00000000  2D24           .LONG   0,7     ; 0 , 7 limits on input
                      88  2D2C              .BYTE   Pd$_Store       ; Indicate store operation
                    0032  2D2D              .WORD   TM78$B_DRIVE            ; Byte TM78$B_DRIVE to data
                      00  2D2F              .BYTE   0                       ; 0 TM78$B_DRIVE to data
                      08  2D30              .BYTE   8                       ; 8 of data field
                      88  2D31              .BYTE   Pd$_Store       ; Indicate store operation
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                     000B  2D32                .WORD   HP$B_DRIVE              ; Byte HP$B_DRIVE to data
                       00  2D34                .BYTE   0                   ; 0 HP$B_DRIVE to data
                       08  2D35                .BYTE   8                   ; 8 of data field
                       88  2D36                .BYTE   Pd$_Store           ; Indicate store operation
                     0018  2D37                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                       07  2D39                .BYTE   7                   ; 7 HP$A_DEVICE to data
                       03  2D3A                .BYTE   3                   ; 3 of data field
                       81  2D3B                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                           2D3C    816 TS04:    $DS_TS04
                           2D3C                .SAVE   LOCAL_BLOCK
                           2D3C                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,HP$L_TS04_CSR,       HP$L_TS04_CSR:
                           0032                .IIF    NB,TS04$L_CSR,  TS04$L_CSR:
                 00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                           0036                .IIF    NB,HP$B_TS04_BR,        HP$B_TS04_BR:
                           0036                .IIF    NB,TS04$B_BR,   TS04$B_BR:
                 00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                           0037                .IIF    NB,HP$K_TS04_LEN,       HP$K_TS04_LEN:
                           0037                .IIF    NB,TS04$K_LEN,  TS04$K_LEN:
                       0002D3C                 .RESTORE
              34 30 53 54 00'  2D3C            .ASCIC  "TS04"  ; TS04 name
                       04  2D3C
                       37  2D41                .BYTE   TS04$K_LEN              ; TS04$K_LEN of resultant P-table
                       01  2D42                .BYTE   1                   ; Maximum unit number                   ;G:65
                     5354  2D43                .WORD   ^A"TS"  ; Two character mnemonic for QIO TS04 TS
                       80  2D45                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                       8D  2D46                .Byte   Pd$_Name            ; Directive op-code
                       03  2D47                .Byte   Ptd$M_Device            ; Enforced MS codes
                 53 4D 00'  2D48                .Ascic  "MS"    ; Enforced device name prefix
                       02  2D48
                       86  2D4B                .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  2D4C                .LONG   HP$M_ALLOC              ; Constant
                       88  2D50                .BYTE   Pd$_Store           ; Indicate store operation
                     000A  2D51                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                       00  2D53                .BYTE   0                   ; 0 HP$B_FLAGS to data
                       08  2D54                .BYTE   8                   ; 8 of data field
                       83  2D55                .BYTE   Pd$_Octal           ; Indicate scan octal
              52 53 43 00'  2D56                .ASCIC  "CSR"   ; CSR string
                       03  2D56
           0003FFFE 0003E000  2D5A              .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                       88  2D62                .BYTE   Pd$_Store           ; Indicate store operation
                     0032  2D63                .WORD   TS04$L_CSR              ; Byte TS04$L_CSR to data
                       00  2D65                .BYTE   0                   ; 0 TS04$L_CSR to data
                       20  2D66                .BYTE   32                  ; 32 of data field
                       88  2D67                .BYTE   Pd$_Store           ; Indicate store operation
                     0018  2D68                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                       00  2D6A                .BYTE   0                   ; 0 HP$A_DEVICE to data
                       12  2D6B                .BYTE   18                  ; 18 of data field
                       83  2D6C                .BYTE   Pd$_Octal           ; Indicate scan octal
        52 4F 54 43 45 56 00'  2D6D             .ASCIC  "VECTOR"            ; VECTOR string
                       06  2D6D
           000001FE 00000002  2D74              .LONG   ^O2,^O776           ; 2 , 776 limits on input
                       88  2D7C                .BYTE   Pd$_Store           ; Indicate store operation
                     0024  2D7D                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                       00  2D7F                .BYTE   0                   ; 0 HP$W_VECTOR to data
                       09  2D80                .BYTE   9                   ; 9 of data field
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                      82  2D81                .BYTE   Pd$_Decimal      ; Indicate scan decimal
                52 42 00' 2D82                .ASCIC  "BR"     ; BR string
                      02  2D82
          00000007 00000004  2D85                .LONG   4,7      ; 4 , 7 limits on input
                      88  2D8D                .BYTE   Pd$_Store        ; Indicate store operation
                    0036  2D8E                .WORD   TS04$B_BR                ; Byte TS04$B_BR to data
                      00  2D90                .BYTE   0                ; 0 TS04$B_BR to data
                      08  2D91                .BYTE   8                ; 8 of data field
                      81  2D92                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          2D93    817 TS05:   $DS_TS05                                ;       [43]
                          2D93                .SAVE   LOCAL_BLOCK
                          2D93                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,TS05$B_BR,   TS05$B_BR:
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,HP$K_TS05_LEN,       HP$K_TS05_LEN:
                          0033                .IIF    NB,TS05$K_LEN,  TS05$K_LEN:
                      0000  2D93                .RESTORE
             35 30 53 54 00' 2D93                .ASCIC  "TS05"   ; TS05 name
                      04  2D93
                      33  2D98                .BYTE   TS05$K_LEN               ; TS05$K_LEN of resultant P-table
                      08  2D99                .BYTE   8                ; Maximum unit number                          ;G:65
                    0000  2D9A                .WORD   ^A""     ; Two character mnemonic for QIO TS05
                      80  2D9C                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                      8D  2D9D                .Byte   Pd$_Name         ; Directive op-code
                      03  2D9E                .Byte   Ptd$M_Device             ; Enforced MS codes
                53 4D 00' 2D9F                .Ascic  "MS"     ; Enforced device name prefix
                      02  2D9F
                      86  2DA2                .BYTE   Pd$_Literal      ; Indicate literal
                00000001  2DA3                .LONG   HP$M_ALLOC               ; Constant
                      88  2DA7                .BYTE   Pd$_Store        ; Indicate store operation
                    000A  2DA8                .WORD   HP$B_FLAGS               ; Byte HP$B_FLAGS to data
                      00  2DAA                .BYTE   0                ; 0 HP$B_FLAGS to data
                      08  2DAB                .BYTE   8                ; 8 of data field
                      83  2DAC                .BYTE   Pd$_Octal        ; Indicate scan octal
44 41 5F 52 53 43 5F 35 30 53 54 00' 2DAD                .ASCIC  "TS05_CSR_ADDRESS"       ; TS05_CSR_ADDRESS string
                53 53 45 52 44  2DB9
                      10  2DAD
          0003FFFE 0003E000  2DBE                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  2DC6                .BYTE   Pd$_Store        ; Indicate store operation
                    0018  2DC7                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                      00  2DC9                .BYTE   0                ; 0 HP$A_DEVICE to data
                      12  2DCA                .BYTE   18               ; 18 of data field
                      83  2DCB                .BYTE   Pd$_Octal        ; Indicate scan octal
52 4F 54 43 45 56 5F 35 30 53 54 00' 2DCC                .ASCIC  "TS05_VECTOR"    ; TS05_VECTOR string
                      0B  2DCC
          000001FE 00000002  2DD8                .LONG   ^O2,^O776        ; 2 , 776 limits on input
                      88  2DE0                .BYTE   Pd$_Store        ; Indicate store operation
                    0024  2DE1                .WORD   HP$W_VECTOR              ; Byte HP$W_VECTOR to data
                      00  2DE3                .BYTE   0                ; 0 HP$W_VECTOR to data
                      10  2DE4                .BYTE   16               ; 16 of data field
                      82  2DE5                .BYTE   Pd$_Decimal      ; Indicate scan decimal
      4C 45 56 45 4C 5F 52 42 00' 2DE6                .ASCIC  "BR_LEVEL"       ; BR_LEVEL string
                      08  2DE6
          00000007 00000004  2DEF                .LONG   4,7      ; 4 , 7 limits on input
                      88  2DF7                .BYTE   Pd$_Store        ; Indicate store operation
                    0032  2DF8                .WORD   TS05$B_BR                ; Byte TS05$B_BR to data
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                    00  2DFA                .BYTE   0               ; 0 TS05$B_BR to data
                    08  2DFB                .BYTE   8               ; 8 of data field
                    81  2DFC                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                        2DFD    818 TS11:   $DS_TS11
                        2DFD                .SAVE   LOCAL_BLOCK
                        2DFD                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$L_TS11_CSR,       HP$L_TS11_CSR:
                        0032                .IIF    NB,TS11$L_CSR,  TS11$L_CSR:
                00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                        0036                .IIF    NB,HP$B_TS11_BR,        HP$B_TS11_BR:
                        0036                .IIF    NB,TS11$B_BR,   TS11$B_BR:
                00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                        0037                .IIF    NB,HP$K_TS11_LEN,       HP$K_TS11_LEN:
                        0037                .IIF    NB,TS11$K_LEN,  TS11$K_LEN:
                    00002DFD                .RESTORE
             31 31 53 54 00' 2DFD           .ASCIC  "TS11"  ; TS11 name
                    04  2DFD
                    37  2E02                .BYTE   TS11$K_LEN              ; TS11$K_LEN of resultant P-table
                    01  2E03                .BYTE   1               ; Maximum unit number                   ;G:65
                  5354  2E04                .WORD   ^A"TS"  ; Two character mnemonic for QIO TS11 TS
                    80  2E06                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                    8D  2E07                .Byte   Pd$_Name        ; Directive op-code
                    03  2E08                .Byte   Ptd$M_Device            ; Enforced MS codes
                 53 4D 00' 2E09             .Ascic  "MS"    ; Enforced device name prefix
                    02  2E09
                    86  2E0C                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  2E0D              .LONG   HP$M_ALLOC              ; Constant
                    88  2E11                .BYTE   Pd$_Store       ; Indicate store operation
                  000A  2E12                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                    00  2E14                .BYTE   0               ; 0 HP$B_FLAGS to data
                    08  2E15                .BYTE   8               ; 8 of data field
                    83  2E16                .BYTE   Pd$_Octal       ; Indicate scan octal
              52 53 43 00' 2E17             .ASCIC  "CSR"   ; CSR string
                    03  2E17
          0003FFFE 0003E000  2E1B           .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                    88  2E23                .BYTE   Pd$_Store       ; Indicate store operation
                  0032  2E24                .WORD   TS11$L_CSR              ; Byte TS11$L_CSR to data
                    00  2E26                .BYTE   0               ; 0 TS11$L_CSR to data
                    20  2E27                .BYTE   32              ; 32 of data field
                    88  2E28                .BYTE   Pd$_Store       ; Indicate store operation
                  0018  2E29                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                    00  2E2B                .BYTE   0               ; 0 HP$A_DEVICE to data
                    12  2E2C                .BYTE   18              ; 18 of data field
                    83  2E2D                .BYTE   Pd$_Octal       ; Indicate scan octal
       52 4F 54 43 45 56 00' 2E2E           .ASCIC  "VECTOR"        ; VECTOR string
                    06  2E2E
          000001FE 00000002  2E35           .LONG   ^O2,^O776       ; 2 , 776 limits on input
                    88  2E3D                .BYTE   Pd$_Store       ; Indicate store operation
                  0024  2E3E                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                    00  2E40                .BYTE   0               ; 0 HP$W_VECTOR to data
                    09  2E41                .BYTE   9               ; 9 of data field
                    82  2E42                .BYTE   Pd$_Decimal     ; Indicate scan decimal
                 52 42 00' 2E43             .ASCIC  "BR"    ; BR string
                    02  2E43
          00000007 00000004  2E46           .LONG   4,7     ; 4 , 7 limits on input
                    88  2E4E                .BYTE   Pd$_Store       ; Indicate store operation
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                    0036  2E4F                .WORD   TS11$B_BR               ; Byte TS11$B_BR to data
                      00  2E51                .BYTE   0               ; 0 TS11$B_BR to data
                      08  2E52                .BYTE   8               ; 8 of data field
                      81  2E53                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2E54    819 TU45:   $DS_TU45
                          2E54                .SAVE   LOCAL_BLOCK
                          2E54                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_TU45_LEN,       HP$K_TU45_LEN:
                          0032                .IIF    NB,TU45$K_LEN,  TU45$K_LEN:
                      0000  2E54                .RESTORE
             35 34 55 54 00' 2E54                .ASCIC  "TU45"  ; TU45 name
                      04  2E54
                      32  2E59                .BYTE   TU45$K_LEN              ; TU45$K_LEN of resultant P-table
                      08  2E5A                .BYTE   8               ; Maximum unit number                   ;G:65
                    0000  2E5B                .WORD   ^A""    ; Two character mnemonic for QIO TU45
                      80  2E5D                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2E5E                .Byte   Pd$_Name        ; Directive op-code
                      1B  2E5F                .Byte   Ptd$M_EndDevice         ; Enforced MT codes
                 54 4D 00' 2E60                .AsCic  "MT"    ; Enforced device name prefix
                      02  2E60
                      86  2E63                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  2E64                .LONG   HP$M_ALLOC              ; Constant
                      88  2E68                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  2E69                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  2E6B                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  2E6C                .BYTE   8               ; 8 of data field
                      81  2E6D                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2E6E    820 TU58:   $DS_TU58
                          2E6E                .SAVE   LOCAL_BLOCK
                          2E6E                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_TU58_LEN,       HP$K_TU58_LEN:
                          0032                .IIF    NB,TU58$K_LEN,  TU58$K_LEN:
                      0000  2E6E                .RESTORE
             38 35 55 54 00' 2E6E                .ASCIC  "TU58"  ; TU58 name
                      04  2E6E
                      32  2E73                .BYTE   TU58$K_LEN              ; TU58$K_LEN of resultant P-table
                      02  2E74                .BYTE   2               ; Maximum unit number                   ;G:65
                    4444  2E75                .WORD   ^A"DD"  ; Two character mnemonic for QIO TU58 DD
                      80  2E77                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2E78                .Byte   Pd$_Name        ; Directive op-code
                      03  2E79                .Byte   Ptd$M_Device            ; Enforced DD codes
                 44 44 00' 2E7A                .Ascic  "DD"    ; Enforced device name prefix
                      02  2E7A
                      86  2E7D                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  2E7E                .LONG   HP$M_ALLOC              ; Constant
                      88  2E82                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  2E83                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  2E85                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  2E86                .BYTE   8               ; 8 of data field
                      81  2E87                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2E88    821 TU70:   $DS_TU70                                ;       [57]
                          2E88                .SAVE   LOCAL_BLOCK
                          2E88                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_TU70_LEN,       HP$K_TU70_LEN::
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                        0032                .IIF    NB,TU70$K_LEN,  TU70$K_LEN::
                    00002E88                .RESTORE
                30 37 55 54 00' 2E88        .ASCIC  "TU70"  ; TU70 name
                          04  2E88
                          32  2E8D        .BYTE   TU70$K_LEN              ; TU70$K_LEN of resultant P-table
                          10  2E8E        .BYTE   16                  ; Maximum unit number                   ;G:65
                        0000  2E8F        .WORD   ^A""    ; Two character mnemonic for QIO TU70
                          80  2E91        .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  2E92        .Byte   Pd$_Name        ; Directive op-code
                          1B  2E93        .Byte   PTD$M_ENDDEVICE         ; Enforced MR codes
                    52 4D 00' 2E94        .Ascic  "MR"    ; Enforced device name prefix
                          02  2E94
                          86  2E97        .BYTE   Pd$_Literal     ; Indicate literal
                    00000001  2E98        .LONG   HP$M_ALLOC              ; Constant
                          88  2E9C        .BYTE   Pd$_Store       ; Indicate store operation
                        000A  2E9D        .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                          00  2E9F        .BYTE   0               ; 0 HP$B_FLAGS to data
                          08  2EA0        .BYTE   8               ; 8 of data field
                          81  2EA1        .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                              2EA2  822 TU72:   $DS_TU72                                ;       [57]
                              2EA2        .SAVE   LOCAL_BLOCK
                              2EA2        .PSECT  $ABS$,ABS
                    00000032  0050        .=HP$A_DEPENDENT
                              0032        .IIF    NB,HP$K_TU72_LEN,       HP$K_TU72_LEN::
                              0032        .IIF    NB,TU72$K_LEN,  TU72$K_LEN::
                    00002EA2              .RESTORE
                32 37 55 54 00' 2EA2      .ASCIC  "TU72"  ; TU72 name
                          04  2EA2
                          32  2EA7        .BYTE   TU72$K_LEN              ; TU72$K_LEN of resultant P-table
                          10  2EA8        .BYTE   16                  ; Maximum unit number                   ;G:65
                        0000  2EA9        .WORD   ^A""    ; Two character mnemonic for QIO TU72
                          80  2EAB        .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  2EAC        .Byte   Pd$_Name        ; Directive op-code
                          1B  2EAD        .Byte   PTD$M_ENDDEVICE         ; Enforced MR codes
                    52 4D 00' 2EAE        .Ascic  "MR"    ; Enforced device name prefix
                          02  2EAE
                          86  2EB1        .BYTE   Pd$_Literal     ; Indicate literal
                    00000001  2EB2        .LONG   HP$M_ALLOC              ; Constant
                          88  2EB6        .BYTE   Pd$_Store       ; Indicate store operation
                        000A  2EB7        .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                          00  2EB9        .BYTE   0               ; 0 HP$B_FLAGS to data
                          08  2EBA        .BYTE   8               ; 8 of data field
                          81  2EBB        .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                              2EBC  823 TU77:   $DS_TU77
                              2EBC        .SAVE   LOCAL_BLOCK
                              2EBC        .PSECT  $ABS$,ABS
                    00000032  0050        .=HP$A_DEPENDENT
                              0032        .IIF    NB,HP$K_TU77_LEN,       HP$K_TU77_LEN:
                              0032        .IIF    NB,TU77$K_LEN,  TU77$K_LEN:
                    00002EBC              .RESTORE
                37 37 55 54 00' 2EBC      .ASCIC  "TU77"  ; TU77 name
                          04  2EBC
                          32  2EC1        .BYTE   TU77$K_LEN              ; TU77$K_LEN of resultant P-table
                          08  2EC2        .BYTE   8                   ; Maximum unit number                   ;G:65
                        0000  2EC3        .WORD   ^A""    ; Two character mnemonic for QIO TU77
                          80  2EC5        .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  2EC6        .Byte   Pd$_Name        ; Directive op-code
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                      1B  2EC7                .Byte   Ptd$M_EndDevice          ; Enforced MT codes
                  54 4D 00' 2EC8                .Ascic  "MT"    ; Enforced device name prefix
                      02  2EC8
                      86  2ECB                .BYTE   Pd$_Literal      ; Indicate literal
                00000001  2ECC                .LONG   HP$M_ALLOC               ; Constant
                      88  2ED0                .BYTE   Pd$_Store        ; Indicate store operation
                    000A  2ED1                .WORD   HP$B_FLAGS               ; Byte HP$B_FLAGS to data
                      00  2ED3                .BYTE   0                ; 0 HP$B_FLAGS to data
                      08  2ED4                .BYTE   8                ; 8 of data field
                      81  2ED5                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          2ED6    824 TU78:   $DS_TU78
                          2ED6                .SAVE   LOCAL_BLOCK
                          2ED6                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_TU78_LEN,       HP$K_TU78_LEN:
                          0032                .IIF    NB,TU78$K_LEN,  TU78$K_LEN:
                          0002ED6             .RESTORE
             38 37 55 54 00' 2ED6             .ASCIC  "TU78"  ; TU78 name
                      04  2ED6
                      32  2EDB                .BYTE   TU78$K_LEN               ; TU78$K_LEN of resultant P-table
                      08  2EDC                .BYTE   8                ; Maximum unit number                          ;G:65
                    0000  2EDD                .WORD   ^A""     ; Two character mnemonic for QIO TU78
                      80  2EDF                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                      8D  2EE0                .Byte   Pd$_Name         ; Directive op-code
                      1B  2EE1                .Byte   Ptd$M_EndDevice          ; Enforced MF codes
                  46 4D 00' 2EE2                .Ascic  "MF"    ; Enforced device name prefix
                      02  2EE2
                      86  2EE5                .BYTE   Pd$_Literal      ; Indicate literal
                00000001  2EE6                .LONG   HP$M_ALLOC               ; Constant
                      88  2EEA                .BYTE   Pd$_Store        ; Indicate store operation
                    000A  2EEB                .WORD   HP$B_FLAGS               ; Byte HP$B_FLAGS to data
                      00  2EED                .BYTE   0                ; 0 HP$B_FLAGS to data
                      08  2EEE                .BYTE   8                ; 8 of data field
                      81  2EEF                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          2EF0    825 TU80:   $DS_TU80                         ;       [28]
                          2EF0                .SAVE   LOCAL_BLOCK
                          2EF0                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$L_TU80_CSR,       HP$L_TU80_CSR:
                00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                          0036                .IIF    NB,TU80$B_BR,   TU80$B_BR:
                          0036                .IIF    NB,HP$B_TU80_BR,        HP$B_TU80_BR:
                00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                          0037                .IIF    NB,HP$K_TU80_LEN,       HP$K_TU80_LEN:
                          0037                .IIF    NB,TU80$K_LEN,  TU80$K_LEN:
                          0002EF0             .RESTORE
             30 38 55 54 00' 2EF0             .ASCIC  "TU80"  ; TU80 name
                      04  2EF0
                      37  2EF5                .BYTE   TU80$K_LEN               ; TU80$K_LEN of resultant P-table
                      08  2EF6                .BYTE   8                ; Maximum unit number                          ;G:65
                    0000  2EF7                .WORD   ^A""     ; Two character mnemonic for QIO TU80
                      80  2EF9                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                      8D  2EFA                .Byte   Pd$_Name         ; Directive op-code
                      03  2EFB                .Byte   Ptd$M_Device             ; Enforced MS codes
                  53 4D 00' 2EFC                .Ascic  "MS"    ; Enforced device name prefix
                      02  2EFC
                      86  2EFF                .BYTE   Pd$_Literal      ; Indicate literal
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                    00000001  2F00                .LONG   HP$M_ALLOC                      ; Constant
                          88  2F04                .BYTE   Pd$_Store       ; Indicate store operation
                        000A  2F05                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                          00  2F07                .BYTE   0               ; 0 HP$B_FLAGS to data
                          08  2F08                .BYTE   8               ; 8 of data field
                          83  2F09                .BYTE   Pd$_Octal       ; Indicate scan octal
44 41 5F 52 53 43 5F 30 38 55 54 00' 2F0A        .ASCIC  "TU80_CSR_ADDRESS"      ; TU80_CSR_ADDRESS string
                53 53 45 52 44  2F16
                          10  2F0A
                0003FFFE 0003E000  2F1B          .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                          88  2F23                .BYTE   Pd$_Store       ; Indicate store operation
                        0032  2F24                .WORD   HP$L_TU80_CSR                   ; Byte HP$L_TU80_CSR to data
                          00  2F26                .BYTE   0               ; 0 HP$L_TU80_CSR to data
                          20  2F27                .BYTE   32              ; 32 of data field
                          88  2F28                .BYTE   Pd$_Store       ; Indicate store operation
                        0018  2F29                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                          00  2F2B                .BYTE   0               ; 0 HP$A_DEVICE to data
                          12  2F2C                .BYTE   18              ; 18 of data field
                          83  2F2D                .BYTE   Pd$_Octal       ; Indicate scan octal
52 4F 54 43 45 56 5F 30 38 55 54 00' 2F2E        .ASCIC  "TU80_VECTOR"   ; TU80_VECTOR string
                          0B  2F2E
                000001FE 00000002  2F3A          .LONG   ^O2,^O776       ; 2 , 776 limits on input
                          88  2F42                .BYTE   Pd$_Store       ; Indicate store operation
                        0024  2F43                .WORD   HP$W_VECTOR                     ; Byte HP$W_VECTOR to data
                          00  2F45                .BYTE   0               ; 0 HP$W_VECTOR to data
                          10  2F46                .BYTE   16              ; 16 of data field
                          82  2F47                .BYTE   Pd$_Decimal     ; Indicate scan decimal
4C 45 56 45 4C 5F 52 42 00' 2F48                .ASCIC  "BR_LEVEL"      ; BR_LEVEL string
                          08  2F48
             00000007 00000004  2F51             .LONG   4,7     ; 4 , 7 limits on input
                          88  2F59                .BYTE   Pd$_Store       ; Indicate store operation
                        0036  2F5A                .WORD   HP$B_TU80_BR                    ; Byte HP$B_TU80_BR to data
                          00  2F5C                .BYTE   0               ; 0 HP$B_TU80_BR to data
                          08  2F5D                .BYTE   8               ; 8 of data field
                          81  2F5E                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                              2F5F    826 TU81:   $DS_TU81                                ;       [29]
                              2F5F                .SAVE   LOCAL_BLOCK
                              2F5F                .PSECT  $ABS$,ABS
                    00000032  0050                .=HP$A_DEPENDENT
                              0032                .IIF    NB,HP$L_TU81_CSR,       HP$L_TU81_CSR:
                              0032                .IIF    NB,TU81$L_CSR,  TU81$L_CSR:
                    00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                              0036                .IIF    NB,HP$B_TU81_BR,        HP$B_TU81_BR:
                              0036                .IIF    NB,TU81$B_BR,   TU81$B_BR:
                    00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                              0037                .IIF    NB,HP$K_TU81_LEN,       HP$K_TU81_LEN:
                              0037                .IIF    NB,TU81$K_LEN,  TU81$K_LEN:
                          00002F5F                .RESTORE
                  31 38 55 54 00' 2F5F            .ASCIC  "TU81"  ; TU81 name
                          04  2F5F
                          37  2F64                .BYTE   TU81$K_LEN                      ; TU81$K_LEN of resultant P-table
                          04  2F65                .BYTE   4               ; Maximum unit number                           ;G:65
                        554D  2F66                .WORD   ^A"MU"  ; Two character mnemonic for QIO TU81 MU
                          80  2F68                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D  2F69                .Byte   Pd$_Name        ; Directive op-code
                          03  2F6A                .Byte   Ptd$M_Device                    ; Enforced MU codes
                     55 4D 00' 2F6B               .Asci   "MU"    ; Enforced device name prefix
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                      02  2F6B
                      86  2F6E                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  2F6F                .LONG   HP$M_ALLOC              ; Constant
                      88  2F73                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  2F74                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  2F76                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  2F77                .BYTE   8               ; 8 of data field
                      83  2F78                .BYTE   Pd$_Octal       ; Indicate scan octal
           52 53 43 00'   2F79                .ASCIC  "CSR"   ; CSR string
                      03  2F79
        0003FFFE 0003E000  2F7D                .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                      88  2F85                .BYTE   Pd$_Store       ; Indicate store operation
                    0032  2F86                .WORD   TU81$L_CSR              ; Byte TU81$L_CSR to data
                      00  2F88                .BYTE   0               ; 0 TU81$L_CSR to data
                      20  2F89                .BYTE   32              ; 32 of data field
                      88  2F8A                .BYTE   Pd$_Store       ; Indicate store operation
                    0018  2F8B                .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                      00  2F8D                .BYTE   0               ; 0 HP$A_DEVICE to data
                      12  2F8E                .BYTE   18              ; 18 of data field
                      83  2F8F                .BYTE   Pd$_Octal       ; Indicate scan octal
  52 4F 54 43 45 56 00'   2F90                .ASCIC  "VECTOR"        ; VECTOR string
                      06  2F90
        000001FE 00000002  2F97                .LONG   ^O2,^O776       ; 2 , 776 limits on input
                      88  2F9F                .BYTE   Pd$_Store       ; Indicate store operation
                    0024  2FA0                .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                      00  2FA2                .BYTE   0               ; 0 HP$W_VECTOR to data
                      09  2FA3                .BYTE   9               ; 9 of data field
                      82  2FA4                .BYTE   Pd$_Decimal     ; Indicate scan decimal
              52 42 00'   2FA5                .ASCIC  "BR"    ; BR string
                      02  2FA5
     00000007 00000004    2FA8                .LONG   4,7     ; 4 , 7 limits on input
                      88  2FB0                .BYTE   Pd$_Store       ; Indicate store operation
                    0036  2FB1                .WORD   TU81$B_BR               ; Byte TU81$B_BR to data
                      00  2FB3                .BYTE   0               ; 0 TU81$B_BR to data
                      08  2FB4                .BYTE   8               ; 8 of data field
                      81  2FB5                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          2FB6    827 UBE:    $DS_UBE
                          2FB6                .SAVE   LOCAL_BLOCK
                          2FB6                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$L_UBE_CSR,        HP$L_UBE_CSR:
                          0032                .IIF    NB,UBE$L_CSR,   UBE$L_CSR:
                00000036  0032                .IIF    NB,.BLKL,       .BLKL   1
                          0036                .IIF    NB,HP$K_UBE_LEN,        HP$K_UBE_LEN:
                          0036                .IIF    NB,UBE$K_LEN,   UBE$K_LEN:
                      00002FB6                .RESTORE
              45 42 55 00'   2FB6                .ASCIC  "UBE"   ; UBE name
                      03  2FB6
                      36  2FBA                .BYTE   UBE$K_LEN               ; UBE$K_LEN of resultant P-table
                      08  2FBB                .BYTE   8               ; Maximum unit number                   ;G:65
                    4555  2FBC                .WORD   ^A"UE"  ; Two character mnemonic for QIO UBE UE
                      80  2FBE                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  2FBF                .Byte   Pd$_Name        ; Directive op-code
                      03  2FC0                .Byte   Ptd$M_Device            ; Enforced UB codes
              42 55 00'   2FC1                .Ascic  "UB"    ; Enforced device name prefix
                      02  2FC1
                      83  2FC4                .BYTE   Pd$_Octal       ; Indicate scan octal
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                52 53 43 00' 2FC5               .ASCIC  "CSR"   ; CSR string
                   03  2FC5
           0003FFFE 0003E000  2FC9               .LONG   ^O760000,^O777776       ; 760000 , 777776 limits on input
                   88  2FD1               .BYTE   Pd$_Store       ; Indicate store operation
                 0032  2FD2               .WORD   UBE$L_CSR               ; Byte UBE$L_CSR to data
                   00  2FD4               .BYTE   0               ; 0 UBE$L_CSR to data
                   20  2FD5               .BYTE   32              ; 32 of data field
                   88  2FD6               .BYTE   Pd$_Store       ; Indicate store operation
                 0018  2FD7               .WORD   HP$A_DEVICE             ; Byte HP$A_DEVICE to data
                   00  2FD9               .BYTE   0               ; 0 HP$A_DEVICE to data
                   12  2FDA               .BYTE   18              ; 18 of data field
                   83  2FDB               .BYTE   Pd$_Octal       ; Indicate scan octal
        52 4F 54 43 45 56 00' 2FDC               .ASCIC  "VECTOR"        ; VECTOR string
                   06  2FDC
           000001FE 00000002  2FE3               .LONG   ^O2,^O776       ; 2 , 776 limits on input
                   88  2FEB               .BYTE   Pd$_Store       ; Indicate store operation
                 0024  2FEC               .WORD   HP$W_VECTOR             ; Byte HP$W_VECTOR to data
                   00  2FEE               .BYTE   0               ; 0 HP$W_VECTOR to data
                   09  2FEF               .BYTE   9               ; 9 of data field
                   81  2FF0               .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                       2FF1   828 UDA50:   $DS_UDA50                       ;       [17]
                       2FF1               .SAVE   LOCAL_BLOCK
                       2FF1               .PSECT  $ABS$,ABS
                   00000032   0050               .=HP$A_DEPENDENT
                       0032               .IIF    NB,HP$L_UDA50_UDAIP,    HP$L_UDA50_UDAIP:
                       0032               .IIF    NB,UDA50$L_UDAIP,       UDA50$L_UDAIP:
                   00000036   0032               .IIF    NB,,BLKL,       .BLKL   1
                       0036               .IIF    NB,HP$B_UDA50_BR,       HP$B_UDA50_BR:
                       0036               .IIF    NB,UDA50$B_BR,  UDA50$B_BR:
                   00000037   0036               .IIF    NB,,BLKB,       .BLKB   1
                       0037               .IIF    NB,HP$B_UDA50_BURST,    HP$B_UDA50_BURST:
                       0037               .IIF    NB,UDA50$B_BURST,       UDA50$B_BURST:
                   00000038   0037               .IIF    NB,,BLKB,       .BLKB   1
                       0038               .IIF    NB,HP$K_UDA50_LEN,      HP$K_UDA50_LEN:
                       0038               .IIF    NB,UDA50$K_LEN, UDA50$K_LEN:
                     00002FF1               .RESTORE
        30 35 41 44 55 00' 2FF1               .ASCIC  "UDA50" ; UDA50 name
                   05  2FF1
                   38  2FF7               .BYTE   HP$K_UDA50_LEN          ; HP$K_UDA50_LEN of resultant P-table
                   00  2FF8               .BYTE   0               ; Maximum unit number                           ;G:65
                 0000  2FF9               .WORD   ^A""    ; Two character mnemonic for QIO UDA50
                   80  2FFB               .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                   8D  2FFC               .Byte   Pd$_Name        ; Directive op-code
                   02  2FFD               .Byte   Ptd$M_Controller                ; Enforced DU codes
                55 44 00' 2FFE               .Ascic  "DU"    ; Enforced device name prefix
                   02  2FFE
                   83  3001               .BYTE   Pd$_Octal       ; Indicate scan octal
        50 49 41 44 55 00' 3002               .ASCIC  "UDAIP" ; UDAIP string
                   05  3002
           0003FFFC 0003E000  3008               .LONG   ^O760000,^O777774       ; 760000 , 777774 limits on input
                   88  3010               .BYTE   Pd$_Store       ; Indicate store operation
                 0032  3011               .WORD   HP$L_UDA50_UDAIP                ; Byte HP$L_UDA50_UDAIP to data
                   00  3013               .BYTE   0               ; 0 HP$L_UDA50_UDAIP to data
                   20  3014               .BYTE   32              ; 32 of data field
                   88  3015               .BYTE   Pd$_Store       ; Indicate store operation
                 0018  3016               .WORD   Hp$A_Device             ; Byte Hp$A_Device to data
                   00  3018               .BYTE   0               ; 0 Hp$A_Device to data
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                      12  3019                .BYTE   18                      ; 18 of data field
                      83  301A                .BYTE   Pd$_Octal               ; Indicate scan octal
          72 6F 74 63 65 56 00' 301B          .ASCIC  "Vector"                ; Vector string
                      06  301B
             000001FC 00000004  3022          .LONG   ^O4,^O0774              ; 4 , 774 limits on input
                      88  302A                .BYTE   Pd$_Store               ; Indicate store operation
                    0024  302B                .WORD   HP$W_VECTOR                     ; Byte HP$W_VECTOR to data
                      00  302D                .BYTE   0                       ; 0 HP$W_VECTOR to data
                      08  302E                .BYTE   8                       ; 8 of data field
                      82  302F                .BYTE   Pd$_Decimal             ; Indicate scan decimal
                   52 42 00' 3030             .ASCIC  "BR"    ; BR string
                      02  3030
             00000007 00000004  3033          .LONG   4,7     ; 4 , 7 limits on input
                      88  303B                .BYTE   Pd$_Store               ; Indicate store operation
                    0036  303C                .WORD   HP$B_UDA50_BR                   ; Byte HP$B_UDA50_BR to data
                      00  303E                .BYTE   0                       ; 0 HP$B_UDA50_BR to data
                      08  303F                .BYTE   8                       ; 8 of data field
                      82  3040                .BYTE   Pd$_Decimal             ; Indicate scan decimal
65 74 61 52 5F 74 73 72 75 42 00' 3041        .ASCIC  "Burst_Rate"            ; Burst_Rate string
                      0A  3041
             0000003F 00000000  304C          .LONG   0,63    ; 0 , 63 limits on input
                      88  3054                .BYTE   Pd$_Store               ; Indicate store operation
                    0037  3055                .WORD   HP$B_UDA50_BURST                ; Byte HP$B_UDA50_BURST to data
                      00  3057                .BYTE   0                       ; 0 HP$B_UDA50_BURST to data
                      06  3058                .BYTE   6                       ; 6 of data field
                      81  3059                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          305A  829 UNA11:    $DS_UNA11                               ;       [27]
                          305A                .SAVE   LOCAL_BLOCK
                          305A                .PSECT  $ABS$,ABS
                   00000032  0050             .=HP$A_DEPENDENT
                          0032                .IIF    NB,UNA11$B_BR,  UNA11$B_BR:
                   00000033  0032             .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,UNA11$L_CSR, UNA11$L_CSR:
                   00000037  0033             .IIF    NB,.BLKL,       .BLKL   1
                          0037                .IIF    NB,UNA11$K_LEN, UNA11$K_LEN:
                     0000305A                 .RESTORE
31 31 41 4E 55 00' 305A                       .ASCIC  "UNA11" ; UNA11 name
                      05  305A
                      37  3060                .BYTE   UNA11$K_LEN                     ; UNA11$K_LEN of resultant P-table
                      08  3061                .BYTE   8                       ; Maximum unit number                   ;G:65
                    0000  3062                .WORD   ^A""    ; Two character mnemonic for QIO UNA11
                      80  3064                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  3065                .Byte   Pd$_Name                ; Directive op-code
                      03  3066                .Byte   PTD$M_DEVICE                    ; Enforced XE codes
                   45 58 00' 3067             .Ascic  "XE"    ; Enforced device name prefix
                      02  3067
                      83  306A                .BYTE   Pd$_Octal               ; Indicate scan octal
                52 53 43 00' 306B             .ASCIC  "CSR"   ; CSR string
                      03  306B
             0003FFFE 0003E000  306F          .LONG   ^O760000,^O777776               ; 760000 , 777776 limits on input
                      88  3077                .BYTE   Pd$_Store               ; Indicate store operation
                    0033  3078                .WORD   UNA11$L_CSR                     ; Byte UNA11$L_CSR to data
                      00  307A                .BYTE   0                       ; 0 UNA11$L_CSR to data
                      20  307B                .BYTE   32                      ; 32 of data field
                      88  307C                .BYTE   Pd$_Store               ; Indicate store operation
                    0018  307D                .WORD   HP$A_DEVICE                     ; Byte HP$A_DEVICE to data
                      00  307F                .BYTE   0                       ; 0 HP$A_DEVICE to data
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                      12  3080                .BYTE   18                      ; 18 of data field
                      83  3081                .BYTE   Pd$_Octal            ; Indicate scan octal
           52 4F 54 43 45 56 00' 3082          .ASCIC  "VECTOR"             ; VECTOR string
                      06  3082
              000001FE 00000002  3089          .LONG   ^O2,^O776            ; 2 , 776 limits on input
                      88  3091                .BYTE   Pd$_Store            ; Indicate store operation
                    0024  3092                .WORD   HP$W_VECTOR                  ; Byte HP$W_VECTOR to data
                      00  3094                .BYTE   0                       ; 0 HP$W_VECTOR to data
                      09  3095                .BYTE   9                       ; 9 of data field
                      82  3096                .BYTE   Pd$_Decimal          ; Indicate scan decimal
                 52 42 00' 3097               .ASCIC  "BR"     ; BR string
                      02  3097
              00000007 00000004  309A          .LONG   4,7      ; 4 , 7 limits on input
                      88  30A2                .BYTE   Pd$_Store            ; Indicate store operation
                    0032  30A3                .WORD   UNA11$B_BR                   ; Byte UNA11$B_BR to data
                      00  30A5                .BYTE   0                       ; 0 UNA11$B_BR to data
                      08  30A6                .BYTE   8                       ; 8 of data field
                      81  30A7                .BYTE   Pd$_End              ; Indicate end of PT-descriptor
                          30A8    830 VS100:  $DS_VS100                                ;       [30]
                          30A8                .SAVE   LOCAL_BLOCK
                          30A8                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$L_VS100_CSR,      HP$L_VS100_CSR:
                          0032                .IIF    NB,VS100$L_CSR, VS100$L_CSR:
                 00000036 0032                .IIF    NB,,BLKL,               .BLKL   1
                          0036                .IIF    NB,HP$B_VS100_BR,       HP$B_VS100_BR:
                          0036                .IIF    NB,VS100$B_BR,  VS100$B_BR:
                 00000037 0036                .IIF    NB,,BLKB,               .BLKB   1
                          0037                .IIF    NB,HP$K_VS100_LEN,      HP$K_VS100_LEN:
                          0037                .IIF    NB,VS100$K_LEN, VS100$K_LEN:
                    000030A8                  .RESTORE
        30 30 31 53 56 00' 30A8               .ASCIC  "VS100" ; VS100 name
                      05  30A8
                      37  30AE                .BYTE   VS100$K_LEN                  ; VS100$K_LEN of resultant P-table
                      01  30AF                .BYTE   1                       ; Maximum unit number                        ;G:65
                    5356  30B0                .WORD   ^A"VS"   ; Two character mnemonic for QIO VS100 VS
                      80  30B2                .BYTE   Pd$_Start            ; Constant to identify start of descriptor
                      8D  30B3                .Byte   Pd$_Name             ; Directive op-code
                      1B  30B4                .Byte   Ptd$M_EndDevice              ; Enforced VB codes
                 42 56 00' 30B5               .Ascic  "VB"     ; Enforced device name prefix
                      02  30B5
                      86  30B8                .BYTE   Pd$_Literal          ; Indicate literal
                 00000001 30B9                .LONG   HP$M_ALLOC                   ; Constant
                      88  30BD                .BYTE   Pd$_Store            ; Indicate store operation
                    000A  30BE                .WORD   HP$B_FLAGS                   ; Byte HP$B_FLAGS to data
                      00  30C0                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  30C1                .BYTE   8                       ; 8 of data field
                      83  30C2                .BYTE   Pd$_Octal            ; Indicate scan octal
              52 53 43 00' 30C3               .ASCIC  "CSR"    ; CSR string
                      03  30C3
        0003FFFE 0003E000  30C7               .LONG   ^O760000,^O777776            ; 760000 , 777776 limits on input
                      88  30CF                .BYTE   Pd$_Store            ; Indicate store operation
                    0032  30D0                .WORD   VS100$L_CSR                  ; Byte VS100$L_CSR to data
                      00  30D2                .BYTE   0                       ; 0 VS100$L_CSR to data
                      20  30D3                .BYTE   32                      ; 32 of data field
                      88  30D4                .BYTE   Pd$_Store            ; Indicate store operation
                    0018  30D5                .WORD   HP$A_DEVICE                  ; Byte HP$A_DEVICE to data
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                      00  30D7                .BYTE   0                       ; 0 HP$A_DEVICE to data
                      12  30D8                .BYTE   18                      ; 18 of data field
                      83  30D9                .BYTE   Pd$_Octal               ; Indicate scan octal
          52 4F 54 43 45 56 00' 30DA           .ASCIC  "VECTOR"                ; VECTOR string
                      06  30DA
             000001FE 00000002  30E1           .LONG   ^O2,^O776               ; 2 , 776 limits on input
                      88  30E9                .BYTE   Pd$_Store               ; Indicate store operation
                    0024  30EA                .WORD   HP$W_VECTOR                     ; Byte HP$W_VECTOR to data
                      00  30EC                .BYTE   0                       ; 0 HP$W_VECTOR to data
                      09  30ED                .BYTE   9                       ; 9 of data field
                      82  30EE                .BYTE   Pd$_Decimal             ; Indicate scan decimal
                 52 42 00' 30EF               .ASCIC  "BR"    ; BR string
                      02  30EF
             00000007 00000004  30F2           .LONG   4,7     ; 4 , 7 limits on input
                      88  30FA                .BYTE   Pd$_Store               ; Indicate store operation
                    0036  30FB                .WORD   VS100$B_BR                      ; Byte VS100$B_BR to data
                      00  30FD                .BYTE   0                       ; 0 VS100$B_BR to data
                      08  30FE                .BYTE   8                       ; 8 of data field
                      81  30FF                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          3100   831 VS125:    $DS_VS125                                       ;       [40]
                          3100                .SAVE   LOCAL_BLOCK
                          3100                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$L_VS125_CSR,      HP$L_VS125_CSR:
                          0032                .IIF    NB,VS125$L_CSR, VS125$L_CSR:
                 00000036 0032                .IIF    NB,,BLKL,               .BLKL   1
                          0036                .IIF    NB,HP$B_VS125_BR,       HP$B_VS125_BR:
                          0036                .IIF    NB,VS125$B_BR,  VS125$B_BR:
                 00000037 0036                .IIF    NB,,BLKB,               .BLKB   1
                          0037                .IIF    NB,HP$K_VS125_LEN,      HP$K_VS125_LEN:
                          0037                .IIF    NB,VS125$K_LEN, VS125$K_LEN:
                    00003100                  .RESTORE
          35 32 31 53 56 00' 3100             .ASCIC  "VS125" ; VS125 name
                      05  3100
                      37  3106                .BYTE   VS125$K_LEN                     ; VS125$K_LEN of resultant P-table
                      01  3107                .BYTE   1                       ; Maximum unit number                   ;G:65
                    5356  3108                .WORD   ^A"VS"  ; Two character mnemonic for QIO VS125 VS
                      80  310A                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  310B                .Byte   Pd$_Name                ; Directive op-code
                      1B  310C                .Byte   Ptd$M_EndDevice                 ; Enforced VB codes
                 42 56 00' 310D               .Ascic  "VB"    ; Enforced device name prefix
                      02  310D
                      86  3110                .BYTE   Pd$_Literal             ; Indicate literal
                 00000001 3111                .LONG   HP$M_ALLOC                      ; Constant
                      88  3115                .BYTE   Pd$_Store               ; Indicate store operation
                    000A  3116                .WORD   HP$B_FLAGS                      ; Byte HP$B_FLAGS to data
                      00  3118                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  3119                .BYTE   8                       ; 8 of data field
                      83  311A                .BYTE   Pd$_Octal               ; Indicate scan octal
               52 53 43 00' 311B              .ASCIC  "CSR"   ; CSR string
                      03  311B
          0003FFFE 0003E000  311F             .LONG   ^O760000,^O777776               ; 760000 , 777776 limits on input
                      88  3127                .BYTE   Pd$_Store               ; Indicate store operation
                    0032  3128                .WORD   VS125$L_CSR                     ; Byte VS125$L_CSR to data
                      00  312A                .BYTE   0                       ; 0 VS125$L_CSR to data
                      20  312B                .BYTE   32                      ; 32 of data field
                      88  312C                .BYTE   Pd$_Store               ; Indicate store operation
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                     0018  312D                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                       00  312F                .BYTE   0                   ; 0 HP$A_DEVICE to data
                       12  3130                .BYTE   18                  ; 18 of data field
                       83  3131                .BYTE   Pd$_Octal           ; Indicate scan octal
           52 4F 54 43 45 56 00' 3132           .ASCIC  "VECTOR"            ; VECTOR string
                       06  3132
              000001FE 00000002  3139           .LONG   ^O2,^O776           ; 2 , 776 limits on input
                       88  3141                .BYTE   Pd$_Store           ; Indicate store operation
                     0024  3142                .WORD   HP$W_VECTOR                 ; Byte HP$W_VECTOR to data
                       00  3144                .BYTE   0                   ; 0 HP$W_VECTOR to data
                       09  3145                .BYTE   9                   ; 9 of data field
                       82  3146                .BYTE   Pd$_Decimal         ; Indicate scan decimal
                  52 42 00' 3147                .ASCIC  "BR"    ; BR string
                       02  3147
              00000007 00000004  314A           .LONG   4,7     ; 4 , 7 limits on input
                       88  3152                .BYTE   Pd$_Store           ; Indicate store operation
                     0036  3153                .WORD   VS125$B_BR                  ; Byte VS125$B_BR to data
                       00  3155                .BYTE   0                   ; 0 VS125$B_BR to data
                       08  3156                .BYTE   8                   ; 8 of data field
                       81  3157                .BYTE   Pd$_End             ; Indicate end of PT-descriptor
                           3158    832 VS300:  $DS_VS300                                   ;       [33]
                           3158                .SAVE   LOCAL_BLOCK
                           3158                .PSECT  $ABS$,ABS
                  00000032  0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,HP$L_VS300_CSR,      HP$L_VS300_CSR:
                           0032                .IIF    NB,VS300$L_CSR, VS300$L_CSR:
                  00000036  0032                .IIF    NB,,.BLKL,          .BLKL   1
                           0036                .IIF    NB,HP$B_VS300_BR,       HP$B_VS300_BR:
                           0036                .IIF    NB,VS300$B_BR,  VS300$B_BR:
                  00000037  0036                .IIF    NB,,.BLKB,          .BLKB   1
                           0037                .IIF    NB,HP$K_VS300_LEN,      HP$K_VS300_LEN:
                           0037                .IIF    NB,VS300$K_LEN, VS300$K_LEN:
                       00003158                .RESTORE
           30 30 33 53 56 00' 3158           .ASCIC  "VS300" ; VS300 name
                       05  3158
                       37  315E                .BYTE   VS300$K_LEN                 ; VS300$K_LEN of resultant P-table
                       01  315F                .BYTE   1                   ; Maximum unit number                   ;G:65
                     5356  3160                .WORD   ^A"VS"  ; Two character mnemonic for QIO VS300 VS
                       80  3162                .BYTE   Pd$_Start           ; Constant to identify start of descriptor
                       8D  3163                .Byte   Pd$_Name            ; Directive op-code
                       1B  3164                .Byte   Ptd$M_EndDevice             ; Enforced VB codes
                  42 56 00' 3165                .Ascic  "VB"    ; Enforced device name prefix
                       02  3165
                       86  3168                .BYTE   Pd$_Literal         ; Indicate literal
                  00000001  3169                .LONG   HP$M_ALLOC                  ; Constant
                       88  316D                .BYTE   Pd$_Store           ; Indicate store operation
                     000A  316E                .WORD   HP$B_FLAGS                  ; Byte HP$B_FLAGS to data
                       00  3170                .BYTE   0                   ; 0 HP$B_FLAGS to data
                       08  3171                .BYTE   8                   ; 8 of data field
                       83  3172                .BYTE   Pd$_Octal           ; Indicate scan octal
                  52 53 43 00' 3173                .ASCIC  "CSR"   ; CSR string
                       03  3173
              0003FFFE 0003E000  3177           .LONG   ^O760000,^O777776           ; 760000 , 777776 limits on input
                       88  317F                .BYTE   Pd$_Store           ; Indicate store operation
                     0032  3180                .WORD   VS300$L_CSR                 ; Byte VS300$L_CSR to data
                       00  3182                .BYTE   0                   ; 0 VS300$L_CSR to data
                       20  3183                .BYTE   32                  ; 32 of data field
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                      88  3184                .BYTE   Pd$_Store        ; Indicate store operation
                    0018  3185                .WORD   HP$A_DEVICE              ; Byte HP$A_DEVICE to data
                      00  3187                .BYTE   0                ; 0 HP$A_DEVICE to data
                      12  3188                .BYTE   18               ; 18 of data field
                      83  3189                .BYTE   Pd$_Octal        ; Indicate scan octal
      52 4F 54 43 45 56 00' 318A              .ASCIC  "VECTOR"         ; VECTOR string
                      06  318A
   000001FE 00000002  3191                    .LONG   ^O2,^O776        ; 2 , 776 limits on input
                      88  3199                .BYTE   Pd$_Store        ; Indicate store operation
                    0024  319A                .WORD   HP$W_VECTOR              ; Byte HP$W_VECTOR to data
                      00  319C                .BYTE   0                ; 0 HP$W_VECTOR to data
                      09  319D                .BYTE   9                ; 9 of data field
                      82  319E                .BYTE   Pd$_Decimal      ; Indicate scan decimal
                52 42 00' 319F                .ASCIC  "BR"     ; BR string
                      02  319F
   00000007 00000004  31A2                    .LONG   4,7      ; 4 , 7 limits on input
                      88  31AA                .BYTE   Pd$_Store        ; Indicate store operation
                    0036  31AB                .WORD   VS300$B_BR               ; Byte VS300$B_BR to data
                      00  31AD                .BYTE   0                ; 0 VS300$B_BR to data
                      08  31AE                .BYTE   8                ; 8 of data field
                      81  31AF                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          31B0    833 VT50:   $DS_VT50
                          31B0                .SAVE   LOCAL_BLOCK
                          31B0                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_VT50_LEN,       HP$K_VT50_LEN:
                          0032                .IIF    NB,VT50$K_LEN,  VT50$K_LEN:
                          000031B0            .RESTORE
          30 35 54 56 00' 31B0                .ASCIC  "VT50"   ; VT50 name
                      04  31B0
                      32  31B5                .BYTE   VT50$K_LEN               ; VT50$K_LEN of resultant P-table
                      FF  31B6                .BYTE   255              ; Maximum unit number                          ;G:65
                    0000  31B7                .WORD   ^A""     ; Two character mnemonic for QIO VT50
                      80  31B9                .BYTE   Pd$_Start        ; Constant to identify start of descriptor
                      8D  31BA                .Byte   Pd$_Name         ; Directive op-code
                      1B  31BB                .Byte   Ptd$M_EndDevice          ; Enforced TT codes
                54 54 00' 31BC                .Ascic  "TT"     ; Enforced device name prefix
                      02  31BC
                      86  31BF                .BYTE   Pd$_Literal      ; Indicate literal
                00000001  31C0                .LONG   HP$M_ALLOC               ; Constant
                      88  31C4                .BYTE   Pd$_Store        ; Indicate store operation
                    000A  31C5                .WORD   HP$B_FLAGS               ; Byte HP$B_FLAGS to data
                      00  31C7                .BYTE   0                ; 0 HP$B_FLAGS to data
                      08  31C8                .BYTE   8                ; 8 of data field
                      81  31C9                .BYTE   Pd$_End          ; Indicate end of PT-descriptor
                          31CA    834 VT52:   $DS_VT52
                          31CA                .SAVE   LOCAL_BLOCK
                          31CA                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_VT52_LEN,       HP$K_VT52_LEN:
                          0032                .IIF    NB,VT52$K_LEN,  VT52$K_LEN:
                          000031CA            .RESTORE
          32 35 54 56 00' 31CA                .ASCIC  "VT52"   ; VT52 name
                      04  31CA
                      32  31CF                .BYTE   VT52$K_LEN               ; VT52$K_LEN of resultant P-table
                      FF  31D0                .BYTE   255              ; Maximum unit number                          ;G:65
                    0000  31D1                .WORD   ^A""     ; Two character mnemonic for QIO VT52
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                      80  31D3                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  31D4                .Byte   Pd$_Name        ; Directive op-code
                      1B  31D5                .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                54 54 00' 31D6                .Ascic  "TT"    ; Enforced device name prefix
                      02  31D6
                      86  31D9                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  31DA                .LONG   HP$M_ALLOC              ; Constant
                      88  31DE                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  31DF                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  31E1                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  31E2                .BYTE   8               ; 8 of data field
                      81  31E3                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          31E4    835 VT55:   $DS_VT55
                          31E4                .SAVE   LOCAL_BLOCK
                          31E4                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_VT55_LEN,       HP$K_VT55_LEN:
                          0032                .IIF    NB,VT55$K_LEN,  VT55$K_LEN:
                      000031E4                .RESTORE
             35 35 54 56 00' 31E4             .ASCIC  "VT55"  ; VT55 name
                      04  31E4
                      32  31E9                .BYTE   VT55$K_LEN              ; VT55$K_LEN of resultant P-table
                      FF  31EA                .BYTE   255             ; Maximum unit number                   ;G:65
                    0000  31EB                .WORD   ^A""    ; Two character mnemonic for QIO VT55
                      80  31ED                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  31EE                .Byte   Pd$_Name        ; Directive op-code
                      1B  31EF                .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                54 54 00' 31F0                .Ascic  "TT"    ; Enforced device name prefix
                      02  31F0
                      86  31F3                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  31F4                .LONG   HP$M_ALLOC              ; Constant
                      88  31F8                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  31F9                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  31FB                .BYTE   0               ; 0 HP$B_FLAGS to data
                      08  31FC                .BYTE   8               ; 8 of data field
                      81  31FD                .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                          31FE    836 VT61:   $DS_VT61                        ;       [66]
                          31FE                .SAVE   LOCAL_BLOCK
                          31FE                .PSECT  $ABS$,ABS
                00000032  0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_VT61_LEN,       HP$K_VT61_LEN:
                          0032                .IIF    NB,VT61$K_LEN,  VT61$K_LEN:
                      000031FE                .RESTORE
             31 36 54 56 00' 31FE             .ASCIC  "VT61"  ; VT61 name
                      04  31FE
                      32  3203                .BYTE   VT61$K_LEN              ; VT61$K_LEN of resultant P-table
                      08  3204                .BYTE   8               ; Maximum unit number                   ;G:65
                    0000  3205                .WORD   ^A""    ; Two character mnemonic for QIO VT61
                      80  3207                .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                      8D  3208                .Byte   Pd$_Name        ; Directive op-code
                      1B  3209                .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                54 54 00' 320A                .Ascic  "TT"    ; Enforced device name prefix
                      02  320A
                      86  320D                .BYTE   Pd$_Literal     ; Indicate literal
                00000001  320E                .LONG   HP$M_ALLOC              ; Constant
                      88  3212                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  3213                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
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                      00  3215                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  3216                .BYTE   8                       ; 8 of data field
                      81  3217                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          3218    837 VT71:   $DS_VT71                                ;       [66]
                          3218                .SAVE   LOCAL_BLOCK
                          3218                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_VT71_LEN,       HP$K_VT71_LEN:
                          0032                .IIF    NB,VT71$K_LEN,  VT71$K_LEN:
                      0000321B                .RESTORE
               31 37 54 56 00' 3218           .ASCIC  "VT71"  ; VT71 name
                      04  3218
                      32  321D                .BYTE   VT71$K_LEN              ; VT71$K_LEN of resultant P-table
                      08  321E                .BYTE   8                       ; Maximum unit number                   ;G:65
                    0000  321F                .WORD   ^A""    ; Two character mnemonic for QIO VT71
                      80  3221                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  3222                .Byte   Pd$_Name                ; Directive op-code
                      1B  3223                .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                 54 54 00' 3224               .Asci   "TT"    ; Enforced device name prefix
                      02  3224
                      86  3227                .BYTE   Pd$_Literal     ; Indicate literal
                 00000001 3228                .LONG   HP$M_ALLOC              ; Constant
                      88  322C                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  322D                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  322F                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  3230                .BYTE   8                       ; 8 of data field
                      81  3231                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          3232    838 VT100:  $DS_VT100
                          3232                .SAVE   LOCAL_BLOCK
                          3232                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_VT100_LEN,      HP$K_VT100_LEN:
                          0032                .IIF    NB,VT100$K_LEN, VT100$K_LEN:
                      00003232                .RESTORE
            30 30 31 54 56 00' 3232           .ASCIC  "VT100" ; VT100 name
                      05  3232
                      32  3238                .BYTE   VT100$K_LEN             ; VT100$K_LEN of resultant P-table
                      FF  3239                .BYTE   255             ; Maximum unit number                   ;G:65
                    0000  323A                .WORD   ^A""    ; Two character mnemonic for QIO VT100
                      80  323C                .BYTE   Pd$_Start               ; Constant to identify start of descriptor
                      8D  323D                .Byte   Pd$_Name                ; Directive op-code
                      1B  323E                .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                 54 54 00' 323F               .Asci   "TT"    ; Enforced device name prefix
                      02  323F
                      86  3242                .BYTE   Pd$_Literal     ; Indicate literal
                 00000001 3243                .LONG   HP$M_ALLOC              ; Constant
                      88  3247                .BYTE   Pd$_Store       ; Indicate store operation
                    000A  3248                .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                      00  324A                .BYTE   0                       ; 0 HP$B_FLAGS to data
                      08  324B                .BYTE   8                       ; 8 of data field
                      81  324C                .BYTE   Pd$_End                 ; Indicate end of PT-descriptor
                          324D    839 VT101:  $DS_VT101                               ;       [55]
                          324D                .SAVE   LOCAL_BLOCK
                          324D                .PSECT  $ABS$,ABS
                 00000032 0050                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$K_VT101_LEN,      HP$K_VT101_LEN:
                          0032                .IIF    NB,VT101$K_LEN, VT101$K_LEN:
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                    0000324D                    .RESTORE
          31 30 31 54 56 00' 324D               .ASCIC  "VT101" ; VT101 name
                       05  324D
                       32  3253                 .BYTE   VT101$K_LEN             ; VT101$K_LEN of resultant P-table
                       FF  3254                 .BYTE   255             ; Maximum unit number                   ;G:65
                     0000  3255                 .WORD   ^A""    ; Two character mnemonic for QIO VT101
                       80  3257                 .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  3258                 .Byte   Pd$_Name        ; Directive op-code
                       1B  3259                 .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                  54 54 00' 325A                .Ascic  "TT"    ; Enforced device name prefix
                       02  325A
                       86  325D                 .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  325E                 .LONG   HP$M_ALLOC              ; Constant
                       88  3262                 .BYTE   Pd$_Store       ; Indicate store operation
                     000A  3263                 .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                       00  3265                 .BYTE   0               ; 0 HP$B_FLAGS to data
                       08  3266                 .BYTE   8               ; 8 of data field
                       81  3267                 .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                           3268    840 VT102:  $DS_VT102
                           3268                .SAVE   LOCAL_BLOCK
                           3268                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,HP$K_VT102_LEN,      HP$K_VT102_LEN:
                           0032                .IIF    NB,VT102$K_LEN, VT102$K_LEN:
                    00003268                    .RESTORE
          32 30 31 54 56 00' 3268               .ASCIC  "VT102" ; VT102 name
                       05  3268
                       32  326E                 .BYTE   VT102$K_LEN             ; VT102$K_LEN of resultant P-table
                       FF  326F                 .BYTE   255             ; Maximum unit number                   ;G:65
                     0000  3270                 .WORD   ^A""    ; Two character mnemonic for QIO VT102
                       80  3272                 .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  3273                 .Byte   Pd$_Name        ; Directive op-code
                       1B  3274                 .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                  54 54 00' 3275                .Ascic  "TT"    ; Enforced device name prefix
                       02  3275
                       86  3278                 .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  3279                 .LONG   HP$M_ALLOC              ; Constant
                       88  327D                 .BYTE   Pd$_Store       ; Indicate store operation
                     000A  327E                 .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                       00  3280                 .BYTE   0               ; 0 HP$B_FLAGS to data
                       08  3281                 .BYTE   8               ; 8 of data field
                       81  3282                 .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                           3283    841 VT125:  $DS_VT125
                           3283                .SAVE   LOCAL_BLOCK
                           3283                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,HP$K_VT125_LEN,      HP$K_VT125_LEN:
                           0032                .IIF    NB,VT125$K_LEN, VT125$K_LEN:
                    00003283                    .RESTORE
          35 32 31 54 56 00' 3283               .ASCIC  "VT125" ; VT125 name
                       05  3283
                       32  3289                 .BYTE   VT125$K_LEN             ; VT125$K_LEN of resultant P-table
                       FF  328A                 .BYTE   255             ; Maximum unit number                   ;G:65
                     0000  328B                 .WORD   ^A""    ; Two character mnemonic for QIO VT125
                       80  328D                 .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  328E                 .Byte   Pd$_Name        ; Directive op-code
                       1B  328F                 .Byte   Ptd$M_EndDevice         ; Enforced TT codes
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                    54 54 00' 3290                  .Ascic  "TT"    ; Enforced device name prefix
                       02  3290
                       86  3293                  .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  3294                  .LONG   HP$M_ALLOC              ; Constant
                       88  3298                  .BYTE   Pd$_Store       ; Indicate store operation
                     000A  3299                  .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                       00  329B                  .BYTE   0               ; 0 HP$B_FLAGS to data
                       08  329C                  .BYTE   8               ; 8 of data field
                       81  329D                  .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                           329E    842 VT131:  $DS_VT131                               ;       [66]
                           329E                .SAVE   LOCAL_BLOCK
                           329E                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,HP$K_VT131_LEN,      HP$K_VT131_LEN:
                           0032                .IIF    NB,VT131$K_LEN, VT131$K_LEN:
                       0000329E                .RESTORE
              31 33 31 54 56 00' 329E          .ASCIC  "VT131" ; VT131 name
                       05  329E
                       32  32A4                  .BYTE   VT131$K_LEN             ; VT131$K_LEN of resultant P-table
                       08  32A5                  .BYTE   8               ; Maximum unit number                   ;G:65
                     0000  32A6                  .WORD   ^A""    ; Two character mnemonic for QIO VT131
                       80  32A8                  .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  32A9                  .Byte   Pd$_Name        ; Directive op-code
                       1B  32AA                  .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                    54 54 00' 32AB                  .Ascic  "TT"    ; Enforced device name prefix
                       02  32AB
                       86  32AE                  .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  32AF                  .LONG   HP$M_ALLOC              ; Constant
                       88  32B3                  .BYTE   Pd$_Store       ; Indicate store operation
                     000A  32B4                  .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                       00  32B6                  .BYTE   0               ; 0 HP$B_FLAGS to data
                       08  32B7                  .BYTE   8               ; 8 of data field
                       81  32B8                  .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                           32B9    843 VT132:  $DS_VT132                               ;       [66]
                           32B9                .SAVE   LOCAL_BLOCK
                           32B9                .PSECT  $ABS$,ABS
                 00000032  0050                .=HP$A_DEPENDENT
                           0032                .IIF    NB,HP$K_VT132_LEN,      HP$K_VT132_LEN:
                           0032                .IIF    NB,VT132$K_LEN, VT132$K_LEN:
                       000032B9                .RESTORE
              32 33 31 54 56 00' 32B9          .ASCIC  "VT132" ; VT132 name
                       05  32B9
                       32  32BF                  .BYTE   VT132$K_LEN             ; VT132$K_LEN of resultant P-table
                       08  32C0                  .BYTE   8               ; Maximum unit number                   ;G:65
                     0000  32C1                  .WORD   ^A""    ; Two character mnemonic for QIO VT132
                       80  32C3                  .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                       8D  32C4                  .Byte   Pd$_Name        ; Directive op-code
                       1B  32C5                  .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                    54 54 00' 32C6                  .Ascic  "TT"    ; Enforced device name prefix
                       02  32C6
                       86  32C9                  .BYTE   Pd$_Literal     ; Indicate literal
                 00000001  32CA                  .LONG   HP$M_ALLOC              ; Constant
                       88  32CE                  .BYTE   Pd$_Store       ; Indicate store operation
                     000A  32CF                  .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                       00  32D1                  .BYTE   0               ; 0 HP$B_FLAGS to data
                       08  32D2                  .BYTE   8               ; 8 of data field
                       81  32D3                  .BYTE   Pd$_End         ; Indicate end of PT-descriptor
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                        32D4    844 VT220:  $DS_VT220                                   ;       [35]
                        32D4                .SAVE   LOCAL_BLOCK
                        32D4                .PSECT  $ABS$,ABS
                    00000032    0050        .=HP$A_DEPENDENT
                                0032        .IIF    NB,HP$K_VT220_LEN,      HP$K_VT220_LEN:
                                0032        .IIF    NB,VT220$K_LEN, VT220$K_LEN:
                                32D4        .RESTORE
                30 32 32 54 56 00' 32D4     .ASCIC  "VT220" ; VT220 name
                          05    32D4
                          32    32DA        .BYTE   VT220$K_LEN             ; VT220$K_LEN of resultant P-table
                          FF    32DB        .BYTE   255             ; Maximum unit number                   ;G:65
                        0000    32DC        .WORD   ^A""    ; Two character mnemonic for QIO VT220
                          80    32DE        .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D    32DF        .Byte   Pd$_Name        ; Directive op-code
                          1B    32E0        .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                    54 54 00'   32E1        .Ascic  "TT"    ; Enforced device name prefix
                          02    32E1
                          86    32E4        .BYTE   Pd$_Literal     ; Indicate literal
                    00000001    32E5        .LONG   HP$M_ALLOC              ; Constant
                          88    32E9        .BYTE   Pd$_Store       ; Indicate store operation
                        000A    32EA        .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                          00    32EC        .BYTE   0               ; 0 HP$B_FLAGS to data
                          08    32ED        .BYTE   8               ; 8 of data field
                          81    32EE        .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                        32EF    845 VT240:  $DS_VT240                                   ;       [35]
                        32EF                .SAVE   LOCAL_BLOCK
                        32EF                .PSECT  $ABS$,ABS
                    00000032    0050        .=HP$A_DEPENDENT
                                0032        .IIF    NB,HP$K_VT240_LEN,      HP$K_VT240_LEN:
                                0032        .IIF    NB,VT240$K_LEN, VT240$K_LEN:
                                32EF        .RESTORE
                30 34 32 54 56 00' 32EF     .ASCIC  "VT240" ; VT240 name
                          05    32EF
                          32    32F5        .BYTE   VT240$K_LEN             ; VT240$K_LEN of resultant P-table
                          FF    32F6        .BYTE   255             ; Maximum unit number                   ;G:65
                        0000    32F7        .WORD   ^A""    ; Two character mnemonic for QIO VT240
                          80    32F9        .BYTE   Pd$_Start       ; Constant to identify start of descriptor
                          8D    32FA        .Byte   Pd$_Name        ; Directive op-code
                          1B    32FB        .Byte   Ptd$M_EndDevice         ; Enforced TT codes
                    54 54 00'   32FC        .Ascic  "TT"    ; Enforced device name prefix
                          02    32FC
                          86    32FF        .BYTE   Pd$_Literal     ; Indicate literal
                    00000001    3300        .LONG   HP$M_ALLOC              ; Constant
                          88    3304        .BYTE   Pd$_Store       ; Indicate store operation
                        000A    3305        .WORD   HP$B_FLAGS              ; Byte HP$B_FLAGS to data
                          00    3307        .BYTE   0               ; 0 HP$B_FLAGS to data
                          08    3308        .BYTE   8               ; 8 of data field
                          81    3309        .BYTE   Pd$_End         ; Indicate end of PT-descriptor
                        330A    846         .END
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```
$$_$                            = 00000001     D
AA11K                             000002BC R   D   04
AA11K$B_BR                        00000032     D
AA11K$K_LEN                       00000033     D
AD11K                             0000030D R   D   04
AD11K$B_BR                        00000032     D
AD11K$K_LEN                       00000033     D
BIT...                          = 00000005     D
CI$B_BI_ID                        00000032     D
CI$B_BR                           00000033     D
CI$B_NODE                         00000034     D
CI$B_TR                           00000032     D
CI$K_LEN                          00000041     D
CI$L_FUNC                         00000035     D
CI$L_INDEX                        0000003D     D
CI$L_MAINT_ID                     00000039     D
CI750                             00000496 R   D   04
CI780                             00000515 R   D   04
CIBCA                             000003FA R   D   04
CIBCI                             0000035E R   D   04
CI_NODE                           0000059C R   D   04
CONSOLE                           000006B8 R   D   04
CONSOLE$K_LEN                     00000032     D
CR11                              000006C6 R   D   04
CR11$B_BR                         00000036     D
CR11$K_LEN                        00000037     D
CR11$L_CSR                        00000032     D
DEBNA                             0000071D R   D   04
DEBNA$B_NODE_ID                   00000032     D
DEBNA$K_LEN                       00000033     D
DEBNK                             00000788 R   D   04
DEBNK$B_NODE_ID                   00000032     D
DEBNK$K_LEN                       00000033     D
DEBNT                             000007F3 R   D   04
DEBNT$B_NODE_ID                   00000032     D
DEBNT$K_LEN                       00000033     D
DHB32                             0000085E R   D   04
DHU11                             000008C5 R   D   04
DHV11                             00000913 R   D   04
DISK                              00000961 R   D   04
DISK$K_LEN                        00000032     D
DL11                              00000974 R   D   04
DL11$B_BR                         00000036     D
DL11$K_LEN                        00000037     D
DL11$L_CSR                        00000032     D
DMB32                             000009C1 R   D   04
DMC11                             00000A28 R   D   04
DMC11$B_BR                        00000036     D
DMC11$K_LEN                       00000037     D
DMC11$L_CSR                       00000032     D
DMF32                             00000A76 R   D   04
DMF32$B_BR                        00000034     D
DMF32$B_COMMON                    00000032     D
DMF32$B_FLAGS                     00000033     D
DMF32$K_LEN                       00000039     D
DMF32$L_CSR                       00000035     D
DMF32A                            00000AC9 R   D   04
DMF32A$B_ACTIV                    00000033     D
DMF32A$B_BR                       00000032     D
DMF32A$B_JUMP                     00000037     D
DMF32A$B_SPEED                    00000034     D
DMF32A$K_LEN                      00000038     D
DMF32A$W_FLAGS                    00000035     D
DMF32P                            00000BEB R   D   04
DMF32P$B_BR                       00000034     D
DMF32P$B_COMMON                   00000032     D
DMF32P$B_FLAGS                    00000033     D
DMF32P$K_LEN                      00000039     D
DMF32P$L_CSR                      00000035     D
DMF32S                            00000C65 R   D   04
DMF32S$B_BR                       00000034     D
DMF32S$B_COMMON                   00000032     D
DMF32S$B_FLAGS                    00000033     D
DMF32S$K_LEN                      00000039     D
DMF32S$L_CSR                      00000035     D
DMP11                             00000CD9 R   D   04
DMP11$B_BR                        00000034     D
DMP11$B_COMMON                    00000032     D
DMP11$B_FLAGS                     00000033     D
DMP11$K_LEN                       00000039     D
DMP11$L_CSR                       00000035     D
DMR11                             00000DA2 R   D   04
DMR11$B_BR                        00000036     D
DMR11$K_LEN                       00000037     D
DMR11$L_CSR                       00000032     D
DMZ32                             00000DF0 R   D   04
DR11B                             00000FB6 R   D   04
DR11B$B_BR                        00000036     D
DR11B$K_LEN                       00000037     D
DR11B$L_CSR                       00000032     D
DR11C                             00001004 R   D   04
DR11K                             0000104D R   D   04
DR11K$B_BR                        00000032     D
DR11K$K_LEN                       00000033     D
DR11W                             0000109E R   D   04
DR11W$B_BR                        00000036     D
DR11W$K_LEN                       00000037     D
DR11W$L_CSR                       00000032     D
DR750                             000010EC R   D   04
DR750$B_BR                        00000033     D
DR750$B_CONFIG                    00000035     D
DR750$B_SELF                      00000034     D
DR750$B_SLOT                      00000032     D
DR750$B_UUT                       00000036     D
DR750$K_LEN                       00000037     D
DR780                             00001177 R   D   04
DR780$B_BR                        00000033     D
DR780$B_CONFIG                    00000035     D
DR780$B_SELF                      00000034     D
DR780$B_TR                        00000032     D
DR780$B_UUT                       00000036     D
DR780$K_LEN                       00000037     D
DRB32                             00000F4E R   D   04
DRB32$B_BR                        00000033     D
```

```
DRB32$B_NODE_ID                 00000032     D
DRB32$K_LEN                     00000034     D
DS$GA_ALLOCATED                 0000022C RG  D  03
DS$GA_ALLOCATES                 00000014 RG  D  03
DS$GA_PTABLE                    00000430 RG  D  03
DS$GA_PTDESC                    00000000 RG  D  04
DS$GA_SELECTED                  00000028 RG  D  03
DS$GA_SELECTS                   00000000 RG  D  03
DUP11                           0000120A R   D  04
DUP11$B_BR                      00000036     D
DUP11$K_LEN                     00000037     D
DUP11$L_CSR                     00000032     D
DW730                           00001258 R   D  04
DW730$K_LEN                     00000032     D
DW750                           00001287 R   D  04
DW750$K_LEN                     00000032     D
DW780                           000012CB R   D  04
DW780$B_BR                      00000033     D
DW780$B_TR                      00000032     D
DW780$K_LEN                     00000034     D
DWBLA                           0000133F R   D  04
DWBLA$B_BR                      00000033     D
DWBLA$B_NODE_ID                 00000032     D
DWBLA$K_LEN                     00000036     D
DWBLA$W_VECTOR                  00000034     D
DWBUA                           000013AF R   D  04
DWBUA$B_BR                      00000033     D
DWBUA$B_NODE_ID                 00000032     D
DWBUA$K_LEN                     00000036     D
DWBUA$W_VECTOR                  00000034     D
DWMBA                           00001426 R   D  04
DX20                            000014CA R   D  04
DX20$B_DRIVE                    00000032   G D
DX20$K_LEN                      00000033   G D
DZ11                            000014F8 R   D  04
DZ11$B_BR                       00000036     D
DZ11$B_MTYPE                    00000037     D
DZ11$K_LEN                      00000038     D
DZ11$L_CSR                      00000032     D
DZ32                            00001561 R   D  04
DZ32$B_ACTIV                    00000033     D
DZ32$B_BRLVL                    00000032     D
DZ32$B_SPEED                    00000034     D
DZ32$W_FLAGS                    00000035     D
DZ32$_LEN                       00000037     D
HP$A_BIIC                       00000034     D
HP$A_DEPENDENT                  00000032     D
HP$A_DEVICE                     00000018     D
HP$A_DVA                        0000001C     D
HP$A_LINK                       00000020     D
HP$B_BI_NODE                    00000033     D
HP$B_BI_NUM                     00000038     D
HP$B_BR                         00000037     D
HP$B_CI_BR                      00000033     D
HP$B_CI_NODE                    00000034     D
HP$B_CI_TR                      00000032     D
HP$B_CPU_ID                     0000004F   G D
HP$B_DHB32_NODE_ID              00000032   G D
HP$B_DHUV_BR                    00000038     D
HP$B_DMB32_NODE_ID              00000032   G D
HP$B_DMF32A_ACTIV               00000033     D
HP$B_DMF32A_BR                  00000032     D
HP$B_DMF32A_JUMP                00000037     D
HP$B_DMF32A_SPEED               00000034     D
HP$B_DMF32P_BR                  00000034     D
HP$B_DMF32P_COMMON              00000032     D
HP$B_DMF32P_FLAGS               00000033     D
HP$B_DMF32S_BR                  00000034     D
HP$B_DMF32S_COMMON              00000032     D
HP$B_DMF32S_FLAGS               00000033     D
HP$B_DMF32_BR                   00000034     D
HP$B_DMF32_COMMON               00000032     D
HP$B_DMF32_FLAGS                00000033     D
HP$B_DMZ32_BR                   00000032     D
HP$B_DMZ32_MODEM                00000039     D
HP$B_DMZ32_OCTET0               00000033     D
HP$B_DMZ32_OCTET1               00000034     D
HP$B_DMZ32_OCTET2               00000035     D
HP$B_DMZ32_SPEED                00000036     D
HP$B_DR11C_BR                   00000032     D
HP$B_DRIVE                      0000000B     D
HP$B_DWMBA_BI_NODE              00000032     D
HP$B_DX20_DRIVE                 00000032   G D
HP$B_DZ32_ACTIV                 00000033     D
HP$B_DZ32_BRLVL                 00000032     D
HP$B_DZ32_SPEED                 00000034     D
HP$B_FLAGS                      0000000A     D
HP$B_IEU11A_BR                  00000032     D
HP$B_KDB50_BR                   00000036     D
HP$B_KDB50_BURST                00000038     D
HP$B_KDB50_NODE_ID              00000037     D
HP$B_LESI_BR                    00000036     D
HP$B_NBIA_COMMON                00000032     D
HP$B_NBIB_COMMON                00000032     D
HP$B_PBIA_COMMON                00000032     D
HP$B_PBR                        00000037     D
HP$B_RB730_BR                   00000036     D
HP$B_RH750_BR                   00000032     D
HP$B_RH780_BR                   00000033     D
HP$B_RH780_TR                   00000032     D
HP$B_RK611_BR                   00000036     D
HP$B_RL11_BR                    00000036     D
HP$B_RUX50_BR                   00000032     D
HP$B_RX211_BR                   00000036     D
HP$B_TM03_DRIVE                 00000032     D
HP$B_TM78_DRIVE                 00000032     D
HP$B_TS04_BR                    00000036     D
HP$B_TS11_BR                    00000036     D
HP$B_TU80_BR                    00000036     D
HP$B_TU81_BR                    00000036     D
HP$B_UDA50_BR                   00000036     D
HP$B_UDA50_BURST                00000037     D
HP$B_VS100_BR                   00000036     D
HP$B_VS125_BR                   00000036     D
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HP$B_VS300_BR	00000036		D	HP$K_TK70_LEN	00000032		D
HP$B_XMI_NODE	00000033		D	HP$K_TM03_LEN	00000033		D
HP$K_CI_LEN	00000041		D	HP$K_TM78_LEN	00000033		D
HP$K_DHB32_LEN	00000033	G	D	HP$K_TS04_LEN	00000037		D
HP$K_DHUV_LEN	00000039		D	HP$K_TS05_LEN	00000033		D
HP$K_DISK_LEN	00000032		D	HP$K_TS11_LEN	00000037		D
HP$K_DMB32_LEN	00000033	G	D	HP$K_TU45_LEN	00000032		D
HP$K_DMF32A_LEN	00000038		D	HP$K_TU58_LEN	00000032		D
HP$K_DMF32P_LEN	00000039		D	HP$K_TU70_LEN	00000032	G	D
HP$K_DMF32S_LEN	00000039		D	HP$K_TU72_LEN	00000032	G	D
HP$K_DMF32_LEN	00000039		D	HP$K_TU77_LEN	00000032		D
HP$K_DMZ32_LEN	0000003A		D	HP$K_TU78_LEN	00000032		D
HP$K_DR11C_LEN	00000033		D	HP$K_TU80_LEN	00000037		D
HP$K_DWMBA_LEN	00000038		D	HP$K_TU81_LEN	00000037		D
HP$K_DX20_LEN	00000033	G	D	HP$K_UBE_LEN	00000036		D
HP$K_IEU11A_LEN	00000033		D	HP$K_UDA50_LEN	00000038		D
HP$K_KDB50_LEN	00000039		D	HP$K_VS100_LEN	00000037		D
HP$K_LA100_LEN	00000032		D	HP$K_VS125_LEN	00000037		D
HP$K_LA12_LEN	00000032		D	HP$K_VS300_LEN	00000037		D
HP$K_LA210_LEN	00000032		D	HP$K_VT100_LEN	00000032		D
HP$K_LEN	00000037		D	HP$K_VT101_LEN	00000032		D
HP$K_LESI_LEN	00000037		D	HP$K_VT102_LEN	00000032		D
HP$K_MSA_LEN	00000032		D	HP$K_VT125_LEN	00000032		D
HP$K_NBIA_LEN	00000038		D	HP$K_VT131_LEN	00000032		D
HP$K_NBIB_LEN	00000039		D	HP$K_VT132_LEN	00000032		D
HP$K_PBIA_LEN	00000038		D	HP$K_VT220_LEN	00000032		D
HP$K_RA60_LEN	00000032		D	HP$K_VT240_LEN	00000032		D
HP$K_RA70_LEN	00000032		D	HP$K_VT50_LEN	00000032		D
HP$K_RA80_LEN	00000032		D	HP$K_VT52_LEN	00000032		D
HP$K_RA81_LEN	00000032		D	HP$K_VT55_LEN	00000032		D
HP$K_RA82_LEN	00000032		D	HP$K_VT61_LEN	00000032		D
HP$K_RA90_LEN	00000032		D	HP$K_VT71_LEN	00000032		D
HP$K_RB730_LEN	00000037		D	HP$L_CI_FUNC	00000035		D
HP$K_RC25_LEN	00000032		D	HP$L_CI_INDEX	0000003D		D
HP$K_RCF25_LEN	00000032		D	HP$L_CI_MAINT_ID	00000039		D
HP$K_RH750_LEN	00000033		D	HP$L_DHUV_CSR	00000032		D
HP$K_RH780_LEN	00000034		D	HP$L_DMF32P_CSR	00000035		D
HP$K_RK06_LEN	00000032		D	HP$L_DMF32S_CSR	00000035		D
HP$K_RK07_LEN	00000032		D	HP$L_DMF32_CSR	00000035		D
HP$K_RK611_LEN	00000037		D	HP$L_KAA_SLOT	0000004B	G	D
HP$K_RL01_LEN	00000032		D	HP$L_KDB50_IP	00000032		D
HP$K_RL02_LEN	00000032		D	HP$L_LESI_IP	00000032		D
HP$K_RL11_LEN	00000037		D	HP$L_NBIA_CSR	00000033		D
HP$K_RM03_LEN	00000032		D	HP$L_NBIB_CSR	00000034		D
HP$K_RM05_LEN	00000032		D	HP$L_PBIA_CSR	00000033		D
HP$K_RM80_LEN	00000032		D	HP$L_RB730_CSR	00000032		D
HP$K_RP04_LEN	00000032		D	HP$L_RK611_CSR	00000032		D
HP$K_RP05_LEN	00000032		D	HP$L_RL11_CSR	00000032		D
HP$K_RP06_LEN	00000032		D	HP$L_RX211_CSR	00000032		D
HP$K_RP07_LEN	00000032		D	HP$L_TS04_CSR	00000032		D
HP$K_RUX50_LEN	00000033		D	HP$L_TS11_CSR	00000032		D
HP$K_RX02_LEN	00000032		D	HP$L_TU80_CSR	00000032		D
HP$K_RX211_LEN	00000037		D	HP$L_TU81_CSR	00000032		D
HP$K_SBIA_LEN	00000032		D	HP$L_UBE_CSR	00000032		D
HP$K_TAPE_LEN	00000032		D	HP$L_UDA50_UDAIP	00000032		D
HP$K_TE16_LEN	00000032		D	HP$L_VS100_CSR	00000032		D
HP$K_TK50_LEN	00000032		D	HP$L_VS125_CSR	00000032		D

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HP$L_VS300_CSR                    00000032    D
HP$M_ALLOC                      = 00000001    D
HP$Q_DEVICE                       00000000    D
HP$T_DEVICE                       0000000C    D
HP$T_TYPE                         00000026    D
HP$W_DHUV_VEC                     00000036    D
HP$W_DMF32A_FLAGS                 00000035    D
HP$W_DMZ32_LOOP                   00000037    D
HP$W_DZ32_FLAGS                   00000035    D
HP$W_SIZE                         00000008    D
HP$W_VECTOR                       00000024    D
IEU11A                            00001652 R  D  04
IEU11A$B_BR                       00000032    D
IEU11A$K_LEN                      00000033    D
IOC$AL_SYSUCB                     00000000 RG D  02
IOC$GL_ADPLIST                    0000000C RG D  02
IOC$GL_DEVLIST                    00000008 RG D  02
IOC$GL_DPTLIST                    00000010 RG D  02
KA$B_ACC_TYPE                     00000042  G D
KA$B_NODE_ID                      00000046  G D
KA$B_RESERVED                     00000043  G D
KA$B_SID_TYPE                     0000003D  G D
KA$K_LEN                          00000050  G D
KA$L_FLAGS                        00000032  G D
KA$L_MEM_SIZE                     00000047  G D
KA$L_SID                          0000003A  G D
KA$M_CHAR                       = 00000100  G D
KA$M_CRC                        = 00000010  G D
KA$M_D_FLOAT                    = 00000002  G D
KA$M_EDIT                       = 00000080  G D
KA$M_F_FLOAT                    = 00000001  G D
KA$M_G_FLOAT                    = 00000004  G D
KA$M_H_FLOAT                    = 00000008  G D
KA$M_PACKED                     = 00000020  G D
KA$M_PACK_MUL                   = 00000040  G D
KA$M_SB_ERR                     = 02000000  G D
KA$M_TODR                       = 00010000  G D
KA$M_WCS_LD                     = 01000000  G D
KA$V_CHAR                       = 00000008  G D
KA$V_CRC                        = 00000004  G D
KA$V_D_FLOAT                    = 00000001  G D
KA$V_EDIT                       = 00000007  G D
KA$V_F_FLOAT                    = 00000000  G D
KA$V_G_FLOAT                    = 00000002  G D
KA$V_H_FLOAT                    = 00000003  G D
KA$V_PACKED                     = 00000005  G D
KA$V_PACK_MUL                   = 00000006  G D
KA$V_SB_ERR                     = 00000019  G D
KA$V_TODR                       = 00000010  G D
KA$V_WCS_LD                     = 00000018  G D
KA$W_LATENCY                      0000003E  G D
KA$W_MEM_SIZE                     00000044  G D
KA$W_PROGRESS                     00000040  G D
KA$W_RESERVED                     00000038  G D
KA$W_WCS                          00000036  G D
KA62A                             0000169D R  D  04
KA730                             0000170C R  D  04
KA750                             000017E7 R  D  04
KA780                             000018B3 R  D  04
KA785                             0000195C R  D  04
KA800                             00001A05 R  D  04
KA800$B_FLOAT                     00000032    D
KA800$B_ID                        00000034    D
KA800$B_MEM                       00000033    D
KA800$K_LEN                       00000035    D
KA820                             00001A77 R  D  04
KA850                             00001BAA R  D  04
KA86                              00001B02 R  D  04
KA880                             00001BE3 R  D  04
KA884                             00001C20 R  D  04
KA9CC                             00001C75 R  D  04
KDB50                             00001CE4 R  D  04
KDB50$B_BR                        00000036    D
KDB50$B_BURST                     00000038    D
KDB50$B_NODE_ID                   00000037    D
KDB50$K_LEN                       00000039    D
KDB50$L_IP                        00000032    D
KFBTA                             00001D77 R  D  04
KFBTA$B_ID                        00000032    D
KFBTA$K_LEN                       00000033    D
KMC11                             00001DDD R  D  04
KMC11$B_BR                        00000036    D
KMC11$K_LEN                       00000037    D
KMC11$L_CSR                       00000032    D
KW11K                             00001E2B R  D  04
KW11K$B_BR                        00000032    D
KW11K$K_LEN                       00000033    D
LA100                             00001EE4 R  D  04
LA100$K_LEN                       00000032    D
LA12                              00001E7C R  D  04
LA12$K_LEN                        00000032    D
LA120                             00001EFF R  D  04
LA120$K_LEN                       00000032    D
LA180                             00001F1A R  D  04
LA180$K_LEN                       00000032    D
LA210                             00001F35 R  D  04
LA210$K_LEN                       00000032    D
LA34                              00001E96 R  D  04
LA34$K_LEN                        00000032    D
LA36                              00001EB0 R  D  04
LA36$K_LEN                        00000032    D
LA38                              00001ECA R  D  04
LA38$K_LEN                        00000032    D
LANCE                             00001F50 R  D  04
LANCE$K_LEN                       00000032    D
LESI                              00001F61 R  D  04
LESI$B_BR                         00000036    D
LESI$K_LEN                        00000037    D
LESI$L_IP                         00000032    D
LG01                              00001FAD R  D  04
LG01$K_LEN                        00000032    D
LG02                              00001FC7 R  D  04
LG02$K_LEN                        00000032    D
LG03                              00001FE1 R  D  04
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LG03$K_LEN                      00000032    D
LN01                            00001FFB R  D  04
LN01$K_LEN                      00000032    D
LN03                            00002015 R  D  04
LN03$K_LEN                      00000032    D
LP04                            0000202A R  D  04
LP04$K_LEN                      00000032    D
LP05                            00002044 R  D  04
LP05$K_LEN                      00000032    D
LP06                            0000205E R  D  04
LP06$K_LEN                      00000032    D
LP07                            00002078 R  D  04
LP07$K_LEN                      00000032    D
LP11                            00002092 R  D  04
LP11$B_BR                       00000036    D
LP11$K_LEN                      00000037    D
LP11$L_CSR                      00000032    D
LP14                            000020DF R  D  04
LP14$K_LEN                      00000032    D
LP25                            000020F9 R  D  04
LP25$K_LEN                      00000032    D
LP26                            00002113 R  D  04
LP26$K_LEN                      00000032    D
LP27                            0000212D R  D  04
LP27$K_LEN                      00000032    D
LPA11K                          00002147 R  D  04
LPA11K$B_BR                     00000036    D
LPA11K$K_LEN                    00000037    D
LPA11K$L_CSR                    00000032    D
LUA11                           000021A0 R  D  04
LUA11$B_BR                      00000032    D
LUA11$K_LEN                     00000037    D
LUA11$L_CSR                     00000033    D
MA780                           000021EE R  D  04
MA780$B_BR                      00000033    D
MA780$B_MPM                     00000034    D
MA780$B_PORT                    00000035    D
MA780$B_TR                      00000032    D
MA780$K_LEN                     00000036    D
MAXPT                         = 00000080    D
MBE                             00002269 R  D  04
MBE$K_LEN                       00000032    D
ML11                            0000227D R  D  04
ML11$B_ARRAY                    00000032    D
ML11$B_CHIP                     00000033    D
ML11$K_LEN                      00000034    D
MS750                           000022DF R  D  04
MS750$K_LEN                     00000032    D
MS780                           000022F0 R  D  04
MS780$B_ARRAYS                  00000033    D
MS780$B_TR                      00000032    D
MS780$K_LEN                     00000034    D
MSAAA                           00002340 R  D  04
NBIA                            00002351 R  D  04
NBIB                            000023C1 R  D  04
NI                              00002424 R  D  04
NI$B_LOOPBACK                   00000032  G D
NI$K_LEN                        00000033  G D
PBIA                            0000245A R  D  04
PCL11                           000024DA R  D  04
PCL11$B_BR                      00000036    D
PCL11$K_LEN                     00000037    D
PCL11$L_CSR                     00000032    D
PD$_ADD                       = 0000008A    D
PD$_CASE                      = 0000008C    D
PD$_COMPLEMENT                = 00000089    D
PD$_DECIMAL                   = 00000082    D
PD$_END                       = 00000081    D
PD$_EPB                       = 0000008E    D
PD$_FETCH                     = 00000087    D
PD$_HEXADECIMAL               = 00000084    D
PD$_LITERAL                   = 00000086    D
PD$_LOGICAL                   = 0000008B    D
PD$_NAME                      = 0000008D    D
PD$_OCTAL                     = 00000083    D
PD$_START                     = 00000080    D
PD$_STORE                     = 00000088    D
PD$_STRING                    = 00000085    D
PTABLE_DESCRIPTORS              000002BC R  D  04
PTD$M_CONTROLLER              = 00000002    D
PTD$M_DEVICE                  = 00000003    D
PTD$M_ENDDEVICE               = 0000001B    D
PTD$M_INHERIT                 = 00000018    D
PTD$M_INHERIT_CON             = 00000010    D
PTD$M_INHERIT_PRE             = 00000008    D
PTD$M_NAME                    = 00000004    D
PTD$M_UNIT                    = 00000001    D
PX780                           00002523 R  D  04
PX780$B_BR                      00000033    D
PX780$B_NODE                    00000034    D
PX780$B_TR                      00000032    D
PX780$K_LEN                     00000035    D
R80                             0000258C R  D  04
R80$K_LEN                       00000032    D
RA60                            000025A5 R  D  04
RA60$K_LEN                      00000032    D
RA70                            000025BF R  D  04
RA70$K_LEN                      00000032    D
RA80                            000025D9 R  D  04
RA80$K_LEN                      00000032    D
RA81                            000025F3 R  D  04
RA81$K_LEN                      00000032    D
RA82                            0000260D R  D  04
RA82$K_LEN                      00000032    D
RA90                            00002627 R  D  04
RA90$K_LEN                      00000032    D
RB730                           00002644 R  D  04
RB730$B_BR                      00000036    D
RB730$K_LEN                     00000037    D
RB730$L_CSR                     00000032    D
RC25                            0000268E R  D  04
RC25$K_LEN                      00000032    D
RCF25                           00002673 R  D  04
RCF25$K_LEN                     00000032    D
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RD52                    000026A8 R  D  04      RX211$B_BR              00000036    D
RD52$K_LEN              00000032    D          RX211$K_LEN             00000037    D
RD53                    000026C2 R  D  04      RX211$L_CSR             00000032    D
RD53$K_LEN              00000032    D          RX31                    00002ACC R  D  04
RD54                    000026DC R  D  04      RX31$K_LEN              00000032    D
RD54$K_LEN              00000032    D          RX32                    00002ADC R  D  04
RH750                   000026F6 R  D  04      RX32$K_LEN              00000032    D
RH750$B_BR              00000032    D          RX50                    00002AEC R  D  04
RH750$K_LEN             00000033    D          RX50$K_LEN              00000032    D
RH780                   0000274F R  D  04      SBIA                    00002B60 R  D  04
RH780$B_BR              00000033    D          SBIA$K_LEN              00000032    D
RH780$B_TR              00000032    D          SIZ...                =  00000001    D
RH780$K_LEN             00000034    D          SLU                     00002BA2 R  D  04
RK06                    00002835 R  D  04      SLU$B_ACTIV             00000033  G D
RK06$K_LEN              00000032    D          SLU$B_EXT               00000032  G D
RK07                    0000284F R  D  04      SLU$B_SPEED             00000034  G D
RK07$K_LEN              00000032    D          SLU$K_LEN               00000035  G D
RK611                   00002869 R  D  04      TAPE                    00002C17 R  D  04
RK611$B_BR              00000036    D          TAPE$K_LEN              00000032    D
RK611$K_LEN             00000037    D          TBK50                   00002C27 R  D  04
RK611$L_CSR             00000032    D          TBK50$B_NODE_ID         00000032    D
RL01                    000027B4 R  D  04      TBK50$K_LEN             00000033    D
RL01$K_LEN              00000032    D          TE16                    00002C92 R  D  04
RL02                    000027CE R  D  04      TE16$K_LEN              00000032    D
RL02$K_LEN              00000032    D          TK50                    00002CAC R  D  04
RL11                    000027E8 R  D  04      TK70                    00002CC6 R  D  04
RL11$B_BR               00000036    D          TM03                    00002CE0 R  D  04
RL11$K_LEN              00000037    D          TM03$B_DRIVE            00000032    D
RL11$L_CSR              00000032    D          TM03$K_LEN              00000033    D
RM03                    000028B7 R  D  04      TM78                    00002D0E R  D  04
RM03$K_LEN              00000032    D          TM78$B_DRIVE            00000032    D
RM05                    000028DB R  D  04      TM78$K_LEN              00000033    D
RM05$K_LEN              00000032    D          TS04                    00002D3C R  D  04
RM80                    000028FF R  D  04      TS04$B_BR               00000036    D
RM80$K_LEN              00000032    D          TS04$K_LEN              00000037    D
RP04                    00002923 R  D  04      TS04$L_CSR              00000032    D
RP04$K_LEN              00000032    D          TS05                    00002D93 R  D  04
RP05                    00002947 R  D  04      TS05$B_BR               00000032    D
RP05$K_LEN              00000032    D          TS05$K_LEN              00000033    D
RP06                    0000296B R  D  04      TS11                    00002DFD R  D  04
RP06$K_LEN              00000032    D          TS11$B_BR               00000036    D
RP07                    0000298F R  D  04      TS11$K_LEN              00000037    D
RP07$K_LEN              00000032    D          TS11$L_CSR              00000032    D
RRD50                   000029B3 R  D  04      TU45                    00002E54 R  D  04
RRD50$B_BR              00000036  G D          TU45$K_LEN              00000032    D
RRD50$K_LEN             00000037  G D          TU58                    00002E6E R  D  04
RRD50$L_CSR             00000032  G D          TU58$K_LEN              00000032    D
RUX50                   00002A6A R  D  04      TU70                    00002E88 R  D  04
RV20                    00002A0F R  D  04      TU70$K_LEN              00000032  G D
RV20$B_BR               00000036    D          TU72                    00002EA2 R  D  04
RV20$K_LEN              00000037    D          TU72$K_LEN              00000032  G D
RV20$L_CSR              00000032    D          TU77                    00002EBC R  D  04
RX02                    00002AB2 R  D  04      TU77$K_LEN              00000032    D
RX02$K_LEN              00000032    D          TU78                    00002ED6 R  D  04
RX180                   00002B01 R  D  04      TU78$K_LEN              00000032    D
RX180$K_LEN             00000032    D          TU80                    00002EF0 R  D  04
RX211                   00002B12 R  D  04      TU80$B_BR               00000036    D
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TU80$K_LEN                      00000037    D
TU81                            00002F5F R  D  04
TU81$B_BR                       00000036    D
TU81$K_LEN                      00000037    D
TU81$L_CSR                      00000032    D
UBE                             00002FB6 R  D  04
UBE$K_LEN                       00000036    D
UBE$L_CSR                       00000032    D
UDA50                           00002FF1 R  D  04
UDA50$B_BR                      00000036    D
UDA50$B_BURST                   00000037    D
UDA50$K_LEN                     00000038    D
UDA50$L_UDAIP                   00000032    D
UNA11                           0000305A R  D  04
UNA11$B_BR                      00000032    D
UNA11$K_LEN                     00000037    D
UNA11$L_CSR                     00000033    D
VS100                           000030A8 R  D  04
VS100$B_BR                      00000036    D
VS100$K_LEN                     00000037    D
VS100$L_CSR                     00000032    D
VS125                           00003100 R  D  04
VS125$B_BR                      00000036    D
VS125$K_LEN                     00000037    D
VS125$L_CSR                     00000032    D
VS300                           00003158 R  D  04
VS300$B_BR                      00000036    D
VS300$K_LEN                     00000037    D
VS300$L_CSR                     00000032    D
VT100                           00003232 R  D  04
VT100$K_LEN                     00000032    D
VT101                           0000324D R  D  04
VT101$K_LEN                     00000032    D
VT102                           00003268 R  D  04
VT102$K_LEN                     00000032    D
VT125                           00003283 R  D  04
VT125$K_LEN                     00000032    D
VT131                           0000329E R  D  04
VT131$K_LEN                     00000032    D
VT132                           000032B9 R  D  04
VT132$K_LEN                     00000032    D
VT220                           000032D4 R  D  04
VT220$K_LEN                     00000032    D
VT240                           000032EF R  D  04
VT240$K_LEN                     00000032    D
VT50                            000031B0 R  D  04
VT50$K_LEN                      00000032    D
VT52                            000031CA R  D  04
VT52$K_LEN                      00000032    D
VT55                            000031E4 R  D  04
VT55$K_LEN                      00000032    D
VT61                            000031FE R  D  04
VT61$K_LEN                      00000032    D
VT71                            00003218 R  D  04
VT71$K_LEN                      00000032    D
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Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	00000050 (80.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
SEP	00000018 (24.)	02 (2.)	NOPIC USR CON REL LCL SHR EXE RD WRT NOVEC LONG
WORK	00000634 (1588.)	03 (3.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC LONG
DATA	0000330A (13066.)	04 (4.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC BYTE

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$_$	=00000001	810 (6)	674 (6) 675 (6) 678 (6) 681 (6)
			682 (6) 683 (6) 684 (6) 689 (6)
			698 (6) 709 (6) 710 (6) 728 (6)
			729 (6) 764 (6) 767 (6) 810 (6)
AA11K	000002BC-R	672 (6)	469 (5)
AA11K$B_BR	00000032		672 (6)
AA11K$K_LEN	00000033		672 (6)
AD11K	0000030D-R	673 (6)	470 (5)
AD11K$B_BR	00000032		673 (6)
AD11K$K_LEN	00000033		673 (6)
BIT...	=00000005	845 (6)	672 (6) 673 (6) 674 (6) 675 (6)
			676 (6) 677 (6) 678 (6) 679 (6)
			680 (6) 681 (6) 682 (6) 683 (6)
			684 (6) 685 (6) 686 (6) 687 (6)
			688 (6) 689 (6) 690 (6) 691 (6)
			692 (6) 693 (6) 694 (6) 695 (6)
			696 (6) 697 (6) 698 (6) 699 (6)
			700 (6) 701 (6) 702 (6) 703 (6)
			704 (6) 705 (6) 706 (6) 707 (6)
			708 (6) 709 (6) 710 (6) 711 (6)
			712 (6) 713 (6) 714 (6) 715 (6)
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			732 (6) 733 (6) 734 (6) 735 (6)
			736 (6) 737 (6) 738 (6) 739 (6)
			740 (6) 741 (6) 742 (6) 743 (6)
			744 (6) 745 (6) 746 (6) 747 (6)
			748 (6) 749 (6) 750 (6) 751 (6)
			752 (6) 753 (6) 754 (6) 755 (6)
			756 (6) 757 (6) 758 (6) 759 (6)
			760 (6) 761 (6) 762 (6) 763 (6)
			764 (6) 765 (6) 766 (6) 767 (6)
			768 (6) 769 (6) 770 (6) 771 (6)
			772 (6) 773 (6) 774 (6) 775 (6)
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			792 (6) 793 (6) 794 (6) 795 (6)
			796 (6) 797 (6) 798 (6) 799 (6)
			800 (6) 801 (6) 802 (6) 803 (6)
			804 (6) 805 (6) 806 (6) 807 (6)
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			812 (6) 813 (6) 814 (6) 815 (6)
			816 (6) 817 (6) 818 (6) 819 (6)
			820 (6) 821 (6) 822 (6) 823 (6)
			824 (6) 825 (6) 826 (6) 827 (6)
			828 (6) 829 (6) 830 (6) 831 (6)

				832	(6)	833	(6)	834	(6)	835	(6)	
				836	(6)	837	(6)	838	(6)	839	(6)	
				840	(6)	841	(6)	842	(6)	843	(6)	
				844	(6)	845	(6)					
CI$B_BI_ID	00000032			674	(6)	675	(6)					
CI$B_BR	00000033			674	(6)	675	(6)	676	(6)	677	(6)	
CI$B_NODE	00000034			674	(6)	675	(6)	676	(6)	677	(6)	
				678	(6)							
CI$B_TR	00000032			676	(6)	677	(6)					
CI$K_LEN	00000041			674	(6)	675	(6)	676	(6)	677	(6)	
				678	(6)							
CI$L_FUNC	00000035			674	(6)	675	(6)	676	(6)	677	(6)	
				678	(6)							
CI$L_INDEX	0000003D			678	(6)							
CI$L_MAINT_ID	00000039			674	(6)	675	(6)	676	(6)	677	(6)	
				678	(6)							
CI750	00000496-R	676	(6)	474	(5)							
CI780	00000515-R	677	(6)	473	(5)							
CIBCA	000003FA-R	675	(6)	471	(5)							
CIBCI	0000035E-R	674	(6)	472	(5)							
CI_NODE	0000059C-R	678	(6)	475	(5)							
CONSOLE	000006B8-R	679	(6)	476	(5)							
CONSOLE$K_LEN	00000032			679	(6)							
CR11	000006C6-R	680	(6)	477	(5)							
CR11$B_BR	00000036			680	(6)							
CR11$K_LEN	00000037			680	(6)							
CR11$L_CSR	00000032			680	(6)							
DEBNA	0000071D-R	681	(6)	478	(5)							
DEBNA$B_NODE_ID	00000032			681	(6)							
DEBNA$K_LEN	00000033			681	(6)							
DEBNK	00000788-R	682	(6)	479	(5)							
DEBNK$B_NODE_ID	00000032			682	(6)							
DEBNK$K_LEN	00000033			682	(6)							
DEBNT	000007F3-R	683	(6)	480	(5)							
DEBNT$B_NODE_ID	00000032			683	(6)							
DEBNT$K_LEN	00000033			683	(6)							
DHB32	0000085E-R	684	(6)	481	(5)							
DHU11	000008C5-R	685	(6)	482	(5)							
DHV11	00000913-R	686	(6)	483	(5)							
DISK	00000961-R	687	(6)	484	(5)							
DISK$K_LEN	00000032			687	(6)							
DL11	00000974-R	688	(6)	485	(5)							
DL11$B_BR	00000036			688	(6)							
DL11$K_LEN	00000037			688	(6)							
DL11$L_CSR	00000032			688	(6)							
DMB32	000009C1-R	689	(6)	486	(5)							
DMC11	00000A28-R	690	(6)	487	(5)							
DMC11$B_BR	00000036			690	(6)							
DMC11$K_LEN	00000037			690	(6)							
DMC11$L_CSR	00000032			690	(6)							
DMF32	00000A76-R	691	(6)	488	(5)							
DMF32$B_BR	00000034			691	(6)							
DMF32$B_COMMON	00000032			691	(6)							
DMF32$K_LEN	00000039			691	(6)	694	(6)					
DMF32$L_CSR	00000035			691	(6)							
DMF32A	00000AC9-R	692	(6)	489	(5)							
DMF32A$B_ACTIV	00000033			692	(6)							

DMF32A$B_BR	00000032			692	(6)
DMF32A$B_JUMP	00000037			692	(6)
DMF32A$B_SPEED	00000034			692	(6)
DMF32A$K_LEN	00000038			692	(6)
DMF32A$W_FLAGS	00000035			692	(6)
DMF32P	00000BEB-R	693	(6)	490	(5)
DMF32P$B_BR	00000034			693	(6)
DMF32P$B_COMMON	00000032			693	(6)
DMF32P$B_FLAGS	00000033			693	(6)
DMF32P$K_LEN	00000039			693	(6)
DMF32P$L_CSR	00000035			693	(6)
DMF32S	00000C65-R	694	(6)	491	(5)
DMF32S$B_BR	00000034			694	(6)
DMF32S$B_FLAGS	00000033			694	(6)
DMF32S$L_CSR	00000035			694	(6)
DMP11	00000CD9-R	695	(6)	492	(5)
DMP11$B_BR	00000034			695	(6)
DMP11$B_COMMON	00000032			695	(6)
DMP11$B_FLAGS	00000033			695	(6)
DMP11$K_LEN	00000039			695	(6)
DMP11$L_CSR	00000035			695	(6)
DMR11	00000DA2-R	696	(6)	493	(5)
DMR11$B_BR	00000036			696	(6)
DMR11$K_LEN	00000037			696	(6)
DMR11$L_CSR	00000032			696	(6)
DMZ32	00000DF0-R	697	(6)	494	(5)
DR11B	00000FB6-R	699	(6)	496	(5)
DR11B$B_BR	00000036			699	(6)
DR11B$K_LEN	00000037			699	(6)
DR11B$L_CSR	00000032			699	(6)
DR11C	00001004-R	700	(6)	497	(5)
DR11K	0000104D-R	701	(6)	498	(5)
DR11K$B_BR	00000032			701	(6)
DR11K$K_LEN	00000033			701	(6)
DR11W	0000109E-R	702	(6)	499	(5)
DR11W$B_BR	00000036			702	(6)
DR11W$K_LEN	00000037			702	(6)
DR11W$L_CSR	00000032			702	(6)
DR750	000010EC-R	703	(6)	500	(5)
DR750$B_BR	00000033			703	(6)
DR750$B_CONFIG	00000035			703	(6)
DR750$B_SELF	00000034			703	(6)
DR750$B_SLOT	00000032			703	(6)
DR750$B_UUT	00000036			703	(6)
DR750$K_LEN	00000037			703	(6)
DR780	00001177-R	704	(6)	501	(5)
DR780$B_BR	00000033			704	(6)
DR780$B_CONFIG	00000035			704	(6)
DR780$B_SELF	00000034			704	(6)
DR780$B_TR	00000032			704	(6)
DR780$B_UUT	00000036			704	(6)
DR780$K_LEN	00000037			704	(6)
DRB32	00000F4E-R	698	(6)	495	(5)
DRB32$B_BR	00000033			698	(6)
DRB32$B_NODE_ID	00000032			698	(6)
DRB32$K_LEN	00000034			698	(6)
DS$GA_ALLOCATED	0000022C-R	443	(4)		

DS$GA_ALLOCATES 00000014-R 431 (4)
DS$GA_PTABLE 00000430-R 455 (4)
DS$GA_PTDESC 00000000-R 466 (5)
DS$GA_SELECTED 00000028-R 440 (4)
DS$GA_SELECTS 00000000-R 424 (4)
DUP11 0000120A-R 705 (6) 502 (5)
DUP11$B_BR 00000036 705 (6)
DUP11$K_LEN 00000037 705 (6)
DUP11$L_CSR 00000032 705 (6)
DW730 00001258-R 706 (6) 503 (5)
DW730$K_LEN 00000032 706 (6)
DW750 00001287-R 707 (6) 504 (5)
DW750$K_LEN 00000032 707 (6)
DW780 000012CB-R 708 (6) 505 (5)
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DW780$B_TR 00000032 708 (6)
DW780$K_LEN 00000034 708 (6)
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DWBUA$B_NODE_ID 00000032 710 (6)
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DX20 000014CA-R 712 (6) 509 (5)
DX20$B_DRIVE 00000032 712 (6)
DX20$K_LEN 00000033 712 (6)
DZ11 000014F8-R 713 (6) 510 (5)
DZ11$B_BR 00000036 713 (6)
DZ11$B_MTYPE 00000037 713 (6)
DZ11$K_LEN 00000038 713 (6)
DZ11$L_CSR 00000032 713 (6)
DZ32 00001561-R 714 (6) 511 (5)
DZ32$B_ACTIV 00000033 714 (6)
DZ32$B_BRLVL 00000032 714 (6)
DZ32$B_SPEED 00000034 714 (6)
DZ32$W_FLAGS 00000035 714 (6)
DZ32$_LEN 00000037 714 (6)
HP$A_BIIC 00000034 711 (6)
HP$A_DEVICE 00000018 672 (6) 673 (6) 674 (6) 675 (6)
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751 (6) 756 (6) 757 (6) 758 (6)
759 (6) 760 (6) 762 (6) 764 (6)
765 (6) 767 (6) 768 (6) 769 (6)

		777	(6)	783	(6)	784	(6)	787	(6)		
		790	(6)	791	(6)	792	(6)	793	(6)		
		794	(6)	795	(6)	796	(6)	797	(6)		
		798	(6)	799	(6)	800	(6)	806	(6)		
		807	(6)	810	(6)	814	(6)	815	(6)		
		816	(6)	817	(6)	818	(6)	825	(6)		
		826	(6)	827	(6)	828	(6)	829	(6)		
		830	(6)	831	(6)	832	(6)				
HP$A_DVA	0000001C	674	(6)	675	(6)	676	(6)	677	(6)		
		678	(6)	681	(6)	682	(6)	683	(6)		
		684	(6)	689	(6)	706	(6)	707	(6)		
		708	(6)	709	(6)	710	(6)	711	(6)		
		728	(6)	729	(6)	764	(6)	765	(6)		
		767	(6)	783	(6)	784	(6)	807	(6)		
		810	(6)								
HP$B_BI_NODE	00000033	765	(6)								
HP$B_BI_NUM	00000038	765	(6)								
HP$B_CPU_ID	0000004F	726	(6)								
HP$B_DHB32_NODE_ID	00000032	684	(6)								
HP$B_DHUV_BR	00000038	685	(6)	686	(6)						
HP$B_DMB32_NODE_ID	00000032	689	(6)								
HP$B_DMZ32_BR	00000032	697	(6)								
HP$B_DMZ32_MODEM	00000039	697	(6)								
HP$B_DMZ32_OCTET0	00000033	697	(6)								
HP$B_DMZ32_OCTET1	00000034	697	(6)								
HP$B_DMZ32_OCTET2	00000035	697	(6)								
HP$B_DMZ32_SPEED	00000036	697	(6)								
HP$B_DR11C_BR	00000032	700	(6)								
HP$B_DRIVE	0000000B	678	(6)	681	(6)	682	(6)	683	(6)		
		707	(6)	708	(6)	712	(6)	729	(6)		
		759	(6)	760	(6)	783	(6)	791	(6)		
		792	(6)	793	(6)	794	(6)	795	(6)		
		796	(6)	797	(6)	807	(6)	810	(6)		
		814	(6)	815	(6)						
HP$B_DWMBA_BI_NODE	00000032	711	(6)								
HP$B_FLAGS	0000000A	680	(6)	732	(6)	733	(6)	734	(6)		
		735	(6)	736	(6)	737	(6)	738	(6)		
		739	(6)	742	(6)	743	(6)	744	(6)		
		745	(6)	746	(6)	747	(6)	748	(6)		
		749	(6)	750	(6)	752	(6)	753	(6)		
		754	(6)	755	(6)	756	(6)	760	(6)		
		770	(6)	771	(6)	772	(6)	773	(6)		
		774	(6)	775	(6)	776	(6)	778	(6)		
		779	(6)	780	(6)	781	(6)	782	(6)		
		785	(6)	786	(6)	788	(6)	789	(6)		
		791	(6)	792	(6)	793	(6)	794	(6)		
		795	(6)	796	(6)	797	(6)	798	(6)		
		799	(6)	801	(6)	804	(6)	811	(6)		
		812	(6)	813	(6)	816	(6)	817	(6)		
		818	(6)	819	(6)	820	(6)	821	(6)		
		822	(6)	823	(6)	824	(6)	825	(6)		
		826	(6)	830	(6)	831	(6)	832	(6)		
		833	(6)	834	(6)	835	(6)	836	(6)		
		837	(6)	838	(6)	839	(6)	840	(6)		
		841	(6)	842	(6)	843	(6)	844	(6)		
		845	(6)								
HP$B_KDB50_BURST	00000038	728	(6)								

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HP$B_LESI_BR                    00000036  741  (6)
HP$B_RUX50_BR                   00000032  800  (6)
HP$B_TU80_BR                    00000036  825  (6)
HP$B_UDA50_BR                   00000036  828  (6)
HP$B_UDA50_BURST                00000037  828  (6)
HP$B_XMI_NODE                   00000033  711  (6)
HP$K_DHB32_LEN                  00000033  684  (6)
HP$K_DHUV_LEN                   00000039  685  (6)  686  (6)
HP$K_DMB32_LEN                  00000033  689  (6)
HP$K_DMZ32_LEN                  0000003A  697  (6)
HP$K_DR11C_LEN                  00000033  700  (6)
HP$K_DWMBA_LEN                  00000038  711  (6)
HP$K_KDB50_LEN                  00000039  728  (6)
HP$K_LEN                        00000037  724  (6)  725  (6)  726  (6)
HP$K_LESI_LEN                   00000037  741  (6)
HP$K_MSA_LEN                    00000032  763  (6)
HP$K_NBIA_LEN                   00000038  764  (6)
HP$K_NBIB_LEN                   00000039  765  (6)
HP$K_PBIA_LEN                   00000038  767  (6)
HP$K_RUX50_LEN                  00000033  800  (6)
HP$K_TK50_LEN                   00000032  812  (6)
HP$K_TK70_LEN                   00000032  813  (6)
HP$K_UDA50_LEN                  00000038  828  (6)
HP$L_DHUV_CSR                   00000032  685  (6)  686  (6)
HP$L_KAA_SLOT                   0000004B  724  (6)  725  (6)  726  (6)
HP$L_KDB50_IP                   00000032  728  (6)
HP$L_LESI_IP                    00000032  741  (6)
HP$L_TU80_CSR                   00000032  825  (6)
HP$L_UDA50_UDAIP                00000032  828  (6)
HP$M_ALLOC                     =00000001  680  (6)  732  (6)  733  (6)  734  (6)
                                          735  (6)  736  (6)  737  (6)  738  (6)
                                          739  (6)  742  (6)  743  (6)  744  (6)
                                          745  (6)  746  (6)  747  (6)  748  (6)
                                          749  (6)  750  (6)  752  (6)  753  (6)
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                                          770  (6)  771  (6)  772  (6)  773  (6)
                                          774  (6)  775  (6)  776  (6)  778  (6)
                                          779  (6)  780  (6)  781  (6)  782  (6)
                                          785  (6)  786  (6)  788  (6)  789  (6)
                                          791  (6)  792  (6)  793  (6)  794  (6)
                                          795  (6)  796  (6)  797  (6)  798  (6)
                                          799  (6)  801  (6)  804  (6)  811  (6)
                                          812  (6)  813  (6)  816  (6)  817  (6)
                                          818  (6)  819  (6)  820  (6)  821  (6)
                                          822  (6)  823  (6)  824  (6)  825  (6)
                                          826  (6)  830  (6)  831  (6)  832  (6)
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                                          841  (6)  842  (6)  843  (6)  844  (6)
                                          845  (6)
HP$W_DHUV_VEC                   00000036  685  (6)  686  (6)
HP$W_DMZ32_LOOP                 00000037  697  (6)
HP$W_VECTOR                     00000024  672  (6)  673  (6)  674  (6)  675  (6)
                                          676  (6)  677  (6)  680  (6)  681  (6)
                                          682  (6)  683  (6)  684  (6)  688  (6)
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                                          693  (6)  694  (6)  695  (6)  696  (6)
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				701 (6) 702 (6) 703 (6) 704 (6)
				705 (6) 706 (6) 707 (6) 708 (6)
				709 (6) 710 (6) 711 (6) 713 (6)
				714 (6) 715 (6) 728 (6) 730 (6)
				731 (6) 741 (6) 751 (6) 756 (6)
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				768 (6) 769 (6) 777 (6) 783 (6)
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				799 (6) 800 (6) 806 (6) 807 (6)
				810 (6) 816 (6) 817 (6) 818 (6)
				825 (6) 826 (6) 827 (6) 828 (6)
				829 (6) 830 (6) 831 (6) 832 (6)
IEU11A	00001652-R	715	(6)	512 (5)
IEU11A$B_BR	00000032			715 (6)
IEU11A$K_LEN	00000033			715 (6)
IOC$AL_SYSUCB	00000000-R	407	(3)	
IOC$GL_ADPLIST	0000000C-R	413	(3)	
IOC$GL_DEVLIST	00000008-R	411	(3)	
IOC$GL_DPTLIST	00000010-R	415	(3)	416 (3)
KA$B_ACC_TYPE	00000042			717 (6) 718 (6) 719 (6) 720 (6)
				722 (6) 723 (6)
KA$B_NODE_ID	00000046			716 (6) 722 (6) 727 (6)
KA$K_LEN	00000050			716 (6) 717 (6) 718 (6) 719 (6)
				720 (6) 722 (6) 723 (6) 727 (6)
KA$L_FLAGS	00000032			716 (6) 717 (6) 718 (6) 719 (6)
				720 (6) 722 (6) 723 (6) 724 (6)
				725 (6) 726 (6) 727 (6)
KA$L_MEM_SIZE	00000047			722 (6)
KA$M_CHAR	=00000100			717 (6) 718 (6) 719 (6) 720 (6)
				722 (6) 723 (6) 724 (6) 725 (6)
				726 (6)
KA$M_CRC	=00000010			717 (6) 718 (6) 719 (6) 720 (6)
				722 (6) 723 (6) 724 (6) 725 (6)
				726 (6)
KA$M_D_FLOAT	=00000002			717 (6) 718 (6) 719 (6) 720 (6)
				722 (6) 723 (6) 724 (6) 725 (6)
				726 (6)
KA$M_EDIT	=00000080			717 (6) 718 (6) 719 (6) 720 (6)
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				726 (6)
KA$M_F_FLOAT	=00000001			717 (6) 718 (6) 719 (6) 720 (6)
				722 (6) 723 (6) 724 (6) 725 (6)
				726 (6)
KA$M_G_FLOAT	=00000004			717 (6) 722 (6) 724 (6) 725 (6)
				726 (6)
KA$M_H_FLOAT	=00000008			717 (6) 722 (6) 724 (6) 725 (6)
				726 (6)
KA$M_PACKED	=00000020			717 (6) 718 (6) 719 (6) 720 (6)
				722 (6) 723 (6) 724 (6) 725 (6)
				726 (6)
KA$M_PACK_MUL	=00000040			717 (6) 718 (6) 719 (6) 720 (6)
				722 (6) 723 (6) 724 (6) 725 (6)
				726 (6)
KA$M_TODR	=00010000			716 (6) 719 (6) 720 (6) 722 (6)
KA$V_D_FLOAT	=00000001			723 (6) 727 (6)
				716 (6) 727 (6)

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KA$V_F_FLOAT                    =00000000                       716     (6)     727     (6)
KA$V_G_FLOAT                    =00000002                       716     (6)     718     (6)     719     (6)     720     (6)
                                                                723     (6)     727     (6)
KA$V_H_FLOAT                    =00000003                       718     (6)     719     (6)     720     (6)     723     (6)
KA$V_SB_ERR                     =00000019                       717     (6)
KA$V_TODR                       =00000010                       717     (6)     718     (6)
KA$V_WCS_LD                     =00000018                       717     (6)
KA$W_LATENCY                     0000003E                       716     (6)     717     (6)     718     (6)     719     (6)
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                                                                725     (6)     726     (6)     727     (6)
KA$W_MEM_SIZE                    00000044                       717     (6)
KA$W_PROGRESS                    00000040                       716     (6)     717     (6)     718     (6)     719     (6)
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                                                                725     (6)     726     (6)     727     (6)
KA$W_WCS                         00000036                       717     (6)     718     (6)     719     (6)     720     (6)
                                                                722     (6)     723     (6)
KA62A                            0000169D-R     716     (6)     513     (5)
KA730                            0000170C-R     717     (6)     514     (5)
KA750                            000017E7-R     718     (6)     515     (5)
KA780                            000018B3-R     719     (6)     516     (5)
KA785                            0000195C-R     720     (6)     517     (5)
KA800                            00001A05-R     721     (6)     518     (5)
KA800$B_FLOAT                    00000032                       721     (6)
KA800$B_ID                       00000034                       721     (6)
KA800$B_MEM                      00000033                       721     (6)
KA800$K_LEN                      00000035                       721     (6)
KA820                            00001A77-R     722     (6)     519     (5)
KA850                            00001BAA-R     724     (6)     521     (5)
KA86                             00001B02-R     723     (6)     520     (5)
KA880                            00001BE3-R     725     (6)     522     (5)
KA884                            00001C20-R     726     (6)     523     (5)
KA9CC                            00001C75-R     727     (6)     524     (5)
KDB50                            00001CE4-R     728     (6)     526     (5)
KDB50$B_BR                       00000036                       728     (6)
KDB50$B_NODE_ID                  00000037                       728     (6)
KFBTA                            00001D77-R     729     (6)     525     (5)
KFBTA$B_ID                       00000032                       729     (6)
KFBTA$K_LEN                      00000033                       729     (6)
KMC11                            00001DDD-R     730     (6)     527     (5)
KMC11$B_BR                       00000036                       730     (6)
KMC11$K_LEN                      00000037                       730     (6)
KMC11$L_CSR                      00000032                       730     (6)
KW11K                            00001E2B-R     731     (6)     528     (5)
KW11K$B_BR                       00000032                       731     (6)
KW11K$K_LEN                      00000033                       731     (6)
LA100                            00001EE4-R     736     (6)     533     (5)
LA100$K_LEN                      00000032                       736     (6)
LA12                             00001E7C-R     732     (6)     529     (5)
LA12$K_LEN                       00000032                       732     (6)
LA120                            00001EFF-R     737     (6)     534     (5)
LA120$K_LEN                      00000032                       737     (6)
LA180                            00001F1A-R     738     (6)     535     (5)
LA180$K_LEN                      00000032                       738     (6)
LA210                            00001F35-R     739     (6)     536     (5)
LA210$K_LEN                      00000032                       739     (6)
LA34                             00001E96-R     733     (6)     530     (5)
LA34$K_LEN                       00000032                       733     (6)
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LA36                            00001EB0-R   734     (6)       531     (5)
LA36$K_LEN                      00000032                       734     (6)
LA38                            00001ECA-R   735     (6)       532     (5)
LA38$K_LEN                      00000032                       735     (6)
LANCE                           00001F50-R   740     (6)       537     (5)
LANCE$K_LEN                     00000032                       740     (6)
LESI                            00001F61-R   741     (6)       538     (5)
LG01                            00001FAD-R   742     (6)       539     (5)
LG01$K_LEN                      00000032                       742     (6)
LG02                            00001FC7-R   743     (6)       540     (5)
LG02$K_LEN                      00000032                       743     (6)
LG03                            00001FE1-R   744     (6)       541     (5)
LG03$K_LEN                      00000032                       744     (6)
LN01                            00001FFB-R   745     (6)       542     (5)
LN01$K_LEN                      00000032                       745     (6)
LN03                            00002015-R   746     (6)       543     (5)
LN03$K_LEN                      00000032                       746     (6)
LP04                            0000202A-R   747     (6)       544     (5)
LP04$K_LEN                      00000032                       747     (6)
LP05                            00002044-R   748     (6)       545     (5)
LP05$K_LEN                      00000032                       748     (6)
LP06                            0000205E-R   749     (6)       546     (5)
LP06$K_LEN                      00000032                       749     (6)
LP07                            00002078-R   750     (6)       547     (5)
LP07$K_LEN                      00000032                       750     (6)
LP11                            00002092-R   751     (6)       548     (5)
LP11$B_BR                       00000036                       751     (6)
LP11$K_LEN                      00000037                       751     (6)
LP11$L_CSR                      00000032                       751     (6)
LP14                            000020DF-R   752     (6)       549     (5)
LP14$K_LEN                      00000032                       752     (6)
LP25                            000020F9-R   753     (6)       550     (5)
LP25$K_LEN                      00000032                       753     (6)
LP26                            00002113-R   754     (6)       551     (5)
LP26$K_LEN                      00000032                       754     (6)
LP27                            0000212D-R   755     (6)       552     (5)
LP27$K_LEN                      00000032                       755     (6)
LPA11K                          00002147-R   756     (6)       553     (5)
LPA11K$B_BR                     00000036                       756     (6)
LPA11K$K_LEN                    00000037                       756     (6)
LPA11K$L_CSR                    00000032                       756     (6)
LUA11                           000021A0-R   757     (6)       554     (5)
LUA11$B_BR                      00000032                       757     (6)
LUA11$K_LEN                     00000037                       757     (6)
LUA11$L_CSR                     00000033                       757     (6)
MA780                           000021EE-R   758     (6)       555     (5)
MA780$B_BR                      00000033                       758     (6)
MA780$B_MPM                     00000034                       758     (6)
MA780$B_PORT                    00000035                       758     (6)
MA780$B_TR                      00000032                       758     (6)
MA780$K_LEN                     00000036                       758     (6)
MAXPT                          =00000080     423     (4)       425     (4)     432     (4)     441     (4)     442     (4)
                                                               444     (4)     445     (4)     456     (4)     457     (4)
MBE                             00002269-R   759     (6)       556     (5)
MBE$K_LEN                       00000032                       759     (6)
ML11                            0000227D-R   760     (6)       557     (5)
ML11$B_ARRAY                    00000032                       760     (6)
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ML11$B_CHIP                     00000033                        760     (6)
ML11$K_LEN                      00000034                        760     (6)
MS750                           000022DF-R      761     (6)     558     (5)
MS750$K_LEN                     00000032                        761     (6)
MS780                           000022F0-R      762     (6)     559     (5)
MS780$B_ARRAYS                  00000033                        762     (6)
MS780$B_TR                      00000032                        762     (6)
MS780$K_LEN                     00000034                        762     (6)
MSAAA                           00002340-R      763     (6)     560     (5)
NBIA                            00002351-R      764     (6)     561     (5)
NBIB                            000023C1-R      765     (6)     562     (5)
NI                              00002424-R      766     (6)     563     (5)
NI$B_LOOPBACK                   00000032                        766     (6)
NI$K_LEN                        00000033                        766     (6)
PBIA                            0000245A-R      767     (6)     564     (5)
PCL11                           000024DA-R      768     (6)     565     (5)
PCL11$B_BR                      00000036                        768     (6)
PCL11$K_LEN                     00000037                        768     (6)
PCL11$L_CSR                     00000032                        768     (6)
PD$_ADD                         =0000008A       845     (6)     678     (6)     707     (6)     711     (6)     716     (6)
                                                                727     (6)     807     (6)
PD$_CASE                        =0000008C       845     (6)     674     (6)     675     (6)     678     (6)     681     (6)
                                                                682     (6)     683     (6)     684     (6)     689     (6)
                                                                698     (6)     709     (6)     710     (6)     728     (6)
                                                                729     (6)     764     (6)     767     (6)     810     (6)
PD$_COMPLEMENT                  =00000089       845     (6)     707     (6)
PD$_DECIMAL                     =00000082       845     (6)     672     (6)     673     (6)     674     (6)     675     (6)
                                                                676     (6)     677     (6)     678     (6)     680     (6)
                                                                685     (6)     686     (6)     688     (6)     690     (6)
                                                                691     (6)     692     (6)     693     (6)     694     (6)
                                                                695     (6)     696     (6)     697     (6)     698     (6)
                                                                699     (6)     700     (6)     701     (6)     702     (6)
                                                                703     (6)     704     (6)     705     (6)     708     (6)
                                                                710     (6)     712     (6)     713     (6)     715     (6)
                                                                717     (6)     718     (6)     719     (6)     720     (6)
                                                                721     (6)     722     (6)     723     (6)     726     (6)
                                                                730     (6)     731     (6)     741     (6)     751     (6)
                                                                756     (6)     757     (6)     758     (6)     760     (6)
                                                                762     (6)     764     (6)     765     (6)     767     (6)
                                                                768     (6)     769     (6)     783     (6)     784     (6)
                                                                787     (6)     790     (6)     798     (6)     799     (6)
                                                                800     (6)     806     (6)     814     (6)     815     (6)
                                                                816     (6)     817     (6)     818     (6)     825     (6)
                                                                826     (6)     828     (6)     829     (6)     830     (6)
                                                                831     (6)     832     (6)
PD$_END                         =00000081       845     (6)     672     (6)     673     (6)     674     (6)     675     (6)
                                                                676     (6)     677     (6)     678     (6)     679     (6)
                                                                680     (6)     681     (6)     682     (6)     683     (6)
                                                                684     (6)     685     (6)     686     (6)     687     (6)
                                                                688     (6)     689     (6)     690     (6)     691     (6)
                                                                692     (6)     693     (6)     694     (6)     695     (6)
                                                                696     (6)     697     (6)     698     (6)     699     (6)
                                                                700     (6)     701     (6)     702     (6)     703     (6)
                                                                704     (6)     705     (6)     706     (6)     707     (6)
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                                                                712     (6)     713     (6)     714     (6)     715     (6)
                                                                716     (6)     717     (6)     718     (6)     719     (6)
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				724 (6) 725 (6) 726 (6) 727 (6)
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				840 (6) 841 (6) 842 (6) 843 (6)
				844 (6) 845 (6)
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PD$_FETCH	=00000087	845	(6)	674 (6) 675 (6) 676 (6) 677 (6)
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				708 (6) 709 (6) 710 (6) 711 (6)
				728 (6) 729 (6) 759 (6) 760 (6)
				764 (6) 765 (6) 767 (6) 783 (6)
				784 (6) 791 (6) 792 (6) 793 (6)
				794 (6) 795 (6) 796 (6) 797 (6)
				807 (6) 810 (6)
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				683 (6) 684 (6) 689 (6) 698 (6)
				709 (6) 710 (6) 711 (6) 716 (6)
				717 (6) 718 (6) 719 (6) 720 (6)
				721 (6) 722 (6) 723 (6) 727 (6)
				728 (6) 729 (6) 765 (6) 810 (6)
PD$_LITERAL	=00000086	845	(6)	674 (6) 675 (6) 676 (6) 677 (6)
				678 (6) 680 (6) 681 (6) 682 (6)
				683 (6) 684 (6) 689 (6) 691 (6)
				693 (6) 695 (6) 697 (6) 703 (6)
				704 (6) 706 (6) 707 (6) 708 (6)
				709 (6) 710 (6) 711 (6) 716 (6)
				717 (6) 718 (6) 719 (6) 720 (6)
				721 (6) 722 (6) 723 (6) 724 (6)
				725 (6) 726 (6) 727 (6) 728 (6)

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				735 (6) 736 (6) 737 (6) 738 (6)
				739 (6) 742 (6) 743 (6) 744 (6)
				745 (6) 746 (6) 747 (6) 748 (6)
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				754 (6) 755 (6) 756 (6) 758 (6)
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				777 (6) 778 (6) 779 (6) 780 (6)
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				799 (6) 801 (6) 804 (6) 807 (6)
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				819 (6) 820 (6) 821 (6) 822 (6)
				823 (6) 824 (6) 825 (6) 826 (6)
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				834 (6) 835 (6) 836 (6) 837 (6)
				838 (6) 839 (6) 840 (6) 841 (6)
				842 (6) 843 (6) 844 (6) 845 (6)
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				720 (6) 723 (6) 725 (6) 726 (6)
				727 (6) 766 (6) 808 (6)
PD$_NAME	=0000008D	845	(6)	672 (6) 673 (6) 674 (6) 675 (6)
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				681 (6) 682 (6) 683 (6) 685 (6)
				686 (6) 687 (6) 688 (6) 690 (6)
				692 (6) 693 (6) 694 (6) 695 (6)
				696 (6) 697 (6) 698 (6) 699 (6)
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				704 (6) 705 (6) 706 (6) 707 (6)
				708 (6) 711 (6) 712 (6) 713 (6)
				714 (6) 715 (6) 717 (6) 718 (6)
				719 (6) 720 (6) 721 (6) 722 (6)
				723 (6) 724 (6) 725 (6) 726 (6)
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				732 (6) 733 (6) 734 (6) 735 (6)
				736 (6) 737 (6) 738 (6) 739 (6)
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				753 (6) 754 (6) 755 (6) 756 (6)
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				799 (6) 800 (6) 801 (6) 802 (6)

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                                                  803   (6)   805   (6)   806   (6)   807   (6)
                                                  808   (6)   809   (6)   810   (6)   811   (6)
                                                  812   (6)   813   (6)   814   (6)   815   (6)
                                                  816   (6)   817   (6)   818   (6)   819   (6)
                                                  820   (6)   821   (6)   822   (6)   823   (6)
                                                  824   (6)   825   (6)   826   (6)   827   (6)
                                                  828   (6)   829   (6)   830   (6)   831   (6)
                                                  832   (6)   833   (6)   834   (6)   835   (6)
                                                  836   (6)   837   (6)   838   (6)   839   (6)
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                                                  696   (6)   697   (6)   699   (6)   700   (6)
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                                                  714   (6)   715   (6)   730   (6)   731   (6)
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                                                  768   (6)   787   (6)   790   (6)   798   (6)
                                                  799   (6)   800   (6)   806   (6)   816   (6)
                                                  817   (6)   818   (6)   825   (6)   826   (6)
                                                  827   (6)   828   (6)   829   (6)   830   (6)
                                                  831   (6)   832   (6)
PD$_START                =00000080     845   (6)   672   (6)   673   (6)   674   (6)   675   (6)
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                                                  680   (6)   681   (6)   682   (6)   683   (6)
                                                  684   (6)   685   (6)   686   (6)   687   (6)
                                                  688   (6)   689   (6)   690   (6)   691   (6)
                                                  692   (6)   693   (6)   694   (6)   695   (6)
                                                  696   (6)   697   (6)   698   (6)   699   (6)
                                                  700   (6)   701   (6)   702   (6)   703   (6)
                                                  704   (6)   705   (6)   706   (6)   707   (6)
                                                  708   (6)   709   (6)   710   (6)   711   (6)
                                                  712   (6)   713   (6)   714   (6)   715   (6)
                                                  716   (6)   717   (6)   718   (6)   719   (6)
                                                  720   (6)   721   (6)   722   (6)   723   (6)
                                                  724   (6)   725   (6)   726   (6)   727   (6)
                                                  728   (6)   729   (6)   730   (6)   731   (6)
                                                  732   (6)   733   (6)   734   (6)   735   (6)
                                                  736   (6)   737   (6)   738   (6)   739   (6)
                                                  740   (6)   741   (6)   742   (6)   743   (6)
                                                  744   (6)   745   (6)   746   (6)   747   (6)
                                                  748   (6)   749   (6)   750   (6)   751   (6)
                                                  752   (6)   753   (6)   754   (6)   755   (6)
                                                  756   (6)   757   (6)   758   (6)   759   (6)
                                                  760   (6)   761   (6)   762   (6)   763   (6)
                                                  764   (6)   765   (6)   766   (6)   767   (6)
                                                  768   (6)   769   (6)   770   (6)   771   (6)
                                                  772   (6)   773   (6)   774   (6)   775   (6)
                                                  776   (6)   777   (6)   778   (6)   779   (6)
                                                  780   (6)   781   (6)   782   (6)   783   (6)
                                                  784   (6)   785   (6)   786   (6)   787   (6)
                                                  788   (6)   789   (6)   790   (6)   791   (6)
                                                  792   (6)   793   (6)   794   (6)   795   (6)
                                                  796   (6)   797   (6)   798   (6)   799   (6)
                                                  800   (6)   801   (6)   802   (6)   803   (6)
                                                  804   (6)   805   (6)   806   (6)   807   (6)
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				808 (6) 809 (6) 810 (6) 811 (6) 812 (6) 813 (6) 814 (6) 815 (6) 816 (6) 817 (6) 818 (6) 819 (6) 820 (6) 821 (6) 822 (6) 823 (6) 824 (6) 825 (6) 826 (6) 827 (6) 828 (6) 829 (6) 830 (6) 831 (6) 832 (6) 833 (6) 834 (6) 835 (6) 836 (6) 837 (6) 838 (6) 839 (6) 840 (6) 841 (6) 842 (6) 843 (6) 844 (6) 845 (6)
PD$_STORE	=00000088	845	(6)	672 (6) 673 (6) 674 (6) 675 (6) 676 (6) 677 (6) 678 (6) 680 (6) 681 (6) 682 (6) 683 (6) 684 (6) 685 (6) 686 (6) 688 (6) 689 (6) 690 (6) 691 (6) 692 (6) 693 (6) 694 (6) 695 (6) 696 (6) 697 (6) 698 (6) 699 (6) 700 (6) 701 (6) 702 (6) 703 (6) 704 (6) 705 (6) 706 (6) 707 (6) 708 (6) 709 (6) 710 (6) 711 (6) 712 (6) 713 (6) 714 (6) 715 (6) 716 (6) 717 (6) 718 (6) 719 (6) 720 (6) 721 (6) 722 (6) 723 (6) 724 (6) 725 (6) 726 (6) 727 (6) 728 (6) 729 (6) 730 (6) 731 (6) 732 (6) 733 (6) 734 (6) 735 (6) 736 (6) 737 (6) 738 (6) 739 (6) 741 (6) 742 (6) 743 (6) 744 (6) 745 (6) 746 (6) 747 (6) 748 (6) 749 (6) 750 (6) 751 (6) 752 (6) 753 (6) 754 (6) 755 (6) 756 (6) 757 (6) 758 (6) 759 (6) 760 (6) 762 (6) 764 (6) 765 (6) 766 (6) 767 (6) 768 (6) 769 (6) 770 (6) 771 (6) 772 (6) 773 (6) 774 (6) 775 (6) 776 (6) 777 (6) 778 (6) 779 (6) 780 (6) 781 (6) 782 (6) 783 (6) 784 (6) 785 (6) 786 (6) 787 (6) 788 (6) 789 (6) 790 (6) 791 (6) 792 (6) 793 (6) 794 (6) 795 (6) 796 (6) 797 (6) 798 (6) 799 (6) 800 (6) 801 (6) 804 (6) 806 (6) 807 (6) 808 (6) 810 (6) 811 (6) 812 (6) 813 (6) 814 (6) 815 (6) 816 (6) 817 (6) 818 (6) 819 (6) 820 (6) 821 (6) 822 (6) 823 (6) 824 (6) 825 (6) 826 (6) 827 (6) 828 (6) 829 (6) 830 (6) 831 (6) 832 (6) 833 (6) 834 (6) 835 (6) 836 (6) 837 (6) 838 (6) 839 (6) 840 (6) 841 (6) 842 (6) 843 (6) 844 (6) 845 (6)
PD$_STRING	=00000085	845	(6)	678 (6) 692 (6) 693 (6) 694 (6) 695 (6) 697 (6) 703 (6) 704 (6) 713 (6) 760 (6) 808 (6)
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                                692     (6)     693     (6)     694     (6)     695     (6)
                                696     (6)     697     (6)     698     (6)     699     (6)
                                700     (6)     701     (6)     702     (6)     703     (6)
                                704     (6)     705     (6)     706     (6)     707     (6)
                                708     (6)     709     (6)     710     (6)     711     (6)
                                712     (6)     713     (6)     714     (6)     715     (6)
                                716     (6)     717     (6)     718     (6)     719     (6)
                                720     (6)     721     (6)     722     (6)     723     (6)
                                724     (6)     725     (6)     726     (6)     727     (6)
                                728     (6)     729     (6)     730     (6)     731     (6)
                                732     (6)     733     (6)     734     (6)     735     (6)
                                736     (6)     737     (6)     738     (6)     739     (6)
                                740     (6)     741     (6)     742     (6)     743     (6)
                                744     (6)     745     (6)     746     (6)     747     (6)
                                748     (6)     749     (6)     750     (6)     751     (6)
                                752     (6)     753     (6)     754     (6)     755     (6)
                                756     (6)     757     (6)     758     (6)     759     (6)
                                760     (6)     761     (6)     762     (6)     763     (6)
                                764     (6)     765     (6)     766     (6)     767     (6)
                                768     (6)     769     (6)     770     (6)     771     (6)
                                772     (6)     773     (6)     774     (6)     775     (6)
                                776     (6)     777     (6)     778     (6)     779     (6)
                                780     (6)     781     (6)     782     (6)     783     (6)
                                784     (6)     785     (6)     786     (6)     787     (6)
                                788     (6)     789     (6)     790     (6)     791     (6)
                                792     (6)     793     (6)     794     (6)     795     (6)
                                796     (6)     797     (6)     798     (6)     799     (6)
                                800     (6)     801     (6)     802     (6)     803     (6)
                                804     (6)     805     (6)     806     (6)     807     (6)
                                808     (6)     809     (6)     810     (6)     811     (6)
                                812     (6)     813     (6)     814     (6)     815     (6)
                                816     (6)     817     (6)     818     (6)     819     (6)
                                820     (6)     821     (6)     822     (6)     823     (6)
                                824     (6)     825     (6)     826     (6)     827     (6)
                                828     (6)     829     (6)     830     (6)     831     (6)
                                832     (6)     833     (6)     834     (6)     835     (6)
                                836     (6)     837     (6)     838     (6)     839     (6)
                                840     (6)     841     (6)     842     (6)     843     (6)
                                844     (6)     845     (6)
PTD$M_DEVICE        =00000003   845     (6)     672     (6)     673     (6)     674     (6)     675     (6)
                                676     (6)     677     (6)     680     (6)     687     (6)
                                690     (6)     694     (6)     695     (6)     696     (6)
                                699     (6)     701     (6)     702     (6)     703     (6)
                                704     (6)     705     (6)     721     (6)     730     (6)
                                731     (6)     740     (6)     756     (6)     757     (6)
                                760     (6)     769     (6)     791     (6)     792     (6)
                                793     (6)     794     (6)     795     (6)     796     (6)
                                797     (6)     798     (6)     799     (6)     808     (6)
                                809     (6)     812     (6)     813     (6)     816     (6)
                                817     (6)     818     (6)     820     (6)     825     (6)
                                826     (6)     827     (6)     829     (6)
PTD$M_ENDDEVICE     =0000001B   845     (6)     732     (6)     733     (6)     734     (6)     735     (6)
                                736     (6)     737     (6)     738     (6)     739     (6)
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PTD$M_INHERIT =00000018 845 (6)

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775 (6) 776 (6) 778 (6) 779 (6)
780 (6) 781 (6) 782 (6) 785 (6)
786 (6) 788 (6) 789 (6) 801 (6)
802 (6) 803 (6) 805 (6) 811 (6)
819 (6) 821 (6) 822 (6) 823 (6)
824 (6) 830 (6) 831 (6) 832 (6)
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837 (6) 838 (6) 839 (6) 840 (6)
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845 (6)
672 (6) 673 (6) 674 (6) 675 (6)
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700 (6) 701 (6) 702 (6) 703 (6)
704 (6) 705 (6) 706 (6) 707 (6)
708 (6) 709 (6) 710 (6) 711 (6)
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724 (6) 725 (6) 726 (6) 727 (6)
728 (6) 729 (6) 730 (6) 731 (6)
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736 (6) 737 (6) 738 (6) 739 (6)
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824 (6) 825 (6) 826 (6) 827 (6)
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836 (6) 837 (6) 838 (6) 839 (6)
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PTD$M_INHERIT_CON              =00000010     845    (6)    672    (6)      673    (6)      674    (6)      675    (6)
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                                                           680    (6)      681    (6)      682    (6)      683    (6)
                                                           684    (6)      685    (6)      686    (6)      687    (6)
                                                           688    (6)      689    (6)      690    (6)      691    (6)
                                                           692    (6)      693    (6)      694    (6)      695    (6)
                                                           696    (6)      697    (6)      698    (6)      699    (6)
                                                           700    (6)      701    (6)      702    (6)      703    (6)
                                                           704    (6)      705    (6)      706    (6)      707    (6)
                                                           708    (6)      709    (6)      710    (6)      711    (6)
                                                           712    (6)      713    (6)      714    (6)      715    (6)
                                                           716    (6)      717    (6)      718    (6)      719    (6)
                                                           720    (6)      721    (6)      722    (6)      723    (6)
                                                           724    (6)      725    (6)      726    (6)      727    (6)
                                                           728    (6)      729    (6)      730    (6)      731    (6)
                                                           732    (6)      733    (6)      734    (6)      735    (6)
                                                           736    (6)      737    (6)      738    (6)      739    (6)
                                                           740    (6)      741    (6)      742    (6)      743    (6)
                                                           744    (6)      745    (6)      746    (6)      747    (6)
                                                           748    (6)      749    (6)      750    (6)      751    (6)
                                                           752    (6)      753    (6)      754    (6)      755    (6)
                                                           756    (6)      757    (6)      758    (6)      759    (6)
                                                           760    (6)      761    (6)      762    (6)      763    (6)
                                                           764    (6)      765    (6)      766    (6)      767    (6)
                                                           768    (6)      769    (6)      770    (6)      771    (6)
                                                           772    (6)      773    (6)      774    (6)      775    (6)
                                                           776    (6)      777    (6)      778    (6)      779    (6)
                                                           780    (6)      781    (6)      782    (6)      783    (6)
                                                           784    (6)      785    (6)      786    (6)      787    (6)
                                                           788    (6)      789    (6)      790    (6)      791    (6)
                                                           792    (6)      793    (6)      794    (6)      795    (6)
                                                           796    (6)      797    (6)      798    (6)      799    (6)
                                                           800    (6)      801    (6)      802    (6)      803    (6)
                                                           804    (6)      805    (6)      806    (6)      807    (6)
                                                           808    (6)      809    (6)      810    (6)      811    (6)
                                                           812    (6)      813    (6)      814    (6)      815    (6)
                                                           816    (6)      817    (6)      818    (6)      819    (6)
                                                           820    (6)      821    (6)      822    (6)      823    (6)
                                                           824    (6)      825    (6)      826    (6)      827    (6)
                                                           828    (6)      829    (6)      830    (6)      831    (6)
                                                           832    (6)      833    (6)      834    (6)      835    (6)
                                                           836    (6)      837    (6)      838    (6)      839    (6)
                                                           840    (6)      841    (6)      842    (6)      843    (6)
                                                           844    (6)      845    (6)
PTD$M_INHERIT_PRE              =00000008     845    (6)    672    (6)      673    (6)      674    (6)      675    (6)
                                                           676    (6)      677    (6)      678    (6)      679    (6)
                                                           680    (6)      681    (6)      682    (6)      683    (6)
                                                           684    (6)      685    (6)      686    (6)      687    (6)
                                                           688    (6)      689    (6)      690    (6)      691    (6)
                                                           692    (6)      693    (6)      694    (6)      695    (6)
                                                           696    (6)      697    (6)      698    (6)      699    (6)
                                                           700    (6)      701    (6)      702    (6)      703    (6)
                                                           704    (6)      705    (6)      706    (6)      707    (6)
                                                           708    (6)      709    (6)      710    (6)      711    (6)
                                                           712    (6)      713    (6)      714    (6)      715    (6)
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                                                716     (6)     717     (6)     718     (6)     719     (6)
                                                720     (6)     721     (6)     722     (6)     723     (6)
                                                724     (6)     725     (6)     726     (6)     727     (6)
                                                728     (6)     729     (6)     730     (6)     731     (6)
                                                732     (6)     733     (6)     734     (6)     735     (6)
                                                736     (6)     737     (6)     738     (6)     739     (6)
                                                740     (6)     741     (6)     742     (6)     743     (6)
                                                744     (6)     745     (6)     746     (6)     747     (6)
                                                748     (6)     749     (6)     750     (6)     751     (6)
                                                752     (6)     753     (6)     754     (6)     755     (6)
                                                756     (6)     757     (6)     758     (6)     759     (6)
                                                760     (6)     761     (6)     762     (6)     763     (6)
                                                764     (6)     765     (6)     766     (6)     767     (6)
                                                768     (6)     769     (6)     770     (6)     771     (6)
                                                772     (6)     773     (6)     774     (6)     775     (6)
                                                776     (6)     777     (6)     778     (6)     779     (6)
                                                780     (6)     781     (6)     782     (6)     783     (6)
                                                784     (6)     785     (6)     786     (6)     787     (6)
                                                788     (6)     789     (6)     790     (6)     791     (6)
                                                792     (6)     793     (6)     794     (6)     795     (6)
                                                796     (6)     797     (6)     798     (6)     799     (6)
                                                800     (6)     801     (6)     802     (6)     803     (6)
                                                804     (6)     805     (6)     806     (6)     807     (6)
                                                808     (6)     809     (6)     810     (6)     811     (6)
                                                812     (6)     813     (6)     814     (6)     815     (6)
                                                816     (6)     817     (6)     818     (6)     819     (6)
                                                820     (6)     821     (6)     822     (6)     823     (6)
                                                824     (6)     825     (6)     826     (6)     827     (6)
                                                828     (6)     829     (6)     830     (6)     831     (6)
                                                832     (6)     833     (6)     834     (6)     835     (6)
                                                836     (6)     837     (6)     838     (6)     839     (6)
                                                840     (6)     841     (6)     842     (6)     843     (6)
                                                844     (6)     845     (6)

PTD$M_NAME              =00000004       845     (6)     678     (6)     722     (6)     766     (6)
PTD$M_UNIT              =00000001       845     (6)     672     (6)     673     (6)     674     (6)     675     (6)
                                                676     (6)     677     (6)     678     (6)     679     (6)
                                                680     (6)     681     (6)     682     (6)     683     (6)
                                                684     (6)     685     (6)     686     (6)     687     (6)
                                                688     (6)     689     (6)     690     (6)     691     (6)
                                                692     (6)     693     (6)     694     (6)     695     (6)
                                                696     (6)     697     (6)     698     (6)     699     (6)
                                                700     (6)     701     (6)     702     (6)     703     (6)
                                                704     (6)     705     (6)     706     (6)     707     (6)
                                                708     (6)     709     (6)     710     (6)     711     (6)
                                                712     (6)     713     (6)     714     (6)     715     (6)
                                                716     (6)     717     (6)     718     (6)     719     (6)
                                                720     (6)     721     (6)     722     (6)     723     (6)
                                                724     (6)     725     (6)     726     (6)     727     (6)
                                                728     (6)     729     (6)     730     (6)     731     (6)
                                                732     (6)     733     (6)     734     (6)     735     (6)
                                                736     (6)     737     (6)     738     (6)     739     (6)
                                                740     (6)     741     (6)     742     (6)     743     (6)
                                                744     (6)     745     (6)     746     (6)     747     (6)
                                                748     (6)     749     (6)     750     (6)     751     (6)
                                                752     (6)     753     (6)     754     (6)     755     (6)
                                                756     (6)     757     (6)     758     (6)     759     (6)
                                                760     (6)     761     (6)     762     (6)     763     (6)
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                                                764     (6)     765     (6)     766     (6)     767     (6)
                                                768     (6)     769     (6)     770     (6)     771     (6)
                                                772     (6)     773     (6)     774     (6)     775     (6)
                                                776     (6)     777     (6)     778     (6)     779     (6)
                                                780     (6)     781     (6)     782     (6)     783     (6)
                                                784     (6)     785     (6)     786     (6)     787     (6)
                                                788     (6)     789     (6)     790     (6)     791     (6)
                                                792     (6)     793     (6)     794     (6)     795     (6)
                                                796     (6)     797     (6)     798     (6)     799     (6)
                                                800     (6)     801     (6)     802     (6)     803     (6)
                                                804     (6)     805     (6)     806     (6)     807     (6)
                                                808     (6)     809     (6)     810     (6)     811     (6)
                                                812     (6)     813     (6)     814     (6)     815     (6)
                                                816     (6)     817     (6)     818     (6)     819     (6)
                                                820     (6)     821     (6)     822     (6)     823     (6)
                                                824     (6)     825     (6)     826     (6)     827     (6)
                                                828     (6)     829     (6)     830     (6)     831     (6)
                                                832     (6)     833     (6)     834     (6)     835     (6)
                                                836     (6)     837     (6)     838     (6)     839     (6)
                                                840     (6)     841     (6)     842     (6)     843     (6)
                                                844     (6)     845     (6)

PTD$V_CONTROLLER                =00000001       845     (6)
PTD$V_INHERIT_CON               =00000004       845     (6)
PTD$V_INHERIT_PRE               =00000003       845     (6)
PTD$V_NAME                      =00000002       845     (6)
PTD$V_UNIT                      =00000000       845     (6)
PX780                            00002523-R     769     (6)     566     (5)
PX780$B_BR                       00000033                       769     (6)
PX780$B_NODE                     00000034                       769     (6)
PX780$B_TR                       00000032                       769     (6)
PX780$K_LEN                      00000035                       769     (6)
R80                              0000258C-R     770     (6)     567     (5)
R80$K_LEN                        00000032                       770     (6)
RA60                             000025A5-R     771     (6)     568     (5)
RA60$K_LEN                       00000032                       771     (6)
RA70                             000025BF-R     772     (6)     569     (5)
RA70$K_LEN                       00000032                       772     (6)
RA80                             000025D9-R     773     (6)     570     (5)
RA80$K_LEN                       00000032                       773     (6)
RA81                             000025F3-R     774     (6)     571     (5)
RA81$K_LEN                       00000032                       774     (6)
RA82                             0000260D-R     775     (6)     573     (5)
RA82$K_LEN                       00000032                       775     (6)
RA90                             00002627-R     776     (6)     572     (5)
RA90$K_LEN                       00000032                       776     (6)
RB730                            00002644-R     777     (6)     574     (5)
RB730$B_BR                       00000036                       777     (6)
RB730$K_LEN                      00000037                       777     (6)
RC25                             0000268E-R     779     (6)     576     (5)
RC25$K_LEN                       00000032                       779     (6)
RCF25                            00002673-R     778     (6)     575     (5)
RCF25$K_LEN                      00000032                       778     (6)
RD52                             000026A8-R     780     (6)     577     (5)
RD52$K_LEN                       00000032                       780     (6)
RD53                             000026C2-R     781     (6)     578     (5)
RD53$K_LEN                       00000032                       781     (6)
RD54                             000026DC-R     782     (6)     579     (5)
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RD54$K_LEN                      00000032                        782     (6)
RH750                           000026F6-R    783     (6)       580     (5)
RH750$B_BR                      00000032                        783     (6)
RH750$K_LEN                     00000033                        783     (6)
RH780                           0000274F-R    784     (6)       581     (5)
RH780$B_BR                      00000033                        784     (6)
RH780$B_TR                      00000032                        784     (6)
RH780$K_LEN                     00000034                        784     (6)
RK06                            00002835-R    788     (6)       585     (5)
RK06$K_LEN                      00000032                        788     (6)
RK07                            0000284F-R    789     (6)       586     (5)
RK07$K_LEN                      00000032                        789     (6)
RK611                           00002869-R    790     (6)       587     (5)
RK611$B_BR                      00000036                        790     (6)
RK611$K_LEN                     00000037                        790     (6)
RK611$L_CSR                     00000032                        790     (6)
RL01                            000027B4-R    785     (6)       582     (5)
RL01$K_LEN                      00000032                        785     (6)
RL02                            000027CE-R    786     (6)       583     (5)
RL02$K_LEN                      00000032                        786     (6)
RL11                            000027E8-R    787     (6)       584     (5)
RL11$B_BR                       00000036                        787     (6)
RL11$K_LEN                      00000037                        787     (6)
RL11$L_CSR                      00000032                        787     (6)
RM03                            000028B7-R    791     (6)       588     (5)
RM03$K_LEN                      00000032                        791     (6)
RM05                            000028DB-R    792     (6)       589     (5)
RM05$K_LEN                      00000032                        792     (6)
RM80                            000028FF-R    793     (6)       590     (5)
RM80$K_LEN                      00000032                        793     (6)
RP04                            00002923-R    794     (6)       592     (5)
RP04$K_LEN                      00000032                        794     (6)
RP05                            00002947-R    795     (6)       593     (5)
RP05$K_LEN                      00000032                        795     (6)
RP06                            0000296B-R    796     (6)       594     (5)
RP06$K_LEN                      00000032                        796     (6)
RP07                            0000298F-R    797     (6)       595     (5)
RP07$K_LEN                      00000032                        797     (6)
RRD50                           000029B3-R    798     (6)       591     (5)
RRD50$B_BR                      00000036                        798     (6)
RRD50$K_LEN                     00000037                        798     (6)
RRD50$L_CSR                     00000032                        798     (6)
RUX50                           00002A6A-R    800     (6)       597     (5)
RV20                            00002A0F-R    799     (6)       596     (5)
RV20$B_BR                       00000036                        799     (6)
RV20$K_LEN                      00000037                        799     (6)
RV20$L_CSR                      00000032                        799     (6)
RX02                            00002AB2-R    801     (6)       598     (5)
RX02$K_LEN                      00000032                        801     (6)
RX180                           00002B01-R    805     (6)       602     (5)
RX180$K_LEN                     00000032                        805     (6)
RX211                           00002B12-R    806     (6)       603     (5)
RX211$B_BR                      00000036                        806     (6)
RX211$K_LEN                     00000037                        806     (6)
RX211$L_CSR                     00000032                        806     (6)
RX31                            00002ACC-R    802     (6)       599     (5)
RX31$K_LEN                      00000032                        802     (6)
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RX32                    00002ADC-R   803    (6)    600    (5)
RX32$K_LEN              00000032                   803    (6)
RX50                    00002AEC-R   804    (6)    601    (5)
RX50$K_LEN              00000032                   804    (6)
SBIA                    00002B60-R   807    (6)    604    (5)
SBIA$K_LEN              00000032                   807    (6)
SIZ...                  =00000001    845    (6)    672    (6)    673    (6)    674    (6)    675    (6)
                                                   676    (6)    677    (6)    678    (6)    679    (6)
                                                   680    (6)    681    (6)    682    (6)    683    (6)
                                                   684    (6)    685    (6)    686    (6)    687    (6)
                                                   688    (6)    689    (6)    690    (6)    691    (6)
                                                   692    (6)    693    (6)    694    (6)    695    (6)
                                                   696    (6)    697    (6)    698    (6)    699    (6)
                                                   700    (6)    701    (6)    702    (6)    703    (6)
                                                   704    (6)    705    (6)    706    (6)    707    (6)
                                                   708    (6)    709    (6)    710    (6)    711    (6)
                                                   712    (6)    713    (6)    714    (6)    715    (6)
                                                   716    (6)    717    (6)    718    (6)    719    (6)
                                                   720    (6)    721    (6)    722    (6)    723    (6)
                                                   724    (6)    725    (6)    726    (6)    727    (6)
                                                   728    (6)    729    (6)    730    (6)    731    (6)
                                                   732    (6)    733    (6)    734    (6)    735    (6)
                                                   736    (6)    737    (6)    738    (6)    739    (6)
                                                   740    (6)    741    (6)    742    (6)    743    (6)
                                                   744    (6)    745    (6)    746    (6)    747    (6)
                                                   748    (6)    749    (6)    750    (6)    751    (6)
                                                   752    (6)    753    (6)    754    (6)    755    (6)
                                                   756    (6)    757    (6)    758    (6)    759    (6)
                                                   760    (6)    761    (6)    762    (6)    763    (6)
                                                   764    (6)    765    (6)    766    (6)    767    (6)
                                                   768    (6)    769    (6)    770    (6)    771    (6)
                                                   772    (6)    773    (6)    774    (6)    775    (6)
                                                   776    (6)    777    (6)    778    (6)    779    (6)
                                                   780    (6)    781    (6)    782    (6)    783    (6)
                                                   784    (6)    785    (6)    786    (6)    787    (6)
                                                   788    (6)    789    (6)    790    (6)    791    (6)
                                                   792    (6)    793    (6)    794    (6)    795    (6)
                                                   796    (6)    797    (6)    798    (6)    799    (6)
                                                   800    (6)    801    (6)    802    (6)    803    (6)
                                                   804    (6)    805    (6)    806    (6)    807    (6)
                                                   808    (6)    809    (6)    810    (6)    811    (6)
                                                   812    (6)    813    (6)    814    (6)    815    (6)
                                                   816    (6)    817    (6)    818    (6)    819    (6)
                                                   820    (6)    821    (6)    822    (6)    823    (6)
                                                   824    (6)    825    (6)    826    (6)    827    (6)
                                                   828    (6)    829    (6)    830    (6)    831    (6)
                                                   832    (6)    833    (6)    834    (6)    835    (6)
                                                   836    (6)    837    (6)    838    (6)    839    (6)
                                                   840    (6)    841    (6)    842    (6)    843    (6)
                                                   844    (6)    845    (6)
SLU                     00002BA2-R   808    (6)    605    (5)
SLU$B_ACTIV             00000033                   808    (6)
SLU$B_EXT               00000032                   808    (6)
SLU$B_SPEED             00000034                   808    (6)
SLU$K_LEN               00000035                   808    (6)
TAPE                    00002C17-R   809    (6)    606    (5)
TAPE$K_LEN              00000032                   809    (6)
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TBK50                           00002C27-R   810    (6)       607    (5)
TBK50$B_NODE_ID                 00000032                      810    (6)
TBK50$K_LEN                     00000033                      810    (6)
TE16                            00002C92-R   811    (6)       608    (5)
TE16$K_LEN                      00000032                      811    (6)
TK50                            00002CAC-R   812    (6)       609    (5)
TK70                            00002CC6-R   813    (6)       610    (5)
TM03                            00002CE0-R   814    (6)       611    (5)
TM03$B_DRIVE                    00000032                      814    (6)
TM03$K_LEN                      00000033                      814    (6)
TM78                            00002D0E-R   815    (6)       612    (5)
TM78$B_DRIVE                    00000032                      815    (6)
TM78$K_LEN                      00000033                      815    (6)
TS04                            00002D3C-R   816    (6)       613    (5)
TS04$B_BR                       00000036                      816    (6)
TS04$K_LEN                      00000037                      816    (6)
TS04$L_CSR                      00000032                      816    (6)
TS05                            00002D93-R   817    (6)       614    (5)
TS05$B_BR                       00000032                      817    (6)
TS05$K_LEN                      00000033                      817    (6)
TS11                            00002DFD-R   818    (6)       615    (5)
TS11$B_BR                       00000036                      818    (6)
TS11$K_LEN                      00000037                      818    (6)
TS11$L_CSR                      00000032                      818    (6)
TU45                            00002E54-R   819    (6)       616    (5)
TU45$K_LEN                      00000032                      819    (6)
TU58                            00002E6E-R   820    (6)       617    (5)
TU58$K_LEN                      00000032                      820    (6)
TU70                            00002E88-R   821    (6)       618    (5)
TU70$K_LEN                      00000032                      821    (6)
TU72                            00002EA2-R   822    (6)       619    (5)
TU72$K_LEN                      00000032                      822    (6)
TU77                            00002EBC-R   823    (6)       620    (5)
TU77$K_LEN                      00000032                      823    (6)
TU78                            00002ED6-R   824    (6)       621    (5)
TU78$K_LEN                      00000032                      824    (6)
TU80                            00002EF0-R   825    (6)       622    (5)
TU80$K_LEN                      00000037                      825    (6)
TU81                            00002F5F-R   826    (6)       623    (5)
TU81$B_BR                       00000036                      826    (6)
TU81$K_LEN                      00000037                      826    (6)
TU81$L_CSR                      00000032                      826    (6)
UBE                             00002FB6-R   827    (6)       624    (5)
UBE$K_LEN                       00000036                      827    (6)
UBE$L_CSR                       00000032                      827    (6)
UDA50                           00002FF1-R   828    (6)       625    (5)
UNA11                           0000305A-R   829    (6)       626    (5)
UNA11$B_BR                      00000032                      829    (6)
UNA11$K_LEN                     00000037                      829    (6)
UNA11$L_CSR                     00000033                      829    (6)
VS100                           000030A8-R   830    (6)       627    (5)
VS100$B_BR                      00000036                      830    (6)
VS100$K_LEN                     00000037                      830    (6)
VS100$L_CSR                     00000032                      830    (6)
VS125                           00003100-R   831    (6)       628    (5)
VS125$B_BR                      00000036                      831    (6)
VS125$K_LEN                     00000037                      831    (6)
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VS125$L_CSR                     00000032                        831     (6)
VS300                           00003158-R      832     (6)     629     (5)
VS300$B_BR                      00000036                        832     (6)
VS300$K_LEN                     00000037                        832     (6)
VS300$L_CSR                     00000032                        832     (6)
VT100                           00003232-R      838     (6)     635     (5)
VT100$K_LEN                     00000032                        838     (6)
VT101                           0000324D-R      839     (6)     636     (5)
VT101$K_LEN                     00000032                        839     (6)
VT102                           00003268-R      840     (6)     637     (5)
VT102$K_LEN                     00000032                        840     (6)
VT125                           00003283-R      841     (6)     638     (5)
VT125$K_LEN                     00000032                        841     (6)
VT131                           0000329E-R      842     (6)     639     (5)
VT131$K_LEN                     00000032                        842     (6)
VT132                           000032B9-R      843     (6)     640     (5)
VT132$K_LEN                     00000032                        843     (6)
VT220                           000032D4-R      844     (6)     641     (5)
VT220$K_LEN                     00000032                        844     (6)
VT240                           000032EF-R      845     (6)     642     (5)
VT240$K_LEN                     00000032                        845     (6)
VT50                            000031B0-R      833     (6)     630     (5)
VT50$K_LEN                      00000032                        833     (6)
VT52                            000031CA-R      834     (6)     631     (5)
VT52$K_LEN                      00000032                        834     (6)
VT55                            000031E4-R      835     (6)     632     (5)
VT55$K_LEN                      00000032                        835     (6)
VT61                            000031FE-R      836     (6)     633     (5)
VT61$K_LEN                      00000032                        836     (6)
VT71                            00003218-R      837     (6)     634     (5)
VT71$K_LEN                      00000032                        837     (6)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	22	00:00:00.02	00:00:00.21
Command processing	892	00:00:00.27	00:00:01.00
Pass 1	6824	00:00:38.11	00:00:44.07
Symbol table sort	0	00:00:00.19	00:00:00.19
Pass 2	6072	00:00:07.40	00:00:12.67
Symbol table output	3	00:00:00.12	00:00:00.36
Psect synopsis output	3	00:00:00.00	00:00:00.00
Cross-reference output	218	00:00:01.61	00:00:02.22
Assembler run totals	14035	00:00:47.72	00:01:00.72

```
The working set limit was 4000 pages.
2641188 bytes (5159 pages) of virtual memory were used to buffer the intermediate code.
There were 40 pages of symbol table space allocated to hold 770 non-local and 0 local symbols.
846 source lines were read in Pass 1, producing 111 object records in Pass 2.
596 pages of virtual memory were used to define 519 macros.
```

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	350
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	5
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	355

3704 GETS were required to define 355 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1)	44	HISTORY ; DETAILED
(2)	100	DECLARATIONS
(3)	139	I/O COMPLETION POSTING
(4)	256	VIRTUAL I/O COMPLETION
(5)	325	QUEUE NEXT SEGMENT
(6)	439	BUFFERED READ COMPLETION AST ROUTINE
(7)	523	DIRECT I/O COMPLETION AST ROUTINE
(8)	600	MOVE DATA TO USER BUFFER
(9)	623	UNLOCK AREAS IN IRPE'S

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element IOPOST.MAR
0000     2 ; *1     6-FEB-1986 15:18:56 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element IOPOST.MAR
0000     4         .TITLE  IOPOST  *** IOPOST I/O completion posting
0000     5         .IDENT  /05-04/
0000     6
0000     7 ;
0000     8 ;*****************************************************************************
0000     9 ;*                                                                           *
0000    10 ;*  COPYRIGHT (c) 1978, 1979, 1980                                           *
0000    11 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
0000    12 ;*                                                                           *
0000    13 ;*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND  COPIED   *
0000    14 ;*  ONLY  IN  ACCORDANCE  WITH  THE  TERMS  OF  SUCH  LICENSE AND WITH THE  *
0000    15 ;*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE OR  ANY  OTHER   *
0000    16 ;*  COPIES  THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY   *
0000    17 ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE  IS  HEREBY   *
0000    18 ;*  TRANSFERRED.                                                             *
0000    19 ;*                                                                           *
0000    20 ;*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE   *
0000    21 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT  *
0000    22 ;*  CORPORATION.                                                             *
0000    23 ;*                                                                           *
0000    24 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS   *
0000    25 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    26 ;*                                                                           *
0000    27 ;*****************************************************************************
0000    28
0000    29 ;++
0000    30 ; FACILITY: EXECUTIVE, I/O SYSTEM
0000    31 ;
0000    32 ; ABSTRACT:
0000    33 ;       IOCIOPOST IMPLEMENTS THE DEVICE INDEPENDENT COMPLETION PROCESSING FOR
0000    34 ;       I/O PACKETS.  IT IS INVOKED BY QUEUEING THE PACKET ON THE I/O POST QUEUE
0000    35 ;       AND TRIGGERING THE IPL$_IOPOST SOFTWARE INTERRUPT.  SOME OF THE IOPOST
0000    36 ;       OPERATIONS SUCH AS SETTING EVENT FLAGS, UNLOCKING BUFFER PAGES,
0000    37 ;       RELEASING BUFFERS AND PAGING I/O COMPLETION ARE PERFORMED IN THE IOPOST
0000    38 ;       INTERRUPT SERVICE ROUTINE, WHILE OTHER OPERATIONS THAT REQUIRE ACCESS
0000    39 ;       TO PROCESS ADDRESS SPACE ARE PERFORMED BY SENDING A SPECIAL KERNEL AST.
0000    40 ;
0000    41 ; ENVIRONMENT:  MODE = KERNEL, RESIDENT
0000    42 ;
0000    43 ;--
0000    44         .SBTTL  HISTORY                 ; DETAILED
0000    45 ;
0000    46 ; AUTHOR: R. HUSTVEDT, CREATION DATE: 26-AUG-76
0000    47 ;
0000    48 ; MODIFIED BY:
0000    49 ;                   Dave Butenhof           12-may-1980, Version 5.4
0000    50 ;       01          Modify VMS source for supervisor
0000    51 ;                   Dave Butenhof           18-jun-1980, version 5.5
0000    52 ;       02          Restore buffered I/O support.
0000    53 ;
0000    54 ;                   Dave Butenhof   17-feb-1981, version 6.3
0000    55 ;       03          Change SEP psect to CODE, correct some reference truncation
0000    56 ;                   errors.
0000    57 ;       04          Bob Bergazzi    6-May,1983      Version 6.11
```

```
0000  ;                 Corrected truncation error.
0000  ;
0000  ;       V0211     KDM0103         KATHLEEN D. MORSE       13-MAR-1980
0000  ;                 REMOVE DUPLICATE MODIFICATION HISTORY.
0000  ;
0000  ;       V0210     RIH0059         RICHARD I. HUSTVEDT     25-FEB-1980
0000  ;                 CHANGE PRIORITY INCREMENT CLASS FOR PAGEFAULT TO GIVE
0000  ;                 SEPARATE AND LOWER BOOST.
0000  ;
0000  ;       V0209     KDM0094         KATHLEEN D. MORSE       22-JAN-1980     13:30
0000  ;                 ADD CHECK FOR DRIVER RETURNING TOTAL BYTE COUNT TRANSFERRED
0000  ;                 ON PAGE READ ERROR.  ASSUME THIS COUNT IS WRONG AND RESET
0000  ;                 IT TO ZERO BYTES TRANSFERRED.  THIS CAUSES THE FIRST PAGE OF
0000  ;                 THE TRANSFER TO BE THE PAGE WITH THE ERROR.
0000  ;
0000  ;       V0208     RIH0036         RICHARD I. HUSTVEDT     02-NOV-1979     09:36
0000  ;                 HONOR IRP$V_TERMIO AND IRP$V_FILACP FLAGS FOR PERFORMANCE
0000  ;                 IMPROVEMENT.
0000  ;
0000  ;       V0207     RIH0033         RICHARD I. HUSTVEDT     19-OCT-1979     15:32
0000  ;                 MOVE BYTCNT FROM PCB TO JIB.
0000  ;
0000  ;       V0206     RIH0032         RICHARD I. HUSTVEDT     10-SEP-1979     11:15
0000  ;                 ADD END ACTION DISPATCHING FOR INTERNAL PACKET COMPLETION.
0000  ;
0000  ;       V0205     KDM0054         KATHLEEN D. MORSE       31-AUG-1979     15:35
0000  ;                 FIX INTERFACE BUG IN CALLING PMS$START_RQ.
0000  ;
0000  ;       V0204     ACG23542        ANDREW C. GOLDSTEIN     04-MAY-1979     16:41
0000  ;                 CHECK LBN OF MAPPED VIRTUAL I/O AGAINST UCB$L_MAXBLOCK.
0000  ;
0000  ;       V0203     KDM0029         KATHLEEN D. MORSE       30-APR-1979     10:00
0000  ;                 ADD CODE TO MAKE $UPDSEC WORK FOR SHARED MEMORY.
0000  ;
0000  ;       V0202     SRB0001         STEVE BECKHARDT         29-MAR-1979     10:00
0000  ;                 ADDED CODE TO UNLOCK REGIONS SPECIFIED IN IRPE'S AND
0000  ;                 TO DEALLOCATE IRPE'S.
0000  ;
0000  ;       V0201     RIH21586        R. I. HUSTVEDT          12-JAN-1979     10:00
0000  ;                 CORRECTED BUFFER PROBING FOR BUFFERED I/O COMPLETION.
0000  ;
```

```
                        0000    100         .SBTTL  DECLARATIONS
                        0000    101 ;
                        0000    102 ; INCLUDE FILES:
                        0000    103 ;
                        0000    104         $ACBDEF                             ; AST CONTROL BLOCK DEFINITIONS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .IIF    NB,ACB$L_ASTQFL,        ACB$L_ASTQFL:
                00000004 0000                       .BLKL   1
                        0004                .IIF    NB,ACB$L_ASTQBL,        ACB$L_ASTQBL:
                00000008 0004                       .BLKL   1
                        0008                .IIF    NB,ACB$W_SIZE,  ACB$W_SIZE:
                0000000A 0008                       .BLKW   1
                        000A                .IIF    NB,ACB$B_TYPE,  ACB$B_TYPE:
                0000000B 000A                       .BLKB   1
                        000B                .IIF    NB,ACB$B_RMOD,  ACB$B_RMOD:
                0000000C 000B                       .BLKB   1
                        000C                .IIF    NB,ACB$L_PID,   ACB$L_PID:
                00000010 000C                       .BLKL   1
                        0010                .IIF    NB,ACB$L_AST,   ACB$L_AST:
                00000014 0010                       .BLKL   1
                        0014                .IIF    NB,ACB$L_ASTPRM,        ACB$L_ASTPRM:
                00000018 0014                       .BLKL   1
                        0018                .IIF    NB,ACB$C_LENGTH,        ACB$C_LENGTH:
                        0018                .IIF    NB,ACB$K_LENGTH,        ACB$K_LENGTH:
                        0018                .IIF    NB,ACB$L_KAST,  ACB$L_KAST:
                0000001C 0018                       .BLKL   1
                        0000                .RESTORE
                        0000    105         $AQBDEF                             ; DEFINE AQB OFFSETS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 001C               .=0
                        0000                .RESTORE
                        0000    106         $CADEF                              ; CONDITIONAL ASSEMBLY PARAMETERS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 001C               .=0
                        0000                .RESTORE
                        0000    107         $CCBDEF                             ; CCB DEFINITIONS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 001C               .=0
                        0000                .IIF    NB,CCB$L_UCB,   CCB$L_UCB:
                00000004 0000                       .BLKL   1
                        0004                .IIF    NB,CCB$L_WIND,  CCB$L_WIND:
                00000008 0004                       .BLKL   1
                        0008                .IIF    NB,CCB$B_STS,   CCB$B_STS:
                00000009 0008                       .BLKB   1
                        0009                .IIF    NB,CCB$B_AMOD,  CCB$B_AMOD:
                0000000A 0009                       .BLKB   1
                        000A                .IIF    NB,CCB$W_IOC,   CCB$W_IOC:
                0000000C 000A                       .BLKW   1
                        000C                .IIF    NB,CCB$L_DIRP,  CCB$L_DIRP:
                00000010 000C                       .BLKL   1
                        0010                .IIF    NB,CCB$C_LENGTH,        CCB$C_LENGTH:
                        0010                .IIF    NB,CCB$K_LENGTH,        CCB$K_LENGTH:
                        0000                .RESTORE
                        0000    108         $CXBDEF                             ; DEFINE CXB OFFSETS
```

```
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
          00000000  001C                .=0
                    0000                .RESTORE
                    0000    109         $IPLDEF                             ; IPL DEFINITIONS
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
          00000000  001C                .=0
                    0000                .RESTORE
                    0000    110         $IRPDEF                             ; IRP DEFINITIONS
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
          00000000  001C                .=0
                    0000                .IIF    NB,IRP$L_IOQFL, IRP$L_IOQFL:
          00000004  0000                        .BLKL   1
                    0004                .IIF    NB,IRP$L_IOQBL, IRP$L_IOQBL:
          00000008  0004                        .BLKL   1
                    0008                .IIF    NB,IRP$W_SIZE,  IRP$W_SIZE:
          0000000A  0008                        .BLKW   1
                    000A                .IIF    NB,IRP$B_TYPE,  IRP$B_TYPE:
          0000000B  000A                        .BLKB   1
                    000B                .IIF    NB,IRP$B_RMOD,  IRP$B_RMOD:
          0000000C  000B                        .BLKB   1
                    000C                .IIF    NB,IRP$L_PID,   IRP$L_PID:
          00000010  000C                        .BLKL   1
                    0010                .IIF    NB,IRP$L_AST,   IRP$L_AST:
          00000014  0010                        .BLKL   1
                    0014                .IIF    NB,IRP$L_ASTPRM,        IRP$L_ASTPRM:
          00000018  0014                        .BLKL   1
                    0018                .IIF    NB,IRP$L_WIND,  IRP$L_WIND:
          0000001C  0018                        .BLKL   1
                    001C                .IIF    NB,IRP$L_UCB,   IRP$L_UCB:
          00000020  001C                        .BLKL   1
                    0020                .IIF    NB,IRP$W_FUNC,  IRP$W_FUNC:
          00000022  0020                        .BLKW   1
                    0022                .IIF    NB,IRP$B_EFN,   IRP$B_EFN:
          00000023  0022                        .BLKB   1
                    0023                .IIF    NB,IRP$B_PRI,   IRP$B_PRI:
          00000024  0023                        .BLKB   1
                    0024                .IIF    NB,IRP$L_IOSB,  IRP$L_IOSB:
          00000028  0024                        .BLKL   1
                    0028                .IIF    NB,IRP$W_CHAN,  IRP$W_CHAN:
          0000002A  0028                        .BLKW   1
                    002A                .IIF    NB,IRP$W_STS,   IRP$W_STS:
          0000002C  002A                        .BLKW   1
                    002C                .IIF    NB,IRP$L_SVAPTE,        IRP$L_SVAPTE:
          00000030  002C                        .BLKL   1
                    0030                .IIF    NB,IRP$W_BOFF,  IRP$W_BOFF:
          00000032  0030                        .BLKW   1
                    0032                .IIF    NB,IRP$W_BCNT,  IRP$W_BCNT:
          00000034  0032                        .BLKW   1
                    0034                .IIF    NB,IRP$L_IOST1, IRP$L_IOST1:
                    0034                .IIF    NB,IRP$L_MEDIA, IRP$L_MEDIA:
          00000038  0034                        .BLKL   1
                    0038                .IIF    NB,IRP$L_IOST2, IRP$L_IOST2:
                    0038                .IIF    NB,IRP$L_TT_TERM,       IRP$L_TT_TERM:
                    0038                .IIF    NB,IRP$B_CARCON,        IRP$B_CARCON:
```

```
00000039  0038                          .BLKB   1
0000003C  0039                          .BLKB   3
          003C              .IIF    NB,IRP$Q_NT_PRVMSK,     IRP$Q_NT_PRVMSK:
          003C              .IIF    NB,IRP$W_ABCNT, IRP$W_ABCNT:
          003C              .IIF    NB,IRP$W_TT_PRMPT,      IRP$W_TT_PRMPT:
0000003E  003C                          .BLKW   1
          003E              .IIF    NB,IRP$W_OBCNT, IRP$W_OBCNT:
00000040  003E                          .BLKW   1
          0040              .IIF    NB,IRP$L_SEGVBN,        IRP$L_SEGVBN:
00000044  0040                          .BLKL   1
          0044              .IIF    NB,IRP$L_DIAGBUF,       IRP$L_DIAGBUF:
00000048  0044                          .BLKL   1
          0048              .IIF    NB,IRP$L_SEQNUM,        IRP$L_SEQNUM:
0000004C  0048                          .BLKL   1
          004C              .IIF    NB,IRP$L_EXTEND,        IRP$L_EXTEND:
00000050  004C                          .BLKL   1
          0050              .IIF    NB,IRP$L_ARB,   IRP$L_ARB:
00000054  0050                          .BLKL   1
00000058  0054                          .BLKL   1
0000005C  0058                          .BLKL   1
          005C              .IIF    NB,IRP$C_LENGTH,        IRP$C_LENGTH:
          005C              .IIF    NB,IRP$K_LENGTH,        IRP$K_LENGTH:
          0000              .RESTORE
          0000    111       $IRPEDEF                        ; IRPE DEFINITIONS
          0000              .SAVE   LOCAL_BLOCK
          0000              .PSECT  $ABS$,ABS
00000000  005C              .=0
00000004  0000                          .BLKL   1
00000008  0004                          .BLKL   1
          0008              .IIF    NB,IRPE$W_SIZE, IRPE$W_SIZE:
0000000A  0008                          .BLKW   1
          000A              .IIF    NB,IRPE$B_TYPE, IRPE$B_TYPE:
0000000B  000A                          .BLKB   1
0000000C  000B                          .BLKB   1
00000028  000C                          .BLKL   7
0000002A  0028                          .BLKW   1
          002A              .IIF    NB,IRPE$W_STS,  IRPE$W_STS:
0000002C  002A                          .BLKW   1
          002C              .IIF    NB,IRPE$L_SVAPTE1,      IRPE$L_SVAPTE1:
00000030  002C                          .BLKL   1
          0030              .IIF    NB,IRPE$W_BOFF1,        IRPE$W_BOFF1:
00000032  0030                          .BLKW   1
00000034  0032                          .BLKW   1
          0034              .IIF    NB,IRPE$L_BCNT1,        IRPE$L_BCNT1:
00000038  0034                          .BLKL   1
          0038              .IIF    NB,IRPE$L_SVAPTE2,      IRPE$L_SVAPTE2:
0000003C  0038                          .BLKL   1
          003C              .IIF    NB,IRPE$W_BOFF2,        IRPE$W_BOFF2:
0000003E  003C                          .BLKW   1
00000040  003E                          .BLKW   1
          0040              .IIF    NB,IRPE$L_BCNT2,        IRPE$L_BCNT2:
00000044  0040                          .BLKL   1
0000004C  0044                          .BLKL   2
          004C              .IIF    NB,IRPE$L_EXTEND,       IRPE$L_EXTEND:
00000050  004C                          .BLKL   1
          0050              .IIF    NB,IRPE$C_LENGTH,       IRPE$C_LENGTH:
          0050              .IIF    NB,IRPE$K_LENGTH,       IRPE$K_LENGTH:
```

```
                        0000            .RESTORE
                        0000    112     $JIBDEF                         ; JIB DEFINITIONS
                        0000            .SAVE   LOCAL_BLOCK
                        0000            .PSECT  $ABS$,ABS
                00000000 005C           .=0
                        0000            .RESTORE
                        0000    113     $PCBDEF                         ; PCB DEFINITIONS
                        0000            .SAVE   LOCAL_BLOCK
                        0000            .PSECT  $ABS$,ABS
                00000000 005C           .=0
                        0000            .IIF    NB,PCB$L_SQFL,  PCB$L_SQFL:
                00000004 0000                    .BLKL   1
                        0004            .IIF    NB,PCB$L_SQBL,  PCB$L_SQBL:
                00000008 0004                    .BLKL   1
                        0008            .IIF    NB,PCB$W_SIZE,  PCB$W_SIZE:
                0000000A 0008                    .BLKW   1
                        000A            .IIF    NB,PCB$B_TYPE,  PCB$B_TYPE:
                0000000B 000A                    .BLKB   1
                        000B            .IIF    NB,PCB$B_PRI,   PCB$B_PRI:
                0000000C 000B                    .BLKB   1
                        000C            .IIF    NB,PCB$B_ASTACT,        PCB$B_ASTACT:
                0000000D 000C                    .BLKB   1
                        000D            .IIF    NB,PCB$B_ASTEN, PCB$B_ASTEN:
                0000000E 000D                    .BLKB   1
                        000E            .IIF    NB,PCB$W_MTXCNT,        PCB$W_MTXCNT:
                00000010 000E                    .BLKW   1
                        0010            .IIF    NB,PCB$L_ASTQFL,        PCB$L_ASTQFL:
                00000014 0010                    .BLKL   1
                        0014            .IIF    NB,PCB$L_ASTQBL,        PCB$L_ASTQBL:
                00000018 0014                    .BLKL   1
                        0018            .IIF    NB,PCB$L_PHYPCB,        PCB$L_PHYPCB:
                0000001C 0018                    .BLKL   1
                        001C            .IIF    NB,PCB$L_OWNER, PCB$L_OWNER:
                00000020 001C                    .BLKL   1
                        0020            .IIF    NB,PCB$L_WSSWP, PCB$L_WSSWP:
                00000024 0020                    .BLKL   1
                        0024            .IIF    NB,PCB$L_STS,   PCB$L_STS:
                00000028 0024                    .BLKL   1
                        0028            .IIF    NB,PCB$L_WTIME, PCB$L_WTIME:
                0000002C 0028                    .BLKL   1
                        002C            .IIF    NB,PCB$W_STATE, PCB$W_STATE:
                0000002E 002C                    .BLKW   1
                        002E            .IIF    NB,PCB$B_WEFC,  PCB$B_WEFC:
                0000002F 002E                    .BLKB   1
                        002F            .IIF    NB,PCB$B_PRIB,  PCB$B_PRIB:
                00000030 002F                    .BLKB   1
                        0030            .IIF    NB,PCB$W_APTCNT,        PCB$W_APTCNT:
                00000032 0030                    .BLKW   1
                        0032            .IIF    NB,PCB$W_TMBU,  PCB$W_TMBU:
                00000034 0032                    .BLKW   1
                        0034            .IIF    NB,PCB$W_GPGCNT,        PCB$W_GPGCNT:
                00000036 0034                    .BLKW   1
                        0036            .IIF    NB,PCB$W_PPGCNT,        PCB$W_PPGCNT:
                00000038 0036                    .BLKW   1
                        0038            .IIF    NB,PCB$W_ASTCNT,        PCB$W_ASTCNT:
                0000003A 0038                    .BLKW   1
                        003A            .IIF    NB,PCB$W_BIOCNT,        PCB$W_BIOCNT:
```

```
0000003C  003A                                  .BLKW   1
          003C                  .IIF    NB,PCB$W_BIOLM, PCB$W_BIOLM:
0000003E  003C                                  .BLKW   1
          003E                  .IIF    NB,PCB$W_DIOCNT,        PCB$W_DIOCNT:
00000040  003E                                  .BLKW   1
          0040                  .IIF    NB,PCB$W_DIOLM, PCB$W_DIOLM:
00000042  0040                                  .BLKW   1
          0042                  .IIF    NB,PCB$W_PRCCNT,        PCB$W_PRCCNT:
00000044  0042                                  .BLKW   1
          0044                  .IIF    NB,PCB$T_TERMINAL,      PCB$T_TERMINAL:
0000004C  0044                                  .BLKB   8
          004C                  .IIF    NB,PCB$L_PQB,   PCB$L_PQB:
          004C                  .IIF    NB,PCB$L_EFWM,  PCB$L_EFWM:
00000050  004C                                  .BLKL   1
          0050                  .IIF    NB,PCB$L_EFCS,  PCB$L_EFCS:
00000054  0050                                  .BLKL   1
          0054                  .IIF    NB,PCB$L_EFCU,  PCB$L_EFCU:
00000058  0054                                  .BLKL   1
          0058                  .IIF    NB,PCB$L_EFC2P, PCB$L_EFC2P:
0000005C  0058                                  .BLKL   1
          005C                  .IIF    NB,PCB$L_EFC3P, PCB$L_EFC3P:
00000060  005C                                  .BLKL   1
          0060                  .IIF    NB,PCB$L_PID,   PCB$L_PID:
00000064  0060                                  .BLKL   1
          0064                  .IIF    NB,PCB$L_PHD,   PCB$L_PHD:
00000068  0064                                  .BLKL   1
          0068                  .IIF    NB,PCB$T_LNAME, PCB$T_LNAME:
00000078  0068                                  .BLKB   16
          0078                  .IIF    NB,PCB$L_JIB,   PCB$L_JIB:
0000007C  0078                                  .BLKL   1
          007C                  .IIF    NB,PCB$Q_PRIV,  PCB$Q_PRIV:
00000084  007C                                  .BLKQ   1
          0084                  .IIF    NB,PCB$L_ARB,   PCB$L_ARB:
00000088  0084                                  .BLKL   1
          0088                  .IIF    NB,PCB$L_UIC,   PCB$L_UIC:
          0088                  .IIF    NB,PCB$W_MEM,   PCB$W_MEM:
0000008A  0088                                  .BLKW   1
          008A                  .IIF    NB,PCB$W_GRP,   PCB$W_GRP:
0000008C  008A                                  .BLKW   1
          008C                  .IIF    NB,PCB$C_LENGTH,        PCB$C_LENGTH:
          008C                  .IIF    NB,PCB$K_LENGTH,        PCB$K_LENGTH:
          0000                  .RESTORE
          0000    114           $PFNDEF                         ; PFN DATA BASE DEFINITIONS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000    115           $PHDDEF                         ; PROCESS HEADER DEFINITIONS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000    116           $PRDEF                          ; PROCESSOR REGISTER DEFINITIONS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
```

```
                        0000   117          $PRIDEF                         ; PRIORITY INCREMENT DEFS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 008C               .=0
                        0000                .RESTORE
                        0000   118          $PTEDEF                         ; PAGE TABLE ENTRY DEFINITIONS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 008C               .=0
                        0000                .RESTORE
                        0000   119          $RSNDEF                         ; DEFINE RESOURCE WAIT NUMBERS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 008C               .=0
                        0000                .RESTORE
                        0000   120          $UCBDEF                         ; DEFINE UCB OFFSETS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 008C               .=0
                        0000                .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                        0000                .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
                00000004 0000                       .BLKL   1
                        0004                .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                        0004                .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
                00000008 0004                       .BLKL   1
                        0008                .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
                0000000A 0008                       .BLKW   1
                        000A                .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
                0000000B 000A                       .BLKB   1
                        000B                .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
                0000000C 000B                       .BLKB   1
                        000C                .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                        000C                .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                        000C                .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
                0000000D 000C                       .BLKB   1
                00000010 000D                       .BLKB   3
                        0010                .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                        0010                .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
                00000014 0010                       .BLKL   1
                        0014                .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                        0014                .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                        0014                .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
                00000016 0014                       .BLKW   1
                        0016                .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
                00000018 0016                       .BLKW   1
                        0018                .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                        0018                .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
                0000001A 0018                       .BLKW   1
                        001A                .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                        001A                .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
                0000001C 001A                       .BLKW   1
                        001C                .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
                00000020 001C                       .BLKL   1
                        0020                .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
                00000024 0020                       .BLKL   1
                        0024                .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
                00000028 0024                       .BLKL   1
```

```
                    0028                .IIF    NB,UCB$L_PID,   UCB$L_PID:
0000002C            0028                        .BLKL   1
                    002C                .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
00000030            002C                        .BLKL   1
                    0030                .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
00000034            0030                        .BLKL   1
                    0034                .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
00000038            0034                        .BLKL   1
                    0038                .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
00000039            0038                        .BLKB   1
                    0039                .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
0000003A            0039                        .BLKB   1
                    003A                .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
0000003C            003A                        .BLKW   1
                    003C                .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
                    003C                .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
                    003C                .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
0000003D            003C                        .BLKB   1
                    003D                .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
                    003D                .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
0000003E            003D                        .BLKB   1
                    003E                .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
                    003E                .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
0000003F            003E                        .BLKB   1
                    003F                .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
00000040            003F                        .BLKB   1
                    0040                .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
00000044            0040                        .BLKL   1
                    0044                .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
00000048            0044                        .BLKL   1
                    0048                .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
0000004A            0048                        .BLKW   1
                    004A                .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
                    004A                .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
0000004B            004A                        .BLKB   1
                    004B                .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
0000004C            004B                        .BLKB   1
                    004C                .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
00000050            004C                        .BLKL   1
                    0050                .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
00000052            0050                        .BLKW   1
                    0052                .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
                    0052                .IIF    NB,UCB$B_STATE, UCB$B_STATE:
00000053            0052                        .BLKB   1
                    0053                .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
00000054            0053                        .BLKB   1
                    0054                .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
00000058            0054                        .BLKL   1
                    0058                .IIF    NB,UCB$W_STS,   UCB$W_STS:
0000005A            0058                        .BLKW   1
                    005A                .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
0000005C            005A                        .BLKW   1
                    005C                .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
                    005C                .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
00000060            005C                        .BLKL   1
                    0060                .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
00000064            0060                        .BLKL   1
```

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                        0064            .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
                        0064            .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
00000068                0064                            .BLKL   1
                        0068            .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
0000006C                0068                            .BLKL   1
                        006C            .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
0000006E                006C                            .BLKW   1
                        006E            .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
00000070                006E                            .BLKW   1
                        0070            .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
00000071                0070                            .BLKB   1
                        0071            .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
00000072                0071                            .BLKB   1
                        0072            .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074                0072                            .BLKW   1
                        0074            .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
                        0074            .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000                0074            . = 0
                        0000            .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002                0000                            .BLKW   1
00000074                0002            . = 116
                        0074            .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078                0074                            .BLKL   1
                        0078            .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C                0078                            .BLKL   1
                        007C            .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080                007C                            .BLKL   1
                        0080            .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084                0080                            .BLKL   1
                        0084            .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088                0084                            .BLKL   1
                        0088            .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C                0088                            .BLKL   1
                        008C            .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090                008C                            .BLKL   1
                        0090            .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
                        0090            .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074                0090            . = 116
                        0074            .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075                0074                            .BLKB   1
                        0075            .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076                0075                            .BLKB   1
                        0076            .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077                0076                            .BLKB   1
                        0077            .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078                0077                            .BLKB   1
                        0078            .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C                0078                            .BLKL   1
0000007E                007C                            .BLKW   1
                        007E            .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080                007E                            .BLKW   1
                        0080            .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084                0080                            .BLKL   1
00000080                0084            . = 128
00000084                0080                            .BLKL   1
                        0084            .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088                0084                            .BLKL   1
```

```
                    0088            .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A            0088                    .BLKW   1
                    008A            .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C            008A                    .BLKW   1
                    008C            .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
                    008C            .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E            008C                    .BLKW   1
                    008E            .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090            008E                    .BLKW   1
                    0090            .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092            0090                    .BLKW   1
                    0092            .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
00000094            0092                    .BLKW   1
                    0094            .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095            0094                    .BLKB   1
                    0095            .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096            0095                    .BLKB   1
                    0096            .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098            0096                    .BLKW   1
00000096            0098            . = 150
00000098            0096                    .BLKW   1
                    0098            .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C            0098                    .BLKL   1
                    009C            .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0            009C                    .BLKL   1
                    00A0            .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
000000A4            00A0                    .BLKL   1
                    00A4            .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
000000A6            00A4                    .BLKW   1
                    00A6            .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
000000A7            00A6                    .BLKB   1
000000A8            00A7                    .BLKB   1
00000074            00A8            . = 116
00000078            0074                    .BLKL   1
0000007C            0078                    .BLKL   1
00000080            007C                    .BLKL   1
00000084            0080                    .BLKL   1
00000088            0084                    .BLKL   1
0000008C            0088                    .BLKL   1
                    008C            .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
00000090            008C                    .BLKL   1
00000094            0090                    .BLKL   1
00000098            0094                    .BLKL   1
0000009C            0098                    .BLKL   1
                    009C            .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
0000009D            009C                    .BLKB   1
                    009D            .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
0000009E            009D                    .BLKB   1
                    009E            .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
0000009F            009E                    .BLKB   1
000000A0            009F                    .BLKB   1
                    00A0            .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
000000A1            00A0                    .BLKB   1
                    00A1            .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
000000A2            00A1                    .BLKB   1
                    00A2            .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
000000A3            00A2                    .BLKB   1
```

```
000000A4  00A3                          .BLKB   1
          00A4                  .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
000000A5  00A4                          .BLKB   1
          00A5                  .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
000000A7  00A5                          .BLKW   1
000000A8  00A7                          .BLKB   1
          00A8                  .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
000000AC  00A8                          .BLKL   1
000000B0  00AC                          .BLKL   1
000000B4  00B0                          .BLKL   1
000000B8  00B4                          .BLKL   1
          00B8                  .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
000000BC  00B8                          .BLKL   1
          00BC                  .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
          00BC                  .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
00000074  00BC                  . = 116
          0074                  .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
00000078  0074                          .BLKL   1
          0078                  .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
0000007C  0078                          .BLKL   1
          007C                  .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
0000007E  007C                          .BLKW   1
00000080  007E                          .BLKW   1
          0000                  .RESTORE
          0000    121           $VADEF                          ; DEFINE VIRTUAL ADDRESS FIELDS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  00BC                  .=0
          0000                  .RESTORE
          0000    122           $VCBDEF                         ; DEFINE VCB OFFSETS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  00BC                  .=0
          0000                  .IIF    NB,VCB$L_FCBFL, VCB$L_FCBFL:
00000004  0000                          .BLKL   1
          0004                  .IIF    NB,VCB$L_FCBBL, VCB$L_FCBBL:
00000008  0004                          .BLKL   1
          0008                  .IIF    NB,VCB$W_SIZE,  VCB$W_SIZE:
0000000A  0008                          .BLKW   1
          000A                  .IIF    NB,VCB$B_TYPE,  VCB$B_TYPE:
0000000B  000A                          .BLKB   1
          000B                  .IIF    NB,VCB$C_MRKLEN,        VCB$C_MRKLEN:
          000B                  .IIF    NB,VCB$K_MRKLEN,        VCB$K_MRKLEN:
          000B                  .IIF    NB,VCB$B_STATUS,        VCB$B_STATUS:
0000000C  000B                          .BLKB   1
          000C                  .IIF    NB,VCB$W_TRANS, VCB$W_TRANS:
0000000E  000C                          .BLKW   1
          000E                  .IIF    NB,VCB$W_RVN,   VCB$W_RVN:
00000010  000E                          .BLKW   1
          0010                  .IIF    NB,VCB$L_AQB,   VCB$L_AQB:
00000014  0010                          .BLKL   1
          0014                  .IIF    NB,VCB$T_VOLNAME,       VCB$T_VOLNAME:
00000020  0014                          .BLKB   12
          0020                  .IIF    NB,VCB$L_RVT,   VCB$L_RVT:
00000024  0020                          .BLKL   1
          0024                  .IIF    NB,VCB$C_COMLEN,        VCB$C_COMLEN:
          0024                  .IIF    NB,VCB$K_COMLEN,        VCB$K_COMLEN:
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                    0024                .IIF    NB,VCB$L_HOMELBN,       VCB$L_HOMELBN:
00000028  0024                                          .BLKL   1
                    0028                .IIF    NB,VCB$L_HOME2LBN,      VCB$L_HOME2LBN:
0000002C  0028                                          .BLKL   1
                    002C                .IIF    NB,VCB$L_IXHDR2LBN,     VCB$L_IXHDR2LBN:
00000030  002C                                          .BLKL   1
                    0030                .IIF    NB,VCB$L_IBMAPLBN,      VCB$L_IBMAPLBN:
00000034  0030                                          .BLKL   1
                    0034                .IIF    NB,VCB$L_SBMAPLBN,      VCB$L_SBMAPLBN:
00000038  0034                                          .BLKL   1
                    0038                .IIF    NB,VCB$B_IBMAPSIZE,     VCB$B_IBMAPSIZE:
00000039  0038                                          .BLKB   1
                    0039                .IIF    NB,VCB$B_SBMAPSIZE,     VCB$B_SBMAPSIZE:
0000003A  0039                                          .BLKB   1
                    003A                .IIF    NB,VCB$B_IBMAPVBN,      VCB$B_IBMAPVBN:
0000003B  003A                                          .BLKB   1
                    003B                .IIF    NB,VCB$B_SBMAPVBN,      VCB$B_SBMAPVBN:
0000003C  003B                                          .BLKB   1
                    003C                .IIF    NB,VCB$W_CLUSTER,       VCB$W_CLUSTER:
0000003E  003C                                          .BLKW   1
                    003E                .IIF    NB,VCB$W_EXTEND,        VCB$W_EXTEND:
00000040  003E                                          .BLKW   1
                    0040                .IIF    NB,VCB$L_FREE,  VCB$L_FREE:
00000044  0040                                          .BLKL   1
                    0044                .IIF    NB,VCB$L_MAXFILES,      VCB$L_MAXFILES:
00000048  0044                                          .BLKL   1
                    0048                .IIF    NB,VCB$B_WINDOW,        VCB$B_WINDOW:
00000049  0048                                          .BLKB   1
                    0049                .IIF    NB,VCB$B_LRU_LIM,       VCB$B_LRU_LIM:
0000004A  0049                                          .BLKB   1
                    004A                .IIF    NB,VCB$W_FILEPROT,      VCB$W_FILEPROT:
0000004C  004A                                          .BLKW   1
                    004C                .IIF    NB,VCB$W_MCOUNT,        VCB$W_MCOUNT:
0000004E  004C                                          .BLKW   1
                    004E                .IIF    NB,VCB$B_EOFDELTA,      VCB$B_EOFDELTA:
0000004F  004E                                          .BLKB   1
                    004F                .IIF    NB,VCB$B_RESFILES,      VCB$B_RESFILES:
00000050  004F                                          .BLKB   1
                    0050                .IIF    NB,VCB$W_RECORDSZ,      VCB$W_RECORDSZ:
00000052  0050                                          .BLKW   1
                    0052                .IIF    NB,VCB$B_BLOCKFACT,     VCB$B_BLOCKFACT:
00000053  0052                                          .BLKB   1
                    0053                .IIF    NB,VCB$B_STATUS2,       VCB$B_STATUS2:
00000054  0053                                          .BLKB   1
                    0054                .IIF    NB,VCB$L_QUOTAFCB,      VCB$L_QUOTAFCB:
00000058  0054                                          .BLKL   1
                    0058                .IIF    NB,VCB$L_CACHE, VCB$L_CACHE:
0000005C  0058                                          .BLKL   1
                    005C                .IIF    NB,VCB$L_QUOCACHE,      VCB$L_QUOCACHE:
00000060  005C                                          .BLKL   1
                    0060                .IIF    NB,VCB$W_QUOSIZE,       VCB$W_QUOSIZE:
00000062  0060                                          .BLKW   1
                    0062                .IIF    NB,VCB$W_PENDERR,       VCB$W_PENDERR:
00000064  0062                                          .BLKW   1
                    0064                .IIF    NB,VCB$C_LENGTH,        VCB$C_LENGTH:
                    0064                .IIF    NB,VCB$K_LENGTH,        VCB$K_LENGTH:
00000000  0064                          . = 0
```

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                    0000                .IIF    NB,VCB$L_BLOCKFL,       VCB$L_BLOCKFL:
00000004            0000                        .BLKL   1
                    0004                .IIF    NB,VCB$L_BLOCKBL,       VCB$L_BLOCKBL:
00000008            0004                        .BLKL   1
0000000B            0008                . = 11
00000024            000B                . = 36
                    0024                .IIF    NB,VCB$L_CUR_FID,       VCB$L_CUR_FID:
                    0024                .IIF    NB,VCB$W_CUR_NUM,       VCB$W_CUR_NUM:
00000026            0024                        .BLKW   1
                    0026                .IIF    NB,VCB$W_CUR_SEQ,       VCB$W_CUR_SEQ:
00000028            0026                        .BLKW   1
                    0028                .IIF    NB,VCB$L_START_FID,     VCB$L_START_FID:
                    0028                .IIF    NB,VCB$W_START_NUM,     VCB$W_START_NUM:
0000002A            0028                        .BLKW   1
                    002A                .IIF    NB,VCB$W_START_SEQ,     VCB$W_START_SEQ:
0000002C            002A                        .BLKW   1
                    002C                .IIF    NB,VCB$W_MODE,  VCB$W_MODE:
0000002E            002C                        .BLKW   1
                    002E                .IIF    NB,VCB$B_TM,    VCB$B_TM:
0000002F            002E                        .BLKB   1
                    002F                .IIF    NB,VCB$B_CUR_RVN,       VCB$B_CUR_RVN:
00000030            002F                        .BLKB   1
                    0030                .IIF    NB,VCB$L_ST_RECORD,     VCB$L_ST_RECORD:
00000034            0030                        .BLKL   1
                    0034                .IIF    NB,VCB$L_MVL,   VCB$L_MVL:
00000038            0034                        .BLKL   1
                    0038                .IIF    NB,VCB$L_WCB,   VCB$L_WCB:
0000003C            0038                        .BLKL   1
                    003C                .IIF    NB,VCB$L_VPFL,  VCB$L_VPFL:
00000040            003C                        .BLKL   1
                    0040                .IIF    NB,VCB$L_VPBL,  VCB$L_VPBL:
00000044            0040                        .BLKL   1
                    0044                .IIF    NB,VCB$L_USRLBLAST,     VCB$L_USRLBLAST:
00000048            0044                        .BLKL   1
0000000B            0048                . = 11
                    000B                .IIF    NB,VCB$B_QNAMECNT,      VCB$B_QNAMECNT:
0000000C            000B                        .BLKB   1
                    000C                .IIF    NB,VCB$T_QNAME, VCB$T_QNAME:
00000020            000C                        .BLKB   20
                    0000                .RESTORE
                    0000    123         $WCBDEF                         ; DEFINE WCB OFFSETS
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
00000000            00BC                .=0
                    0000                .IIF    NB,WCB$L_WLFL,  WCB$L_WLFL:
00000004            0000                        .BLKL   1
                    0004                .IIF    NB,WCB$L_WLBL,  WCB$L_WLBL:
00000008            0004                        .BLKL   1
                    0008                .IIF    NB,WCB$W_SIZE,  WCB$W_SIZE:
0000000A            0008                        .BLKW   1
                    000A                .IIF    NB,WCB$B_TYPE,  WCB$B_TYPE:
0000000B            000A                        .BLKB   1
                    000B                .IIF    NB,WCB$B_ACCESS,        WCB$B_ACCESS:
0000000C            000B                        .BLKB   1
                    000C                .IIF    NB,WCB$L_PID,   WCB$L_PID:
0000000E            000C                        .BLKB   2
                    000E                .IIF    NB,WCB$W_REFCNT,        WCB$W_REFCNT:
```

```
                00000010  000E                    .BLKW   1
                          0010            .IIF    NB,WCB$L_ORGUCB,        WCB$L_ORGUCB:
                00000014  0010                    .BLKL   1
                          0014            .IIF    NB,WCB$W_ACON,  WCB$W_ACON:
                00000016  0014                    .BLKW   1
                          0016            .IIF    NB,WCB$W_NMAP,  WCB$W_NMAP:
                00000018  0016                    .BLKW   1
                          0018            .IIF    NB,WCB$L_FCB,   WCB$L_FCB:
                0000001C  0018                    .BLKL   1
                          001C            .IIF    NB,WCB$L_RVT,   WCB$L_RVT:
                00000020  001C                    .BLKL   1
                          0020            .IIF    NB,WCB$L_STVBN, WCB$L_STVBN:
                00000024  0020                    .BLKL   1
                          0024            .IIF    NB,WCB$C_MAP,   WCB$C_MAP:
                          0024            .IIF    NB,WCB$K_MAP,   WCB$K_MAP:
                          0024            .IIF    NB,WCB$C_LENGTH,        WCB$C_LENGTH:
                          0024            .IIF    NB,WCB$K_LENGTH,        WCB$K_LENGTH:
                          0024            .IIF    NB,WCB$W_P1_COUNT,      WCB$W_P1_COUNT:
                00000026  0024                    .BLKW   1
                          0026            .IIF    NB,WCB$L_P1_LBN,        WCB$L_P1_LBN:
                0000002A  0026                    .BLKL   1
                          002A            .IIF    NB,WCB$W_P2_COUNT,      WCB$W_P2_COUNT:
                0000002C  002A                    .BLKW   1
                          002C            .IIF    NB,WCB$L_P2_LBN,        WCB$L_P2_LBN:
                00000030  002C                    .BLKL   1
                00000000  0030          . = 0
                          0000          .IIF    NB,WCB$W_COUNT, WCB$W_COUNT:
                00000002  0000                    .BLKW   1
                          0002          .IIF    NB,WCB$L_LBN,   WCB$L_LBN:
                00000006  0002                    .BLKL   1
                00000000  0006          . = 0
                FFFFFFFA  0000                    .BLKB   -6
                          FFFA          .IIF    NB,WCB$W_PREVCOUNT,     WCB$W_PREVCOUNT:
                FFFFFFFC  FFFA                    .BLKW   1
                          FFFC          .IIF    NB,WCB$L_PREVLBN,       WCB$L_PREVLBN:
                00000000  FFFC                    .BLKL   1
                          0000          .RESTORE
                          0000    124   $WQHDEF                         ; WAIT QUEUE HEADER DEFINITIONS
                          0000          .SAVE   LOCAL_BLOCK
                          0000          .PSECT  $ABS$,ABS
                00000000  FFFC          .=0
                          0000          .IIF    NB,WQH$L_WQFL,  WQH$L_WQFL:
                00000004  0000                    .BLKL   1
                          0004          .IIF    NB,WQH$L_WQBL,  WQH$L_WQBL:
                00000008  0004                    .BLKL   1
                          0008          .IIF    NB,WQH$W_WQCNT, WQH$W_WQCNT:
                0000000A  0008                    .BLKW   1
                          000A          .IIF    NB,WQH$W_WQSTATE,       WQH$W_WQSTATE:
                0000000C  000A                    .BLKW   1
                          000C          .IIF    NB,WQH$C_LENGTH,        WQH$C_LENGTH:
                          000C          .IIF    NB,WQH$K_LENGTH,        WQH$K_LENGTH:
                          0000          .RESTORE
                          0000    125
                          0000    126 ;
                          0000    127 ; OWN STORAGE:
                          0000    128 ;
                00000000  129           .PSECT  DATA, SHR, NOEXE, NOWRT, LONG
```

```
                                  0000   130          MODNAM  IOPOST
          54 53 4F 50 4F 49 00'   0000        $MODULE:        .ASCIC  \IOPOST\
                              06  0000
   52 4F 52 52 45 20 50 43 41 00'  0007   131 AACPERR:.ASCIC  .ACP ERROR.
                              09  0007
                              00000000   132          .PSECT  CODE, SHR, EXE, LONG, NOWRT
                                  0000   133 PRITBL:                                  ; TABLE OF PRIORITY INCR CLASSES
                              01  0000   134          .BYTE   PRI$_IOCOM               ; 0 => DIRECT WRITE
                              03  0001   135          .BYTE   PRI$_TOCOM               ; 1 => BUFFERED WRITE
                              01  0002   136          .BYTE   PRI$_IOCOM               ; 2 => DIRECT READ
                              04  0003   137          .BYTE   PRI$_TICOM               ; 3 => BUFFERED READ
```

```
                                0004          .SBTTL  I/O COMPLETION POSTING
                                0004  ;++
                                0004  ; FUNCTIONAL DESCRIPTION:
                                0004  ;
                                0004  ;       IOC$IOPOST IS INITIATED BY TRIGGERING AN IPL$_IOPOST SOFTWARE
                                0004  ;       INTERRUPT AFTER PLACING A COMPLETED I/O PACKET IN THE IOPOST
                                0004  ;       QUEUE.  IOC$IOPOST PERFORMS ALL APPROPRIATE COMPLETION ACTIVITY
                                0004  ;       REQUIRED FOR THE PACKET EITHER DIRECTLY OR BY QUEUEING KERNEL
                                0004  ;       ASTS TO CONCLUDE PROCESSING IN THE CONTEXT OF THE PROCESS
                                0004  ;       WHEN REQUIRED.
                                0004  ;
                                0004  ; CALLING SEQUENCE:
                                0004  ;
                                0004  ;       SOFTINT #IPL$_IOPOST
                                0004  ;
                                0004  ; INPUT PARAMETERS:
                                0004  ;
                                0004  ;       NONE
                                0004  ;
                                0004  ; IMPLICIT INPUTS:
                                0004  ;
                                0004  ;       IOC$GL_PSFL - IOPOSTING QUEUE
                                0004  ;
                                0004  ; OUTPUT PARAMETERS:
                                0004  ;
                                0004  ;       NONE
                                0004  ;
                                0004  ;--
                                0004
                                0004          .ENABL  LSB
                                0004  IOC$IOPOST::                                  ; I/O POSTING INTERRUPT
          7E    54    7D        0004          MOVQ    R4,-(SP)                      ; SAVE
          7E    52    7D        0007          MOVQ    R2,-(SP)                      ; NORMAL
          7E    50    7D        000A          MOVQ    R0,-(SP)                      ; REGISTERS
   55   00000000'FF    0F        000D  IOPOST: REMQUE  @IOC$GL_PSFL,R5               ; GET HEAD OF POST QUEUE
                11    1C        0014          BVC     10$                           ; QUEUE NOT YET EMPTY
          50    8E    7D        0016          MOVQ    (SP)+,R0                      ; RESTORE
          52    8E    7D        0019          MOVQ    (SP)+,R2                      ; REGISTERS
          54    8E    7D        001C          MOVQ    (SP)+,R4                      ; AND EXIT
                      02        001F          REI                                   ; IF QUEUE EMPTY
                                0020
             00C5     31        0020  5$:     BRW     VIRTUAL                       ; PROCESS VIRTUAL I/O COMPLETION
                                0023
                61    16        0023  7$:     JSB     (R1)                          ; CALL END ACTION ROUTINE
                E6    11        0025          BRB     IOPOST                        ;
                                0027
      51    0C A5     D0        0027  10$:    MOVL    IRP$L_PID(R5),R1              ; GET PID/END ACTION ADDRESS
                F6    19        002B          BLSS    7$                            ; BR IF END ACTION ADDRESS
                                002D                                                ; (SYSTEM SPACE ADDRESSES ARE NEGATIVE)
          51    51    3C        002D          MOVZWL  R1,R1                         ; GET PROCESS INDEX
   54   00000000'FF41  D0        0030          MOVL    @L^SCH$GL_PCBVEC[R1],R4       ; And translate to PCB address
      03 2A A5    00  E1        0038          BBC     #IRP$V_BUFIO,IRP$W_STS(R5),12$  ; IF CLEAR, DIRECT I/O
             0056     31        003D          BRW     BUFIO                         ; BUFFERED I/O
            3E A4     B6        0040  12$:    INCW    PCB$W_DIOCNT(R4)              ; UPDATE DIRECT I/O COUNT
      53    2C A5     D0        0043          MOVL    IRP$L_SVAPTE(R5),R3           ; GET ADDRESS OF FIRST PTE
                                0047
                                0047          ASSUME  IRP$V_PAGIO LE 7
```

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                                0047   196          ASSUME  IRP$V_SWAPIO LE 7
                2A A5    44 8F   93  0047   197          BITB    #<IRP$M_PAGIO ! IRP$M_SWAPIO>,IRP$W_STS(R5) ; PAGIO OR SWAPIO?
                            37   12  004C   198          BNEQ    PAGIO_OR_SWAPIO
                                0004E  199
                                0004E  200 ;
                                0004E  201 ; DIRECT I/O COMPLETION
                                0004E  202 ;
                                0004E  203
                            53   D5  004E   204 DIRIO:   TSTL    R3                      ; PTE ADDRESS VALID?
                            29   13  0050   205          BEQL    14$                     ; IF EQL NO PAGES TO UNLOCK
                   51    32 A5   3C  0052   206          MOVZWL  IRP$W_BCNT(R5),R1       ; GET REQUESTED TRANSFER BYTE COUNT
                   52    30 A5   3C  0056   207          MOVZWL  IRP$W_BOFF(R5),R2       ; GET BYTE OFFSET IN PAGE
             0B 2A A5     04   E1  005A   208          BBC     #IRP$V_VIRTUAL,IRP$W_STS(R5),UNLOCK ; BRANCH IF NOT VIRTUAL I/O
                BD 34 A5     E9  005F   209          BLBC    IRP$L_IOST1(R5),5$      ; BRANCH IF ERROR IN VIRTUAL REQUEST
             3E A5    36 A5   B1  0063   210          CMPW    IRP$L_IOST1+2(R5),IRP$W_OBCNT(R5) ; IF COMPLETED ORIGINAL BYTE COUNT
                                0068   211                                          ; THEN NO SPECIAL VIRTUAL PROCESSING
                            B6   12  0068   212          BNEQ    5$                      ; OTHERWISE DO THE SEGMENTED COMPLETION
           51    01FF C142     9E  006A   213 UNLOCK:  MOVAB   511(R1)[R2],R1          ; COMBINE OFFSET AND COUNT AND ROUND
          51    51    F7 8F    78  0070   214          ASHL    #-VA$S_BYTE,R1,R1       ; CONVERT TO NUMBER OF PAGES
              00000000'EF      16  0075   215          JSB     L^MMG$UNLOCK            ; Unlock pages
             03 2A A5     0B   E1  007B   216 14$:     BBC     #IRP$V_EXTEND,IRP$W_STS(R5),15$ ; BRANCH IF NO IRPE'S ATTACHED
                       02FE   30  0080   217          BSBW    UNLOCK_MORE             ; UNLOCK AREAS DESCRIBED IN IRPE'S
                                0083   218 15$:                                       ; REFERENCE LABEL
                            30   11  0083   219          BRB     30$                     ;
                                0085   220
                                0085   221 ;
                                0085   222 ;       PAGE I/O OR SWAP I/O COMPLETION
                                0085   223 ;
                                0085   224
                                0085   225 PAGIO_OR_SWAPIO:
                                0085   226          ERRSUP_S
                00000000'EF      DF  0085                        PUSHAL  $MODULE
                            00   DD  008B                        PUSHL   #0
                            01   DD  008D                        PUSHL   #$ER
             00000000'EF    03   FB  008F                        CALLS   #3, DS_ERRSUP
                                0096   227 ;
                                0096   228 ; BUFFERED I/O COMPLETION
                                0096   229 ;
                                0096   230
                         3A A4   B6  0096   231 BUFIO:   INCW    PCB$W_BIOCNT(R4)        ; UPDATE BUFFERED I/O COUNT
             03 2A A5     0C   E1  0099   232          BBC     #IRP$V_FILACP,IRP$W_STS(R5),NOTACP ; BR IF NOT ACP I/O
                         3E A4   B6  009E   233          INCW    PCB$W_DIOCNT(R4)        ; RESTORE DIRECT I/O COUNT
                                00A1   234 NOTACP:                                     ;
                   50    2C A5   D0  00A1   235          MOVL    IRP$L_SVAPTE(R5),R0     ; ANY BUFFER SPECIFIED?
                            0E   13  00A5   236          BEQL    30$                     ; IF EQL NO
             18 A5    01E8'CF     9E  00A7   237          MOVAB   W^BUFPOST,ACB$L_KAST(R5) ; ASSUME READ FUNCTION
               09 2A A5     01   E0  00AD   238          BBS     #IRP$V_FUNC,IRP$W_STS(R5),40$  ; IF SET, READ FUNCTION
                      FF4B'   30   00B2   239          BSBW    EXE$DEANONPAGED         ; DEALLOCATE WRITE BUFFER
             18 A5    02BE'CF     9E  00B5   240 30$:    MOVAB   W^DIRPOST,ACB$L_KAST(R5) ; SET SPECIAL KERNEL AST ADDRESS
50           2A A5    02   00    EF  00BB   241 40$:    EXTZV   #IRP$V_BUFIO,#2,IRP$W_STS(R5),R0  ; GET PACKET TYPE
               03 2A A5     09   E0  00C1   242          BBS     #IRP$V_TERMIO,IRP$W_STS(R5),50$ ; BR IF TERMINAL I/O
                         50   01   AA  00C6   243          BICW    #1,R0                   ; ELSE TREAT AS NORMAL I/O COMPLETION
                                00C9   244 50$:                                        ; FOR PRIORITY INCREMENT SELECTION
                   51    0C A5   D0  00C9   245          MOVL    IRP$L_PID(R5),R1        ; PROCESS IDENTIFICATION
                52    FF2E CF40   9A  00CD   246          MOVZBL  PRITBL[R0],R2           ; SET PRIORITY INCREMENT CLASS
                   53    22 A5   9A  00D3   247          MOVZBL  IRP$B_EFN(R5),R3        ; GET EVENT FLAG NUMBER
                         FF26'   30  00D7   248          BSBW    SCH$POSTEF              ; AND POST IT
```

```
                        00DA   249 IOPOST_KAST:
 0B A5   80 8F    88    00DA   250          BISB    #^X80,ACB$B_RMOD(R5)    ; SET INTERNAL AST FLAG
   00000000'EF    16    00DF   251          JSB     SCH$QAST                ; NOW QUEUE THE KERNEL AST              [04]
          FF25    31    00E5   252          BRW     IOPOST                  ; GET NEXT PACKET TO POST
                        00E8   253          .DSABL  LSB
                        00E8   254
```

```
                                00E8   256          .SBTTL  VIRTUAL I/O COMPLETION
                                00E8   257 ;
                                00E8   258 ; VIRTUAL I/O COMPLETION
                                00E8   259 ;
                                00E8   260 ; CALLING SEQUENCE:
                                00E8   261 ;
                                00E8   262 ;       BRW     VIRTUAL
                                00E8   263 ;
                                00E8   264 ; INPUTS:
                                00E8   265 ;
                                00E8   266 ;       R1 = REQUESTED BYTE COUNT, POSSIBLY DIFFERENT FROM TRANSFERRED
                                00E8   267 ;            BYTE COUNT FOR MAGTAPE
                                00E8   268 ;       R2 = IRP$W_BOFF CONTENTS
                                00E8   269 ;       R3 = SVAPTE OF START OF TRANSFER
                                00E8   270 ;
                                00E8   271 ; OUTPUTS:
                                00E8   272 ;
                                00E8   273 ;       BRANCHES TO UNLOCK, PRESERVING R1,R2,R3
                                00E8   274 ;       OR BRANCHES TO IOPOST
                                00E8   275 ;
                                00E8   276
                                00E8   277          .ENABL  LSB
                                00E8   278
                                00E8   279 VIRTUAL:                                 ; VIRTUAL I/O FUNCTION
          50    36 A5    3C     00E8   280          MOVZWL  IRP$L_IOST1+2(R5),R0    ; GET ACTUAL NUMBER OF BYTES TRANSFERED
          3C A5    50    A0     00EC   281          ADDW    R0,IRP$W_ABCNT(R5)      ; ACCUMULATE TOTAL BYTES TRANSFERED
    50    50     F7 8F    78     00F0   282          ASHL    #-VA$S_BYTE,R0,R0       ; CALCULATE NUMBER OF BLOCKS TRANSFERED
          40 A5    50    C0     00F5   283          ADDL    R0,IRP$L_SEGVBN(R5)     ; CALCULATE DISK ADDRESS OF NEXT SEGMENT
       36 A5    3C A5    B0     00F9   284          MOVW    IRP$W_ABCNT(R5),IRP$L_IOST1+2(R5) ; SET ACCUMULATED BYTES TRANSFERED
             33 34 A5    E9     00FE   285          BLBC    IRP$L_IOST1(R5),20$     ; IF LBC I/O ERROR
          50    1C A5    D0     0102   286          MOVL    IRP$L_UCB(R5),R0        ; GET ADDRESS OF DEVICE UCB
       1F 34 A0    00'   E0     0106   287          BBS     S^#DEV$V_SQD,UCB$L_DEVCHAR(R0),10$ ; IF SET, SEQUENTIAL DEVICE
       3E A5    3C A5    A3     010B   288          SUBW3   IRP$W_ABCNT(R5),IRP$W_OBCNT(R5),- ; CALCULATE BYTES REMAINING
                32 A5           0110   289                  IRP$W_BCNT(R5)          ;
                   16    13     0112   290          BEQL    10$                     ; IF EQL NONE
    51    51     F7 8F    78     0114   291          ASHL    #-VA$S_BYTE,R1,R1       ; CALCULATE NUMBER OF PAGES REQUESTED
                           0119   292 QNXTSEG:
          2C A5    6341    DE     0119   293          MOVAL   (R3)[R1],IRP$L_SVAPTE(R5) ; SET ADDRESS OF NEXT PTE ENTRY
             53    55      D0     011E   294          MOVL    R5,R3                   ; COPY I/O REQUEST PACKET ADDRESS
          55    1C A3    D0     0121   295          MOVL    IRP$L_UCB(R3),R5        ; GET ADDRESS OF DEVICE UCB
                   25    10     0125   296          BSBB    IOC$QNXTSEG             ; QUEUE THE NEXT VIRTUAL SEGMNET
                 FEE3    31     0127   297 5$:      BRW     IOPOST
                         012A   298 ;
                         012A   299 ; ALL SEGMENTS OF THIS TRANSFER ARE COMPLETE
                         012A   300 ;
          51    3E A5    3C     012A   301 10$:     MOVZWL  IRP$W_OBCNT(R5),R1      ; GET ORIGINAL BYTE COUNT
          53    44 A5    D0     012E   302          MOVL    IRP$L_DIAGBUF(R5),R3    ; GET ORIGINAL PAGE TABLE ADDRESS
                FF35    31     0132   303          BRW     UNLOCK                  ;
                         0135   304
                         0135   305 ;
                         0135   306 ; I/O OPERATION ENDED WITH AN UNSUCCESSFUL STATUS
                         0135   307 ;
                         0135   308 ;               IF THE DEVICE IS A SEQUENTIAL DEVICE, THEN THE I/O PACKET IS
                         0135   309 ;               MERELY SENT TO THE ACP FOR NOTIFICATION OF THE ERROR.
                         0135   310 ;
                         0135   311 ;               IF THE DEVICE IS A RANDOM DEVICE, THEN THE VIRTUAL BLOCK NUMBER
                         0135   312 ;               STORED IN IRP$L_SEGVBN IS THE BLOCK THAT HAS AN ERROR.
```

```
                                0135   313 ;
                                0135   314
          53    55    D0        0135   315 20$:    MOVL    R5,R3                      ; COPY IRP ADDRESS
            3E  A4    B7        0138   316         DECW    PCB$W_DIOCNT(R4)           ; ADJUST DIRECT I/O COUNT
       2A A3    10    AA        013B   317         BICW    #IRP$M_VIRTUAL,IRP$W_STS(R3) ; CLEAR VIRTUAL I/O FLAG
    2C A3    44 A3    D0        013F   318         MOVL    IRP$L_DIAGBUF(R3),IRP$L_SVAPTE(R3) ; RESET PAGE TABLE ADDRESS
       52    3E A3    3C        0144   319         MOVZWL  IRP$W_OBCNT(R3),R2         ; GET ORIGINAL BYTE COUNT
                5B    10        0148   320         BSBB    IOC$QTOACP                 ; QUEUE PACKET TO ACP
                DB    11        014A   321         BRB     5$
                                014C   322
                                014C   323         .DSABL  LSB
```

```
                                014C   325          .SBTTL  QUEUE NEXT SEGMENT
                                014C   326 ;
                                014C   327 ; FUNCTIONAL DESCRIPTION:
                                014C   328 ;
                                014C   329 ;       IOC$QNXTSEG PERFORMS THE FUNCTION OF QUEUEING THE NEXT
                                014C   330 ;       SEGMENT OF A VIRTUAL I/O REQUEST THAT DID NOT MAP TO A
                                014C   331 ;       SINGLE CONTIGUOUS I/O REQUEST.
                                014C   332 ;
                                014C   333 ; CALLING SEQUENCE:
                                014C   334 ;
                                014C   335 ;       BSBW    IOC$QNXTSEG
                                014C   336 ;
                                014C   337 ; INPUTS:
                                014C   338 ;
                                014C   339 ;       R3 = I/O REQUEST PACKET ADDRESS
                                014C   340 ;       R4 = PCB ADDRESS ASSOCIATED WITH THE PID IN THE PACKET
                                014C   341 ;       R5 = UCB ADDRESS OF THE ASSOCIATED DEVICE
                                014C   342 ;
                                014C   343 ; OUTPUTS:
                                014C   344 ;
                                014C   345 ;       R4 NOT PRESERVED
                                014C   346 ;
                                014C   347 IOC$QNXTSEG::
          52    18 A3    D0     014C   348          MOVL    IRP$L_WIND(R3),R2       ; GET ADDRESS OF MAPPING WINDOW
          51    32 A3    3C     0150   349          MOVZWL  IRP$W_BCNT(R3),R1       ; GET SIZE OF NEXT SEGMENT
          50    40 A3    D0     0154   350          MOVL    IRP$L_SEGVBN(R3),R0     ; GET STARTING VIRTUAL BLOCK NUMBER
                                0158   351 ;
                                0158   352 ; ALTERNATE ENTRY TO IOC$QNXTSEG:
                                0158   353 ;
                                0158   354 ;       BSBW    IOC$QNXTSEG1
                                0158   355 ;
                                0158   356 ; ADDITIONAL INPUTS:
                                0158   357 ;
                                0158   358 ;       R0 = VIRTUAL BLOCK NUMBER OF START OF NEXT SEGMENT
                                0158   359 ;       R1 = DESIRED BYTE COUNT OF NEXT SEGMENT
                                0158   360 ;       R2 = WINDOW ADDRESS
                                0158   361 ;
                                0158   362 IOC$QNXTSEG1::
             3E A4    B7     0158   363          DECW    PCB$W_DIOCNT(R4)        ; ADJUST THE DIRECT I/O COUNT
   00000000'EF    16     015B   364          JSB     L^IOC$MAPVBLK           ; Map virtual to logical block
32 A3    32 A3    52     A3     0161   365          SUBW3   R2,IRP$W_BCNT(R3),IRP$W_BCNT(R3) ; CALCULATE SIZE OF NEXT SEGMENT
                  3C     13     0167   366          BEQL    30$             ; IF EQL TOTAL MAP FAILURE
          50      51     D0     0169   367          MOVL    R1,R0           ; COPY STARTING LOGICAL BLOCK NUMBER
       52    32 A3    3C     016C   368          MOVZWL  IRP$W_BCNT(R3),R2       ; GET TRANSFER BYTE COUNT
                  52     D7     0170   369          DECL    R2              ; ROUND DOWN AND...
   52     52    F7 8F    78     0172   370          ASHL    #-VA$S_BYTE,R2,R2       ; SHIFT DOWN FOR BLOCK COUNT - 1
          52      51     C0     0177   371          ADDL    R1,R2           ; COMPUTE ENDING BLOCK NUMBER
                  13     1F     017A   372          BCS     25$             ; BRANCH ON OVERFLOW
      0084 C5     52     D1     017C   373          CMPL    R2,UCB$L_MAXBLOCK(R5)   ; AND CHECK AGAINST DEVICE SIZE
                  0C     1E     0181   374          BGEQU   25$             ; BRANCH IF NOT LEGAL
   00000000'EF    16     0183   375          JSB     L^IOC$CVTLOGPHY         ; Convert logical to physical block
   00000000'EF    17     0189   376          JMP     L^EXE$INSIOQ            ; Insert I/O packet in device queue
                                018F   377                                  ; AND RETURN
                                018F   378 ;
                                018F   379 ; TO HERE IF THE VIRTUAL BLOCKS MAP OFF THE END OF THE VOLUME. COMPLETE THE
                                018F   380 ; I/O WITH AN ERROR. WE QUEUE THE PACKET FOR PROCESSING, RATHER THAN WANDERING
                                018F   381 ; OFF INTO THE COMPLETION CODE BECAUSE THIS IS A GENERALLY CALLABLE ROUTINE.
```

```
                                  018F   ;
          34 A3   0000'8F   3C    018F   25$:    MOVZWL  #SS$_ILLBLKNUM,IRP$L_IOST1(R3) ; SET ILLEGAL BLOCK NUMBER STATUS
                     38 A3   D4    0195           CLRL    IRP$L_IOST2(R3)          ; ZERO 2ND I/O STATUS LONGWORD
        00000000'FF    63   0E    0198           INSQUE  (R3),@IOC$GL_PSBL        ; INSERT AT TAIL OF I/O POST QUEUE
                       03   12    019F           BNEQ    26$                      ; BRANCH IF NOT EMPTY
                                  01A1           SOFTINT #IPL$_IOPOST             ; WAKE UP I/O COMPLETION
                 14    04   DA    01A1                   MTPR    #IPL$_IOPOST,S^#PR$_SIRR
                            05    01A4   26$:    RSB
                                  01A5
                                  01A5   30$:
                                  01A5   ;
                                  01A5   ; ALTERNATE ENTRY TO IOC$WAKACP:
                                  01A5   ;
                                  01A5   ;       BSBW    IOC$QTOACP
                                  01A5   ;
                                  01A5   ; INPUTS:
                                  01A5   ;
                                  01A5   ;       R2 = DESIRED BYTE COUNT
                                  01A5   ;       R3 = IRP ADDRESS
                                  01A5   ;       PCB$W_DIOCNT(R4) ALREADY DECREMENTED
                                  01A5   ;
                                  01A5   IOC$QTOACP:
             32 A3    52   B0    01A5           MOVW    R2,IRP$W_BCNT(R3)        ; SET REMAINING BYTES TO TRANSFER
             52    18 A3   D0    01A9           MOVL    IRP$L_WIND(R3),R2        ; GET WINDOW ADDRESS
             0B A2    02   E0    01AD           BBS     #WCB$V_NOTFCP,WCB$B_ACCESS(R2),- ; IF SET THEN
                      20         01B1                   NOTFCPWCB                ; NOT FCP WINDOW
             52    1C A3   D0    01B2           MOVL    IRP$L_UCB(R3),R2         ; GET ADDRESS OF DEVICE UCB
                                  01B6   ;
                                  01B6   ; FUNCTIONAL DESCRIPTION:
                                  01B6   ;
                                  01B6   ;       SUBROUTINE TO QUEUE AN I/O PACKET FOR AN ACP PROCESS AND WAKE
                                  01B6   ;       THE PROCESS IF ITS QUEUE WAS PREVIOUSLY EMPTY.
                                  01B6   ;
                                  01B6   ; CALLING SEQUENCE:
                                  01B6   ;
                                  01B6   ;       BSBW    IOC$WAKACP
                                  01B6   ;
                                  01B6   ; INPUTS:
                                  01B6   ;
                                  01B6   ;       R2 = DEVICE UCB ADDRESS
                                  01B6   ;       R3 = I/O REQUEST PACKET ADDRESS
                                  01B6   ;
                                  01B6   ; OUTPUTS:
                                  01B6   ;
                                  01B6   ;       R4 ALTERED
                                  01B6   ;
                                  01B6   IOC$WAKACP::                             ; QUEUE I/O PACKET AND WAKE ACP PROCESS
                                  01B6           DSBINT  #IPL$_SYNCH              ; SYNCHRONIZE ACCESS TO SYSTEM DATA BASE
                 7E    12   DB    01B6                   MFPR    S^#PR$_IPL,-(SP)
                 12    07   DA    01B9                   MTPR    #IPL$_SYNCH,S^#PR$_IPL
                                  01BC           BUG_CHECK NONEXSTACP             ; NONEXISTENT ACP PROCESS
              00000000'9F    16    01BC           JSB     @#BUG$CHECK
2C 50 43 41 54 53 58 45 4E 4F 4E 00'  01C2           .ASCIC  "NONEXSTACP,"
                            0B    01C2
                                  01CE   10$:    ENBINT                           ; RESTORE SAVED IPL
                 12    8E   DA    01CE                   MTPR    (SP)+,S^#PR$_IPL
                            05    01D1           RSB                              ;
```

```
                                01D2   432 ;
                                01D2   433 ; WINDOW IS NOT AN FCP WINDOW, ONLY USED FOR BOOT TIME INTIALIZED WINDOWS
                                01D2   434 ; FOR CONTIGUOUS FILES.  IT IS NOT POSSIBLE TO NEED TO TURN SUCH A WINDOW.
                                01D2   435 ;
                                01D2   436 NOTFCPWCB:
                                01D2   437          BUG_CHECK NOTFCPWCB,FATAL
                  00000000'9F    16  01D2                JSB     a#BUG$CHECK
46 2C 42 43 57 50 43 46 54 4F 4E 00'  01D8                .ASCIC  "NOTFCPWCB,FATAL"
                        4C 41 54 41   01E4
                              0F      01D8
```

```
                                01E8   439          .SBTTL  BUFFERED READ COMPLETION AST ROUTINE
                                01E8   440 ;++
                                01E8   441 ; FUNCTIONAL DESCRIPTION:
                                01E8   442 ;
                                01E8   443 ;       BUFPOST PERFORMS ALL NECESSARY COMPLETION OPERATIONS REQUIRED
                                01E8   444 ;       FOR A BUFFERED READ OPERATION IN THE CONTEXT OF THE PROCESS
                                01E8   445 ;       ISSUING THE I/O REQUEST.
                                01E8   446 ;
                                01E8   447 ; CALLING SEQUENCE:
                                01E8   448 ;
                                01E8   449 ;       JSB     BUFPOST
                                01E8   450 ;
                                01E8   451 ; INPUT PARAMETERS:
                                01E8   452 ;
                                01E8   453 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                                01E8   454 ;       R5 = IRP/AST CONTROL BLOCK.
                                01E8   455 ;
                                01E8   456 ; IMPLICIT INPUTS:
                                01E8   457 ;
                                01E8   458 ;       SCH$GL_CURPCB - POINTER TO PCB OF CURRENT PROCESS
                                01E8   459 ;--
                                01E8   460
                                01E8   461 BUFPOST:                                     ; BUFFERED READ COMPLETION
                    00E0 8F     BB  01E8   462          PUSHR   #^M<R5,R6,R7>           ; SAVE REGISTERS
                       56 2C A5 D0  01EC   463          MOVL    IRP$L_SVAPTE(R5),R6     ; GET ADDRESS OF I/O BUFFER
                       57 32 A5 3C  01F0   464          MOVZWL  IRP$W_BCNT(R5),R7       ; GET COUNT OF BYTES OR DESCRIPTORS
                 4A 2A A5  03 E1    01F4   465          BBC     #IRP$V_COMPLX,IRP$W_STS(R5),40$ ;IF CLR, NOT COMPLEX BUFFER FORMAT
                 4D 2A A5  05 E0    01F9   466          BBS     #IRP$V_CHAINED,IRP$W_STS(R5),50$ ;IF SET ,CHAINED BUFFERS
                       56  66 D0    01FE   467          MOVL    (R6),R6                 ; GET ADDRESS OF FIRST BUFFER DESCRIPTOR
                    50 02 A6 3C     0201   468 10$:     MOVZWL  2(R6),R0                ; GET COUNT OF BYTES TO TRANSFER
                          32 13     0205   469          BEQL    30$                     ; IF EQL NONE THIS DESCRIPTOR
                    51 04 A6 D0     0207   470          MOVL    4(R6),R1                ; GET ADDRESS OF USER BUFFER
                       50  51 C0    020B   471          ADDL    R1,R0                   ; CALCULATE ENDING ADDRESS OF BUFFER
                 51 01FF 8F AA      020E   472          BICW    #VA$M_BYTE,R1           ; TRUNCATE ADDRESS TO PAGE BOUNDARY
                       50  51 C2    0213   473          SUBL    R1,R0                   ; COMPUTE NUMBER OF BYTES TO PROBE
                       54  66 3C    0216   474          MOVZWL  (R6),R4                 ; GET OFFSET TO DATA AREA
                 53 FE00 8F 32      0219   475          CVTWL   #-^X200,R3              ; SET ADDITION CONSTANT
                                    021E   476 20$:     IFNOWRT R0,(R1),35$,(R6)[R4]    ; CAN BUFFER BE WRITTEN?
                 61 50 6644 0D      021E                        PROBEW  (R6)[R4],R0,(R1)
                          1C 13     0223                        BEQL    35$
                       51  53 C2    0225   477          SUBL    R3,R1                   ; UPDATE ADDRESS OF BUFFER
                    50 6043 3E      0228   478          MOVAW   (R0)[R3],R0             ; UPDATE REMAINING LENGTH
                          F0 14     022C   479          BGTR    20$                     ; IF GEQ MORE TO CHECK
              04 B6 01 A644 02 A6 28022E   480          MOVC    2(R6),1(R6)[R4],#4(R6)  ; MOVE DATA TO USER BUFFER
                       55  6E D0    0236   481          MOVL    (SP),R5                 ; RESTORE ADDRESS OF I/O PACKET
                       56  08 C0    0239   482 30$:     ADDL    #8,R6                   ; ADVANCE TO NEXT BUFFER DESCRIPTOR
                          C2 57 F5  023C   483          SOBGTR  R7,10$                  ; ANY MORE DESCRIPTORS TO PROCESS?
                          72 11     023F   484          BRB     130$                    ;
                          6D 11     0241   485 35$:     BRB     120$                    ; CONTINUE
                       0103 30      0243   486 40$:     BSBW    MOVBUF                  ; MOVE BUFFER TO USER
                       55  6E D0    0246   487          MOVL    (SP),R5                 ; RETRIEVE ADDRESS OF I/O PACKET
                          68 11     0249   488          BRB     130$                    ;
                       50  57 D0    024B   489 50$:     MOVL    R7,R0                   ; SET LENGTH OF USER BUFFER
                    51 04 A6 D0     024E   490          MOVL    4(R6),R1                ; SET ADDRESS OF USER BUFFER
                       50  51 C0    0252   491          ADDL    R1,R0                   ; CALCULATE END OF USER BUFFER
                 51 01FF 8F AA      0255   492          BICW    #VA$M_BYTE,R1           ; TRUNCATE TO PAGE BOUNDARY
                       50  51 C2    025A   493          SUBL    R1,R0                   ; COMPUTE NUMBER OF BYTES TO PROBE
```

```
52   0B A5   02   00   EF  025D   494          EXTZV   #0,#2,IRP$B_RMOD(R5),R2 ; GET REQUEST ACCESS MODE
        53   FE00 8F   32  0263   495          CVTWL   #-^X200,R3               ; SET ADDITION CONSTANT
                            0268   496 60$:    IFNOWRT R0,(R1),90$,R2           ; CAN BUFFER BE WRITTEN?
        61   50   52   0D  0268                        PROBEW  R2,R0,(R1)
                  2D   13  026C                        BEQL    90$
             51   53   C2  026E   497          SUBL    R3,R1                    ; UPDATE ADDRESS OF BUFFER
          50   6043   3E  0271   498          MOVAW   (R0)[R3],R0              ; CALCULATE NEW LENGTH
                  F1   14  0275   499          BGTR    60$                      ; IF GEQ MORE TO PROBE
        53   04 A6   D0  0277   500          MOVL    4(R6),R3                 ; GET STARTING ADDRESS OF USER BUFFER
        0C A6   57   B1  027B   501 70$:     CMPW    R7,CXB$W_LENGTH(R6)      ; REMAINING LENGTH LARGER THAN DATA AREA?
                  04   1E  027F   502          BGEQU   80$                      ; IF GEQU YES
        0C A6   57   B0  0281   503          MOVW    R7,CXB$W_LENGTH(R6)      ; TRUNCATE LENGTH OF DATA AREA
   63   96   0C A6   28  0285   504 80$:     MOVC    CXB$W_LENGTH(R6),a(R6)+,(R3) ; MOVE DATA TO USER BUFFER
             55   6E   D0  028A   505          MOVL    (SP),R5                  ; RETRIEVE ADDRESS OF I/O PACKET
        57   08 A6   A2  028D   506          SUBW    CXB$W_LENGTH-4(R6),R7    ; REDUCE REMAINING BYTES TO TRANSFER
                  0B   13  0291   507          BEQL    100$                     ; IF EQL DONE
        56   0C A6   D0  0293   508          MOVL    CXB$L_LINK-4(R6),R6      ; GET ADDRESS OF NEXT BUFFER IN CHAIN
                  E2   12  0297   509          BNEQ    70$                      ; IF NEQ MORE TO GO
                  03   11  0299   510          BRB     100$                     ;
                00DE   30  029B   511 90$:     BSBW    ACCVIO                   ; SET ACCESS VIOLATION
        50   2C A5   D0  029E   512 100$:    MOVL    IRP$L_SVAPTE(R5),R0      ; GET ADDRESS OF FIRST BUFFER
        56   10 A0   D0  02A2   513 110$:    MOVL    CXB$L_LINK(R0),R6        ; GET ADDRESS OF NEXT BUFFER
                  0F   13  02A6   514          BEQL    140$                     ; IF EQL NONE
               FD55'   30  02A8   515          BSBW    EXE$DEANONPAGED          ; DEALLOCATE BUFFER
             50   56   D0  02AB   516          MOVL    R6,R0                    ; SET ADDRESS OF NEXT BUFFER
                  F2   11  02AE   517          BRB     110$                     ;
                00C9   30  02B0   518 120$:    BSBW    ACCVIO                   ; SET ACCESS VIOLATION STATUS
        50   2C A5   D0  02B3   519 130$:    MOVL    IRP$L_SVAPTE(R5),R0      ; GET ADDRESS OF BUFFER TO RELEASE
               FD46'   30  02B7   520 140$:    BSBW    EXE$DEANONPAGED          ; DEALLOCATE BUFFER
           00E0 8F   BA  02BA   521          POPR    #^M<R5,R6,R7>            ; RESTORE REGISTERS
```

```
                        02BE   523          .SBTTL  DIRECT I/O COMPLETION AST ROUTINE
                        02BE   524 ;++
                        02BE   525 ; FUNCTIONAL DESCRIPTION:
                        02BE   526 ;
                        02BE   527 ;        DIRPOST PERFORMS ALL GENERAL I/O COMPLETION ACTIVITIES WHICH
                        02BE   528 ;        MUST BE DONE IN THE CONTEXT OF THE PROCESS. THESE INCLUDE
                        02BE   529 ;        I/O STATUS POSTING IF AN IOSB WAS SPECIFIED, CHANNEL CONTROL
                        02BE   530 ;        BLOCK ACTIVITY COUNT DECREMENTING, QUEUEING OF ANY REQUESTED
                        02BE   531 ;        AST OR RELEASE OF THE I/O REQUEST PACKET.
                        02BE   532 ;
                        02BE   533 ; CALLING SEQUENCE:
                        02BE   534 ;
                        02BE   535 ;        JSB     DIRPOST
                        02BE   536 ;
                        02BE   537 ; INPUT PARAMETERS:
                        02BE   538 ;
                        02BE   539 ;        R4 = CURRENT PROCESS PCB ADDRESS.
                        02BE   540 ;        R5 = IRP/AST CONTROL BLOCK ADDRESS.
                        02BE   541 ;
                        02BE   542 ; IMPLICIT INPUTS:
                        02BE   543 ;
                        02BE   544 ;        SCH$GL_CURPCB - POINTER TO CURRENT PCB
                        02BE   545 ;--
                        02BE   546
                        02BE   547 DIRPOST:                                     ; DIRECT I/O POSTING AST
1C 2A A5   07   E1      02BE   548          BBC     #IRP$V_DIAGBUF,IRP$W_STS(R5),10$ ; IF CLR, NO DIAGNOSTIC BUFFER
     00E0 8F   BB       02C3   549          PUSHR   #^M<R5,R6,R7>               ; SAVE REGISTERS
   56   44 A5   D0       02C7   550          MOVL    IRP$L_DIAGBUF(R5),R6        ; GET ADDRESS OF DIAGNOSTIC BUFFER
   57   08 A6   3C       02CB   551          MOVZWL  IRP$W_SIZE(R6),R7           ; GET SIZE OF DIAGNOSTIC BUFFER
        57   0C   C2      02CF   552          SUBL    #12,R7                      ; REDUCE BY SIZE OF BUFFER HEADER
             75   10      02D2   553          BSBB    MOVBUF                      ; MOVE DIAGNOSTIC INFORMATION TO USER
     00E0 8F   BA       02D4   554          POPR    #^M<R5,R6,R7>               ; RESTORE REGISTERS
   50   44 A5   D0       02D8   555          MOVL    IRP$L_DIAGBUF(R5),R0        ; RETRIEVE ADDRESS OF DIAGNOSTIC BUFFER
          FD21'  30       02DC   556          BSBW    EXE$DEANONPAGED             ; DEALLOCATE DIAGNOSTIC BUFFER
   50   28 A5   32       02DF   557 10$:     CVTWL   IRP$W_CHAN(R5),R0           ; GET CHANNEL NUMBER (NEGATED)
51 00000000'FF40   9E      02E3   558          MOVAB   @CTL$GL_CCBBASE[R0],R1      ; SET CCB BASE ADDRESS
        0A A1   B7       02EB   559          DECW    CCB$W_IOC(R1)               ; DECREMENT I/O COUNT FOR CHANNEL
             12   12      02EE   560          BNEQ    30$                         ; NOT IDLE YET
   53   0C A1   D0       02F0   561          MOVL    CCB$L_DIRP(R1),R3           ; GET ADDRESS OF DEACCESS PACKET
             0C   13      02F4   562          BEQL    30$                         ; IF EQL NONE
        0C A1   D4       02F6   563          CLRL    CCB$L_DIRP(R1)              ; CLEAR ADDRESS OF DEACCESS PACKET
        0A A1   B6       02F9   564          INCW    CCB$W_IOC(R1)               ; ACCOUNT FOR DEACCESS
   52   61   D0       02FC   565          MOVL    CCB$L_UCB(R1),R2            ; GET ASSIGNED DEVICE UCB ADDRESS
          FEB4   30       02FF   566          BSBW    IOC$WAKACP                  ; QUEUE I/O PACKET AND WAKE ACP
                          0302   567                                              ; R4 ALTERERED
                          0302   568 30$:
                          0302   569 ;
                          0302   570 ; R4 DOES NOT NECESSARILY HAVE CURRENT PCB ADDRESS IN IT AT THIS POINT
                          0302   571 ;
                          0302   572 IOC$DIRPOST1::
   50   24 A5   D0       0302   573          MOVL    IRP$L_IOSB(R5),R0           ; GET IOSB ADDRESS
             10   13      0306   574          BEQL    35$                         ; IF EQL NONE SPECIFIED
51 0B A5   02   00   EF   0308   575          EXTZV   #0,#2,IRP$B_RMOD(R5),R1     ; GET REQUEST ACCESS MODE
                          030E   576          IFNOWRT #8,(R0),35$,R1              ; CAN I/O STATUS BE WRITTEN?
   60   08   51   0D   030E                   PROBEW  R1,#8,(R0)
             04   13      0312                BEQL    35$
   60   34 A5   7D       0314   577          MOVQ    IRP$L_IOST1(R5),(R0)        ; MOVE STATUS INTO IOSB
```

```
                13 2A A5    0B    E0  0318    578 35$:    BBS     #IRP$V_EXTEND,IRP$W_STS(R5),50$ ; BRANCH TO DEALLOCATE IRPE'S
                08 0B A5    06    E1  031D    579 37$:    BBC     #ACB$V_QUOTA,IRP$B_RMOD(R5),40$ ; IF CLR, NO AST SPECIFIED
                              52    D4  0322    580         CLRL    R2                              ; SET NULL PRIORITY INCREMENT
                  00000000'EF     17  0324    581         JMP     SCH$QAST                        ; QUEUE AST FOR REQUESTOR
                      50    55    D0  032A    582 40$:    MOVL    R5,R0                           ; SETUP ADDRESS FOR DEALLOCATE
                         FCD0'    31  032D    583         BRW     EXE$DEANONPAGED                 ; AND RELEASE I/O PACKET
                                      0330    584
                                      0330    585
                                      0330    586         ;
                                      0330    587         ; DEALLOCATE IRPE'S
                                      0330    588         ;
                                      0330    589
                   50    4C A5    D0  0330    590 50$:    MOVL    IRP$L_EXTEND(R5),R0             ; GET ADDRESS OF FIRST IRPE
                                      0334    591
                              54    D4  0334    592 60$:    CLRL    R4                              ; WILL HOLD ADDRESS OF NEXT IRPE
                04 2A A0    0B    E1  0336    593         BBC     #IRPE$V_EXTEND,IRPE$W_STS(R0),70$ ; BR. IF NO MORE IRPE'S
                   54    4C A0    D0  033B    594         MOVL    IRPE$L_EXTEND(R0),R4            ; SAVE ADDRESS OF NEXT IRPE
                         FCBE'    30  033F    595 70$:    BSBW    EXE$DEANONPAGED                 ; DEALLOCATE IRPE POINTED TO BY R0
                      50    54    D0  0342    596         MOVL    R4,R0                           ; PUT ADDRESS OF NEXT IRPE IN R0
                              ED    12  0345    597         BNEQ    60$                             ; BR. IF THERE IS ANOTHER IRPE
                              D4    11  0347    598         BRB     37$                             ; DONE DEALLOCATING IRPE'S
```

```
                                0349          .SBTTL  MOVE DATA TO USER BUFFER
                                0349    ;
                                0349    ; SUBROUTINE TO MOVE DATA FROM A SIMPLE BUFFERED I/O BUFFER TO A USER BUFFER
                                0349    ;
                                0349
                                0349    MOVBUF:                                         ; MOVE BUFFER
          50    57    D0        0349            MOVL    R7,R0                           ; SET LENGTH OF USER BUFFER
                2D    13        034C            BEQL    15$                             ; BR IF NULL STRING
      51    04 A6    D0        034E            MOVL    4(R6),R1                        ; GET ADDRESS OF USER BUFFER
          50    51    C0        0352            ADDL    R1,R0                           ; CALCULATE ENDING BUFFER ADDRESS
    51    01FF 8F    AA        0355            BICW    #VA$M_BYTE,R1                   ; TRUNCATE ADDRESS TO START OF PAGE
          50    51    C2        035A            SUBL    R1,R0                           ; CALCULATE LENGTH OF BUFFER TO PROBE
52  0B A5   02    00    EF        035D            EXTZV   #0,#2,IRP$B_RMOD(R5),R2         ; GET REQUEST ACCESS MODE
    53    FE00 8F    32        0363            CVTWL   #-^X200,R3                      ; SET ADDITION CONSTANT
                                0368    10$:    IFNOWRT R0,(R1),ACCVIO,R2               ; CAN BUFFER BE WRITTEN?
    61    50    52    0D        0368                    PROBEW  R2,R0,(R1)
                0E    13        036C                    BEQL    ACCVIO
          51    53    C2        036E            SUBL    R3,R1                           ; UPDATE BUFFER ADDRESS
       50    6043    3E        0371            MOVAW   (R0)[R3],R0                     ; UPDATE REMAINING LENGTH OF BUFFER
                F1    14        0375            BGTR    10$                             ; IF GEQ MORE TO CHECK
    96    96    57    28        0377            MOVC    R7,@(R6)+,@(R6)+                ; MOVE DATA TO USER BUFFER
                      05        037B    15$:    RSB                                     ;
      34 A5    00'    B0        037C    ACCVIO: MOVW    S^#SS$_ACCVIO,IRP$L_IOST1(R5) ; SET FINAL TRANSFER STATUS
                      05        0380            RSB                                     ;
```

```
                        0381   623          .SBTTL  UNLOCK AREAS IN IRPE'S
                        0381   624 ;++
                        0381   625 ; FUNCTIONAL DESCRIPTION:
                        0381   626 ;
                        0381   627 ;       THIS ROUTINE UNLOCKS THE AREAS DESCRIBED BY FIELDS IN THE IRPE'S.  EACH
                        0381   628 ;       IRPE HAS SPACE TO HOLD TWO AREA DESCRIPTIONS.
                        0381   629 ;
                        0381   630 ; CALLING SEQUENCE:
                        0381   631 ;
                        0381   632 ;       BSBW    UNLOCK_MORE
                        0381   633 ;
                        0381   634 ; INPUT PARAMETERS:
                        0381   635 ;
                        0381   636 ;       R5 = I/O REQUEST PACKET ADDRESS
                        0381   637 ;
                        0381   638 ; SIDE EFFECTS:
                        0381   639 ;
                        0381   640 ;       R0 - R3 ARE NOT PRESERVED
                        0381   641 ;--
                        0381   642
                        0381   643          ASSUME  IRP$L_EXTEND EQ IRPE$L_EXTEND
                        0381   644
                        0381   645 UNLOCK_MORE:
                    55  DD  0381   646          PUSHL   R5                      ; SAVE IRP ADDRESS
                        0383   647
                        0383   648 10$:     ; UNLOCK AREAS SPECIFIED IN NEXT IRPE
                        0383   649
                55  4C A5  D0  0383   650          MOVL    IRPE$L_EXTEND(R5),R5    ; GET ADDRESS OF NEXT IRPE
                53  2C A5  D0  0387   651          MOVL    IRPE$L_SVAPTE1(R5),R3   ; GET SVAPTE OF FIRST AREA
                    0A  13  038B   652          BEQL    20$                     ; BR. IF NOTHING TO UNLOCK
                52  30 A5  3C  038D   653          MOVZWL  IRPE$W_BOFF1(R5),R2     ; GET BYTE OFFSET IN PAGE
                51  34 A5  D0  0391   654          MOVL    IRPE$L_BCNT1(R5),R1     ; GET SIZE OF AREA
                    19  10  0395   655          BSBB    UNLK                    ; UNLOCK FIRST AREA
                        0397   656
                53  38 A5  D0  0397   657 20$:     MOVL    IRPE$L_SVAPTE2(R5),R3   ; GET SVAPTE OF SECOND AREA
                    0A  13  039B   658          BEQL    30$                     ; BR. IF NOTHING TO UNLOCK
                52  3C A5  3C  039D   659          MOVZWL  IRPE$W_BOFF2(R5),R2     ; GET BYTE OFFSET IN PAGE
                51  40 A5  D0  03A1   660          MOVL    IRPE$L_BCNT2(R5),R1     ; GET SIZE OF AREA
                    09  10  03A5   661          BSBB    UNLK                    ; UNLOCK SECOND AREA
                        03A7   662
            D7 2A A5    0B  E0  03A7   663 30$:     BBS     #IRPE$V_EXTEND,IRPE$W_STS(R5),10$ ; BR. IF THERE'S ANOTHER IRPE
                    55 8ED0  03AC   664          POPL    R5                      ; RESTORE R5
                        05  03AF   665          RSB
                        03B0   666
                        03B0   667          ;
                        03B0   668          ; LOCAL SUBROUTINE TO UNLOCK PAGES
                        03B0   669          ;
                        03B0   670          ;       R1 = BYTE COUNT (OR SIZE OF AREA)
                        03B0   671          ;       R2 = BYTE OFFSET IN PAGE
                        03B0   672          ;       R3 = SVAPTE OF START OF AREA
                        03B0   673          ;
                        03B0   674
             51   01FF C142   9E  03B0   675 UNLK:    MOVAB   511(R1)[R2],R1          ; COMBINE OFFSET AND SIZE AND ROUND
            51   51   F7 8F   78  03B6   676          ASHL    #-VA$S_BYTE,R1,R1       ; CONVERT TO NUMBER OF PAGES TO UNLOCK
                00000000'EF   16  03BB   677          JSB     L^MMG$UNLOCK            ; Unlock pages
                        05  03C1   678          RSB
                        03C2   679
```

```
                    03C2   680
                    03C2   681          .END
```

```
$ER                             = 00000002     D
$MODULE                           00000000 R   D   02
AACPERR                           00000007 R   D   02
ACB$B_RMOD                        0000000B     D
ACB$B_TYPE                        0000000A     D
ACB$C_LENGTH                      00000018     D
ACB$K_LENGTH                      00000018     D
ACB$L_AST                         00000010     D
ACB$L_ASTPRM                      00000014     D
ACB$L_ASTQBL                      00000004     D
ACB$L_ASTQFL                      00000000     D
ACB$L_KAST                        00000018     D
ACB$L_PID                         0000000C     D
ACB$V_QUOTA                     = 00000006     D
ACB$W_SIZE                        00000008     D
ACCVIO                            0000037C R   D   03
BUFIO                             00000096 R   D   03
BUFPOST                           000001E8 R   D   03
BUG$CHECK                         ********   X   03
CCB$B_AMOD                        00000009     D
CCB$B_STS                         00000008     D
CCB$C_LENGTH                      00000010     D
CCB$K_LENGTH                      00000010     D
CCB$L_DIRP                        0000000C     D
CCB$L_UCB                         00000000     D
CCB$L_WIND                        00000004     D
CCB$W_IOC                         0000000A     D
CTL$GL_CCBBASE                    ********   X   03
CXB$L_LINK                      = 00000010     D
CXB$W_LENGTH                    = 0000000C     D
DEV$V_SQD                         ********   X   03
DIRIO                             0000004E R   D   03
DIRPOST                           000002BE R   D   03
DS_ERRSUP                         ********   X   03
EXE$DEANONPAGED                   ********   X   03
EXE$INSIOQ                        ********   X   03
IOC$CVTLOGPHY                     ********   X   03
IOC$DIRPOST1                      00000302 RG  D   03
IOC$GL_PSBL                       ********   X   03
IOC$GL_PSFL                       ********   X   03
IOC$IOPOST                        00000004 RG  D   03
IOC$MAPVBLK                       ********   X   03
IOC$QNXTSEG                       0000014C RG  D   03
IOC$QNXTSEG1                      00000158 RG  D   03
IOC$QTOACP                        000001A5 R   D   03
IOC$WAKACP                        000001B6 RG  D   03
IOPOST                            0000000D R   D   03
IOPOST_KAST                       000000DA R   D   03
IPL$_IOPOST                     = 00000004     D
IPL$_SYNCH                      = 00000007     D
IRP$B_CARCON                      00000038     D
IRP$B_EFN                         00000022     D
IRP$B_PRI                         00000023     D
IRP$B_RMOD                        0000000B     D
IRP$B_TYPE                        0000000A     D
IRP$C_LENGTH                      0000005C     D
IRP$K_LENGTH                      0000005C     D
IRP$L_ARB                         00000050     D
IRP$L_AST                         00000010     D
IRP$L_ASTPRM                      00000014     D
IRP$L_DIAGBUF                     00000044     D
IRP$L_EXTEND                      0000004C     D
IRP$L_IOQBL                       00000004     D
IRP$L_IOQFL                       00000000     D
IRP$L_IOSB                        00000024     D
IRP$L_IOST1                       00000034     D
IRP$L_IOST2                       00000038     D
IRP$L_MEDIA                       00000034     D
IRP$L_PID                         0000000C     D
IRP$L_SEGVBN                      00000040     D
IRP$L_SEQNUM                      00000048     D
IRP$L_SVAPTE                      0000002C     D
IRP$L_TT_TERM                     00000038     D
IRP$L_UCB                         0000001C     D
IRP$L_WIND                        00000018     D
IRP$M_PAGIO                     = 00000004     D
IRP$M_SWAPIO                    = 00000040     D
IRP$M_VIRTUAL                   = 00000010     D
IRP$Q_NT_PRVMSK                   0000003C     D
IRP$V_BUFIO                     = 00000000     D
IRP$V_CHAINED                   = 00000005     D
IRP$V_COMPLX                    = 00000003     D
IRP$V_DIAGBUF                   = 00000007     D
IRP$V_EXTEND                    = 0000000B     D
IRP$V_FILACP                    = 0000000C     D
IRP$V_FUNC                      = 00000001     D
IRP$V_PAGIO                     = 00000002     D
IRP$V_SWAPIO                    = 00000006     D
IRP$V_TERMIO                    = 00000009     D
IRP$V_VIRTUAL                   = 00000004     D
IRP$W_ABCNT                       0000003C     D
IRP$W_BCNT                        00000032     D
IRP$W_BOFF                        00000030     D
IRP$W_CHAN                        00000028     D
IRP$W_FUNC                        00000020     D
IRP$W_OBCNT                       0000003E     D
IRP$W_SIZE                        00000008     D
IRP$W_STS                         0000002A     D
IRP$W_TT_PRMPT                    0000003C     D
IRPE$B_TYPE                       0000000A     D
IRPE$C_LENGTH                     00000050     D
IRPE$K_LENGTH                     00000050     D
IRPE$L_BCNT1                      00000034     D
IRPE$L_BCNT2                      00000040     D
IRPE$L_EXTEND                     0000004C     D
IRPE$L_SVAPTE1                    0000002C     D
IRPE$L_SVAPTE2                    00000038     D
IRPE$V_EXTEND                   = 0000000B     D
IRPE$W_BOFF1                      00000030     D
IRPE$W_BOFF2                      0000003C     D
IRPE$W_SIZE                       00000008     D
IRPE$W_STS                        0000002A     D
MMG$UNLOCK                        ********   X   03
MOVBUF                            00000349 R   D   03
```

```
NOTACP                          000000A1 R   D  03
NOTFCPWCB                       000001D2 R   D  03
PAGIO_OR_SWAPIO                 00000085 R   D  03
PCB$B_ASTACT                    0000000C     D
PCB$B_ASTEN                     0000000D     D
PCB$B_PRI                       0000000B     D
PCB$B_PRIB                      0000002F     D
PCB$B_TYPE                      0000000A     D
PCB$B_WEFC                      0000002E     D
PCB$C_LENGTH                    0000008C     D
PCB$K_LENGTH                    0000008C     D
PCB$L_ARB                       00000084     D
PCB$L_ASTQBL                    00000014     D
PCB$L_ASTQFL                    00000010     D
PCB$L_EFC2P                     00000058     D
PCB$L_EFC3P                     0000005C     D
PCB$L_EFCS                      00000050     D
PCB$L_EFCU                      00000054     D
PCB$L_EFWM                      0000004C     D
PCB$L_JIB                       00000078     D
PCB$L_OWNER                     0000001C     D
PCB$L_PHD                       00000064     D
PCB$L_PHYPCB                    00000018     D
PCB$L_PID                       00000060     D
PCB$L_PQB                       0000004C     D
PCB$L_SQBL                      00000004     D
PCB$L_SQFL                      00000000     D
PCB$L_STS                       00000024     D
PCB$L_UIC                       00000088     D
PCB$L_WSSWP                     00000020     D
PCB$L_WTIME                     00000028     D
PCB$Q_PRIV                      0000007C     D
PCB$T_LNAME                     00000068     D
PCB$T_TERMINAL                  00000044     D
PCB$W_APTCNT                    00000030     D
PCB$W_ASTCNT                    00000038     D
PCB$W_BIOCNT                    0000003A     D
PCB$W_BIOLM                     0000003C     D
PCB$W_DIOCNT                    0000003E     D
PCB$W_DIOLM                     00000040     D
PCB$W_GPGCNT                    00000034     D
PCB$W_GRP                       0000008A     D
PCB$W_MEM                       00000088     D
PCB$W_MTXCNT                    0000000E     D
PCB$W_PPGCNT                    00000036     D
PCB$W_PRCCNT                    00000042     D
PCB$W_SIZE                      00000008     D
PCB$W_STATE                     0000002C     D
PCB$W_TMBU                      00000032     D
PR$_IPL                       = 00000012     D
PR$_SIRR                      = 00000014     D
PRI$_IOCOM                    = 00000001     D
PRI$_TICOM                    = 00000004     D
PRI$_TOCOM                    = 00000003     D
PRITBL                          00000000 R   D  03
QNXTSEG                         00000119 R   D  03
SCH$GL_PCBVEC                   ********     X  03
SCH$POSTEF                      ********     X  03
SCH$QAST                        ********     X  03
SIZ...                        = 00000001     D
SS$_ACCVIO                      ********     X  03
SS$_ILLBLKNUM                   ********     X  03
UCB$B_AMOD                      00000053     D
UCB$B_CEX                       00000077     D
UCB$B_CM1                       0000004A     D
UCB$B_CM2                       0000004B     D
UCB$B_DEVCLASS                  00000038     D
UCB$B_DEVTYPE                   00000039     D
UCB$B_DIPL                      00000052     D
UCB$B_DX_SCTCNT                 000000A6     D
UCB$B_ERTCNT                    00000070     D
UCB$B_ERTMAX                    00000071     D
UCB$B_FEX                       00000076     D
UCB$B_FIPL                      0000000B     D
UCB$B_LOCSRV                    0000003C     D
UCB$B_OFFNDX                    00000094     D
UCB$B_OFFRTC                    00000095     D
UCB$B_REMSRV                    0000003D     D
UCB$B_SECTORS                   0000003C     D
UCB$B_SLAVE                     00000074     D
UCB$B_SPR                       00000075     D
UCB$B_STATE                     00000052     D
UCB$B_TRACKS                    0000003D     D
UCB$B_TT_CRFILL                 0000009D     D
UCB$B_TT_DECRF                  000000A1     D
UCB$B_TT_DELFF                  000000A2     D
UCB$B_TT_DESPEE                 000000A0     D
UCB$B_TT_DETYPE                 000000A4     D
UCB$B_TT_LFFILL                 0000009E     D
UCB$B_TT_SPEED                  0000009C     D
UCB$B_TYPE                      0000000A     D
UCB$B_VERTSZ                    0000003F     D
UCB$C_LENGTH                    00000074     D
UCB$C_MB_LENGTH                 00000090     D
UCB$C_TT_LENGTH                 000000BC     D
UCB$K_LENGTH                    00000074     D
UCB$K_MB_LENGTH                 00000090     D
UCB$K_TT_LENGTH                 000000BC     D
UCB$L_AMB                       00000054     D
UCB$L_ASTQBL                    00000010     D
UCB$L_ASTQFL                    0000000C     D
UCB$L_CPID                      0000005C     D
UCB$L_CRB                       00000020     D
UCB$L_DDB                       00000024     D
UCB$L_DEVCHAR                   00000034     D
UCB$L_DEVDEPEND                 0000003C     D
UCB$L_DPC                       00000080     D
UCB$L_DUETIM                    0000005C     D
UCB$L_DX_BFPNT                  0000009C     D
UCB$L_DX_BUF                    00000098     D
UCB$L_DX_RXDB                   000000A0     D
UCB$L_EMB                       00000078     D
UCB$L_FIRST                     00000014     D
UCB$L_FPC                       0000000C     D
```

UCB$L_FQBL	00000004	D	UCB$W_SRCADDR	0000001A	D					
UCB$L_FQFL	00000000	D	UCB$W_STS	00000058	D					
UCB$L_FR3	00000010	D	UCB$W_TT_DESIZE	000000A5	D					
UCB$L_FR4	00000014	D	UCB$W_UNIT	00000048	D					
UCB$L_IOQBL	00000044	D	UCB$W_VPROT	0000001A	D					
UCB$L_IOQFL	00000040	D	UNLK	000003B0	R	D	03			
UCB$L_IRP	0000004C	D	UNLOCK	0000006A	R	D	03			
UCB$L_LINK	0000002C	D	UNLOCK_MORE	00000381	R	D	03			
UCB$L_LOGADR	00000064	D	VA$M_BYTE	= 000001FF		D				
UCB$L_MAXBLOCK	00000084	D	VA$S_BYTE	= 00000009		D				
UCB$L_MB_MBX	0000007C	D	VCB$B_BLOCKFACT	00000052		D				
UCB$L_MB_PORT	0000008C	D	VCB$B_CUR_RVN	0000002F		D				
UCB$L_MB_RAST	00000078	D	VCB$B_EOFDELTA	0000004E		D				
UCB$L_MB_SHB	00000080	D	VCB$B_IBMAPSIZE	00000038		D				
UCB$L_MB_WAST	00000074	D	VCB$B_IBMAPVBN	0000003A		D				
UCB$L_MB_WIOQBL	00000088	D	VCB$B_LRU_LIM	00000049		D				
UCB$L_MB_WIOQFL	00000084	D	VCB$B_QNAMECNT	0000000B		D				
UCB$L_MEDIA	0000008C	D	VCB$B_RESFILES	0000004F		D				
UCB$L_NT_DATSSB	00000074	D	VCB$B_SBMAPSIZE	00000039		D				
UCB$L_NT_INTSSB	00000078	D	VCB$B_SBMAPVBN	0000003B		D				
UCB$L_OPCNT	00000060	D	VCB$B_STATUS	0000000B		D				
UCB$L_OWNUIC	0000001C	D	VCB$B_STATUS2	00000053		D				
UCB$L_PID	00000028	D	VCB$B_TM	0000002E		D				
UCB$L_RQBL	00000004	D	VCB$B_TYPE	0000000A		D				
UCB$L_RQFL	00000000	D	VCB$B_WINDOW	00000048		D				
UCB$L_SVAPTE	00000068	D	VCB$C_COMLEN	00000024		D				
UCB$L_SVPN	00000064	D	VCB$C_LENGTH	00000064		D				
UCB$L_TT_DECHAR	000000A8	D	VCB$C_MRKLEN	0000000B		D				
UCB$L_TT_RDUE	0000008C	D	VCB$K_COMLEN	00000024		D				
UCB$L_TT_RTIMOU	000000B8	D	VCB$K_LENGTH	00000064		D				
UCB$L_VCB	00000030	D	VCB$K_MRKLEN	0000000B		D				
UCB$T_PARTNER	0000000C	D	VCB$L_AQB	00000010		D				
UCB$W_BCNT	0000006E	D	VCB$L_BLOCKBL	00000004		D				
UCB$W_BCR	00000096	D	VCB$L_BLOCKFL	00000000		D				
UCB$W_BOFF	0000006C	D	VCB$L_CACHE	00000058		D				
UCB$W_BUFQUO	00000018	D	VCB$L_CUR_FID	00000024		D				
UCB$W_BYTESTOGO	0000003E	D	VCB$L_FCBBL	00000004		D				
UCB$W_CHARGE	0000004A	D	VCB$L_FCBFL	00000000		D				
UCB$W_CYLINDERS	0000003E	D	VCB$L_FREE	00000040		D				
UCB$W_DA	0000008C	D	VCB$L_HOME2LBN	00000028		D				
UCB$W_DC	0000008E	D	VCB$L_HOMELBN	00000024		D				
UCB$W_DEVBUFSIZ	0000003A	D	VCB$L_IBMAPLBN	00000030		D				
UCB$W_DEVSTS	0000005A	D	VCB$L_IXHDR2LBN	0000002C		D				
UCB$W_DIRSEQ	00000088	D	VCB$L_MAXFILES	00000044		D				
UCB$W_DSTADDR	00000018	D	VCB$L_MVL	00000034		D				
UCB$W_DX_BCR	000000A4	D	VCB$L_QUOCACHE	0000005C		D				
UCB$W_EC1	00000090	D	VCB$L_QUOTAFCB	00000054		D				
UCB$W_EC2	00000092	D	VCB$L_RVT	00000020		D				
UCB$W_ERRCNT	00000072	D	VCB$L_SBMAPLBN	00000034		D				
UCB$W_FUNC	0000007E	D	VCB$L_START_FID	00000028		D				
UCB$W_MB_SEED	00000000	D	VCB$L_ST_RECORD	00000030		D				
UCB$W_MSGCNT	00000016	D	VCB$L_USRLBLAST	00000044		D				
UCB$W_MSGMAX	00000014	D	VCB$L_VPBL	00000040		D				
UCB$W_NT_CHAN	0000007C	D	VCB$L_VPFL	0000003C		D				
UCB$W_OFFSET	0000008A	D	VCB$L_WCB	00000038		D				
UCB$W_REFC	00000050	D	VCB$T_QNAME	0000000C		D				
UCB$W_SIZE	00000008	D	VCB$T_VOLNAME	00000014		D				

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VCB$W_CLUSTER                     0000003C     D
VCB$W_CUR_NUM                     00000024     D
VCB$W_CUR_SEQ                     00000026     D
VCB$W_EXTEND                      0000003E     D
VCB$W_FILEPROT                    0000004A     D
VCB$W_MCOUNT                      0000004C     D
VCB$W_MODE                        0000002C     D
VCB$W_PENDERR                     00000062     D
VCB$W_QUOSIZE                     00000060     D
VCB$W_RECORDSZ                    00000050     D
VCB$W_RVN                         0000000E     D
VCB$W_SIZE                        00000008     D
VCB$W_START_NUM                   00000028     D
VCB$W_START_SEQ                   0000002A     D
VCB$W_TRANS                       0000000C     D
VIRTUAL                           000000E8 R   D  03
WCB$B_ACCESS                      0000000B     D
WCB$B_TYPE                        0000000A     D
WCB$C_LENGTH                      00000024     D
WCB$C_MAP                         00000024     D
WCB$K_LENGTH                      00000024     D
WCB$K_MAP                         00000024     D
WCB$L_FCB                         00000018     D
WCB$L_LBN                         00000002     D
WCB$L_ORGUCB                      00000010     D
WCB$L_P1_LBN                      00000026     D
WCB$L_P2_LBN                      0000002C     D
WCB$L_PID                         0000000C     D
WCB$L_PREVLBN                     FFFFFFFC     D
WCB$L_RVT                         0000001C     D
WCB$L_STVBN                       00000020     D
WCB$L_WLBL                        00000004     D
WCB$L_WLFL                        00000000     D
WCB$V_NOTFCP                    = 00000002     D
WCB$W_ACON                        00000014     D
WCB$W_COUNT                       00000000     D
WCB$W_NMAP                        00000016     D
WCB$W_P1_COUNT                    00000024     D
WCB$W_P2_COUNT                    0000002A     D
WCB$W_PREVCOUNT                   FFFFFFFA     D
WCB$W_REFCNT                      0000000E     D
WCB$W_SIZE                        00000008     D
WQH$C_LENGTH                      0000000C     D
WQH$K_LENGTH                      0000000C     D
WQH$L_WQBL                        00000004     D
WQH$L_WQFL                        00000000     D
WQH$W_WQCNT                       00000008     D
WQH$W_WQSTATE                     0000000A     D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	FFFFFFFC (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
DATA	00000011 (17.)	02 (2.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC LONG
CODE	000003C2 (962.)	03 (3.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$ER	=00000002	226 (3)	#-226 (3)
$MODULE	00000000-R	130 (2)	226 (3)
AACPERR	00000007-R	131 (2)	
ACB$B_RMOD	0000000B		#-250 (3)
ACB$L_KAST	00000018		#-237 (3) #-240 (3)
ACB$V_QUOTA	=00000006		#-579 (7)
ACCVIO	0000037C-R	620 (8)	#-511 (6) #-518 (6) #-614 (8)
BUFIO	00000096-R	231 (3)	#-191 (3)
BUFPOST	000001E8-R	461 (6)	237 (3)
BUG$CHECK	00000000-XR		429 (5) 437 (5)
CCB$L_DIRP	0000000C		#-561 (7) #-563 (7)
CCB$L_UCB	00000000		#-565 (7)
CCB$W_IOC	0000000A		#-559 (7) #-564 (7)
CTL$GL_CCBBASE	00000000-XR		558 (7)
CXB$L_LINK	=00000010		#-508 (6) #-513 (6)
CXB$W_LENGTH	=0000000C		#-501 (6) #-503 (6) #-504 (6) #-506 (6)
DEV$V_SQD	00000000-XR		#-287 (4)
DIRIO	0000004E-R	204 (3)	
DIRPOST	000002BE-R	547 (7)	240 (3)
DS_ERRSUP	00000000-XR		226 (3)
EXE$DEANONPAGED	00000000-XR		#-239 (3) #-515 (6) #-520 (6) #-556 (7)
			#-583 (7) #-595 (7)
EXE$INSIOQ	00000000-XR		376 (5)
IOC$CVTLOGPHY	00000000-XR		375 (5)
IOC$DIRPOST1	00000302-R	572 (7)	
IOC$GL_PSBL	00000000-XR		385 (5)
IOC$GL_PSFL	00000000-XR		173 (3)
IOC$IOPOST	00000004-R	169 (3)	
IOC$MAPVBLK	00000000-XR		364 (5)
IOC$QNXTSEG	0000014C-R	347 (5)	#-296 (4)
IOC$QNXTSEG1	00000158-R	362 (5)	
IOC$QTOACP	000001A5-R	402 (5)	#-320 (4)
IOC$WAKACP	000001B6-R	427 (5)	#-566 (7)
IOPOST	0000000D-R	173 (3)	#-183 (3) #-252 (3) #-297 (4)
IOPOST_KAST	000000DA-R	249 (3)	
IPL$_IOPOST	=00000004		#-387 (5)
IPL$_SYNCH	=00000007		#-428 (5)
IRP$B_EFN	00000022		#-247 (3)
IRP$B_RMOD	0000000B		494 (6) 575 (7) 579 (7) 612 (8)
IRP$L_DIAGBUF	00000044		#-302 (4) #-318 (4) #-550 (7) #-555 (7)
IRP$L_EXTEND	0000004C		#-590 (7) 643 (9)
IRP$L_IOSB	00000024		#-573 (7)
IRP$L_IOST1	00000034		#-209 (3) #-210 (3) #-280 (4) #-284 (4)
			#-285 (4) #-383 (5) #-577 (7) #-620 (8)
IRP$L_IOST2	00000038		#-384 (5)
IRP$L_PID	0000000C		#-185 (3) #-245 (3)
IRP$L_SEGVBN	00000040		#-283 (4) #-350 (5)
IRP$L_SVAPTE	0000002C		#-193 (3) #-235 (3) #-293 (4) #-318 (4)
			#-463 (6) #-512 (6) #-519 (6)
IRP$L_UCB	0000001C		#-286 (4) #-295 (4) #-407 (5)

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IRP$L_WIND                      00000018                        #-348   (5)     #-404   (5)
IRP$M_PAGIO                    =00000004                        #-197   (3)
IRP$M_SWAPIO                   =00000040                        #-197   (3)
IRP$M_VIRTUAL                  =00000010                        #-317   (4)
IRP$V_BUFIO                    =00000000                        #-190   (3)     #-241   (3)
IRP$V_CHAINED                  =00000005                        #-466   (6)
IRP$V_COMPLX                   =00000003                        #-465   (6)
IRP$V_DIAGBUF                  =00000007                        #-548   (7)
IRP$V_EXTEND                   =0000000B                        #-216   (3)     #-578   (7)
IRP$V_FILACP                   =0000000C                        #-232   (3)
IRP$V_FUNC                     =00000001                        #-238   (3)
IRP$V_PAGIO                    =00000002                         195    (3)
IRP$V_SWAPIO                   =00000006                         196    (3)
IRP$V_TERMIO                   =00000009                        #-242   (3)
IRP$V_VIRTUAL                  =00000004                        #-208   (3)
IRP$W_ABCNT                     0000003C                        #-281   (4)     #-284   (4)     #-288   (4)
IRP$W_BCNT                      00000032                        #-206   (3)     #-289   (4)     #-349   (5)     #-365   (5)
                                                                #-368   (5)     #-403   (5)     #-464   (6)
IRP$W_BOFF                      00000030                        #-207   (3)
IRP$W_CHAN                      00000028                        #-557   (7)
IRP$W_OBCNT                     0000003E                        #-210   (3)     #-288   (4)     #-301   (4)     #-319   (4)
IRP$W_SIZE                      00000008                        #-551   (7)
IRP$W_STS                       0000002A                         190    (3)     #-197   (3)      208    (3)      216    (3)
                                                                 232    (3)      238    (3)      241    (3)      242    (3)
                                                                #-317   (4)      465    (6)      466    (6)      548    (7)
                                                                 578    (7)
IRPE$L_BCNT1                    00000034                        #-654   (9)
IRPE$L_BCNT2                    00000040                        #-660   (9)
IRPE$L_EXTEND                   0000004C                        #-594   (7)      643    (9)     #-650   (9)
IRPE$L_SVAPTE1                  0000002C                        #-651   (9)
IRPE$L_SVAPTE2                  00000038                        #-657   (9)
IRPE$V_EXTEND                  =0000000B                        #-593   (7)     #-663   (9)
IRPE$W_BOFF1                    00000030                        #-653   (9)
IRPE$W_BOFF2                    0000003C                        #-659   (9)
IRPE$W_STS                      0000002A                         593    (7)      663    (9)
MMG$UNLOCK                      00000000-XR                      215    (3)      677    (9)
MOVBUF                          00000349-R   605    (8)      #-486   (6)     #-553   (7)
NOTACP                          000000A1-R   234    (3)      #-232   (3)
NOTFCPWCB                       000001D2-R   436    (5)      #-406   (5)
PAGIO_OR_SWAPIO                 00000085-R   225    (3)      #-198   (3)
PCB$W_BIOCNT                    0000003A                        #-231   (3)
PCB$W_DIOCNT                    0000003E                        #-192   (3)     #-233   (3)     #-316   (4)     #-363   (5)
PR$_IPL                        =00000012                        #-428   (5)     #-430   (5)
PR$_SIRR                       =00000014                        #-387   (5)
PRI$_IOCOM                     =00000001                         134    (2)      136    (2)
PRI$_TICOM                     =00000004                         137    (2)
PRI$_TOCOM                     =00000003                         135    (2)
PRITBL                          00000000-R   133    (2)      #-246   (3)
QNXTSEG                         00000119-R   292    (4)
SCH$GL_PCBVEC                   00000000-XR                     #-189   (3)
SCH$POSTEF                      00000000-XR                     #-248   (3)
SCH$QAST                        00000000-XR                      251    (3)      581    (7)
SS$_ACCVIO                      00000000-XR                     #-620   (8)
SS$_ILLBLKNUM                   00000000-XR                     #-383   (5)
UCB$L_DEVCHAR                   00000034                         287    (4)
UCB$L_MAXBLOCK                  00000084                        #-373   (5)
UNLK                            000003B0-R   675    (9)      #-655   (9)     #-661   (9)
```

```
UNLOCK                           0000006A-R  213    (3)    #-208    (3)    #-303    (4)
UNLOCK_MORE                      00000381-R  645    (9)    #-217    (3)
VA$M_BYTE                       =000001FF                   #-472    (6)    #-492    (6)    #-610    (8)
VA$S_BYTE                       =00000009                   #-214    (3)    #-282    (4)    #-291    (4)    #-370    (5)
                                                            #-676    (9)
VIRTUAL                          000000E8-R  279    (4)    #-180    (3)
WCB$B_ACCESS                     0000000B                      405    (5)
WCB$V_NOTFCP                    =00000002                   #-405    (5)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	37	00:00:00.02	00:00:00.24
Command processing	945	00:00:00.30	00:00:00.89
Pass 1	670	00:00:03.10	00:00:04.60
Symbol table sort	0	00:00:00.28	00:00:00.28
Pass 2	20	00:00:00.88	00:00:01.91
Symbol table output	2	00:00:00.07	00:00:00.22
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	4	00:00:00.07	00:00:00.12
Assembler run totals	1682	00:00:04.73	00:00:08.27

```
The working set limit was 3400 pages.
186284 bytes (364 pages) of virtual memory were used to buffer the intermediate code.
There were 60 pages of symbol table space allocated to hold 1018 non-local and 44 local symbols.
681 source lines were read in Pass 1, producing 69 object records in Pass 2.
40 pages of virtual memory were used to define 39 macros.
```

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	3
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	10
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	14
SYS$COMMON:[SYSLIB]STARLET.MLB;2	8
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	35

```
1512 GETS were required to define 35 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 91 CANCEL I/O ON CHANNEL
(1) 125 FILL DIAGNOSTIC BUFFER
(1) 160 RELEASE I/O CHANNEL
(1) 215 REQUEST I/O CHANNEL
(1) 273 I/O REQUEST COMPLETION PROCESSING
(1) 317 INITIATE I/O FUNCTION ON DEVICE
(1) 354 RELEASE BUFFERED DATAPATH
(1) 402 REQUEST BUFFERED DATAPATH
(1) 456 RELEASE UNIBUS MAP REGISTERS
(1) 509 REQUEST UNIBUS MAP REGISTERS
(1) 544 ALTER UBA MAP REGISTER BITMAP
(1) 577 SEARCH MAP REGISTER BITMAP AND ALLOCATE MAP REGISTERS
(1) 630 RETURN TO CALLER
(1) 649 WAITFOR INTERRUPT OR TIMEOUT AND KEEP CHANNEL
(1) 683 WAITFOR INTERRUPT OR TIMEOUT AND RELEASE CHANNEL
(1) 719 ALLOCATE SYSTEM PAGE TABLE

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element IOSNPG.MAR
0000     2 ; *2    26-OCT-1987 09:35:04 SALEM "DONE"
0000     3 ; *1     6-FEB-1986 15:18:58 DS ""
0000     4 ; DEC/CMS REPLACEMENT HISTORY, Element IOSNPG.MAR
0000     5         .TITLE  IOSNPG  *** IOSNPG services for QIO
0000     6         .IDENT  /06-04/                                                    ;G:2
0000     7 ;*****************************************************************************
0000     8 ;*                                                                           *
0000     9 ;*  COPYRIGHT (c) 1977, 1978, 1979, 1980                                     *
0000    10 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
0000    11 ;*                                                                           *
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0000    20 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT  *
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0000    24 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    25 ;*                                                                           *
0000    26 ;*****************************************************************************
0000    27 ;
0000    28 ; D. N. CUTLER 13-JUN-76
0000    29 ;
0000    30 ;
0000    31 ; NONPAGED I/O RELATED SUBROUTINES
0000    32 ;
0000    33 ; MODIFICATION HISTORY:
0000    34 ;
0000    35 ;
0000    36 ;       CHANGE PARAMETERS TO WAIT FOR INTERRUPTS.
0000    37 ;
0000    38 ;              Dave Butenhof   13-may-1980, Version 5.4
0000    39 ;       01     Modify VMS V2.0 sources for Supervisor environment
0000    40 ;              Roger Riggs, 23-july-1980, Version 5.5
0000    41 ;       02     Changed word offsets to longword
0000    42 ;              Dave Butenhof   24-nov-1980, Version 6.2
0000    43 ;       03     Restore entry point IOC$ALLOSPT to satisfy device drivers
0000    44 ;              using it.  It remains essentially "dummied out," since
0000    45 ;              Supervisor I/O drivers do not require system space
0000    46 ;                                                                          ;G:2
0000    47 ;       04     TED SALEM       14-JAN-87       VERSION 10.X               ;G:2
0000    48 ;              Changed BSBW to JSB for linking with /system=10000         ;G:2
0000    49 ;               - NI systems link.                                        ;G:2
0000    50 ;                                                                         ;G:2
0000    51 ;       0206   KDM0086         KATHLEEN D. MORSE       07-JAN-1980
0000    52 ;              CHANGE UCB$W_DEVSTS TO UCB$W_STS, AND EMB$W_DV_DEVSTS TO
0000    53 ;              EMB$W_DV_STS.
0000    54 ;
0000    55 ;       0205   RIH0033         R. HUSTVEDT             16-OCT-1979
0000    56 ;              CHANGE PCB$W_BYTLM TO JIB$L_BYTLM.
0000    57 ;
```

```
                        0000     58 ;        0204    NPK0002         N. KRONENBERG           21-SEP-1979
                        0000     59 ;                MODIFIED IOC$RELDATAP TO ZERO THE DATAPATH
                        0000     60 ;                NUMBER IN THE CALLERS CRB.
                        0000     61 ;
                        0000     62 ;        0203    NPKCOMET        N. KRONENBERG           11-FEB-1979
                        0000     63 ;                MODIFIED IOC$REQDATAP AND IOC$RELDATAP TO HANDLE
                        0000     64 ;                6 BIT DATAPATH NUMBERS.
                        0000     65 ;
                        0000     66 ;        0202    LMK0001         LEN KAWELL              07-FEB-1979
                        0000     67 ;                ADDED IOC$ALLOSPT ROUTINE THAT ALLOCATES SYSTEM
                        0000     68 ;                PAGE TABLE ENTRIES.
```

```
                        0000     70 ;
                        0000     71 ;
                        0000     72 ; MACRO LIBRARY CALLS
                        0000     73 ;
                        0000     74
                        0000     75          $ADPDEF                             ;DEFINE ADP OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .IIF    NB,ADP$L_CSR,   ADP$L_CSR:
00000004                0000                         .BLKL   1
                        0004                 .IIF    NB,ADP$L_LINK,  ADP$L_LINK:
00000008                0004                         .BLKL   1
                        0008                 .IIF    NB,ADP$W_SIZE,  ADP$W_SIZE:
0000000A                0008                         .BLKW   1
                        000A                 .IIF    NB,ADP$B_TYPE,  ADP$B_TYPE:
0000000B                000A                         .BLKB   1
                        000B                 .IIF    NB,ADP$B_NUMBER,        ADP$B_NUMBER:
0000000C                000B                         .BLKB   1
                        000C                 .IIF    NB,ADP$W_TR,    ADP$W_TR:
0000000E                000C                         .BLKW   1
                        000E                 .IIF    NB,ADP$W_ADPTYPE,       ADP$W_ADPTYPE:
00000010                000E                         .BLKW   1
                        0010                 .IIF    NB,ADP$L_VECTOR,        ADP$L_VECTOR:
                        0010                 .IIF    NB,ADP$L_CRB,   ADP$L_CRB:
00000014                0010                         .BLKL   1
                        0014                 .IIF    NB,ADP$C_MBAADPLEN,     ADP$C_MBAADPLEN:
                        0014                 .IIF    NB,ADP$K_MBAADPLEN,     ADP$K_MBAADPLEN:
                        0014                 .IIF    NB,ADP$C_DRADPLEN,      ADP$C_DRADPLEN:
                        0014                 .IIF    NB,ADP$K_DRADPLEN,      ADP$K_DRADPLEN:
                        0014                 .IIF    NB,ADP$L_DPQFL, ADP$L_DPQFL:
                        0014                 .IIF    NB,ADP$L_PRQQFL,        ADP$L_PRQQFL:
00000018                0014                         .BLKL   1
                        0018                 .IIF    NB,ADP$L_DPQBL, ADP$L_DPQBL:
                        0018                 .IIF    NB,ADP$L_PRQQBL,        ADP$L_PRQQBL:
0000001C                0018                         .BLKL   1
                        001C                 .IIF    NB,ADP$L_MRQFL, ADP$L_MRQFL:
                        001C                 .IIF    NB,ADP$L_SHB,   ADP$L_SHB:
00000020                001C                         .BLKL   1
                        0020                 .IIF    NB,ADP$L_MRQBL, ADP$L_MRQBL:
                        0020                 .IIF    NB,ADP$B_PORT,  ADP$B_PORT:
00000021                0020                         .BLKB   1
00000024                0021                         .BLKB   3
                        0024                 .IIF    NB,ADP$W_DPBITMAP,      ADP$W_DPBITMAP:
00000026                0024                         .BLKW   1
                        0026                 .IIF    NB,ADP$W_MRBITMAP,      ADP$W_MRBITMAP:
00000064                0026                         .BLKW   31
                        0064                 .IIF    NB,ADP$L_INTD,  ADP$L_INTD:
00000070                0064                         .BLKL   3
                        0070                 .IIF    NB,ADP$C_MPMADPLEN,     ADP$C_MPMADPLEN:
                        0070                 .IIF    NB,ADP$K_MPMADPLEN,     ADP$K_MPMADPLEN:
                        0070                 .IIF    NB,ADP$C_UBAADPLEN,     ADP$C_UBAADPLEN:
                        0070                 .IIF    NB,ADP$K_UBAADPLEN,     ADP$K_UBAADPLEN:
                        0000                 .RESTORE
                        0000     76          $CADEF                              ;DEFINE CONDITIONAL ASSEMBLY PARAMETERS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
00000000                0070                 .=0
                        0000                 .RESTORE
```

```
                        0000     77          $CRBDEF                                 ;DEFINE CRB OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 0070                .=0
                        0000                 .IIF    NB,CRB$L_WQFL,  CRB$L_WQFL:
                00000004 0000                        .BLKL   1
                        0004                 .IIF    NB,CRB$L_WQBL,  CRB$L_WQBL:
                00000008 0004                        .BLKL   1
                        0008                 .IIF    NB,CRB$W_SIZE,  CRB$W_SIZE:
                0000000A 0008                        .BLKW   1
                        000A                 .IIF    NB,CRB$B_TYPE,  CRB$B_TYPE:
                0000000B 000A                        .BLKB   1
                0000000C 000B                        .BLKB   1
                        000C                 .IIF    NB,CRB$W_REFC,  CRB$W_REFC:
                0000000E 000C                        .BLKW   1
                        000E                 .IIF    NB,CRB$B_MASK,  CRB$B_MASK:
                0000000F 000E                        .BLKB   1
                00000010 000F                        .BLKB   1
                        0010                 .IIF    NB,CRB$L_LINK,  CRB$L_LINK:
                00000014 0010                        .BLKL   1
                        0014                 .IIF    NB,CRB$L_INTD,  CRB$L_INTD:
                00000038 0014                        .BLKL   9
                        0038                 .IIF    NB,CRB$C_LENGTH,        CRB$C_LENGTH:
                        0038                 .IIF    NB,CRB$K_LENGTH,        CRB$K_LENGTH:
                        0038                 .IIF    NB,CRB$L_INTD2, CRB$L_INTD2:
                0000005C 0038                        .BLKL   9
                        0000                 .RESTORE
                        0000     78          $DDBDEF                                 ;DEFINE DDB OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 0070                .=0
                        0000                 .IIF    NB,DDB$L_LINK,  DDB$L_LINK:
                00000004 0000                        .BLKL   1
                        0004                 .IIF    NB,DDB$L_UCB,   DDB$L_UCB:
                00000008 0004                        .BLKL   1
                        0008                 .IIF    NB,DDB$W_SIZE,  DDB$W_SIZE:
                0000000A 0008                        .BLKW   1
                        000A                 .IIF    NB,DDB$B_TYPE,  DDB$B_TYPE:
                0000000B 000A                        .BLKB   1
                0000000C 000B                        .BLKB   1
                        000C                 .IIF    NB,DDB$L_DDT,   DDB$L_DDT:
                00000010 000C                        .BLKL   1
                        0010                 .IIF    NB,DDB$L_ACPD,  DDB$L_ACPD:
                00000013 0010                        .BLKB   3
                        0013                 .IIF    NB,DDB$B_ACPCLASS,      DDB$B_ACPCLASS:
                00000014 0013                        .BLKB   1
                        0014                 .IIF    NB,DDB$T_NAME,  DDB$T_NAME:
                00000015 0014                        .BLKB   1
                00000024 0015                        .BLKB   15
                        0024                 .IIF    NB,DDB$T_DRVNAME,       DDB$T_DRVNAME:
                00000025 0024                        .BLKB   1
                00000034 0025                        .BLKB   15
                        0034                 .IIF    NB,DDB$C_LENGTH,        DDB$C_LENGTH:
                        0034                 .IIF    NB,DDB$K_LENGTH,        DDB$K_LENGTH:
                        0000                 .RESTORE
                        0000     79          $DDTDEF                                 ;DEFINE DDT OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
```

```
                    0000                .PSECT  $ABS$,ABS
           00000000 0070                .=0
                    0000                .IIF    NB,DDT$L_START, DDT$L_START:
           00000004 0000                        .BLKL   1
                    0004                .IIF    NB,DDT$L_UNSOLINT,      DDT$L_UNSOLINT:
           00000008 0004                        .BLKL   1
                    0008                .IIF    NB,DDT$L_FDT,   DDT$L_FDT:
           0000000C 0008                        .BLKL   1
                    000C                .IIF    NB,DDT$L_CANCEL,        DDT$L_CANCEL:
           00000010 000C                        .BLKL   1
                    0010                .IIF    NB,DDT$L_REGDUMP,       DDT$L_REGDUMP:
           00000014 0010                        .BLKL   1
                    0014                .IIF    NB,DDT$W_DIAGBUF,       DDT$W_DIAGBUF:
           00000016 0014                        .BLKW   1
                    0016                .IIF    NB,DDT$W_ERRORBUF,      DDT$W_ERRORBUF:
           00000018 0016                        .BLKW   1
                    0018                .IIF    NB,DDT$L_UNITINIT,      DDT$L_UNITINIT:
           0000001C 0018                        .BLKL   1
                    001C                .IIF    NB,DDT$L_ALTSTART,      DDT$L_ALTSTART:
           00000020 001C                        .BLKL   1
                    0000                .RESTORE
                    0000     80         $EMBDEF                                 ;DEFINE EMB OFFSETS
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
           00000000 0070                .=0
                    0000                .RESTORE
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
           00000000 0070                .=0
                    0000                .RESTORE
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
           00000000 0070                .=0
                    0000                .RESTORE
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
           00000000 0070                .=0
                    0000                .RESTORE
                    0000     81         $IDBDEF                                 ;DEFINE IDB OFFSETS
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
           00000000 0070                .=0
                    0000                .IIF    NB,IDB$L_CSR,   IDB$L_CSR:
           00000004 0000                        .BLKL   1
                    0004                .IIF    NB,IDB$L_OWNER, IDB$L_OWNER:
           00000008 0004                        .BLKL   1
                    0008                .IIF    NB,IDB$W_SIZE,  IDB$W_SIZE:
           0000000A 0008                        .BLKW   1
                    000A                .IIF    NB,IDB$B_TYPE,  IDB$B_TYPE:
           0000000B 000A                        .BLKB   1
           0000000C 000B                        .BLKB   1
                    000C                .IIF    NB,IDB$W_UNITS, IDB$W_UNITS:
           0000000E 000C                        .BLKW   1
           00000010 000E                        .BLKW   1
                    0010                .IIF    NB,IDB$L_ADP,   IDB$L_ADP:
           00000014 0010                        .BLKL   1
                    0014                .IIF    NB,IDB$L_UCBLST,        IDB$L_UCBLST:
```

```
                    00000034  0014                        .BLKL   8
                              0034              .IIF    NB,IDB$C_LENGTH,        IDB$C_LENGTH:
                              0034              .IIF    NB,IDB$K_LENGTH,        IDB$K_LENGTH:
                              0000              .RESTORE
                              0000    82        $IPLDEF                         ;DEFINE INTERRUPT PRIORITY LEVELS
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  0070              .=0
                              0000              .RESTORE
                              0000    83        $IRPDEF                         ;DEFINE IRP OFFSETS
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  0070              .=0
                              0000              .IIF    NB,IRP$L_IOQFL, IRP$L_IOQFL:
                    00000004  0000                      .BLKL   1
                              0004              .IIF    NB,IRP$L_IOQBL, IRP$L_IOQBL:
                    00000008  0004                      .BLKL   1
                              0008              .IIF    NB,IRP$W_SIZE,  IRP$W_SIZE:
                    0000000A  0008                      .BLKW   1
                              000A              .IIF    NB,IRP$B_TYPE,  IRP$B_TYPE:
                    0000000B  000A                      .BLKB   1
                              000B              .IIF    NB,IRP$B_RMOD,  IRP$B_RMOD:
                    0000000C  000B                      .BLKB   1
                              000C              .IIF    NB,IRP$L_PID,   IRP$L_PID:
                    00000010  000C                      .BLKL   1
                              0010              .IIF    NB,IRP$L_AST,   IRP$L_AST:
                    00000014  0010                      .BLKL   1
                              0014              .IIF    NB,IRP$L_ASTPRM,        IRP$L_ASTPRM:
                    00000018  0014                      .BLKL   1
                              0018              .IIF    NB,IRP$L_WIND,  IRP$L_WIND:
                    0000001C  0018                      .BLKL   1
                              001C              .IIF    NB,IRP$L_UCB,   IRP$L_UCB:
                    00000020  001C                      .BLKL   1
                              0020              .IIF    NB,IRP$W_FUNC,  IRP$W_FUNC:
                    00000022  0020                      .BLKW   1
                              0022              .IIF    NB,IRP$B_EFN,   IRP$B_EFN:
                    00000023  0022                      .BLKB   1
                              0023              .IIF    NB,IRP$B_PRI,   IRP$B_PRI:
                    00000024  0023                      .BLKB   1
                              0024              .IIF    NB,IRP$L_IOSB,  IRP$L_IOSB:
                    00000028  0024                      .BLKL   1
                              0028              .IIF    NB,IRP$W_CHAN,  IRP$W_CHAN:
                    0000002A  0028                      .BLKW   1
                              002A              .IIF    NB,IRP$W_STS,   IRP$W_STS:
                    0000002C  002A                      .BLKW   1
                              002C              .IIF    NB,IRP$L_SVAPTE,        IRP$L_SVAPTE:
                    00000030  002C                      .BLKL   1
                              0030              .IIF    NB,IRP$W_BOFF,  IRP$W_BOFF:
                    00000032  0030                      .BLKW   1
                              0032              .IIF    NB,IRP$W_BCNT,  IRP$W_BCNT:
                    00000034  0032                      .BLKW   1
                              0034              .IIF    NB,IRP$L_IOST1, IRP$L_IOST1:
                              0034              .IIF    NB,IRP$L_MEDIA, IRP$L_MEDIA:
                    00000038  0034                      .BLKL   1
                              0038              .IIF    NB,IRP$L_IOST2, IRP$L_IOST2:
                              0038              .IIF    NB,IRP$L_TT_TERM,       IRP$L_TT_TERM:
                              0038              .IIF    NB,IRP$B_CARCON,        IRP$B_CARCON:
```

```
00000039  0038                          .BLKB   1
0000003C  0039                          .BLKB   3
          003C                .IIF    NB,IRP$Q_NT_PRVMSK,     IRP$Q_NT_PRVMSK:
          003C                .IIF    NB,IRP$W_ABCNT, IRP$W_ABCNT:
          003C                .IIF    NB,IRP$W_TT_PRMPT,      IRP$W_TT_PRMPT:
0000003E  003C                          .BLKW   1
          003E                .IIF    NB,IRP$W_OBCNT, IRP$W_OBCNT:
00000040  003E                          .BLKW   1
          0040                .IIF    NB,IRP$L_SEGVBN,        IRP$L_SEGVBN:
00000044  0040                          .BLKL   1
          0044                .IIF    NB,IRP$L_DIAGBUF,       IRP$L_DIAGBUF:
00000048  0044                          .BLKL   1
          0048                .IIF    NB,IRP$L_SEQNUM,        IRP$L_SEQNUM:
0000004C  0048                          .BLKL   1
          004C                .IIF    NB,IRP$L_EXTEND,        IRP$L_EXTEND:
00000050  004C                          .BLKL   1
          0050                .IIF    NB,IRP$L_ARB,   IRP$L_ARB:
00000054  0050                          .BLKL   1
00000058  0054                          .BLKL   1
0000005C  0058                          .BLKL   1
          005C                .IIF    NB,IRP$C_LENGTH,        IRP$C_LENGTH:
          005C                .IIF    NB,IRP$K_LENGTH,        IRP$K_LENGTH:
          0000                .RESTORE
          0000      84        $JIBDEF                         ;DEFINE JIB OFFSETS
          0000                .SAVE   LOCAL_BLOCK
          0000                .PSECT  $ABS$,ABS
00000000  0070                .=0
          0000                .RESTORE
          0000      85        $LOGDEF                         ;DEFINE LOGICAL NAME BLOCK OFFSETS
          0000                .SAVE   LOCAL_BLOCK
          0000                .PSECT  $ABS$,ABS
00000000  0070                .=0
          0000                .RESTORE
          0000      86        $PCBDEF                         ;DEFINE PCB OFFSETS
          0000                .SAVE   LOCAL_BLOCK
          0000                .PSECT  $ABS$,ABS
00000000  0070                .=0
          0000                .IIF    NB,PCB$L_SQFL,  PCB$L_SQFL:
00000004  0000                          .BLKL   1
          0004                .IIF    NB,PCB$L_SQBL,  PCB$L_SQBL:
00000008  0004                          .BLKL   1
          0008                .IIF    NB,PCB$W_SIZE,  PCB$W_SIZE:
0000000A  0008                          .BLKW   1
          000A                .IIF    NB,PCB$B_TYPE,  PCB$B_TYPE:
0000000B  000A                          .BLKB   1
          000B                .IIF    NB,PCB$B_PRI,   PCB$B_PRI:
0000000C  000B                          .BLKB   1
          000C                .IIF    NB,PCB$B_ASTACT,        PCB$B_ASTACT:
0000000D  000C                          .BLKB   1
          000D                .IIF    NB,PCB$B_ASTEN, PCB$B_ASTEN:
0000000E  000D                          .BLKB   1
          000E                .IIF    NB,PCB$W_MTXCNT,        PCB$W_MTXCNT:
00000010  000E                          .BLKW   1
          0010                .IIF    NB,PCB$L_ASTQFL,        PCB$L_ASTQFL:
00000014  0010                          .BLKL   1
          0014                .IIF    NB,PCB$L_ASTQBL,        PCB$L_ASTQBL:
00000018  0014                          .BLKL   1
```

```
                    0018            .IIF    NB,PCB$L_PHYPCB,        PCB$L_PHYPCB:
0000001C  0018                              .BLKL   1
                    001C            .IIF    NB,PCB$L_OWNER, PCB$L_OWNER:
00000020  001C                              .BLKL   1
                    0020            .IIF    NB,PCB$L_WSSWP, PCB$L_WSSWP:
00000024  0020                              .BLKL   1
                    0024            .IIF    NB,PCB$L_STS,   PCB$L_STS:
00000028  0024                              .BLKL   1
                    0028            .IIF    NB,PCB$L_WTIME, PCB$L_WTIME:
0000002C  0028                              .BLKL   1
                    002C            .IIF    NB,PCB$W_STATE, PCB$W_STATE:
0000002E  002C                              .BLKW   1
                    002E            .IIF    NB,PCB$B_WEFC,  PCB$B_WEFC:
0000002F  002E                              .BLKB   1
                    002F            .IIF    NB,PCB$B_PRIB,  PCB$B_PRIB:
00000030  002F                              .BLKB   1
                    0030            .IIF    NB,PCB$W_APTCNT,        PCB$W_APTCNT:
00000032  0030                              .BLKW   1
                    0032            .IIF    NB,PCB$W_TMBU,  PCB$W_TMBU:
00000034  0032                              .BLKW   1
                    0034            .IIF    NB,PCB$W_GPGCNT,        PCB$W_GPGCNT:
00000036  0034                              .BLKW   1
                    0036            .IIF    NB,PCB$W_PPGCNT,        PCB$W_PPGCNT:
00000038  0036                              .BLKW   1
                    0038            .IIF    NB,PCB$W_ASTCNT,        PCB$W_ASTCNT:
0000003A  0038                              .BLKW   1
                    003A            .IIF    NB,PCB$W_BIOCNT,        PCB$W_BIOCNT:
0000003C  003A                              .BLKW   1
                    003C            .IIF    NB,PCB$W_BIOLM, PCB$W_BIOLM:
0000003E  003C                              .BLKW   1
                    003E            .IIF    NB,PCB$W_DIOCNT,        PCB$W_DIOCNT:
00000040  003E                              .BLKW   1
                    0040            .IIF    NB,PCB$W_DIOLM, PCB$W_DIOLM:
00000042  0040                              .BLKW   1
                    0042            .IIF    NB,PCB$W_PRCCNT,        PCB$W_PRCCNT:
00000044  0042                              .BLKW   1
                    0044            .IIF    NB,PCB$T_TERMINAL,      PCB$T_TERMINAL:
0000004C  0044                              .BLKB   8
                    004C            .IIF    NB,PCB$L_PQB,   PCB$L_PQB:
                    004C            .IIF    NB,PCB$L_EFWM,  PCB$L_EFWM:
00000050  004C                              .BLKL   1
                    0050            .IIF    NB,PCB$L_EFCS,  PCB$L_EFCS:
00000054  0050                              .BLKL   1
                    0054            .IIF    NB,PCB$L_EFCU,  PCB$L_EFCU:
00000058  0054                              .BLKL   1
                    0058            .IIF    NB,PCB$L_EFC2P, PCB$L_EFC2P:
0000005C  0058                              .BLKL   1
                    005C            .IIF    NB,PCB$L_EFC3P, PCB$L_EFC3P:
00000060  005C                              .BLKL   1
                    0060            .IIF    NB,PCB$L_PID,   PCB$L_PID:
00000064  0060                              .BLKL   1
                    0064            .IIF    NB,PCB$L_PHD,   PCB$L_PHD:
00000068  0064                              .BLKL   1
                    0068            .IIF    NB,PCB$T_LNAME, PCB$T_LNAME:
00000078  0068                              .BLKB   16
                    0078            .IIF    NB,PCB$L_JIB,   PCB$L_JIB:
0000007C  0078                              .BLKL   1
```

```
                        007C                .IIF    NB,PCB$Q_PRIV,  PCB$Q_PRIV:
                00000084  007C                        .BLKQ   1
                        0084                .IIF    NB,PCB$L_ARB,   PCB$L_ARB:
                00000088  0084                        .BLKL   1
                        0088                .IIF    NB,PCB$L_UIC,   PCB$L_UIC:
                        0088                .IIF    NB,PCB$W_MEM,   PCB$W_MEM:
                0000008A  0088                        .BLKW   1
                        008A                .IIF    NB,PCB$W_GRP,   PCB$W_GRP:
                0000008C  008A                        .BLKW   1
                        008C                .IIF    NB,PCB$C_LENGTH,        PCB$C_LENGTH:
                        008C                .IIF    NB,PCB$K_LENGTH,        PCB$K_LENGTH:
                        0000                .RESTORE
                        0000        87      $PRDEF                          ;DEFINE PROCESSOR REGISTERS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000  008C                .=0
                        0000                .RESTORE
                        0000        88      $UCBDEF                         ;DEFINE UCB OFFSETS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000  008C                .=0
                        0000                .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                        0000                .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
                00000004  0000                        .BLKL   1
                        0004                .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                        0004                .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
                00000008  0004                        .BLKL   1
                        0008                .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
                0000000A  0008                        .BLKW   1
                        000A                .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
                0000000B  000A                        .BLKB   1
                        000B                .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
                0000000C  000B                        .BLKB   1
                        000C                .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                        000C                .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                        000C                .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
                0000000D  000C                        .BLKB   1
                00000010  000D                        .BLKB   3
                        0010                .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                        0010                .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
                00000014  0010                        .BLKL   1
                        0014                .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                        0014                .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                        0014                .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
                00000016  0014                        .BLKW   1
                        0016                .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
                00000018  0016                        .BLKW   1
                        0018                .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                        0018                .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
                0000001A  0018                        .BLKW   1
                        001A                .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                        001A                .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
                0000001C  001A                        .BLKW   1
                        001C                .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
                00000020  001C                        .BLKL   1
                        0020                .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
                00000024  0020                        .BLKL   1
```

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                        0024              .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
                        0024                              .BLKL   1
                        0028              .IIF    NB,UCB$L_PID,   UCB$L_PID:
                        0028                              .BLKL   1
                        002C              .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
                        002C                              .BLKL   1
                        0030              .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
                        0030                              .BLKL   1
                        0034              .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
                        0034                              .BLKL   1
                        0038              .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
                        0038                              .BLKB   1
                        0039              .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
                        0039                              .BLKB   1
                        003A              .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
                        003A                              .BLKW   1
                        003C              .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
                        003C              .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
                        003C              .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
                        003C                              .BLKB   1
                        003D              .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
                        003D              .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
                        003D                              .BLKB   1
                        003E              .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
                        003E              .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
                        003E                              .BLKB   1
                        003F              .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
                        003F                              .BLKB   1
                        0040              .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
                        0040                              .BLKL   1
                        0044              .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
                        0044                              .BLKL   1
                        0048              .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
                        0048                              .BLKW   1
                        004A              .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
                        004A              .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
                        004A                              .BLKB   1
                        004B              .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
                        004B                              .BLKB   1
                        004C              .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
                        004C                              .BLKL   1
                        0050              .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
                        0050                              .BLKW   1
                        0052              .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
                        0052              .IIF    NB,UCB$B_STATE, UCB$B_STATE:
                        0052                              .BLKB   1
                        0053              .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
                        0053                              .BLKB   1
                        0054              .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
                        0054                              .BLKL   1
                        0058              .IIF    NB,UCB$W_STS,   UCB$W_STS:
                        0058                              .BLKW   1
                        005A              .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
                        005A                              .BLKW   1
                        005C              .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
                        005C              .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
                        005C                              .BLKL   1
```

```
                        0060            .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
00000064  0060                                  .BLKL   1
                        0064            .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
                        0064            .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
00000068  0064                                  .BLKL   1
                        0068            .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
0000006C  0068                                  .BLKL   1
                        006C            .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
0000006E  006C                                  .BLKW   1
                        006E            .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
00000070  006E                                  .BLKW   1
                        0070            .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
00000071  0070                                  .BLKB   1
                        0071            .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
00000072  0071                                  .BLKB   1
                        0072            .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074  0072                                  .BLKW   1
                        0074            .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
                        0074            .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000  0074                          . = 0
                        0000            .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002  0000                                  .BLKW   1
00000074  0002                          . = 116
                        0074            .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078  0074                                  .BLKL   1
                        0078            .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C  0078                                  .BLKL   1
                        007C            .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080  007C                                  .BLKL   1
                        0080            .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084  0080                                  .BLKL   1
                        0084            .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088  0084                                  .BLKL   1
                        0088            .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C  0088                                  .BLKL   1
                        008C            .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090  008C                                  .BLKL   1
                        0090            .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
                        0090            .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074  0090                          . = 116
                        0074            .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075  0074                                  .BLKB   1
                        0075            .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076  0075                                  .BLKB   1
                        0076            .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077  0076                                  .BLKB   1
                        0077            .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078  0077                                  .BLKB   1
                        0078            .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C  0078                                  .BLKL   1
0000007E  007C                                  .BLKW   1
                        007E            .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080  007E                                  .BLKW   1
                        0080            .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084  0080                                  .BLKL   1
00000080  0084                          . = 128
00000084  0080                                  .BLKL   1
```

```
                        0084              .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088  0084                                    .BLKL   1
                        0088              .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A  0088                                    .BLKW   1
                        008A              .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C  008A                                    .BLKW   1
                        008C              .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
                        008C              .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E  008C                                    .BLKW   1
                        008E              .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090  008E                                    .BLKW   1
                        0090              .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092  0090                                    .BLKW   1
                        0092              .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
00000094  0092                                    .BLKW   1
                        0094              .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095  0094                                    .BLKB   1
                        0095              .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096  0095                                    .BLKB   1
                        0096              .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098  0096                                    .BLKW   1
00000096  0098                          . = 150
00000098  0096                                    .BLKW   1
                        0098              .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C  0098                                    .BLKL   1
                        009C              .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0  009C                                    .BLKL   1
                        00A0              .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
000000A4  00A0                                    .BLKL   1
                        00A4              .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
000000A6  00A4                                    .BLKW   1
                        00A6              .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
000000A7  00A6                                    .BLKB   1
000000A8  00A7                                    .BLKB   1
00000074  00A8                          . = 116
00000078  0074                                    .BLKL   1
0000007C  0078                                    .BLKL   1
00000080  007C                                    .BLKL   1
00000084  0080                                    .BLKL   1
00000088  0084                                    .BLKL   1
0000008C  0088                                    .BLKL   1
                        008C              .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
00000090  008C                                    .BLKL   1
00000094  0090                                    .BLKL   1
00000098  0094                                    .BLKL   1
0000009C  0098                                    .BLKL   1
                        009C              .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
0000009D  009C                                    .BLKB   1
                        009D              .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
0000009E  009D                                    .BLKB   1
                        009E              .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
0000009F  009E                                    .BLKB   1
000000A0  009F                                    .BLKB   1
                        00A0              .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
000000A1  00A0                                    .BLKB   1
                        00A1              .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
000000A2  00A1                                    .BLKB   1
```

```
                    00A2            .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
000000A3  00A2                              .BLKB   1
000000A4  00A3                              .BLKB   1
                    00A4            .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
000000A5  00A4                              .BLKB   1
                    00A5            .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
000000A7  00A5                              .BLKW   1
000000A8  00A7                              .BLKB   1
                    00A8            .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
000000AC  00A8                              .BLKL   1
000000B0  00AC                              .BLKL   1
000000B4  00B0                              .BLKL   1
000000B8  00B4                              .BLKL   1
                    00B8            .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
000000BC  00B8                              .BLKL   1
                    00BC            .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
                    00BC            .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
00000074  00BC                      . = 116
                    0074            .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
00000078  0074                              .BLKL   1
                    0078            .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
0000007C  0078                              .BLKL   1
                    007C            .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
0000007E  007C                              .BLKW   1
00000080  007E                              .BLKW   1
                    0000            .RESTORE
                    0000     89     $VECDEF                         ;DEFINE CRB VECTOR OFFSETS
                    0000            .SAVE   LOCAL_BLOCK
                    0000            .PSECT  $ABS$,ABS
00000000  00BC                      .=0
                    0000            .IIF    NB,VEC$Q_DISPATCH,      VEC$Q_DISPATCH:
00000008  0000                              .BLKQ   1
                    0008            .IIF    NB,VEC$L_IDB,   VEC$L_IDB:
0000000C  0008                              .BLKL   1
                    000C            .IIF    NB,VEC$L_INITIAL,       VEC$L_INITIAL:
00000010  000C                              .BLKL   1
                    0010            .IIF    NB,VEC$W_MAPREG,        VEC$W_MAPREG:
00000012  0010                              .BLKW   1
                    0012            .IIF    NB,VEC$B_NUMREG,        VEC$B_NUMREG:
00000013  0012                              .BLKB   1
                    0013            .IIF    NB,VEC$B_DATAPATH,      VEC$B_DATAPATH:
00000014  0013                              .BLKB   1
                    0014            .IIF    NB,VEC$L_ADP,   VEC$L_ADP:
00000018  0014                              .BLKL   1
                    0018            .IIF    NB,VEC$L_UNITINIT,      VEC$L_UNITINIT:
0000001C  0018                              .BLKL   1
                    001C            .IIF    NB,VEC$L_START, VEC$L_START:
00000020  001C                              .BLKL   1
                    0020            .IIF    NB,VEC$L_UNITDISC,      VEC$L_UNITDISC:
00000024  0020                              .BLKL   1
                    0024            .IIF    NB,VEC$C_LENGTH,        VEC$C_LENGTH:
                    0024            .IIF    NB,VEC$K_LENGTH,        VEC$K_LENGTH:
                    0000            .RESTORE
```

```
                        0000     91          .SBTTL  CANCEL I/O ON CHANNEL
                        0000     92 ;+
                        0000     93 ; IOC$CANCELIO - CANCEL I/O ON CHANNEL
                        0000     94 ;
                        0000     95 ; THIS ROUTINE IS A DEVICE INDEPENDENT CANCEL I/O ROUTINE THAT CONDITIONALLY
                        0000     96 ; MARKS THE UCB SUCH THAT THE CURRENT I/O REQUEST WILL BE CANCELED IF CONDITIONS
                        0000     97 ; WARRANT SUCH A ACTION.
                        0000     98 ;
                        0000     99 ; INPUTS:
                        0000    100 ;
                        0000    101 ;       R2 = NEGATIVE OF THE CHANNEL NUMBER.
                        0000    102 ;       R3 = CURRENT IO PACKET.
                        0000    103 ;       R4 = PCB ADDRESS.
                        0000    104 ;       R5 = UCB ADDRESS.
                        0000    105 ;
                        0000    106 ; OUTPUTS:
                        0000    107 ;
                        0000    108 ;       IF THE DEVICE IS BUSY, THE REQUEST IS FOR THE CURRENT PROCESS, AND
                        0000    109 ;       THE I/O WAS ISSUED FROM THE DESIGNATED CHANNEL, THEN THE CANCEL I/O
                        0000    110 ;       BIT IS SET IN THE CORRESPONDING UCB.
                        0000    111 ;
                        0000    112 ;       R2, R3, R4, AND R5 ARE PRESERVED ACROSS CALL.
                        0000    113 ;-
                        0000    114
                        00000000    115          .PSECT  SEP, SHR, EXE, WRT, LONG        ; **** SUPERVISOR ****
                        0000    116 IOC$CANCELIO::                          ;CANCEL I/O ON CHANNEL
11 58 A5    08  E1      0000    117          BBC     #UCB$V_BSY,UCB$W_STS(R5),10$ ;IF CLR, DEVICE NOT BUSY
60 A4    0C A3  D1      0005    118          CMPL    IRP$L_PID(R3),PCB$L_PID(R4) ;PROCESS ID MATCH?
                0A  12  000A    119          BNEQ    10$                         ;IF NEQ NO
   28 A3    52  B1      000C    120          CMPW    R2,IRP$W_CHAN(R3)           ;CHANNEL NUMBER MATCH
                04  12  0010    121          BNEQ    10$                         ;IF NEQ NO
   58 A5    08  A8      0012    122          BISW    #UCB$M_CANCEL,UCB$W_STS(R5) ;SET CANCEL PENDING
                05  0016    123 10$:     RSB                                     ;
```

```
                                0017   125          .SBTTL  FILL DIAGNOSTIC BUFFER
                                0017   126 ;+
                                0017   127 ; IOC$DIAGBUFILL - FILL DIAGNOSTIC BUFFER
                                0017   128 ;
                                0017   129 ; THIS ROUTINE IS CALLED AT THE END OF AN I/O OPERATION, BUT BEFORE RELEASING
                                0017   130 ; THE I/O CHANNEL, TO FILL THE FINAL DEVICE PARAMETERS INTO AN INTERNAL DIAG-
                                0017   131 ; NOSTIC BUFFER IF ONE IS SPECIFIED.
                                0017   132 ;
                                0017   133 ; INPUTS:
                                0017   134 ;
                                0017   135 ;       R4 = ADDRESS OF DEVICE CSR REGISTER.
                                0017   136 ;       R5 = DEVICE UNIT UCB ADDRESS.
                                0017   137 ;
                                0017   138 ; OUTPUTS:
                                0017   139 ;
                                0017   140 ;       IF A DIAGNOSTIC BUFFER WAS SPECIFIED IN THE ORIGINAL REQUEST, THEN
                                0017   141 ;       THE COMPLETION TIME, FINAL ERROR COUNTERS, AND DEVICE REGISTERS ARE
                                0017   142 ;       FILLED INTO THE DIAGNOSTIC BUFFER.
                                0017   143 ;-
                                0017   144
                                0017   145 IOC$DIAGBUFILL::                           ;FILL DIAGNOSTIC BUFFER
          53    4C A5    D0   0017   146          MOVL    UCB$L_IRP(R5),R3           ;GET ADDRESS OF I/O PACKET
       27 2A A3    07    E1   001B   147          BBC     #IRP$V_DIAGBUF,IRP$W_STS(R3),10$ ;IF CLR, NO DIAGNOSTIC BUFFER
          50    44 B3    D0   0020   148          MOVL    @IRP$L_DIAGBUF(R3),R0      ;GET ADDRESS OF INTERNAL BUFFER DATA AREA
             50    08    C0   0024   149          ADDL    #8,R0                      ;POINT PAST START TIME
    80   00000000'EF    7D   0027   150          MOVQ    EXE$GQ_SYSTIME,(R0)+       ;INSERT COMPLETION TIME
          80    70 A5    3C   002E   151          MOVZWL  UCB$B_ERTCNT(R5),(R0)+     ;INSERT FINAL ERROR COUNTERS
          52    24 A5    D0   0032   152          MOVL    UCB$L_DDB(R5),R2           ;GET ADDRESS OF DDB
          52    0C A2    D0   0036   153          MOVL    DDB$L_DDT(R2),R2           ;GET ADDRESS OF DDT
          51    10 A2    D0   003A   154          MOVL    DDT$L_REGDUMP(R2),R1       ;FETCH ADDRESS OF DUMP ROUTINE
       03 51    10    E0   003E   155          BBS     #16,R1,5$                  ;+++ BRANCH IF SUPERVISOR ABSOLUTE
          51    52    C0   0042   156          ADDL    R2,R1                      ;+++ INCLUDE BASE ADDRESS
                61    16   0045   157 5$:       JSB     (R1)                       ;CALL DEVICE SPECIFIC REGISTER DUMP ROUTINE
                      05   0047   158 10$:      RSB                                ;
```

```
                     0048   160          .SBTTL  RELEASE I/O CHANNEL
                     0048   161 ;+
                     0048   162 ; IOC$RELCHAN - RELEASE ALL I/O CHANNELS
                     0048   163 ; IOC$RELSCHAN - RELEASE SECONDARY I/O CHANNEL
                     0048   164 ;
                     0048   165 ; THIS ROUTINE IS CALLED AT THE END OF AN I/O OPERATION TO RELEASE ALL
                     0048   166 ; CHANNELS THE I/O WAS BEING PERFORMED ON.
                     0048   167 ;
                     0048   168 ; INPUTS:
                     0048   169 ;
                     0048   170 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                     0048   171 ;
                     0048   172 ; OUTPUTS:
                     0048   173 ;
                     0048   174 ;       THE CHANNELS ARE RELEASED AND AN ATTEMPT IS MADE TO REMOVE THE NEXT
                     0048   175 ;       WAITING DRIVER PROCESS FROM EACH CHANNEL QUEUE. IF A DRIVER PROCESS
                     0048   176 ;       IS WAITING, THEN THE CHANNEL IS ASSIGNED TO THAT DRIVER PROCESS AND
                     0048   177 ;       IT IS CALLED VIA A JSB TO ITS CHANNEL WAIT RETURN ADDRESS. WHEN THE
                     0048   178 ;       CALLED DRIVER PROCESS RETURNS, A RETURN IS MADE TO THE DRIVER PROCESS
                     0048   179 ;       THAT RELEASED THE CHANNEL. IF THERE IS NO DRIVER PROCESS WAITING FOR
                     0048   180 ;       THE CHANNEL, THEN THE CHANNEL STATUS IS SET TO IDLE.
                     0048   181 ;
                     0048   182 ;       R3 AND R4 ARE PRESERVED ACROSS CALL.
                     0048   183 ;-
                     0048   184
                     0048   185          .ENABL  LSB
                     0048   186 IOC$RELSCHAN::                            ;RELEASE SECONDARY I/O CHANNEL
 50   20 A5   D0     0048   187          MOVL    UCB$L_CRB(R5),R0          ;GET ADDRESS OF PRIMARY CRB
 50   10 A0   D0     004C   188          MOVL    CRB$L_LINK(R0),R0         ;GET ADDRESS OF SECONARY CRB
        10   11     0050   189          BRB     20$                       ;
                     0052   190 IOC$RELCHAN::                             ;RELEASE I/O CHANNEL
 50   20 A5   D0     0052   191          MOVL    UCB$L_CRB(R5),R0          ;GET ADDRESS OF PRIMARY CRB
 50   10 A0   D0     0056   192          MOVL    CRB$L_LINK(R0),R0         ;GET ADDRESS OF SECONDARY CRB
        02   13     005A   193          BEQL    10$                       ;IF EQL NONE
        04   10     005C   194          BSBB    20$                       ;RELEASE SECONDARY CHANNEL
 50   20 A5   D0     005E   195 10$:     MOVL    UCB$L_CRB(R5),R0          ;GET ADDRESS OF PRIMARY CRB
25 0E A0     00     E1     0062   196 20$:     BBC     #CRB$V_BSY,CRB$B_MASK(R0),30$ ;IF CLR, THEN CHANNEL NOT BUSY
 51   1C A0   D0     0067   197          MOVL    CRB$L_INTD+VEC$L_IDB(R0),R1 ;GET ADDRESS OF IDB
 04 A1   55   D1     006B   198          CMPL    R5,IDB$L_OWNER(R1)        ;DRIVER PROCESS OWN CHANNEL?
        1B   12     006F   199          BNEQ    30$                       ;IF NEQ NO
 52   00 B0   0F     0071   200          REMQUE  @CRB$L_WQFL(R0),R2        ;GET ADDRESS OF NEXT DRIVER FORK BLOCK
        16   1D     0075   201          BVS     40$                       ;IF VS NO DRIVER PROCESS WAITING
        38   BB     0077   202          PUSHR   #^M<R3,R4,R5>             ;SAVE CONTEXT OF CURRENT DRIVER PROCESS
    55   52   D0     0079   203          MOVL    R2,R5                     ;COPY ADDRESS OF DRIVER PROCESS FORK BLOCK
 53   10 A5   D0     007C   204          MOVL    UCB$L_FR3(R5),R3          ;LOAD WAITING DRIVER PROCESS CONTEXT
    54   61   D0     0080   205          MOVL    IDB$L_CSR(R1),R4          ;SET ASSIGNED CHANNEL CSR ADDRESS
 04 A1   55   D0     0083   206          MOVL    R5,IDB$L_OWNER(R1)        ;SET ADDRESS OF OWNER PROCESS UCB
      0C B5   16     0087   207          JSB     @UCB$L_FPC(R5)            ;CALL DRIVER AT CHANNEL WAIT RETURN ADDRESS
        38   BA     008A   208          POPR    #^M<R3,R4,R5>             ;RESTORE PREVIOUS DRIVER PROCESS CONTEXT
        05   8C     008C   209 30$:     RSB                               ;
    04 A1   D4     008D   210 40$:     CLRL    IDB$L_OWNER(R1)           ;CLEAR OWNER UNIT UCB ADDRESS
 0E A0   01   8A     0090   211          BICB    #CRB$M_BSY,CRB$B_MASK(R0) ;CLEAR CHANNEL BUSY
        05   94     0094   212          RSB                               ;
                     0095   213          .DSABL  LSB
```

```
                     0095   215          .SBTTL  REQUEST I/O CHANNEL
                     0095   216 ;+
                     0095   217 ; IOC$REQPCHANH - REQUEST PRIMARY I/O CHANNEL HIGH PRIORITY
                     0095   218 ; IOC$REQSCHANH - REQUEST SECONDARY I/O CHANNEL HIGH PRIORITY
                     0095   219 ; IOC$REQPCHANL - REQUEST PRIMARY I/O CHANNEL LOW PRIORITY
                     0095   220 ; IOC$REQSCHANL - REQUEST SECONDARY I/O CHANNEL LOW PRIORITY
                     0095   221 ;
                     0095   222 ; THESE ROUTINES ARE CALLED TO REQUEST AN I/O CHANNEL TO PERFORM AN I/O
                     0095   223 ; OPERATION ON.
                     0095   224 ;
                     0095   225 ; INPUTS:
                     0095   226 ;
                     0095   227 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                     0095   228 ;       04(SP) = RETURN ADDRESS OF CALLER'S CALLER.
                     0095   229 ;
                     0095   230 ; OUTPUTS:
                     0095   231 ;
                     0095   232 ;       IF THE SPECIFIED I/O CHANNEL IS IDLE, THEN IT IS IMMEDIATELY
                     0095   233 ;       ASSIGNED TO THE CURRENT DRIVER PROCESS. ELSE THE DRIVER PROCESS
                     0095   234 ;       CONTEXT IS SAVED IN ITS FORK BLOCK, THE FORK BLOCK IS INSERTED
                     0095   235 ;       IN THE CHANNEL WAIT QUEUE, AND A RETURN TO THE DRIVER PROCESS'
                     0095   236 ;       CALLER IS EXECUTED.
                     0095   237 ;
                     0095   238 ;       WHEN THE CHANNEL IS ASSIGNED, THE CSR ADDRESS OF THE ASSIGNED
                     0095   239 ;       CONTROLLER IS RETURNED TO THE CALLER IN REGISTER R4.
                     0095   240 ;
                     0095   241 ;       R3 IS PRESERVED ACROSS CALL.
                     0095   242 ;-
                     0095   243
                     0095   244          .ENABL  LSB
                     0095   245 IOC$REQSCHANH::                           ;REQUEST SECONDARY I/O CHANNEL HIGH PRIORITY
 50   20 A5   D0     0095   246          MOVL    UCB$L_CRB(R5),R0          ;GET ADDRESS OF PRIMARY CRB
 50   10 A0   D0     0099   247          MOVL    CRB$L_LINK(R0),R0         ;GET ADDRESS OF SECONDARY CRB
        0E   11     009D   248          BRB     10$                       ;
                     009F   249 IOC$REQSCHANL::                           ;REQUEST SECONDARY I/O CHANNEL LOW PRIORITY
 50   20 A5   D0     009F   250          MOVL    UCB$L_CRB(R5),R0          ;GET ADDRESS OF PRIMARY CRB
 50   10 A0   D0     00A3   251          MOVL    CRB$L_LINK(R0),R0         ;GET ADDRESS OF SECONDARY CRB
        0D   11     00A7   252          BRB     20$                       ;
                     00A9   253 IOC$REQPCHANH::                           ;REQUEST PRIMARY I/O CHANNEL HIGH PRIORITY
 50   20 A5   D0     00A9   254          MOVL    UCB$L_CRB(R5),R0          ;GET ADDRESS OF PRIMARY CRB
 52   50   D0     00AD   255 10$:       MOVL    R0,R2                     ;SET ADDDRESS OF WAIT QUEUE LISTHEAD
        08   11     00B0   256          BRB     30$                       ;
                     00B2   257 IOC$REQPCHANL::                           ;REQUEST PRIMARY I/O CHANNEL LOW PRIORITY
 50   20 A5   D0     00B2   258          MOVL    UCB$L_CRB(R5),R0          ;GET ADDRESS OF PRIMARY CRB
 52   04 A0   D0     00B6   259 20$:       MOVL    CRB$L_WQBL(R0),R2         ;GET ADDRESS OF LAST ENTRY IN QUEUE
 51   1C A0   D0     00BA   260 30$:       MOVL    CRB$L_INTD+VEC$L_IDB(R0),R1 ;GET ADDRESS OF IDB
08 0E A0   00   E2     00BE   261          BBSS    #CRB$V_BSY,CRB$B_MASK(R0),40$ ;IF SET, THEN CHANNEL BUSY
 54   61   D0     00C3   262          MOVL    IDB$L_CSR(R1),R4          ;SET ASSIGNED CHANNEL CSR ADDRESS
 04 A1   55   D0     00C6   263          MOVL    R5,IDB$L_OWNER(R1)        ;SET OWNER UCB ADDRESS
        05   00CA   264          RSB                               ;
 10 A5   53   D0     00CB   265 40$:       MOVL    R3,UCB$L_FR3(R5)          ;SAVE R3 IN FORK BLOCK
    0C A5 8ED0     00CF   266          POPL    UCB$L_FPC(R5)             ;SAVE CHANNEL WAIT RETURN ADDRESS
 62   65   0E     00D3   267          INSQUE  UCB$L_FQFL(R5),CRB$L_WQFL(R2) ;INSERT DRIVER PROCESS IN CHANNEL WAIT
 04 A1   55   D1     00D6   268          CMPL    R5,IDB$L_OWNER(R1)        ;CURRENT DRIVER PROCESS OWNER?
        41   13     00DA   269          BEQL    RELEASE                   ;IF EQL YES - RELEASE CHANNELS
        05   00DC   270          RSB                               ;
                     00DD   271          .DSABL  LSB
```

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                                00DD   273          .SBTTL  I/O REQUEST COMPLETION PROCESSING
                                00DD   274 ;+
                                00DD   275 ; IOC$REQCOM - I/O REQUEST COMPLETE
                                00DD   276 ;
                                00DD   277 ; THIS ROUTINE IS ENTERED WHEN AN I/O OPERATION IS COMPLETED ON A
                                00DD   278 ; DEVICE UNIT. THE FINAL I/O STATUS IS STORED IN THE ASSOCIATED I/O
                                00DD   279 ; PACKET AND THE PACKET IS INSERTED IN THE I/O FINISH QUEUE FOR
                                00DD   280 ; I/O POST PROCESSING. DEVICE UNIT BUSY IS CLEARED AND AN ATTEMPT
                                00DD   281 ; IS MADE TO START ANOTHER I/O REQUEST ON THE DEVICE UNIT.
                                00DD   282 ;
                                00DD   283 ; INPUTS:
                                00DD   284 ;
                                00DD   285 ;       R0 = FIRST LONGWORD OF I/O STATUS.
                                00DD   286 ;       R1 = SECOND LONGWORD OF I/O STATUS.
                                00DD   287 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                                00DD   288 ;
                                00DD   289 ; OUTPUTS:
                                00DD   290 ;
                                00DD   291 ;       THE I/O PACKET IS INSERTED IN THE I/O POST PROCESSING QUEUE
                                00DD   292 ;       AND DEVICE UNIT BUSY IS CLEARED. A SOFTWARE INTERRUPT IS
                                00DD   293 ;       REQUESTED TO INITIATE I/O POST PROCESSING.
                                00DD   294 ;-
                                00DD   295
                                00DD   296 IOC$REQCOM::                                 ;I/O DONE PROCESSING
            53    4C A5    D0  00DD   297          MOVL    UCB$L_IRP(R5),R3            ;GET ADDRESS OF I/O PACKET
            34 A3    50    7D  00E1   298          MOVQ    R0,IRP$L_MEDIA(R3)          ;STORE FINAL I/O STATUS
                  60 A5    D6  00E5   299          INCL    UCB$L_OPCNT(R5)             ;INCREMENT OPERATIONS COMPLETED
                                00E8   300
                                00E8   301
00000000'FF       63    0E  00E8   302          INSQUE  (R3),@L^IOC$GL_PSBL         ;INSERT PACKET IN POST PROCESS QUEUE
                     03    12  00EF   303          BNEQ    10$                         ;IF NEQ NOT FIRST ENTRY IN QUEUE
                                00F1   304          SOFTINT #IPL$_IOPOST                ;INITIATE SOFTWARE INTERRUPT
                     14    04  DA  00F1                   MTPR    #IPL$_IOPOST,S^#PR$_SIRR
      18 58 A5       02    E5  00F4   305 10$:     BBCC    #UCB$V_ERLOGIP,UCB$W_STS(R5),20$ ;IF CLR, ERROR LOG NOT IN PROGRESS
         52    78 A5    D0  00F9   306          MOVL    UCB$L_EMB(R5),R2            ;GET ADDRESS OF ERROR MESSAGE BUFFER
      1A A2    58 A5    B0  00FD   307          MOVW    UCB$W_STS(R5),EMB$W_DV_STS(R2) ;INSERT FINAL DEVICE STATUS
      10 A2    70 A5    B0  0102   308          MOVW    UCB$B_ERTCNT(R5),EMB$B_DV_ERTCNT(R2) ;INSERT FINAL ERROR COUNTERS
         12 A2    50    7D  0107   309          MOVQ    R0,EMB$Q_DV_IOSB(R2)        ;INSERT FINAL I/O STATUS
           00000000'EF    16  010B   310          JSB     ERL$RELEASEMB               ;RELEASE ERROR MESSAGE BUFFER   [04]  ;G:2
         53    40 B5    0F  0111   311 20$:     REMQUE  @UCB$L_IOQFL(R5),R3         ;REMOVE I/O PACKET FROM DEVICE UNIT QUEUE
                     09    1C  0115   312          BVC     IOC$INITIATE                ;IF VC INITIATE NEXT FUNCTION
   58 A5       0100 8F    AA  0117   313          BICW    #UCB$M_BSY,UCB$W_STS(R5)    ;CLEAR UNIT BUSY
                                011D   314 RELEASE:                                    ;RELEASE ALL CHANNELS
                  FF32    31  011D   315          BRW     IOC$RELCHAN                 ;
```

```
                        0120   317          .SBTTL  INITIATE I/O FUNCTION ON DEVICE
                        0120   318 ;+
                        0120   319 ; IOC$INITIATE - INITIATE NEXT FUNCTION ON DEVICE
                        0120   320 ;
                        0120   321 ; THIS ROUTINE IS CALLED TO INITIATE THE NEXT FUNCTION ON A DEVICE BY CLEARING
                        0120   322 ; STATUS BITS, SETTING THE OPERATION START TIME IF A DIAGNOSTIC BUFFER IS
                        0120   323 ; SPECIFIED, AND CALLING THE DRIVER AT ITS START I/O ENTRY POINT.
                        0120   324 ;
                        0120   325 ; INPUTS:
                        0120   326 ;
                        0120   327 ;       R3 = ADDRESS OF I/O REQUEST PACKET.
                        0120   328 ;       R5 = DEVICE UNIT UCB ADDRESS.
                        0120   329 ;
                        0120   330 ; OUTPUTS:
                        0120   331 ;
                        0120   332 ;       CANCEL I/O, POWERFAIL, AND TIME OUT STATUS BITS ARE CLEARED, THE
                        0120   333 ;       CURRENT SYSTEM TIME IS FILLED INTO THE INTERNAL DIAGNOSTIC BUFFER
                        0120   334 ;       IF ONE IS SPECIFIED, AND THE DRIVER IS CALLED AT ITS START I/O ENTRY
                        0120   335 ;       POINT.
                        0120   336 ;-
                        0120   337
                        0120   338 IOC$INITIATE::                           ;INITIATE I/O FUNCTION
          4C A5   53    D0    0120   339          MOVL    R3,UCB$L_IRP(R5)        ;SAVE I/O PACKET ADDRESS
                        0124   340
                        0124   341
       68 A5   2C A3    7D    0124   342          MOVQ    IRP$L_SVAPTE(R3),UCB$L_SVAPTE(R5) ;COPY TRANSFER PARAMETERS
    58 A5   0048 8F     AA    0129   343          BICW    #UCB$M_CANCEL!UCB$M_TIMOUT,UCB$W_STS(R5) ;CLEAR CANCEL AND TIME OUT
      0B 2A A3   07     E1    012F   344          BBC     #IRP$V_DIAGBUF,IRP$W_STS(R3),10$ ;IF CLR, NO DIAGNOSTIC BUFFER
         50   44 B3     D0    0134   345          MOVL    @IRP$L_DIAGBUF(R3),R0   ;GET ADDRESS OF DIAGNOSTIC BUFFER DATA AREA
60   00000000'EF     7D    0138   346          MOVQ    EXE$GQ_SYSTIME,(R0)     ;INSERT I/O OPERATION START TIME
         50   24 A5     D0    013F   347 10$:    MOVL    UCB$L_DDB(R5),R0        ;GET ADDRESS OF DEVICE DATA BLOCK
         50   0C A0     D0    0143   348          MOVL    DDB$L_DDT(R0),R0        ;GET ADDRESS OF DRIVER DISPATCH TABLE
            51   60     D0    0147   349          MOVL    DDT$L_START(R0),R1      ;FETCH ADDRESS OF START ENTRY POINT
         03 51   10     E0    014A   350          BBS     #16,R1,20$              ;+++ BRANCH IF SUPERVISOR ABSOLUTE
            51   50     C0    014E   351          ADDL    R0,R1                   ;+++ CHANGE OFFSET TO ABSOLUTE
                 61     17    0151   352 20$:    JMP     (R1)                    ;START I/O OPERATION
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                        0153   354          .SBTTL  RELEASE BUFFERED DATAPATH
                        0153   355 ;+
                        0153   356 ; IOC$RELDATAP - RELEASE BUFFERED DATAPATH
                        0153   357 ;
                        0153   358 ; THIS ROUTINE IS CALLED AT THE END OF AN I/O OPERATION TO RELEASE A UNIBUS
                        0153   359 ; ADAPTER BUFFERED DATAPATH.
                        0153   360 ;
                        0153   361 ; INPUTS:
                        0153   362 ;
                        0153   363 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                        0153   364 ;
                        0153   365 ; OUTPUTS:
                        0153   366 ;
                        0153   367 ;       IF THE BUFFERED DATAPATH IS PERMANENTLY ASSIGNED TO THE ASSOCIATED
                        0153   368 ;       I/O CHANNEL, THEN CONTROL IS IMMEDIATELY RETURNED TO THE CALLER.
                        0153   369 ;       ELSE THE BUFFERED DATAPATH IS RELEASED AND AN ATTEMPT IS MADE TO
                        0153   370 ;       REMOVE THE NEXT WAITING DRIVER PROCESS FROM THE DATAPATH WAIT QUEUE.
                        0153   371 ;       IF A DRIVER PROCESS IS WAITING, THEN THE BUFFERED DATAPATH IS
                        0153   372 ;       ASSIGNED TO THE ASSOCIATED I/O CHANNEL AND THE DRIVER IS CALLED
                        0153   373 ;       VIA A JSB TO ITS BUFFERED DATAPATH WAIT RETURN ADDRESS.
                        0153   374 ;-
                        0153   375
                        0153   376 IOC$RELDATAP::                              ;RELEASE BUFFERED DATAPATH
          50   20 A5    D0  0153   377          MOVL    UCB$L_CRB(R5),R0        ;GET ADDRESS OF CRB
          51   28 A0    D0  0157   378          MOVL    CRB$L_INTD+VEC$L_ADP(R0),R1 ;GET ADDRESS OF ADP
          52   27 A0    98  015B   379          CVTBL   CRB$L_INTD+VEC$B_DATAPATH(R0),R2 ;GET DATAPATH DESIGNATOR
                 29    19  015F   380          BLSS    10$                     ;IF LSS PERMANENT ASSIGNMENT
              00   00    F0  0161   381          INSV    #0,#VEC$V_DATAPATH,-    ;ZERO DATAPATH NUMBER
                   05        0164   382                  #VEC$S_DATAPATH,-       ;
                 27 A0       0165   383                  CRB$L_INTD+VEC$B_DATAPATH(R0)
                   00    EF  0167   384          EXTZV   #VEC$V_DATAPATH,-       ;EXTRACT DATAPATH NUMBER
           52    52   05        0169   385                  #VEC$S_DATAPATH,R2,R2   ;
            50    14 B1    0F  016C   386          REMQUE  @ADP$L_DPQFL(R1),R0     ;GET ADDRESS OF NEXT DRIVER FORK BLOCK
                   19    1D  0170   387          BVS     20$                     ;IF VS NO DRIVER PROCESS WAITING
                   38    BB  0172   388          PUSHR   #^M<R3,R4,R5>           ;SAVE CONTEXT OF CURRENT DRIVER PROCESS
              55   50    D0  0174   389          MOVL    R0,R5                   ;COPY ADDRESS OF DRIVER PROCESS FORK BLOCK
            51    20 A5    D0  0177   390          MOVL    UCB$L_CRB(R5),R1        ;GET ADDRESS OF CRB
              00   52    F0  017B   391          INSV    R2,#VEC$V_DATAPATH,-    ;STORE ASSIGNED
                   05        017E   392                  #VEC$S_DATAPATH,-       ; DATAPATH NUMBER
                 27 A1       017F   393                  CRB$L_INTD+VEC$B_DATAPATH(R1)
            53    10 A5    7D  0181   394          MOVQ    UCB$L_FR3(R5),R3        ;RESTORE DRIVER PROCESS CONTEXT
                  0C B5    16  0185   395          JSB     @UCB$L_FPC(R5)          ;CALL DRIVER AT DATAPATH WAIT RETURN ADDRESS
                   38    BA  0188   396          POPR    #^M<R3,R4,R5>           ;RESTORE PREVIOUS DRIVER PROCESS CONTEXT
                   05    18  018A   397 10$:     RSB                             ;
        FA 24 A1    52    E3  018B   398 20$:     BBCS    R2,ADP$W_DPBITMAP(R1),10$ ;SET DATAPATH BIT AND EXIT
                          0190   399          BUG_CHECK INCONSTATE                ;INCONSISTENT STATE
         00000000'9F      16  0190             JSB     @#BUG$CHECK
2C 45 54 41 54 53 4E 4F 43 4E 49 00' 0196             .ASCIC  "INCONSTATE,"
                   0B        0196
                   05    1A  01A2   400          RSB                             ;
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                        01A3   402          .SBTTL  REQUEST BUFFERED DATAPATH
                        01A3   403 ;+
                        01A3   404 ; IOC$REQDATAP - REQUEST BUFFERED DATAPATH (WAIT)
                        01A3   405 ; IOC$REQDATAPNW - REQUEST BUFFERED DATAPATH (NO WAIT)
                        01A3   406 ;
                        01A3   407 ; THIS ROUTINE IS CALLED TO REQUEST A UNIBUS ADAPTER BUFFERED DATAPATH TO
                        01A3   408 ; PERFORM AN I/O OPERATION ON.
                        01A3   409 ;
                        01A3   410 ; INPUTS:
                        01A3   411 ;
                        01A3   412 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                        01A3   413 ;       04(SP) = RETURN ADDRESS OF CALLER'S CALLER.
                        01A3   414 ;
                        01A3   415 ;       IT IS ASSUMED THAT THE CALLER OWNS THE I/O CHANNEL ON WHICH THE
                        01A3   416 ;       TRANSFER IS TO OCCUR.
                        01A3   417 ;
                        01A3   418 ; OUTPUTS:
                        01A3   419 ;
                        01A3   420 ;       IF A BUFFERED DATAPATH HAS BEEN PERMANENTLY ASSIGNED TO THE ASSOCIATED
                        01A3   421 ;       I/O CHANNEL, THEN CONTROL IS IMMEDIATELY RETURNED TO THE CALLER.
                        01A3   422 ;       ELSE AN ATTEMPT IS MADE TO FIND A FREE BUFFERED DATAPATH. IF A FREE
                        01A3   423 ;       BUFFERED DATAPATH IS FOUND, THEN ITS NUMBER IS STORED IN THE ASSO-
                        01A3   424 ;       CIATED CHANNEL REQUEST BLOCK AND CONTROL IS RETURNED TO THE CALLER.
                        01A3   425 ;       ELSE IF NO WAIT IS SPECIFIED, THEN A FAILURE INDICATION IS RETURNED
                        01A3   426 ;       TO THE CALLER. ELSE THE DRIVER PROCESS CONTEXT IS SAVED IN ITS FORK
                        01A3   427 ;       BLOCK, THE FORK BLOCK IS INSERTED IN THE BUFFERED DATAPATH WAIT QUEUE,
                        01A3   428 ;       AND A RETURN TO THE DRIVER PROCESS' CALLER IS EXECUTED.
                        01A3   429 ;-
                        01A3   430
                        01A3   431          .ENABL  LSB
                        01A3   432 IOC$REQDATAPNW::                             ;REQUEST BUFFERED DATAPATH NO WAIT
                     00 DD      01A3   433          PUSHL   #0                  ;SET NO WAIT INDICATOR
                     02 11      01A5   434          BRB     5$                  ;
                        01A7   435 IOC$REQDATAP::                               ;REQUEST BUFFERED DATAPATH WAIT
                     01 DD      01A7   436          PUSHL   #1                  ;SET WAIT INDICATOR
                50   20 A5      01A9   437 5$:      MOVL    UCB$L_CRB(R5),R0    ;GET ADDRESS OF CRB
              28 27 A0  07      01AD   438          BBS     #VEC$V_PATHLOCK,CRB$L_INTD+VEC$B_DATAPATH(R0),20$ ;IF SET, PERMANENT
                51   28 A0      01B2   439          MOVL    CRB$L_INTD+VEC$L_ADP(R0),R1 ;GET ADDRESS OF ADP
52    24 A1    10   00  EA      01B6   440          FFS     #0,#ADP$C_NUMDATAP,ADP$W_DPBITMAP(R1),R2 ;SEARCH FOR FREE DATAPATH
                     0B  13      01BC   441          BEQL    10$                 ;IF EQL NONE FOUND
                  00 52  F0      01BE   442          INSV    R2,#VEC$V_DATAPATH,-    ;STORE ASSIGNED
                     05          01C1   443                  #VEC$S_DATAPATH,-       ; DATAPATH NUMBER
                   27 A0         01C2   444                  CRB$L_INTD+VEC$B_DATAPATH(R0)
              11 24 A1  52  E4      01C4   445          BBSC    R2,ADP$W_DPBITMAP(R1),20$ ;CLEAR DATAPATH BIT AND EXIT
                 13 8E  E9      01C9   446 10$:      BLBC    (SP)+,30$           ;IF LBC NO WAIT SPECIFIED
                 10 A5  53  7D      01CC   447          MOVQ    R3,UCB$L_FR3(R5)    ;SAVE DRIVER PROCESS CONTEXT
                   0C A5 8ED0      01D0   448          POPL    UCB$L_FPC(R5)       ;SAVE DATAPATH WAIT RETURN ADDRESS
                 18 B1  65  0E      01D4   449          INSQUE  UCB$L_FQFL(R5),@ADP$L_DPQBL(R1) ;INSERT DRIVER PROCESS IN DATAPATH W
                     7E  D5      01D8   450          TSTL    -(SP)               ;PUSH DUMMY INDICATOR ON STACK
                  50 00' 9A      01DA   451 20$:      MOVZBL  S^#SS$_NORMAL,R0    ;SET SUCCESS INDICATOR
                     8E  D5      01DD   452          TSTL    (SP)+               ;REMOVE WAIT INDICATOR FROM STACK
                         05      01DF   453 30$:      RSB                         ;
                        01E0   454          .DSABL  LSB
```

```
                     01E0    456          .SBTTL  RELEASE UNIBUS MAP REGISTERS
                     01E0    457 ;+
                     01E0    458 ; IOC$RELMAPREG - RELEASE UNIBUS MAP REGISTERS
                     01E0    459 ;
                     01E0    460 ; THIS ROUTINE IS CALLED TO RELEASE UNIBUS MAP REGISTERS THAT WERE PREVIOUSLY
                     01E0    461 ; ASSIGNED FOR AN I/O TRANSFER.
                     01E0    462 ;
                     01E0    463 ; INPUTS:
                     01E0    464 ;
                     01E0    465 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                     01E0    466 ;
                     01E0    467 ;       IT IS ASSUMED THAT THE CALLER STILL OWNS THE I/O CHANNEL ON WHICH
                     01E0    468 ;       THE TRANSFER TOOK PLACE.
                     01E0    469 ;
                     01E0    470 ; OUTPUTS:
                     01E0    471 ;
                     01E0    472 ;       IF THE MAPPING REGISTERS HAVE BEEN PERMANENTLY ASSIGNED TO THE ASSO-
                     01E0    473 ;       CIATED I/O CHANNEL, THEN CONTROL IS IMMEDIATELY RETURNED TO THE CALLER.
                     01E0    474 ;       ELSE THE MAPPING REGISTERS ARE RELEASED AND AN ATTEMPT IS MADE TO
                     01E0    475 ;       REMOVE THE NEXT DRIVER PROCESS FROM THE MAP REGISTER WAIT QUEUE. IF
                     01E0    476 ;       A DRIVER PROCESS IS WAITING, THEN IT IS REMOVED FROM THE MAP REGISTER
                     01E0    477 ;       WAIT QUEUE AND AN ATTEMPT IS MADE TO ASSIGN THE REQUESTED NUMBER OF
                     01E0    478 ;       CONTIGUOUS MAP REGISTERS TO THE TRANSFER. IF THE ALLOCATION IS SUCCESS-
                     01E0    479 ;       FUL, THEN THE DRIVER IS CALLED VIA A JSB TO ITS MAP REGISTER WAIT
                     01E0    480 ;       RETURN ADDRESS. WHEN THE DRIVER RETURNS ANOTHER ATTEMPT WILL BE MADE
                     01E0    481 ;       TO ALLOCATE MAP REGISTERS TO THE NEXT DRIVER PROCESS IN THE MAP REGISTER
                     01E0    482 ;       WAIT QUEUE. THE PROCESS OF ATTEMPTING TO ALLOCATE REGISTERS TO WAIT-
                     01E0    483 ;       ING DRIVER PROCESSES IS CONTINUED UNTIL EITHER THERE ARE NO DRIVER
                     01E0    484 ;       PROCESSES WAITING OR AN ALLOCATION FAILURE OCCURS. IN THE CASE OF
                     01E0    485 ;       AN ALLOCATION FAILURE THE DRIVER PROCESS IS REINSERTED AT THE FRONT
                     01E0    486 ;       OF THE MAP REGISTER WAIT QUEUE.
                     01E0    487 ;-
                     01E0    488
                     01E0    489 IOC$RELMAPREG::                                 ;RELEASE UNIBUS MAP REGISTERS
   51    20 A5   D0  01E0    490          MOVL    UCB$L_CRB(R5),R1               ;GET ADDRESS OF CRB
30 24 A1    0F   E0  01E4    491          BBS     #VEC$V_MAPLOCK,CRB$L_INTD+VEC$W_MAPREG(R1),40$ ;IF SET, PERMANENT
   0078 8F      BB  01E9    492          PUSHR   #^M<R3,R4,R5,R6>               ;SAVE REGISTERS
   52    28 A1   D0  01ED    493          MOVL    CRB$L_INTD+VEC$L_ADP(R1),R2    ;GET ADDRESS OF ADP
      56    52   D0  01F1    494          MOVL    R2,R6                          ;SAVE ADDRESS OF ADP
   54    24 A1   3C  01F4    495          MOVZWL  CRB$L_INTD+VEC$W_MAPREG(R1),R4 ;GET STARTING MAP REGISTER NUMBER
      50    00   D2  01F8    496          MCOML   #0,R0                          ;SET ALTER PATTERN
            2F   10  01FB    497          BSBB    IOC$ALTUBAMAP                  ;ALTER MAP REGISTER BITMAP
   55    1C B6   0F  01FD    498 10$:     REMQUE  @ADP$L_MRQFL(R6),R5            ;GET ADDRESS OF NEXT DRIVER FORK BLOCK
            12   1D  0201    499          BVS     30$                            ;IF VS NO DRIVER PROCESS WAITING
            49   10  0203    500          BSBB    IOC$ALOUBAMAP                  ;SEARCH MAP REGISTER BITMAP AND ALLOCATE
         09 50   E9  0205    501          BLBC    R0,20$                         ;IF LBC ALLOCATION FAILURE
   53    10 A5   7D  0208    502          MOVQ    UCB$L_FR3(R5),R3               ;RESTORE DRIVE PROCESS CONTEXT
         0C B5   16  020C    503          JSB     @UCB$L_FPC(R5)                 ;CALL DRIVER AT MAP REGISTER WAIT RETURN ADD
            EC   11  020F    504          BRB     10$                            ;
   1C A6    65   0E  0211    505 20$:     INSQUE  UCB$L_FQFL(R5),ADP$L_MRQFL(R6) ;REINSERT DRIVER PROCESS AT FRONT OF
      0078 8F      BA  0215    506 30$:     POPR    #^M<R3,R4,R5,R6>               ;RESTORE REGISTERS
                   05  0219    507 40$:     RSB                                    ;
```

```
                     021A   509          .SBTTL  REQUEST UNIBUS MAP REGISTERS
                     021A   510 ;+
                     021A   511 ; IOC$REQMAPREG - REQUEST UNIBUS MAP REGISTERS
                     021A   512 ;
                     021A   513 ; THIS ROUTINE IS CALLED TO REQUEST UNIBUS MAP REGISTERS TO PERFORM AN
                     021A   514 ; I/O TRANSFER.
                     021A   515 ;
                     021A   516 ; INPUTS:
                     021A   517 ;
                     021A   518 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                     021A   519 ;       04(SP) = RETURN ADDRESS OF CALLER'S CALLER.
                     021A   520 ;
                     021A   521 ;       IT IS ASSUMED THAT THE CALLER OWNS THE I/O CHANNEL ON WHICH THE
                     021A   522 ;       TRANSFER IS TO OCCUR ON.
                     021A   523 ;
                     021A   524 ; OUTPUTS:
                     021A   525 ;
                     021A   526 ;       IF MAP REGISTERS HAVE BEEN PERMANENTLY ASSIGNED TO THE ASSOCIATED
                     021A   527 ;       I/O CHANNEL, THEN CONTROL IS IMMEDIATELY RETURNED TO THE CALLER.
                     021A   528 ;       ELSE AN ATTEMPT IS MADE TO ALLOCATE THE REQUESTED NUMBER OF MAP REG-
                     021A   529 ;       ISTERS. IF SUFFICIENT CONTIGUOUS MAP REGISTERS ARE FOUND, THEN THEY
                     021A   530 ;       ARE ASSIGNED TO THE ASSOCIATED I/O CHANNEL AND CONTROL IS RETURNED
                     021A   531 ;       TO THE CALLER. ELSE THE DRIVER PROCESS CONTEXT IS SAVED IN ITS FORK
                     021A   532 ;       BLOCK, THE FORK BLOCK IS INSERTED IN THE MAP REGISTER WAIT QUEUE,
                     021A   533 ;       AND A RETURN TO THE DRIVER PROCESS' CALLER IS EXECUTED.
                     021A   534 ;-
                     021A   535
                     021A   536 IOC$REQMAPREG::                                ;REQUEST UNIBUS MAP REGISTERS
          32   10    021A   537          BSBB    IOC$ALOUBAMAP                 ; ALLOCATE UBA MAP REGISTER
       0C 50   E8    021C   538          BLBS    R0,10$                        ;IF LBS SUCCESSFUL ALLOCATION
10 A5     53   7D    021F   539          MOVQ    R3,UCB$L_FR3(R5)              ;SAVE DRIVER PROCESS CONTEXT
       0C A5 8ED0    0223   540          POPL    UCB$L_FPC(R5)                 ;SAVE MAP REGISTER WAIT RETURN ADDRESS
20 B2     65   0E    0227   541          INSQUE  UCB$L_FQFL(R5),@ADP$L_MRQBL(R2) ;INSERT PROCESS IN MAP REGISTER WAIT
                05    022B   542 10$:     RSB                                   ;
```

```
                                022C   544          .SBTTL  ALTER UBA MAP REGISTER BITMAP
                                022C   545 ;+
                                022C   546 ; IOC$ALTUBAMAP - ALTER UBA MAP REGISTER BIT MAP
                                022C   547 ;
                                022C   548 ; THIS ROUTINE IS CALLED TO EITHER CLEAR OF SET A FIELD OF BITS IN THE UBA MAP
                                022C   549 ; REGISTER ALLOCATION BITMAP.
                                022C   550 ;
                                022C   551 ; INPUTS:
                                022C   552 ;
                                022C   553 ;       R0 = ALTERATION BIT MASK.
                                022C   554 ;       R1 = ADDRESS OF CRB.
                                022C   555 ;       R2 = ADDRESS OF ADP.
                                022C   556 ;       R4 = STARTING MAP REGISTER NUMBER.
                                022C   557 ;
                                022C   558 ; OUTPUTS:
                                022C   559 ;
                                022C   560 ;       THE SPECIFIED BIT FIELD IN THE UBA MAP ALLOCATION BIT MAP IS EITHER SET
                                022C   561 ;       OR CLEARED DEPENDING ON THE STATE OF THE ALTERATION MASK.
                                022C   562 ;
                                022C   563 ;       R3 AND R4 ARE DESTROYED.
                                022C   564 ;-
                                022C   565
                                022C   566 IOC$ALTUBAMAP::                           ;ALTER MAP REGISTER BIT MAP
          53   26 A1    9A     022C   567          MOVZBL  CRB$L_INTD+VEC$B_NUMREG(R1),R3 ;GET NUMBER OF BITS TO ALTER
               53    20   D1   0230   568 10$:     CMPL    #32,R3                  ;MORE THAN LONGWORD LEFT?
                     0E   18   0233   569          BGEQ    20$                     ;IF GEQ NO
    26 A2   20   54    50   F0   0235   570          INSV    R0,R4,#32,ADP$W_MRBITMAP(R2) ;ALTER BITMAP WITH SUPPLIED PATTERN
               54    20   C0   023B   571          ADDL    #32,R4                  ;UPDATE STARTING BIT POSITION
               53    20   C2   023E   572          SUBL    #32,R3                  ;REDUCE NUMBER OF BITS TO ALTER
                     ED   11   0241   573          BRB     10$                     ;
26 A2   53   54    50   F0   0243   574 20$:     INSV    R0,R4,R3,ADP$W_MRBITMAP(R2) ;ALTER BITMAP WITH SUPPLIED PATTERN
                          05   0249   575          RSB                             ;
```

```
                                024A   577          .SBTTL  SEARCH MAP REGISTER BITMAP AND ALLOCATE MAP REGISTERS
                                024A   578 ;+
                                024A   579 ; IOC$ALOUBAMAP - ALLOCATE UBA MAP REGISTERS (CRB DATABASE SPECIFIED)
                                024A   580 ; IOC$ALOUBAMAPN - ALLOCATE UBA MAP REGISTERS (ARGUMENT SPECIFIED)
                                024A   581 ;
                                024A   582 ; THIS ROUTINE IS CALLED TO ALLOCATE UBA MAP REGISTERS AND TO MARK THE ALLOCATION
                                024A   583 ; IN THE UBA MAP REGISTER ALLOCATION BITMAP.
                                024A   584 ;
                                024A   585 ; INPUTS:
                                024A   586 ;
                                024A   587 ;       R3 = NUMBER OF MAP REGISTERS TO ALLOCATE (ARGUMENT SPECIFIED ENTRY).
                                024A   588 ;       R5 = DEVICE UNIT UCB ADDRESS.
                                024A   589 ;
                                024A   590 ; OUTPUTS:
                                024A   591 ;
                                024A   592 ;       R0 = SUCCESS INDICATION.
                                024A   593 ;-
                                024A   594
                                024A   595          .ENABL  LSB
                                024A   596 IOC$ALOUBAMAPN::                         ;ALLOCATE UBA MAP REGISTERS ARGUMENT SPECIFI
                    38   BB     024A   597          PUSHR   #^M<R3,R4,R5>           ;SAVE REGISTERS
                    15   11     024C   598          BRB     5$                      ;
                                024E   599 IOC$ALOUBAMAP::                          ;ALLOCATE UBA MAP REGISTERS CRB SPECIFIED
                    38   BB     024E   600          PUSHR   #^M<R3,R4,R5>           ;SAVE REGISTERS
              53    6E A5   3C   0250   601          MOVZWL  UCB$W_BCNT(R5),R3       ;GET TRANSFER BYTE COUNT
              54    6C A5   3C   0254   602          MOVZWL  UCB$W_BOFF(R5),R4       ;GET BYTE OFFSET IN PAGE
         53    03FF C344   9E   0258   603          MOVAB   ^X3FF(R3)[R4],R3        ;CALCULATE HIGHEST RELATIVE BYTE AND ROUND
    53   53    F7 8F       78   025E   604          ASHL    #-9,R3,R3               ;CALCULATE NUMBER OF MAP REGISTERS REQUIRED
                    50   D4   0263   605 5$:        CLRL    R0                      ;ASSUME ALLOCATION FAILURE
              51    20 A5   D0   0265   606          MOVL    UCB$L_CRB(R5),R1        ;GET ADDRESS OF CRB
              52    28 A1   D0   0269   607          MOVL    CRB$L_INTD+VEC$L_ADP(R1),R2 ;GET ADDRESS OF ADP
           39 24 A1         0F   E0   026D   608          BBS     #VEC$V_MAPLOCK,CRB$L_INTD+VEC$W_MAPREG(R1),40$ ;IF SET, PERMANENT
              26 A1         53   90   0272   609          MOVB    R3,CRB$L_INTD+VEC$B_NUMREG(R1) ;SET NUMBER OF MAP REGISTERS ALLOCATE
                            54   D4   0276   610          CLRL    R4                      ;CLEAR STARTING BIT POSITION
               55    54     53   C1   0278   611 10$:      ADDL3   R3,R4,R5                ;CALCULATE HIGHEST BIT IN REQUIRED SCAN
               01F0 8F      55   B1   027C   612          CMPW    R5,#496                 ;BEYOND END OF ALLOCATION BITMAP?
                            2A   14   0281   613          BGTR    50$                     ;IF GTR YES
    54    26 A2    20      54   EA   0283   614          FFS     R4,#32,ADP$W_MRBITMAP(R2),R4 ;FIND A SET BIT
                            ED   13   0289   615          BEQL    10$                     ;IF EQL BIT NOT FOUND
               55    54     53   C1   028B   616          ADDL3   R3,R4,R5                ;CALCULATE HIGH BIT FOR SUCCESSFUL ALLOCATIO
                 24 A1      54   B0   028F   617          MOVW    R4,CRB$L_INTD+VEC$W_MAPREG(R1) ;SAVE STARTING BIT NUMBER
    54    26 A2    20      54   EB   0293   618 20$:      FFC     R4,#32,ADP$W_MRBITMAP(R2),R4 ;FIND A CLEAR BIT
                            55   54   D1   0299   619          CMPL    R4,R5                   ;ENOUGH SET BITS SCANNED OVER?
                            07   18   029C   620          BGEQ    30$                     ;IF GEQ YES
          F0 26 A2          54   E0   029E   621          BBS     R4,ADP$W_MRBITMAP(R2),20$ ;IF SET, CONTINUE SCAN
                            D3   11   02A3   622          BRB     10$                     ;
               54    24 A1   3C   02A5   623 30$:      MOVZWL  CRB$L_INTD+VEC$W_MAPREG(R1),R4 ;RETRIEVE STARTING MAP REGISTER
                            81   10   02A9   624          BSBB    IOC$ALTUBAMAP           ;ALTER MAP REGISTER BITMAP
                            50   D6   02AB   625 40$:      INCL    R0                      ;SET SUCCESS INDICATOR
                            38   BA   02AD   626 50$:      POPR    #^M<R3,R4,R5>           ;RESTORE REGISTERS
                                 05   02AF   627          RSB                             ;
                                      02B0   628          .DSABL  LSB
```

```
                     02B0    630          .SBTTL  RETURN TO CALLER
                     02B0    631 ;+
                     02B0    632 ; IOC$RETURN - RETURN TO CALLER
                     02B0    633 ;
                     02B0    634 ; THIS ROUTINE IS CALLED AS A RESULT OF A DDT DISPATCH TO A NULL ENTRY. ITS
                     02B0    635 ; FUNCTION IS MERELY TO RETURN TO ITS CALLER.
                     02B0    636 ;
                     02B0    637 ; INPUTS:
                     02B0    638 ;
                     02B0    639 ;       NONE.
                     02B0    640 ;
                     02B0    641 ; OUTPUTS:
                     02B0    642 ;
                     02B0    643 ;       NONE.
                     02B0    644 ;-
                     02B0    645
                     02B0    646 IOC$RETURN::                            ;RETURN TO CALLER
                  05 02B0    647          RSB                            ;
```

```
                                02B1    649          .SBTTL  WAITFOR INTERRUPT OR TIMEOUT AND KEEP CHANNEL
                                02B1    650 ;+
                                02B1    651 ; IOC$WFIKPCH - WAITFOR INTERRUPT OR TIMEOUT AND KEEP CHANNEL
                                02B1    652 ;
                                02B1    653 ; THIS ROUTINE IS CALLED TO SOFTWARE ENABLE INTERRUPTS AND TIMEOUT ON
                                02B1    654 ; A DEVICE UNIT AND TO KEEP THE CHANNEL. THIS ROUTINE CAN BE CALLED AT
                                02B1    655 ; EITHER FORK OR DEVICE INTERRUPT LEVEL.
                                02B1    656 ;
                                02B1    657 ; INPUTS:
                                02B1    658 ;
                                02B1    659 ;       00(SP) = RETURN ADDRESS OF CALLER.
                                02B1    660 ;       04(SP) = TIMEOUT VALUE IN SECONDS.
                                02B1    661 ;       08(SP) = IPL TO LOWER TO AFTER SETTING WAIT.
                                02B1    662 ;       12(SP) = RETURN ADDRESS OF CALLER'S CALLER.
                                02B1    663 ;
                                02B1    664 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                                02B1    665 ;
                                02B1    666 ; OUTPUTS:
                                02B1    667 ;
                                02B1    668 ;       THE TIMEOUT VALUE IS COMPUTED AND STORED IN DUE TIME, REGISTERS R3 AND
                                02B1    669 ;       R4 ALONG WITH THE RETURN PC ARE SAVED IN THE FORK BLOCK, INTERRUPTS AND
                                02B1    670 ;       TIMEOUT ARE ENABLED, AND A RETURN TO THE CALLER'S CALLER IS EXECUTED.
                                02B1    671 ;-
                                02B1    672
                                02B1    673 IOC$WFIKPCH::                               ;WAITFOR INTERRUPT/TIMEOUT AND KEEP CHANNEL
            6E    02    C0    02B1    674          ADDL    #2,(SP)                         ;CALCULATE OFFSET TO NORMAL RETURN
          10 A5   53    7D    02B4    675          MOVQ    R3,UCB$L_FR3(R5)                ;SAVE REGISTERS R3 AND R4
              0C A5 8ED0    02B8    676          POPL    UCB$L_FPC(R5)                   ;SAVE INTERRUPT RETURN ADDRESS
          58 A5   03    A8    02BC    677          BISW    #UCB$M_INT!UCB$M_TIM,UCB$W_STS(R5) ;ENABLE INTERRUPT AND TIMEOUT
5C A5 00000000'EF   8E    C1    02C0    678          ADDL3   (SP)+,EXE$GL_ABSTIM,UCB$L_DUETIM(R5) ;SET TIMEOUT TIME
       58 A5  0040 8F    AA    02C9    679          BICW    #UCB$M_TIMOUT,UCB$W_STS(R5) ;CLEAR UNIT TIMED OUT
                              02CF    680          ENBINT                          ;ENABLE INTERRUPTS
            12    8E    DA    02CF                 MTPR    (SP)+,S^#PR$_IPL
                        05    02D2    681          RSB                             ;
```

```
                        02D3    683          .SBTTL  WAITFOR INTERRUPT OR TIMEOUT AND RELEASE CHANNEL
                        02D3    684 ;+
                        02D3    685 ; IOC$WFIRLCH - WAITFOR INTERRUPT OR TIMEOUT AND RELEASE CHANNEL
                        02D3    686 ;
                        02D3    687 ; THIS ROUTINE IS CALLED TO SOFTWARE ENABLE INTERRUPTS AND TIMEOUT ON A DEVICE
                        02D3    688 ; UNIT AND TO RELEASE THE CHANNEL. THIS ROUTINE CAN ONLY BE CALLED AT FORK LEVEL.
                        02D3    689 ;
                        02D3    690 ; INPUTS:
                        02D3    691 ;
                        02D3    692 ;       00(SP) = RETURN ADDRESS OF CALLER.
                        02D3    693 ;       04(SP) = TIMEOUT VALUE IN SECONDS.
                        02D3    694 ;       08(SP) = IPL TO LOWER TO AFTER SETTING WAIT.
                        02D3    695 ;       12(SP) = RETURN ADDRESS OF CALLER'S CALLER.
                        02D3    696 ;
                        02D3    697 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                        02D3    698 ;
                        02D3    699 ; OUTPUTS:
                        02D3    700 ;
                        02D3    701 ;       THE TIMEOUT VALUE IS COMPUTED AND STORED IN DUE TIME, REGISTERS R3 AND
                        02D3    702 ;       R4 ALONG WITH THE RETURN PC ARE SAVED IN THE FORK BLOCK, INTERRUPTS AND
                        02D3    703 ;       TIMEOUT ARE ENABLED, THE CHANNEL IS RELEASED, AND A RETURN TO THE CALLER'S
                        02D3    704 ;       CALLER IS EXECUTED.
                        02D3    705 ;-
                        02D3    706
                        02D3    707 IOC$WFIRLCH::                               ;WAITFOR INTERRUPT/TIMEOUT AND RELEASE CHANN
            6E  02  C0  02D3    708          ADDL    #2,(SP)                    ;CALCULATE OFFSET TO NORMAL RETURN
        10 A5  53  7D   02D6    709          MOVQ    R3,UCB$L_FR3(R5)           ;SAVE REGISTERS R3 AND R4
           0C A5 8ED0   02DA    710          POPL    UCB$L_FPC(R5)              ;SAVE INTERRUPT RETURN ADDRESS
        58 A5  03  A8   02DE    711          BISW    #UCB$M_INT!UCB$M_TIM,UCB$W_STS(R5) ;ENABLE INTERRUPT AND TIMEOUT
5C A5 00000000'EF  8E  C1   02E2    712          ADDL3   (SP)+,EXE$GL_ABSTIM,UCB$L_DUETIM(R5) ;SET TIMEOUT TIME
        58 A5 0040 8F  AA   02EB    713          BICW    #UCB$M_TIMOUT,UCB$W_STS(R5) ;CLEAR UNIT TIMED OUT
                    02F1    714          ENBINT                             ;ENABLE INTERRUPTS
            12  8E  DA   02F1                    MTPR    (SP)+,S^#PR$_IPL
               FD5B  31   02F4    715          BRW     IOC$RELCHAN                ;RELEASE ALL CHANNELS AND RETURN TO CALLER
                    02F7    716
                    02F7    717
```

```
                     02F7   719          .SBTTL  ALLOCATE SYSTEM PAGE TABLE
                     02F7   720 ;+
                     02F7   721 ; IOC$ALLOSPT - ALLOCATE SYSTEM PAGE TABLE
                     02F7   722 ;
                     02F7   723 ; THIS ROUTINE ALLOCATES SYSTEM PAGE TABLE (SPT) ENTRIES.
                     02F7   724 ;
                     02F7   725 ; INPUTS:
                     02F7   726 ;
                     02F7   727 ;       R1 = NUMBER OF SPT ENTRIES TO BE ALLOCATED
                     02F7   728 ;
                     02F7   729 ;       BOO$GL_SPTFREL = LOWEST FREE VPN
                     02F7   730 ;       BOO$GL_SPTFREH = HIGHEST FREE VPN
                     02F7   731 ;
                     02F7   732 ;       IT IS ASSUMED THAT THE CALLER IS RUNNING AT IPL$_SYNCH.
                     02F7   733 ;
                     02F7   734 ; OUTPUTS:
                     02F7   735 ;
                     02F7   736 ;       R0 = SUCCESS INDICATION.
                     02F7   737 ;       R2 = STARTING PAGE NUMBER ALLOCATED (SVPN).
                     02F7   738 ;       R3 = ADDRESS OF BASE OF SYSTEM PAGE TABLE (MMG$GL_SPTBASE).
                     02F7   739 ;
                     02F7   740 ;       R1 IS PRESERVED ACROSS CALL.
                     02F7   741 ;-
                     02F7   742 IOC$ALLOSPT::                            ;ALLOCATE SYSTEM PAGE TABLE
 53   00000000'EF    D0  02F7   743          MOVL    L^MMG$GL_SPTBASE,R3     ; Get addr of base of SPT
       50    01      D0  02FE   744          MOVL    #1,R0                   ; Set success
                     0301   745 10$:
                 05  0301   746          RSB                             ;
                     0302   747
                     0302   748          .END
```

```
ADP$B_NUMBER                    0000000B    D          DDT$L_REGDUMP                   00000010    D
ADP$B_PORT                      00000020    D          DDT$L_START                     00000000    D
ADP$B_TYPE                      0000000A    D          DDT$L_UNITINIT                  00000018    D
ADP$C_DRADPLEN                  00000014    D          DDT$L_UNSOLINT                  00000004    D
ADP$C_MBAADPLEN                 00000014    D          DDT$W_DIAGBUF                   00000014    D
ADP$C_MPMADPLEN                 00000070    D          DDT$W_ERRORBUF                  00000016    D
ADP$C_NUMDATAP                =  00000010    D          EMB$B_DV_ERTCNT               =  00000010    D
ADP$C_UBAADPLEN                 00000070    D          EMB$Q_DV_IOSB                 =  00000012    D
ADP$K_DRADPLEN                  00000014    D          EMB$W_DV_STS                  =  0000001A    D
ADP$K_MBAADPLEN                 00000014    D          ERL$RELEASEMB                   ********    X   02
ADP$K_MPMADPLEN                 00000070    D          EXE$GL_ABSTIM                   ********    X   02
ADP$K_UBAADPLEN                 00000070    D          EXE$GQ_SYSTIME                  ********    X   02
ADP$L_CRB                       00000010    D          IDB$B_TYPE                      0000000A    D
ADP$L_CSR                       00000000    D          IDB$C_LENGTH                    00000034    D
ADP$L_DPQBL                     00000018    D          IDB$K_LENGTH                    00000034    D
ADP$L_DPQFL                     00000014    D          IDB$L_ADP                       00000010    D
ADP$L_INTD                      00000064    D          IDB$L_CSR                       00000000    D
ADP$L_LINK                      00000004    D          IDB$L_OWNER                     00000004    D
ADP$L_MRQBL                     00000020    D          IDB$L_UCBLST                    00000014    D
ADP$L_MRQFL                     0000001C    D          IDB$W_SIZE                      00000008    D
ADP$L_PRQQBL                    00000018    D          IDB$W_UNITS                     0000000C    D
ADP$L_PRQQFL                    00000014    D          IOC$ALLOSPT                     000002F7 RG D   02
ADP$L_SHB                       0000001C    D          IOC$ALOUBAMAP                   0000024E RG D   02
ADP$L_VECTOR                    00000010    D          IOC$ALOUBAMAPN                  0000024A RG D   02
ADP$W_ADPTYPE                   0000000E    D          IOC$ALTUBAMAP                   0000022C RG D   02
ADP$W_DPBITMAP                  00000024    D          IOC$CANCELIO                    00000000 RG D   02
ADP$W_MRBITMAP                  00000026    D          IOC$DIAGBUFILL                  00000017 RG D   02
ADP$W_SIZE                      00000008    D          IOC$GL_PSBL                     ********    X   02
ADP$W_TR                        0000000C    D          IOC$INITIATE                    00000120 RG D   02
BUG$CHECK                       ********    X   02     IOC$RELCHAN                     00000052 RG D   02
CRB$B_MASK                      0000000E    D          IOC$RELDATAP                    00000153 RG D   02
CRB$B_TYPE                      0000000A    D          IOC$RELMAPREG                   000001E0 RG D   02
CRB$C_LENGTH                    00000038    D          IOC$RELSCHAN                    00000048 RG D   02
CRB$K_LENGTH                    00000038    D          IOC$REQCOM                      000000DD RG D   02
CRB$L_INTD                      00000014    D          IOC$REQDATAP                    000001A7 RG D   02
CRB$L_INTD2                     00000038    D          IOC$REQDATAPNW                  000001A3 RG D   02
CRB$L_LINK                      00000010    D          IOC$REQMAPREG                   0000021A RG D   02
CRB$L_WQBL                      00000004    D          IOC$REQPCHANH                   000000A9 RG D   02
CRB$L_WQFL                      00000000    D          IOC$REQPCHANL                   000000B2 RG D   02
CRB$M_BSY                     =  00000001    D          IOC$REQSCHANH                   00000095 RG D   02
CRB$V_BSY                     =  00000000    D          IOC$REQSCHANL                   0000009F RG D   02
CRB$W_REFC                      0000000C    D          IOC$RETURN                      000002B0 RG D   02
CRB$W_SIZE                      00000008    D          IOC$WFIKPCH                     000002B1 RG D   02
DDB$B_ACPCLASS                  00000013    D          IOC$WFIRLCH                     000002D3 RG D   02
DDB$B_TYPE                      0000000A    D          IPL$_IOPOST                   =  00000004    D
DDB$C_LENGTH                    00000034    D          IRP$B_CARCON                    00000038    D
DDB$K_LENGTH                    00000034    D          IRP$B_EFN                       00000022    D
DDB$L_ACPD                      00000010    D          IRP$B_PRI                       00000023    D
DDB$L_DDT                       0000000C    D          IRP$B_RMOD                      0000000B    D
DDB$L_LINK                      00000000    D          IRP$B_TYPE                      0000000A    D
DDB$L_UCB                       00000004    D          IRP$C_LENGTH                    0000005C    D
DDB$T_DRVNAME                   00000024    D          IRP$K_LENGTH                    0000005C    D
DDB$T_NAME                      00000014    D          IRP$L_ARB                       00000050    D
DDB$W_SIZE                      00000008    D          IRP$L_AST                       00000010    D
DDT$L_ALTSTART                  0000001C    D          IRP$L_ASTPRM                    00000014    D
DDT$L_CANCEL                    0000000C    D          IRP$L_DIAGBUF                   00000044    D
DDT$L_FDT                       00000008    D          IRP$L_EXTEND                    0000004C    D
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IRP$L_IOQBL		00000004	D		PCB$W_ASTCNT		00000038	D			
IRP$L_IOQFL		00000000	D		PCB$W_BIOCNT		0000003A	D			
IRP$L_IOSB		00000024	D		PCB$W_BIOLM		0000003C	D			
IRP$L_IOST1		00000034	D		PCB$W_DIOCNT		0000003E	D			
IRP$L_IOST2		00000038	D		PCB$W_DIOLM		00000040	D			
IRP$L_MEDIA		00000034	D		PCB$W_GPGCNT		00000034	D			
IRP$L_PID		0000000C	D		PCB$W_GRP		0000008A	D			
IRP$L_SEGVBN		00000040	D		PCB$W_MEM		00000088	D			
IRP$L_SEQNUM		00000048	D		PCB$W_MTXCNT		0000000E	D			
IRP$L_SVAPTE		0000002C	D		PCB$W_PPGCNT		00000036	D			
IRP$L_TT_TERM		00000038	D		PCB$W_PRCCNT		00000042	D			
IRP$L_UCB		0000001C	D		PCB$W_SIZE		00000008	D			
IRP$L_WIND		00000018	D		PCB$W_STATE		0000002C	D			
IRP$Q_NT_PRVMSK		0000003C	D		PCB$W_TMBU		00000032	D			
IRP$V_DIAGBUF	=	00000007	D		PR$_IPL	=	00000012	D			
IRP$W_ABCNT		0000003C	D		PR$_SIRR	=	00000014	D			
IRP$W_BCNT		00000032	D		RELEASE		0000011D	R	D	02	
IRP$W_BOFF		00000030	D		SIZ...	=	00000001		D		
IRP$W_CHAN		00000028	D		SS$_NORMAL		********		X	02	
IRP$W_FUNC		00000020	D		UCB$B_AMOD		00000053		D		
IRP$W_OBCNT		0000003E	D		UCB$B_CEX		00000077		D		
IRP$W_SIZE		00000008	D		UCB$B_CM1		0000004A		D		
IRP$W_STS		0000002A	D		UCB$B_CM2		0000004B		D		
IRP$W_TT_PRMPT		0000003C	D		UCB$B_DEVCLASS		00000038		D		
MMG$GL_SPTBASE		********	X	02	UCB$B_DEVTYPE		00000039		D		
PCB$B_ASTACT		0000000C	D		UCB$B_DIPL		00000052		D		
PCB$B_ASTEN		0000000D	D		UCB$B_DX_SCTCNT		000000A6		D		
PCB$B_PRI		0000000B	D		UCB$B_ERTCNT		00000070		D		
PCB$B_PRIB		0000002F	D		UCB$B_ERTMAX		00000071		D		
PCB$B_TYPE		0000000A	D		UCB$B_FEX		00000076		D		
PCB$B_WEFC		0000002E	D		UCB$B_FIPL		0000000B		D		
PCB$C_LENGTH		0000008C	D		UCB$B_LOCSRV		0000003C		D		
PCB$K_LENGTH		0000008C	D		UCB$B_OFFNDX		00000094		D		
PCB$L_ARB		00000084	D		UCB$B_OFFRTC		00000095		D		
PCB$L_ASTQBL		00000014	D		UCB$B_REMSRV		0000003D		D		
PCB$L_ASTQFL		00000010	D		UCB$B_SECTORS		0000003C		D		
PCB$L_EFC2P		00000058	D		UCB$B_SLAVE		00000074		D		
PCB$L_EFC3P		0000005C	D		UCB$B_SPR		00000075		D		
PCB$L_EFCS		00000050	D		UCB$B_STATE		00000052		D		
PCB$L_EFCU		00000054	D		UCB$B_TRACKS		0000003D		D		
PCB$L_EFWM		0000004C	D		UCB$B_TT_CRFILL		0000009D		D		
PCB$L_JIB		00000078	D		UCB$B_TT_DECRF		000000A1		D		
PCB$L_OWNER		0000001C	D		UCB$B_TT_DELFF		000000A2		D		
PCB$L_PHD		00000064	D		UCB$B_TT_DESPEE		000000A0		D		
PCB$L_PHYPCB		00000018	D		UCB$B_TT_DETYPE		000000A4		D		
PCB$L_PID		00000060	D		UCB$B_TT_LFFILL		0000009E		D		
PCB$L_PQB		0000004C	D		UCB$B_TT_SPEED		0000009C		D		
PCB$L_SQBL		00000004	D		UCB$B_TYPE		0000000A		D		
PCB$L_SQFL		00000000	D		UCB$B_VERTSZ		0000003F		D		
PCB$L_STS		00000024	D		UCB$C_LENGTH		00000074		D		
PCB$L_UIC		00000088	D		UCB$C_MB_LENGTH		00000090		D		
PCB$L_WSSWP		00000020	D		UCB$C_TT_LENGTH		000000BC		D		
PCB$L_WTIME		00000028	D		UCB$K_LENGTH		00000074		D		
PCB$Q_PRIV		0000007C	D		UCB$K_MB_LENGTH		00000090		D		
PCB$T_LNAME		00000068	D		UCB$K_TT_LENGTH		000000BC		D		
PCB$T_TERMINAL		00000044	D		UCB$L_AMB		00000054		D		
PCB$W_APTCNT		00000030	D		UCB$L_ASTQBL		00000010		D		

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UCB$L_ASTQFL                    0000000C    D
UCB$L_CPID                      0000005C    D
UCB$L_CRB                       00000020    D
UCB$L_DDB                       00000024    D
UCB$L_DEVCHAR                   00000034    D
UCB$L_DEVDEPEND                 0000003C    D
UCB$L_DPC                       00000080    D
UCB$L_DUETIM                    0000005C    D
UCB$L_DX_BFPNT                  0000009C    D
UCB$L_DX_BUF                    00000098    D
UCB$L_DX_RXDB                   000000A0    D
UCB$L_EMB                       00000078    D
UCB$L_FIRST                     00000014    D
UCB$L_FPC                       0000000C    D
UCB$L_FQBL                      00000004    D
UCB$L_FQFL                      00000000    D
UCB$L_FR3                       00000010    D
UCB$L_FR4                       00000014    D
UCB$L_IOQBL                     00000044    D
UCB$L_IOQFL                     00000040    D
UCB$L_IRP                       0000004C    D
UCB$L_LINK                      0000002C    D
UCB$L_LOGADR                    00000064    D
UCB$L_MAXBLOCK                  00000084    D
UCB$L_MB_MBX                    0000007C    D
UCB$L_MB_PORT                   0000008C    D
UCB$L_MB_RAST                   00000078    D
UCB$L_MB_SHB                    00000080    D
UCB$L_MB_WAST                   00000074    D
UCB$L_MB_WIOQBL                 00000088    D
UCB$L_MB_WIOQFL                 00000084    D
UCB$L_MEDIA                     0000008C    D
UCB$L_NT_DATSSB                 00000074    D
UCB$L_NT_INTSSB                 00000078    D
UCB$L_OPCNT                     00000060    D
UCB$L_OWNUIC                    0000001C    D
UCB$L_PID                       00000028    D
UCB$L_RQBL                      00000004    D
UCB$L_RQFL                      00000000    D
UCB$L_SVAPTE                    00000068    D
UCB$L_SVPN                      00000064    D
UCB$L_TT_DECHAR                 000000A8    D
UCB$L_TT_RDUE                   0000008C    D
UCB$L_TT_RTIMOU                 000000B8    D
UCB$L_VCB                       00000030    D
UCB$M_BSY                     = 00000100    D
UCB$M_CANCEL                  = 00000008    D
UCB$M_INT                     = 00000002    D
UCB$M_TIM                     = 00000001    D
UCB$M_TIMOUT                  = 00000040    D
UCB$T_PARTNER                   0000000C    D
UCB$V_BSY                     = 00000008    D
UCB$V_ERLOGIP                 = 00000002    D
UCB$W_BCNT                      0000006E    D
UCB$W_BCR                       00000096    D
UCB$W_BOFF                      0000006C    D
UCB$W_BUFQUO                    00000018    D
UCB$W_BYTESTOGO                 0000003E    D
UCB$W_CHARGE                    0000004A    D
UCB$W_CYLINDERS                 0000003E    D
UCB$W_DA                        0000008C    D
UCB$W_DC                        0000008E    D
UCB$W_DEVBUFSIZ                 0000003A    D
UCB$W_DEVSTS                    0000005A    D
UCB$W_DIRSEQ                    00000088    D
UCB$W_DSTADDR                   00000018    D
UCB$W_DX_BCR                    000000A4    D
UCB$W_EC1                       00000090    D
UCB$W_EC2                       00000092    D
UCB$W_ERRCNT                    00000072    D
UCB$W_FUNC                      0000007E    D
UCB$W_MB_SEED                   00000000    D
UCB$W_MSGCNT                    00000016    D
UCB$W_MSGMAX                    00000014    D
UCB$W_NT_CHAN                   0000007C    D
UCB$W_OFFSET                    0000008A    D
UCB$W_REFC                      00000050    D
UCB$W_SIZE                      00000008    D
UCB$W_SRCADDR                   0000001A    D
UCB$W_STS                       00000058    D
UCB$W_TT_DESIZE                 000000A5    D
UCB$W_UNIT                      00000048    D
UCB$W_VPROT                     0000001A    D
VEC$B_DATAPATH                  00000013    D
VEC$B_NUMREG                    00000012    D
VEC$C_LENGTH                    00000024    D
VEC$K_LENGTH                    00000024    D
VEC$L_ADP                       00000014    D
VEC$L_IDB                       00000008    D
VEC$L_INITIAL                   0000000C    D
VEC$L_START                     0000001C    D
VEC$L_UNITDISC                  00000020    D
VEC$L_UNITINIT                  00000018    D
VEC$Q_DISPATCH                  00000000    D
VEC$S_DATAPATH                = 00000005    D
VEC$V_DATAPATH                = 00000000    D
VEC$V_MAPLOCK                 = 0000000F    D
VEC$V_PATHLOCK                = 00000007    D
VEC$W_MAPREG                    00000010    D
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Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	000000BC (188.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
SEP	00000302 (770.)	02 (2.)	NOPIC USR CON REL LCL SHR EXE RD WRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
ADP$C_NUMDATAP	=00000010		#-440 (1)
ADP$L_DPQBL	00000018		449 (1)
ADP$L_DPQFL	00000014		386 (1)
ADP$L_MRQBL	00000020		541 (1)
ADP$L_MRQFL	0000001C		498 (1) 505 (1)
ADP$W_DPBITMAP	00000024		398 (1) 440 (1) 445 (1)
ADP$W_MRBITMAP	00000026		570 (1) 574 (1) 614 (1) 618 (1)
			621 (1)
BUG$CHECK	00000000-XR		399 (1)
CRB$B_MASK	0000000E		196 (1) #-211 (1) 261 (1)
CRB$L_INTD	00000014		#-197 (1) #-260 (1) #-378 (1) #-379 (1)
			383 (1) 393 (1) 438 (1) #-439 (1)
			444 (1) 491 (1) #-493 (1) #-495 (1)
			#-567 (1) #-607 (1) 608 (1) #-609 (1)
			#-617 (1) #-623 (1)
CRB$L_LINK	00000010		#-188 (1) #-192 (1) #-247 (1) #-251 (1)
CRB$L_WQBL	00000004		#-259 (1)
CRB$L_WQFL	00000000		200 (1) 267 (1)
CRB$M_BSY	=00000001		#-211 (1)
CRB$V_BSY	=00000000		#-196 (1) #-261 (1)
DDB$L_DDT	0000000C		#-153 (1) #-348 (1)
DDT$L_REGDUMP	00000010		#-154 (1)
DDT$L_START	00000000		#-349 (1)
EMB$B_DV_ERTCNT	=00000010		#-308 (1)
EMB$Q_DV_IOSB	=00000012		#-309 (1)
EMB$W_DV_STS	=0000001A		#-307 (1)
ERL$RELEASEMB	00000000-XR		310 (1)
EXE$GL_ABSTIM	00000000-XR		#-678 (1) #-712 (1)
EXE$GQ_SYSTIME	00000000-XR		#-150 (1) #-346 (1)
IDB$L_CSR	00000000		#-205 (1) #-262 (1)
IDB$L_OWNER	00000004		#-198 (1) #-206 (1) #-210 (1) #-263 (1)
			#-268 (1)
IOC$ALLOSPT	000002F7-R	742 (1)	
IOC$ALOUBAMAP	0000024E-R	599 (1)	#-500 (1) #-537 (1)
IOC$ALOUBAMAPN	0000024A-R	596 (1)	
IOC$ALTUBAMAP	0000022C-R	566 (1)	#-497 (1) #-624 (1)
IOC$CANCELIO	00000000-R	116 (1)	
IOC$DIAGBUFILL	00000017-R	145 (1)	
IOC$GL_PSBL	00000000-XR		302 (1)
IOC$INITIATE	00000120-R	338 (1)	#-312 (1)
IOC$RELCHAN	00000052-R	190 (1)	#-315 (1) #-715 (1)
IOC$RELDATAP	00000153-R	376 (1)	
IOC$RELMAPREG	000001E0-R	489 (1)	
IOC$RELSCHAN	00000048-R	186 (1)	
IOC$REQCOM	000000DD-R	296 (1)	
IOC$REQDATAP	000001A7-R	435 (1)	
IOC$REQDATAPNW	000001A3-R	432 (1)	
IOC$REQMAPREG	0000021A-R	536 (1)	
IOC$REQPCHANH	000000A9-R	253 (1)	
IOC$REQPCHANL	000000B2-R	257 (1)	

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IOC$REQSCHANH                   00000095-R   245    (1)
IOC$REQSCHANL                   0000009F-R   249    (1)
IOC$RETURN                      000002B0-R   646    (1)
IOC$WFIKPCH                     000002B1-R   673    (1)
IOC$WFIRLCH                     000002D3-R   707    (1)
IPL$_IOPOST                    =00000004                    #-304    (1)
IRP$L_DIAGBUF                   00000044                    #-148    (1)    #-345    (1)
IRP$L_MEDIA                     00000034                    #-298    (1)
IRP$L_PID                       0000000C                    #-118    (1)
IRP$L_SVAPTE                    0000002C                    #-342    (1)
IRP$V_DIAGBUF                  =00000007                    #-147    (1)    #-344    (1)
IRP$W_CHAN                      00000028                    #-120    (1)
IRP$W_STS                       0000002A                      147    (1)      344    (1)
MMG$GL_SPTBASE                  00000000-XR                 #-743    (1)
PCB$L_PID                       00000060                    #-118    (1)
PR$_IPL                        =00000012                    #-680    (1)    #-714    (1)
PR$_SIRR                       =00000014                    #-304    (1)
RELEASE                         0000011D-R   314    (1)     #-269    (1)
SS$_NORMAL                      00000000-XR                 #-451    (1)
UCB$B_ERTCNT                    00000070                    #-151    (1)    #-308    (1)
UCB$L_CRB                       00000020                    #-187    (1)    #-191    (1)    #-195    (1)    #-246    (1)
                                                            #-250    (1)    #-254    (1)    #-258    (1)    #-377    (1)
                                                            #-390    (1)    #-437    (1)    #-490    (1)    #-606    (1)
UCB$L_DDB                       00000024                    #-152    (1)    #-347    (1)
UCB$L_DUETIM                    0000005C                    #-678    (1)    #-712    (1)
UCB$L_EMB                       00000078                    #-306    (1)
UCB$L_FPC                       0000000C                      207    (1)    #-266    (1)      395    (1)    #-448    (1)
                                                              503    (1)    #-540    (1)    #-676    (1)    #-710    (1)
UCB$L_FQFL                      00000000                      267    (1)      449    (1)      505    (1)      541    (1)
UCB$L_FR3                       00000010                    #-204    (1)    #-265    (1)    #-394    (1)    #-447    (1)
                                                            #-502    (1)    #-539    (1)    #-675    (1)    #-709    (1)
UCB$L_IOQFL                     00000040                      311    (1)
UCB$L_IRP                       0000004C                    #-146    (1)    #-297    (1)    #-339    (1)
UCB$L_OPCNT                     00000060                    #-299    (1)
UCB$L_SVAPTE                    00000068                    #-342    (1)
UCB$M_BSY                      =00000100                    #-313    (1)
UCB$M_CANCEL                   =00000008                    #-122    (1)    #-343    (1)
UCB$M_INT                      =00000002                    #-677    (1)    #-711    (1)
UCB$M_TIM                      =00000001                    #-677    (1)    #-711    (1)
UCB$M_TIMOUT                   =00000040                    #-343    (1)    #-679    (1)    #-713    (1)
UCB$V_BSY                      =00000008                    #-117    (1)
UCB$V_ERLOGIP                  =00000002                    #-305    (1)
UCB$W_BCNT                      0000006E                    #-601    (1)
UCB$W_BOFF                      0000006C                    #-602    (1)
UCB$W_STS                       00000058                      117    (1)    #-122    (1)      305    (1)    #-307    (1)
                                                            #-313    (1)    #-343    (1)    #-677    (1)    #-679    (1)
                                                            #-711    (1)    #-713    (1)
VEC$B_DATAPATH                  00000013                    #-379    (1)      383    (1)      393    (1)      438    (1)
                                                              444    (1)
VEC$B_NUMREG                    00000012                    #-567    (1)    #-609    (1)
VEC$L_ADP                       00000014                    #-378    (1)    #-439    (1)    #-493    (1)    #-607    (1)
VEC$L_IDB                       00000008                    #-197    (1)    #-260    (1)
VEC$S_DATAPATH                 =00000005                    #-382    (1)    #-385    (1)    #-392    (1)    #-443    (1)
VEC$V_DATAPATH                 =00000000                    #-381    (1)    #-384    (1)    #-391    (1)    #-442    (1)
VEC$V_MAPLOCK                  =0000000F                    #-491    (1)    #-608    (1)
VEC$V_PATHLOCK                 =00000007                    #-438    (1)
VEC$W_MAPREG                    00000010                      491    (1)    #-495    (1)      608    (1)    #-617    (1)
```

#-623   (1)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	33	00:00:00.01	00:00:00.19
Command processing	942	00:00:00.29	00:00:01.16
Pass 1	568	00:00:02.42	00:00:04.31
Symbol table sort	0	00:00:00.19	00:00:00.19
Pass 2	20	00:00:00.68	00:00:01.90
Symbol table output	2	00:00:00.07	00:00:00.20
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	4	00:00:00.09	00:00:00.11
Assembler run totals	1573	00:00:03.75	00:00:08.06

The working set limit was 2900 pages.
140774 bytes (275 pages) of virtual memory were used to buffer the intermediate code.
There were 40 pages of symbol table space allocated to hold 747 non-local and 35 local symbols.
748 source lines were read in Pass 1, producing 53 object records in Pass 2.
32 pages of virtual memory were used to define 31 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	10
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	10
SYS$COMMON:[SYSLIB]STARLET.MLB;2	6
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	27

1149 GETS were required to define 27 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 97 CONVERT DEVICE NAME AND UNIT
(1) 135 FIND FREE I/O CHANNEL
(1) 171 SEARCH FOR DEVICE
(1) 319 UNLOCK I/O DATA BASE AND RETURN STATUS
(1) 341 VERIFY I/O CHANNEL NUMBER

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element IOSPGD.MAR
0000     2 ; *1     6-FEB-1986 15:19:02 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element IOSPGD.MAR
0000     4         .TITLE  IOSPGD  *** IOSPGD services for QIO
0000     5         .IDENT  /05-02/
0000     6         .LIST   MEB
0000     7         .NLIST  CND
0000     8
0000     9 ;
0000    10 ;*****************************************************************************
0000    11 ;*                                                                           *
0000    12 ;*  COPYRIGHT (c) 1977, 1978, 1979, 1980                                    *
0000    13 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
0000    14 ;*                                                                           *
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0000    23 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT  *
0000    24 ;*  CORPORATION.                                                             *
0000    25 ;*                                                                           *
0000    26 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS   *
0000    27 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    28 ;*                                                                           *
0000    29 ;*****************************************************************************
0000    30 ;
0000    31 ; D. N. CUTLER 13-JUN-76
0000    32 ;
0000    33 ; PAGED I/O RELATED SUBROUTINES
0000    34 ;
0000    35 ;
0000    36 ;
0000    37 ;       ADAPTED TO DIAGNOSTIC SUPERVISOR ENVIRONMENT
0000    38 ;
0000    39 ;               Dave Butenhof   14-may-1980, Version 5.4
0000    40 ;       02      Modify VMS V2.0 source for Supervisor environment
0000    41 ;       V04     LMK0001         LEN KAWELL      27-JUL-1979
0000    42 ;               CHANGE INTERFACE TO IOC$CREATE_UCB TO ASSUME THAT THE
0000    43 ;               I/O DATABASE IS LOCKED FOR WRITE ACCESS.
0000    44 ;
0000    45 ;       V03     SPR23081        LEN KAWELL      28-MAR-1979
0000    46 ;               CHANGE OVERFLOW CHECK IN IOC$SEARCHDEV SO THAT UNIT
0000    47 ;               NUMBERS BETWEEN 32768 AND 65535 ARE VALID.
0000    48 ;
0000    49 ;       V02     SPR20488                LEN KAWELL      7-FEB-1979
0000    50 ;               RESTORE PCB ADDRESS WHEN CHECKING FOR ALLSPOOL
0000    51 ;               PRIVILEGE DURING GENERIC ALLOCATION OF A SPOOLED DEVICE.
0000    52 ;
0000    53 ; MACRO LIBRARY CALLS
0000    54 ;
0000    58
0000    59         $ACBDEF                         ;DEFINE AST CONTROL BLOCK
0000               .SAVE   LOCAL_BLOCK
```

```
                        0000              .IIF    NB,ACB$L_ASTQFL,        ACB$L_ASTQFL:
00000004                0000                      .BLKL   1
                        0004              .IIF    NB,ACB$L_ASTQBL,        ACB$L_ASTQBL:
00000008                0004                      .BLKL   1
                        0008              .IIF    NB,ACB$W_SIZE,  ACB$W_SIZE:
0000000A                0008                      .BLKW   1
                        000A              .IIF    NB,ACB$B_TYPE,  ACB$B_TYPE:
0000000B                000A                      .BLKB   1
                        000B              .IIF    NB,ACB$B_RMOD,  ACB$B_RMOD:
0000000C                000B                      .BLKB   1
                        000C              .IIF    NB,ACB$L_PID,   ACB$L_PID:
00000010                000C                      .BLKL   1
                        0010              .IIF    NB,ACB$L_AST,   ACB$L_AST:
00000014                0010                      .BLKL   1
                        0014              .IIF    NB,ACB$L_ASTPRM,        ACB$L_ASTPRM:
00000018                0014                      .BLKL   1
                        0018              .IIF    NB,ACB$C_LENGTH,        ACB$C_LENGTH:
                        0018              .IIF    NB,ACB$K_LENGTH,        ACB$K_LENGTH:
                        0018              .IIF    NB,ACB$L_KAST,  ACB$L_KAST:
0000001C                0018                      .BLKL   1
                        0000              .RESTORE
                        0000      60      $CCBDEF                         ;DEFINE CCB OFFSETS
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
00000000                001C              .=0
                        0000              .IIF    NB,CCB$L_UCB,   CCB$L_UCB:
00000004                0000                      .BLKL   1
                        0004              .IIF    NB,CCB$L_WIND,  CCB$L_WIND:
00000008                0004                      .BLKL   1
                        0008              .IIF    NB,CCB$B_STS,   CCB$B_STS:
00000009                0008                      .BLKB   1
                        0009              .IIF    NB,CCB$B_AMOD,  CCB$B_AMOD:
0000000A                0009                      .BLKB   1
                        000A              .IIF    NB,CCB$W_IOC,   CCB$W_IOC:
0000000C                000A                      .BLKW   1
                        000C              .IIF    NB,CCB$L_DIRP,  CCB$L_DIRP:
00000010                000C                      .BLKL   1
                        0010              .IIF    NB,CCB$C_LENGTH,        CCB$C_LENGTH:
                        0010              .IIF    NB,CCB$K_LENGTH,        CCB$K_LENGTH:
                        0000              .RESTORE
                        0000      61      $CRBDEF                         ;DEFINE CRB OFFSETS
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
00000000                001C              .=0
                        0000              .IIF    NB,CRB$L_WQFL,  CRB$L_WQFL:
00000004                0000                      .BLKL   1
                        0004              .IIF    NB,CRB$L_WQBL,  CRB$L_WQBL:
00000008                0004                      .BLKL   1
                        0008              .IIF    NB,CRB$W_SIZE,  CRB$W_SIZE:
0000000A                0008                      .BLKW   1
                        000A              .IIF    NB,CRB$B_TYPE,  CRB$B_TYPE:
0000000B                000A                      .BLKB   1
0000000C                000B                      .BLKB   1
                        000C              .IIF    NB,CRB$W_REFC,  CRB$W_REFC:
0000000E                000C                      .BLKW   1
                        000E              .IIF    NB,CRB$B_MASK,  CRB$B_MASK:
0000000F                000E                      .BLKB   1
```

```
                    00000010  000F                    .BLKB   1
                              0010          .IIF      NB,CRB$L_LINK,  CRB$L_LINK:
                    00000014  0010                    .BLKL   1
                              0014          .IIF      NB,CRB$L_INTD,  CRB$L_INTD:
                    00000038  0014                    .BLKL   9
                              0038          .IIF      NB,CRB$C_LENGTH,        CRB$C_LENGTH:
                              0038          .IIF      NB,CRB$K_LENGTH,        CRB$K_LENGTH:
                              0038          .IIF      NB,CRB$L_INTD2, CRB$L_INTD2:
                    0000005C  0038                    .BLKL   9
                              0000          .RESTORE
                              0000    62    $DDBDEF                         ;DEFINE DDB OFFSETS
                              0000          .SAVE   LOCAL_BLOCK
                              0000          .PSECT  $ABS$,ABS
                    00000000  005C          .=0
                              0000          .IIF      NB,DDB$L_LINK,  DDB$L_LINK:
                    00000004  0000                    .BLKL   1
                              0004          .IIF      NB,DDB$L_UCB,   DDB$L_UCB:
                    00000008  0004                    .BLKL   1
                              0008          .IIF      NB,DDB$W_SIZE,  DDB$W_SIZE:
                    0000000A  0008                    .BLKW   1
                              000A          .IIF      NB,DDB$B_TYPE,  DDB$B_TYPE:
                    0000000B  000A                    .BLKB   1
                    0000000C  000B                    .BLKB   1
                              000C          .IIF      NB,DDB$L_DDT,   DDB$L_DDT:
                    00000010  000C                    .BLKL   1
                              0010          .IIF      NB,DDB$L_ACPD,  DDB$L_ACPD:
                    00000013  0010                    .BLKB   3
                              0013          .IIF      NB,DDB$B_ACPCLASS,      DDB$B_ACPCLASS:
                    00000014  0013                    .BLKB   1
                              0014          .IIF      NB,DDB$T_NAME,  DDB$T_NAME:
                    00000015  0014                    .BLKB   1
                    00000024  0015                    .BLKB   15
                              0024          .IIF      NB,DDB$T_DRVNAME,       DDB$T_DRVNAME:
                    00000025  0024                    .BLKB   1
                    00000034  0025                    .BLKB   15
                              0034          .IIF      NB,DDB$C_LENGTH,        DDB$C_LENGTH:
                              0034          .IIF      NB,DDB$K_LENGTH,        DDB$K_LENGTH:
                              0000          .RESTORE
                              0000    63    $DEVDEF                         ;DEFINE DEVICE CHARACTERISTICS
                              0000          .SAVE   LOCAL_BLOCK
                              0000          .PSECT  $ABS$,ABS
                    00000000  005C          .=0
                              0000          .RESTORE
                              0000    64    $IPLDEF                         ;DEFINE IPL LEVELS
                              0000          .SAVE   LOCAL_BLOCK
                              0000          .PSECT  $ABS$,ABS
                    00000000  005C          .=0
                              0000          .RESTORE
                              0000    65    $LOGDEF                         ;DEFINE LOG OFFSETS
                              0000          .SAVE   LOCAL_BLOCK
                              0000          .PSECT  $ABS$,ABS
                    00000000  005C          .=0
                              0000          .RESTORE
                              0000    66    $PCBDEF                         ;DEFINE PCB OFFSETS
                              0000          .SAVE   LOCAL_BLOCK
                              0000          .PSECT  $ABS$,ABS
                    00000000  005C          .=0
```

```
                        0000            .IIF    NB,PCB$L_SQFL,  PCB$L_SQFL:
                00000004 0000                   .BLKL   1
                        0004            .IIF    NB,PCB$L_SQBL,  PCB$L_SQBL:
                00000008 0004                   .BLKL   1
                        0008            .IIF    NB,PCB$W_SIZE,  PCB$W_SIZE:
                0000000A 0008                   .BLKW   1
                        000A            .IIF    NB,PCB$B_TYPE,  PCB$B_TYPE:
                0000000B 000A                   .BLKB   1
                        000B            .IIF    NB,PCB$B_PRI,   PCB$B_PRI:
                0000000C 000B                   .BLKB   1
                        000C            .IIF    NB,PCB$B_ASTACT,        PCB$B_ASTACT:
                0000000D 000C                   .BLKB   1
                        000D            .IIF    NB,PCB$B_ASTEN, PCB$B_ASTEN:
                0000000E 000D                   .BLKB   1
                        000E            .IIF    NB,PCB$W_MTXCNT,        PCB$W_MTXCNT:
                00000010 000E                   .BLKW   1
                        0010            .IIF    NB,PCB$L_ASTQFL,        PCB$L_ASTQFL:
                00000014 0010                   .BLKL   1
                        0014            .IIF    NB,PCB$L_ASTQBL,        PCB$L_ASTQBL:
                00000018 0014                   .BLKL   1
                        0018            .IIF    NB,PCB$L_PHYPCB,        PCB$L_PHYPCB:
                0000001C 0018                   .BLKL   1
                        001C            .IIF    NB,PCB$L_OWNER, PCB$L_OWNER:
                00000020 001C                   .BLKL   1
                        0020            .IIF    NB,PCB$L_WSSWP, PCB$L_WSSWP:
                00000024 0020                   .BLKL   1
                        0024            .IIF    NB,PCB$L_STS,   PCB$L_STS:
                00000028 0024                   .BLKL   1
                        0028            .IIF    NB,PCB$L_WTIME, PCB$L_WTIME:
                0000002C 0028                   .BLKL   1
                        002C            .IIF    NB,PCB$W_STATE, PCB$W_STATE:
                0000002E 002C                   .BLKW   1
                        002E            .IIF    NB,PCB$B_WEFC,  PCB$B_WEFC:
                0000002F 002E                   .BLKB   1
                        002F            .IIF    NB,PCB$B_PRIB,  PCB$B_PRIB:
                00000030 002F                   .BLKB   1
                        0030            .IIF    NB,PCB$W_APTCNT,        PCB$W_APTCNT:
                00000032 0030                   .BLKW   1
                        0032            .IIF    NB,PCB$W_TMBU,  PCB$W_TMBU:
                00000034 0032                   .BLKW   1
                        0034            .IIF    NB,PCB$W_GPGCNT,        PCB$W_GPGCNT:
                00000036 0034                   .BLKW   1
                        0036            .IIF    NB,PCB$W_PPGCNT,        PCB$W_PPGCNT:
                00000038 0036                   .BLKW   1
                        0038            .IIF    NB,PCB$W_ASTCNT,        PCB$W_ASTCNT:
                0000003A 0038                   .BLKW   1
                        003A            .IIF    NB,PCB$W_BIOCNT,        PCB$W_BIOCNT:
                0000003C 003A                   .BLKW   1
                        003C            .IIF    NB,PCB$W_BIOLM, PCB$W_BIOLM:
                0000003E 003C                   .BLKW   1
                        003E            .IIF    NB,PCB$W_DIOCNT,        PCB$W_DIOCNT:
                00000040 003E                   .BLKW   1
                        0040            .IIF    NB,PCB$W_DIOLM, PCB$W_DIOLM:
                00000042 0040                   .BLKW   1
                        0042            .IIF    NB,PCB$W_PRCCNT,        PCB$W_PRCCNT:
                00000044 0042                   .BLKW   1
                        0044            .IIF    NB,PCB$T_TERMINAL,      PCB$T_TERMINAL:
```

```
0000004C  0044                                  .BLKB   8
          004C                  .IIF    NB,PCB$L_PQB,   PCB$L_PQB:
          004C                  .IIF    NB,PCB$L_EFWM,  PCB$L_EFWM:
00000050  004C                                  .BLKL   1
          0050                  .IIF    NB,PCB$L_EFCS,  PCB$L_EFCS:
00000054  0050                                  .BLKL   1
          0054                  .IIF    NB,PCB$L_EFCU,  PCB$L_EFCU:
00000058  0054                                  .BLKL   1
          0058                  .IIF    NB,PCB$L_EFC2P, PCB$L_EFC2P:
0000005C  0058                                  .BLKL   1
          005C                  .IIF    NB,PCB$L_EFC3P, PCB$L_EFC3P:
00000060  005C                                  .BLKL   1
          0060                  .IIF    NB,PCB$L_PID,   PCB$L_PID:
00000064  0060                                  .BLKL   1
          0064                  .IIF    NB,PCB$L_PHD,   PCB$L_PHD:
00000068  0064                                  .BLKL   1
          0068                  .IIF    NB,PCB$T_LNAME, PCB$T_LNAME:
00000078  0068                                  .BLKB   16
          0078                  .IIF    NB,PCB$L_JIB,   PCB$L_JIB:
0000007C  0078                                  .BLKL   1
          007C                  .IIF    NB,PCB$Q_PRIV,  PCB$Q_PRIV:
00000084  007C                                  .BLKQ   1
          0084                  .IIF    NB,PCB$L_ARB,   PCB$L_ARB:
00000088  0084                                  .BLKL   1
          0088                  .IIF    NB,PCB$L_UIC,   PCB$L_UIC:
          0088                  .IIF    NB,PCB$W_MEM,   PCB$W_MEM:
0000008A  0088                                  .BLKW   1
          008A                  .IIF    NB,PCB$W_GRP,   PCB$W_GRP:
0000008C  008A                                  .BLKW   1
          008C                  .IIF    NB,PCB$C_LENGTH,        PCB$C_LENGTH:
          008C                  .IIF    NB,PCB$K_LENGTH,        PCB$K_LENGTH:
          0000                  .RESTORE
          0000      67          $PRDEF                          ;DEFINE PROCESSOR REGISTERS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000      68          $PRVDEF                         ;DEFINE PRIVILEGE BITS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000      69          $PSLDEF                         ;DEFINE PROCESSOR STATUS FIELDS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000      70          $SSDEF                          ;DEFINE SYSTEM STATUS VALUES
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000      71          $UCBDEF                         ;DEFINE UCB OFFSETS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
```

```
                    0000            .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
00000004            0000                            .BLKL   1
                    0004            .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                    0004            .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
00000008            0004                            .BLKL   1
                    0008            .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
0000000A            0008                            .BLKW   1
                    000A            .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
0000000B            000A                            .BLKB   1
                    000B            .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
0000000C            000B                            .BLKB   1
                    000C            .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                    000C            .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                    000C            .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
0000000D            000C                            .BLKB   1
00000010            000D                            .BLKB   3
                    0010            .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                    0010            .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
00000014            0010                            .BLKL   1
                    0014            .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                    0014            .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                    0014            .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
00000016            0014                            .BLKW   1
                    0016            .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
00000018            0016                            .BLKW   1
                    0018            .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                    0018            .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
0000001A            0018                            .BLKW   1
                    001A            .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                    001A            .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
0000001C            001A                            .BLKW   1
                    001C            .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
00000020            001C                            .BLKL   1
                    0020            .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
00000024            0020                            .BLKL   1
                    0024            .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
00000028            0024                            .BLKL   1
                    0028            .IIF    NB,UCB$L_PID,   UCB$L_PID:
0000002C            0028                            .BLKL   1
                    002C            .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
00000030            002C                            .BLKL   1
                    0030            .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
00000034            0030                            .BLKL   1
                    0034            .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
00000038            0034                            .BLKL   1
                    0038            .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
00000039            0038                            .BLKB   1
                    0039            .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
0000003A            0039                            .BLKB   1
                    003A            .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
0000003C            003A                            .BLKW   1
                    003C            .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
                    003C            .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
                    003C            .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
0000003D            003C                            .BLKB   1
                    003D            .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
                    003D            .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
```

```
                    0000003E  003D                        .BLKB   1
                              003E              .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
                              003E              .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
                    0000003F  003E                        .BLKB   1
                              003F              .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
                    00000040  003F                        .BLKB   1
                              0040              .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
                    00000044  0040                        .BLKL   1
                              0044              .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
                    00000048  0044                        .BLKL   1
                              0048              .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
                    0000004A  0048                        .BLKW   1
                              004A              .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
                              004A              .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
                    0000004B  004A                        .BLKB   1
                              004B              .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
                    0000004C  004B                        .BLKB   1
                              004C              .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
                    00000050  004C                        .BLKL   1
                              0050              .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
                    00000052  0050                        .BLKW   1
                              0052              .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
                              0052              .IIF    NB,UCB$B_STATE, UCB$B_STATE:
                    00000053  0052                        .BLKB   1
                              0053              .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
                    00000054  0053                        .BLKB   1
                              0054              .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
                    00000058  0054                        .BLKL   1
                              0058              .IIF    NB,UCB$W_STS,   UCB$W_STS:
                    0000005A  0058                        .BLKW   1
                              005A              .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
                    0000005C  005A                        .BLKW   1
                              005C              .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
                              005C              .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
                    00000060  005C                        .BLKL   1
                              0060              .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
                    00000064  0060                        .BLKL   1
                              0064              .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
                              0064              .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
                    00000068  0064                        .BLKL   1
                              0068              .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
                    0000006C  0068                        .BLKL   1
                              006C              .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
                    0000006E  006C                        .BLKW   1
                              006E              .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
                    00000070  006E                        .BLKW   1
                              0070              .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
                    00000071  0070                        .BLKB   1
                              0071              .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
                    00000072  0071                        .BLKB   1
                              0072              .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
                    00000074  0072                        .BLKW   1
                              0074              .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
                              0074              .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
                    00000000  0074              . = 0
                              0000              .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
                    00000002  0000                        .BLKW   1
```

```
                    00000074  0002              . = 116
                              0074              .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
                    00000078  0074                              .BLKL   1
                              0078              .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
                    0000007C  0078                              .BLKL   1
                              007C              .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
                    00000080  007C                              .BLKL   1
                              0080              .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
                    00000084  0080                              .BLKL   1
                              0084              .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
                    00000088  0084                              .BLKL   1
                              0088              .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
                    0000008C  0088                              .BLKL   1
                              008C              .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
                    00000090  008C                              .BLKL   1
                              0090              .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
                              0090              .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
                    00000074  0090              . = 116
                              0074              .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
                    00000075  0074                              .BLKB   1
                              0075              .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
                    00000076  0075                              .BLKB   1
                              0076              .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
                    00000077  0076                              .BLKB   1
                              0077              .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
                    00000078  0077                              .BLKB   1
                              0078              .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
                    0000007C  0078                              .BLKL   1
                    0000007E  007C                              .BLKW   1
                              007E              .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
                    00000080  007E                              .BLKW   1
                              0080              .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
                    00000084  0080                              .BLKL   1
                    00000080  0084              . = 128
                    00000084  0080                              .BLKL   1
                              0084              .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
                    00000088  0084                              .BLKL   1
                              0088              .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
                    0000008A  0088                              .BLKW   1
                              008A              .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
                    0000008C  008A                              .BLKW   1
                              008C              .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
                              008C              .IIF    NB,UCB$W_DA,    UCB$W_DA:
                    0000008E  008C                              .BLKW   1
                              008E              .IIF    NB,UCB$W_DC,    UCB$W_DC:
                    00000090  008E                              .BLKW   1
                              0090              .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
                    00000092  0090                              .BLKW   1
                              0092              .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
                    00000094  0092                              .BLKW   1
                              0094              .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
                    00000095  0094                              .BLKB   1
                              0095              .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
                    00000096  0095                              .BLKB   1
                              0096              .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
                    00000098  0096                              .BLKW   1
                    00000096  0098              . = 150
```

```
00000098  0096                                    .BLKW   1
          0098          .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C  0098                                    .BLKL   1
          009C          .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0  009C                                    .BLKL   1
          00A0          .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
000000A4  00A0                                    .BLKL   1
          00A4          .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
000000A6  00A4                                    .BLKW   1
          00A6          .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
000000A7  00A6                                    .BLKB   1
000000A8  00A7                                    .BLKB   1
00000074  00A8          . = 116
00000078  0074                                    .BLKL   1
0000007C  0078                                    .BLKL   1
00000080  007C                                    .BLKL   1
00000084  0080                                    .BLKL   1
00000088  0084                                    .BLKL   1
0000008C  0088                                    .BLKL   1
          008C          .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
00000090  008C                                    .BLKL   1
00000094  0090                                    .BLKL   1
00000098  0094                                    .BLKL   1
0000009C  0098                                    .BLKL   1
          009C          .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
0000009D  009C                                    .BLKB   1
          009D          .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
0000009E  009D                                    .BLKB   1
          009E          .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
0000009F  009E                                    .BLKB   1
000000A0  009F                                    .BLKB   1
          00A0          .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
000000A1  00A0                                    .BLKB   1
          00A1          .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
000000A2  00A1                                    .BLKB   1
          00A2          .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
000000A3  00A2                                    .BLKB   1
000000A4  00A3                                    .BLKB   1
          00A4          .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
000000A5  00A4                                    .BLKB   1
          00A5          .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
000000A7  00A5                                    .BLKW   1
000000A8  00A7                                    .BLKB   1
          00A8          .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
000000AC  00A8                                    .BLKL   1
000000B0  00AC                                    .BLKL   1
000000B4  00B0                                    .BLKL   1
000000B8  00B4                                    .BLKL   1
          00B8          .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
000000BC  00B8                                    .BLKL   1
          00BC          .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
          00BC          .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
00000074  00BC          . = 116
          0074          .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
00000078  0074                                    .BLKL   1
          0078          .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
0000007C  0078                                    .BLKL   1
```

```
                          007C                .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
                 0000007E 007C                                .BLKW   1
                 00000080 007E                                .BLKW   1
                          0000                .RESTORE
                          0000
                          0000  ;
                          0000  ; LOCAL SYMBOLS
                          0000  ;
                          0000  ; CHARACTER DEFINITIONS
                          0000  ;
                          0000
                 0000003A 0000  COLON=58                                  ;COLON
                      00000000          .PSECT  SEP, SHR, EXE, WRT, LONG
                 00000039 0000  NINE=57                                   ;DIGIT 9
                 00000041 0000  UCA=65                                    ;UPPER CASE A
                 00000064 0000  UCZ=100                                   ;UPPER CASE Z
                 0000005F 0000  UNDERSCORE=95                             ;UNDERSCORE
                 00000030 0000  ZERO=48                                   ;DIGIT 0
                          0000
                          0000  ;
                          0000  ; LOCAL DATA
                          0000  ;
                          0000
3A 57 55 21 43 41 21 5F 00' 0000  DEVCTL: .ASCIC  /_!AC!UW:/              ;DEVICE NAME CONVERSION CONTROL STRING
                       08 0000
```

```
                                0009          .SBTTL  CONVERT DEVICE NAME AND UNIT
                                0009    ;+
                                0009    ; IOC$CVT_DEVNAM - CONVERT DEVICE NAME AND UNIT
                                0009    ;
                                0009    ; THIS ROUTINE IS CALLED TO CONVERT A DEVICE NAME AND UNIT NUMBER TO A PHYSICAL
                                0009    ; DEVICE NAME STRING.
                                0009    ;
                                0009    ; INPUTS:
                                0009    ;
                                0009    ;       R0 = LENGTH OF OUTPUT BUFFER.
                                0009    ;       R1 = ADDRESS OF OUTPUT BUFFER.
                                0009    ;       R6 = ADDRESS OF DEVICE UCB.
                                0009    ;
                                0009    ; OUTPUTS:
                                0009    ;
                                0009    ;       THE DEVICE NAME AND UNIT NUMBER ARE CONVERTED AND STORED IN THE SPECIFIED
                                0009    ;       OUTPUT BUFFER. THE FOLLOWING REGISTER VALUES ARE RETURNED:
                                0009    ;
                                0009    ;               R0 = FINAL CONVERSION STATUS.
                                0009    ;               R1 = LENGTH OF CONVERSION STRING.
                                0009    ;
                                0009    ;       R3 IS PRESERVED ACROSS CALL.
                                0009    ;-
                                0009
                                0009    IOC$CVT_DEVNAM::                                ;CONVERT DEVICE NAME AND UNIT
          7E    50    7D        0009            MOVQ    R0,-(SP)                        ;SAVE OUTPUT BUFFER DESCRIPTOR
          52    5E    D0        000C            MOVL    SP,R2                           ;SET ADDRESS OF OUTPUT BUFFER DESCRIPTOR
     51    EE    AF    9E        000F            MOVAB   DEVCTL,R1                       ;GET ADDRESS OF CONVERSION CONTROL STRING
          50    81    9A        0013            MOVZBL  (R1)+,R0                        ;GET LENGTH OF CONVERSION CONTROL STRING
          7E    50    7D        0016            MOVQ    R0,-(SP)                        ;SAVE CONVERSION CONTROL STRING DESCRIPTOR
          51    5E    D0        0019            MOVL    SP,R1                           ;SET ADDRESS OF CONTROL STRING DESCRIPTOR
     50    24    A6    D0        001C            MOVL    UCB$L_DDB(R6),R0                ;GET ADDRESS OF DDB
     50    14    A0    9E        0020            MOVAB   DDB$T_NAME(R0),R0               ;GET ADDRESS OF DEVICE NAME
                                0024            $FAO_S  (R1),(R1),(R2),R0,UCB$W_UNIT(R6) ;CONVERT DEVICE AND UNIT
          48    A6    DD        0024                    PUSHL   UCB$W_UNIT(R6)
                50    DD        0027                    PUSHL   R0
                62    7F        0029                    PUSHAQ  (R2)
                61    3F        002B                    PUSHAW  (R1)
                61    7F        002D                    PUSHAQ  (R1)
00000000'GF     05    FB        002F                    CALLS   #$$T2,G^SYS$FAO
          51    6E    3C        0036            MOVZWL  (SP),R1                         ;GET LENGTH OF OUTPUT STRING
          5E    10    C0        0039            ADDL    #16,SP                          ;REMOVE DESCRIPTORS FROM STACK
                      05        003C            RSB                                     ;
```

```
                                003D   135          .SBTTL  FIND FREE I/O CHANNEL
                                003D   136 ;+
                                003D   137 ; IOC$FFCHAN - FIND FREE I/O CHANNEL
                                003D   138 ;
                                003D   139 ; THIS ROUTINE IS CALLED TO SEARCH THE I/O CHANNEL TABLE FOR A FREE CHANNEL.
                                003D   140 ;
                                003D   141 ; INPUTS:
                                003D   142 ;
                                003D   143 ;       NONE.
                                003D   144 ;
                                003D   145 ; OUTPUTS:
                                003D   146 ;
                                003D   147 ;       R0 LOW BIT CLEAR INDICATES FAILURE TO FIND FREE I/O CHANNEL.
                                003D   148 ;
                                003D   149 ;               R0 = SS$_NOIOCHAN - NO I/O CHANNEL AVAILABLE.
                                003D   150 ;
                                003D   151 ;       R0 LOW BIT SET INDICATES SUCCESS WITH:
                                003D   152 ;
                                003D   153 ;               R1 = AVAILABLE CHANNEL NUMBER.
                                003D   154 ;
                                003D   155 ;       R3 IS PRESERVED ACROSS CALL.
                                003D   156 ;-
                                003D   157
                                003D   158 IOC$FFCHAN::                                 ;FIND FREE I/O CHANNEL
    50   09   00000000'EF   C1  003D   159          ADDL3   CTL$GL_CCBBASE,#CCB$B_AMOD,R0   ;BASE AND OFFSET TO TEST ASSIGNMENT
              51   10        CE  0045   160          MNEGL   #CCB$C_LENGTH,R1        ;SET STARTING CHANNEL INDEX
         52   00000000'9F    3C  0048   161          MOVZWL  @#CTL$GW_NMIOCH,R2      ;GET NUMBER OF I/O CHANNELS
                    6041    95  004F   162 10$:     TSTB    (R0)[R1]                ;CHANNEL ASSIGNED?
                      0C    13  0052   163          BEQL    20$                     ;IF EQL NO
              51    10        C2  0054   164          SUBL    #CCB$C_LENGTH,R1        ;CALCULATE NEXT CHANNEL INDEX
                F5  52        F5  0057   165          SOBGTR  R2,10$                  ;ANY MORE CCB'S TO EXAMINE?
         50   01B4  8F        3C  005A   166          MOVZWL  #SS$_NOIOCHAN,R0        ;INDICATE FAILURE
                                05  005F   167          RSB                             ;
              50    01        3C  0060   168 20$:     MOVZWL  #SS$_NORMAL,R0          ;INDICATE SUCCESS
                                05  0063   169          RSB                             ;
```

```
                     0064   171          .SBTTL  SEARCH FOR DEVICE
                     0064   172 ;+
                     0064   173 ; IOC$SEARCHDEV - SEARCH FOR PHYSICAL DEVICE
                     0064   174 ; IOC$SEARCHGEN - SEARCH FOR GENERIC DEVICE
                     0064   175 ;
                     0064   176 ; THIS ROUTINE IS CALLED TO SEARCH THE DEVICE DATA BASE FOR A SPECIFIED
                     0064   177 ; DEVICE. IT IS ASSUMED THAT THE DEVICE DATA BASE HAS BEEN LOCKED FOR
                     0064   178 ; READ ACCESS.
                     0064   179 ;
                     0064   180 ; INPUTS:
                     0064   181 ;
                     0064   182 ;       R1 = ADDRESS OF LOGICAL NAME STRING DESCRIPTOR.
                     0064   183 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                     0064   184 ;
                     0064   185 ; OUTPUTS:
                     0064   186 ;
                     0064   187 ;       R0 LOW BIT CLEAR INDICATES FAILURE TO FIND DEVICE.
                     0064   188 ;
                     0064   189 ;               R0 = SS$_IVDEVNAM - INVALID DEVICE NAME.
                     0064   190 ;               R0 = SS$_NONLOCAL - NONLOCAL DEVICE.
                     0064   191 ;               R0 = SS$_NOSUCHDEV - NO SUCH DEVICE.
                     0064   192 ;
                     0064   193 ;       R0 LOW BIT SET INDICATES SUCCESS WITH:
                     0064   194 ;
                     0064   195 ;               R1 = UCB ADDRESS OF DEVICE UNIT.
                     0064   196 ;-
                     0064   197
                     0064   198          .ENABL  LSB
                     0064   199 IOC$SEARCHDEV::                          ;SEARCH FOR PHYSICAL DEVICE
     52    02    D0  0064   200          MOVL    #2,R2                   ;INDICATE PHYSICAL DEVICE SEARCH
           03    11  0067   201          BRB     5$                      ;
                     0069   202 IOC$SEARCHGEN::                         ;SEARCH FOR GENERIC DEVICE
     52    01    D0  0069   203          MOVL    #1,R2                   ;INDICATE GENERIC DEVICE SEARCH
     01F4  8F    BB  006C   204 5$:      PUSHR   #^M<R2,R4,R5,R6,R7,R8>  ;SAVE REGISTERS
 52    40  8F    9A  0070   205          MOVZBL  #LOG$C_NAMLENGTH,R2     ;SET MAXIMUM LENGTH OF RESULT STRING
     5E    52    C2  0074   206          SUBL    R2,SP                   ;ALLOCATE SPACE FOR RESULT STRING
     54    61    3C  0077   207          MOVZWL  (R1),R4                 ;GET LENGTH OF NAME STRING IN BYTES
           69    13  007A   208          BEQL    70$                     ;IF EQL INVALID DEVICE NAME
 55    04  A1    D0  007C   209          MOVL    4(R1),R5                ;GET ADDRESS OF NAME STRING
 85    5F  8F    91  0080   210          CMPB    #UNDERSCORE,(R5)+       ;DEVICE NAME START WITH UNDERSCORE?
           06    12  0084   211          BNEQ    7$                      ;IF NEQ NO
           54    D7  0086   212          DECL    R4                      ;REDUCE LENGTH OF DEVICE NAME
           5B    13  0088   213          BEQL    70$                     ;IF EQL INVALID DEVICE NAME
           10    11  008A   214          BRB     10$                     ;
75   54     3A    3A  008C   215 7$:      LOCC    #^A/:/,R4,-(R5)         ;SEARCH STRING FOR A COLON
           0A    13  0090   216          BEQL    10$                     ;IF EQL COLON NOT FOUND
           50    D7  0092   217          DECL    R0                      ;POSSIBLY A NODE NAME?
           06    13  0094   218          BEQL    10$                     ;IF EQL NO
 01  A1    3A    91  0096   219          CMPB    #^A/:/,1(R1)            ;NEXT CHARACTER A COLON?
           42    13  009A   220          BEQL    50$                     ;IF EQL YES
     50    54    7D  009C   221 10$:     MOVQ    R4,R0                   ;COPY DEVICE NAME PARAMETERS
 61    64  8F    91  009F   222 20$:     CMPB    #UCZ,(R1)               ;POSSIBLY UPPER CASE ALPHABETIC?
           40    1F  00A3   223          BLSSU   70$                     ;IF LSSU NO
 61    41  8F    91  00A5   224          CMPB    #UCA,(R1)               ;UPPER CASE ALPHABETIC?
           05    1A  00A9   225          BGTRU   30$                     ;IF GTRU NO
           51    D6  00AB   226          INCL    R1                      ;POINT TO NEXT CHARACTER
        EF 50    F5  00AD   227          SOBGTR  R0,20$                  ;ANY MORE CHARACTERS TO SCAN?
```

```
                56   D4   00B0    228 30$:    CLRL    R6                          ;CLEAR UNIT NUMBER
             54 50   C2   00B2    229         SUBL    R0,R4                       ;CALCULATE LENGTH OF DEVICE NAME
                2E   13   00B5    230         BEQL    70$                         ;IF EQL NO DEVICE NAME SPECIFIED
                50   D7   00B7    231 40$:    DECL    R0                          ;ANY MORE CHARACTERS IN STRING?
                31   19   00B9    232         BLSS    80$                         ;IF LSS NO
             52 81   9A   00BB    233         MOVZBL  (R1)+,R2                    ;GET NEXT CHARACTER
             52 3A   91   00BE    234         CMPB    #COLON,R2                   ;DEVICE NAME TERMINATOR?
                29   13   00C1    235         BEQL    80$                         ;IF EQL YES
          40 AE 02   C8   00C3    236         BISL    #2,LOG$C_NAMLENGTH(SP)      ;SET EXPLICIT UNIT NUMBER FLAG
             52 30   82   00C7    237         SUBB    #ZERO,R2                    ;POSSIBLY A DECIMAL DIGIT?
                19   19   00CA    238         BLSS    70$                         ;IF LSS NO
             52 09   91   00CC    239         CMPB    #NINE-ZERO,R2               ;DECIMAL DIGIT?
                14   19   00CF    240         BLSS    70$                         ;IF LSS NO
             56 05   A4   00D1    241         MULW    #5,R6                       ;SCALE CURRENT UNIT NUMBER BY 10
                             00D4    242                                         ; IN TWO STEPS, FOR OVERFLOW CHECK
                0F   1D   00D4    243         BVS     70$                         ;IF VS OVERFLOW - NUMBER TOO BIG
             56 56   A0   00D6    244         ADDW    R6,R6                       ;SECOND STEP OF SCALE BY 10
             56 52   C0   00D9    245         ADDL    R2,R6                       ;ADD NEW DIGIT TO ACCUMULATION
                D9   11   00DC    246         BRB     40$                         ;
                             00DE    247
                             00DE    248 ;
                             00DE    249 ; NONLOCAL DEVICE
                             00DE    250 ;
                             00DE    251
          50 08F0 8F   3C   00DE    252 50$:    MOVZWL  #SS$_NONLOCAL,R0            ;SET NONLOCAL DEVICE
                35   11   00E3    253 60$:    BRB     120$                        ;
                             00E5    254
                             00E5    255 ;
                             00E5    256 ; INVALID DEVICE NAME
                             00E5    257 ;
                             00E5    258
       50 0144 8F   3C   00E5    259 70$:    MOVZWL  #SS$_IVDEVNAM,R0            ;SET INVALID DEVICE NAME
                2E   11   00EA    260         BRB     120$                        ;
                             00EC    261
                             00EC    262 ;
                             00EC    263 ; SEARCH DEVICE DATA BASE FOR NAME/UNIT MATCH
                             00EC    264 ;
                             00EC    265
          57   01   D0   00EC    266 80$:    MOVL    #1,R7                       ;SET DEVICE NAME LENGTH ADJUSTMENT VALUE
58 00000000'EF   DE   00EF    267         MOVAL   L^IOC$GL_DEVLIST-DDB$L_LINK,R8 ;GET ADDRESS OF I/O DATABASE LISTHEAD
                2B   10   00F6    268 90$:    BSBB    SEARCHDEV                   ;SEARCH FOR DEVICE NAME MATCH
                09   12   00F8    269         BNEQ    100$                        ;IF NEQ MATCH NOT FOUND
                43   10   00FA    270 95$:    BSBB    SEARCHUNIT                  ;SEARCH FOR UNIT NUMBER MATCH
             1B 50   E8   00FC    271         BLBS    R0,120$                     ;IF LBS UNIT NUMBER MATCH FOUND
          F3 40 AE   E8   00FF    272         BLBS    LOG$C_NAMLENGTH(SP),90$     ;IF LBS GENERIC DEVICE NAME SEARCH
                57   D4   0103    273 100$:   CLRL    R7                          ;CLEAR DEVICE NAME LENGTH ADJUSTMENT VALUE
58 00000000'EF   DE   0105    274         MOVAL   L^IOC$GL_DEVLIST-DDB$L_LINK,R8 ;GET ADDRESS OF I/O DATABASE LISTHEAD
                15   10   010C    275         BSBB    SEARCHDEV                   ;SEARCH FOR DEVICE NAME MATCH
                05   12   010E    276         BNEQ    110$                        ;IF NEQ MATCH NOT FOUND
                2D   10   0110    277         BSBB    SEARCHUNIT                  ;SEARCH FOR UNIT NUMBER MATCH
             05 50   E8   0112    278         BLBS    R0,120$                     ;IF LBS UNIT NUMBER MATCH FOUND
       50 0908 8F   3C   0115    279 110$:   MOVZWL  #SS$_NOSUCHDEV,R0           ;SET NO SUCH DEVICE
          5E 40 AE   9E   011A    280 120$:   MOVAB   LOG$C_NAMLENGTH(SP),SP      ;REMOVE DEVICE NAME STRING FROM STACK
             01F4 8F   BA   011E    281         POPR    #^M<R2,R4,R5,R6,R7,R8>      ;RESTORE REGISTERS
                05   0122    282         RSB                                     ;
                             0123    283         .DSABL  LSB
                             0123    284
```

```
                                0123    285 ;
                                0123    286 ; SUBROUTINE TO SEARCH FOR DEVICE NAME MATCH
                                0123    287 ;
                                0123    288
                                0123    289 SEARCHDEV:                                  ;SEARCH FOR DEVICE NAME
          58    68    D0        0123    290 10$:    MOVL    DDB$L_LINK(R8),R8           ;GET ADDRESS OF NEXT DDB
                14    13        0126    291         BEQL    20$                         ;IF EQL END OF LIST
     50    14    A8    DE        0128    292         MOVAL   DDB$T_NAME(R8),R0           ;GET ADDRESS OF GENERIC DEVICE NAME
51   80    57    83              012C    293         SUBB3   R7,(R0)+,R1                 ;CALCULATE LENGTH OF STRING TO COMPARE
          54    51    91        0130    294         CMPB    R1,R4                       ;LENGTH OF NAMES MATCH?
                EE    12        0133    295         BNEQ    10$                         ;IF NEQ NO
65   60    54    29              0135    296         CMPC    R4,(R0),(R5)                ;COMPARE DEVICE NAMES
                E8    12        0139    297         BNEQ    10$                         ;IF NEQ NAMES DO NOT MATCH
                      05        013B    298         RSB                                 ;
          58    D6              013C    299 20$:    INCL    R8                          ;INDICATE SEARCH FAILURE
                      05        013E    300         RSB                                 ;
                                013F    301
                                013F    302 ;
                                013F    303 ; SUBROUTINE TO SEARCH FOR UNIT NUMBER MATCH
                                013F    304 ;
                                013F    305
                                013F    306 SEARCHUNIT:                                 ;SEARCH FOR UNIT NUMBER
          50    D4              013F    307         CLRL    R0                          ;ASSUME SEARCH FAILURE
  51    D8    A8    DE        0141    308         MOVAL   DDB$L_UCB-UCB$L_LINK(R8),R1 ;GET ADDRESS OF NEXT UCB ADDRESS
  51    2C    A1    D0        0145    309 10$:    MOVL    UCB$L_LINK(R1),R1           ;GET ADDRESS OF NEXT UCB
                0F    13        0149    310         BEQL    40$                         ;IF EQL END OF LIST
08 44 AE    01    E1              014B    311         BBC     #1,LOG$C_NAMLENGTH+4(SP),20$ ;IF CLR, GENERIC SEARCH
  48 A1     56    B1              0150    312         CMPW    R6,UCB$W_UNIT(R1)           ;UNIT NUMBER MATCH?
          02    13        0154    313         BEQL    30$                         ;IF EQL YES
          ED    11        0156    314         BRB     10$                         ;
                          0158    315 20$:
          50    D6        0158    316 30$:    INCL    R0                          ;INDICATE UNIT NUMBER MATCH
                05        015A    317 40$:    RSB                                 ;
```

```
                        015B          .SBTTL  UNLOCK I/O DATA BASE AND RETURN STATUS
                        015B  ;+
                        015B  ; IOC$UNLOCK - UNLOCK I/O DATA BASE AND RETURN STATUS
                        015B  ;
                        015B  ; THIS ROUTINE IS JUMPED TO AT THE END OF AN I/O RELATED SYSTEM SERVICE TO
                        015B  ; UNLOCK THE I/O DATA BASE, SET THE CURRENT PROCESSOR PRIORITY TO ZERO,
                        015B  ; AND TO RETURN STATUS TO THE CHANGE MODE DISPATCHER.
                        015B  ;
                        015B  ; INPUTS:
                        015B  ;
                        015B  ;       R0 = FINAL SYSTEM SERVICE STATUS VALUE.
                        015B  ;
                        015B  ; OUTPUTS:
                        015B  ;
                        015B  ;       THE I/O DATA BASE IS UNLOCKED, THE CURRENT PROCESSOR PRIORITY IS SET
                        015B  ;       TO ZERO, AND A RETURN TO THE CHANGE MODE DISPATCHER IS EXECUTED.
                        015B  ;-
                        015B
                        015B  IOC$UNLOCK::                                  ;UNLOCK I/O DATA BASE AND RETURN STATUS
                        015B          SETIPL  #0                            ;ALLOW ALL INTERRUPTS
          12    00   DA 015B                  MTPR    #0,S^#PR$_IPL
                    04  015E          RET                                   ;
```

```
                                015F   341          .SBTTL  VERIFY I/O CHANNEL NUMBER
                                015F   342 ;+
                                015F   343 ; IOC$VERIFYCHAN - VERIFY I/O CHANNEL NUMBER
                                015F   344 ;
                                015F   345 ; THIS ROUTINE IS CALLED TO VERIFY AND TRANSLATE AN I/O CHANNEL NUMBER TO
                                015F   346 ; A CCB ADDRESS. THE CHANNEL IS CHECKED FOR ACCESSIBILITY BY THE PREVIOUS
                                015F   347 ; ACCESS MODE.
                                015F   348 ;
                                015F   349 ; INPUTS:
                                015F   350 ;
                                015F   351 ;       R0 = I/O CHANNEL NUMBER.
                                015F   352 ;
                                015F   353 ; OUTPUTS:
                                015F   354 ;
                                015F   355 ;       R0 LOW BIT CLEAR INDICATES FAILURE TO VERIFY.
                                015F   356 ;
                                015F   357 ;               R0 = SS$_IVCHAN - INVALID CHANNEL NUMBER.
                                015F   358 ;               R0 = SS$_NOPRIV - NO PRIVILEGE TO ACCESS CHANNEL.
                                015F   359 ;               R1 = ADDRESS OF CCB IF R0 = SS$_NOPRIV
                                015F   360 ;
                                015F   361 ;       R0 LOW BIT SET INDICATES VERIFY SUCCESS WITH:
                                015F   362 ;
                                015F   363 ;               R1 = ADDRESS OF CCB.
                                015F   364 ;               R2 = CHANNEL INDEX.
                                015F   365 ;-
                                015F   366
                                015F   367 IOC$VERIFYCHAN::                             ;VERIFY I/O CHANNEL NUMBER
          50    0F    AA      015F   368          BICW    #CCB$C_LENGTH-1,R0           ;CLEAR EXTRANEOUS LOW ORDER BITS
                28    13      0162   369          BEQL    10$                          ;IF EQL INVALID CHANNEL
  00000000'9F   50    B1      0164   370          CMPW    R0,a#CTL$GW_CHINDX           ;LEGAL CHANNEL NUMBER?
                1F    1E      016B   371          BGEQU   10$                          ;IF GEQU NO
          52    50    CE      016D   372          MNEGL   R0,R2                        ;CONVERT TO CHANNEL INDEX
51  00000000'FF42    9E      0170   373          MOVAB   @CTL$GL_CCBBASE[R2],R1       ;GET ADDRESS OF CORRESPONDING CCB
                53    DC      0178   374          MOVPSL  R3                           ;READ CURRENT PSL
53  53    02    16    EF      017A   375          EXTZV   #PSL$V_PRVMOD,#PSL$S_PRVMOD,R3,R3 ;EXTRACT PREVIOUS MODE FIELD
          50    24    3C      017F   376          MOVZWL  #SS$_NOPRIV,R0               ;ASSUME CALLER DOES NOT HAVE PRIVILEGE
       09 A1    53    91      0182   377          CMPB    R3,CCB$B_AMOD(R1)            ;CALLER HAVE PRIVILEGE TO ACCESS CHANNEL?
                09    18      0186   378          BGEQ    20$                          ;IF GEQ NO
       05 50    00    E3      0188   379          BBCS    #0,R0,20$                    ;INDICATE SUCCESS
    50    013C 8F    3C      018C   380 10$:     MOVZWL  #SS$_IVCHAN,R0               ;SET INVALID CHANNEL
                05    RSB     0191   381 20$:     RSB                                  ;
                            0192   382
                            0192   383          .END
```

```
$$T2                    = 00000005    D
ACB$B_RMOD                0000000B    D
ACB$B_TYPE                0000000A    D
ACB$C_LENGTH              00000018    D
ACB$K_LENGTH              00000018    D
ACB$L_AST                 00000010    D
ACB$L_ASTPRM              00000014    D
ACB$L_ASTQBL              00000004    D
ACB$L_ASTQFL              00000000    D
ACB$L_KAST                00000018    D
ACB$L_PID                 0000000C    D
ACB$W_SIZE                00000008    D
CCB$B_AMOD                00000009    D
CCB$B_STS                 00000008    D
CCB$C_LENGTH              00000010    D
CCB$K_LENGTH              00000010    D
CCB$L_DIRP                0000000C    D
CCB$L_UCB                 00000000    D
CCB$L_WIND                00000004    D
CCB$W_IOC                 0000000A    D
COLON                   = 0000003A    D
CRB$B_MASK                0000000E    D
CRB$B_TYPE                0000000A    D
CRB$C_LENGTH              00000038    D
CRB$K_LENGTH              00000038    D
CRB$L_INTD                00000014    D
CRB$L_INTD2               00000038    D
CRB$L_LINK                00000010    D
CRB$L_WQBL                00000004    D
CRB$L_WQFL                00000000    D
CRB$W_REFC                0000000C    D
CRB$W_SIZE                00000008    D
CTL$GL_CCBBASE            ********    X   02
CTL$GW_CHINDX             ********    X   02
CTL$GW_NMIOCH             ********    X   02
DDB$B_ACPCLASS            00000013    D
DDB$B_TYPE                0000000A    D
DDB$C_LENGTH              00000034    D
DDB$K_LENGTH              00000034    D
DDB$L_ACPD                00000010    D
DDB$L_DDT                 0000000C    D
DDB$L_LINK                00000000    D
DDB$L_UCB                 00000004    D
DDB$T_DRVNAME             00000024    D
DDB$T_NAME                00000014    D
DDB$W_SIZE                00000008    D
DEVCTL                    00000000 R  D   02
IOC$CVT_DEVNAM            00000009 RG D   02
IOC$FFCHAN                0000003D RG D   02
IOC$GL_DEVLIST            ********    X   02
IOC$SEARCHDEV             00000064 RG D   02
IOC$SEARCHGEN             00000069 RG D   02
IOC$UNLOCK                0000015B RG D   02
IOC$VERIFYCHAN            0000015F RG D   02
LOG$C_NAMLENGTH         = 00000040    D
NINE                    = 00000039    D
PCB$B_ASTACT              0000000C    D
PCB$B_ASTEN               0000000D    D
PCB$B_PRI                 0000000B    D
PCB$B_PRIB                0000002F    D
PCB$B_TYPE                0000000A    D
PCB$B_WEFC                0000002E    D
PCB$C_LENGTH              0000008C    D
PCB$K_LENGTH              0000008C    D
PCB$L_ARB                 00000084    D
PCB$L_ASTQBL              00000014    D
PCB$L_ASTQFL              00000010    D
PCB$L_EFC2P               00000058    D
PCB$L_EFC3P               0000005C    D
PCB$L_EFCS                00000050    D
PCB$L_EFCU                00000054    D
PCB$L_EFWM                0000004C    D
PCB$L_JIB                 00000078    D
PCB$L_OWNER               0000001C    D
PCB$L_PHD                 00000064    D
PCB$L_PHYPCB              00000018    D
PCB$L_PID                 00000060    D
PCB$L_PQB                 0000004C    D
PCB$L_SQBL                00000004    D
PCB$L_SQFL                00000000    D
PCB$L_STS                 00000024    D
PCB$L_UIC                 00000088    D
PCB$L_WSSWP               00000020    D
PCB$L_WTIME               00000028    D
PCB$Q_PRIV                0000007C    D
PCB$T_LNAME               00000068    D
PCB$T_TERMINAL            00000044    D
PCB$W_APTCNT              00000030    D
PCB$W_ASTCNT              00000038    D
PCB$W_BIOCNT              0000003A    D
PCB$W_BIOLM               0000003C    D
PCB$W_DIOCNT              0000003E    D
PCB$W_DIOLM               00000040    D
PCB$W_GPGCNT              00000034    D
PCB$W_GRP                 0000008A    D
PCB$W_MEM                 00000088    D
PCB$W_MTXCNT              0000000E    D
PCB$W_PPGCNT              00000036    D
PCB$W_PRCCNT              00000042    D
PCB$W_SIZE                00000008    D
PCB$W_STATE               0000002C    D
PCB$W_TMBU                00000032    D
PR$_IPL                 = 00000012    D
PSL$S_PRVMOD            = 00000002    D
PSL$V_PRVMOD            = 00000016    D
SEARCHDEV                 00000123 R  D   02
SEARCHUNIT                0000013F R  D   02
SIZ...                  = 00000002    D
SS$_IVCHAN              = 0000013C    D
SS$_IVDEVNAM            = 00000144    D
SS$_NOIOCHAN            = 000001B4    D
SS$_NONLOCAL            = 000008F0    D
SS$_NOPRIV              = 00000024    D
SS$_NORMAL              = 00000001    D
```

SS$_NOSUCHDEV	= 00000908	D		UCB$L_FR3	00000010	D
SYS$FAO	********	X	02	UCB$L_FR4	00000014	D
UCA	= 00000041	D		UCB$L_IOQBL	00000044	D
UCB$B_AMOD	00000053	D		UCB$L_IOQFL	00000040	D
UCB$B_CEX	00000077	D		UCB$L_IRP	0000004C	D
UCB$B_CM1	0000004A	D		UCB$L_LINK	0000002C	D
UCB$B_CM2	0000004B	D		UCB$L_LOGADR	00000064	D
UCB$B_DEVCLASS	00000038	D		UCB$L_MAXBLOCK	00000084	D
UCB$B_DEVTYPE	00000039	D		UCB$L_MB_MBX	0000007C	D
UCB$B_DIPL	00000052	D		UCB$L_MB_PORT	0000008C	D
UCB$B_DX_SCTCNT	000000A6	D		UCB$L_MB_RAST	00000078	D
UCB$B_ERTCNT	00000070	D		UCB$L_MB_SHB	00000080	D
UCB$B_ERTMAX	00000071	D		UCB$L_MB_WAST	00000074	D
UCB$B_FEX	00000076	D		UCB$L_MB_WIOQBL	00000088	D
UCB$B_FIPL	0000000B	D		UCB$L_MB_WIOQFL	00000084	D
UCB$B_LOCSRV	0000003C	D		UCB$L_MEDIA	0000008C	D
UCB$B_OFFNDX	00000094	D		UCB$L_NT_DATSSB	00000074	D
UCB$B_OFFRTC	00000095	D		UCB$L_NT_INTSSB	00000078	D
UCB$B_REMSRV	0000003D	D		UCB$L_OPCNT	00000060	D
UCB$B_SECTORS	0000003C	D		UCB$L_OWNUIC	0000001C	D
UCB$B_SLAVE	00000074	D		UCB$L_PID	00000028	D
UCB$B_SPR	00000075	D		UCB$L_RQBL	00000004	D
UCB$B_STATE	00000052	D		UCB$L_RQFL	00000000	D
UCB$B_TRACKS	0000003D	D		UCB$L_SVAPTE	00000068	D
UCB$B_TT_CRFILL	0000009D	D		UCB$L_SVPN	00000064	D
UCB$B_TT_DECRF	000000A1	D		UCB$L_TT_DECHAR	000000A8	D
UCB$B_TT_DELFF	000000A2	D		UCB$L_TT_RDUE	0000008C	D
UCB$B_TT_DESPEE	000000A0	D		UCB$L_TT_RTIMOU	000000B8	D
UCB$B_TT_DETYPE	000000A4	D		UCB$L_VCB	00000030	D
UCB$B_TT_LFFILL	0000009E	D		UCB$T_PARTNER	0000000C	D
UCB$B_TT_SPEED	0000009C	D		UCB$W_BCNT	0000006E	D
UCB$B_TYPE	0000000A	D		UCB$W_BCR	00000096	D
UCB$B_VERTSZ	0000003F	D		UCB$W_BOFF	0000006C	D
UCB$C_LENGTH	00000074	D		UCB$W_BUFQUO	00000018	D
UCB$C_MB_LENGTH	00000090	D		UCB$W_BYTESTOGO	0000003E	D
UCB$C_TT_LENGTH	000000BC	D		UCB$W_CHARGE	0000004A	D
UCB$K_LENGTH	00000074	D		UCB$W_CYLINDERS	0000003E	D
UCB$K_MB_LENGTH	00000090	D		UCB$W_DA	0000008C	D
UCB$K_TT_LENGTH	000000BC	D		UCB$W_DC	0000008E	D
UCB$L_AMB	00000054	D		UCB$W_DEVBUFSIZ	0000003A	D
UCB$L_ASTQBL	00000010	D		UCB$W_DEVSTS	0000005A	D
UCB$L_ASTQFL	0000000C	D		UCB$W_DIRSEQ	00000088	D
UCB$L_CPID	0000005C	D		UCB$W_DSTADDR	00000018	D
UCB$L_CRB	00000020	D		UCB$W_DX_BCR	000000A4	D
UCB$L_DDB	00000024	D		UCB$W_EC1	00000090	D
UCB$L_DEVCHAR	00000034	D		UCB$W_EC2	00000092	D
UCB$L_DEVDEPEND	0000003C	D		UCB$W_ERRCNT	00000072	D
UCB$L_DPC	00000080	D		UCB$W_FUNC	0000007E	D
UCB$L_DUETIM	0000005C	D		UCB$W_MB_SEED	00000000	D
UCB$L_DX_BFPNT	0000009C	D		UCB$W_MSGCNT	00000016	D
UCB$L_DX_BUF	00000098	D		UCB$W_MSGMAX	00000014	D
UCB$L_DX_RXDB	000000A0	D		UCB$W_NT_CHAN	0000007C	D
UCB$L_EMB	00000078	D		UCB$W_OFFSET	0000008A	D
UCB$L_FIRST	00000014	D		UCB$W_REFC	00000050	D
UCB$L_FPC	0000000C	D		UCB$W_SIZE	00000008	D
UCB$L_FQBL	00000004	D		UCB$W_SRCADDR	0000001A	D
UCB$L_FQFL	00000000	D		UCB$W_STS	00000058	D

```
UCB$W_TT_DESIZE                   000000A5    D
UCB$W_UNIT                        00000048    D
UCB$W_VPROT                       0000001A    D
UCZ                             = 00000064    D
UNDERSCORE                      = 0000005F    D
ZERO                            = 00000030    D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	000000BC (188.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
SEP	00000192 (402.)	02 (2.)	NOPIC USR CON REL LCL SHR EXE RD WRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$T2	=00000005	130 (1)	130 (1)
CCB$B_AMOD	00000009		#-159 (1) #-377 (1)
CCB$C_LENGTH	00000010		#-160 (1) #-164 (1) #-368 (1)
COLON	=0000003A	82 (1)	#-234 (1)
CTL$GL_CCBBASE	00000000-XR		#-159 (1) 373 (1)
CTL$GW_CHINDX	00000000-XR		#-370 (1)
CTL$GW_NMIOCH	00000000-XR		#-161 (1)
DDB$L_LINK	00000000		267 (1) 274 (1) #-290 (1)
DDB$L_UCB	00000004		308 (1)
DDB$T_NAME	00000014		129 (1) 292 (1)
DEVCTL	00000000-R	94 (1)	124 (1)
IOC$CVT_DEVNAM	00000009-R	121 (1)	
IOC$FFCHAN	0000003D-R	158 (1)	
IOC$GL_DEVLIST	00000000-XR		267 (1) 274 (1)
IOC$SEARCHDEV	00000064-R	199 (1)	
IOC$SEARCHGEN	00000069-R	202 (1)	
IOC$UNLOCK	0000015B-R	337 (1)	
IOC$VERIFYCHAN	0000015F-R	367 (1)	
LOG$C_NAMLENGTH	=00000040		#-205 (1) #-236 (1) #-272 (1) 280 (1) 311 (1)
NINE	=00000039	84 (1)	#-239 (1)
PR$_IPL	=00000012		#-338 (1)
PSL$S_PRVMOD	=00000002		#-375 (1)
PSL$V_PRVMOD	=00000016		#-375 (1)
SEARCHDEV	00000123-R	289 (1)	#-268 (1) #-275 (1)
SEARCHUNIT	0000013F-R	306 (1)	#-270 (1) #-277 (1)
SS$_IVCHAN	=0000013C		#-380 (1)
SS$_IVDEVNAM	=00000144		#-259 (1)
SS$_NOIOCHAN	=000001B4		#-166 (1)
SS$_NONLOCAL	=000008F0		#-252 (1)
SS$_NOPRIV	=00000024		#-376 (1)
SS$_NORMAL	=00000001		#-168 (1)
SS$_NOSUCHDEV	=00000908		#-279 (1)
SYS$FAO	00000000-XR		130 (1)
UCA	=00000041	85 (1)	#-224 (1)
UCB$L_DDB	00000024		#-128 (1)
UCB$L_LINK	0000002C		308 (1) #-309 (1)
UCB$W_UNIT	00000048		#-130 (1) #-312 (1)
UCZ	=00000064	86 (1)	#-222 (1)
UNDERSCORE	=0000005F	87 (1)	#-210 (1)
ZERO	=00000030	88 (1)	#-237 (1) #-239 (1)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.01	00:00:00.19
Command processing	892	00:00:00.27	00:00:01.03

Pass 1	731	00:00:02.61	00:00:04.04
Symbol table sort	0	00:00:00.30	00:00:00.30
Pass 2	75	00:00:00.70	00:00:01.35
Symbol table output	2	00:00:00.03	00:00:00.07
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	3	00:00:00.05	00:00:00.17
Assembler run totals	1732	00:00:03.98	00:00:07.16

The working set limit was 2400 pages.
168114 bytes (329 pages) of virtual memory were used to buffer the intermediate code.
There were 60 pages of symbol table space allocated to hold 1027 non-local and 25 local symbols.
383 source lines were read in Pass 1, producing 67 object records in Pass 2.
27 pages of virtual memory were used to define 25 macros.

```
+----------------------------+
! Macro library statistics !
+----------------------------+
```

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	8
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	2
SYS$COMMON:[SYSLIB]STARLET.MLB;2	11
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	21

1350 GETS were required to define 21 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 67 APPLY ECC CORRECTION
(1) 129 CONVERT LOGICAL BLOCK TO PHYSICAL ADDRESS
(1) 167 MAP VIRTUAL TO LOGICAL BLOCK
(1) 278 UPDATE TRANSFER PARAMETERS
(1) 328 SENSE DISK'S SIZE FDT ROUTINE

```
0000      1 ; DEC/CMS REPLACEMENT HISTORY, Element IOSRAM.MAR
0000      2 ; *1     6-FEB-1986 15:19:05 DS ""
0000      3 ; DEC/CMS REPLACEMENT HISTORY, Element IOSRAM.MAR
0000      4         .TITLE  IOSRAM  *** IOSRAM random access I/O service routines
0000      5         .IDENT  /05-02/
0000      6         .LIST   MEB
0000      7         .NLIST  CND
0000      8
0000      9 ;
0000     10 ;*****************************************************************************
0000     11 ;*                                                                           *
0000     12 ;*  COPYRIGHT (c) 1977, 1978, 1979, 1980                                     *
0000     13 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
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0000     23 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT   *
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0000     27 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000     28 ;*                                                                           *
0000     29 ;*****************************************************************************
0000     30 ;
0000     31 ; D. N. CUTLER 16-MAR-77
0000     32 ;
0000     33 ; MODIFIED BY  T.L. SOUTTER  20-FEB-78
0000     34 ;
0000     35 ;       ADAPTED TO DIAGNOSTIC SUPERVISOR ENVIRONMENT
0000     36 ;
0000     37 ;             Dave Butenhof   14-may-1980, Version 5.4
0000     38 ;       02    Modified VMS V2.0 source for Supervisor environment
0000     39 ;
0000     40 ; NONPAGED RANDOM ACCESS MASS STORAGE I/O RELATED ROUTINES
0000     41 ;
0000     42 ; MACRO LIBRARY CALLS
0000     43 ;
0000     44
0000     45
0000     49
0000     50         $DEVDEF                         ;DEFINE DEVICE CHARACTERISTIC BITS
0000                .SAVE   LOCAL_BLOCK
0000                .RESTORE
0000     51         $DYNDEF                         ;DEFINE DATA STRUCTURE TYPE CODES
0000                .SAVE   LOCAL_BLOCK
0000                .RESTORE
0000     52         $IPLDEF                         ;DEFINE INTERRUPT PRIORITY LEVELS
0000                .SAVE   LOCAL_BLOCK
0000                .RESTORE
0000     53         $IRPDEF                         ;DEFINE IRP OFFSETS
0000                .SAVE   LOCAL_BLOCK
```

```
                        0000            .IIF    NB,IRP$L_IOQFL, IRP$L_IOQFL:
00000004                0000                    .BLKL   1
                        0004            .IIF    NB,IRP$L_IOQBL, IRP$L_IOQBL:
00000008                0004                    .BLKL   1
                        0008            .IIF    NB,IRP$W_SIZE,  IRP$W_SIZE:
0000000A                0008                    .BLKW   1
                        000A            .IIF    NB,IRP$B_TYPE,  IRP$B_TYPE:
0000000B                000A                    .BLKB   1
                        000B            .IIF    NB,IRP$B_RMOD,  IRP$B_RMOD:
0000000C                000B                    .BLKB   1
                        000C            .IIF    NB,IRP$L_PID,   IRP$L_PID:
00000010                000C                    .BLKL   1
                        0010            .IIF    NB,IRP$L_AST,   IRP$L_AST:
00000014                0010                    .BLKL   1
                        0014            .IIF    NB,IRP$L_ASTPRM,        IRP$L_ASTPRM:
00000018                0014                    .BLKL   1
                        0018            .IIF    NB,IRP$L_WIND,  IRP$L_WIND:
0000001C                0018                    .BLKL   1
                        001C            .IIF    NB,IRP$L_UCB,   IRP$L_UCB:
00000020                001C                    .BLKL   1
                        0020            .IIF    NB,IRP$W_FUNC,  IRP$W_FUNC:
00000022                0020                    .BLKW   1
                        0022            .IIF    NB,IRP$B_EFN,   IRP$B_EFN:
00000023                0022                    .BLKB   1
                        0023            .IIF    NB,IRP$B_PRI,   IRP$B_PRI:
00000024                0023                    .BLKB   1
                        0024            .IIF    NB,IRP$L_IOSB,  IRP$L_IOSB:
00000028                0024                    .BLKL   1
                        0028            .IIF    NB,IRP$W_CHAN,  IRP$W_CHAN:
0000002A                0028                    .BLKW   1
                        002A            .IIF    NB,IRP$W_STS,   IRP$W_STS:
0000002C                002A                    .BLKW   1
                        002C            .IIF    NB,IRP$L_SVAPTE,        IRP$L_SVAPTE:
00000030                002C                    .BLKL   1
                        0030            .IIF    NB,IRP$W_BOFF,  IRP$W_BOFF:
00000032                0030                    .BLKW   1
                        0032            .IIF    NB,IRP$W_BCNT,  IRP$W_BCNT:
00000034                0032                    .BLKW   1
                        0034            .IIF    NB,IRP$L_IOST1, IRP$L_IOST1:
                        0034            .IIF    NB,IRP$L_MEDIA, IRP$L_MEDIA:
00000038                0034                    .BLKL   1
                        0038            .IIF    NB,IRP$L_IOST2, IRP$L_IOST2:
                        0038            .IIF    NB,IRP$L_TT_TERM,       IRP$L_TT_TERM:
                        0038            .IIF    NB,IRP$B_CARCON,        IRP$B_CARCON:
00000039                0038                    .BLKB   1
0000003C                0039                    .BLKB   3
                        003C            .IIF    NB,IRP$Q_NT_PRVMSK,     IRP$Q_NT_PRVMSK:
                        003C            .IIF    NB,IRP$W_ABCNT, IRP$W_ABCNT:
                        003C            .IIF    NB,IRP$W_TT_PRMPT,      IRP$W_TT_PRMPT:
0000003E                003C                    .BLKW   1
                        003E            .IIF    NB,IRP$W_OBCNT, IRP$W_OBCNT:
00000040                003E                    .BLKW   1
                        0040            .IIF    NB,IRP$L_SEGVBN,        IRP$L_SEGVBN:
00000044                0040                    .BLKL   1
                        0044            .IIF    NB,IRP$L_DIAGBUF,       IRP$L_DIAGBUF:
00000048                0044                    .BLKL   1
                        0048            .IIF    NB,IRP$L_SEQNUM,        IRP$L_SEQNUM:
```

```
0000004C  0048                                  .BLKL   1
          004C                  .IIF    NB,IRP$L_EXTEND,        IRP$L_EXTEND:
00000050  004C                                  .BLKL   1
          0050                  .IIF    NB,IRP$L_ARB,   IRP$L_ARB:
00000054  0050                                  .BLKL   1
00000058  0054                                  .BLKL   1
0000005C  0058                                  .BLKL   1
          005C                  .IIF    NB,IRP$C_LENGTH,        IRP$C_LENGTH:
          005C                  .IIF    NB,IRP$K_LENGTH,        IRP$K_LENGTH:
          0000                  .RESTORE
          0000      54          $PRDEF                          ;DEFINE PROCESSOR REGISTERS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  005C                  .=0
          0000                  .RESTORE
          0000      55          $PTEDEF                         ;DEFINE PAGE TABLE ENTRY FIELDS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  005C                  .=0
          0000                  .RESTORE
          0000      56          $RVTDEF                         ;DEFINE RVT OFFSETS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  005C                  .=0
          0000                  .RESTORE
          0000      57          $UCBDEF                         ;DEFINE UCB OFFSETS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  005C                  .=0
          0000                  .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
          0000                  .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
00000004  0000                                  .BLKL   1
          0004                  .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
          0004                  .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
00000008  0004                                  .BLKL   1
          0008                  .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
0000000A  0008                                  .BLKW   1
          000A                  .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
0000000B  000A                                  .BLKB   1
          000B                  .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
0000000C  000B                                  .BLKB   1
          000C                  .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
          000C                  .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
          000C                  .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
0000000D  000C                                  .BLKB   1
00000010  000D                                  .BLKB   3
          0010                  .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
          0010                  .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
00000014  0010                                  .BLKL   1
          0014                  .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
          0014                  .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
          0014                  .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
00000016  0014                                  .BLKW   1
          0016                  .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
00000018  0016                                  .BLKW   1
          0018                  .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
          0018                  .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
```

```
0000001A  0018                                  .BLKW   1
          001A                  .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
          001A                  .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
0000001C  001A                                  .BLKW   1
          001C                  .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
00000020  001C                                  .BLKL   1
          0020                  .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
00000024  0020                                  .BLKL   1
          0024                  .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
00000028  0024                                  .BLKL   1
          0028                  .IIF    NB,UCB$L_PID,   UCB$L_PID:
0000002C  0028                                  .BLKL   1
          002C                  .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
00000030  002C                                  .BLKL   1
          0030                  .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
00000034  0030                                  .BLKL   1
          0034                  .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
00000038  0034                                  .BLKL   1
          0038                  .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
00000039  0038                                  .BLKB   1
          0039                  .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
0000003A  0039                                  .BLKB   1
          003A                  .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
0000003C  003A                                  .BLKW   1
          003C                  .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
          003C                  .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
          003C                  .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
0000003D  003C                                  .BLKB   1
          003D                  .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
          003D                  .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
0000003E  003D                                  .BLKB   1
          003E                  .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
          003E                  .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
0000003F  003E                                  .BLKB   1
          003F                  .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
00000040  003F                                  .BLKB   1
          0040                  .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
00000044  0040                                  .BLKL   1
          0044                  .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
00000048  0044                                  .BLKL   1
          0048                  .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
0000004A  0048                                  .BLKW   1
          004A                  .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
          004A                  .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
0000004B  004A                                  .BLKB   1
          004B                  .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
0000004C  004B                                  .BLKB   1
          004C                  .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
00000050  004C                                  .BLKL   1
          0050                  .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
00000052  0050                                  .BLKW   1
          0052                  .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
          0052                  .IIF    NB,UCB$B_STATE, UCB$B_STATE:
00000053  0052                                  .BLKB   1
          0053                  .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
00000054  0053                                  .BLKB   1
          0054                  .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
```

```
                00000058  0054                    .BLKL   1
                          0058          .IIF    NB,UCB$W_STS,   UCB$W_STS:
                0000005A  0058                    .BLKW   1
                          005A          .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
                0000005C  005A                    .BLKW   1
                          005C          .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
                          005C          .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
                00000060  005C                    .BLKL   1
                          0060          .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
                00000064  0060                    .BLKL   1
                          0064          .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
                          0064          .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
                00000068  0064                    .BLKL   1
                          0068          .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
                0000006C  0068                    .BLKL   1
                          006C          .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
                0000006E  006C                    .BLKW   1
                          006E          .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
                00000070  006E                    .BLKW   1
                          0070          .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
                00000071  0070                    .BLKB   1
                          0071          .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
                00000072  0071                    .BLKB   1
                          0072          .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
                00000074  0072                    .BLKW   1
                          0074          .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
                          0074          .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
                00000000  0074          . = 0
                          0000          .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
                00000002  0000                    .BLKW   1
                00000074  0002          . = 116
                          0074          .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
                00000078  0074                    .BLKL   1
                          0078          .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
                0000007C  0078                    .BLKL   1
                          007C          .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
                00000080  007C                    .BLKL   1
                          0080          .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
                00000084  0080                    .BLKL   1
                          0084          .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
                00000088  0084                    .BLKL   1
                          0088          .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
                0000008C  0088                    .BLKL   1
                          008C          .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
                00000090  008C                    .BLKL   1
                          0090          .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
                          0090          .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
                00000074  0090          . = 116
                          0074          .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
                00000075  0074                    .BLKB   1
                          0075          .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
                00000076  0075                    .BLKB   1
                          0076          .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
                00000077  0076                    .BLKB   1
                          0077          .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
                00000078  0077                    .BLKB   1
                          0078          .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
```

```
                        0000007C  0078                    .BLKL   1
                        0000007E  007C                    .BLKW   1
                                  007E          .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
                        00000080  007E                    .BLKW   1
                                  0080          .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
                        00000084  0080                    .BLKL   1
                        00000080  0084          . = 128
                        00000084  0080                    .BLKL   1
                                  0084          .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
                        00000088  0084                    .BLKL   1
                                  0088          .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
                        0000008A  0088                    .BLKW   1
                                  008A          .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
                        0000008C  008A                    .BLKW   1
                                  008C          .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
                                  008C          .IIF    NB,UCB$W_DA,    UCB$W_DA:
                        0000008E  008C                    .BLKW   1
                                  008E          .IIF    NB,UCB$W_DC,    UCB$W_DC:
                        00000090  008E                    .BLKW   1
                                  0090          .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
                        00000092  0090                    .BLKW   1
                                  0092          .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
                        00000094  0092                    .BLKW   1
                                  0094          .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
                        00000095  0094                    .BLKB   1
                                  0095          .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
                        00000096  0095                    .BLKB   1
                                  0096          .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
                        00000098  0096                    .BLKW   1
                        00000096  0098          . = 150
                        00000098  0096                    .BLKW   1
                                  0098          .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
                        0000009C  0098                    .BLKL   1
                                  009C          .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
                        000000A0  009C                    .BLKL   1
                                  00A0          .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
                        000000A4  00A0                    .BLKL   1
                                  00A4          .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
                        000000A6  00A4                    .BLKW   1
                                  00A6          .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
                        000000A7  00A6                    .BLKB   1
                        000000A8  00A7                    .BLKB   1
                        00000074  00A8          . = 116
                        00000078  0074                    .BLKL   1
                        0000007C  0078                    .BLKL   1
                        00000080  007C                    .BLKL   1
                        00000084  0080                    .BLKL   1
                        00000088  0084                    .BLKL   1
                        0000008C  0088                    .BLKL   1
                                  008C          .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
                        00000090  008C                    .BLKL   1
                        00000094  0090                    .BLKL   1
                        00000098  0094                    .BLKL   1
                        0000009C  0098                    .BLKL   1
                                  009C          .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
                        0000009D  009C                    .BLKB   1
                                  009D          .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
```

```
0000009E  009D                          .BLKB   1
          009E          .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
0000009F  009E                          .BLKB   1
000000A0  009F                          .BLKB   1
          00A0          .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
000000A1  00A0                          .BLKB   1
          00A1          .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
000000A2  00A1                          .BLKB   1
          00A2          .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
000000A3  00A2                          .BLKB   1
000000A4  00A3                          .BLKB   1
          00A4          .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
000000A5  00A4                          .BLKB   1
          00A5          .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
000000A7  00A5                          .BLKW   1
000000A8  00A7                          .BLKB   1
          00A8          .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
000000AC  00A8                          .BLKL   1
000000B0  00AC                          .BLKL   1
000000B4  00B0                          .BLKL   1
000000B8  00B4                          .BLKL   1
          00B8          .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
000000BC  00B8                          .BLKL   1
          00BC          .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
          00BC          .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
00000074  00BC          . = 116
          0074          .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
00000078  0074                          .BLKL   1
          0078          .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
0000007C  0078                          .BLKL   1
          007C          .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
0000007E  007C                          .BLKW   1
00000080  007E                          .BLKW   1
          0000          .RESTORE
          0000    58    $VADEF                                  ;DEFINE VIRTUAL ADDRESS FIELDS
          0000          .SAVE   LOCAL_BLOCK
          0000          .PSECT  $ABS$,ABS
00000000  00BC          .=0
          0000          .RESTORE
          0000    59    $WCBDEF                                 ;DEFINE WCB OFFSETS
          0000          .SAVE   LOCAL_BLOCK
          0000          .PSECT  $ABS$,ABS
00000000  00BC          .=0
          0000          .IIF    NB,WCB$L_WLFL,  WCB$L_WLFL:
00000004  0000                  .BLKL   1
          0004          .IIF    NB,WCB$L_WLBL,  WCB$L_WLBL:
00000008  0004                  .BLKL   1
          0008          .IIF    NB,WCB$W_SIZE,  WCB$W_SIZE:
0000000A  0008                  .BLKW   1
          000A          .IIF    NB,WCB$B_TYPE,  WCB$B_TYPE:
0000000B  000A                  .BLKB   1
          000B          .IIF    NB,WCB$B_ACCESS,        WCB$B_ACCESS:
0000000C  000B                  .BLKB   1
          000C          .IIF    NB,WCB$L_PID,   WCB$L_PID:
0000000E  000C                  .BLKB   2
          000E          .IIF    NB,WCB$W_REFCNT,        WCB$W_REFCNT:
00000010  000E                  .BLKW   1
```

```
                    0010                .IIF    NB,WCB$L_ORGUCB,        WCB$L_ORGUCB:
00000014            0010                        .BLKL   1
                    0014                .IIF    NB,WCB$W_ACON,  WCB$W_ACON:
00000016            0014                        .BLKW   1
                    0016                .IIF    NB,WCB$W_NMAP,  WCB$W_NMAP:
00000018            0016                        .BLKW   1
                    0018                .IIF    NB,WCB$L_FCB,   WCB$L_FCB:
0000001C            0018                        .BLKL   1
                    001C                .IIF    NB,WCB$L_RVT,   WCB$L_RVT:
00000020            001C                        .BLKL   1
                    0020                .IIF    NB,WCB$L_STVBN, WCB$L_STVBN:
00000024            0020                        .BLKL   1
                    0024                .IIF    NB,WCB$C_MAP,   WCB$C_MAP:
                    0024                .IIF    NB,WCB$K_MAP,   WCB$K_MAP:
                    0024                .IIF    NB,WCB$C_LENGTH,        WCB$C_LENGTH:
                    0024                .IIF    NB,WCB$K_LENGTH,        WCB$K_LENGTH:
                    0024                .IIF    NB,WCB$W_P1_COUNT,      WCB$W_P1_COUNT:
00000026            0024                        .BLKW   1
                    0026                .IIF    NB,WCB$L_P1_LBN,        WCB$L_P1_LBN:
0000002A            0026                        .BLKL   1
                    002A                .IIF    NB,WCB$W_P2_COUNT,      WCB$W_P2_COUNT:
0000002C            002A                        .BLKW   1
                    002C                .IIF    NB,WCB$L_P2_LBN,        WCB$L_P2_LBN:
00000030            002C                        .BLKL   1
00000000            0030                . = 0
                    0000                .IIF    NB,WCB$W_COUNT, WCB$W_COUNT:
00000002            0000                        .BLKW   1
                    0002                .IIF    NB,WCB$L_LBN,   WCB$L_LBN:
00000006            0002                        .BLKL   1
00000000            0006                . = 0
FFFFFFFA            0000                        .BLKB   -6
                    FFFA                .IIF    NB,WCB$W_PREVCOUNT,     WCB$W_PREVCOUNT:
FFFFFFFC            FFFA                        .BLKW   1
                    FFFC                .IIF    NB,WCB$L_PREVLBN,       WCB$L_PREVLBN:
00000000            FFFC                        .BLKL   1
                    0000                .RESTORE
```

```
00000000     64          .PSECT  SEP, SHR, EXE, WRT, LONG
    0000     65
```

```
                     0000     67          .SBTTL  APPLY ECC CORRECTION
                     0000     68 ;+
                     0000     69 ; IOC$APPLYECC - APPLY ECC CORRECTION
                     0000     70 ;
                     0000     71 ; THIS ROUTINE IS CALLED TO APPLY AN ECC CORRECTION TO DATA THAT HAS BEEN
                     0000     72 ; TRANSFERED INTO MEMORY FROM A DISK DEVICE.
                     0000     73 ;
                     0000     74 ; INPUTS:
                     0000     75 ;
                     0000     76 ;       R0 = NUMBER OF BYTES OF DATA THAT WERE TRANSFERED UP TO, BUT NOT
                     0000     77 ;            INCLUDING, BLOCK TO BE CORRECTED (MUST BE A MULTIPLE OF 512
                     0000     78 ;            BYTES).
                     0000     79 ;       R5 = DEVICE UNIT UCB ADDRESS.
                     0000     80 ;
                     0000     81 ;       UCB$W_BCNT(R5) = LENGTH OF TRANSFER IN BYTES.
                     0000     82 ;       UCB$W_EC1(R5) = STARTING BIT NUMBER OF ERROR BURST.
                     0000     83 ;       UCB$W_EC2(R5) = EXCLUSIVE OR CORRECTION PATTERN.
                     0000     84 ;       UCB$L_SVAPTE(R5) = SYSTEM VIRTUAL ADDRESS OF PAGE TABLE THAT MAPS
                     0000     85 ;            THE TRANSFER.
                     0000     86 ;
                     0000     87 ; OUTPUTS:
                     0000     88 ;
                     0000     89 ;       THE CORRECTION PATTERN IS EXCLUSIVE OR'ED WITH THE DATA IN MEMORY
                     0000     90 ;       PROVIDING THE NECESSARY CORRECTION.
                     0000     91 ;
                     0000     92 ;       R3 IS PRESERVED ACROSS CALL.
                     0000     93 ;-
                     0000     94
                     0000     95 IOC$APPLYECC::                               ;APPLY ECC CORRECTION
            18   BB  0000     96          PUSHR   #^M<R3,R4>                  ;SAVE REGISTERS
    52 0090 C5   3C  0002     97          MOVZWL  UCB$W_EC1(R5),R2            ;GET STARTING BIT NUMBER OF ERROR BURST
            52   D7  0007     98          DECL    R2                          ;CONVERT TO RELATIVE BIT NUMBER
 51  52   F8 8F   8B  0009     99          BICB3   #^XF8,R2,R1                 ;ISOLATE PATTERN SHIFT COUNT
        52   08   C6  000E    100          DIVL    #8,R2                       ;CALCULATE RELATIVE BYTE OFFSET IN BLOCK
        52   50   C0  0011    101          ADDL    R0,R2                       ;CALCULATE RELATIVE OFFSET IN BUFFER
    50  0092 C5   3C  0014    102          MOVZWL  UCB$W_EC2(R5),R0            ;GET EXCLUSIVE OR CORRECTION PATTERN
    50  50   51   78  0019    103          ASHL    R1,R0,R0                    ;SHIFT PATTERN TO PROPER POSITION
        54   03   D0  001D    104          MOVL    #3,R4                       ;SET LOOP COUNT
      6E A5  52   B1  0020    105 10$:     CMPW    R2,UCB$W_BCNT(R5)           ;BYTE OFFSET WITHIN RANGE?
             47   1E  0024    106          BGEQU   40$                         ;IF GEQU NO
      51   6C A5  3C  0026    107          MOVZWL  UCB$W_BOFF(R5),R1           ;GET BYTE OFFSET IN PAGE
        51   52   C0  002A    108          ADDL    R2,R1                       ;CALCULATE BYTE OFFSET OF TRANFER PTE
 51   51   F7 8F   78  002D    109          ASHL    #-VA$S_BYTE,R1,R1           ;CALCULATE LONGWORD OFFSET TO TRANSFER PTE
    53   68 B541  D0  0032    110          MOVL    @UCB$L_SVAPTE(R5)[R1],R3    ;GET TRANSFER PTE
             03   19  0037    111          BLSS    20$                         ;IF LSS VALID PTE
          FFC4'   30  0039    112          BSBW    IOC$PTETOPFN                ;CONVERT TO VALID PTE
 51   64 A5  04   C5  003C    113 20$:     MULL3   #4,UCB$L_SVPN(R5),R1        ;CALCULATE BYTE OFFSET TO SYSTEM PTE
        00   53   F0  0041    114          INSV    R3,#PTE$V_PFN,-             ;MOVE TRANSFER PTE INTO SYSTEM PAGE TABLE
00000000'FF41   15       0044    115                  #PTE$S_PFN,@MMG$GL_SPTBASE[R1]  ;
      51   51   07   78  004B    116          ASHL    #VA$S_BYTE-2,R1,R1          ;CONVERT SVPN TO SYSTEM VIRTUAL ADDRESS
        00 51   1F   E2  004F    117          BBSS    #VA$V_SYSTEM,R1,30$         ;SET SYSTEM VIRTUAL ADDRESS BIT
                     0053    118 30$:     INVALID R1                          ;INVALIDATE TRANSLATION BUFFER
        3A   51   DA  0053                   MTPR    R1,S^#PR$_TBIS
  53   52   6C A5  C1  0056    119          ADDL3   UCB$W_BOFF(R5),R2,R3        ;CALCULATE BYTE OFFSET IN BLOCK
51   09   00   53   F0  005B    120          INSV    R3,#VA$V_BYTE,#VA$S_BYTE,R1 ;INSERT BYTE OFFSET IN BLOCK
        61   50   8C  0060    121          XORB    R0,(R1)                     ;CORRECT MEMORY BYTE
  50   50   F8 8F   78  0063    122          ASHL    #-8,R0,R0                   ;SHIFT NEXT CORRECTION BYTE INTO PLACE
```

```
                52   D6  0068   123          INCL    R2                              ;UPDATE OFFSET IN BUFFER
             B3 54   F5  006A   124          SOBGTR  R4,10$                          ;ANY MORE CORRECTIONS TO MAKE?
                18   BA  006D   125 40$:      POPR    #^M<R3,R4>                      ;RESTORE REGISTERS
          5A A5 01   A8  006F   126          BISW    #UCB$M_ECC,UCB$W_DEVSTS(R5) ;SET ECC CORRECTION MADE
                05   0073   127          RSB                                     ;
```

```
                                0074   129          .SBTTL  CONVERT LOGICAL BLOCK TO PHYSICAL ADDRESS
                                0074   130 ;+
                                0074   131 ; IOC$CVTLOGPHY - CONVERT LOGICAL BLOCK TO PHYSICAL ADDRESS
                                0074   132 ;
                                0074   133 ; THIS ROUTINE IS CALLED TO CONDITIONALLY CONVERT A LOGICAL BLOCK NUMBER
                                0074   134 ; TO A PHYSICAL DISK ADDRESS AND STORE THE RESULT IN THE I/O PACKET.
                                0074   135 ;
                                0074   136 ; INPUTS:
                                0074   137 ;
                                0074   138 ;       R0 = LOGICAL BLOCK NUMBER TO BE CONVERTED.
                                0074   139 ;       R3 = I/O PACKET ADDRESS.
                                0074   140 ;       R5 = DEVICE UNIT UCB ADDRESS.
                                0074   141 ;
                                0074   142 ; OUTPUTS:
                                0074   143 ;
                                0074   144 ;       IF UCB$V_NOCNVRT IS CLEAR IN UCB$W_DEVSTS, THE LOGICAL BLOCK NUMBER
                                0074   145 ;       IS CONVERTED TO A PHYSICAL DISK ADDRESS USING THE DISK GEOMETRY PARA-
                                0074   146 ;       METERS IN THE UCB. THE RESULT IS STORED IN THE MEDIA ADDRESS LONGWORD
                                0074   147 ;       OF THE I/O PACKET.
                                0074   148 ;
                                0074   149 ;       IF UCB$V_NOCNVRT IS SET, THE BLOCK NUMBER IS STORED IN THE MEDIA ADDRESS
                                0074   150 ;       LONGWORD WITHOUT CONVERSION.
                                0074   151 ;
                                0074   152 ;       R3 IS PRESERVED ACROSS CALL.
                                0074   153 ;-
                                0074   154
                                0074   155 IOC$CVTLOGPHY::                            ;CONVERT LOGICAL BLOCK TO PHYSICAL ADDRESS
          34 A3    50    D0     0074   156          MOVL    R0,IRP$L_MEDIA(R3)       ;ASSUME NO CONVERSION
        1D 5A A5     02    E0  0078   157          BBS     #UCB$V_NOCNVRT,UCB$W_DEVSTS(R5),10$ ;BYPASS CONVERSION IF SET
          52    3C A5    9A     007D   158          MOVZBL  UCB$L_DEVDEPEND(R5),R2   ;GET NUMBER OF SECTORS PER TRACK
                   51    D4     0081   159          CLRL    R1                       ;CLEAR HIGH PART OF DIVIDEND
 34 A3    50    50    52    7B  0083   160          EDIV    R2,R0,R0,IRP$L_MEDIA(R3) ;CALCULATE SECTOR NUMBER AND STORE
          52    3D A5    9A     0089   161          MOVZBL  UCB$L_DEVDEPEND+1(R5),R2 ;GET NUMBER OF TRACKS PER CYLINDER
    51    50    50    52    7B  008D   162          EDIV    R2,R0,R0,R1              ;CALCULATE TRACK AND CYLINDER
          35 A3    51    90     0092   163          MOVB    R1,IRP$L_MEDIA+1(R3)     ;STORE TRACK NUMBER
          36 A3    50    B0     0096   164          MOVW    R0,IRP$L_MEDIA+2(R3)     ;STORE CYLINDER NUMBER
                         05     009A   165 10$:      RSB                              ;
```

```
                                009B    167          .SBTTL  MAP VIRTUAL TO LOGICAL BLOCK
                                009B    168 ;*
                                009B    169 ; IOC$MAPVBLK - MAP VIRTUAL TO LOGICAL BLOCK
                                009B    170 ;
                                009B    171 ; THIS ROUTINE IS CALLED TO MAP A VIRTUAL BLOCK TO A LOGICAL BLOCK USING A
                                009B    172 ; MAPPING WINDOW.
                                009B    173 ;
                                009B    174 ; INPUTS:
                                009B    175 ;
                                009B    176 ;       R0 = VIRTUAL BLOCK NUMBER.
                                009B    177 ;       R1 = NUMBER OF BYTES TO MAP.
                                009B    178 ;       R2 = ADDRESS OF WINDOW MAPPING BLOCK.
                                009B    179 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                                009B    180 ;
                                009B    181 ; OUTPUTS:
                                009B    182 ;
                                009B    183 ;       R0 LOW BIT CLEAR INDICATES A TOTAL MAPPING FAILURE.
                                009B    184 ;
                                009B    185 ;               R2 = NUMBER OF UNMAPPED BYTES.
                                009B    186 ;
                                009B    187 ;       R0 LOW BIT SET INDICATES PARTIAL MAP WITH:
                                009B    188 ;
                                009B    189 ;               R1 = LOGICAL BLOCK NUMBER OF FIRST BLOCK.
                                009B    190 ;               R2 = NUMBER OF UNMAPPED BYTES.
                                009B    191 ;               R5 = UCB ADDRESS OF DEVICE UNIT (POSSIBLY MODIFIED).
                                009B    192 ;
                                009B    193 ;       R3 IS PRESERVED ACROSS CALL.
                                009B    194 ;-
                                009B    195
                                009B    196 IOC$MAPVBLK::                               ;MAP VIRTUAL TO LOGICAL BLOCK
    12    0A A2    91         009B    197          CMPB    WCB$B_TYPE(R2),#DYN$C_WCB ;SEE IF THIS IS REALLY A WINDOW
             77    12         009F    198          BNEQ    110$                       ;IF NEQ NO
                              00A1    199 10$:     DSBINT  UCB$B_FIPL(R5)             ;SYNCHRONIZE ACCESS TO SYSTEM DATABASE
       7E    12    DB         00A1                 MFPR    S^#PR$_IPL,-(SP)
    12    0B A5    DA         00A4                 MTPR    UCB$B_FIPL(R5),S^#PR$_IPL
             1A    BB         00A8    200          PUSHR   #^M<R1,R3,R4>              ;SAVE REGISTERS
    53    16 A2    3C         00AA    201          MOVZWL  WCB$W_NMAP(R2),R3          ;GET COUNT OF RETRIEVAL POINTERS
             1B    13         00AE    202          BEQL    30$                        ;BRANCH IF EMPTY WINDOW
    54    20 A2    DE         00B0    203          MOVAL   WCB$L_STVBN(R2),R4         ;POINT TO STARTING VBN
       50    84    C2         00B4    204          SUBL    (R4)+,R0                   ;SUBTRACT STARTING VBN FROM DESIRED
 13 34 A5    05    E0         00B7    205          BBS     #DEV$V_SQD,UCB$L_DEVCHAR(R5),40$ ;IF SET, SEQUENTIAL DEVICE
             0D    1F         00BC    206          BLSSU   30$                        ;BRANCH IF VBN PRECEDES WINDOW
                              00BE    207
                              00BE    208 ;
                              00BE    209 ; SCAN THE WINDOW, SUBTRACTING THE COUNT FIELD OF EACH POINTER FROM THE
                              00BE    210 ; CURRENT RELATIVE BLOCK NUMBER.
                              00BE    211 ;
                              00BE    212
       51    84    3C         00BE    213 20$:     MOVZWL  (R4)+,R1                   ;GET COUNT FIELD OF RETRIEVAL POINTER
       50    51    C2         00C1    214          SUBL    R1,R0                      ;SUBTRACT FROM RELATIVE BLOCK NUMBER
             0E    1F         00C4    215          BLSSU   50$                        ;BRANCH IF VBN LOCATED IN THIS POINTER
             84    D5         00C6    216          TSTL    (R4)+                      ;SKIP LBN FIELD OF POINTER
       F3    53    F5         00C8    217          SOBGTR  R3,20$                     ;LOOP THRU WINDOW
             50    D4         00CB    218 30$:     CLRL    R0                         ;VBN IS BEYOND WINDOW
             43    11         00CD    219          BRB     100$                       ;RETURN FAILURE
                              00CF    220
                              00CF    221 ;
```

```
                                00CF   ; DEVICE IS A SEQUENTIAL DEVICE. FIRST MAPPING POINTER CONTAINS THE UCB ADDRESS
                                00CF   ; OF THE CURRENT VOLUME THAT IS BEING PROCESSED. ALL BYTES ALWAYS MAP.
                                00CF   ;
                                00CF
                55   64   D0    00CF   40$:    MOVL    (R4),R5                  ;GET CURRENT VOLUME UCB ADDRESS
                     35   11    00D2           BRB     80$                      ;
                                00D4
                                00D4   ;
                                00D4   ; FOUND THE RETRIEVAL POINTER CONTAINING THE STARTING VBN. R0 NOW
                                00D4   ; CONTAINS A NEGATIVE VALUE WHICH IS THE NUMBER OF BLOCKS BETWEEN
                                00D4   ; THE STARTING VBN AND THE END OF THE POINTER.
                                00D4   ;
                                00D4
                     50   DD    00D4   50$:    PUSHL   R0                       ;SAVE # BLOCKS MAPPED PAST START VBN
                51   84   C0    00D6           ADDL    (R4)+,R1                 ;FIRST LBN BEYOND THIS POINTER
                50   51   C0    00D9           ADDL    R1,R0                    ;COMPUTE STARTING LBN
                                00DC
                                00DC   ;
                                00DC   ; IF THE NEXT RETRIEVAL POINTER IS CONTIGUOUS WITH THE ONE FOUND, ADD
                                00DC   ; IN ITS COUNT TO HANDLE THE CASE WHERE A TRANSFER SPANS TWO POINTERS.
                                00DC   ; NOTE THAT THE GREATEST NUMBER OF CONTIGUOUS POINTERS A TRANSFER CAN
                                00DC   ; SPAN IS TWO.
                                00DC   ;
                                00DC
                     53   D7    00DC           DECL    R3                       ;SEE IF THERE IS ANOTHER POINTER
                     0B   15    00DE           BLEQ    60$                      ;BRANCH IF NONE
                53   84   3C    00E0           MOVZWL  (R4)+,R3                 ;GET COUNT OF NEXT RETRIEVAL POINTER
                64   51   D1    00E3           CMPL    R1,(R4)                  ;SEE IF THE NEXT POINTER IS CONTIGUOUS
                     03   12    00E6           BNEQ    60$                      ;BRANCH IF NOT
                6E   53   C2    00E8           SUBL    R3,(SP)                  ;ADD TO # BLOCKS MAPPED (NEGATIVE)
                                00EB
                                00EB   ;
                                00EB   ; EXTRACT THE LBN AND RVN COMPONENTS OF THE STARTING "LBN" AND SWITCH
                                00EB   ; TO THE RIGHT UCB IF THIS IS A MULTI-VOLUME SET.
                                00EB   ;
                                00EB
      51   50   18   00   EF    00EB   60$:    EXTZV   #0,#24,R0,R1             ;EXTRACT LBN PART
      50   50   08   18   EF    00F0           EXTZV   #24,#8,R0,R0             ;EXTRACT RVN
                     09   13    00F5           BEQL    70$                      ;BRANCH IF NOT VOLUME SET
           52   1C A2   D0    00F7           MOVL    WCB$L_RVT(R2),R2         ;GET RELATIVE VOLUME TABLE ADDR
      55   40 A240      D0    00FB           MOVL    RVT$L_UCBLST-4(R2)[R0],R5 ;GET THE RIGHT UCB ADDRESS
                                0100
                                0100   ;
                                0100   ; SEE IF THE ENTIRE TRANSFER IS MAPPED CONTIGUOUSLY.
                                0100   ;
                                0100
      6E   6E   09   78         0100   70$:    ASHL    #9,(SP),(SP)             ;CONVERT TO # BYTES MAPPED
           6E   8E   C0         0104           ADDL    (SP)+,(SP)               ;SUBTRACT FROM BYTES DESIRED
                     02   18    0107           BGEQ    90$                      ;BRANCH IF NOT TOTAL MAP
                     6E   D4    0109   80$:    CLRL    (SP)                     ;ZERO INDICATES COMPLETE MAP
      50   00000000'8F   D0    010B   90$:    MOVL    #SS$_NORMAL,R0           ;INDICATE SUCCESS
                     1C   BA    0112   100$:   POPR    #^M<R2,R3,R4>            ;RESTORE REGISTERS
                                0114           ENBINT                           ;ALLOW INTERRUPTS
           12   8E   DA         0114                   MTPR    (SP)+,S^#PR$_IPL
                     05         0117           RSB                              ;
                                0118   110$:   BUG_CHECK STRNOTWCB,FATAL        ;STRUCTURE IS NOT A WINDOW BLOCK
      00000000'9F   16         0118           JSB     @#BUG$CHECK
```

```
46 2C 42 43 57 54 4F 4E 52 54 53 00' 011E              .ASCIC  "STRNOTWCB,FATAL"
                        4C 41 54 41  012A
                              0F     011E
```

```
                        012E    278          .SBTTL  UPDATE TRANSFER PARAMETERS
                        012E    279 ;+
                        012E    280 ; IOC$UPDATRANSP - UPDATE TRANSFER PARAMETERS
                        012E    281 ;
                        012E    282 ; THIS ROUTINE IS CALLED TO UPDATE THE TRANSFER PARAMETERS AFTER A DISK ERROR
                        012E    283 ; HAS BEEN DISCOVERED BUT GOOD DATA WAS TRANSFERED.
                        012E    284 ;
                        012E    285 ; INPUTS:
                        012E    286 ;
                        012E    287 ;       R0 = NUMBER OF BYTES OF DATA THAT WERE TRANSFERED (MUST BE A MULTIPLE
                        012E    288 ;            OF 512 BYTES).
                        012E    289 ;       R5 = DEVICE UNIT UCB ADDRESS.
                        012E    290 ;
                        012E    291 ;       UCB$W_BCNT(R5) = LENGTH OF TRANSFER IN BYTES.
                        012E    292 ;       UCB$W_DA(R5) = CURRENT SECTOR AND TRACK ADDRESS.
                        012E    293 ;       UCB$W_DC(R5) = CURRENT CYLINDER ADDRESS.
                        012E    294 ;       UCB$L_SVAPTE(R5) = SYSTEM VIRTUAL ADDRESS OF PAGE TABLE THAT MAPS
                        012E    295 ;            THE TRANSFER.
                        012E    296 ;
                        012E    297 ; OUTPUTS:
                        012E    298 ;
                        012E    299 ;       THE NUMBER OF BYTES REMAINING TO BE TRANSFERED, THE SYSTEM VIRTUAL
                        012E    300 ;       ADDRESS OF THE NEXT PTE, AND THE CURRENT DISK ADDRESS OF THE TRANSFER
                        012E    301 ;       ARE UPDATED.
                        012E    302 ;
                        012E    303 ;       R3 IS PRESERVED ACROSS CALL.
                        012E    304 ;-
                        012E    305
                        012E    306 IOC$UPDATRANSP::                            ;UPDATE TRANSFER PARAMETERS
      6E A5   50   A2   012E    307          SUBW    R0,UCB$W_BCNT(R5)          ;CALCULATE REMAINING BYTES TO TRANSFER
50    50   F9 8F   78   0132    308          ASHL    #-7,R0,R0                  ;CALCULATE PTE LONGWORDS TO SKIP OVER
      68 A5   50   C0   0137    309          ADDL    R0,UCB$L_SVAPTE(R5)        ;UPDATE SYSTEM VIRTUAL ADDRESS OF NEXT PTE
         50   04   C6   013B    310          DIVL    #4,R0                      ;CALCULATE NUMBER OF SECTORS TRANSFERED
   008C C5   50   80   013E    311          ADDB    R0,UCB$W_DA(R5)            ;UPDATE SECTOR ADDRESS
                        0143    312
                        0143    313 ;
                        0143    314 ; RIPPLE CARRY FROM SECTOR TO TRACK AND FROM TRACK TO CYLINDER
                        0143    315 ;
                        0143    316
008C C5   3C A5   91    0143    317 10$:     CMPB    UCB$L_DEVDEPEND(R5),UCB$W_DA(R5) ;SECTOR OVERFLOW?
          1E      1A    0149    318          BGTRU   20$                        ;IF GTRU NO
008C C5   3C A5   82    014B    319          SUBB    UCB$L_DEVDEPEND(R5),UCB$W_DA(R5) ;SUBTRACT OUT A TRACK
       008D C5   96    0151    320          INCB    UCB$W_DA+1(R5)             ;INCREMENT TRACK ADDRESS
008D C5   3D A5   91    0155    321          CMPB    UCB$L_DEVDEPEND+1(R5),UCB$W_DA+1(R5) ;TRACK OVERFLOW?
          E6      1A    015B    322          BGTRU   10$                        ;IF GTRU NO
008D C5   3D A5   82    015D    323          SUBB    UCB$L_DEVDEPEND+1(R5),UCB$W_DA+1(R5) ;SUBTRACT OUT A CYLINDER
       008E C5   B6    0163    324          INCW    UCB$W_DC(R5)               ;UPDATE CYLINDER ADDRESS
          DA      11    0167    325          BRB     10$                        ;
                  05    0169    326 20$:     RSB                                ;
```

```
                        016A   328          .SBTTL  SENSE DISK'S SIZE FDT ROUTINE
                        016A   329 ;*
                        016A   330 ; IOC$SENSEDISK - SENSE DISK'S SIZE FDT ROUTINE
                        016A   331 ;
                        016A   332 ; THIS ROUTINE IS THE STANDARD SENSEMODE/SENSECHAR FDT ROUTINE FOR
                        016A   333 ; DISK DEVICES.  IT OBTAINS THE DISK'S SIZE, IN LOGICAL BLOCKS, FROM THE
                        016A   334 ; UCB (UCB$L_MAXBLOCK) AND IMMEDIATELY COMPLETES THE I/O REQUEST WITH
                        016A   335 ; THE SECOND LONGWORD OF THE FINAL I/O STATUS EQUAL TO THE DISK'S SIZE.
                        016A   336 ;
                        016A   337 ; INPUTS:
                        016A   338 ;
                        016A   339 ;       R0 = SCRATCH.
                        016A   340 ;       R1 = SCRATCH.
                        016A   341 ;       R2 = SCRATCH.
                        016A   342 ;       R3 = ADDRESS OF I/O REQUEST PACKET.
                        016A   343 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                        016A   344 ;       R5 = ASSIGNED DEVICE UCB ADDRESS.
                        016A   345 ;       R6 = ADDRESS OF CCB.
                        016A   346 ;       R7 = I/O FUNCTION CODE BIT NUMBER.
                        016A   347 ;       R8 = FUNCTION DECISION TABLE DISPATCH ADDRESS.
                        016A   348 ;       R9 = SCRATCH.
                        016A   349 ;       R10 = SCRATCH.
                        016A   350 ;       R11 = SCRATCH.
                        016A   351 ;       AP = ADDRESS OF FIRST FUNCTION DEPENDENT PARAMETER.
                        016A   352 ;
                        016A   353 ; OUTPUTS:
                        016A   354 ;
                        016A   355 ;       THE DISK'S SIZE, IN LOGICAL BLOCKS, IS OBTAINED FROM THE UCB
                        016A   356 ;       AND THE I/O IS COMPLETED WITH THE SECOND I/O STATUS LONGWORD
                        016A   357 ;       EQUAL TO THE DISK'S SIZE.
                        016A   358 ;-
                        016A   359
                        016A   360 IOC$SENSEDISK::                              ;SENSE DISK'S SIZE
51   0084 C5   D0       016A   361          MOVL    UCB$L_MAXBLOCK(R5),R1      ;GET DISK'S SIZE IN LOGICAL BLOCKS
50     00'     3C       016F   362          MOVZWL  S^#SS$_NORMAL,R0           ;SET NORMAL COMPLETION STATUS
   FE8B'       31       0172   363          BRW     EXE$FINISHIO               ;FINISH I/O OPERATION
                        0175   364
                        0175   365          .END
```

```
BUG$CHECK           ********   X   02
DEV$V_SQD         = 00000005     D
DYN$C_WCB         = 00000012     D
EXE$FINISHIO        ********   X   02
IOC$APPLYECC        00000000 RG  D  02
IOC$CVTLOGPHY       00000074 RG  D  02
IOC$MAPVBLK         0000009B RG  D  02
IOC$PTETOPFN        ********   X   02
IOC$SENSEDISK       0000016A RG  D  02
IOC$UPDATRANSP      0000012E RG  D  02
IRP$B_CARCON        00000038     D
IRP$B_EFN           00000022     D
IRP$B_PRI           00000023     D
IRP$B_RMOD          0000000B     D
IRP$B_TYPE          0000000A     D
IRP$C_LENGTH        0000005C     D
IRP$K_LENGTH        0000005C     D
IRP$L_ARB           00000050     D
IRP$L_AST           00000010     D
IRP$L_ASTPRM        00000014     D
IRP$L_DIAGBUF       00000044     D
IRP$L_EXTEND        0000004C     D
IRP$L_IOQBL         00000004     D
IRP$L_IOQFL         00000000     D
IRP$L_IOSB          00000024     D
IRP$L_IOST1         00000034     D
IRP$L_IOST2         00000038     D
IRP$L_MEDIA         00000034     D
IRP$L_PID           0000000C     D
IRP$L_SEGVBN        00000040     D
IRP$L_SEQNUM        00000048     D
IRP$L_SVAPTE        0000002C     D
IRP$L_TT_TERM       00000038     D
IRP$L_UCB           0000001C     D
IRP$L_WIND          00000018     D
IRP$Q_NT_PRVMSK     0000003C     D
IRP$W_ABCNT         0000003C     D
IRP$W_BCNT          00000032     D
IRP$W_BOFF          00000030     D
IRP$W_CHAN          00000028     D
IRP$W_FUNC          00000020     D
IRP$W_OBCNT         0000003E     D
IRP$W_SIZE          00000008     D
IRP$W_STS           0000002A     D
IRP$W_TT_PRMPT      0000003C     D
MMG$GL_SPTBASE      ********   X   02
PR$_IPL           = 00000012     D
PR$_TBIS          = 0000003A     D
PTE$S_PFN         = 00000015     D
PTE$V_PFN         = 00000000     D
RVT$L_UCBLST      = 00000044     D
SIZ...            = 00000001     D
SS$_NORMAL          ********   X   02
UCB$B_AMOD          00000053     D
UCB$B_CEX           00000077     D
UCB$B_CM1           0000004A     D
UCB$B_CM2           0000004B     D
UCB$B_DEVCLASS      00000038     D
UCB$B_DEVTYPE       00000039     D
UCB$B_DIPL          00000052     D
UCB$B_DX_SCTCNT     000000A6     D
UCB$B_ERTCNT        00000070     D
UCB$B_ERTMAX        00000071     D
UCB$B_FEX           00000076     D
UCB$B_FIPL          0000000B     D
UCB$B_LOCSRV        0000003C     D
UCB$B_OFFNDX        00000094     D
UCB$B_OFFRTC        00000095     D
UCB$B_REMSRV        0000003D     D
UCB$B_SECTORS       0000003C     D
UCB$B_SLAVE         00000074     D
UCB$B_SPR           00000075     D
UCB$B_STATE         00000052     D
UCB$B_TRACKS        0000003D     D
UCB$B_TT_CRFILL     0000009D     D
UCB$B_TT_DECRF      000000A1     D
UCB$B_TT_DELFF      000000A2     D
UCB$B_TT_DESPEE     000000A0     D
UCB$B_TT_DETYPE     000000A4     D
UCB$B_TT_LFFILL     0000009E     D
UCB$B_TT_SPEED      0000009C     D
UCB$B_TYPE          0000000A     D
UCB$B_VERTSZ        0000003F     D
UCB$C_LENGTH        00000074     D
UCB$C_MB_LENGTH     00000090     D
UCB$C_TT_LENGTH     000000BC     D
UCB$K_LENGTH        00000074     D
UCB$K_MB_LENGTH     00000090     D
UCB$K_TT_LENGTH     000000BC     D
UCB$L_AMB           00000054     D
UCB$L_ASTQBL        00000010     D
UCB$L_ASTQFL        0000000C     D
UCB$L_CPID          0000005C     D
UCB$L_CRB           00000020     D
UCB$L_DDB           00000024     D
UCB$L_DEVCHAR       00000034     D
UCB$L_DEVDEPEND     0000003C     D
UCB$L_DPC           00000080     D
UCB$L_DUETIM        0000005C     D
UCB$L_DX_BFPNT      0000009C     D
UCB$L_DX_BUF        00000098     D
UCB$L_DX_RXDB       000000A0     D
UCB$L_EMB           00000078     D
UCB$L_FIRST         00000014     D
UCB$L_FPC           0000000C     D
UCB$L_FQBL          00000004     D
UCB$L_FQFL          00000000     D
UCB$L_FR3           00000010     D
UCB$L_FR4           00000014     D
UCB$L_IOQBL         00000044     D
UCB$L_IOQFL         00000040     D
UCB$L_IRP           0000004C     D
UCB$L_LINK          0000002C     D
UCB$L_LOGADR        00000064     D
UCB$L_MAXBLOCK      00000084     D
UCB$L_MB_MBX        0000007C     D
UCB$L_MB_PORT       0000008C     D
UCB$L_MB_RAST       00000078     D
UCB$L_MB_SHB        00000080     D
UCB$L_MB_WAST       00000074     D
UCB$L_MB_WIOQBL     00000088     D
UCB$L_MB_WIOQFL     00000084     D
UCB$L_MEDIA         0000008C     D
UCB$L_NT_DATSSB     00000074     D
UCB$L_NT_INTSSB     00000078     D
UCB$L_OPCNT         00000060     D
UCB$L_OWNUIC        0000001C     D
UCB$L_PID           00000028     D
UCB$L_RQBL          00000004     D
UCB$L_RQFL          00000000     D
UCB$L_SVAPTE        00000068     D
UCB$L_SVPN          00000064     D
UCB$L_TT_DECHAR     000000A8     D
UCB$L_TT_RDUE       0000008C     D
UCB$L_TT_RTIMOU     000000B8     D
UCB$L_VCB           00000030     D
UCB$M_ECC         = 00000001     D
UCB$T_PARTNER       0000000C     D
UCB$V_NOCNVRT     = 00000002     D
UCB$W_BCNT          0000006E     D
UCB$W_BCR           00000096     D
UCB$W_BOFF          0000006C     D
UCB$W_BUFQUO        00000018     D
UCB$W_BYTESTOGO     0000003E     D
UCB$W_CHARGE        0000004A     D
UCB$W_CYLINDERS     0000003E     D
UCB$W_DA            0000008C     D
UCB$W_DC            0000008E     D
UCB$W_DEVBUFSIZ     0000003A     D
UCB$W_DEVSTS        0000005A     D
UCB$W_DIRSEQ        00000088     D
UCB$W_DSTADDR       00000018     D
UCB$W_DX_BCR        000000A4     D
UCB$W_EC1           00000090     D
UCB$W_EC2           00000092     D
UCB$W_ERRCNT        00000072     D
UCB$W_FUNC          0000007E     D
UCB$W_MB_SEED       00000000     D
UCB$W_MSGCNT        00000016     D
UCB$W_MSGMAX        00000014     D
UCB$W_NT_CHAN       0000007C     D
UCB$W_OFFSET        0000008A     D
UCB$W_REFC          00000050     D
UCB$W_SIZE          00000008     D
UCB$W_SRCADDR       0000001A     D
UCB$W_STS           00000058     D
UCB$W_TT_DESIZE     000000A5     D
UCB$W_UNIT          00000048     D
UCB$W_VPROT         0000001A     D
VA$S_BYTE         = 00000009     D
VA$V_BYTE         = 00000000     D
```

```
VA$V_SYSTEM     = 0000001F     D
WCB$B_ACCESS      0000000B     D
WCB$B_TYPE        0000000A     D
WCB$C_LENGTH      00000024     D
WCB$C_MAP         00000024     D
WCB$K_LENGTH      00000024     D
WCB$K_MAP         00000024     D
WCB$L_FCB         00000018     D
WCB$L_LBN         00000002     D
WCB$L_ORGUCB      00000010     D
WCB$L_P1_LBN      00000026     D
WCB$L_P2_LBN      0000002C     D
WCB$L_PID         0000000C     D
WCB$L_PREVLBN     FFFFFFFC     D
WCB$L_RVT         0000001C     D
WCB$L_STVBN       00000020     D
WCB$L_WLBL        00000004     D
WCB$L_WLFL        00000000     D
WCB$W_ACON        00000014     D
WCB$W_COUNT       00000000     D
WCB$W_NMAP        00000016     D
WCB$W_P1_COUNT    00000024     D
WCB$W_P2_COUNT    0000002A     D
WCB$W_PREVCOUNT   FFFFFFFA     D
WCB$W_REFCNT      0000000E     D
WCB$W_SIZE        00000008     D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	FFFFFFFC (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
SEP	00000175 (373.)	02 (2.)	NOPIC USR CON REL LCL SHR EXE RD WRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
BUG$CHECK	00000000-XR		276 (1)
DEV$V_SQD	=00000005		#-205 (1)
DYN$C_WCB	=00000012		#-197 (1)
EXE$FINISHIO	00000000-XR		#-363 (1)
IOC$APPLYECC	00000000-R	95 (1)	
IOC$CVTLOGPHY	00000074-R	155 (1)	
IOC$MAPVBLK	0000009B-R	196 (1)	
IOC$PTETOPFN	00000000-XR		#-112 (1)
IOC$SENSEDISK	0000016A-R	360 (1)	
IOC$UPDATRANSP	0000012E-R	306 (1)	
IRP$L_MEDIA	00000034		#-156 (1) #-160 (1) #-163 (1) #-164 (1)
MMG$GL_SPTBASE	00000000-XR		115 (1)
PR$_IPL	=00000012		#-199 (1) #-274 (1)
PR$_TBIS	=0000003A		#-118 (1)
PTE$S_PFN	=00000015		#-115 (1)
PTE$V_PFN	=00000000		#-114 (1)
RVT$L_UCBLST	=00000044		#-262 (1)
SS$_NORMAL	00000000-XR		#-272 (1) #-362 (1)
UCB$B_FIPL	0000000B		#-199 (1)
UCB$L_DEVCHAR	00000034		205 (1)
UCB$L_DEVDEPEND	0000003C		#-158 (1) #-161 (1) #-317 (1) #-319 (1) #-321 (1)
			#-323 (1)
UCB$L_MAXBLOCK	00000084		#-361 (1)
UCB$L_SVAPTE	00000068		#-110 (1) #-309 (1)
UCB$L_SVPN	00000064		#-113 (1)
UCB$M_ECC	=00000001		#-126 (1)
UCB$V_NOCNVRT	=00000002		#-157 (1)
UCB$W_BCNT	0000006E		#-105 (1) #-307 (1)
UCB$W_BOFF	0000006C		#-107 (1) #-119 (1)
UCB$W_DA	0000008C		#-311 (1) #-317 (1) #-319 (1) #-320 (1) #-321 (1)
			#-323 (1)
UCB$W_DC	0000008E		#-324 (1)
UCB$W_DEVSTS	0000005A		#-126 (1) 157 (1)
UCB$W_EC1	00000090		#-97 (1)
UCB$W_EC2	00000092		#-102 (1)
VA$S_BYTE	=00000009		#-109 (1) #-116 (1) #-120 (1)
VA$V_BYTE	=00000000		#-120 (1)
VA$V_SYSTEM	=0000001F		#-117 (1)
WCB$B_TYPE	0000000A		#-197 (1)
WCB$L_RVT	0000001C		#-261 (1)
WCB$L_STVBN	00000020		203 (1)
WCB$W_NMAP	00000016		#-201 (1)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	40	00:00:00.03	00:00:00.22
Command processing	930	00:00:00.29	00:00:01.66
Pass 1	532	00:00:02.09	00:00:03.99
Symbol table sort	0	00:00:00.14	00:00:00.14
Pass 2	19	00:00:00.54	00:00:01.13
Symbol table output	2	00:00:00.02	00:00:00.06
Psect synopsis output	0	00:00:00.01	00:00:00.00
Cross-reference output	2	00:00:00.02	00:00:00.06
Assembler run totals	1527	00:00:03.14	00:00:07.28

The working set limit was 2900 pages.
138352 bytes (271 pages) of virtual memory were used to buffer the intermediate code.
There were 40 pages of symbol table space allocated to hold 608 non-local and 18 local symbols.
365 source lines were read in Pass 1, producing 44 object records in Pass 2.
24 pages of virtual memory were used to define 23 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	6
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	6
SYS$COMMON:[SYSLIB]STARLET.MLB;2	6
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	19

902 GETS were required to define 19 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 711 Libraries and Macros ;G:41
(1) 790 Equated Symbols
(1) 848 Data Psect Declarations
(1) 871 Work Psect Declarations
(1) 1046 GLOBAL PSECT DECLARATIONS FOR VSDP ;G:28
(1) 1069 Data Psect Declarations
(5) 1091 DIAGNOSTIC SUPERVISOR BOOTSTRAP ROUTINE.
(5) 1350 USEP KERNEL ROUTINE
(5) 1596 COMMON KERNEL REFRESH ENTRY POINT.
(6) 1824 INIT_CONTEXT Initialize process context
(6) 1950 CONTROL-C AST HANDLER
(6) 1997 KEYBOARD CHECK ROUTINE
(6) 2200 GET_TIME Convert TODR to current system time ;G:16
(6) 2310 DSX$CNTRLC Program enable for Control-C intercept
(6) 2360 DSV$EXIT, Process EXIT command
(6) 2435 EXIT$HANDLR Process EXIT handler
(6) 2501 DSR$Check_MenuTest_Off_Set Routine
(6) 2581 DSR$Check_AutoTest_Off_Set Routine
(8) 2655 DSX$GETTERM Get User Terminal Characteristics [87]

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element KERNEL.MAR
0000     2 ;  42    7-MAR-1988 09:21:56 FORTUNA "Deleted CRD init code from boot code and add c
0000     3 ; *41   19-JAN-1988 11:11:10 MEIER "Fixed st/time, ^C, continue scenario"
0000     4 ; *40    9-DEC-1987 10:10:07 BARANSKI "merging 37a1"
0000     5 ; *39    9-DEC-1987 09:25:17 BARANSKI "merging 37B1"
0000     6 ; *38   11-NOV-1987 08:59:20 GEARIN "ADD CODE TO remember SCORPIO CONSOLE LOAD PATH"
0000     7 ;  37B1 27-AUG-1987 10:05:53 MEIER "CHANGES TO DS"
0000     8 ;  37A1 27-AUG-1987 07:40:04 GEARIN "ALLOW VDS TO remember CONSOLE LOAD DISK # FOR S
0000     9 ; *37   10-AUG-1987 17:15:34 BARANSKI "Merging Gen:35A1 and Gen:36 to Gen:37"
0000    10 ;  35A1 10-AUG-1987 15:05:36 GEARIN "SAVED R3 UPON BOOTING IF BOOTED ON 8200 [R3 HAS
0000    11 ; *36   27-JUL-1987 08:46:52 MEIER "CHANGED A SYMBOL"
0000    12 ; *35    1-MAY-1987 11:01:06 MEIER "REMOVED REFERENCES TO LLL PRODUCT NAME"
0000    13 ; *34   29-APR-1987 16:02:29 MARTIN "MODIFIED FOR PSTAR"
0000    14 ; *33   26-JAN-1987 15:21:13 MARTIN "FIXED THE VDS HEADER"
0000    15 ; *32   26-JAN-1987 14:04:30 MEIER "CALYPSO FIX DONE"
0000    16 ; *31   24-DEC-1986 10:01:16 MUSE "RECOMPILE"
0000    17 ; *30   22-DEC-1986 13:51:05 MARTIN "NO CHANGES"
0000    18 ; *29   10-DEC-1986 15:50:16 MARTIN "LINED UP DISPLAY OF LEGAL STATEMENT"
0000    19 ; *28    5-DEC-1986 10:01:00 BARANSKI "Delete MUSE changes, Add SILVER changes."
0000    20 ; *27   22-OCT-1986 09:14:57 MUSE "CAPTURE THE AN RPB VALUE ON BOOT FOR PABTDRIVR"
0000    21 ; *26   20-JUN-1986 12:55:18 SALEM "DONE"
0000    22 ; *25   19-JUN-1986 12:48:50 SALEM "<no reason given>"
0000    23 ; *24   18-JUN-1986 14:51:27 SALEM "DONE"
0000    24 ; *23   18-JUN-1986 14:07:13 SALEM "DONE"
0000    25 ; *22    5-JUN-1986 14:17:07 BAGGETT "<no reason given>"
0000    26 ; *21    5-JUN-1986 13:49:45 BAGGETT "<no reason given>"
0000    27 ; *20    5-JUN-1986 13:41:21 BAGGETT "<no reason given>"
0000    28 ; *19    5-JUN-1986 12:20:31 ANDELLA "<no reason given>"
0000    29 ; *18    2-JUN-1986 10:15:04 BAGGETT "FINISHED"
0000    30 ; *17   28-MAY-1986 13:30:49 BERGAZZI "/TIME CHANGE"
0000    31 ; *16   20-MAY-1986 10:25:24 BERGAZZI "/TIME"
0000    32 ; *15   14-MAY-1986 16:07:40 SALEM "DONE WITH SYSTYPE CHECK"
0000    33 ; *14   28-APR-1986 14:59:47 SHELHAMER "<no reason given>"
0000    34 ; *13   25-APR-1986 13:34:50 SHELHAMER "<no reason given>"
0000    35 ; *12   23-APR-1986 11:41:34 SHELHAMER "<no reason given>"
0000    36 ; *11   23-APR-1986 10:51:07 SHELHAMER "<no reason given>"
0000    37 ; *10   18-APR-1986 15:41:18 SHELHAMER "<no reason given>"
0000    38 ; *9    16-APR-1986 14:53:41 SHELHAMER "<no reason given>"
0000    39 ; *8    15-APR-1986 12:46:20 SHELHAMER "<no reason given>"
0000    40 ; *7    10-APR-1986 16:57:49 SHELHAMER "<no reason given>"
0000    41 ; *6    20-MAR-1986 09:39:41 MUSE "<no reason given>"
0000    42 ; *5    10-MAR-1986 17:08:45 SHELHAMER "<no reason given>"
0000    43 ; *4    10-MAR-1986 16:50:33 SHELHAMER "<no reason given>"
0000    44 ; *3    10-MAR-1986 10:56:17 SHELHAMER "<no reason given>"
0000    45 ; *2    12-FEB-1986 09:22:13 BERGAZZI "REMOVAL OF LIB$GET_FOREIGN CALL"
0000    46 ; *1     6-FEB-1986 15:19:09 DS ""
0000    47 ; DEC/CMS REPLACEMENT HISTORY, Element KERNEL.MAR
0000    48         .Title  KERNEL  *** KERNEL Main control routine
0000    49         .Ident  "10.10-41"                                              ;G:35A
0000    50         .NoShow Conditionals
0000    51
0000    52 ;++
0000    53 ; Copyright (c) 1977, 1983, 1984, 1985, 1986, 1987, 1988                ;G:41
0000    54 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    55 ;
0000    56 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
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```

```
0000     72 ;**
0000     73 ; Facility:
0000     74 ;
0000     75 ;       VAX Diagnostic Supervisor.
0000     76 ;
0000     77 ; Abstract:
0000     78 ;
0000     79 ;       This module contains the main control routines for the VAX
0000     80 ;       Diagnostic Supervisor.
0000     81 ;
0000     82 ; Environment:
0000     83 ;
0000     84 ;       Not applicable.
0000     85 ;
0000     86 ; Author:
0000     87 ;
0000     88 ;       Ken Chapman
0000     89 ;
0000     90 ; Date:
0000     91 ;
0000     92 ;       26-Oct-77
0000     93 ;
0000     94 ; Version:
0000     95 ;
0000     96 ;       Version 01.
0000     97 ;
```

```
                        ;
                        ; Modified By:
                        ;       01      - Nick Howgate, 15-nov-1977, Version 02.
                        ;               APT INTERFACE UPDATES.
                        ;
                        ;       02      - Tom Soutter, 21-nov-1977, Version 03.
                        ;               DSPR #14  DEFAULT FLAG SETTING.
                        ;
                        ;       03      - Ken Chapman, 06-dec-1977, Version 04.
                        ;               REMOVED MEMORY MAPS.
                        ;
                        ;       04      - Ken Chapman, 06-dec-1977, Version 04.
                        ;               DSPR #3  MODIFIED ^C BREAK TO CLI.
                        ;
                        ;       05      - Nick Howgate, 19-dec-1977, Version 05.
                        ;               MADE AX_BUFF, USTKPTR, SSTKPTR, ESTKPTR GLOBAL FOR MEMMGT.
                        ;
                        ;       06      - Nick Howgate, 19-dec-1977, Version 05.
                        ;               MADE ALL STACKS 2 PAGES.
                        ;
                        ;       07      - Nick Howgate, 30-Dec-1977, Version 06 (ESSAA-3.06).
                        ;               DELETE SYMBOL DS$GL_PASSES
                        ;
                        ;       08      - Nick Howgate, 06-Feb-1978, Version 07 (ESSAA-4.00).
                        ;               INCLUDE QIO SUPPORT
                        ;
                        ;               - Tom Soutter, 03-Mar-1978
                        ;       09      ADDED SOFTWARE PCB FOR AST HANDLING
                        ;       10      FIXED SOME BUGS IN PCB SETUP CODE
                        ;       11      DEFINED DIAGNOSTIC PID, SET UP SAME IN SOFTWARE PCB
                        ;
                        ;       12      - Ken Chapman, 23-Mar-1978, Version 08 (ESSAA-4.01).
                        ;               ADDED BUFFER INIT CODE.
                        ;               REMOVED MOVCS AND LDPCTX INSTRUCTIONS.
                        ;
                        ;               - Tom Soutter, 30-Mar-1978
                        ;       13      ADDED CODE TO INITIALIZE THE SYSTEM TIMER
                        ;       14      REMOVED STACK BUFFER PAGES, REDUCED USER STACK TO ONE
                        ;               PAGE AND OVER-MAPPED THE SUPERVISOR & EXECUTIVE STACKS
                        ;               ONTO THE USER STACK
                        ;
                        ;       15      - Nick Howgate, 18-May-1978, Version 09 (ESSAA-4.02).
                        ;               PLACE IPL LEVEL AT 1F AT SYSTEM START UP
                        ;               LOWER IPL LEVEL ONLY AFTER SOFTWARE INITIALIZATION
                        ;
                        ;       16      - Nick Howgate, 09-Jun-1978, Version 10 (ESSAA-4.03).
                        ;               FIX APT ^C PROBLEM
                        ;
                        ;       17      - Nick Howgate, 14-Jun-1978
                        ;               CLEAR EVENTS FLAGS AT SUPERVISOR START
```

```
0000   ;                 - Roger Riggs, 10-Aug-1978
0000   ;        18       Revised basic program loop
0000   ;        19       Fix for changed position of year in DS$GT_NEWYEAR
0000   ;                 Added separate allocations for USER, EXEC, and SUPER stacks
0000   ;        20       Added call to INI$PTABLE to initialize P-table list at
0000   ;                 supervisor start.
0000   ;        21       Added code to Auto configure/ATTACH the default load device
0000   ;                 when loaded with DIAGBOOT.
0000   ;        22       Added process exit handler to execute use cleanup and
0000   ;                 deallocate device allocated by select.
0000   ;
0000   ;        23       - Roger Riggs, 31-Aug-1979
0000   ;                 Added initial VDT breakpoint and saved VMB boot flags
0000   ;
0000   ;        24       - Roger Riggs, 21-Jan-1980, Version 5.2
0000   ;                 Added code to always prompt APT on start, also copy
0000   ;                 processor type code to EXE$GB_CPUTYPE
0000   ;
0000   ;        25       - David R. Butenhof, 06-feb-1980
0000   ;                 Routine INIT_CONTEXT should force AST delivery enable.
0000   ;
0000   ;        26       - John Ciukaj, 25-Jan-1980, Version 5.2
0000   ;                 Added location BOOT$L_DEVTYP to be loaded from RPB$B_DEVTYP.
0000   ;
0000   ;        27       - Roger Riggs, 12-Mar-1980
0000   ;                 Clear DS$GB_MM_ENB on START 10000, as well as memory managment
0000   ;
0000   ;                 - Roger Riggs, 24-Mar-1980
0000   ;        28       Added code to verify that system identification register
0000   ;                 agrees with current supervisor.
0000   ;        29       Added code to type message and exit if SYS$INPUT is not
0000   ;                 a terminal or a mailbox.  Fix for SPR#11-28511.
0000   ;                 Later fix will use RMS for SYS$INPUT I/O in usermode.
0000   ;
0000   ;                 - Dave Butenhof, -Mar-1980
0000   ;        30       Add RMS setup in usermode, to allow supervisor execution
0000   ;                 via VMS command file/batch.
0000   ;        31       Fix CTL$GL_CCBBASE label define to point to a pointer
0000   ;                 longword.  And fix order of arguments to PRINT on SID
0000   ;                 mis-match.
0000   ;
0000   ;        32       - Roger Riggs, 21-May-1980, Version 5.4
0000   ;                 Changed order of stacks to allow for memory protection
0000   ;                 when MM is on
```

```
                        0000   195 ;                - Roger Riggs, 19-Jun-1980, Version 6.0
                        0000   196 ;          33    Moved IOC$GL_PSFL/BL to Entry
                        0000   197 ;          34    Added JIB
                        0000   198 ;
                        0000   199 ;          35    - Dave Butenhof, 28-aug-1980, Version 6.0
                        0000   200 ;                Add call to RMS$INIT in standalone initialization to
                        0000   201 ;                clear RMS file table.
                        0000   202 ;
                        0000   203 ;                - Roger Riggs, 08-Sept-1980, Version 6.0
                        0000   204 ;          36    Added code to set and restore on exit the default directory
                        0000   205 ;                and disk.
                        0000   206 ;          37    Move translation of load device name to DEF$Q_DEV on
                        0000   207 ;                usemode entry
```

```
                        0000    209 ;
                        0000    210 ;       38      - Roger Riggs, 17-Oct-1980
                        0000    211 ;               Made reference to EXE$GQ_SYSTIME LA offset.
                        0000    212 ;
                        0000    213 ;               - Dave Butenhof, 17-oct-1980, version 6.1
                        0000    214 ;       39      Add new argument to DSX$CNTRLC; DISABL--if low bit is set,
                        0000    215 ;               disables control C handling, if clear, enables it.  Also
                        0000    216 ;               KB_CHECK ignores control C flag if handling is disabled.
                        0000    217 ;               Also, if user control C routine return failure code, the
                        0000    218 ;               Supervisor will proceed to handle the control C normally
                        0000    219 ;               itself.
                        0000    220 ;       40      Add label BEGIN_BLISS (same as BEGIN) for BLISS routines to
                        0000    221 ;               use after INIT_CONTEXT, since BEGIN is reserved word.
```

```
                        0000    223 ;
                        0000    224 ;       41      - Dave Butenhof, 18-feb-1981, version 6.3
                        0000    225 ;               Delete use of SEP psect.
                        0000    226 ;
                        0000    227 ;       42      - Dave Butenhof, 16-mar-1981, version 6.3
                        0000    228 ;               Fix ^C handling; move flag clears to make user status=0
                        0000    229 ;               return work under APT.
                        0000    230 ;
                        0000    231 ;       43      - Dave Butenhof, 23-mar-1981, version 6.3
                        0000    232 ;               Expand Exec/Supervisor stack to 3 pages each.
```

```
                        0000   234 ;       44      - Jack Stansbury, 21-Oct-1981, Version 6.5
                        0000   235 ;               Added calls to QA$MAIN for the QA enhancement.
                        0000   236 ;               Also added .LIBRARY statements for $DS and $DIAG.
                        0000   237 ;               Also changed one of the error messages to lower case.
                        0000   238 ;               Also fixed some truncation errors.
                        0000   239 ;
                        0000   240 ;       45      - Jack Stansbury, 10-Nov-1981, Version 6.5
                        0000   241 ;               Changed ALL W^ to L^.
                        0000   242 ;
                        0000   243 ;       46      - Dave Butenhof, 12-Nov-1981, version 6.5
                        0000   244 ;               Add DS$GB_TYPECODE for 'SET BINARY' function.
                        0000   245 ;
                        0000   246 ;       47      - Dave Butenhof, 13-Nov-1981, version 6.5
                        0000   247 ;               Implement EXIT command (DSV$EXIT).  It will do an
                        0000   248 ;               $EXIT in user mode, or a HALT in standalone; after
                        0000   249 ;               doing program cleanup, etc.
                        0000   250 ;
                        0000   251 ;       48      - Jack Stansbury, 21-Nov-1981, Version 6.5
                        0000   252 ;               Commented out several calls to QA_MAIN because it appears as
                        0000   253 ;               though they will not be needed for the 6.5 DS version.
```

```
                                0000   255 ;
                                0000   256 ;       49      - Dave Butenhof, 14-Dec-1981, version 6.6
                                0000   257 ;               Modify startup to use $GETSYI call in usermode, to get
                                0000   258 ;               the actual processor SID into DSA$GL_SID.
                                0000   259 ;
                                0000   260 ;       50      - Dave Butenhof, 29-Dec-1981, version 6.6
                                0000   261 ;               Add locations to store error counts for HARD, SOFT, DEVICE,
                                0000   262 ;               SYSTEM, and SOFTWARE (ERRSUP) errors.
                                0000   263 ;
                                0000   264 ;       51      - Jack Stansbury, 10-Feb-1982, Version 6.6X
                                0000   265 ;               Added another Control-C handler for the DS to use. This is for
                                0000   266 ;               QA to trap control-c's, but can be used by any other
                                0000   267 ;               DS-integrated facility. See the KB_Check routine for the code.
                                0000   268 ;
                                0000   269 ;       52      - Dave Butenhof, 09-Mar-1982, version 6.6
                                0000   270 ;               Add support for rooted systems.  When booted from DIAGBOOT,
                                0000   271 ;               startup code will do 'SET LOAD' command on the filespec in the
                                0000   272 ;               RPB$T_FILE field.
```

```
0000   274 ;       53      - Dave Butenhof, 26-Mar-1982, version 6.7
0000   275 ;               Fix rooted system directory support...redefine SYS$DISK when
0000   276 ;               translating SYS$SYSROOT.  SYS$SYSROOT:[SYS0.SYSMAINT] don't
0000   277 ;               Added SYS$LIBRARY:LIB.
0000   278 ;
0000   279 ;       54      Marion Baggett, 31-Mar-1982, Version 6.7
0000   280 ;               Added SYS$LIBRARY:LIB
0000   281 ;
0000   282 ;       55      Marion Baggett, 2-Apr-1982, Version 6.7
0000   283 ;               Added DS$GL_PREPERR_COUNT field to count device preparation   ;G:2
0000   284 ;               errors.                                                       ;G:2
0000   285 ;
0000   286 ;       56      Marion Baggett, 5-Apr-1982, Version 6.7
0000   287 ;               Changed $DS_PRINT to $PRINT macros.
0000   288 ;
0000   289 ;       57      Marion Baggett, 7-Apr-1982, Version 6.7
0000   290 ;               Added $DS_TYPEDEF to define type codes.
0000   291 ;
0000   292 ;       58      Dave Butenhof, 08-Apr-1982, version 6.7
0000   293 ;               Fix truncation error.
0000   294 ;
0000   295 ;       59      Jack Stansbury, 9-Apr-1982, Version 6.7
0000   296 ;               Added $CRD Library statement. Added support for the
0000   297 ;               Customer Runnable Diagnostic package.
0000   298 ;
0000   299 ;       60      Dave Butenhof, 13-Apr-1982, version 6.7
0000   300 ;               Add setup of DS$GB_INHIBIT_NAMING, to enable/disable
0000   301 ;               generic name enforcement. (Set in APT mode).
```

```
0000    303 ;
0000    304 ;       61      Dave Butenhof, 17-May-1982, version 6.8
0000    305 ;               Fix size of Kernel stack (make it larger to minimize trouble).
0000    306 ;
0000    307 ;       62      Dave Butenhof, 21-May-1982, version 6.8
0000    308 ;               Automatically attach console device at startup, to make
0000    309 ;               RMS and DIRECTORY a bit simpler (no special case for device
0000    310 ;               without Ptable).
0000    311 ;
0000    312 ;       63      Jack Stansbury, 7-June-1982, Version 6.8
0000    313 ;               Added code in DSV$Exit routine that will not allow the user
0000    314 ;               to Continue (console command) once a HALT instruction has been
0000    315 ;               executed - only if CRD-AutoTest bits are set in the R5 passed
0000    316 ;               to the DS.
0000    317 ;
0000    318 ;       64      Jack Stansbury, 9-Jun-1982, Version 6.8
0000    319 ;               Added code in the DSV$Exit routine that will allow output of
0000    320 ;               pertinent CRD variables when a CRD-Internal error occurs. This
0000    321 ;               is indicated by CRD changing the byte in its own dispatch vector
0000    322 ;               area (DS$GA_CRD_Starting_Address + 1) to be one more than the ;G:2
0000    323 ;               absolute value of its dispatch vectors + 2 byte. That is, CRD ;G:2
0000    324 ;               will increment the "positive version number" in its dispatch  ;G:2
0000    325 ;               vector area by one when it detects a internal error. CRD will ;G:2
0000    326 ;               then put the values of a select number of pertinent variables ;G:2
0000    327 ;               into its own dispatch vector area. DSV$Exit will print these  ;G:2
0000    328 ;               out when the user types a console Continue command.           ;G:2
0000    329 ;
0000    330 ;       65      Marion Baggett, 9-June-1982, Version 6.8
0000    331 ;               Increase the size of the interupt stack to 4 pages so the
0000    332 ;               Vax Architecture exerciser will run.
0000    333 ;
0000    334 ;       66      Richard Brown, 15-June-82, Version 6.8
0000    335 ;               Addition of IMAGE_HEADER, which is a buffer to hold the
0000    336 ;               image header of a diagnostic file, if the file was linked
0000    337 ;               with a header.  The header is used by the debugger.
0000    338 ;
0000    339 ;       67      Jack Stansbury, 28-June-1982, Version 6.8
0000    340 ;               Disabled ^C's in stand-alone initialization code so that CRD  ;G:2
0000    341 ;               will have a chance to set up a ^C handler. This takes care of ;G:2
0000    342 ;               the problem of ^C's being typed while DIAGBOOT is running, and ;G:2
0000    343 ;               then having the DS see the ^C before CRD is loaded in (thus   ;G:2
0000    344 ;               causing the DS> prompt to appear without the DS_Start message ;G:2
0000    345 ;               being printed). ^C's are re-enabled in the Begin_0 code.      ;G:2
```

```
                                0000   347 ;
                                0000   348 ;       68      Richard Brown, 16-July-82, Version 6.9
                                0000   349 ;               Addition of code in INIT_CONTEXT to see if the T-bit is set
                                0000   350 ;               in the PSL and if so to set it in the new PSL.  This is so
                                0000   351 ;               that if the debugger has set the T-bit, it will not be cleared
                                0000   352 ;               out when the context is initialized.
                                0000   353 ;
                                0000   354 ;       69      Jack Stansbury, 24-July-1982, Version 6.9
                                0000   355 ;               Added two new routine that return a 1 in R0 iff the correct   ;G:2
                                0000   356 ;               bits are set in Boot$L_R5 for CRD_AutoTest and for             ;G:2
                                0000   357 ;               CRD_MenuTest. Used these routines in the Begin0 part.          ;G:2
                                0000   358 ;
                                0000   359 ;       70      Jack Stansbury, 27-July-1982, Version 6.9
                                0000   360 ;               Added another ^C handler for the VDS. This allows CRD Menu Test ;G:2
                                0000   361 ;               to let the User handle a ^C if the user has established a      ;G:2
                                0000   362 ;               handler routine; but at the same time, if this user routine    ;G:2
                                0000   363 ;               returns failure meaning they did not want to handle it, let the ;G:2
                                0000   364 ;               "third" handler (VDS's second handler) have it. Leave DS$Cli   ;G:2
                                0000   365 ;               as the last chance handler.                                    ;G:2
                                0000   366 ;
                                0000   367 ;       71      Jack Stansbury, 8-September-1982, Version 6.9
                                0000   368 ;               Made some changes to the DSV$Exit routine for CRD Menu Test.   ;G:2
                                0000   369 ;               Also made a few changes to the routines mentioned in 69 above  ;G:2
                                0000   370 ;               - they were looking at the wrong bits.                         ;G:2
                                0000   371 ;
                                0000   372 ;       72      Jack Stansbury, 15-September-1982, Version 6.9
                                0000   373 ;               Cleared out the three ^C handler addresses in the VDS          ;G:2
                                0000   374 ;               stand-alone initialization code.                               ;G:2
                                0000   375 ;
                                0000   376 ;       73      Jack Stansbury, September 15, 1982, Version 6.9
                                0000   377 ;               Made the DS$L_UserCntrlC longword global, for use by the CLI   ;G:2
                                0000   378 ;               routine.                                                       ;G:2
                                0000   379 ;
                                0000   380 ;       74      Jack Stansbury, September 23, 1982, Version 6.9
                                0000   381 ;               Added a print statement to be printed if the CRD               ;G:2
                                0000   382 ;               initialization fails.                                          ;G:2
                                0000   383 ;
                                0000   384 ;       75      Jack Stansbury, September 24, 1982, Version 6.9
                                0000   385 ;               Added code to check to see if both CRD bits were set in the R5 ;G:2
                                0000   386 ;               passed to the VDS from Diagboot. If so, print an error message ;G:2
                                0000   387 ;               and exit.                                                      ;G:2
                                0000   388 ;
                                0000   389 ;       76      Jack Stansbury, September 28, 1982, Version 6.9
                                0000   390 ;               Added code to take care of the following: Start up the VDS.    ;G:2
                                0000   391 ;               Type CRD. Hit ^P while CRD is running - get back to ">>>"      ;G:2
                                0000   392 ;               console prompt. Type S 10000 - get a DS> prompt. Type CRD      ;G:2
                                0000   393 ;               again,but the CRD image is already loaded. This was causing a  ;G:2
                                0000   394 ;               halt at PC = 00000001. So, the solution is to call the         ;G:2
                                0000   395 ;               Unload_CRD routine when the bits are set in the DSA flags      ;G:2
                                0000   396 ;               longword when the Supervisor is being inited (it is            ;G:2
                                0000   397 ;               normally inited without any of the CRD bits being set).
                                0000   398 ;
                                0000   399 ;       77      Bob Bergazzi    7-Oct-82        Version 6.9
                                0000   400 ;               Changed the way system service vectors are handled; after wecopy ;G:
                                0000   401 ;               the VMS system service vectors to 10200 (in order to get the
                                0000   402 ;               correct word mask), modify each entry point to immediately JMP
                                0000   403 ;               to the corresponding entry point in the real system service    ;G:36
```

```
0000  ;                 table at 80000xxx. This solves the problem of code in the system
0000  ;                 service vectors which branches around outside of the three pages
0000  ;                 which we were copying before.
0000  ;
0000  ;        78       Bob Bergazzi    24-Nov-82       Version 6.10
0000  ;                 Added a call to load the PCS on startup (DS$_LOADPCS_S)
0000  ;
0000  ;        79       Jack Stansbury, 4-Mar-83, Version 6.11
0000  ;                 Changed the code in the DSR$Check routines (for CRD) - they must
0000  ;                 check the DSA bits while online, not the Boot$L_R5 longword.
0000  ;
0000  ;        80       John Ciukaj,    2-Apr.-1983     Version 6.11
0000  ;                 - Changed code that referenced CRD bits in DSA Flags.
0000  ;                   The bits were redefined to distinguish between
0000  ;                   online and offline.
0000  ;                 - Changed name of DSR$Check_... routines to distinguish
0000  ;                   between Online and Offline.
0000  ;
0000  ;        81       Bob Bergazzi    8-Apr-1983      Version 6.11
0000  ;                 Made on-line mode start up with terminal width set to 80.
0000  ;
0000  ;        82       Bob Bergazzi    25-April-1983   Version 6.11
0000  ;                 During boot of ESSAA, we must determine if this is 780 or a
0000  ;                 785, and if it is a 785, then we need to change
0000  ;                 the clock overhead factor (DS$GK_USOVR) in the WAITUS routine.
0000  ;                 This is done by referencing the symbol DSX$WAITUS_USOVR which
0000  ;                 addresses the beginning of the instruction which uses the
0000  ;                 overhead factor, and modifying the instruction. This is done
0000  ;                 in order to avoid adding more instructions to the DSX$WAITUS
0000  ;                 routine which would change the value of the DS$GK_USOVR for
0000  ;                 existing processors.
0000  ;
0000  ;        83       Bob Bergazzi    25-April-1983   Version 6.11
0000  ;                 Increased SCB size to 4 pages for VENUS. Related changes in
0000  ;                 SCB module.
0000  ;
0000  ;        84       John Ciukaj     29-Apr-83       version 6.11
0000  ;                                13-May-83
0000  ;                 DSR$Check.. routines: check both DSA Flags and RPB
0000  ;                 regardless of Standalone or Online.
0000  ;
0000  ;        85       Bob Bergazzi    May 16,1983     Version 6.11
0000  ;                 Changed the order of the .LIB statements.
0000  ;
0000  ;        86       M.Baggett       May 16, 1983    Version 6.11
0000  ;                 Get RPB$L_BOOTR2 field from RPB.
0000  ;
0000  ;        87       Richard Brown   June 22, 1983   Version 6.12
0000  ;                 Added code to fetch user terminal characteristics
0000  ;                 and store them in $DSGL_TERMCHAR so the new service
0000  ;                 $DS_GETTERM can pass them to a diagnostic.
0000  ;
0000  ;                 Added new system service $DS_GETTERM, which returns
0000  ;                 the characteristics of the user terminal.
0000  ;
0000  ;        88       Bob Bergazzi    Sep 22, 1983    Version 6.13
0000  ;                 Added a $CANTIM if a ^C is typed to cancel a $SETIMR
```

```
0000   461 ;                  which may have been done at program start for the
0000   462 ;                  /TIME switch.
0000   463 ;                  Commented out for version 6.13 and 6.14, and 7.0
0000   464 ;
0000   465 ;          89      Bob Bergazzi    11-11-83        Version 6.14
0000   466 ;                  Clear the DS$M_CTRLC and DS$M_CTRLO flags before we call
0000   467 ;                  a control-c handler. This fixes the problem of terminal
0000   468 ;                  output in a ^C handler being suppressed in S/A.
0000   469 ;
0000   470 ;          90      Bob Bergazzi    12-28-83        Version 6.14
0000   471 ;                  The definition of JIB$L_ARB in the JIB was removed from VMS V4,
0000   472 ;                  so define it to its old offset value (the space in the JIB is
0000   473 ;                  still there).
0000   474 ;
0000   475 ;          91      Bob Bergazzi    2-14-84         Version 6.14
0000   476 ;                  Moved the code which builds ptables for the console load device
0000   477 ;                  and the boot device into the CONFIG module, called by
0000   478 ;                  JSB INI$LOAD_DEVICE. This was done so SET MEM could call it.  ;G:2
0000   479 ;
0000   480 ;          92      Richard Brown   May 14, 1984    Version 7.0
0000   481 ;                  Added display of legal statement on startup.
0000   482 ;
0000   483 ;          93      M. Baggett      May-17-1984     Version 7.0
0000   484 ;                  Allow word length unit to be save in RPB.
0000   485 ;
0000   486 ;          94      Bob Bergazzi    May 18, 1984    Version 7.0
0000   487 ;                  Made legal display not print out when running under APT.
0000   488 ;
0000   489 ;          95      Bob Bergazzi    June 19, 1984   Version 7.0
0000   490 ;                  Also, do not display legal message when CRD is running.
0000   491 ;
0000   492 ;          96      R.E. Muse       July 13, 1984   Version 7.0
0000   493 ;                  Search order bit mask added to $TRNLOG system service.
0000   494 ;                  SYS$DISK is now search for in the system logical name
0000   495 ;                  table exclusively.
0000   496 ;
0000   497 ;          97      R.E. Muse       19 July 1984    version 7.0
0000   498 ;                  logical translation for SYS$SYSROOT added and SYS$DISK
0000   499 ;                  removed. Now default directory is "[sys0.sysmaint].
0000   500 ;
0000   501 ;          98      Bob Bergazzi    July 27, 1984   Version 7.1
0000   502 ;                  Moved $DS_LOADPCS to after memory is initialized and ptables
0000   503 ;                  are built and RMS is initialized, so that we can load
0000   504 ;                  patches from a file.
0000   505 ;
0000   506 ;          99      Bob Bergazzi    Aug. 30, 1984   Version 7.1
0000   507 ;                  Added call to HDW_CLOCK_SET to do cpu specific clock setup.
0000   508 ;
0000   509 ;          100     Ron Parker      November 1,1984 Version 7.1
0000   510 ;                  Added support for CRD_Menutest_Online
0000   511 ;
0000   512 ;          101     RE Muse         Novemeber 7,1984 version 7.1
0000   513 ;                  removed PSECT _LAST and placed in each machine specific
0000   514 ;                  ONLYnnn module. This was done in particular to accomodate
0000   515 ;                  the large SCB page allocation for NAUTILUS, otherwise all
0000   516 ;                  supervisor's would carry more SCB page allocation than
0000   517 ;                  really needed. ie. nautilus needs 37 pages for the scb.
```

```
0000    518 ;
0000    519 ;       102     M. Baggett      9-Nov-1984      Version 7.1
0000    520 ;               Improved the coding of CASE statement.
0000    521 ;
0000    522 ;       103     Jim Shelhamer   Feb 11, 1985    Version 8.1
0000    523 ;               Added code for Attached Processor EXIT instruction.
0000    524 ;
0000    525 ;       104     Bob Bergazzi    Feb. 13, 1985   Version 8.1
0000    526 ;               Changed location of call to HDW_CLOCK_SET, since it no
0000    527 ;               longer changes DS$GT_NEWYEAR+7.
0000    528 ;
0000    529 ;       105     Ted Salem       Feb. 25, 1985   Version 8.1
0000    530 ;               Added code for simulation of the NI - i.e. may be temporary.
0000    531 ;
0000    532 ;       106     Bob Bergazzi    Feb. 26, 1985   Version 8.1
0000    533 ;               Fix edit [88] (/TIME).
0000    534 ;
0000    535 ;       107     Ted Salem       Feb. 26, 1985   Version 8.1
0000    536 ;               Made NDS$OPEN, RECEIVE_POLL weak symbols.
0000    537 ;
0000    538 ;       108     Bob Bergazzi    Mar. 4, 1985    Version 8.1
0000    539 ;               Commented out edit 106.
0000    540 ;
0000    541 ;       109     M. Baggett      6-Mar-1985      Version 8.1
0000    542 ;               Expanded legal notice to show copyright year.
0000    543 ;
0000    544 ;       110     Ted Salem       March 14, 1985  Version 8.2
0000    545 ;               Added code to clear the MP$R_ACTIVE_SERVICES bitvector.
0000    546 ;
0000    547 ;       111     Domenic Andella 22-May-1985     Version 8.2
0000    548 ;               Added multi-processing support to KB_CHECK.
0000    549 ;
0000    550 ;       112     Domenic Andella 11-Jun-1985     Version 9.0
0000    551 ;               Temporarily add mp symbol MP$GR_BOOTED_PROCESSORS
0000    552 ;               until all mp modules are included in link. Add
0000    553 ;               WEAK symbol definitions.
0000    554 ;
0000    555 ;       113     Bob Bergazzi    11-June-1985    Version 9.0
0000    556 ;               Set up EXE$GL_TENUSEC and EXE$GL_UBDELAY in the
0000    557 ;               BOOTDRIVR module for use by the TIMEDWAIT macro
0000    558 ;               which is in some bootdrivrs.
0000    559 ;
0000    560 ;       114     M. Baggett      19-June-1985    Version 9.0
0000    561 ;               Fix directory if booting from ULTRIX disk.
0000    562 ;
0000    563 ;       115     Jim Shelhamer   24-JUN-1985     Version 9.0
0000    564 ;               Made ds$gt_copyear gloabl, it is referenced by APBOOT8200.
0000    565 ;
0000    566 ;       117     Jim Shelhamer   2-Aug-1985      Version 9.0
0000    567 ;               Took out JSB to VRSETWIDTH.
0000    568 ;               This was messng up characteristics of MBX for VSDP.
0000    569 ;
0000    570 ;       118     M. Baggett      13-Aug-1985     Version 9.0
0000    571 ;               Added field for RPB bootr1.
0000    572 ;
0000    573 ;       119     Bob Bergazzi    30-Sep-1985     Version 9.0
0000    574 ;               T/M for SCORPIO should merely do a normal supervisor
```

```
0000    575 ;               boot, not invoking CRD MENU mode.
0000    576 ;
0000    577 ;       120     Jim Shelhamer   28-Oct-1985     Version 9.1
0000    578 ;               During boot of EDSAA, we must determine if this is 8600 or a
0000    579 ;               8650, and if it is a 8650, then we need to change
0000    580 ;               the clock overhead factor (DS$GK_USOVR) in the WAITUS routine.
0000    581 ;               This is done by referencing the symbol DSX$WAITUS_USOVR which
0000    582 ;               addresses the beginning of the instruction which uses the
0000    583 ;               overhead factor, and modifying the instruction. This is done
0000    584 ;               in order to avoid adding more instructions to the DSX$WAITUS
0000    585 ;               routine which would change the value of the DS$GK_USOVR for
0000    586 ;               existing processors.
0000    587 ;
0000    588 ;       121     Jim Baranski     1-Nov-1985     Version 9.1
0000    589 ;               Un Comment Out START/TIME.
0000    590 ;
0000    591 ;       122     Bob Bergazzi    Jan 17, 1986    Version 9.1
0000    592 ;               For a NAUTILUS supervisor, change the default directory
0000    593 ;               in the online mode from USERFILES to SYSMAINT.
0000    594 ;
0000    595 ;       122     Bob Bergazzi    Jan 17, 1986    Version 9.1
0000    596 ;               For a NAUTILUS supervisor, change the default directory
0000    597 ;               in the online mode from USERFILES to SYSMAINT.
0000    598 ;
0000    599 ;       123     Ted Salem       30-Jan-1986     Version 9.2
0000    600 ;               Moved code in change #110 from Init_common to Begin0.
0000    601 ;
0000    602 ;       124     Bob Bergazzi    12-Feb-1986     Version 10.0                ;G:2
0000    603 ;               Remove call to LIB$GET_FOREIGN. This was put in as part of  ;G:2
0000    604 ;               an online CRD enhancement, which is no longer needed.       ;G:2
0000    605 ;                                                                           ;G:3
0000    606 ;       125     Jim Shelhamer   5-Mar-1986      Version 10.0                ;G:3
0000    607 ;               On EXIT from AP, request that PP set up RXCD intr vector    ;G:3
0000    608 ;               to handle console prompt which will occur on HALT inst.     ;G:3
0000    609 ;               Added $PR8SSDEF.                                            ;G:3
0000    610 ;                                                                           ;G:7
0000    611 ;       126     Jim Shelhamer   10-Apr-1986     Version 10.0                ;G:7
0000    612 ;               Added call to ONLY_CPU, which will be located in            ;G:7
0000    613 ;               each ONLYxxx module. This will provide an area for          ;G:7
0000    614 ;               CPU specific start up code. Also, ignore RXCD intrs.        ;G:13
0000    615 ;                                                                           ;G:15
0000    616 ;       127     Ted Salem       4-May-1986      Version 10.0                ;G:15
0000    617 ;               Added structures and functionality to read the system       ;G:15
0000    618 ;               type for MicroVax2 based systems.  This is used to          ;G:36
0000    619 ;               distinguish an Aurora from an Andromeda system.             ;G:15
0000    620 ;               Also, added code to read Module Id for Andromeda.           ;G:15
0000    621 ;                                                                           ;G:16
0000    622 ;       128     Bob Bergazzi    15-May-1986     Version 10.1                ;G:16
0000    623 ;               Added support to KB_CHECK for /TIME.                        ;G:16
0000    624 ;                                                                           ;G:17
0000    625 ;       129     Bob Bergazzi    28-May-1986     Version 10.1                ;G:17
0000    626 ;               Changed /TIME under VMS from elapsed time to execution time.;G:17
0000    627 ;                                                                           ;G:18
0000    628 ;       130     M. Baggett      2-Jun-1986      Version 10.1                ;G:18
0000    629 ;               Added support for RT-VAX.                                   ;G:18
0000    630 ;                                                                           ;G:19
0000    631 ;       131     Domenic Andella 2-June-1986     Version 10.2                ;G:19
```

```
0000    632 ;               Save, restore R0, and R1 at several places                  ;G:19
0000    633 ;               in routine KB_CHECK.                                        ;G:36
0000    634 ;                                                                           ;G:20
0000    635 ;       132     M. Baggett      5-Jun-1986      Version 10.2                ;G:20
0000    636 ;               Allow AURORA to have to SID values.                         ;G:20
0000    637 ;                                                                           ;G:25
0000    638 ;       133     Ted Salem       19-June-1986    Version 10.2                ;G:25
0000    639 ;               Changed all access of Andromeda IOspace to                  ;G:36
0000    640 ;               longword access only. (FBI is longword access).             ;G:25
0000    641 ;                                                                           ;G:28
0000    642 ;       134     Doug Silver     20-Sep-1986     Version 10.3                ;G:28
0000    643 ;               Made PASSNO,TESTNO,SUBTESTNO global variables               ;G:28
0000    644 ;               for VSDP in GLBL_SECT_AREA.                                 ;G:28
0000    645 ;                                                                           ;G:28
0000    646 ;       135     Doug Silver     20-Nov-1986     Version 10.3                ;G:28
0000    647 ;               Made default load path the logical name                     ;G:28
0000    648 ;               "SYS$MAINTENANCE:".                                         ;G:36
0000    649 ;                                                                           ;G:36
0000    650 ;       136     Stephen Meier   5-Jan-1987      Version 10.5                ;G:32
0000    651 ;               Add LLL specific code to take the pointer                   ;G:34
0000    652 ;               to the console communications area out of the               ;G:36
0000    653 ;               RPB and save it in a global location.                       ;G:32
0000    654 ;                                                                           ;G:33
0000    655 ;       137     Ingrid Martin   26-JAN-1987     Version 10.5                ;G:33
0000    656 ;               Fixed the VDS header using spaces rather than               ;G:33
0000    657 ;               tabs.                                                       ;G:33
0000    658 ;                                                                           ;G:34
0000    659 ;       138     ingrid martin   31-mar-1987     version 10.7                ;G:34
0000    660 ;               updates for rrr machine:  get_time                          ;G:34
0000    661 ;                                                                           ;G:34
0000    662 ;       139     David Gearin    1-Apr-1987      Version 10.7                ;G:34
0000    663 ;               Add code to permit booting and usage of csa2                ;G:34
0000    664 ;               (RX50 console drive) on a Scorpio.                          ;G:34
0000    665 ;                                                                           ;G:34
0000    666 ;       140     Ingrid Martin   7-April-1987    Version 10.7                ;G:34
0000    667 ;               Fixed a line that got jumbled.                              ;G:34
0000    668 ;                                                                           ;G:35
0000    669 ;       Edit #'s by generation # from now on....                            ;G:35
0000    670 ;                                                                           ;G:36
0000    671 ;       35      Stephen Meier   1-may-87        Version10.7                 ;G:35
0000    672 ;               Removed references to the LLL product name.                 ;G:35
0000    673 ;                                                                           ;G:36
0000    674 ;       36      Stephen Meier   27-Jul-87       Version 10.10               ;G:36
0000    675 ;               Removed an LLL specific dummy symbol and replaced it with   ;G:36
0000    676 ;               the real value.                                             ;G:36
0000    677 ;                                                                           ;G:36
0000    678 ;                                                                           ;G:37
0000    679 ;       36      David Gearin    3-Aug-87        Version 10.10               ;G:39
0000    680 ;               Continuation of Edit #139. Saved contents of R3 upon        ;G:39
0000    681 ;               entering the main code.  R3 contains the # of disk drive    ;G:39
0000    682 ;               used if Scorpio was booted via the console.                 ;G:39
0000    683 ;                                                                           ;G:39
0000    684 ;       36      David Gearin    3-Aug-87        Version 10.10               ;G:40
0000    685 ;               Continuation of Edit #139. Saved contents of R3 upon        ;G:40
0000    686 ;               entering the main code.  R3 contains the # of disk drive    ;G:40
0000    687 ;               used if Scorpio was booted via the console.                 ;G:40
0000    688 ;                                                                           ;G:40
```

```
                        0000   689 ;       38      David Gearin    26-Aug-1987     Version 10.10                   ;G:40
                        0000   690 ;               Add a branch around saving of R3 [drive #] if VDS               ;G:40
                        0000   691 ;               was already booted from csa2.  [i.e. if VDS was restarted       ;G:40
                        0000   692 ;               using "S 10000" R3 will retain it's old value.  This allows     ;G:40
                        0000   693 ;               the supervisor to "remember" the console load path.             ;G:40
                        0000   694 ;                                                                               ;G:40
                        0000   695 ;       37A1    Stephen Meier   27-Aug-1987     Version 10.10                   ;G:39
                        0000   696 ;               Recompile to include changes to BR_IF_NOT_MP in DS              ;G:39
                        0000   697 ;                                                                               ;G:38
                        0000   698 ;       37B1    David Gearin    11-Nov-1987     Version 10.10                   ;G:39
                        0000   699 ;               Add code to "remember" which drive # scorpio booted             ;G:39
                        0000   700 ;               from, if booted from console rx50.                              ;G:38
                        0000   701 ;                                                                               ;G:41
                        0000   702 ;       40      Stephen Meier   19-Jan-1988     Version 10.11                   ;G:41
                        0000   703 ;               Fixed a bug in KB_CHECK which prevented /time from              ;G:41
                        0000   704 ;               stopping a diagnostic's execution after a ^C. The bug           ;G:41
                        0000   705 ;               also prevented continue's from starting up the AP's             ;G:41
                        0000   706 ;               in an MP environment. The fix was to look one more              ;G:41
                        0000   707 ;               longword up on the stack to get some data which was pushed      ;G:41
                        0000   708 ;               further back by a saved register.                               ;G:41
                        0000   709 ;;--                                                                             ;G:25
```

```
                0000          .Subtitle       Libraries and Macros                                    ;G:4
                0000  ;
                0000  ; INCLUDE FILES:
                0000  ;
                0000          .Library        /SYS$LIBRARY:LIB/       ;                       [54]  ;G:32
                0000          .Library        /$CRD/                  ; CRD-specific defns    [59]  ;G:2
                0000          .Library        /$DS/                   ;                       [44]  ;G:2
                0000          .Library        /$DIAG/                 ;                       [44]  ;G:2
                0000
                0000  ;
                0000  ; WEAK EXTERNALS
                0000  ;
                0000
                0000          .WEAK   XDELBPT,XDELTBIT,NDS$OPEN,RECEIVE_POLL  ;               [107] ;G:16
                0000          .WEAK   MP$_PRIMARY_CPU_CHECK   ; Checks and acts on mp flags.  [112] ;G:16
                0000          .WEAK   MP$_RESUME_ATTACHED_PROCESSORS; Resumes attached processors[112] ;G:
                0000          .WEAK   MP$R_ACTIVE_SERVICES    ; Bitvector used in interlock         ;G:16
                0000                                          ; routine                       [110] ;G:16
                0000          .WEAK   MP$R_INTERLOCK_END      ; Endmark of all interlocking         ;G:16
                0000                                          ; structures                    [110] ;G:16
                0000          .WEAK   ap$i_prompt_check,ap$b_prompt_buffer_count,ap$b_prompt_count  ;G:5
                0000          .WEAK   PPA$GB_MID, PPA$GB_CPU  ; Module # and ID # for Andromeda [127] ;G:1
                0000          .WEAK   TXCS$V_RDY,TODR_STORE,TODR_BYTE_CNT     ; 8800 specific [128] ;G:16
                0000                                                                                ;G:36
                0000  ; EXTERNALS
                0000  ;
                0000          .EXTRN  RECEIVE_POLL,NDS$OPEN   ; TO OPEN SIMULATION FILES FOR NI [105]
                0000          ;.EXTRN MP$GR_BOOTED_PROCESSORS ; Bitvector to indicate attached processors
                0000          .EXTRN  MP$_PRIMARY_CPU_CHECK; Checks and acts on mp flags.           [111
                0000          .EXTRN  MP$_RESUME_ATTACHED_PROCESSORS; Resumes attached processors    [111
                0000  ;
                0000  ; EQUATED SYMBOLS:
                0000  ;
                0000                                                  ; *** System type for RT-VAX [130] ;
        00000010 0000  PR$_SID_TYPRTUV2 ==^X10                        ; ***** TEMPORARY UNTIL DEFINED [130
        00000002 0000  PR$_SYS_TYP800 == 2                    ; System Type for Aurora        [127] ;G:15
        00000003 0000  PR$_SYS_TYP900 == 3                    ; System Type for Andromeda     [127] ;G:15
        0000000A 0000  PR$_SYS_TYP_LLL == 10                  ; System type for LLL           [136] ;G:35
        00000011 0000  PR$_SID_TYP8RR  =  17                  ; System type for RRR           [138] ;G:34
        00000006 0000  PR$_SID_TYP8NN  =  6                   ; System type for nautilus      [138] ;G:34
        20040004 0000  SYS_TYPE = ^x20040004                  ; System Type in IOSPACE   [127][133] ;G:26
        3FFFE400 0000  PPA_SPID = ^x3FFFE400                  ; Secondary ID for Andromeda    [127] ;G:23
        00000000 0000  RPB$V_MENUTEST = 0                     ; This is missing from the
        00000001 0000  RPB$M_MENUTEST = 1@RPB$V_MENUTEST      ; SYS$LIBRARY:LIB.MLB library           [119
                0000
        00000001 0000  SS$_NORMAL=1                           ; SUCCESS
                0000          $DS_DSDEF                       ; SHOULD PRECEDE "IOC$K_DIAGPID"
        00660000 0000  IOC$K_DIAGPID == DS$K_SUBSYS@16        ; DIAGNOSTIC PROCESS I.D.
                0000          $ARBDEF                                                               ;G:17
                0000          .SAVE   LOCAL_BLOCK
                0000          .RESTORE
                0000          $CCBDEF
                0000          .SAVE   LOCAL_BLOCK
                0000          .IIF    NB,CCB$L_UCB,   CCB$L_UCB:
        00000004 0000                          .BLKL   1
                0004          .IIF    NB,CCB$L_WIND,  CCB$L_WIND:
        00000008 0004                          .BLKL   1
```

```
                     0008                .IIF    NB,CCB$B_STS,   CCB$B_STS:
00000009             0008                        .BLKB   1
                     0009                .IIF    NB,CCB$B_AMOD,  CCB$B_AMOD:
0000000A             0009                        .BLKB   1
                     000A                .IIF    NB,CCB$W_IOC,   CCB$W_IOC:
0000000C             000A                        .BLKW   1
                     000C                .IIF    NB,CCB$L_DIRP,  CCB$L_DIRP:
00000010             000C                        .BLKL   1
                     0010                .IIF    NB,CCB$C_LENGTH,        CCB$C_LENGTH:
                     0010                .IIF    NB,CCB$K_LENGTH,        CCB$K_LENGTH:
                     0000                .RESTORE
                     0000    761         $DEVDEF                         ; Define device type codes              ;G:17
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
00000000             0010                .=0
                     0000                .RESTORE
                     0000    762         $DIBDEF
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
00000000             0010                .=0
                     0000                .RESTORE
                     0000    763         $JIBDEF
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
00000000             0010                .=0
                     0000                .RESTORE
00000000             0000    764                 JIB$L_ARB = 0           ; This was removed from VMS v4.0 [90] ;G:16
                     0000    765         $JPIDEF                         ; For $GETJPIW service          [129] ;G:17
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
00000000             0010                .=0
                     0000                .RESTORE
                     0000    766         $PCBDEF                                                         ;G:17
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
00000000             0010                .=0
                     0000                .IIF    NB,PCB$L_SQFL,  PCB$L_SQFL:
00000004             0000                        .BLKL   1
                     0004                .IIF    NB,PCB$L_SQBL,  PCB$L_SQBL:
00000008             0004                        .BLKL   1
                     0008                .IIF    NB,PCB$W_SIZE,  PCB$W_SIZE:
0000000A             0008                        .BLKW   1
                     000A                .IIF    NB,PCB$B_TYPE,  PCB$B_TYPE:
0000000B             000A                        .BLKB   1
                     000B                .IIF    NB,PCB$B_PRI,   PCB$B_PRI:
0000000C             000B                        .BLKB   1
                     000C                .IIF    NB,PCB$B_ASTACT,        PCB$B_ASTACT:
0000000D             000C                        .BLKB   1
                     000D                .IIF    NB,PCB$B_ASTEN, PCB$B_ASTEN:
0000000E             000D                        .BLKB   1
                     000E                .IIF    NB,PCB$W_MTXCNT,        PCB$W_MTXCNT:
00000010             000E                        .BLKW   1
                     0010                .IIF    NB,PCB$L_ASTQFL,        PCB$L_ASTQFL:
00000014             0010                        .BLKL   1
                     0014                .IIF    NB,PCB$L_ASTQBL,        PCB$L_ASTQBL:
00000018             0014                        .BLKL   1
                     0018                .IIF    NB,PCB$L_PHYPCB,        PCB$L_PHYPCB:
```

```
0000001C  0018                                  .BLKL   1
          001C                  .IIF    NB,PCB$L_OWNER, PCB$L_OWNER:
00000020  001C                                  .BLKL   1
          0020                  .IIF    NB,PCB$L_WSSWP, PCB$L_WSSWP:
00000024  0020                                  .BLKL   1
          0024                  .IIF    NB,PCB$L_STS,   PCB$L_STS:
00000028  0024                                  .BLKL   1
          0028                  .IIF    NB,PCB$L_WTIME, PCB$L_WTIME:
0000002C  0028                                  .BLKL   1
          002C                  .IIF    NB,PCB$W_STATE, PCB$W_STATE:
0000002E  002C                                  .BLKW   1
          002E                  .IIF    NB,PCB$B_WEFC,  PCB$B_WEFC:
0000002F  002E                                  .BLKB   1
          002F                  .IIF    NB,PCB$B_PRIB,  PCB$B_PRIB:
00000030  002F                                  .BLKB   1
          0030                  .IIF    NB,PCB$W_APTCNT,        PCB$W_APTCNT:
00000032  0030                                  .BLKW   1
          0032                  .IIF    NB,PCB$W_TMBU,  PCB$W_TMBU:
00000034  0032                                  .BLKW   1
          0034                  .IIF    NB,PCB$W_GPGCNT,        PCB$W_GPGCNT:
00000036  0034                                  .BLKW   1
          0036                  .IIF    NB,PCB$W_PPGCNT,        PCB$W_PPGCNT:
00000038  0036                                  .BLKW   1
          0038                  .IIF    NB,PCB$W_ASTCNT,        PCB$W_ASTCNT:
0000003A  0038                                  .BLKW   1
          003A                  .IIF    NB,PCB$W_BIOCNT,        PCB$W_BIOCNT:
0000003C  003A                                  .BLKW   1
          003C                  .IIF    NB,PCB$W_BIOLM, PCB$W_BIOLM:
0000003E  003C                                  .BLKW   1
          003E                  .IIF    NB,PCB$W_DIOCNT,        PCB$W_DIOCNT:
00000040  003E                                  .BLKW   1
          0040                  .IIF    NB,PCB$W_DIOLM, PCB$W_DIOLM:
00000042  0040                                  .BLKW   1
          0042                  .IIF    NB,PCB$W_PRCCNT,        PCB$W_PRCCNT:
00000044  0042                                  .BLKW   1
          0044                  .IIF    NB,PCB$T_TERMINAL,      PCB$T_TERMINAL:
0000004C  0044                                  .BLKB   8
          004C                  .IIF    NB,PCB$L_PQB,   PCB$L_PQB:
          004C                  .IIF    NB,PCB$L_EFWM,  PCB$L_EFWM:
00000050  004C                                  .BLKL   1
          0050                  .IIF    NB,PCB$L_EFCS,  PCB$L_EFCS:
00000054  0050                                  .BLKL   1
          0054                  .IIF    NB,PCB$L_EFCU,  PCB$L_EFCU:
00000058  0054                                  .BLKL   1
          0058                  .IIF    NB,PCB$L_EFC2P, PCB$L_EFC2P:
0000005C  0058                                  .BLKL   1
          005C                  .IIF    NB,PCB$L_EFC3P, PCB$L_EFC3P:
00000060  005C                                  .BLKL   1
          0060                  .IIF    NB,PCB$L_PID,   PCB$L_PID:
00000064  0060                                  .BLKL   1
          0064                  .IIF    NB,PCB$L_PHD,   PCB$L_PHD:
00000068  0064                                  .BLKL   1
          0068                  .IIF    NB,PCB$T_LNAME, PCB$T_LNAME:
00000078  0068                                  .BLKB   16
          0078                  .IIF    NB,PCB$L_JIB,   PCB$L_JIB:
0000007C  0078                                  .BLKL   1
          007C                  .IIF    NB,PCB$Q_PRIV,  PCB$Q_PRIV:
```

```
00000084  007C                                  .BLKQ   1
          0084                  .IIF    NB,PCB$L_ARB,   PCB$L_ARB:
00000088  0084                                  .BLKL   1
          0088                  .IIF    NB,PCB$L_UIC,   PCB$L_UIC:
          0088                  .IIF    NB,PCB$W_MEM,   PCB$W_MEM:
0000008A  0088                                  .BLKW   1
          008A                  .IIF    NB,PCB$W_GRP,   PCB$W_GRP:
0000008C  008A                                  .BLKW   1
          008C                  .IIF    NB,PCB$C_LENGTH,        PCB$C_LENGTH:
          008C                  .IIF    NB,PCB$K_LENGTH,        PCB$K_LENGTH:
          0000                  .RESTORE
          0000    767           $PHDDEF                                                         ;G:17
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000    768           $PR780DEF                       ; Define 780 specific IPRs      [126] ;G:17
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000    769           $PR8SSDEF                       ; Define Scorpio specifics      [125] ;G:17
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000    770           $PRDEF
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000    771           $PSLDEF
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000    772           $RPBDEF                         ; Define offsets in RPB                 ;G:17
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000    773           $SECDEF                         ; Define section codes          [134] ;G:28
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000    774           $SFDEF                          ;                               [128] ;G:16
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000    775           $SHRDEF                         ; Define shareable status codes
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  008C                  .=0
          0000                  .RESTORE
          0000    776           $SYIDEF                         ; Define SYI codes              [49]  ;G:16
```

```
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
                00000000  008C            .=0
                        0000              .RESTORE
                        0000    777       $DS_SCBDEF                                                      ;G:39
                        0000    778       CLIDEF                          ; Define CLI data base offsets  [52]  ;G:16
                        0000    779       CMKDEF
                        0000    780       $DS_DSADEF                                                      ;G:17
                        0000    781       DSFDEF
                        0000    782       ENVDEF
```

```
                     0000   783          DSQA                                ; QA routine name constants     [44]  ;G:16
                     0000   784          $DS_HPODEF                          ; P-table offsets                     ;G:17
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
                00000000  FE70           .=0
                     0000                .IIF    NB,HP$Q_DEVICE, HP$Q_DEVICE:
                00000008  0000           .IIF    NB,.BLKQ,       .BLKQ   1
                     0008                .IIF    NB,HP$W_SIZE,   HP$W_SIZE:
                0000000A  0008           .IIF    NB,.BLKW,       .BLKW   1
                     000A                .IIF    NB,HP$B_FLAGS,  HP$B_FLAGS:
                0000000B  000A           .IIF    NB,.BLKB,       .BLKB   1
                     000B                .IIF    NB,HP$B_DRIVE,  HP$B_DRIVE:
                0000000C  000B           .IIF    NB,.BLKB,       .BLKB   1
                     000C                .IIF    NB,HP$T_DEVICE, HP$T_DEVICE:
                00000018  000C           .IIF    NB,.BLKB,       .BLKB   12
                     0018                .IIF    NB,HP$A_DEVICE, HP$A_DEVICE:
                0000001C  0018           .IIF    NB,.BLKL,       .BLKL   1
                     001C                .IIF    NB,HP$A_DVA,    HP$A_DVA:
                00000020  001C           .IIF    NB,.BLKL,       .BLKL   1
                     0020                .IIF    NB,HP$A_LINK,   HP$A_LINK:
                00000024  0020           .IIF    NB,.BLKL,       .BLKL   1
                     0024                .IIF    NB,HP$W_VECTOR, HP$W_VECTOR:
                00000026  0024           .IIF    NB,.BLKW,       .BLKW   1
                     0026                .IIF    NB,HP$T_TYPE,   HP$T_TYPE:
                00000032  0026           .IIF    NB,.BLKB,       .BLKB   12
                     0032                .IIF    NB,HP$A_DEPENDENT,      HP$A_DEPENDENT:
                     0000                .RESTORE
                     0000   785          $DS_TYPEDEF                         ; Define type codes             [57]  ;G:16
                     0000   786          $CRD_Literals                       ; Define the CRD literals       [59]  ;G:16
                     0000   787          APDEF                               ;                               [103] ;G:16
                     0000   788                                                                                    ;G:36
```

```
                 0000          .Subtitle       Equated Symbols
                 0000                                                                                  ;G:36
                 0000
        00003000 0000  DSA$M_DFLTFLGS  == DSA$M_OPER ! DSA$M_PROMPT
                 0000
        00000200 0000  DS$A_PRGBGN     == ^X200
        0000F800 0000  DS$K_PRGSIZ     == ^XFA00 - DS$A_PRGBGN                                        ;G:36
                 0000
        0000000D 0000          CR      = 13
        0000000A 0000          LF      = 10
                 0000
                 0000  ; INITIAL FREE-CORE REQUEST SIZE
                 0000
        00000098 0000  UCB$SIZE        =       ^X98
        00000018 0000  DDB$SIZE        =       ^X18
        0000002C 0000  CRB$SIZE        =       ^X2C
        00000020 0000  IDB$SIZE        =       ^X20
        00000050 0000  IRP$SIZE        =       ^X50
        00000010 0000  CCB$SIZE        =       ^X10                                                   ;G:36
        00000050 0000  VCB$SIZE        =       ^X50
        00000030 0000  WCB$SIZE        =       ^X30
        00000030 0000  FCB$SIZE        =       ^X30
                 0000
        00000040 0000  SGN$C_IRPCNT    ==      64
                 0000  SGN$C_NPAGEDYN  ==      <UCB$SIZE*24>           -; 24 UCB'S
                 0000                          +<DDB$SIZE*5>           -;  5 DDB'S
                 0000                          +<CRB$SIZE*3>           -;  3 CRB'S
                 0000                          +<IDB$SIZE*5>           -;  5 IDB'S
                 0000                          +<IRP$SIZE*SGN$C_IRPCNT>-; IRP'S
                 0000                          +<CCB$SIZE*16>          -; 16 CCB'S
                 0000                          +<VCB$SIZE*2>           -;  2 VCB'S
                 0000                          +<WCB$SIZE*2>           -;  2 WCB'S
        0000263C 0000                          +<FCB$SIZE*2>            ;  2 FCB'S
        00000800 0000  DB_SIZ  = ^X800                          ; Size of DBDRIVER
        00000800 0000  DL_SIZ  = ^X800                          ; Size of DLDRIVER
        00000A00 0000  DM_SIZ  = ^XA00                          ; Size of DMDRIVER
        00000800 0000  DR_SIZ  = ^X800                          ; Size of DRDRIVER
        00001000 0000  TM_SIZ  = ^X1000                         ; Size of TMDRIVER
        00000600 0000  XF_SIZ  = ^X600                          ; Size of XFDRIVER
                 0000
        00005E3C 0000  QIO$MINCORE==SGN$C_NPAGEDYN + <DB_SIZ+DL_SIZ+DM_SIZ+DR_SIZ+TM_SIZ+XF_SIZ>
                 0000
                 0000  ;
                 0000  ; ALLOCATION GRANULARITY MASK
                 0000  ;
                 0000
        0000000F 0000  MASK    = ^XF
                 0000
                 0000  ;
                 0000  ; STARLET VECTOR LOCAL DEFINITION OVERRIDES DS STARLET SERVICE VECTOR.
                 0000  ;
                 0000
        800000C8 0000  SYS$CRETVA      = ^X800000C8
        800000F0 0000  SYS$DXLEXH      = ^X800000F0
        80000110 0000  SYS$DELTVA      = ^X80000110
        80000208 0000  SYS$SETEXV      = ^X80000208
        80000230 0000  SYS$SETPRT      = ^X80000230
```

```
                                        0000   848          .Subtitle       Data Psect Declarations
                                    00000000   849          .PSECT  DATA, SHR, NOEXE, NOWRT, BYTE
                                        0000   850 ;
                                        0000   851 ; Read only data
                                        0000   852 ;
                                        0000   853 CRD_Switch_1:
                         44 52 43 2F    0000   854          .ASCII  '/CRD'                                          ;       [100
                                        0004   855 CRD_Switch_2:
      45 43 41 52 54 5F 44 52 43 2F     0004   856          .ASCII  '/CRD_TRACE'
                                        000E   857 T_WRONGCPU:
44 49 20 6D 65 74 73 79 53 07 07 00'    000E   858          .ASCIC  <7><7>"System ID register type = !UB, expected !UB!/"   ;       [44]
79 74 20 72 65 74 73 69 67 65 72 20     001A
78 65 20 2C 42 55 21 20 3D 20 65 70     0026
2F 21 42 55 21 20 64 65 74 63 65 70     0032
                                   2F   000E
                                        003E   859
                                        003E   860 T_Both_CRD_Bits_Set:                                            ;       [75]
4E 49 20 52 4F 52 52 45 20 3F 3F 00'    003E   861          .Ascic  "?? ERROR IN STARTING CRD - INCORRECT BITS SET!/"       ;       [75]
52 43 20 47 4E 49 54 52 41 54 53 20     004A
43 45 52 52 4F 43 4E 49 20 2D 20 44     0056
2F 21 54 45 53 20 53 54 49 42 20 54     0062
                                   2F   003E
                                        006E   862 DS$GT_LEGAL::                                                  ;       [92]
20 20 20 20 20 20 20 2F 21 2F 21 00'    006E   863          .ASCIC  "!/!/                    VAX DIAGNOSTIC SOFTWARE" -          ;
20 20 20 20 20 20 20 20 20 20 20 20     007A
53 4F 4E 47 41 49 44 20 58 41 56 20     0086
45 52 41 57 54 46 4F 53 20 43 49 54     0092
20 20 20 20 20 20 20 20 20 20 2F 21     009E   864                  "!/                          PROPERTY OF" -                 ;
20 20 20 20 20 20 20 20 20 20 20 20     00AA
59 54 52 45 50 4F 52 50 20 20 20 20     00B6
                                 46 4F  00C2
20 20 20 20 20 20 20 20 20 20 2F 21     00C5   865                  "!/                 DIGITAL EQUIPMENT CORPORATION" -        ;
54 49 47 49 44 20 20 20 20 20 20 20     00D1
54 4E 45 4D 50 49 55 51 45 20 4C 41     00DD
4E 4F 49 54 41 52 4F 50 52 4F 43 20     00E9
20 20 20 20 20 20 20 20 2F 21 2F 21     00F5   866                  "!/!/              ***CONFIDENTIAL AND PROPRIETARY***" -     ;
4E 4F 43 2A 2A 2A 20 20 20 20 20 20     0101
4E 41 20 4C 41 49 54 4E 45 44 49 46     010D
52 41 54 45 49 52 50 4F 52 50 20 44     0119
                         2A 2A 2A 59    0125
75 41 20 65 73 55 2F 21 2F 21 2F 21     0129   867                  "!/!/!/Use Authorized Only Pursuant to a Valid Right-to-Use License"
6C 6E 4F 20 64 65 7A 69 72 6F 68 74     0135
74 20 74 6E 61 75 73 72 75 50 20 79     0141
69 52 20 64 69 6C 61 56 20 61 20 6F     014D
4C 20 65 73 55 2D 6F 74 2D 74 68 67     0159
                  65 73 6E 65 63 69     0165
                                   FC   006E
                                        016B   868
                                        016B   869
```

```
                                    016B   871          .Subtitle       Work Psect Declarations
                                00000000   872          .PSECT  WORK, NOSHR, NOEXE, WRT, LONG
                                    0000   873 DS$GT_COPYRIGHT::
                                4C' 0000   874          .BYTE   DS$GT_LEGAL_END - .-1           ; Form ASCIC format          [109
2C 74 68 67 69 72 79 70 6F 43 2F 21 0001   875          .ASCII  "!/Copyright, Digital Equipment Corporation,  "          ;      [109
75 71 45 20 6C 61 74 69 67 69 44 20 000D
6F 70 72 6F 43 20 74 6E 65 6D 70 69 0019
         20 20 2C 6E 6F 69 74 61 72 0025
                                    002E   876 DS$GT_COPYEAR::                                                          ; [115]
                        36 38 39 31 002E   877          .ASCII  "1986"                                                          ;G:19
74 68 67 69 52 20 6C 6C 41 20 20 2E 0032   878          .ASCII  ".  All Rights Reserved.!/!/"
21 2E 64 65 76 72 65 73 65 52 20 73 003E
                           2F 21 2F 004A
                                    004D   879 DS$GT_LEGAL_END::
                                    004D   880 ULTRIX_FILE:
                                0A' 004D   881          .BYTE   ULTRIX_END - .-1                ; Form ASCIC format          [114
                           2C 30 28 004E   882          .ASCII  "(0,"
                                    0051   883 ULTRIX_PARTITION:
                64 6C 65 69 66 29 36 0051   884          .ASCII  "6)field"
                                    0058   885 ULTRIX_END:
                                    0058   886 CRD_DESC:
                               000A 0058   887          .WORD   10                                                          ; [ 100 ]
                               010E 005A   888          .WORD   ^X010E                                                      ; [ 100 ]
                           00000060' 005C   889          .ADDRESS        CRD_DESC_BUF                                        ; [ 100 ]
                                    0060   890 CRD_DESC_BUF:
                           0000006A 0060   891          .BLKB   10                                                          ; [ 100 ]
                                    006A   892          .align  long
                                    006C   893 DS$FAB_INPUT::
                                    006C   894          $FAB    FAC=GET, FNA=SYS$INPUT+1, FNS=9
                                    006C               .SAVE   LOCAL_BLOCK
                                    006C               .PSECT  $ABS$,ABS
                           00000000 FE70               .=0
                                0000006C               .RESTORE
                                03 006C               .BYTE FAB$C_BID
                                50 006D               .BYTE FAB$C_BLN
                           000000BC 006E               .BLKB FAB$C_BLN-2
                           00000070 00BC               .=$$.TAB+FAB$L_FOP
                           00000000' 0070               .ADDRESS        $$.TMP
                           0000007C 0074               .=$$.TAB+FAB$L_ALQ
                           00000000' 007C               .ADDRESS        0
                               0000 0080               .WORD   0
                                02 0082               .BYTE   $$.TMP
                                00 0083               .BYTE   $$.TMP
                           00000000' 0084               .ADDRESS        0
                                00 0088               .BYTE   0
                                00 0089               .BYTE   FAB$C_SEQ
                                00 008A               .BYTE   $$.TMP
                                02 008B               .BYTE   FAB$C_VAR
                                00 008C               .BYTE   $$.TMP
                                00 008D               .BYTE   0
                               0000 008E               .WORD
                           00000000' 0090               .ADDRESS        0
                           00000000' 0094               .ADDRESS        0
                           0000018B' 0098               .ADDRESS        SYS$INPUT+1
                           00000000' 009C               .ADDRESS        0
                                09 00A0               .BYTE   9
                                00 00A1               .BYTE   0
```

```
                     0000  00A2                .WORD   0
                00000000' 00A4                .ADDRESS        0
                     0000  00A8                .WORD   0
                       00  00AA                .BYTE   0
                       00  00AB                .BYTE   0
                000000B4  00AC                .=$$.TAB+FAB$W_GBC
                     0000  00B4                .WORD   0
                       00  00B6                .BYTE   <<0@FAB$V_LNM_MODE> + <0@FAB$V_CHAN_MODE> + -
                000000BC  00B7                .=$$.TABEND
                          00BC   895
                          00BC   896 DS$RAB_INPUT::
                          00BC   897            $RAB    FAB=DS$FAB_INPUT, ROP=CVT
                          00BC                  .SAVE   LOCAL_BLOCK
                          00BC                  .PSECT  $ABS$,ABS
                00000000  FE70                .=0
                      000000BC                .RESTORE
                       01  00BC                .BYTE RAB$C_BID
                       44  00BD                .BYTE RAB$C_BLN
                00000100  00BE                .BLKB RAB$C_BLN-2
                000000C0  0100                .=$$.TAB+RAB$L_ROP
                04000000' 00C0                .ADDRESS        $$.TMP
                000000D4  00C4                .=$$.TAB+RAB$L_CTX
                00000000' 00D4                .ADDRESS        0
                000000DA  00D8                .=$$.TAB+RAB$B_RAC
                       00  00DA                .BYTE   RAB$C_SEQ
                       00  00DB                .BYTE   0
                     0000  00DC                .WORD   0
                     0000  00DE                .WORD   0
                00000000' 00E0                .ADDRESS        0
                00000000' 00E4                .ADDRESS        0
                00000000' 00E8                .ADDRESS        0
                00000000' 00EC                .ADDRESS        0
                       00  00F0                .BYTE   0
                       00  00F1                .BYTE   0
                       00  00F2                .BYTE   0
                       00  00F3                .BYTE   0
                00000000' 00F4                .ADDRESS        0
                0000006C' 00F8                .ADDRESS        DS$FAB_INPUT
                00000000' 00FC                .ADDRESS        0
                          0100   898
                          0100   899 DS$FAB_OUTPUT::
                          0100   900            $FAB    FAC=PUT, FNA=SYS$OUTPUT+1, FNS=10, FOP=CIF
                       03  0100                .BYTE FAB$C_BID
                       50  0101                .BYTE FAB$C_BLN
                00000150  0102                .BLKB FAB$C_BLN-2
                00000104  0150                .=$$.TAB+FAB$L_FOP
                02000000' 0104                .ADDRESS        $$.TMP
                00000110  0108                .=$$.TAB+FAB$L_ALQ
                00000000' 0110                .ADDRESS        0
                     0000  0114                .WORD   0
                       01  0116                .BYTE   $$.TMP
                       00  0117                .BYTE   $$.TMP
                00000000' 0118                .ADDRESS        0
                       00  011C                .BYTE   0
                       00  011D                .BYTE   FAB$C_SEQ
                       00  011E                .BYTE   $$.TMP
                       02  011F                .BYTE   FAB$C_VAR
```

```
                      00  0120                .BYTE   $$.TMP
                      00  0121                .BYTE   0
                    0000  0122                .WORD
                00000000' 0124                .ADDRESS        0
                00000000' 0128                .ADDRESS        0
                00000195' 012C                .ADDRESS        SYS$OUTPUT+1
                00000000' 0130                .ADDRESS        0
                      0A  0134                .BYTE   10
                      00  0135                .BYTE   0
                    0000  0136                .WORD   0
                00000000' 0138                .ADDRESS        0
                    0000  013C                .WORD   0
                      00  013E                .BYTE   0
                      00  013F                .BYTE   0
                00000148  0140                .=$$.TAB+FAB$W_GBC
                    0000  0148                .WORD   0
                      00  014A                .BYTE   <<0@FAB$V_LNM_MODE> + <0@FAB$V_CHAN_MODE> + -
                00000150  014B                .=$$.TABEND
                          0150   901
                          0150   902 DS$RAB_OUTPUT::
                          0150   903          $RAB    FAB=DS$FAB_OUTPUT, ROP=CCO
                      01  0150                .BYTE RAB$C_BID
                      44  0151                .BYTE RAB$C_BLN
                00000194  0152                .BLKB RAB$C_BLN-2
                00000154  0194                .=$$.TAB+RAB$L_ROP
                80000000' 0154                .ADDRESS        $$.TMP
                00000168  0158                .=$$.TAB+RAB$L_CTX
                00000000' 0168                .ADDRESS        0
                0000016E  016C                .=$$.TAB+RAB$B_RAC
                      00  016E                .BYTE   RAB$C_SEQ
                      00  016F                .BYTE   0
                    0000  0170                .WORD   0
                    0000  0172                .WORD   0
                00000000' 0174                .ADDRESS        0
                00000000' 0178                .ADDRESS        0
                00000000' 017C                .ADDRESS        0
                00000000' 0180                .ADDRESS        0
                      00  0184                .BYTE   0
                      00  0185                .BYTE   0
                      00  0186                .BYTE   0
                      00  0187                .BYTE   0
                00000000' 0188                .ADDRESS        0
                00000100' 018C                .ADDRESS        DS$FAB_OUTPUT
                00000000' 0190                .ADDRESS        0
                          0194   904
                          0194   905
                          0194   906 DS$GA_DS_Ctrl_C_First::                ; Address of 1st DS Control-C Handler   [70]
                00000000  0194   907          .Long   0                     ; No handler by default.                [51]
                          0198   908
                          0198   909 DS$GA_DS_Ctrl_C_Second::               ; Address of 2nd DS Control-C handler   [70]
                00000000  0198   910          .Long   0                     ; No handler by default.                [70]
                          019C   911
                          019C   912 DS$L_UserCntrlC::                      ;                                       [73]
                00000000  019C   913          .Long   0                     ; Address of user Control-C handler
                          01A0   914
                          01A0   915 EXIT$DESBLK:                           ; DESCRIPTOR OF EXIT HANDLER
                00000000  01A0   916          .LONG   0                     ; FORWARD LINK
```

```
00000E71' 01A4   917          .ADDRESS        EXIT$HANDLR     ; ADDRESS OF EXIT HANDLER
00000001  01A8   918          .LONG   1                       ; ONE PARAMETER
000001B0' 01AC   919          .ADDRESS        10$             ; ADDRESS TO STORE EXIT REASON
00000000  01B0   920 10$:     .LONG   0
          01B4   921
000001B8  01B4   922 SAVEFP: .BLKL   1                       ; INITIAL CONTENTS OF FP
          01B8   923
000001E0  01B8   924 DS$AT_DDIR:      .BLKW   20              ; Saved default directory
          01E0   925
00000208  01E0   926 DS$AT_DDEV:      .BLKW   20              ; Saved default device
          0208   927
00000408  0208   928 IMAGE_HEADER::   .BLKB   512             ; Storage for diagnostic's image header
          0408   929 IMAGE_HEADER_END::                       ; End of buffer.
          0408   930
          0408   931 ; The following location is for temporary usage until all mp modules are linked. [11
          0408   932                                                                                  ;G:6
00000000  0408   933 MP$GR_BOOTED_PROCESSORS::       .LONG 0 ; Structure to denote active mp system [112]
          040C   934
       00 040C   935 DS$GB_SYSTYPE:: .BYTE   0               ; SYSTEM TYPE (for MicroVax CPU)  [127] ;G:1
00000000  040D   936 DS$GL_SYSTYPE:  .LONG   0               ; and longword for FBI access     [133] ;G:2
          0411   937                                                                                ;G:15
00000000  0411   938 START_RUN_PC:   .LONG   0               ; PC in KB_CHECK                  [128] ;G:17
          0415   939                                         ; Item list for $GETJPIW call     [129] ;G:17
     0004 0415   940 CPUTIM:         .WORD   4               ; buffer length                   [129] ;G:17
     0407 0417   941                 .WORD   JPI$_CPUTIM     ; Item                            [129] ;G:17
00000425' 0419   942                 .ADDRESS JPICPUTIM      ; address of buffer               [129] ;G:17
00000429' 041D   943                 .ADDRESS JPICPUTIMS     ; return buffer length            [129] ;G:17
00000000  0421   944                 .LONG   0               ; end of list                     [129] ;G:17
00000000  0425   945 JPICPUTIM:      .LONG   0               ; Contains cpu time               [129] ;G:17
00000000  0429   946 JPICPUTIMS:     .LONG   0               ; Return # bytes of cpu time      [129] ;G:17
```

```
                     042D   948
                     042D   949 ;
                     042D   950 ; PERMANENT CCB DATA BASE
                     042D   951 ;
            00000040 042D   952 DS$K_CCB         ==      64              ; NUMBER OF CCB'S
                     042D   953
                     042D   954 CTL$GL_CCB::
            0000082D 042D   955         .BLKB   DS$K_CCB * CCB$C_LENGTH
                     082D   956
                     082D   957 CTL$GL_CCBBASE::
            0000082D' 082D  958         .ADDRESS        CTL$GL_CCBBASE
                     0831   959
                     0831   960 SCH$GL_CURPCB::          ; And Incidentially the current PCB address
                     0831   961 DS$GL_PCBVEC::           ; List of PCB's (indexed) (DS has only 1)
            00000000' 0831  962         .ADDRESS DS$AX_SOFTPCB          ; Address of software PCB
                     0835   963
                     0835   964 ;
                     0835   965 ; FORK QUEUE LISTHEADS
                     0835   966 ;
                     0835   967
                     0835   968 ;       .ALIGN  QUAD
                     0835   969 SWI$GL_FQFL::                            ; FORWARD LINK
            00000835' 0835  970 A:      .LONG   A                       ; IPL-6 LISTHEAD
                     0839   971
                     0839   972 SWI$GL_FQBL::                            ; BACKWARD LINK
            00000835' 0839  973         .LONG   A                       ;
0000083D'0000083D' 083D     974 2$:     .LONG   2$,2$                   ; IPL-7 LISTHEAD
00000845'00000845' 0845     975 3$:     .LONG   3$,3$                   ; IPL-8 LISTHEAD
0000084D'0000084D' 084D     976 4$:     .LONG   4$,4$                   ; IPL-9 LISTHEAD
00000855'00000855' 0855     977 5$:     .LONG   5$,5$                   ; IPL-10 LISTHEAD
0000085D'0000085D' 085D     978 6$:     .LONG   6$,6$                   ; IPL-11 LISTHEAD
                     0865   979
            00000869 0865   980 BOOT$L_ADP::     .BLKL   1               ; Address of BOOT adapter                   [91]
            0000086D 0869   981 BOOT$L_CSR::     .BLKL   1               ; Address of BOOT device csr                [91]
            00000871 086D   982 BOOT$L_UNIT::    .BLKL   1               ; Unit number of Boot device                [91]
            00000875 0871   983 BOOT$L_R1::      .BLKL   1               ; BI port to boot from                      [117
            00000879 0875   984 BOOT$L_R2::      .BLKL   1               ; CI port station to boot from      [86][91]
            0000087D 0879   985 Boot$L_R5::      .BLKL   1               ; R5 with switches from VMB/DIAGBOOT        [71]
            00000881 087D   986 BOOT$L_DEVTYP:: .BLKL   1               ; device type of BOOT media:                [91]
                     0881   987                                        ; 0=massbus,1=RK06/07,2=RL01/02         ;G:36
                     0881   988 BOOT$L_SCORPIO_R3::                                                            ;G:34
            00000885 0881   989                 .BLKL   1               ; R3 contains #of console drive booted from
                     0885   990                                        ; 0=massbus,1=RK06/07,2=RL01/02         ;G:39
                     0885   991 RX50_DISK_SELECT::                                                            ;G:39
            00000889 0885   992                 .BLKL   1               ; contains #of console drive booted from (sc
            0000088D 0889   993 BOOT$A_CCA::     .BLKL   1               ; Addr of LLL's console communications area.
                     088D   994 DS$GQ_EFL::                             ; EVENT FLAGS, LOGICAL.
            00000891 088D   995 DS$GL_EFC0::     .BLKL   1               ; EVENT FLAG CLUSTER 0.
            00000895 0891   996 DS$GL_EFC1::     .BLKL   1               ; EVENT FLAG CLUSTER 1.
            00000899 0895   997 DS$GA_LASTADR:: .BLKL   1               ; LAST ADDRESS USED BY SUPERVISOR.
```

```
                        0899   999 ;
                        0899  1000 ; DYNAMIC EXECUTIVE STORAGE.
                        0899  1001 ;
                        0899  1002
0000000F                0899  1003 DS$K_ASCIBUF     == 15
00000200                0899  1004 DS$K_BUFSIZ      == 512
00000080                0899  1005 DS$K_STRBUF      == 128
                        0899  1006
0000089D                0899  1007 DS$GL_FLAGS::    .BLKL   1       ; SUPERVISOR INTERNAL FLAGS
0000089F                089D  1008 DS$GW_TTIN::     .BLKW   1
000008A1                089F  1009 DS$GW_TTOUT::    .BLKW   1
000008A5                08A1  1010 DS$GL_ERRCNT::   .BLKL   1       ; RUNNING ERROR COUNT.                          [50]
                        08A5  1011 DS$GL_HARDERR_COUNT::            ;                                               [50]
000008A9                08A5  1012                  .BLKL   1       ; Summary of Hard Errors                        [50]
                        08A9  1013 DS$GL_PREPERR_COUNT::            ;                                               [55]
000008AD                08A9  1014                  .BLKL   1       ; Summary of Device Peparation Errors           [55]
                        08AD  1015 DS$GL_SOFTERR_COUNT::            ;                                               [50]
000008B1                08AD  1016                  .BLKL   1       ; Summary of Soft Errors                        [50]
                        08B1  1017 DS$GL_DEVERR_COUNT::             ;                                               [50]
000008B5                08B1  1018                  .BLKL   1       ; Summary of Device Errors                      [50]
                        08B5  1019 DS$GL_SYSERR_COUNT::             ;                                               [50]
000008B9                08B5  1020                  .BLKL   1       ; Summary of System Errors                      [50]
                        08B9  1021 DS$GL_ERRSUP_COUNT::             ;                                               [50]
000008BD                08B9  1022                  .BLKL   1       ; Summary of ErrSup Errors                      [50]
000008C1                08BD  1023 DS$GL_NUMTEST::  .BLKL   1       ; NUMBER OF TESTS IN PROGRAM.
000008C5                08C1  1024 DS$GL_FSTTEST::  .BLKL   1       ; FIRST TEST TO EXECUTE
000008C9                08C5  1025 DS$GL_LSTTEST::  .BLKL   1       ; LAST TEST TO EXECUTE
000008CD                08C9  1026 DS$GL_SUBTEST::  .BLKL   1       ; SUBTEST NUMBER FOR LOOPING.
000008D1                08CD  1027 DS$GA_CHKLPPC::  .BLKL   1       ; ADDR OF CURRENT 'CHKLOOP' CALL
000008D5                08D1  1028 DS$GA_LOOPADR::  .BLKL   1       ; ADDRESS OF CURRENT SUBTEST
000008D9                08D5  1029 DS$GL_RUNTIM::   .BLKL   1       ; LOCATION TO HOLD ELAPSED RUN TIME
000008DD                08D9  1030 DS$GL_TIMESEC::  .BLKL   1       ; CONVERTED RUN TIME IN SECONDS
000008E1                08DD  1031 DS$GL_WAITIM::   .BLKL   1       ; NUMBER OF MICROSECONDS TO DELAY
000008E5                08E1  1032 DS$GL_RADIX::    .BLKL   1       ; DEFAULT RADIX.
000008E9                08E5  1033 DS$GL_SIZE::     .BLKL   1       ; DEFAULT DATA SIZE.
                        08E9  1034 DS$GQ_BUFQWD::                   ; BUFFER QUADWORD DESCRIPTOR.
000008ED                08E9  1035 DS$GL_BUFLEN::   .BLKL   1       ; LENGTH OF CURRENT BUFFER CONTENTS.
000008F1                08ED  1036 DS$GA_BUFPTR::   .BLKL   1       ; POINTS TO CURRENT POSITION
000008F2                08F1  1037 DS$GB_BYTEBUF::  .BLKB   1       ; ONE BYTE BUFFER FOR CHK K.B.
000008F3                08F2  1038 DS$GB_TYPECODE::.BLKB    1       ; Type code for 'SET BINARY' output             [46]
                        08F3  1039 DS$GB_INHIBIT_NAMING::           ; Flag byte for ATTACH                          [60]
000008F4                08F3  1040                  .BlkB   1       ;                                               [60]
00000903                08F4  1041 DS$GT_ASCIBUF::  .BLKB   DS$K_ASCIBUF    ; 15 BYTES FOR NUMERICAL ASCII
00000B03                0903  1042 DS$GT_BUFFER::   .BLKB   DS$K_BUFSIZ     ; INPUT-OUTPUT BUFFER
00000B83                0B03  1043 DS$GT_STRBUF::   .BLKB   DS$K_STRBUF     ; COUNTED ASCII STRING BUFFER
00000B8B                0B83  1044 DS$GL_TERMCHAR::.BLKQ    1       ; Characteristics of user terminal      [87]
```

```
                                  0B8B  1046          .SBTTL  GLOBAL PSECT DECLARATIONS FOR VSDP                          ;G:28
                         00000000 0B8B  1047 DEVCHAR:    .LONG        0                                  ; [134]       ;G:28
                         00000000 0B8F  1048 PID:     .LONG   0                                          ; [134]       ;G:28
                         00000B97 0B93  1049 PIDNO:   .BLKL   1                                          ; [134]       ;G:28
                         00000B9B 0B97  1050 PIDNOS:  .BLKL   1                                          ; [134]       ;G:28
                             000C 0B9B  1051 ITEMS:   .WORD   12                                         ; [134]       ;G:28
                             0319 0B9D  1052          .WORD   JPI$_PID                                   ; [134]       ;G:28
                         00000B93' 0B9F  1053          .ADDRESS PIDNO                                                   ;G:28
                         00000B97' 0BA3  1054          .ADDRESS PIDNOS                                                  ;G:28
                         00000000 0BA7  1055          .LONG   0                                          ; [134]       ;G:28
                         00000BB3 0BAB  1056 IOSB:    .BLKQ   1                                          ; [134]       ;G:28
                                  0BB3  1057 GLBL_SECT_NAME:                                                              ;G:28
                         0000000C 0BB3  1058          .LONG   12                                         ; [134]       ;G:28
                         00000BC3' 0BB7  1059          .ADDRESS FAOBUF                                    ; [134]       ;G:28
                                  0BBB  1060 GLBL_SECT_AREA:                                                              ;G:28
                         00000BC3 0BBB  1061          .BLKL   2                                                        ;G:28
                         00000BCF 0BC3  1062 FAOBUF:  .BLKB   12                                         ; [134]       ;G:28
                         00000BD1 0BCF  1063 FAOLEN:  .BLKW   1                                                        ;G:28
                         00000BD3 0BD1  1064          .BLKW   1                                          ; [134]       ;G:28
                                  0BD3  1065 CTRL_STR:                                                                    ;G:28
58 21 5F 43 53 47 00000BDB'010E0000' 0BD3  1066          .ASCID /GSC_!XL/                                   ; [134]       ;G:28
                               4C 0BE1
                                  0BE2  1067 ;                                                                            ;G:28
```

```
                                 0BE2  1069          .Subtitle       Data Psect Declarations
                             0000016B  1070          .PSECT  DATA, SHR, NOEXE, NOWRT, BYTE
                                 016B  1071
                                 016B  1072          MODNAM  KERNEL
          4C 45 4E 52 45 4B 00'  016B        $MODULE:        .ASCIC  \KERNEL\
                             06  016B
                                 0172  1073
             00000000'00000000'  0172  1074 SYSVEC: .LONG   DS$AQ_SYSSRV, DS$AQ_SSEND       ; SYSTEM SERVICE VECTORS.
                                 017A  1075
                                 017A  1076 SSPROT: $CRETVA INADR=SYSVEC
                       00000003'  017A                      .ADDRESS        3
                       00000172'  017E                      .ADDRESS        SYSVEC
                       00000000'  0182                      .ADDRESS        0
                       00000000'  0186                      .ADDRESS        0
                                 018A  1077
```

018A 1079 SYS$INPUT:

```
      54 55 50 4E 49 24 53 59 53 00' 018A  1081          .ASCIC  "SYS$INPUT"
                                 09  018A
                                     0194  1082 SYS$OUTPUT:
   54 55 50 54 55 4F 24 53 59 53 00' 0194  1083          .ASCIC  "SYS$OUTPUT"
                                 0A  0194
                                     019F  1084
                0000FE00 0000FE00  019F  1085 SUPBUF: .LONG   DSA$AL_APTMAIL,DSA$AL_APTMAIL ; APT MAILBOX AREA
```

```
                          01A7  1087
0000F9FF 00000200         01A7  1088 PRGBUF: .LONG   DS$A_PRGBGN,DS$A_PRGBGN+DS$K_PRGSIZ-1 ; PROGRAM OVERLAY AREA
                          01AF  1089 ;                                                        [101]
```

```
                        01AF  1091          .SBTTL  DIAGNOSTIC SUPERVISOR BOOTSTRAP ROUTINE.
                    00000000  1092          .PSECT  CODE, EXE, NOWRT, SHR, LONG
                        0000  1093 ;++
                        0000  1094 ; FUNCTIONAL DESCRIPTION:
                        0000  1095 ;
                        0000  1096 ;       INITIAL SETUP ROUTINE FOR STAND ALONE VERSIONS OF THE DIAGNOSTIC
                        0000  1097 ;       SUPERVISOR.
                        0000  1098 ;
                        0000  1099 ; CALLING SEQUENCE:
                        0000  1100 ;
                        0000  1101 ;       NONE
                        0000  1102 ;
                        0000  1103 ; INPUT PARAMETERS:
                        0000  1104 ;
                        0000  1105 ;       NONE
                        0000  1106 ;
                        0000  1107 ; IMPLICIT INPUTS:
                        0000  1108 ;
                        0000  1109 ;       NONE
                        0000  1110 ;
                        0000  1111 ; OUTPUT PARAMETERS:
                        0000  1112 ;
                        0000  1113 ;       NONE
                        0000  1114 ;
                        0000  1115 ; IMPLICIT OUTPUTS:
                        0000  1116 ;
                        0000  1117 ;       NONE
                        0000  1118 ;
                        0000  1119 ; COMPLETION CODES:
                        0000  1120 ;
                        0000  1121 ;       NONE
                        0000  1122 ;
                        0000  1123 ; SIDE EFFECTS:
                        0000  1124 ;
                        0000  1125 ;       Plenty!
                        0000  1126 ;
                        0000  1127 ;--
```

```
                                0000  1129 ;+
                                0000  1130 ; Normal Diagnostic Supervisor (in stand-alone mode) entry from START 10000
                                0000  1131 ;-
                                0000  1132
                                0000  1133 BOOT::
                    12   1F    DA  0000  1134          MTPR    #31,#PR$_IPL                    ; RAISE IPL TO 1F
                5E  00000000'8F  D0  0003  1135          MOVL    #ISTKPTR, SP                    ; INITIALIZE INTERRUPT STACK
                    52   50    D0  000A  1136          MOVL    R0,R2                           ; Save Flag
                50   01   06    78  000D  1137          ASHL    #9-3, #1, R0                    ; PAGE OF QUADWORDS COUNT.
                51  0000FE00'EF  DE  0011  1138          MOVAL   DSA$AL_APTMAIL, R1              ; START OF APT MAILBOX, ETC.
                        81    7C  0018  1139 10$:     CLRQ    (R1)+                           ; CLEAR IT.
                      FB 50   F5  001A  1140          SOBGTR  R0, 10$                         ; UNTIL END.
0000FE00'EF     00003000 8F   C8  001D  1141          BISL2   #DSA$M_DFLTFLGS, DSA$GL_FLAGS   ; SET DEFAULT FLAGS.
                                0028  1142
                00000865'EF   D5  0028  1143          TSTL    BOOT$L_ADP                      ; Check one-shot flag
                        08    12  002E  1144          BNEQ    12$                             ; Branch if shot                [114
                    50   3E   DB  0030  1145          MFPR    #PR$_SID,R0                     ; Get SID register
                    52   50    D1  0033  1146          CMPL    R0,R2                           ; Entered from DIAGBOOT?
                        03    13  0036  1147          BEQL    15$                             ;                               [114
                      009E    31  0038  1148 12$:     BRW     30$                             ; Branch if not                 [114
        00000865'EF   5C  AB    D0  003B  1149 15$:     MOVL    RPB$L_ADPPHY(R11),L^BOOT$L_ADP  ; Save adapter address
        00000869'EF   54  AB    D0  0043  1150          MOVL    RPB$L_CSRPHY(R11),L^BOOT$L_CSR  ; Save device csr address
        0000086D'EF   64  AB    3C  004B  1151          MOVZWL  RPB$W_UNIT(R11),L^BOOT$L_UNIT   ; Save boot unit number        [93]
        00000871'EF   20  AB    D0  0053  1152          MOVL    RPB$L_BOOTR1(R11),L^BOOT$L_R1   ; Save BI number               [117
        00000875'EF   24  AB    D0  005B  1153          MOVL    RPB$L_BOOTR2(R11),L^BOOT$L_R2   ; Save CI port number          [86]
        00000879'EF   30  AB    D0  0063  1154          MOVL    RPB$L_BOOTR5(R11),L^BOOT$L_R5   ; Save flags from boot
        0000087D'EF   66  AB    9A  006B  1155          MOVZBL  RPB$B_DEVTYP(R11), -
                                    0073  1156                  L^BOOT$L_DEVTYP                 ; Save device type from boot
            50   50   E8  8F    78  0073  1157          ASHL    #-24,R0,R0                      ; Get upper byte of PR$_SID     [136
                    0A   50    91  0078  1158          CMPB    R0,#PR$_SYS_TYP_LLL             ; Are we a LLL system?  [136] ;G:35
                         08    12  007B  1159          BNEQ    17$                             ; If not skip next line         [136
        00000889'EF   2C  AB    D0  007D  1160          MOVL    RPB$L_BOOTR4(R11),BOOT$A_CCA    ; Save addr of LLL's CCA.       [136
                5A   68  AB    9E  0085  1161 17$:     MovAB   RPB$T_File(R11), R10            ; point to ASCIC file name      [52]
                    59   8A    9A  0089  1162          MovZBL  (R10)+, R9                      ; get length/address in R9/R10  [52]
                         1D    12  008C  1163          BNEQ    20$                             ; Branch if present            [114
50      00000879'EF   04   1C    EE  008E  1164          EXTV    #28,#4,L^BOOT$L_R5,R0           ; Get partition value          [114
        00000051'EF   50   30    81  0097  1165          ADDB3   #^A"0",R0,L^ULTRIX_PARTITION    ; Put ascii number in text     [114
             5A  0000004D'EF  9E  009F  1166          MOVAB   ULTRIX_FILE,R10                 ; Address of default specs     [114
                    50   8A    9A  00A6  1167          MOVZBL  (R10)+,R0                       ; Length of string             [114
                         1A    11  00A9  1168          BRB     25$                             ; Set ULTRIX default           [114
                    50   59    D0  00AB  1169 20$:     MOVL    R9,R0                           ; Length of string             [114
                    6A   28    91  00AE  1170          CMPB    #^A"(",(R10)                    ; Check if ULTRIX              [114
                         12    13  00B1  1171          BEQL    25$                             ; Branch to use entire string  [114
                    50   6A    9A  00B3  1172          MovZBL  (R10), R0                       ; Get first character of name  [52]
                    50   02    80  00B6  1173          AddB2   #2, R0                          ; Make ] or > for end of dir.  [52]
                6A  59   50    3A  00B9  1174          LocC    R0, R9, (R10)                   ; Search for end of directory  [52]
                         1A    13  00BD  1175          BEql    30$                             ; Exit if not found            [52]
                50   51   5A    C3  00BF  1176          SubL3   R10, R1, R0                     ; Compute length of the        [52]
                         50    D6  00C3  1177          IncL    R0                              ; .. file name string          [52]
                    51   5A    D0  00C5  1178 25$:     MovL    R10, R1                         ; Get address of string        [52]
            52  00000000'EF   DE  00C8  1179          MovAL   L^Ds$GL_CliBase, R2             ; Point to CLI data base       [52]
                 08 A2   50    7D  00CF  1180          MovQ    R0, Cli$Q_File(R2)              ; Set it up for SET LOAD       [52]
                00000000'EF    16  00D3  1181          Jsb     L^Dsv$SetLoad                   ; And do the SET LOAD command  [58]
                                00D9  1182 30$:
```

```
                                00D9  1184 ;+
                                00D9  1185 ; APT ENTRY POINT FROM START 10004
                                00D9  1186 ;-
                                00D9  1187 APT::
                     12   1F    DA  00D9  1188          MTPR    #31,#PR$_IPL                    ; RAISE IPL TO HOLD OFF
                                00DC  1189                                                      ; ANY INTERRUPTS
            5E    00000000'8F   D0  00DC  1190          MOVL    #ISTKPTR,SP                     ; SET INTERRUPT STACK
                        5D    D4  00E3  1191          CLRL    FP                              ; NO PREVIOUS STACK FRAME
            0000FE14'EF   3E    DB  00E5  1192          MFPR    #PR$_SID,DSA$GL_SID             ; SID SAVED IN FULL
                                00EC  1193 ;+                                                                           ;G:34
                                00EC  1194 ;  If Scorpio save R3                                                        ;G:34
                                00EC  1195 ;-                                                                           ;G:34
            05    0000FE17'EF   91  00EC  1196          CMPB    DSA$GL_SID+3,#PR$_SID_TYP8SS    ; Is it a Scorpio?                [139
                          10    12  00F3  1197          BNEQ    1$                              ; If NO branch, ELSE save         [139
            02    00000885'EF   91  00F5  1198          CMPB    RX50_DISK_SELECT,#2             ; Already booted from csa2?   ;G:40
                          07    13  00FC  1199          BEQL    1$                              ; Yes? Leave this as the drive # ;G:
            00000885'EF   53    D0  00FE  1200          MOVL    R3,RX50_DISK_SELECT             ; # of drive booted from          [139
    00000000'EF   0000FE17'EF   90  0105  1201 1$:       MOVB    DSA$GL_SID+3, -                                                 ;G:34
                                0110  1202                  EXE$GB_CPUTYPE                  ; Load processor type for BOOTDRIVR
            10    00000000'EF   91  0110  1203          CMPB    EXE$GB_CPUTYPE,#PR$_SID_TYPRTUV2; Is CPU type a RT  MicroVax2? [130]
                          09    13  0117  1204          BEQL    2$                              ; Yes                         [130] ;G:
            08    00000000'EF   91  0119  1205          CMPB    EXE$GB_CPUTYPE,#PR$_SID_TYPUV2  ; Is CPU type a MicroVax2? [127] ;G:
                          3D    12  0120  1206          BNEQ    3$                              ; NO, let SYSTYPE = 0         [127] ;G:
    0000040D'EF   20040004 9F   D0  0122  1207 2$:       MOVL    @#SYS_TYPE,DS$GL_SYSTYPE        ; Get Sys Type from IOSPACE[127][133
    0000040C'EF   00000410'EF   90  012D  1208          MOVB    DS$GL_SYSTYPE+3,DS$GB_SYSTYPE   ; Move upper byte of longw.[133] ;G:
            03    0000040C'EF   91  0138  1209          CMPB    DS$GB_SYSTYPE,#PR$_SYS_TYP900   ; Is this an Andromeda sys [127] ;G:
                          1E    12  013F  1210          BNEQ    3$                              ; NO, then branch             [127] ;G:
            50    3FFFE400 9F   D0  0141  1211          MOVL    @#PPA_SPID,R0                   ; Get CPU ID from IOspace  [127][133
                  00000000'EF   50  F6  0148  1212          CVTLB   R0,PPA$GB_CPU                   ; Move it into a byte      [133] ;G:
50  00000000'EF     06    02    EF  014F  1213          EXTZV   #2,#6,PPA$GB_CPU,R0             ; EXTRACT the Module #     [133] ;G:
                  00000000'EF   50  F6  0158  1214          CVTLB   R0,PPA$GB_MID                   ; and move the lower byte  [133] ;G:
                                015F  1215                                                                              ;G:15
 00000899'EF      00000082 8F   D0  015F  1216 3$:       MOVL    #DS$M_CMDFLG ! DS$M_LODFLG, -   ; SET COMMAND AND LOAD MODE FLAGS. ;
                                016A  1217                    L^DS$GL_FLAGS
            000008E1'EF   10    D0  016A  1218          MOVL    #16, L^DS$GL_RADIX              ; SET UP DEFAULT RADIX.
            11    00000000'8F   DA  0171  1219          MTPR    #SCB_IMAGE, #PR$_SCBB           ; SYSTEM CONTROL BLOCK BASE.
            10    00000000'8F   DA  0178  1220          MTPR    #PCB_BASE, #PR$_PCBB            ; PROCESS CONTROL BLOCK BASE.
                                017F  1221 ;
                                017F  1222 ; CLEAR ALL BUFFER AREAS.
                                017F  1223 ;
            50    00000000'EF   DE  017F  1224          MOVAL   AX_BUFF, R0                     ; START OF BUFFERS.
                          80    7C  0186  1225 10$:     CLRQ    (R0)+                           ; CLEAR IT.
            00000000'8F   50    D1  0188  1226          CMPL    R0, #POPT_BASE                  ; CHECK FOR ENOUGH.               ;G:34
                          F5    19  018F  1227          BLSS    10$                             ; LOOP TIL DONE.
                                0191  1228
                                0191  1229 ;
                                0191  1230 ; SYSTEM CONTROL BLOCK INITIALIZATION.
                                0191  1231 ;
            50    00000000'8F   D0  0191  1232          MOVL    #XDELTBIT,R0                    ; Get address of Tbit handler
                          1E    13  0198  1233          BEQL    20$                             ; Branch if no XDELTA linked
            51    00000000'EF   DE  019A  1234          MOVAL   SCB_IMAGE,R1                    ; Point to SCBB
                    28 A1   60    DE  01A1  1235          MOVAL   (R0),SCB$L_TBIT(R1)             ; Set tbit vector
        2C A1   00000000'EF   9E  01A5  1236          MOVAB   XDELBPT,SCB$L_BREAK(R1)         ; Set breakpoint vector
        03 00000879'EF    02    E1  01AD  1237          BBC     #RPB$V_INIBPT,BOOT$L_R5,20$     ; Branch if no initial breakpoint
                        010A    30  01B5  1238          BSBW    INI$BRK                         ; Initial XDELTA breakpoint
                                01B8  1239 20$:
                                01B8  1240 ;
```

```
                          01B8  1241 ; Disable recognition of ^C's for the duration of this stand-alone              [66]
                          01B8  1242 ; initialization. Note that the KB_Check routine MUST NOT be called before      [66]
                          01B8  1243 ; this is executed!!!!!                                                         [66]
                          01B8  1244 ;
                          01B8  1245
                          01B8  1246          $DS_CntrlC_S    Disabl=#1                   ; Set Disable flag         [66]
                    01    DD  01B8                  PUSHL   #1
                    00    DD  01BA                  PUSHL   #0
        00000000'9F 02    FB  01BC                  CALLS   #2, a#DS$CNTRLC
                          01C3  1247
             00000194'EF  D4  01C3  1248          ClrL    L^DS$GA_DS_Ctrl_C_First     ; Clear the VDS's 1st ^C routine[72]
             00000198'EF  D4  01C9  1249          ClrL    L^DS$GA_DS_Ctrl_C_Second    ; Clear the VDS's 2nd ^C routine[72]
             0000019C'EF  D4  01CF  1250          ClrL    L^DS$L_UserCntrlC           ; Clear the User's ^C handler  [72]
                          01D5  1251
                          01D5  1252 ;
                          01D5  1253 ; Check correct processor type for this supervisor
                          01D5  1254 ;
              50  00'8F   9A  01D5  1255          MOVZBL  #<DS$GK_SIDa-24>,R0         ; Get expected value for type
        50    0000FE17'EF 91  01D9  1256          CMPB    DSA$GL_SID+3,R0             ; Same as current?
                    23    13  01E0  1257          BEQL    30$                         ; Branch if so
                 50 10    91  01E2  1258          CMPB    #PR$_SID_TYPRTUV2,R0        ; Was RT-VAX expected          [132
                    09    12  01E5  1259          BNEQ    28$                         ; Branch if not, error.        [132
        0000FE17'EF 08    91  01E7  1260          CMPB    #PR$_SID_TYPUV2,DSA$GL_SID+3 ; Is it AURORA ?              [132
                    15    13  01EE  1261          BEQL    30$                         ; Allow both AURORA and RT-VAX [132
                          01F0  1262                                                                               ;G:20
                          01F0  1263 28$:     $PRINTI_S       T_WRONGCPU, -                                        ;G:20
                          01F0  1264                    DSA$GL_SID+3,R0             ; No, inform the operator
                    50    DD  01F0                  PUSHL   R0
             0000FE17'EF  DD  01F2                  PUSHL   DSA$GL_SID+3
             0000000E'EF  9F  01F8                  PUSHAB  T_WRONGCPU
        00000000'EF 03    FB  01FE                  CALLS   #$$N, DSX$PRINTI
                          0205  1265 ;
                          0205  1266 ; Do CPU specific stuff
                          0205  1267 ;
             00000000'EF  16  0205  1268 30$:    JSB     ONLY_CPU                    ;                              [126
                          020B  1269                                                                               ;G:7
                          020B  1270 ;                                                                             ;G:7
                          020B  1271 ; Initialize the SCB                                                          ;G:7
                          020B  1272 ;                                                                             ;G:7
                          020B  1273          $DS_INITSCB_G                           ; Initialize SCB             ;G:7
        00000000'9F 6E    FA  020B                  CALLG   (SP), a#DS$INITSCB
                          0212  1274
                          0212  1275                                                                               ;G:8
                          0212  1276 ;
                          0212  1277 ; MEMORY MANAGEMENT INITIALIZATION.
                          0212  1278 ;
                          0212  1279
             00000000'EF  16  0212  1280 40$:    JSB     L^MAPMEM                    ; Map physical memory          ;G:8
                          0218  1281
        00000000'EF 6E    FA  0218  1282          CALLG   (SP),QIO$INITIALIZE         ; SETUP QIO DATABASE
             00000000'EF  7C  021F  1283          CLRQ    L^DS$GL_BUFCNT              ; INIT BUFFER COUNTS, P0 + P1.
             00000008'EF  7C  0225  1284          CLRQ    L^DS$GL_BUFCNT+8            ;  SYS AND (UNUSED).
                 38  00    DA  022B  1285          MTPR    #0, #PR$_MAPEN              ;
             00000000'EF  94  022E  1286          CLRB    DS$GB_MM_ENB            ; Memory management not enabled
                          0234  1287
                          0234  1288 ;
                          0234  1289 ; INITIALIZE PROCESS CONTROL BLOCK.
```

```
                                0234  1290 ;
                                0234  1291
                                0234  1292 ;
                                0234  1293 ; INITIALIZE EXE$GQ_SYSTIME (SYSTEM DATE/TIME QUADWORD)
                                0234  1294 ;
                                0234  1295
00000007'EF   0000000F'EF   D0  0234  1296          MOVL    L^DS$GQ_DAYTIM+15, -            ; GET YEAR FROM LINK DATE
                                023F  1297            L^DS$GT_NEWYEAR+7
    00000000'EF    0000'8F   3C  023F  1298          MOVZWL  #DS$K_NYSIZ, L^DS$GQ_CURYEAR    ; BUILD A STRING DESCRIPTOR
00000004'EF   00000000'EF   DE  0248  1299          MOVAL   L^DS$GT_NEWYEAR, -
                                0253  1300            L^DS$GQ_CURYEAR+4
                                0253  1301          $BINTIM_S  L^DS$GQ_CURYEAR, L^DS$GQ_CURYEAR
              00000000'EF   7F  0253                        PUSHAQ  L^DS$GQ_CURYEAR
              00000000'EF   7F  0259                        PUSHAQ  L^DS$GQ_CURYEAR
         00000000'GF    02   FB  025F                        CALLS   #2,G^SYS$BINTIM
00000000'EF   00000000'EF   7D  0266  1302          MOVQ    L^DS$GQ_CURYEAR, EXE$GQ_SYSTIME ; PRIME SYSTIME WITH THIS YEAR
              00000000'EF   16  0271  1303          JSB     HDW_CLOCK_SET                   ; Do cpu specific clock setup.  [104
                                0277  1304                                                  ; Reads/sets WATCH chip/TODR    [104
                                0277  1305                                                  ; for 11/zzz,11/bbb.            [104
                                0277  1306                                                                                  ;G:8
              00000000'EF   16  0277  1307          JSB     L^CLK$RE_INIT                   ; INIT INTERVAL TIMER AND CLOCK
              00000000'EF   16  027D  1308          JSB     L^DSR$SETIMR_INI                ; INIT THE TIMER QUEUE'S
                                0283  1309
00000000'EF   00000000'EF   D0  0283  1310          MOVL    ONLY$GL_TENUSEC,EXE$GL_TENUSEC  ; For TIMEDWAIT macro           [113
00000000'EF   00000000'EF   D0  028E  1311          MOVL    ONLY$GL_UBDELAY,EXE$GL_UBDELAY  ; For TIMEDWAIT macro           [113
                                0299  1312
                                0299  1313 ;        PUSHL   #0                              ; CLEAR CONTROL-C HANDLER       [66]
                                0299  1314 ;        CALLS   #1,L^DSX$CNTRLC                                                 [66]
                                0299  1315
              00000000'EF   16  0299  1316          JSB     L^INI$PTABLE                    ; Clear P-table pointers
                                029F  1317
              0000088A'EF   16  029F  1318          JSB     L^INIT_CONTEXT                  ; Initialize Context....
                                02A5  1319
              00000000'EF   16  02A5  1320 50$:     JSB     L^INI$LOAD_DEVICE               ; Make ptables for console and  [91]
                                02AB  1321                                                  ; boot devices                  [91]
                                02AB  1322
                                02AB  1323 ; Size the console terminal.                                                 [87]
                                02AB  1324
00000000'EF   00   FB           02AB  1325          CALLS   #0,SIZE_TERM                    ;                               [87]
                                02B2  1326
                                02B2  1327 ;
                                02B2  1328 ; Initialize RMS file control block pointer table (RMS$FILE_TABLE)
                                02B2  1329 ;
              00000000'EF   16  02B2  1330          JSB     L^RMS$INIT                      ; Call initialization routine
                                02B8  1331
                                02B8  1332 ;
                                02B8  1333 ; Load cpu microcode patches                                                 [98]
                                02B8  1334 ;
                                02B8  1335
                                02B8  1336          $DS_LOADPCS_S                           ; Loads patches from onboard    [78]
00000000'9F   00   FB           02B8                        CALLS   #0, a#DS$LOADPCS
                                02BF  1337                                                  ; supervisor image if a COMET   [78]
                                02BF  1338                                                  ; looks for a file if 11/ZZZ    [98]
                03BD   31       02BF  1339          BRW     BEGIN0
                                02C2  1340
                                02C2  1341 INI$BRK::
                          03    02C2  1342          BPT                                     ; Known XDELTA breakpoint
```

```
                    05  02C3  1343          RSB                                  ; Return
                        02C4  1344 DS$SOFTIPL5::
        00000000'8F  D5  02C4  1345          TSTL    #XDELBPT                     ; XDELTA present?
                  02  13  02CA  1346          BEQL    10$                          ; Branch if not
                  F4  10  02CC  1347          BSBB    INI$BRK                      ; Take XDELTA breakpoint
                    02  02CE  1348 10$:      REI                                  ; Return from IPL 5
```

```
                        02CF  1350          .SBTTL  USEP KERNEL ROUTINE
                    000002CF  1351          .PSECT  CODE, SHR, EXE, NOWRT, BYTE
                        02CF  1352 ;++
                        02CF  1353 ; FUNCTIONAL DESCRIPTION:
                        02CF  1354 ;
                        02CF  1355 ;       Entry from command mode, perform usermode only initialization.
                        02CF  1356 ;
                        02CF  1357 ; CALLING SEQUENCE:
                        02CF  1358 ;
                        02CF  1359 ;       CALLS   #0,DS$USERMODE
                        02CF  1360 ;
                        02CF  1361 ; INPUT PARAMETERS:      NONE
                        02CF  1362 ;
                        02CF  1363 ; IMPLICIT INPUTS:       NONE
                        02CF  1364 ;
                        02CF  1365 ; OUTPUT PARAMETERS:     NONE
                        02CF  1366 ;
                        02CF  1367 ; IMPLICIT OUTPUTS:      NONE
                        02CF  1368 ;
                        02CF  1369 ; COMPLETION CODES:      NONE
                        02CF  1370 ;
                        02CF  1371 ; SIDE EFFECTS:          NONE
                        02CF  1372 ;
                        02CF  1373 ;--
```

```
                          0FFC  02CF  1375 .ENTRY  DS$USERMODE,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>
            00000899'EF    D4  02D1  1376         CLRL    DS$GL_FLAGS                ; Clear flags initially
                               02D7  1377         $CRETVA_S  L^SUPBUF                ; GET ACCESS TO APT MAILBOX AREA
                       00      DD  02D7                    PUSHL   #0
                       00      DD  02D9                    PUSHL   #0
                0000019F'EF    7F  02DB                    PUSHAQ  L^SUPBUF
            800000C8'GF    03  FB  02E1                    CALLS   #3,G^SYS$CRETVA
                               02E8  1378         $CRETVA_S  L^PRGBUF                ; GET ACCESS TO PROGRAM OVERLAY AREA
                       00      DD  02E8                    PUSHL   #0
                       00      DD  02EA                    PUSHL   #0
                000001A7'EF    7F  02EC                    PUSHAQ  L^PRGBUF
            800000C8'GF    03  FB  02F2                    CALLS   #3,G^SYS$CRETVA
                               02F9  1379         $SETEXV_S #1,COND_DEBUG            ; SET UP EXCEPTION HANDLER FOR DEBUG
                       00      DD  02F9                    PUSHL   #0
                       00      DD  02FB                    PUSHL   #0
                00000000'EF    DF  02FD                    PUSHAL  COND_DEBUG
                       01      DD  0303                    PUSHL   #1
            80000208'GF    04  FB  0305                    CALLS   #4,G^SYS$SETEXV
            6D  00000000'EF    DE  030C  1380         MOVAL   L^COND_HANDLR,(FP)         ; SET UP SUPERVISOR'S EXCEPTION HANDLER
                               0313  1381         $DELTVA_G       L^SSPROT           ; UNPROTECT SYSTEM SERVICE VECTORS.
    80000110'GF 0000017A'EF    FA  0313                    CALLG   L^SSPROT,G^SYS$DELTVA
                               031E  1382         $CRETVA_G       L^SSPROT           ; RECAPTURE SPACE.
    800000C8'GF 0000017A'EF    FA  031E                    CALLG   L^SSPROT,G^SYS$CRETVA
                               0329  1383         $DCLEXH_S EXIT$DESBLK              ; Declare image exit handler
                000001A0'EF    DF  0329                    PUSHAL  EXIT$DESBLK
            00000000'GF    01  FB  032F                    CALLS   #1,G^SYS$DCLEXH
        80000000'EF  0000'8F   28  0336  1384         MOVC3   #DS$K_SSSIZE, -            ; COPY STARLET SYSTEM SERVICE VECTORS.
                00000000'EF        033F  1385                   ^X80000000, L^DS$AQ_SYSSRV    ; IN ORDER TO GET THE CORRECT
                                   0344  1386                                          ; WORD MASK FOR CALLx
                                   0344  1387 ;
                                   0344  1388 ; SET UP THE COPIED STARLET SYSTEM SERVICE VECTORS TO JMP TO 80000xxx          [77]
                                   0344  1389 ; SO WE DON'T HAVE TO WORRY THAT THE SYSTEM SERVICE VECTOR CODE REMAINS IN      [77]
                                   0344  1390 ; 3 PAGES (WHICH IS ALL WE HAVE ROOM FOR IN ENTRY)                             [77]
                                   0344  1391 ;
        50  80000002 8F    D0  0344  1392         MOVL    #^X80000002,R0             ; BEGINNING OF SYSTEM SERVICE VECTOR  [77]
        51  00000000'EF    DE  034B  1393         MOVAL   DS$AQ_SYSSRV,R1            ; 10200                               [77]
                               0352  1394                                          ; QIOW                                [77]
         02 A1    9F17  8F    B0  0352  1395         MOVW    #^X9F17,2(R1)              ; JMP OPCODE, SKIPPING WORD MASK      [77]
              04 A1    50    D0  0358  1396         MOVL    R0,4(R1)                   ; ABSOLUTE ADDRESS 80000002           [77]
                               035C  1397                                          ; CALL_HANDL                          [77]
                 50    0E    C0  035C  1398         ADDL2   #^XE,R0                    ; 80000010                            [77]
         10 A1    9F17  8F    B0  035F  1399         MOVW    #^X9F17,^X10(R1)           ; 10210                               [77]
              12 A1    50    D0  0365  1400         MOVL    R0,^X12(R1)                ; 80000010                            [77]
                               0369  1401                                          ; THE REST CAN BE LOOPED              [77]
                 51    1A    C0  0369  1402         ADDL2   #^X1A,R1                   ; START AT 1021A                      [77]
                 50    0A    C0  036C  1403         ADDL2   #^XA,R0                    ; JUMPING TO 8000001A                 [77]
            61   9F17  8F    B0  036F  1404 2$:     MOVW    #^X9F17,(R1)               ; SET UP THE JMP                      [77]
              02 A1    50    D0  0374  1405         MOVL    R0,2(R1)                   ; SET UP THE ADDRESS TO JMP TO        [77]
                 50    08    C0  0378  1406         ADDL2   #8,R0                      ; NEXT...                             [77]
FFEA 51   08   00000000'8F    F1  037B  1407         ACBL    #DS$AQ_SSEND,#8,R1,2$      ; DONE ?                              [77]
                               0385  1408 ;
        50  0000018A'EF    9E  0385  1409         MOVAB   L^SYS$INPUT,R0             ; ADDRESS OF LOGICAL NAME
                     02A8  30  038C  1410         BSBW    TRAN_ASSIGN                ; TRANSLATE AND ASSIGN
                   06 50   E8  038F  1411         BLBS    R0,100$                    ; Branch if success                   [87]
              0000041C'EF  17  0392  1412         JMP     10$                        ; Jump if failure                     [87]
                               0398  1413 100$:                                    ;                                     [87]
        0000089D'EF    51    B0  0398  1414         MOVW    R1,L^DS$GW_TTIN            ; SAVE INPUT CHANNEL NUMBER
```

```
                      7E   D5  039F  1415          TSTL    -(SP)                   ; Allocate space for characteristics
                      7E   7F  03A1  1416          PUSHAQ  -(SP)                   ; Allocate 8 more bytes and push addr
                      0C   DD  03A3  1417          PUSHL   #12                     ; Length of Device characteristics buf
                   50 6E   7E  03A5  1418          MOVAQ   (SP),R0                 ; Point to DIB descriptor
                           03A8  1419          $GETCHN_S R1,(R0),(R0)          ; Get characteristics of SYS$INPUT:
                      00   DD  03A8                       PUSHL   #0
                      00   DD  03AA                       PUSHL   #0
                      60   7F  03AC                       PUSHAQ  (R0)
                      60   3F  03AE                       PUSHAW  (R0)
                   7E 51   3C  03B0                       MOVZWL  R1,-(SP)
          00000000'GF 05   FB  03B3                       CALLS   #5,G^SYS$GETCHN
                65 50 E9   03BA  1420          BLBC    R0,17$                  ; Branch if fails                       [87]
                   1F   BA  03BD  1421          POPR    #^M<R0,R1,R2,R3,R4>     ; R0=len, R1=adr  R2,R3,R4=DEVchar
          00000B8B'EF   52  D0  03BF  1422          MOVL    R2,DEVCHAR              ; Save device characteristics   [134] ;G:28
             48 52   0E   E1  03C6  1423 3$:      BBC     S^#DEV$V_FOD, R2, 5$    ; Branch if not command file            ;G:28
                           03CA  1424          $OPEN   DS$FAB_INPUT            ; Open command file
              0000006C'EF  DF  03CA                       PUSHAL  DS$FAB_INPUT
          00000000'GF   01  FB  03D0                       CALLS   #$$.TMP1,G^SYS$OPEN
                42 50 E9   03D7  1425          BLBC    R0, 10$                 ; Exit if error
                           03DA  1426          $CONNECT        DS$RAB_INPUT    ; Connect record block
              000000BC'EF  DF  03DA                       PUSHAL  DS$RAB_INPUT
          00000000'GF   01  FB  03E0                       CALLS   #$$.TMP1,G^SYS$CONNECT
                32 50 E9   03E7  1427          BLBC    R0, 10$                 ; Exit if error
                           03EA  1428          $CREATE DS$FAB_OUTPUT           ; Open output file
              00000100'EF  DF  03EA                       PUSHAL  DS$FAB_OUTPUT
          00000000'GF   01  FB  03F0                       CALLS   #$$.TMP1,G^SYS$CREATE
                22 50 E9   03F7  1429          BLBC    R0, 10$                 ; Exit if error
                           03FA  1430          $CONNECT        DS$RAB_OUTPUT   ; Connect record block
              00000150'EF  DF  03FA                       PUSHAL  DS$RAB_OUTPUT
          00000000'GF   01  FB  0400                       CALLS   #$$.TMP1,G^SYS$CONNECT
                12 50 E9   0407  1431          BLBC    R0, 10$                 ; Exit if error
          00000899'EF   16  E3  040A  1432          BBCS    S^#DS$V_BATCH, -
                      6E         0411  1433                   L^DS$GL_FLAGS, 20$ ; Set 'RMS' mode bit & skip
                                 0412  1434 5$:
                                 0412  1435
50        00000194'EF   9E  0412  1436          MOVAB   L^SYS$OUTPUT,R0         ; ADDRESS OF LOGICAL NAME FOR OUTPUT
                   021B   30  0419  1437          BSBW    TRAN_ASSIGN             ; TRANSLATE AND ASSIGN
                                 041C  1438 10$:
                08 50 E8   041C  1439          BLBS    R0,15$                  ; Branch if no error
                   0214   31  041F  1440          BRW     DS$USERMODE_X           ; Exit w/ error
                                 0422  1441
                5E   14   C0  0422  1442 17$:    ADDL    #20,SP                  ; Fix stack after $GETCHN error         [87]
                      F5   11  0425  1443          BRB     10$                     ; and leave.                            [87]
                                 0427  1444 15$:
0000089F'EF           51   B0  0427  1445          MOVW    R1,L^DS$GW_TTOUT        ; SAVE OUTPUT CHANNEL NUMBER
                                 042E  1446
                      7E   D5  042E  1447          TSTL    -(SP)                   ; Allocate space for characteristics    [87]
                      7E   7F  0430  1448          PUSHAQ  -(SP)                   ; Allocate 8 more bytes and push addr   [87]
                      0C   DD  0432  1449          PUSHL   #12                     ; Length of Device characteristics buf  [87]
                   50 6E   7E  0434  1450          MOVAQ   (SP),R0                 ; Point to DIB descriptor               [87]
                           0437  1451          $GETCHN_S R1,(R0),(R0)          ; Get characteristics of SYS$OUTPUT:    [87]
                      00   DD  0437                       PUSHL   #0
                      00   DD  0439                       PUSHL   #0
                      60   7F  043B                       PUSHAQ  (R0)
                      60   3F  043D                       PUSHAW  (R0)
                   7E 51   3C  043F                       MOVZWL  R1,-(SP)
          00000000'GF   05  FB  0442                       CALLS   #5,G^SYS$GETCHN
```

```
                 D6 50    E9  0449  1452          BLBC    R0,17$                          ; Branch if fails                                  [87]
                    1F    BA  044C  1453          POPR    #^M<R0,R1,R2,R3,R4>             ; R0=len, R1=adr  R2,R3,R4=DEVchar                 [87]
          00000B83'EF    53    7D  044E  1454          MOVQ    R3,DS$GL_TERMCHAR               ; Save terminal characteristics (R3,R4)           [87]
                               0455  1455
                 50    7E    7E  0455  1456          MOVAQ   -(SP),R0                        ; Address of quad status block
                               0458  1457          $QIOW_S  ,L^DS$GW_TTIN,#IO$_SETMODE!IO$M_CTRLCAST,(R0),,,L^RCTRLC
                       7E    7C  0458                      CLRQ    -(SP)
                       7E    7C  045A                      CLRQ    -(SP)
                       00    DD  045C                      PUSHL   #0
               000009E9'EF    DF  045E                      PUSHAL  L^RCTRLC
                       7E    7C  0464                      CLRQ    -(SP)
                       60    7F  0466                      PUSHAQ  (R0)
            7E    0000'8F    3C  0468                      MOVZWL  #IO$_SETMODE!IO$M_CTRLCAST,-(SP)
          7E    0000089D'EF    3C  046D                      MOVZWL  L^DS$GW_TTIN,-(SP)
                       00    DD  0474                      PUSHL   #0
          00000000'GF    0C    FB  0476                      CALLS   #12,G^SYS$QIOW
                 50    8E    7D  047D  1458          MOVQ    (SP)+,R0                        ; Get status
                               0480  1459 20$:
                               0480  1460          $CRETVA_S  L^SUPBUF                     ; GET ACCESS TO APT MAILBOX AREA
                       00    DD  0480                      PUSHL   #0
                       00    DD  0482                      PUSHL   #0
               0000019F'EF    7F  0484                      PUSHAQ  L^SUPBUF
          800000C8'GF    03    FB  048A                      CALLS   #3,G^SYS$CRETVA
                               0491  1461          $CRETVA_S  L^PRGBUF                     ; GET ACCESS TO PROGRAM OVERLAY AREA
                       00    DD  0491                      PUSHL   #0
                       00    DD  0493                      PUSHL   #0
               000001A7'EF    7F  0495                      PUSHAQ  L^PRGBUF
          800000C8'GF    03    FB  049B                      CALLS   #3,G^SYS$CRETVA
       7A 00000B8B'EF    14    E1  04A2  1462          BBC     S^#DEV$V_MBX, DEVCHAR, 19$                                                ;G:28
                               04AA  1463                                                  ; Branch if no mailbox                 [134] ;G:28
                               04AA  1464          $GETJPI_S -                             ; Get current process id               [134] ;G:28
                               04AA  1465                  EFN = #1, -                                                                   ;G:28
                               04AA  1466                  PIDADR = PID, -                                                               ;G:28
                               04AA  1467                  ITMLST = ITEMS, -                                                             ;G:28
                               04AA  1468                  IOSB = IOSB                                                                   ;G:28
                       7E    7C  04AA                      CLRQ    -(SP)
                00000BAB'EF    7F  04AC                      PUSHAQ  IOSB
                00000B9B'EF    DF  04B2                      PUSHAL  ITEMS
                       00    DD  04B8                      PUSHL   #0
                00000B8F'EF    DF  04BA                      PUSHAL  PID
                       01    DD  04C0                      PUSHL   #1
             00000000'GF    07    FB  04C2                      CALLS   #7,G^SYS$GETJPI
                               04C9  1469          $FAO_S -                                ; Create global section name           [134] ;G:28
                               04C9  1470                  CTRSTR = CTRL_STR, -                                                          ;G:28
                               04C9  1471                  OUTBUF = GLBL_SECT_NAME, -                                                    ;G:28
                               04C9  1472                  OUTLEN = FAOLEN, -                                                            ;G:28
                               04C9  1473                  P1 = PIDNO                                                                    ;G:28
                00000B93'EF    DD  04C9                      PUSHL   PIDNO
                00000BB3'EF    7F  04CF                      PUSHAQ  GLBL_SECT_NAME
                00000BCF'EF    3F  04D5                      PUSHAW  FAOLEN
                00000BD3'EF    7F  04DB                      PUSHAQ  CTRL_STR
             00000000'GF    04    FB  04E1                      CALLS   #$$T2,G^SYS$FAO
 00000BBB'EF    FE4B 8F    3C  04E8  1474          MOVZWL  #^XFE4B, GLBL_SECT_AREA ; Global area's starting address [134] ;G:28
 00000BBF'EF    FE54 8F    3C  04F1  1475          MOVZWL  #^XFE54, GLBL_SECT_AREA+4 ; Global area's ending address [134] ;G:28
                               04FA  1476          $CRMPSC_S -                             ; Make it global                       [134] ;G:28
                               04FA  1477                  INADR = GLBL_SECT_AREA, -                                                     ;G:28
                               04FA  1478                  FLAGS = #SEC$M_WRT!SEC$M_GBL!SEC$M_PAGFIL, -                                  ;G:28
```

```
                                04FA  1479                GSDNAM = GLBL_SECT_NAME, -                                      ;G:28
                                04FA  1480                CHAN = #0, -                                                    ;G:28
                                04FA  1481                PAGCNT = #1                                                     ;G:28
                          7E    7C  04FA                  CLRQ    -(SP)
                          00    DD  04FC                  PUSHL   #0
                          01    DD  04FE                  PUSHL   #1
                       7E 00    3C  0500                  MOVZWL  #0,-(SP)
                          00    DD  0503                  PUSHL   #0
                          00    DD  0505                  PUSHL   #0
                00000BB3'EF     7F  0507                  PUSHAQ  GLBL_SECT_NAME
                00080009 8F     DD  050D                  PUSHL   #SEC$M_WRT!SEC$M_GBL!SEC$M_PAGFIL
                          00    DD  0513                  PUSHL   #0
                          00    DD  0515                  PUSHL   #0
                00000BBB'EF     7F  0517                  PUSHAQ  GLBL_SECT_AREA
           00000000'GF  0C      FB  051D                  CALLS   #12,G^SYS$CRMPSC
                                0524  1482                                                                                  ;G:28
        1D 00000899'EF  1A      E1  0524  1483 19$:       BBC     #DS$V_NI,DS$GL_FLAGS,22$  ; BRANCH IF NOT OVER NI    [105]  ;G:28
                                052C  1484
                                052C  1485 ;;;
```

```
        00000000'EF   04   FB  05B6          CallS   #4, Sys$CreLog          ; Create logical name                [53]
                               05BD
             000001BA'EF   9F  05BD          PUSHAB  L^DS$AT_DDIR+2          ; Address of area to save original default d
                        26   DD  05C3          PUSHL   #38                     ; Length of area
                        6E   7F  05C5          PUSHAQ  (SP)                    ; Address of buffer for old
             000001B8'EF   3F  05C7          PUSHAW  L^DS$AT_DDIR            ; Address for length of buffer
             00000000'EF   7F  05CD          PUSHAQ  DEF$Q_DIR               ; Address of descriptor of current dir
        00000000'EF   03   FB  05D3          CALLS   #3,SYS$SETDDIR          ; Set new default directory
                               05DA
                               05DA  ;
                               05DA  ; Use the (all-new for V3.0 VMS) $GETSYI service to find the processor type
                               05DA  ; we are actually running on, and use this for the DSA$GL_SID longword.  If
                               05DA  ; the service fails for any reason, do the same thing we always did before, and
                               05DA  ; use the DS$GK_SID value, rather than fail the startup.
                               05DA  ;
                               05DA
                        7E   7C  05DA          clrq    -(sp)                   ; Terminate argument list            [49]
             0000FE14'EF   9F  05DC          pushab  L^dsa$gl_sid            ; Address of internal SID location   [49]
          7E    1001 8F   B0  05E2          movw    #syi$_sid, -(sp)        ; Push item code for full SID        [49]
                  7E   04   B0  05E7          movw    #4, -(sp)               ; And length of buffer (longword)    [49]
                  50   6E   9E  05EA          movab   (sp), r0                ; Remember where we are              [49]
                               05ED          $getsyi_s       itmlst=(r0)     ; Get the information                [49]
                        7E   7C  05ED                  CLRQ    -(SP)
                        00   DD  05EF                  PUSHL   #0
                        60   DF  05F1                  PUSHAL  (r0)
                        00   DD  05F3                  PUSHL   #0
                        00   DD  05F5                  PUSHL   #0
                        00   DD  05F7                  PUSHL   #0
        00000000'GF   07   FB  05F9                  CALLS   #7,G^SYS$GETSYI
                  5E   10   C0  0600          addl2   #4*4, sp                ; Clear off argument list            [49]
                     0B 50   E8  0603          blbs    r0, 70$                 ; Continue if successful             [49]
0000FE14'EF   00000000'8F   D0  0606          movl    #ds$gk_sid,dsa$gl_sid   ; Set pseudo SID value               [49]
                               0611
0000FE00'EF   10003000 8F   C8  0611  70$:    BISL2   #DSA$M_DFLTFLGS ! DSA$M_USER, -
                               061C                    L^DSA$GL_FLAGS          ; SET DEFAULT CONTROL FLAGS
                               061C
             00000000'EF   16  061C          Jsb     L^MEMPOOL$INIT          ; SETUP MEMORY POOL                  [52]
                               0622
                    F9DB'  30  0622          BSBW    INI$PTABLE              ; Clear P-table pointers
                               0625
        000008E1'EF   10   D0  0625          MOVL    #16,L^DS$GL_RADIX       ; DEFAULT FOR EXAM/DEP FUNCTIONS
        000001B4'EF   5D   D0  062C          MOVL    FP,L^SAVEFP             ; PRESERVE CLEAN STACK POINTER
                    0049   31  0633          BRW     BEGIN0                  ; AND START FRESH                    [52]
                               0636
                               0636  DS$USERMODE_X:
                        04     0636          RET                             ; RETURN
```

```
                        0637  1561 ;
                        0637  1562 ; TRANSLATE AND ASSIGN CHANNEL
                        0637  1563 ; INPUT:  R0    ADDR OF ASCIC LOGICAL NAME
                        0637  1564 ; OUTPUT: R0    SUCCESS/FAILURE
                        0637  1565 ;         R1    CHANNEL NUMBER
                        0637  1566 TRAN_ASSIGN:
              5E  28 C2 0637  1567         SUBL    #40,SP
                  6E 9F 063A  1568         PUSHAB  (SP)                    ; MAKE DESCRIPTOR OF OUTPUT BUFFER
                  28 DD 063C  1569         PUSHL   #40                     ; LENGTH
                        063E  1570                                         ; ++++ STACK CLEANED TO HERE AFTER CALL
                01 A0 9F 063E  1571         PUSHAB  1(R0)                   ; INPUT DESCRIPTOR
              7E  60 9A 0641  1572         MOVZBL  (R0),-(SP)              ; LENGTH
                  7E D4 0644  1573         CLRL    -(SP)                   ; DUMMY ARG
                  7E 7C 0646  1574         CLRQ    -(SP)                   ; 2 DUMMY ARGS
                14 AE 7F 0648  1575         PUSHAQ  20(SP)                  ; ADDRESS OF OUTPUT DESCRIPTOR
                18 AE DF 064B  1576         PUSHAL  24(SP)                  ; ADDRESS OF OUTPUT LENGTH
                14 AE 7F 064E  1577         PUSHAQ  20(SP)                  ; ADDRESS OF INPUT DESCRIPTOR
00000000'EF     08 FB 0651  1578         CALLS   #8,SYS$TRNLOG           ; TRANSLATE THE NAME
              20 50 E9 0658  1579         BLBC    R0,120$                 ; BRANCH IF FAILED
                        065B  1580
          1B  08 AE 91 065B  1581         CMPB    8(SP),#^X1B             ; ESCAPE?
                  07 12 065F  1582         BNEQ    110$                    ; NO
              6E  04 C2 0661  1583         SUBL    #4,(SP)                 ; SHORTEN STRING
           04 AE  04 C0 0664  1584         ADDL    #4,4(SP)                ; UPDATE ADDRESS
                        0668  1585 110$:
                  7E D4 0668  1586         CLRL    -(SP)                   ; SPACE FOR CHANNEL NUMBER
                  7E 7C 066A  1587         CLRQ    -(SP)                   ; 2 DUMMY ARGS
                08 AE DF 066C  1588         PUSHAL  8(SP)                   ; ADDRESS TO RETURN CHANNEL NUMBER
                10 AE 7F 066F  1589         PUSHAQ  16(SP)                  ; ADDRESS OF DESCRIPTOR
00000000'EF     04 FB 0672  1590         CALLS   #4,SYS$ASSIGN           ; ASSIGN THE CHANNEL
                  02 BA 0679  1591         POPR    #^M1                    ; GET CHANNEL ASSIGNED
                        067B  1592 120$:
              5E  30 C0 067B  1593         ADDL    #48,SP                  ; CLEANUP STACK
                  05 067E  1594         RSB                             ; RETURN
```

```
                        1596          .SBTTL  COMMON KERNEL REFRESH ENTRY POINT.
                        1597 ;++
                        1598 ; FUNCTIONAL DESCRIPTION:
                        1599 ;
                        1600 ;       This routine is the basic loop of the supervisor.
                        1601 ;       At begin it refreshes the image context and calls DS$CLI.
                        1602 ;       The diagonostic is entered from the command processor.
                        1603 ;
                        1604 ; CALLING SEQUENCE:
                        1605 ;
                        1606 ;       ENTERED FROM "BOOT".
                        1607 ;
                        1608 ; INPUT PARAMETERS:     NONE
                        1609 ;
                        1610 ; IMPLICIT INPUTS:      NONE
                        1611 ;
                        1612 ; OUTPUT PARAMETERS:    NONE
                        1613 ;
                        1614 ; IMPLICIT OUTPUTS:     NONE
                        1615 ;
                        1616 ; COMPLETION CODES:     NONE
                        1617 ;
                        1618 ; SIDE EFFECTS:
                        1619 ;
                        1620 ;       Cleans stacks, registers, and ends up in Kernel mode.
                        1621 ;       Call the CRD Image-Loading routine and CRD Initialization if
                        1622 ;       either of the CRD bits have been set in the DSA flags.
                        1623 ;--
```

```
                                  067F  BEGIN0: ; Only come here once ...                    [59]
                                  067F
                                  067F                                                  ; Only clear the structure once [123
                                  067F          Br_If_Not_MP    MP_clear_end            ; Branch if not an MP system
05000000 8F   00000000'8F   D1    067F          CMPL    #DS$GK_SID,#^X05000000          ; Branch if Scorpio [61]
                      27    13    068A          BEQL    30001$                          ; Yes, branch
06000000 8F   00000000'8F   D1    068C          CMPL    #DS$GK_SID,#^X06000000          ; Branch if Nautilus [61]
                      1A    13    0697          BEQL    30001$                          ; Yes, branch                ;G:23
11000000 8F   00000000'8F   D1    0699          CMPL    #DS$GK_SID,#^X11000000          ; Branch if RRR [69]         ;G:20
                      0D    13    06A4          BEQL    30001$                                                       ;G:23
0A000000 8F   00000000'8F   D1    06A6          CMPL    #DS$GK_SID,#^X0A000000          ; Branch if LLL [69]         ;G:20
                      18    12    06B1          BNEQ    MP_clear_end
                                  06B3    30001$:
                      18    BB    06B3          PUSHR   #^M<R3,R4>                      ; Save registers                [110
         53   00000000'EF   DE    06B5          MOVAL   MP$R_ACTIVE_SERVICES,R3         ; Move address of Beggining     [110
         54   00000000'EF   DE    06BC          MOVAL   MP$R_INTERLOCK_END,R4           ; and end of strustures         [110
                      63    94    06C3    1$:   CLRB    (R3)                            ; then clear them               [110
               FA 53  54    F2    06C5          AOBLSS  R4,R3,1$                        ; all out.                      [110
                      18    BA    06C9          POPR    #^M<R3,R4>                      ; Restore registers             [110
                                  06CB
                                  06CB    MP_clear_end:
                                  06CB
                                  06CB
                                  06CB
                                  06CB          ;+
                                  06CB          ; Restore the CRD vectors that were originally
                                  06CB          ; set up in the DSVECS module.
                                  06CB          ;-
                                  06CB
         00000000'EF   00    FB    06CB          Calls   #0, L^DSR$Restore_CRD_Vectors
                                  06D2
                                  06D2          ;+
                                  06D2          ; Clear all the CRD flags in the DSA$GL_Flags longword
                                  06D2          ; Original flag settings still in RPB$ block, for offline only
                                  06D2          ;-
                                  06D2
0000FE00'EF   00070800 8F   CA    06D2          BICL2   #<DSA$M_CRD_Autotest_Off! -                  ; [ 100 ]
                                  06DD                    DSA$M_CRD_Menutest_Off! -                  ; [ 100 ]
                                  06DD                    DSA$M_CRD_Menutest_On ! -                  ; [ 100 ]
                                  06DD                    DSA$M_CRD_Trace>, -                        ; [ 100 ]
                                  06DD                  L^DSA$GL_Flags                               ; [ 100 ]
                                  06DD
                                  06DD          ;+
                                  06DD          ;   Set up R4 to contain bits of interest from L^Boot$L_R5,
                                  06DD          ;   the RPB$ block, DSA$V_USER mode and LIB$GET_FOREIGN results.
                                  06DD          ;   A case statement will later take action based on these
                                  06DD          ;   combinations.
                                  06DD          ;
                                  06DD          ;   The last section, 3$, tests for being in USER mode (VMS) and
                                  06DD          ;   if so checks for the command string that envoked the VDS. The
                                  06DD          ;   command string will be $ESSAA/CRD.  The LIB$GET_FOREIGN
                                  06DD          ;   will return the /CRD part. This is tested against the required
                                  06DD          ;   text string to envoke CRD online.
                                  06DD          ;-
                                  06DD
                      54    D4    06DD          CLRL    R4                                                   ; [100] ;G:2
      02 00000879'EF  04    E1    06DF          BBC     #RPB$V_Diag, L^Boot$L_R5,1$     ; Check Diag bit     ; [100] ;G:3
```

```
                     54   96   06E7  1673          INCB    R4                                                      ; [100] ;G:3
          03 00000879'EF  54   E1   06E9  1674 1$:   BBC     #RPB$V_Menutest, L^Boot$L_R5,2$ ; Check Menutest_off bit; [100] ;G:3
                     54   02   80   06F1  1675          ADDB2   #2,R4                                                   ; [100] ;G:3
          03 00000879'EF  0F   E1   06F4  1676 2$:   BBC     #RPB$V_Autotest, L^Boot$L_R5,3$ ; Check Autotest_off bit; [100] ;G:3
                     54   04   80   06FC  1677          ADDB2   #4,R4                                                   ; [100] ;G:3
                                  06FF  1678 3$:                                                                        ;G:2
                                  06FF  1679                                                  ;                 begin [124] ;G:2
                                  06FF  1680 ;        BBC     #DSA$V_User, L^DSA$GL_Flags,4$  ; Check VMS user mode   ; [100] ;G:3
                                  06FF  1681 ;        PUSHAB  CRD_DESC                        ; Now in USER mode      ; [100] ;G:2
                                  06FF  1682 ;        CALLS   #1,L^LIB$GET_FOREIGN            ; Get envoking command  ; [100] ;G:2
                                  06FF  1683 ;        BLBC    R0,4$                           ; Skip rest if not right; [100] ;G:2
                                  06FF  1684 ;        CMPC3   #4,@<CRD_DESC+4>,CRD_Switch_1   ; Compare command      ; [100] ;G:2
                                  06FF  1685 ;        TSTL    R0                              ; Check result         ; [100] ;G:2
                                  06FF  1686 ;        BNEQ    4$                              ; IF nonzero, no match  ; [100] ;G:2
                                  06FF  1687 ;        ADDB2   #8,R4                           ; A match, indicate so  ; [100] ;G:2
                                  06FF  1688                                                  ;                   end [124] ;G:2
                                  06FF  1689 4$:
                                  06FF  1690          ;+
                                  06FF  1691          ; Test the R4 bits to determine which if any DSA$ bits to set and
                                  06FF  1692          ; any action to take.
                                  06FF  1693          ;-
                                  06FF  1694
          0F'8F    00   54   8F   06FF  1695          CASEB   R4,#0,#<<15$-10$>/2>-1                                  ; [100][102]  ;G:36
                                  0704  1696 10$:     .SIGNED_WORD -                                                  ; [100][102]  ;G:36
                          00D1'   0704  1697            100$-10$,-    ; 0, No bits set, skip CRD stuff                 ; [100] ;G:3
                                  0706  1698            100$-10$,-    ; 1, Only Diag bit set, skip CRD stuff           ; [100] ;G:3
                          00D1'   0706  1699            20$-10$,-     ; 2, ERROR                                       ; [100] ;G:3
                          0022'   0708  1700            21$-10$,-     ; 3, Diag and Menu offline, do action 21$        ; [100] ;G:3
                          003B'   070A  1701            20$-10$,-     ; 4, ERROR                                       ; [100] ;G:3
                          0022'   070C  1702            23$-10$,-     ; 5, Diag and auto, do action 23$                ; [100] ;G:3
                          005B'   070E  1703            20$-10$,-     ; 6, ERROR                                       ; [100] ;G:3
                          0022'   0710  1704            20$-10$,-     ; 7, ERROR                                       ; [100] ;G:3
                          0022'   0712  1705            24$-10$,-     ; 8, Menu online, ignore other bits              ; [100] ;G:3
                          0068'   0714  1706            24$-10$,-     ; 9, Menu online, ignore other bits              ; [100] ;G:3
                          0068'   0716  1707            24$-10$,-     ;10, Menu online, ignore other bits              ; [100] ;G:3
                          0068'   0718  1708            24$-10$,-     ;11, Menu online, ignore other bits              ; [100] ;G:3
                          0068'   071A  1709            24$-10$,-     ;12, Menu online, ignore other bits              ; [100] ;G:3
                          0068'   071C  1710            24$-10$,-     ;13, Menu online, ignore other bits              ; [100] ;G:3
                          0068'   071E  1711            24$-10$,-     ;14, Menu online, ignore other bits              ; [100] ;G:3
                    0068'0068'    0720  1712            24$-10$       ;15, Menu online, ignore other bits              ; [100] ;G:3
                                  0724  1713 15$:
                            00    11    0724  1714          BRB     20$     ; This should never happen                  ; [100] ;G:3
                                  0726  1715
                                  0726  1716          ;+
                                  0726  1717          ; The case action routines
                                  0726  1718          ;-
                                  0726  1719
                                  0726  1720 20$:     $Print  #DS$K_Type_General_Error, #DS$K_PrintF, L^T_Both_CRD_Bits_Set ;[75]
               0000003E'EF    9F    0726                      PUSHAB  L^T_Both_CRD_Bits_Set
                     7E    01    9A    072C                  movzbl  #DS$K_PrintF, -(sp)
                     7E    03    98    072F                  cvtbl   #DS$K_Type_General_Error, -(sp)
          00000000'GF    03    FB    0732                  CALLS   #$$N+2, G^DSX$PRINT
               00000DF0'EF    17    0739  1721          JMP     L^DSV$Exit                      ; Bail out - exit to console    ; [75]
          05   0000FE17'EF    91    073F  1722 21$:     CMPB    DSA$GL_SID+3,#PR$_SID_TYP8SS    ; If SCORPIO, then               [119]
                         0A    12    0746  1723          BNEQ    22$                             ; don't do CRD MENU, instead     [119]
          00000879'EF    01    CA    0748  1724          BICL2   #RPB$M_MENUTEST,BOOT$L_R5       ; do normal VDS boot            [119]
                    0083    31    074F  1725          BRW     100$                            ; Continue with VDS boot        [119]
```

```
0000FE00'EF   00010000 8F   C8  0752  1726 22$:    BISL2   #DSA$M_CRD_Menutest_Off, L^DSA$GL_Flags                  ; [ 100 ]
                       39   11  075D  1727         BRB     30$                                                      ; [ 100 ]
0000FE00'EF   00000800 8F   C8  075F  1728 23$:    BISL2   #DSA$M_CRD_Autotest_Off, L^DSA$GL_Flags                 ; [ 100 ]
                       2C   11  076A  1729         BRB     30$                                                      ; [ 100 ]
0000FE00'EF   00040000 8F   C8  076C  1730 24$:    BISL2   #DSA$M_CRD_Menutest_On,  L^DSA$GL_Flags                 ; [ 100 ]
0000005C'FF   00000058'EF   29  0777  1731         CMPC3   CRD_DESC,a<CRD_DESC+4>,CRD_Switch_2; Compare command    ; [ 100 ]
              00000004'EF       0782
                       50   D5  0787  1732         TSTL    R0                                ; Check result         ; [ 100 ]
                       0B   12  0789  1733         BNEQ    25$                               ; IF nonzero, no match ; [ 100 ][11
0000FE00'EF   00020000 8F   C8  078B  1734         BISL2   #DSA$M_CRD_Trace, L^DSA$GL_Flags                        ; [ 1000 ]
                       00   11  0796  1735 25$:    BRB     30$                                                      ; [ 100 ]
                                0798  1736
```

```
                                0798  1738          ;+
                                0798  1739          ; Take this path to do CRD stuff
                                0798  1740          ;-
                                0798  1741
          00000000'EF    00   FB  0798  1742 30$:    CALLS   #0, L^DSR$Load_CRD      ; Load the CRD image file       [59]
                                079F  1743
                                079F  1744          ;+
                                079F  1745          ; Call the main CRD routine and have it initialize itself. This routine
                                079F  1746          ; will return failure when its initialization fails for some reason. It
                                079F  1747          ; will return success otherwise. If it fails, the DS image will exit.
                                079F  1748          ; If it succeeds, the DS will continue normally.
                                079F  1749          ;-
                                079F  1750
                          00    DD  079F  1751          PUSHL   #0                      ; Push 0 as param-4             [59]
                          00    DD  07A1  1752          PUSHL   #0                      ; Push 0 as param-3             [59]
                          00    DD  07A3  1753          PUSHL   #CRD$K_CRD_Initialization ; Push Initialization as param-2      [59]
                          00    DD  07A5  1754          PUSHL   #CRD$K_Hook_Point       ; Push Hook_Point as param-1    [59]
          00000000'FF     04    FB  07A7  1755          CALLS   #4, @L^DS$GA_CRD_DS_Interface                           ; [59]
                    24    50    E8  07AE  1756          BLBS    R0, 100$                ; If routine returns success, branch    [59]
                                07B1  1757
                                07B1  1758          ;+
                                07B1  1759          ; The init routine failed - print an error message and exit the VDS     [74]
                                07B1  1760          ; Clear the DSA Flags for CRD stuff                                     ; [
                                07B1  1761          ;-
                                07B1  1762
0000FE00'EF     00050802  8F    CA  07B1  1763          BICL2   #<DSA$M_Binary          ! -                             ; [ 100 ]
                                07BC  1764                    DSA$M_CRD_Menutest_Off ! -                            ; [ 100 ]
                                07BC  1765                    DSA$M_CRD_Autotest_Off ! -                            ; [ 100 ]
                                07BC  1766                    DSA$M_CRD_Menutest_On >, -                            ; [ 100 ]
                                07BC  1767                  L^DSA$GL_Flags                                          ; [ 100 ]
                                07BC  1768
                                07BC  1769          $Print  #DS$K_Type_General_Error, -     ; Print an error message         [74]
                                07BC  1770                    #DS$K_PrintF, -           ; . . . use PrintF               [74]
                                07BC  1771                    L^GT_Menu_Error           ; . . . the format string        [74]
                    00000000'EF     9F  07BC                  PUSHAB  L^GT_Menu_Error
                          7E    01    9A  07C2                movzbl  #DS$K_PrintF, -(sp)
                          7E    03    98  07C5                cvtbl   #DS$K_Type_General_Error, -(sp)
                00000000'GF     03    FB  07C8                CALLS   #$$N+2, G^DSX$PRINT
                                07CF  1772
                    00000DF0'EF     16  07CF  1773          JSB     DSV$Exit                ; Exit if routine failed        [59]
                                07D5  1774
0000FE00'EF     80050800  8F    D3  07D5  1775 100$:    BITL    #DSA$M_CRD_AUTOTEST_OFF!-; Don't display legal statement if     [95]
                                07E0  1776                    DSA$M_CRD_MENUTEST_OFF! -; CRD MENU or AUTO or if APT           [95]
                                07E0  1777                    DSA$M_APT! -
                                07E0  1778                    DSA$M_CRD_MENUTEST_ON, -                        ;100
                                07E0  1779                    L^DSA$GL_FLAGS ;                                [95]
                          31    12  07E0  1780          BNEQ    150$                    ;                               [95]
                                07E2  1781          $PRINT  #DS$K_TYPE_DS_START, -  ; Display statement from legal dept.    [92]
                                07E2  1782                    #DS$K_PRINTF,-          ; ... use PRINTF                [92]
                                07E2  1783                    DS$GT_LEGAL             ; ... format statement          [92]
                    0000006E'EF     9F  07E2                PUSHAB  DS$GT_LEGAL
                          7E    01    9A  07E8                movzbl  #DS$K_PRINTF, -(sp)
                          7E    1D    98  07EB                cvtbl   #DS$K_TYPE_DS_START, -(sp)
                00000000'GF     03    FB  07EE                CALLS   #$$N+2, G^DSX$PRINT
0000002E'EF     0000000F'EF     D0  07F5  1784                MOVL    L^DS$GQ_DAYTIM+15, -    ; GET YEAR FROM LINK DATE       [109
                                0800  1785                    L^DS$GT_COPYEAR         ; Insert year for link          [109
                                0800  1786          $PRINT  #DS$K_TYPE_DS_START, -  ; Display statement from legal dept.    [109
```

```
                                0800  1787                  #DS$K_PRINTF,-          ; ... use PRINTF                        [109
                                0800  1788                  DS$GT_COPYRIGHT         ; ... format statement                  [109
          00000000'EF    9F     0800                        PUSHAB  DS$GT_COPYRIGHT
                7E   01    9A   0806                        movzbl  #DS$K_PRINTF, -(sp)
                7E   1D    98   0809                        cvtbl   #DS$K_TYPE_DS_START, -(sp)
     00000000'GF    03    FB   080C                        CALLS   #$$N+2, G^DSX$PRINT
                                0813  1789
                                0813  1790 150$:   $Print   #DS$K_TYPE_DS_START,-   ; Print startup message                 [56]
                                0813  1791                    #DS$K_PRINTF,-        ; ... use PrintF
                                0813  1792                    L^DS$GT_START,-       ; ... the format string
                                0813  1793                    #0                    ; ... the current time
                    00    DD   0813                        PUSHL   #0
          00000000'EF    9F     0815                        PUSHAB  L^DS$GT_START
                7E   01    9A   081B                        movzbl  #DS$K_PRINTF, -(sp)
                7E   1D    98   081E                        cvtbl   #DS$K_TYPE_DS_START, -(sp)
     00000000'GF    04    FB   0821                        CALLS   #$$N+2, G^DSX$PRINT
                                0828  1794
          00000000'EF    16     0828  1795          JSB     SCRIPT$INIT             ; Init script flags and pointers        [44]
                    52    D4   082E  1796          CLRL    R2                      ; START AT EFN ZERO
                                0830  1797
                                0830  1798 200$:   $CLREF_S        R2              ; CLEAR THE EVENT FLAG
                    52    DD   0830                        PUSHL   R2
     00000000'GF    01    FB   0832                        CALLS   #1,G^SYS$CLREF
           F3 52    3F    F3   0839  1799          AOBLEQ  #63, R2, 200$           ; CLEAR ALL 64 FLAGS
                                083D  1800
                                083D  1801          $DS_CntrlC_S    Disabl=#0       ; Re-enable catching of ^C's - clear    [66]
                    00    DD   083D                        PUSHL   #0
                    00    DD   083F                        PUSHL   #0
     00000000'9F    02    FB   0841                        CALLS   #2, a#DS$CNTRLC
                                0848  1802                                          ; ... the Disable flag.                 [66]
                                0848  1803
 0000FE00'EF    01    1F    EF   0848  1804          ExTZV   #Dsa$V_Apt, #1, -       ; Extract the APT mode bit              [60]
                    50          0850  1805                    L^DSA$GL_Flags, R0    ; .. into R0                            [60]
     000008F3'EF    50    90   0851  1806          MovB    R0, -                   ; .. and copy byte into flag            [60]
                                0858  1807                    L^DS$GB_Inhibit_Naming;                                       [60]
                                0858  1808
                                0858  1809          Br_If_Not_APT   Begin           ; Branch around if not in APT-mode      [59]
     0000FE00'EF    1F    E1   0858                BBC     #DSA$V_Apt, -                   ; If bit not set, branch
                    0D          085F                          L^DSA$GL_Flags, Begin         ;
                                0860  1810          $PRINTI_S DS$GT_PROMPT          ; Type prompt on APT start
          00000000'EF    9F     0860                        PUSHAB  DS$GT_PROMPT
     00000000'EF    01    FB   0866                        CALLS   #$$N, DSX$PRINTI
```

```
                                086D  1812 BEGIN::
                                086D  1813 BEGIN_BLISS::
                          1B    10  086D  1814          BSBB    INIT_CONTEXT            ; REINITIALIZE IMAGE CONTEXT
                          7E    DC  086F  1815          MOVPSL  -(SP)                   ; CURRENT PSL
                7E  00000888'EF   9E  0871  1816          MOVAB   20$,-(SP)               ; CURRENT PC
                        7FFF  8F  BB  0878  1817          PUSHR   #^X7FFF                 ; SAVE R0-R14
                00000000'EF   6E  FA  087C  1818          CALLG   (SP),DS$CLI             ; ENTER COMMAND INTERPRETER
                        7FFF  8F  BA  0883  1819          POPR    #^X7FFF                 ; RESTORE R0-R14
                              02  0887  1820          REI                             ; NOTE: USES PC/PSL SAVED/MODIFIED ABOVE
                                  0888  1821
                          E3    11  0888  1822 20$:     BRB     BEGIN                   ; IF DS$CLI EVER RETURNS DO IT AGAIN
```

```
                        088A  1824          .SBTTL  INIT_CONTEXT    Initialize process context
                        088A  1825 ;++
                        088A  1826 ; FUNCTIONAL DESCRIPTION:
                        088A  1827 ;
                        088A  1828 ;       This routine is called to reinitialize the entire process context.
                        088A  1829 ;       It initializes the contents of the registers and resets the stack
                        088A  1830 ;       pointers.  In stand alone it also resets the SYSTEM, P0, and P1 base
                        088A  1831 ;       and length registers, as well as all the stack pointers in all modes.
                        088A  1832 ;       It does not effect the mapping or availablity of memory or the current
                        088A  1833 ;       state of memory management.
                        088A  1834 ;
                        088A  1835 ; CALLING SEQUENCE:
                        088A  1836 ;
                        088A  1837 ;       BSBW    INIT_CONTEXT
                        088A  1838 ;
                        088A  1839 ; INPUT PARAMETERS:     NONE
                        088A  1840 ;
                        088A  1841 ; IMPLICIT INPUTS:
                        088A  1842 ;
                        088A  1843 ;       Initial contents of system, P0, and P1 base registers, stack pointers
                        088A  1844 ;       etc.
                        088A  1845 ;
                        088A  1846 ; OUTPUT PARAMETERS:    NONE
                        088A  1847 ;
                        088A  1848 ; IMPLICIT OUTPUTS:
                        088A  1849 ;
                        088A  1850 ;       The stack and frame pointer are reset it initial values, all registers
                        088A  1851 ;       are modified.
                        088A  1852 ;
                        088A  1853 ; COMPLETION CODES:     NONE
                        088A  1854 ;
                        088A  1855 ; SIDE EFFECTS:
                        088A  1856 ;
                        088A  1857 ;       The entire process context is refreshed.
                        088A  1858 ;--
```

```
                                088A  1860 INIT_CONTEXT::
                                088A  1861          QA_MAIN Kernel_Init_Context     ;                                   [44]
                          08    DD  088A                  PUSHL   #DSQA$K_Kernel_Init_Context
          00000000'9F     01    FB  088C                  CALLS   #1, a#QA$MAIN
          0000FE00'EF     1C    E1  0893  1862            BBC     #DSA$V_USER, L^DSA$GL_FLAGS -
                          03        089A  1863                    , 10$                   ; BRANCH IF STAND ALONE
                       00F9   31  089B  1864            BRW     INIT_USERMODE           ; DO USER MODE STUFF
                                089E  1865
                                089E  1866 10$:
     50   00000000'EF     9E  089E  1867            MOVAB   DS$AX_SOFTPCB, R0               ; GET BASE ADDRESS.
 60  A0   00660000 8F     D0  08A5  1868            MOVL    #IOC$K_DIAGPID, PCB$L_PID(R0)   ; SET UP DIAG PID.
     10 A0    10 A0     DE  08AD  1869            MOVAL   PCB$L_ASTQFL(R0), PCB$L_ASTQFL(R0) ; INIT AST DELIVERY QUEUE.
     14 A0    10 A0     DE  08B2  1870            MOVAL   PCB$L_ASTQFL(R0), PCB$L_ASTQBL(R0) ;
           0C A0    94  08B7  1871            CLRB    PCB$B_ASTACT(R0)                ; Clear AST actives
                                08BA  1872 ;
                                08BA  1873 ; Initialize JIB and ARB
                                08BA  1874 ;
     53   00000000'EF     9E  08BA  1875            MOVAB   DS$AX_JIB,R3            ; Point to JIB
           78 A0    53     D0  08C1  1876            MOVL    R3,PCB$L_JIB(R0)        ; Make PCB point to JIB
     52   00000000'EF     9E  08C5  1877            MOVAB   DS$AX_ARB,R2            ; Point to ARB
        0084 C0    52     D0  08CC  1878            MOVL    R2,PCB$L_ARB(R0)        ; Make PCB point to ARB
             63    52     D0  08D1  1879            MOVL    R2,JIB$L_ARB(R3)        ; Make JIB point to ARB
                                08D4  1880
     50   00000000'EF     DE  08D4  1881            MOVAL   PHD_BASE, R0                    ; GET BASE POINTER.
             00C0 C0 8ED0    08DB  1882            POPL    PHD$L_PC(R0)                    ; SAVE RETURN PC.
          00000993'EF     DC  08E0  1883            MOVPSL  PSL_SAVE                        ; GET CURRENT PSL IN R4 [68]
                          DC  08E6  1884            CMK     REFRESH
                          DC  08E6                  MOVPSL  -(SP)
           06 6E          E0  08E8                  BBS     #PSL$V_IS, (SP), 30002$
                          D4  08EC                  CLRL    (SP)+
                          BC  08EE                  CHMK    #CMK$_REFRESH
                          11  08F0                  BRB     30003$
          0000097B'EF     16  08F2        30002$:   JSB     CMK$REFRESH
                              08F8        30003$:
     04   00000000'8F     DA  08F8  1885            MTPR    #ISTKPTR, #PR$_ISP              ; RESET INTERRUPT STACK.
     5E   00000000'EF     DE  08FF  1886            MOVAL   KSTKPTR, SP                     ; RESET KERNEL STACK POINTER.
             00    5E     DA  0906  1887            MTPR    SP, #PR$_KSP                    ; INITIALIZE KERNEL STACK
           78 A0    00     DB  0909  1888            MFPR    #PR$_KSP, PHD$L_KSP(R0)         ; KERNEL STACK POINTER.
     01   00000000'8F     DA  090D  1889            MTPR    #ESTKPTR, #PR$_ESP              ; INITIALIZE EXECUTIVE STACK
           7C A0    01     DB  0914  1890            MFPR    #PR$_ESP, PHD$L_ESP(R0)         ; EXECUTIVE STACK POINTER.
     02   00000000'8F     DA  0918  1891            MTPR    #SSTKPTR, #PR$_SSP              ; INITIALIZE SUPERVISOR STACK
        0080 C0    02     DB  091F  1892            MFPR    #PR$_SSP, PHD$L_SSP(R0)         ; SUPERVISOR STACK POINTER.
     03   00000000'8F     DA  0924  1893            MTPR    #USTKPTR, #PR$_USP              ; INITIALIZE USER STACK
        0084 C0    03     DB  092B  1894            MFPR    #PR$_USP, PHD$L_USP(R0)         ; USER STACK POINTER.
                                0930  1895
                          5D  D4  0930  1896            CLRL    FP                          ; NO PREVIOUS STACK FRAME
                                0932  1897
     51   00B8 C0         DE  0932  1898            MOVAL   PHD$L_R12(R0),R1                ; POINT TO REGISTER AREA FOR R12
     61    CCCCCCCC 8F     D0  0937  1899            MOVL    #^XCCCCCCCC,(R1)                ; STORE INITIAL AP
71   61    11111111 8F     C3  093E  1900 20$:       SUBL3   #^X11111111,(R1),-(R1)          ; STORE NEXT LOWER REGISTER
                          F6  12  0946  1901            BNEQ    20$                         ; CONTINUE UNTIL R0 STORED
             00C4 C0      DC  0948  1902            MOVPSL  PHD$L_PSL(R0)                   ; PROCESSOR STATUS LONGWORD.
        00C8 C0    08     DB  094C  1903            MFPR    #PR$_P0BR, PHD$L_P0BR(R0)       ; P0 BASE REGISTER.
        00CC C0    09     DB  0951  1904            MFPR    #PR$_P0LR, PHD$L_P0LRASTL(R0)   ; P0 LENGTH REGISTER.
             13    04     DA  0956  1905            MTPR    #4,#PR$_ASTLVL          ; Set ASTLVL
        00CF C0    04     90  0959  1906            MOVB    #4, PHD$B_ASTLVL(R0)            ; SET NO PENDING AST.
        00D0 C0    0A     DB  095E  1907            MFPR    #PR$_P1BR, PHD$L_P1BR(R0)       ; P1 BASE REGISTER.
```

```
                00D4 C0    0B    DB  0963  1908          MFPR    #PR$_P1LR, PHD$L_P1LR(R0)       ; P1 LENGTH REGISTER.
          0088 C0   12345678 8F    D0  0968  1909          MOVL    #^X12345678, PHD$L_R0(R0)       ; ^X12345678 INTO R0 IMAGE.
                       12    00    DA  0971  1910          MTPR    #0,#PR$_IPL                     ; NOW LOWER IPL
                                       0974  1911
                50    00C0 C0    D0  0974  1912          MOVL    PHD$L_PC(R0),R0                 ; GET RETURN ADDRESS
                             29    11  0979  1913          BRB     INIT_COMMON                     ; DO COMMON INITIALIZATION
                                       097B  1914 CMK$REFRESH::
                       12    1F    DA  097B  1915          MTPR    #31,#PR$_IPL            ; Set IPL to 31 so REI doesn't fault
            04 AE    001F0000 8F    D0  097E  1916          MOVL    #PSL$M_IPL,4(SP)                ; SET TO KERNEL MODE & IPL=31
            04 00000993'EF    04    E1  0986  1917          BBC     #PSL$V_TBIT,PSL_SAVE,10$        ;IF T-BIT SET IN OLD PSL[68]
                     04 AE    10    C8  098E  1918          BISL    #1@PSL$V_TBIT,4(SP)             ;THEN SET IT IN NEW PSL [68]
                                       0992  1919 10$:                                           ;ELSE DON'T.            [68]
                             02    02  0992  1920          REI
                                       0993  1921
                          00000000     0993  1922 PSL_SAVE:      .LONG   0                       ;TEMP. STORAGE FOR PSL  [68]
```

```
                                0997  1924 INIT_USERMODE:
                     50 8ED0    0997  1925          POPL    R0                              ; GET RETURN ADDRESS
           5D   000001B4'EF     D0    099A  1926          MOVL    L^SAVEFP,FP                     ; RESET FRAME POINTER
                5E   5D         D0    09A1  1927          MOVL    FP,SP                           ; DITTO FOR STACK POINTER
                                0A4   1928
                                0A4   1929 INIT_COMMON:
                                0A4   1930
                000008F2'EF     94    09A4  1931          clrb    L^ds$gb_typecode                ; Clear the SET BINARY code     [46]
                         01     BB    09AA  1932          PUSHR   #^M<R0>                         ; Save return address
                                09AC  1933          $SETAST_S       #1                          ; Enable AST delivery
                         01     DD    09AC                      PUSHL   #1
           00000000'GF   01     FB    09AE                      CALLS   #1,G^SYS$SETAST
                         01     BA    09B5  1934          POPR    #^M<R0>                         ; Restore return address
           000009C1'EF   00     FB    09B7  1935          CALLS   #0,10$                          ; SETUP DUMMY CALL FRAME
                       FEAC     31    09BE  1936          BRW     BEGIN                           ; IN THE UNLIKELY EVENT IT RETURN
                                09C1  1937
                       0000     09C1  1938 10$:     .WORD   0                               ; SAVE NO REGISTERS
                         50     DD    09C3  1939          PUSHL   R0                              ; PUT RETURN ADDRESS BACK
           6D   00000000'EF     9E    09C5  1940          MOVAB   L^COND_HANDLR,(FP)              ; STACK BASED CONDITION HANDLER
                                09CC  1941
           7E   CCCCCCCC 8F     D0    09CC  1942          MOVL    #^XCCCCCCCC,-(SP)               ; SET INITIAL AP
      7E   6E   11111111 8F     C3    09D3  1943 20$:     SUBL3   #^X11111111,(SP),-(SP)          ; NEXT LOWER REGISTER
                         F6     12    09DB  1944          BNEQ    20$                             ; UNTIL R0
                     1FFF 8F     BA    09DD  1945          POPR    #^M<R0,R1,R2,R3,R4,R5,R6,R7,R8,R9,R10,R11,AP>
           50   12345678 8F     D0    09E1  1946          MOVL    #^X12345678,R0                  ; INITIAL R0
                                09E8  1947
                                05    09E8  1948          RSB                                     ; RETURN ALL REFRESHED
```

```
                                09E9  1950          .SBTTL  CONTROL-C AST HANDLER
                                09E9  1951 ;++
                                09E9  1952 ; FUNCTIONAL DESCRIPTION:
                                09E9  1953 ;
                                09E9  1954 ;       This is the usermode CONTROL-C handler. It sets
                                09E9  1955 ;       DS$V_CTRLC in DS$GL_FLAGS and renables the ^C AST.
                                09E9  1956 ;
                                09E9  1957 ; CALLING SEQUENCE:
                                09E9  1958 ;
                                09E9  1959 ;       CALLS   #0,RCTRLC
                                09E9  1960 ;
                                09E9  1961 ; INPUT PARAMETERS:     NONE
                                09E9  1962 ;
                                09E9  1963 ; IMPLICIT INPUTS:      NONE
                                09E9  1964 ;
                                09E9  1965 ; OUTPUT PARAMETERS:    NONE
                                09E9  1966 ;
                                09E9  1967 ; IMPLICIT OUTPUTS:     NONE
                                09E9  1968 ;
                                09E9  1969 ; COMPLETION CODES:     NONE
                                09E9  1970 ;
                                09E9  1971 ; SIDE EFFECTS:
                                09E9  1972 ;
                                09E9  1973 ;       SETS DS$V_CTRLC IN DS$GL_FLAGS
                                09E9  1974 ;--
                                09E9  1975
                         0000   09E9  1976 .ENTRY  RCTRLC,^M<>
5E    00000074 8F        C2     09EB  1977        SUBL    #DIB$K_LENGTH,SP        ; Space for device characteristics
                 6E        9F     09F2  1978        PUSHAB  (SP)                    ; Make descriptor of DIB
      00000074 8F        DD     09F4  1979        PUSHL   #DIB$K_LENGTH           ; Set length
            50   5E        D0     09FA  1980        MOVL    SP,R0                   ; Save address of data area
                                09FD  1981        $GETCHN_S L^DS$GW_TTIN,(R0),(R0); Get characterictics
                   00     DD     09FD                    PUSHL   #0
                   00     DD     09FF                    PUSHL   #0
                   60     7F     0A01                    PUSHAQ  (R0)
                   60     3F     0A03                    PUSHAW  (R0)
7E    0000089D'EF        3C     0A05                    MOVZWL  L^DS$GW_TTIN,-(SP)
00000000'GF        05     FB     0A0C                    CALLS   #5,G^SYS$GETCHN
            5E     08     C0     0A13  1982        ADDL    #8,SP                   ; Remove descriptor
              11   50     E8     0A16  1983        BLBS    R0,10$                  ; Branch if ok
                                0A19  1984        ERRSUP_S
      0000016B'EF        DF     0A19                    PUSHAL  $MODULE
                   00     DD     0A1F                    PUSHL   #0
                   01     DD     0A21                    PUSHL   #$ER
00000000'EF        03     FB     0A23                    CALLS   #3, DS_ERRSUP
       30 6E       14     E1     0A2A  1985 10$:     BBC     #DEV$V_MBX, -
                                0A2E  1986                    DIB$L_DEVCHAR(SP),30$   ; Branch if not mailbox
              08 AE    B7     0A2E  1987 20$:     DECW    DIB$L_DEVDEPEND(SP)     ; Decrement count of messaged
                   2B  19     0A31  1988        BLSS    30$                     ; Finish
                                0A33  1989        $QIOW_S ,L^DS$GW_TTIN,#IO$_READVBLK!IO$M_NOW,,,,L^DS$GT_BUFFER,#80
                   7E  7C     0A33                    CLRQ    -(SP)
                   7E  7C     0A35                    CLRQ    -(SP)
      00000050 8F        DD     0A37                    PUSHL   #80
      00000903'EF        DF     0A3D                    PUSHAL  L^DS$GT_BUFFER
                   7E  7C     0A43                    CLRQ    -(SP)
                   00  DD     0A45                    PUSHL   #0
    7E    0000'8F        3C     0A47                    MOVZWL  #IO$_READVBLK!IO$M_NOW,-(SP)
```

```
7E   0000089D'EF   3C  0A4C                          MOVZWL  L^DS$GW_TTIN,-(SP)
                00  DD  0A53                          PUSHL   #0
00000000'GF     0C  FB  0A55                          CALLS   #12,G^SYS$QIOW
                D0  11  0A5C  1990          BRB       20$                        ; Try again
                        0A5E  1991 30$:
                        0A5E  1992          $QIOW_S   ,L^DS$GW_TTIN,#IO$_SETMODE!IO$M_CTRLCAST,,,,RCTRLC
                7E  7C  0A5E                          CLRQ    -(SP)
                7E  7C  0A60                          CLRQ    -(SP)
                00  DD  0A62                          PUSHL   #0
             82 AF  DF  0A64                          PUSHAL  RCTRLC
                7E  7C  0A67                          CLRQ    -(SP)
                00  DD  0A69                          PUSHL   #0
    7E   0000'8F   3C  0A6B                          MOVZWL  #IO$_SETMODE!IO$M_CTRLCAST,-(SP)
7E   0000089D'EF   3C  0A70                          MOVZWL  L^DS$GW_TTIN,-(SP)
                00  DD  0A77                          PUSHL   #0
00000000'GF     0C  FB  0A79                          CALLS   #12,G^SYS$QIOW
00000899'EF     01  C8  0A80  1993          BISL2     #DS$M_CTRLC,L^DS$GL_FLAGS        ; SET CONTROL-C FLAG
                        0A87  1994
                    04  0A87  1995          RET                                  ; RETURN
```

```
                        0A88  1997          .SBTTL  KEYBOARD CHECK ROUTINE
                        0A88  1998 ;++
                        0A88  1999 ; FUNCTIONAL DESCRIPTION:
                        0A88  2000 ;
                        0A88  2001 ;       This routine is called to check for ^C, if it has been typed
                        0A88  2002 ;       control is passes to command mode by calling DS$CLI.
                        0A88  2003 ;       If Any ASTS are active (S/A only) the call is ignored
                        0A88  2004 ;
                        0A88  2005 ; CALLING SEQUENCE:
                        0A88  2006 ;
                        0A88  2007 ;       BSBW    KB_CHECK
                        0A88  2008 ;
                        0A88  2009 ; INPUT PARAMETERS:
                        0A88  2010 ;
                        0A88  2011 ;       NONE
                        0A88  2012 ;
                        0A88  2013 ; IMPLICIT INPUTS:
                        0A88  2014 ;
                        0A88  2015 ;       NONE
                        0A88  2016 ;
                        0A88  2017 ; OUTPUT PARAMETERS:
                        0A88  2018 ;
                        0A88  2019 ;       NONE
                        0A88  2020 ;
                        0A88  2021 ; IMPLICIT OUTPUTS:
                        0A88  2022 ;
                        0A88  2023 ;       NONE
                        0A88  2024 ;
                        0A88  2025 ; COMPLETION CODES:
                        0A88  2026 ;
                        0A88  2027 ;       NONE
                        0A88  2028 ;
                        0A88  2029 ; SIDE EFFECTS:
                        0A88  2030 ;
                        0A88  2031 ;       NONE
                        0A88  2032 ;--
```

```
                                 0A88  2034 KB_CHECK::                                                                                ;G:36
        03 00000899'EF    19     E0  0A88  2035          BBS     #DS$V_TIMED,DS$GL_FLAGS,1$ ; TIMED?                          [128] ;G:16
                  004D    31     11  0A90  2036          BRW     20$                        ; Branch if no /TIME              [128] ;G:16
                                 0A93  2037                                                                                        ;G:16
                    03    BB     11  0A93  2038 1$:       PUSHR   #^M<R0,R1>                 ; Used by GET_TIME                [128] ;G:17
             00000000'EF  DF     11  0A95  2039          PUSHAL  POLL_TIME                  ; Address to store result         [128] ;G:16
          00000C9A'EF  01     FB  0A9B  2040          CALLS   #1,GET_TIME                ; Use TODR to calculate time      [128] ;G:16
                    03    BA     11  0AA2  2041          POPR    #^M<R0,R1>                 ; Used by GET_TIME                [128] ;G:17
                                 0AA4  2042                                                                                        ;G:16
    00000004'EF  00000004'EF  D1     11  0AA4  2043          CMPL    L^DUE_TIME+4, -            ; See if time is due              [128] ;G:16
                                 0AAF  2044                  L^POLL_TIME+4              ; Compare high order of quad      [128] ;G:16
                    0F    1F     11  0AAF  2045          BLSSU   10$                        ; If LSSU, then time is due       [128] ;G:16
                    2D    1A     11  0AB1  2046          BGTRU   20$                        ; If GTRU, then time is not due   [128] ;G:16
    00000000'EF  00000000'EF  D1     11  0AB3  2047          CMPL    L^DUE_TIME,L^POLL_TIME     ; Compare low order               [128] ;G:16
                    20    1A     11  0ABE  2048          BGTRU   20$                        ; If GTRU, then time is not due   [128] ;G:16
                                 0AC0  2049 10$:
    00000899'EF  02000000 8F     CA  0AC0  2050          BICL2   #DS$M_TIMED,DS$GL_FLAGS ; Clear flag until a CONTINUE     [128] ;G:16
    00000899'EF  08000000 8F     C8  0ACB  2051          BISL2   #DS$M_TIMED_OUT,DS$GL_FLAGS ; Set flag for ABORT          [128] ;G:16
                  50   10 AD     D0  0AD6  2052          MOVL    SF$L_SAVE_PC(FP),R0        ; /TIME is due, set up R0 for     [128] ;G:16
                 00000000'EF  17     11  0ADA  2053          JMP     DSI$ABORT                  ; DSI$ABORT. Abort the program    [128] ;G:16
                                 0AE0  2054 20$:                                                                                   ;G:36
                 0000FE48'EF  D6     11  0AE0  2055          INCL    L^DSA$GL_EVENT             ; INCREMENT EVENT COUNTER
                                 0AE6  2056 KB_CHECK_APT::
          0000FE00'EF  1C     E0  0AE6  2057          BBS     #DSA$V_USER, -             ; CHECK FOR USER ENVIRONMENT.
                    24              0AED  2058                    L^DSA$GL_FLAGS, 10$
                 0000000C'EF  95     11  0AEE  2059          TSTB    DS$AX_SOFTPCB+PCB$B_ASTACT ; Any ASTS active?
                    03    13     11  0AF4  2060          BEQL    5$                         ; Continue if not                 [51]  ;G:16
                  01A0    31     11  0AF6  2061          BRW     KB_CHECK_X                 ; Exit immediately if so          [51]  ;G:16
                                 0AF9  2062
                 00000000'EF  16     11  0AF9  2063 5$:       JSB     L^KB_POLL                  ; Poll console
                                 0AFF  2064
                 00000408'EF  D5     11  0AFF  2065          TSTL    MP$GR_BOOTED_PROCESSORS        ; Are we an mp system?  [111]
                    0B    13     11  0B05  2066          BEQL    10$                            ; Not mp system         [111]
                    03    BB     11  0B07  2067          PUSHR   #^M<R0,R1>             ; Save Registers        [131]          ;G:19
          00000000'EF  00     FB  0B09  2068          CALLS   #0,MP$_PRIMARY_CPU_CHECK       ; Call mp code          [111]
                    03    BA     11  0B10  2069          POPR    #^M<R0,R1>             ; Restore Registers     [131]          ;G:19
    00000899'EF  00     E0  0B12  2070 10$:       BBS     #DS$V_CTRLC, -             ; CHECK CONTROL-C FLAG
                    03              0B19  2071                    L^DS$GL_FLAGS, 12$     ; If set, continue on             [51]  ;G:16
                  017C    31     11  0B1A  2072          BRW     KB_CHECK_X                 ; If clear, exit routine          [51]  ;G:16
                                 0B1D  2073
    00000899'EF  18     E1  0B1D  2074 12$:       BBC     #DS$V_DISABLCC, -          ; Continue if ^C enabled          [70]  ;G:16
                    03              0B24  2075                    DS$GL_FLAGS, -         ; . . .                           [51]  ;G:16
                                 0B25  2076                    13$                    ; . . .                           [70]  ;G:16
                  0171    31     11  0B25  2077          Brw     KB_Check_X                 ; Exit if ^C is disabled          [70]  ;G:16
                                 0B28  2078
                 00000000'EF  16     11  0B28  2079 13$:       JSB     SCRIPT$STOP                ; Stop script input               [44]  ;G:16
```

```
                        0B2E  2081          ;+
                        0B2E  2082          ; Algorithm:                                                    [70]  ;G:16
                        0B2E  2083          ; 1. Check the 1st DS ^C handler.                               [70]  ;G:16
                        0B2E  2084          ; 2. If there is not one, go to 4.                              [70]  ;G:16
                        0B2E  2085          ; 3. If there is one, do the following:                         [70]  ;G:16
                        0B2E  2086          ;       a. Call the 1st DS handler.                             [70]  ;G:16
                        0B2E  2087          ;       b. If it returns failure, go to 4.                      [70]  ;G:16
                        0B2E  2088          ;       c. If it returns success, clear the ^C flag and return. [70]  ;G:16
                        0B2E  2089          ; 4. Check the user ^C handler.                                 [70]  ;G:16
                        0B2E  2090          ; 5. If there is not one, go to 7.                              [70]  ;G:16
                        0B2E  2091          ; 6. If there is one, do the following:                         [70]  ;G:16
                        0B2E  2092          ;       a. Call the user handler.                               [70]  ;G:16
                        0B2E  2093          ;       b. If it returns failure, go to 7.                      [70]  ;G:16
                        0B2E  2094          ;       c. If it returns success, clear the ^C flag and return. [70]  ;G:16
                        0B2E  2095          ; 7. Check the 2nd DS ^C handler.                               [70]  ;G:16
                        0B2E  2096          ; 8. If there is not one, go to 10.                             [70]  ;G:16
                        0B2E  2097          ; 9. If there is one, do the following:                         [70]  ;G:16
                        0B2E  2098          ;       a. Call the 2nd DS handler.                             [70]  ;G:16
                        0B2E  2099          ;       b. If it returns failure, go to 10.                     [70]  ;G:16
                        0B2E  2100          ;       c. If it returns success, clear the ^C flag and return. [70]  ;G:16
                        0B2E  2101          ; 10. Set up the stack in preparation for doing an REI.         [70]  ;G:16
                        0B2E  2102          ; 11. Call DS$Cli for VDS command mode.                         [70]  ;G:16
                        0B2E  2103          ; 12. REI.                                                      [70]  ;G:16
                        0B2E  2104          ;--                                                             [70]  ;G:16
                        0B2E  2105                                                                                ;G:36
          00000194'EF   D5  0B2E  2106          TSTL    L^DS$GA_DS_Ctrl_C_First ; Check 1st DS Control-C Handler?[70] ;G:16
                  1F    13  0B34  2107          BEQL    15$                     ; If not one, branch          [70]  ;G:16
       7E 00000194'EF   D0  0B36  2108          MOVL    L^DS$GA_DS_Ctrl_C_First,-; Move the 1st handler address [70] ;G:16
                           0B3D  2109            -(SP)                         ; . . . to the stack          [70]  ;G:16
          00000194'EF   D4  0B3D  2110          CLRL    L^DS$GA_DS_Ctrl_C_First ; Clear out the 1st handler address[70] ;G:1
          00010001 8F   CA  0B43  2111          BICL2   #DS$M_CTRLO!DS$M_CTRLC,-; Clear the ^C and ^O bits    [89]  ;G:16
          00000899'EF       0B49  2112            L^DS$GL_FLAGS                 ; . . .                       [89]  ;G:16
              9E    6E    FA  0B4E  2113          CALLG   (SP), @(SP)+          ; Enter the first DS handler  [70]  ;G:16
                01  50    E9  0B51  2114          BLBC    R0, 15$               ; If 1st 'failed', check user's [70]  ;G:16
                            05  0B54  2115          RSB                           ; . . . and return to the caller.[70] ;G:16
                            0B55  2116                                                                            ;G:36
          0000019C'EF   D5  0B55  2117 15$:     TSTL    L^DS$L_UserCntrlC       ; ANY USER HANDLER?           [70]  ;G:16
                  1F    13  0B5B  2118          BEQL    20$                     ; NO, go check DS's second handler[70] ;G:16
       7E 0000019C'EF   D0  0B5D  2119          MOVL    L^DS$L_UserCntrlC,-(SP) ; GET ADDR OF USER CNTRL-C ROUTINE[70] ;G:16
          0000019C'EF   D4  0B64  2120          CLRL    L^DS$L_UserCntrlC       ; CLEAR HANDLER ADDRESS       [70]  ;G:16
00000899'EF 00010001 8F   CA  0B6A  2121          BICL2   #DS$M_CTRLO!DS$M_CTRLC, -       ;                     [89]  ;G:16
                            0B75  2122            L^DS$GL_FLAGS                 ; CLEAR CONTROL-C PENDING     [89]  ;G:16
              9E    6E    FA  0B75  2123          CALLG   (SP),@(SP)+           ; ENTER HANDLER                     ;G:36
                01  50    E9  0B78  2124          BLBC    R0, 20$               ; If handler 'failed', let DS handle
                            05  0B7B  2125          RSB                           ; RETURN
                            0B7C  2126
          00000198'EF   D5  0B7C  2127 20$:     TstL    L^DS$GA_DS_Ctrl_C_Second; Is there a 2nd DS Cntrl-C Handler?[70] ;G:
                  1F    13  0B82  2128          Beql    50$                     ; If not, call DS$Cli.        [70]  ;G:
       7E 00000198'EF   D0  0B84  2129          MovL    L^DS$GA_DS_Ctrl_C_Second,-; Move the 2nd handler address [70] ;G:
                           0B8B  2130            -(SP)                         ; . . . to the stack          [70]  ;G:
          00000198'EF   D4  0B8B  2131          ClrL    L^DS$GA_DS_Ctrl_C_Second; Clear out the 2nd handler address [70] ;G:
          00010001 8F   CA  0B91  2132          BicL2   #DS$M_CtrlO!DS$M_CtrlC,-; Otherwise, clear ^C and ^O bits [89] ;G:
          00000899'EF       0B97  2133            L^DS$GL_Flags                 ; . . .                       [89]  ;G:
              9E    6E    FA  0B9C  2134          CallG   (SP), @(SP)+          ; Enter the second DS handler [70]  ;G:
                B3  50    E9  0B9F  2135          BlbC    R0, 15$               ; If 2nd 'failed', call DS$Cli  [70]  ;G:16
                            05  0BA2  2136          Rsb                           ; . . . and return to the caller.[70] ;G:16
                            0BA3  2137                                                                            ;G:36
```

```
00000899'EF   02000000 8F   CA   0BA3  2138 50$:    BICL2   #DS$M_TIMED,DS$GL_FLAGS ; /TIME is off until a CONTINUE [128] ;G:16
                      01   BB   0BAE  2139           PUSHR   #^M<R0>                 ; Save original value           [131] ;G:19
           50   00000000'EF   DE   0BB0  2140           MOVAL   DS$GL_CLIBASE,R0        ; base of CLI data structure    [128] ;G:16
            08 0444 C0   03   E1   0BB7  2141           BBC     #CLI$V_START_OR_RUN, -  ; If the last command was a RUN [128] ;G:16
                                  0BBD  2142                   CLI$L_FLAGS2(R0),53$    ; or a START,                           ;G:16
        00000411'EF   04 AE   D0   0BBD  2143           MOVL    4(SP),START_RUN_PC      ; Save PC in case of a CONTINUE [128] ;G:41
                      01   BA   0BC5  2144 53$:    POPR    #^M<R0>                 ; Restore original value        [131] ;G:19
                   7E   6E   D0   0BC7  2145           MOVL    (SP),-(SP)              ; COPY RETURN ADDRESS           [131] ;G:19
                     04 AE   DC   0BCA  2146           MOVPSL  4(SP)                   ; SAVE CURRENT PSL
                     08 AE   9F   0BCD  2147           PUSHAB  8(SP)                   ; TRUE STACK POINTER AT ENTRY
                   3FFF 8F   BB   0BD0  2148           PUSHR   #^X3FFF                 ; STACK REGISTERS
              00000000'EF   6E   FA   0BD4  2149           CALLG   (SP),L^DS$CLI           ; ENTER COMMAND DECODER
                                  0BDB  2150
        00000411'EF   3C AE   D1   0BDB  2151           CMPL    60(SP),START_RUN_PC     ; If we are CONTINUING from a   [128] ;G:16
                      03   13   0BE3  2152           BEQL    55$                     ; RUN or START command, check   [128] ;G:16
                   00A0   31   0BE5  2153           BRW     75$                     ; for /TIME and MP startup      [128] ;G:16
                                  0BE8  2154                                                                          ;G:16
00000000'EF   00000000'EF   7D   0BE8  2155 55$:    MOVQ    L^BIN_TIME,L^BIN_TIME   ; Leave if /TIME not given      [88]  ;G:16
                      03   12   0BF3  2156           BNEQ    61$                     ;                               [128] ;G:16
                   0075   31   0BF5  2157           BRW     70$                                                             ;G:16
00000000'EF   00000000'EF   C2   0BF8  2158 61$:    SUBL2   L^BEGIN_TIME, -         ; Calculate remaining time for  [88]  ;G:36
                                  0C03  2159                   L^POLL_TIME             ; /TIME                         [88][128] ;G:
00000004'EF   00000004'EF   D9   0C03  2160           SBWC    L^BEGIN_TIME+4, -       ; Subtract 2 quads              [88]  ;G:16
                                  0C0E  2161                   L^POLL_TIME+4           ; Result is time actually used.[88][128] ;G:
00000000'EF   00000000'EF   C0   0C0E  2162           ADDL2   L^POLL_TIME, -          ; Now, calculate how much more [88][128] ;G:
                                  0C19  2163                   L^BIN_TIME              ; to let it run. BIN_TIME is a  [88]  ;G:16
00000004'EF   00000004'EF   D8   0C19  2164           ADWC    L^POLL_TIME+4, -        ; delta time, thus is negative [88][128] ;G:
                                  0C24  2165                   L^BIN_TIME+4            ;                               [88]  ;G:16
                                  0C24  2166                                           ; Calculate new due time        [128] ;G:16
                      03   BB   0C24  2167           PUSHR   #^M<R0,R1>              ; Used by GET_TIME              [128] ;G:17
              00000000'EF   DF   0C26  2168           PUSHAL  BEGIN_TIME              ; Address to store result       [128] ;G:16
        00000C9A'EF   01   FB   0C2C  2169           CALLS   #1,GET_TIME             ; Use TODR to calculate SYSTIME [128] ;G:16
                      03   BA   0C33  2170           POPR    #^M<R0,R1>              ; Used by GET_TIME              [128] ;G:17
                                  0C35  2171                                                                          ;G:16
00000000'EF   00000000'EF   7D   0C35  2172           MOVQ    L^BEGIN_TIME,L^DUE_TIME ; Initialize DUE_TIME           [128] ;G:16
00000000'EF   00000000'EF   C2   0C40  2173           SUBL2   L^BIN_TIME,L^DUE_TIME   ; BIN_TIME is negative, so      [128] ;G:16
                                  0C4B  2174                                           ; subtracting it is really      [128] ;G:16
00000004'EF   00000004'EF   D9   0C4B  2175           SBWC    L^BIN_TIME+4,L^DUE_TIME+4 ; adding it.                  [128] ;G:16
00000899'EF   02000000 8F   C8   0C56  2176           BISL2   #DS$M_TIMED,DS$GL_FLAGS ; This run is timed             [128] ;G:16
           50   00000000'EF   DE   0C61  2177           MOVAL   DS$GL_CLIBASE,R0        ; base of CLI data structure    [128] ;G:16
            0444 C0   08   C8   0C68  2178           BISL2   #CLI$M_START_OR_RUN, -  ; Pretend the last command was  [128] ;G:16
                                  0C6D  2179                   CLI$L_FLAGS2(R0)        ; a START or RUN, so that we can[128] ;G:16
                                  0C6D  2180                                           ; CONTINUE from another ^C.     [128] ;G:16
                                  0C6D  2181 70$:
              00000408'EF   D5   0C6D  2182           TSTL    MP$GR_BOOTED_PROCESSORS         ; Are we an mp system?  [111] ;G:19
                      13   13   0C73  2183           BEQL    75$                             ; Not mp system         [111] ;G:16
        00000000'EF   00   FB   0C75  2184           CALLS   #0,MP$_RESUME_ATTACHED_PROCESSORS ; If CONT, then restart [111] ;G:1
                                  0C7C  2185                                                   ; all Ap's              [111] ;G:16
           50   00000000'EF   DE   0C7C  2186           MOVAL   DS$GL_CLIBASE,R0        ; base of CLI data structure    [131] ;G:19
            0444 C0   08   C8   0C83  2187           BISL2   #CLI$M_START_OR_RUN, -  ; Pretend the last command was  [128] ;G:16
                                  0C88  2188                   CLI$L_FLAGS2(R0)        ; a START or RUN, so that we can[128] ;G:16
                                  0C88  2189                                           ; CONTINUE from another ^C.     [128] ;G:16
                                  0C88  2190                                                                          ;G:16
              50   38 AE   D0   0C88  2191 75$:    MOVL    14*4(SP),R0             ; GET NEW STACK POINTER         [111] ;G:16
              70   3C AE   7D   0C8C  2192           MOVQ    15*4(SP),-(R0)          ; PUT NEW PC/PSL THERE
              38 AE   50   D0   0C90  2193           MOVL    R0,14*4(SP)             ; PUT UPDATED NEW STACK POINTER BACK
                 7FFF 8F   BA   0C94  2194           POPR    #^X7FFF                 ; RESTORE REGISTERS, CHANGES SP
```

```
                02  0C98  2195          REI                     ; USE NEW PC/PSL
                    0C99  2196
                    0C99  2197 KB_CHECK_X:
                05  0C99  2198          RSB                     ; RETURN
```

```
                        0C9A  2200          .SBTTL  GET_TIME        Convert TODR to current system time          ;G:16
                        0C9A  2201 ;++                                                              begin   [128] ;G:16
                        0C9A  2202 ; FUNCTIONAL DESCRIPTION:                                                      ;G:16
                        0C9A  2203 ;                                                                              ;G:16
                        0C9A  2204 ;       This routine returns the system time.                                  ;G:17
                        0C9A  2205 ;       If running under VMS, returns execution time.                          ;G:17
                        0C9A  2206 ;       If standalone, execution time and elapsed time are the same. For       ;G:17
                        0C9A  2207 ;       non-8800 systems, the time is obtained from EXE$GQ_SYSTIME, unless the ;G:17
                        0C9A  2208 ;       DS$V_TIMRON flag indicates that the diagnostic is using the interval   ;G:17
                        0C9A  2209 ;       clock, in which case EXE$GQ_SYSTIME is not current. In that case, read ;G:17
                        0C9A  2210 ;       the TODR, and convert it to the current system time.                    ;G:17
                        0C9A  2211 ;       For 8800 systems, a different algorithm is followed because too        ;G:16
                        0C9A  2212 ;       many reads of the TODR can drastically slow down execution time.       ;G:16
                        0C9A  2213 ;       The time is obtained from EXE$GQ_SYSTIME regardless of whether the      ;G:16
                        0C9A  2214 ;       diagnostic is using the interval timer (DS$V_TIMRON). This does        ;G:16
                        0C9A  2215 ;       not seem to affect the accuracy of the /TIME switch too much. Only     ;G:16
                        0C9A  2216 ;       when CONTINUing from a ^C is the TODR read.                             ;G:16
                        0C9A  2217 ;                                                                              ;G:16
                        0C9A  2218 ; CALLING SEQUENCE:                                                            ;G:16
                        0C9A  2219 ;                                                                              ;G:16
                        0C9A  2220 ;       CALLS   #1,GET_TIME                                                    ;G:16
                        0C9A  2221 ;                                                                              ;G:16
                        0C9A  2222 ; INPUT PARAMETERS:                                                            ;G:16
                        0C9A  2223 ;                                                                              ;G:16
                        0C9A  2224 ;       4(AP)   Address of quadword which receives current system time         ;G:16
                        0C9A  2225 ;                                                                              ;G:16
                        0C9A  2226 ; IMPLICIT INPUTS:      NONE                                                   ;G:16
                        0C9A  2227 ;                                                                              ;G:16
                        0C9A  2228 ; OUTPUT PARAMETERS:    NONE                                                   ;G:16
                        0C9A  2229 ;                                                                              ;G:16
                        0C9A  2230 ; IMPLICIT OUTPUTS:     NONE                                                   ;G:16
                        0C9A  2231 ;                                                                              ;G:16
                        0C9A  2232 ; COMPLETION CODES:     NONE                                                   ;G:16
                        0C9A  2233 ;                                                                              ;G:16
                        0C9A  2234 ; SIDE EFFECTS:         NONE                                                   ;G:16
                        0C9A  2235 ;--                                                                            ;G:16
                  0028  0C9A  2236 .ENTRY  GET_TIME,^M<R3,R5>                                                     ;G:16
                        0C9C  2237          BR_IF_NOT_USER  50$             ;                           [129] ;G:17
0000FE00'EF     1C    E1  0C9C                BBC     #DSA$V_User, -                  ; If bit not set, branch
                  38        0CA3                    L^DSA$GL_Flags, 50$         ;
                        0CA4  2238          $GETJPIW_S ITMLST=CPUTIM        ; Returns process's accumulated [129] ;G:17
                    7E  7C  0CA4                    CLRQ    -(SP)
                    00  DD  0CA6                    PUSHL   #0
          00000415'EF   DF  0CA8                    PUSHAL  CPUTIM
                    00  DD  0CAE                    PUSHL   #0
                    00  DD  0CB0                    PUSHL   #0
                    00  DD  0CB2                    PUSHL   #0
00000000'GF         07  FB  0CB4                    CALLS   #7,G^SYS$GETJPIW
                        0CBB  2239                                      ; cpu time in 10ms units    [129] ;G:17
                 14 50  E8  0CBB  2240          BLBS    R0,10$                  ;                   [129] ;G:17
                        0CBE  2241          ERRSUP_S                        ; Couldn't get cpu time     [129] ;G:17
          0000016B'EF   DF  0CBE                    PUSHAL  $MODULE
                    00  DD  0CC4                    PUSHL   #0
                    02  DD  0CC6                    PUSHL   #$ER
00000000'EF         03  FB  0CC8                    CALLS   #3, DS_ERRSUP
                 00F2   31  0CCF  2242          BRW     1000$                   ;                   [129] ;G:17
50      00000425'EF   D0  0CD2  2243 10$:      MOVL    JPICPUTIM,R0            ; R0 gets cpu time          [129] ;G:17
```

```
                  00C5   31  0CD9  2244          BRW     751$                    ;                                [129] ;G:17
                             0CDC  2245                                                                                ;G:17
      06   0000FE17'EF   91  0CDC  2246 50$:     CMPB    DSA$GL_SID+3,#PR$_SID_TYP8NN ; 8800? [138]                   ;G:36
                    3A   13  0CE3  2247          BEQL    500$                                                          ;G:34
      11   0000FE17'EF   91  0CE5  2248          CMPB    DSA$GL_SID+3,#PR$_SID_TYP8RR ; RRR? [138]                    ;G:34
                    31   13  0CEC  2249          BEQL    500$                                                          ;G:34
                             0CEE  2250                                                                                ;G:16
                             0CEE  2251 100$:                                  ; not an 8800                          ;G:17
      00000899'EF   11   E0  0CEE  2252          BBS     #DS$V_TIMRON, -         ; Use EXE$GQ_SYSTIME unless someone   ;G:16
                    0B       0CF5  2253                  DS$GL_FLAGS,200$        ; is using the interval clock         ;G:17
                             0CF6  2254                                                                                ;G:16
   04 BC   00000000'EF   7D  0CF6  2255          MOVQ    EXE$GQ_SYSTIME,@4(AP)   ; Store current time                  ;G:16
                  00C3   31  0CFE  2256          BRW     1000$                   ; Exit                                ;G:16
                             0D01  2257                                                                                ;G:36
              53    1B   D0  0D01  2258 200$:    MOVL    #PR780$_TODR,R3         ; Standalone, use TODR                ;G:17
              55    01   D0  0D04  2259          MOVL    #1,R5                   ; Code for EXAMINE command            ;G:16
                             0D07  2260          CMK     SGIPR                   ; Must be in KERNEL mode              ;G:16
                    7E   DC  0D07                MOVPSL  -(SP)
           06 6E    1A   E0  0D09                BBS     #PSL$V_IS, (SP), 30004$
                    8E   D4  0D0D                CLRL    (SP)+
                    0A   BC  0D0F                CHMK    #CMK$_SGIPR
                    06   11  0D11                BRB     30005$
         00000000'EF    16  0D13       30004$:  JSB     CMK$SGIPR
                             0D19       30005$:
              50    51   D0  0D19  2261          MOVL    R1,R0                   ; Put TODR contents in R0             ;G:16
                  007B   31  0D1C  2262          BRW     750$                    ; Finish with common code             ;G:16
                             0D1F  2263                                                                                ;G:16
                             0D1F  2264                                                                                ;G:16
                             0D1F  2265 500$:                                  ; 8800 and RRR routine [138]          ;G:34
   0B 00000899'EF   19   E1  0D1F  2266          BBC     #DS$V_TIMED,DS$GL_FLAGS,510$ ; Flag is clear if this routine  ;G:16
                             0D27  2267                                        ; is called as a result of a CONTINUE ;G:16
                             0D27  2268                                        ; command                             ;G:16
                             0D27  2269                                                                                ;G:16
                             0D27  2270                                        ; If not from a CONTINUE command,     ;G:16
                             0D27  2271                                        ; it is polling in KB_CHECK,          ;G:16
   04 BC   00000000'EF   7D  0D27  2272          MOVQ    EXE$GQ_SYSTIME,@4(AP)   ; store current time                  ;G:16
                  0092   31  0D2F  2273          BRW     1000$                   ; Exit                                ;G:16
                             0D32  2274                                                                                ;G:16
                             0D32  2275                                        ; Fetch TODR from console             ;G:16
                             0D32  2276                                        ; This is only done if this routine   ;G:16
                             0D32  2277                                        ; is called as a result of a CONTINUE ;G:16
                             0D32  2278                                        ; command                             ;G:16
                             0D32  2279 510$:                                                                          ;G:16
         00000000'EF    D4  0D32  2280          CLRL    TODR_BYTE_CNT           ; init byte/loop count                ;G:16
                             0D38  2281 520$:                                                                          ;G:16
              53    22   D0  0D38  2282          MOVL    #PR$_TXCS,R3            ; Standalone, use TODR                ;G:16
              55    01   D0  0D3B  2283          MOVL    #1,R5                   ; Code for EXAMINE command            ;G:16
                             0D3E  2284          CMK     SGIPR                   ; Must be in KERNEL mode              ;G:16
                    7E   DC  0D3E                MOVPSL  -(SP)
           06 6E    1A   E0  0D40                BBS     #PSL$V_IS, (SP), 30006$
                    8E   D4  0D44                CLRL    (SP)+
                    0A   BC  0D46                CHMK    #CMK$_SGIPR
                    06   11  0D48                BRB     30007$
         00000000'EF    16  0D4A       30006$:  JSB     CMK$SGIPR
                             0D50       30007$:
   E0 51   00000000'8F   E1  0D50  2285          BBC     #TXCS$V_RDY,R1,520$     ; branch if not ready to xmit         ;G:16
                    55   D4  0D58  2286          CLRL    R5                      ; CMK$SGIPR code for DEPOSIT function ;G:16
```

```
          51   00000F08 8F   D0  0D5A  2287          MOVL    #^X00000F08,R1          ; TOY read request                    ;G:16
                    53   23   D0  0D61  2288          MOVL    #PR$_TXDB,R3            ; IPR to write to                     ;G:16
                                  0D64  2289          CMK     SGIPR                   ; Must be in KERNEL mode              ;G:16
                         7E   DC  0D64                MOVPSL  -(SP)
                 06 6E   1A   E0  0D66                BBS     #PSL$V_IS, (SP), 30008$
                         8E   D4  0D6A                CLRL    (SP)+
                         0A   BC  0D6C                CHMK    #CMK$_SGIPR
                         06   11  0D6E                BRB     30009$
               00000000'EF    16  0D70        30008$: JSB     CMK$SGIPR
                                  0D76        30009$:
                                  0D76  2290  530$:                                                                         ;G:16
                                  0D76  2291          CMK     RCONSOLE                ; get binary data                     ;G:16
                         7E   DC  0D76                MOVPSL  -(SP)
                 06 6E   1A   E0  0D78                BBS     #PSL$V_IS, (SP), 30010$
                         8E   D4  0D7C                CLRL    (SP)+
                         01   BC  0D7E                CHMK    #CMK$_RCONSOLE
                         06   11  0D80                BRB     30011$
               00000000'EF    16  0D82        30010$: JSB     CMK$RCONSOLE
                                  0D88        30011$:
          04   00000000'EF    D1  0D88  2292          CMPL    TODR_BYTE_CNT,#4        ; do we have all four bytes of        ;G:16
                                  0D8F  2293                                          ; toy data                            ;G:16
                         02   13  0D8F  2294          BEQL    540$                    ; yes then continue                   ;G:16
                         E3   11  0D91  2295          BRB     530$                    ; branch if not                       ;G:16
                                  0D93  2296  540$:                                                                         ;G:16
          50   00000000'EF    D0  0D93  2297          MOVL    TODR_STORE,R0           ; get toy data                        ;G:16
                                  0D9A  2298                                                                                ;G:16
          50   00000000'8F    C2  0D9A  2299  750$:   SUBL2   #TODR_BIAS,R0           ; Remove validation bias              ;G:16
                    50   01   CA  0DA1  2300  751$:   BICL    #1,R0                   ; Clear low bit                [129] ;G:17
           50   50   FF 8F    9C  0DA4  2301          ROTL    #-1,R0,R0               ; Divide by 2 unsigned                ;G:16
  50   00   50   00000000'8F   7A  0DA9  2302          EMUL    #2*TICK_NS,R0,#0,R0     ; Convert to SYSTIME format           ;G:16
                                  0DB2  2303                                          ; 10ms to 100 ns                      ;G:16
          50   00000000'EF    C0  0DB2  2304          ADDL2   L^DS$GQ_CURYEAR,R0      ; Adjust to current time/date         ;G:16
          51   00000004'EF    D8  0DB9  2305          ADWC    L^DS$GQ_CURYEAR+4,R1    ; (all 64 bits)                       ;G:16
                 04 BC   50   7D  0DC0  2306          MOVQ    R0,a4(AP)               ; Return result                       ;G:16
                                04  0DC4  2307  1000$:  RET                             ;                       end   [128] ;G:16
                                  0DC5  2308                                                                                ;G:16
```

```
                                ODC5  2310          .SBTTL  DSX$CNTRLC      Program enable for Control-C intercept
                                ODC5  2311 ;++
                                ODC5  2312 ; FUNCTIONAL DESCRIPTION:
                                ODC5  2313 ;
                                ODC5  2314 ;       This routine enables the diagnostic to intercept the next
                                ODC5  2315 ;       Control-C typed by the operator.
                                ODC5  2316 ;       If a routine has been specified when the next Control-C is
                                ODC5  2317 ;       typed, the enable is cleared and the routine called.
                                ODC5  2318 ;       The enable is effective until a Control-C is typed
                                ODC5  2319 ;       or canceled by calling with a zero routine_address.
                                ODC5  2320 ;
                                ODC5  2321 ;       The routine also allows enabling or disabling control C handling.  If
                                ODC5  2322 ;       the DISABL argument has low bit SET, ^C handling is DISABLED.
                                ODC5  2323 ;
                                ODC5  2324 ; CALLING SEQUENCE:
                                ODC5  2325 ;
                                ODC5  2326 ;       DS$CNTRLC(routine_address)
                                ODC5  2327 ;
                                ODC5  2328 ; INPUT PARAMETERS:
                                ODC5  2329 ;
                                ODC5  2330 ;       4(AP)   Address of routine to call on Control-C
                                ODC5  2331 ;       8(AP)   DISABL flag (LBS to disable, LBC to enable)
                                ODC5  2332 ;
                                ODC5  2333 ; IMPLICIT INPUTS:      NONE
                                ODC5  2334 ;
                                ODC5  2335 ; OUTPUT PARAMETERS:    NONE
                                ODC5  2336 ;
                                ODC5  2337 ; IMPLICIT OUTPUTS:
                                ODC5  2338 ;
                                ODC5  2339 ;       DS$L_USERCNTRLC is set to value of routine_address
                                ODC5  2340 ;
                                ODC5  2341 ; COMPLETION CODES:     NONE
                                ODC5  2342 ;
                                ODC5  2343 ; SIDE EFFECTS:         NONE
                                ODC5  2344 ;--
                                ODC5  2345
                          0000  ODC5  2346 .ENTRY  DSX$CNTRLC,^M<>
                                ODC7  2347
 0000019C'EF    04 AC     D0    ODC7  2348          MOVL    4(AP),L^DS$L_USERCNTRLC ; SET USER CONTROL-C ADDRESS
                50        D4    ODCF  2349          CLRL    R0
             02 6C        91    ODD1  2350          CMPB    (AP),#2                 ; Is DISABL included?
                16        1F    ODD4  2351          BLSSU   10$                     ; No: don't use it
   51  00000899'EF        9E    ODD6  2352          MOVAB   L^DS$GL_FLAGS, R1       ; Point to internal flags
   50  61    01           18    EF    ODDD  2353          EXTZV   #DS$V_DISABLCC,#1,(R1),R0; Extract current value of disable bit
61  01  18    08 AC        F0    ODE2  2354          INSV    8(AP),#DS$V_DISABLCC,#1,(R1); Insert new value
       50    50           03    78    ODE8  2355          ASHL    #3,R0,R0                ; Make old value into a
             50           01    88    ODEC  2356 10$:     BISB    #1,R0                   ;  WASSET or WASCLR return code
                          04    ODEF  2357          RET
                                ODF0  2358                                                                  ;G:3
```

```
                        0DF0  2360          .Sbttl  DSV$EXIT, Process EXIT command
                        0DF0  2361 ;++
                        0DF0  2362 ; Functional Description:
                        0DF0  2363 ;
                        0DF0  2364 ;       This routine is called from CLI when an EXIT command is
                        0DF0  2365 ;       typed.  It will call DS_CLEANUP, INIT_CONTEXT; then if
                        0DF0  2366 ;       in standalone, it will HALT; if on-line, it will do a
                        0DF0  2367 ;       $EXIT call. If the bits in the R5 that was passed from the
                        0DF0  2368 ;       BOOT routines are setup for CRD-AutoTest, then do some
                        0DF0  2369 ;       special things.
                        0DF0  2370 ;
                        0DF0  2371 ; Inputs:
                        0DF0  2372 ;
                        0DF0  2373 ;       None
                        0DF0  2374 ;
                        0DF0  2375 ; Outputs:
                        0DF0  2376 ;
                        0DF0  2377 ;       None
                        0DF0  2378 ;
                        0DF0  2379 ;--
```

```
                                0DF0  DSV$EXIT::                                  ;                                                [47]
                                0DF0          Br_If_Not_LodFlg        10$         ; Branch if no program loaded                    [63]
        00000899'EF   01   E1   0DF0          BBC     #DS$V_LodFlg, -                     ; If bit not set, branch                 [29]
                      06        0DF7                    L^DS$GL_Flags, 10$                  ;                                        [29]
            00000000'EF   16   0DF8          jsb     Ds_Cleanup                  ; Conditionally call                 [47]  ;G:3
                                0DFE                                              ;  program cleanup                   [47][125] ;G
                                0DFE
                    FA89   30   0DFE  10$:    Bsbw    Init_Context                ; Clean up after ourselves                       [47]
                                0E01
                                0E01          ;+
                                0E01          ; Call the Unload_CRD routine - this routine will check to see if CRD           [71]
                                0E01          ; been running. If it hasn't, it will return. If CRD has been running,          [71]
                                0E01          ; the routine will deallocate all the memory that was allocated for             [71]
                                0E01          ; the CRD image. In this case, it will not return to here! It goes to           [71]
                                0E01          ; either the Begin_Bliss label, or it does a Halt.                               [71]
                                0E01          ;-
                                0E01
                      00   DD   0E01          PushL   #0                          ; If the CRD image is in memory, then            [76]
                                0E03                                              ; . . . don't return to here.                    [76]
        00000000'EF   01   FB   0E03          Calls   #1, DSR$Unload_CRD          ; 'Unload' the CRD image from memory             [76]
                                0E0A
                                0E0A          ;+
                                0E0A          ; If it comes to here, then the CRD image was not in memory.                     [76]
                                0E0A          ;-
                                0E0A
                                0E0A          Br_If_User      60$                 ; If in User-Mode, don't try to halt             [63]
        0000FE00'EF   1C   E0   0E0A          BBS     #DSA$V_User, -                      ; If bit set  branch                     [28]
                      55        0E11                    L^DSA$GL_Flags, 60$                 ;                                        [28]
                                0E12
                                0E12          BR_IF_NOT_AP    20$                 ; Not AP, normal exit                [125] ;G:3
     49 00000000'EF   08   E1   0E12          BBC     #AP$V_AP_Running,AP$GW_Data,20$
        7E   0000005E 8F   DB   0E1A          MFPR    #PR8SS$_BINID,-(SP)                 ; Get our node id
    00000000'EF   04   04   ED   0E21          CMPZV   #AP$V_AP_Node_Id,#AP$S_AP_Node_Id, - ; Is our node id the same as
                      8E        0E29                    AP$GW_Data, (SP)+                   ; the AP node id?
                      37   12   0E2A          BNEQ    20$                                 ; No, Branch
                                0E2C  ;+                                                                                          ;G:3
                                0E2C  ; If we are running in the AP, request the PP to set up its RXCD intr   [125] ;G:3
                                0E2C  ; to handle the console prompt, as well as getting ready to verify that [125] ;G:3
                                0E2C  ; >>> did come over, and clear the AP_RUNNING bit and HALT                [102][125] ;
                                0E2C  ;-                                                                                          ;G:3
        00000000'EF   01   D0   0E2C          MOVL    #AP$_REQ_RXCDVEC, -         ; Set request type                   [125] ;G:3
                                0E33                    AP$GR_SHARED_DATA           ;                                    [125] ;G:3
  00000004'EF   00000001'EF   DE   0E33          MOVAL   AP$I_PROMPT_CHECK+1, -      ; PP will get console prompt         [125] ;G:3
                                0E3E                    AP$GR_SHARED_DATA+4         ;                                    [125] ;G:3
    00000000'EF   0400 8F   A8   0E3E          BISW2   #AP$M_REQUEST, -            ; Set request bit                    [125] ;G:3
                                0E47                    AP$GW_DATA                  ;                                    [125] ;G:3
        00000000'EF   0A   E0   0E47  15$:    BBS     #AP$V_REQUEST, -            ; Loop until PP finishes req         [125] ;G:3
                      F8        0E4E                    AP$GW_DATA, 15$             ;                                    [125] ;G:3
            00000000'EF   94   0E4F          CLRB    AP$B_PROMPT_BUFFER_COUNT ; Clear buffer pointer                  [125] ;G:3
            00000000'EF   94   0E55          CLRB    AP$B_PROMPT_COUNT           ; Clear count of '>'s recvd          [125] ;G:3
                                0E5B                                                                                              ;G:3
     00 00000000'EF   08   E4   0E5B          bbsc    #ap$v_ap_running,AP$gw_data,20$ ; clear ap_running bit  [102] ;G:3
                                0E63
                      00        0E63  20$:    Halt                                ; Halt processor in standalone                   [63]
                    FA06   31   0E64          BrW     Begin                       ; ReStart the VDS if console Continue            [71]
                                0E67
                                0E67          ;+
```

```
                                0E67  2429          ; We are in User-Mode. Do a system service exit.                    [63]
                                0E67  2430          ;-
                                0E67  2431
                                0E67  2432 60$:     $Exit_S                          ; Exit with success code            [63]
                     01    DD   0E67                          PUSHL   #1
        00000000'GF  01    FB   0E69                          CALLS   #1,G^SYS$EXIT
                           05   0E70  2433          Rsb                              ; (just in case)                    [47]
```

```
                                0E71  2435          .SBTTL  EXIT$HANDLR     Process EXIT handler
                                0E71  2436 ;++
                                0E71  2437 ; FUNCTIONAL DESCRIPTION:
                                0E71  2438 ;
                                0E71  2439 ;       This routine is called from the command interpreter
                                0E71  2440 ;       when the image is forced to exit.  It's sole purpose is
                                0E71  2441 ;       to execute the diagnostic program cleanup code.
                                0E71  2442 ;       DS_CLEANUP is called only if a program is loaded.
                                0E71  2443 ;       In addition any devices allocated by select are deallocated.
                                0E71  2444 ;
                                0E71  2445 ; CALLING SEQUENCE:
                                0E71  2446 ;
                                0E71  2447 ;       EXIT$HANDLR()
                                0E71  2448 ;
                                0E71  2449 ; INPUT PARAMETERS:     NONE
                                0E71  2450 ;
                                0E71  2451 ; IMPLICIT INPUTS:
                                0E71  2452 ;
                                0E71  2453 ;       DS$GL_FLAGS     DS$V_DONFLG, DS$V_LODFLG, DS$V_STRFLG
                                0E71  2454 ;
                                0E71  2455 ; OUTPUT PARAMETERS:    NONE
                                0E71  2456 ;
                                0E71  2457 ; IMPLICIT OUTPUTS:     NONE
                                0E71  2458 ;
                                0E71  2459 ; COMPLETION CODES:     NONE
                                0E71  2460 ;--
                                0E71  2461
                                0E71  2462 EXIT$HANDLR:
                          0FFC  0E71  2463          .WORD   ^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>
06 00000899'EF    01    E1    0E73  2464          BBC     #DS$V_LODFLG,L^DS$GL_FLAGS,10$ ; Branch if not program loaded
       00000000'EF    16    0E7B  2465          JSB     DS_CLEANUP                     ; Conditionally execute program cleanup ;G:4
                                0E81  2466
   55  00000000'EF    DE    0E81  2467 10$:     MOVAL   DS$GA_PTABLE,R5                ; Point to P-table list
   53  00000000'EF    DE    0E88  2468          MOVAL   DS$GA_SELECTS,R3               ; Point to select bits
           54   65    D0    0E8F  2469          MOVL    (R5),R4                        ; Get max count of units
                                0E92  2470
         52   6544    D0    0E92  2471 20$:     MOVL    (R5)[R4],R2                    ; Get address of P-table
                15    13    0E96  2472          BEQL    30$                            ; Branch if no P-table
      10 0A A2   00    E1    0E98  2473          BBC     #HP$V_ALLOC, -
                                0E9D  2474                  HP$B_FLAGS(R2),30$        ; Branch if should not be deallocated
      0B 0A A2   01    E1    0E9D  2475          BBC     #HP$V_WASALL, -
                                0EA2  2476                  HP$B_FLAGS(R2),30$        ; Branch if is not allocated
                                0EA2  2477          $DALLOC_S HP$Q_DEVICE(R2)         ; Deallocate device
                00   DD    0EA2                          PUSHL   #0
                62   7F    0EA4                          PUSHAQ  HP$Q_DEVICE(R2)
   00000000'GF  02   FB    0EA6                          CALLS   #2,G^SYS$DALLOC
             E2 54   F5    0EAD  2478 30$:     SOBGTR  R4,20$                         ; Count and branch
                                0EB0  2479 ;
                                0EB0  2480 ; Restore sys$disk and original default directory                    ;G:28
                                0EB0  2481 ;
   50   000001E0'EF    9E    0EB0  2482          MOVAB   L^DS$AT_DDEV,R0                ; Address of new logical name   [135] ;G:28
              02 A0    9F    0EB7  2483          PUSHAB  2(R0)
           7E   60    3C    0EBA  2484          MOVZWL  (R0),-(SP)                     ; Length of new logical name    [135] ;G:28
                7E    D4    0EBD  2485          CLRL    -(SP)                          ; Access mode                   [135] ;G:28
                04 AE    7F    0EBF  2486          PUSHAQ  4(SP)                          ; point to descriptor of new name [135] ;G:2
      00000000'EF    7F    0EC2  2487          PUSHAQ  SYS$DISK                       ; Address of descriptor of logical name [135
                00   DD    0EC8  2488          PUSHL   #0                             ; In process logical name table [135] ;G:28
```

```
                00000000'EF   04   FB  0ECA  2489          CALLS   #4,SYS$CRELOG            ; Create logical name          [135] ;G:28
                                      0ED1  2490
                50    000001B8'EF   9E  0ED1  2491          MOVAB   L^DS$AT_DDIR,R0          ; Address of old directory
                   04 AE    02 A0   9E  0ED8  2492          MOVAB   2(R0),4(SP)              ; Fill in descriptor
                         6E    60   3C  0EDD  2493          MOVZWL  (R0),(SP)                ; Fill in length
                               7E   7C  0EE0  2494          CLRQ    -(SP)                    ; Null parameters
                            08 AE   7F  0EE2  2495          PUSHAQ  8(SP)                    ; Address of descriptor
                00000000'EF   03   FB  0EE5  2496          CALLS   #3,SYS$SETDDIR           ; Set default directory back
                         5E   08   C0  0EEC  2497          ADDL    #8,SP                    ; Remove extra stuff
                                      0EEF  2498
                                04    0EEF  2499          RET
```

```
                                0EF0          .SubTitle       DSR$Check_MenuTest_Off_Set Routine
                                0EF0  ;++
                                0EF0  ; FUNCTIONAL DESCRIPTION:
                                0EF0  ;
                                0EF0  ;       This routine checks to see if CRD MenuTest Offline is active.
                                0EF0  ;       It checks the Boot$L_R5 longword and DSA Flags.
                                0EF0  ;       The value in Boot$L_R5 is the value that
                                0EF0  ;       is passes to the VDS from DiagBoot (in R5).
                                0EF0  ;
                                0EF0  ; CALLING SEQUENCE:
                                0EF0  ;
                                0EF0  ;       Jsb/Bsbw/Bsbb DSR$Check_MenuTest_Off_Set
                                0EF0  ;
                                0EF0  ; INPUT PARAMETERS:
                                0EF0  ;
                                0EF0  ;       NONE
                                0EF0  ;
                                0EF0  ; IMPLICIT INPUTS:
                                0EF0  ;
                                0EF0  ;       Boot$L_R5
                                0EF0  ;       DSA$GL_Flags
                                0EF0  ;
                                0EF0  ; OUTPUT PARAMETERS:
                                0EF0  ;
                                0EF0  ;       NONE
                                0EF0  ;
                                0EF0  ; IMPLICIT OUTPUTS:
                                0EF0  ;
                                0EF0  ;       NONE
                                0EF0  ;
                                0EF0  ; COMPLETION CODES:
                                0EF0  ;
                                0EF0  ;       R0 bit 0 set:
                                0EF0  ;               CRD MENU active.
                                0EF0  ;       R0 bit 1 set:
                                0EF0  ;               The correct bits are set  in Boot$L_R5.
                                0EF0  ;               This indicates that CRD MENU
                                0EF0  ;               was invoked from 'T/M' console command. R0 bit
                                0EF0  ;               1 clear indicates that CRD MENU was invoked by VDS
                                0EF0  ;               'CRD' command.
                                0EF0  ;       R0 = 0: CRD MENU not active.
                                0EF0  ;--
                                0EF0  DSR$Check_MenuTest_Off_Set::            ;                                    [80]
                                0EF0
                    50    D4    0EF0          ClrL    R0                      ; Assume they are not set            [69]
                                0EF2
0000FE00'EF         10    E1    0EF2          Bbc     #DSA$V_CRD_MenuTest_Off, - ; If the CRD_MenuTest_Off
                    03          0EF9                    L^DSA$GL_Flags,    -  ; ...bit is not set in the DSA flags
                                0EFA                    50$                    ; ... branch to 50$                  [84]
                                0EFA
              50    01    C8    0EFA          BISL2   #1, R0          ; CRD MENU active; set the flag              [84]
                                0EFD
                                0EFD          ;+                                                                   [69]
                                0EFD          ; If the DIAG and the MenuTest bits are both set in the R5 passed from [71]
                                0EFD          ; DiagBoot, set the low bit in R0 and return.                        [69]
                                0EFD          ;-                                                                   [69]
                                0EFD
```

```
                00000879'EF    04   E1  0EFD  2558 50$:    Bbc     #Rpb$V_Diag, -          ; If the DIAG bit is clear ...          [79]
                               0E       0F04  2559           L^Boot$L_R5, -          ; ... in the R5 passed from DiagBoot,   [69]
                                        0F05  2560           100$                    ; ... branch to 100$.                   [69]
                                        0F05  2561
                                        0F05  2562       ;+                                                                  [69]
                                        0F05  2563       ; The DIAG bit is set.                                              [71]
                                        0F05  2564       ;-                                                                  [69]
                                        0F05  2565
                00000879'EF    00   E1  0F05  2566           Bbc     #Rpb$V_MenuTest, -      ; If the MenuTest bit is clear ...      [69]
                               06       0F0C  2567           L^Boot$L_R5, -          ; ... in the R5 passed from DiagBoot,   [69]
                                        0F0D  2568           100$                    ; ... branch to 100$.                   [69]
                                        0F0D  2569
                                        0F0D  2570       ;+                                                                  [69]
                                        0F0D  2571       ; The MenuTest bit is also set. This indicates that CRD-MenuTest    [69]
                                        0F0D  2572       ; should be run.                                                    [84]
                                        0F0D  2573       ;-                                                                  [69]
                                        0F0D  2574
                          50    01   C8  0F0D  2575 75$:    BISL2   #1, R0                  ; CRD MENU active                       [84]
                          50    02   C8  0F10  2576           BISL2   #2, R0                  ; CRD MENU invoked by 'T/M' cosole command
                                        0F13  2577                                           ;                                       [84]
                                        0F13  2578
                                   05   0F13  2579 100$:    Rsb                             ; Return to caller                      [69]
```

```
                        0F14  2581          .SubTitle       DSR$Check_AutoTest_Off_Set Routine
                        0F14  2582 ;++
                        0F14  2583 ; FUNCTIONAL DESCRIPTION:
                        0F14  2584 ;
                        0F14  2585 ;       This routine checks to see if CRD AutoTest Offline is active.
                        0F14  2586 ;       It checks the Boot$L_R5 longword or DSA Flags.
                        0F14  2587 ;       The value in Boot$L_R5 is the value that
                        0F14  2588 ;       is passes to the VDS from DiagBoot (in R5).
```

```
                        0F14  2590 ;
                        0F14  2591 ; CALLING SEQUENCE:
                        0F14  2592 ;
                        0F14  2593 ;       Jsb/Bsbw/Bsbb DSR$Check_AutoTest_Off_Set
```

```
                                0F14  ;
                                0F14  ; INPUT PARAMETERS:
                                0F14  ;
                                0F14  ;       NONE
                                0F14  ;
                                0F14  ; IMPLICIT INPUTS:
                                0F14  ;
                                0F14  ;       Boot$L_R5
                                0F14  ;       DSA$GL_Flags
                                0F14  ;
                                0F14  ; OUTPUT PARAMETERS:
                                0F14  ;
                                0F14  ;       NONE
                                0F14  ;
                                0F14  ; IMPLICIT OUTPUTS:
                                0F14  ;
                                0F14  ;       NONE
                                0F14  ;
                                0F14  ; COMPLETION CODES:
                                0F14  ;
                                0F14  ;       R0 = 1: CRD AUTO active
                                0F14  ;       R0 = 0: CRD AUTO not active
                                0F14  ;--
                                0F14  DSR$Check_AutoTest_Off_Set::            ;                                    [80]
                                0F14
                    50    D4    0F14          ClrL    R0                      ; Assume they are not set            [69]
                                0F16
        0000FE00'EF 0B    E1    0F16          Bbc     #DSA$V_CRD_AutoTest_Off, - ; If the CRD_AutoTest_Off
                    02          0F1D                    L^DSA$GL_Flags,    -  ; ... bit is not set in the DSA flags
                                0F1E                    50$                    ; ... branch to 50$.                 [84]
                                0F1E
                    10    11    0F1E          Brb     75$                     ; The bit is set; set the flag       [79]
                                0F20
                                0F20          ;+                                                                   [69]
                                0F20          ; If the AutoTest and the DIAG bits are both set in the R5 passed from [69]
                                0F20          ; DiagBoot, set the low bit in R0 and return.                        [69]
                                0F20          ;-                                                                   [69]
                                0F20
        00000879'EF 04    E1    0F20  50$:    Bbc     #Rpb$V_Diag, -          ; If the DIAG bit is clear ...       [79]
                    0A          0F27                    L^Boot$L_R5, -         ; ... in the R5 passed from DiagBoot, [69]
                                0F28                    100$                   ; ... branch to 100$.                [69]
                                0F28
                                0F28          ;+                                                                   [69]
                                0F28          ; The DIAG bit is set.                                               [69]
                                0F28          ;-                                                                   [69]
                                0F28
        00000879'EF 0F    E1    0F28          Bbc     #Rpb$V_AutoTest, -      ; If the AutoTest bit is clear ...   [69]
                    02          0F2F                    L^Boot$L_R5, -         ; ... in the R5 passed from DiagBoot, [69]
                                0F30                    100$                   ; ... branch to 100$.                [69]
                                0F30
                                0F30          ;+                                                                   [69]
                                0F30          ; The AutoTest bit is also set. This indicates that CRD-AutoTest     [69]
                                0F30          ; should be run. Return a 1 in R0.                                   [69]
                                0F30          ;-                                                                   [69]
                                0F30
                    50    D6    0F30  75$:    IncL    R0                      ; CRD AutoTest is running.           [79]
                                0F32
```

```
05  0F32  2652 100$:   Rsb                          ; Return to caller                [69]
    0F33  2653
```

```
                        0F33  2655 .sbttl DSX$GETTERM  Get User Terminal Characteristics                    [87]
                        0F33  2656
                        0F33  2657 ;++                                                                      [87]
                        0F33  2658 ; FUNCTIONAL DESCRIPTION:                                                [87]
                        0F33  2659 ;                                                                        [87]
                        0F33  2660 ;       This routine simply passes the user terminal's characteristics   [87]
                        0F33  2661 ;       to the caller.  The characteristics are stored in bits 0 through[87]
                        0F33  2662 ;       23.  They are defined by the $TTDEF macro of VMS.  The charac-   [87]
                        0F33  2663 ;       teristics are determined at startup time and stored in           [87]
                        0F33  2664 ;       DS$GL_TERMCHAR.                                                  [87]
                        0F33  2665 ;                                                                        [87]
                        0F33  2666 ; CALLING SEQUENCE:                                                      [87]
                        0F33  2667 ;                                                                        [87]
                        0F33  2668 ;       PUSHAL  addr                                                     [87]
                        0F33  2669 ;       CALLS   #1,DSX$GETTERM                                           [87]
                        0F33  2670 ;                                                                        [87]
                        0F33  2671 ; INPUT PARAMETERS:                                                      [87]
                        0F33  2672 ;                                                                        [87]
                        0F33  2673 ;       4(AP)   Address of longword in which to load characteristics     [87]
                        0F33  2674 ;                                                                        [87]
                        0F33  2675 ; IMPLICIT INPUTS:                                                       [87]
                        0F33  2676 ;                                                                        [87]
                        0F33  2677 ;       DS$GL_TERMCHAR  Longword containing terminal characteristics     [87]
                        0F33  2678 ;                                                                        [87]
                        0F33  2679 ; OUTPUT PARAMETERS:                                                     [87]
                        0F33  2680 ;                                                                        [87]
                        0F33  2681 ;       NONE                                                             [87]
                        0F33  2682 ;                                                                        [87]
                        0F33  2683 ; INPLICIT OUTPUTS:                                                      [87]
                        0F33  2684 ;                                                                        [87]
                        0F33  2685 ;       NONE                                                             [87]
                        0F33  2686 ;                                                                        [87]
                        0F33  2687 ; COMPLETION CODES:                                                      [87]
                        0F33  2688 ;                                                                        [87]
                        0F33  2689 ;       SS$_NORMAL - Service successfully completed.                     [87]
                        0F33  2690 ;                                                                        [87]
                        0F33  2691 ; SIDE EFFECTS:                                                          [87]
                        0F33  2692 ;                                                                        [87]
                        0F33  2693 ;       NONE                                                             [87]
                        0F33  2694 ;                                                                        [87]
                        0F33  2695
                        0F33  2696
                   0000 0F33  2697 .ENTRY DSX$GETTERM, ^M<>                ;                               [87]
                        0F35  2698
04 BC  00000B83'EF   7D 0F35  2699       MOVQ    DS$GL_TERMCHAR, a4(AP)  ; Load term. characteristics    [87]
         50   01     D0 0F3D  2700       MOVL    #SS$_NORMAL,R0          ; Indicate successful return.   [87]
                     04 0F40  2701       RET                             ; Done.                         [87]
                        0F41  2702
                        0F41  2703       .END
```

```
$$.TAB                          = 00000150 R   D  03
$$.TABEND                       = 00000194 R   D  03
$$.TMP                          = 80000000     D
$$.TMP1                         = 00000001     D
$$.TMP2                         = 000000CF
$$ARGS                          = 00000003     D
$$N                             = 00000001     D
$$T1                            = 00000001     D
$$T2                            = 00000004     D
$ER                             = 00000003     D
$MODULE                           0000016B R   D  02
A                                 00000835 R   D  03
AP$B_PROMPT_BUFFER_COUNT          ********W GX    00
AP$B_PROMPT_COUNT                 ********W GX    00
AP$GK_PROMPT_WAIT               = 00FFFFFF     D
AP$GR_SHARED_DATA                 ********    X   04
AP$GW_DATA                        ********    X   04
AP$I_PROMPT_CHECK                 ********W GX    00
AP$M_AP_NODE_ID                 = 000000F0     D
AP$M_AP_RUNNING                 = 00000100     D
AP$M_BUFFER_FULL                = 00000800     D
AP$M_DATA_READY                 = 00000200     D
AP$M_PP_NODE_ID                 = 0000000F     D
AP$M_REQUEST                    = 00000400     D
AP$S_AP_NODE_ID                 = 00000004     D
AP$S_PP_NODE_ID                 = 00000004     D
AP$V_AP_NODE_ID                 = 00000004     D
AP$V_AP_RUNNING                 = 00000008     D
AP$V_BUFFER_FULL                = 0000000B     D
AP$V_DATA_READY                 = 00000009     D
AP$V_PP_NODE_ID                 = 00000000     D
AP$V_REQUEST                    = 0000000A     D
AP$_REQ_CONSRX                  = 00000000   G D
AP$_REQ_RXCDVEC                 = 00000001   G D
APT                               000000D9 RG  D  04
AX_BUFF                           ********    X   04
BEGIN                             0000086D RG  D  04
BEGIN0                            0000067F R   D  04
BEGIN_BLISS                       0000086D RG  D  04
BEGIN_TIME                        ********    X   04
BIN_TIME                          ********    X   04
BIT...                          = 0000000C     D
BOOT                              00000000 RG  D  04
BOOT$A_CCA                        00000889 RG  D  03
BOOT$L_ADP                        00000865 RG  D  03
BOOT$L_CSR                        00000869 RG  D  03
BOOT$L_DEVTYP                     0000087D RG  D  03
BOOT$L_R1                         00000871 RG  D  03
BOOT$L_R2                         00000875 RG  D  03
BOOT$L_R5                         00000879 RG  D  03
BOOT$L_SCORPIO_R3                 00000881 RG  D  03
BOOT$L_UNIT                       0000086D RG  D  03
CCB$B_AMOD                        00000009     D
CCB$B_STS                         00000008     D
CCB$C_LENGTH                      00000010     D
CCB$K_LENGTH                      00000010     D
CCB$L_DIRP                        0000000C     D
CCB$L_UCB                         00000000     D
CCB$L_WIND                        00000004     D
CCB$SIZE                        = 00000010     D
CCB$W_IOC                         0000000A     D
CLI$K_BUFSIZ                    = 00000100     D
CLI$K_SIZE                        0000044C     D
CLI$L_ADDRESS                     00000018     D
CLI$L_COMMAND                     00000004     D
CLI$L_DATA                        0000001C     D
CLI$L_FLAGS                       00000000     D
CLI$L_FLAGS2                      00000444     D
CLI$L_LAST                        00000024     D
CLI$L_NEXT                        00000030     D
CLI$L_PASS                        0000002C     D
CLI$L_SUBT                        00000028     D
CLI$L_TEMP_BASE                   00000448     D
CLI$L_TEST                        00000020     D
CLI$M_START_OR_RUN              = 00000008     D
CLI$Q_BUFQWD                      00000034     D
CLI$Q_FILE                        00000008     D
CLI$Q_SECTION                     00000010     D
CLI$Q_TIME                        0000043C     D
CLI$T_BUFFER                      0000003C     D
CLI$V_ADAPTER                   = 00000018     D
CLI$V_ADR                       = 0000000B     D
CLI$V_ASCII                     = 00000013     D
CLI$V_BASE_QUAL                 = 00000002     D
CLI$V_BREAK                     = 0000000A     D
CLI$V_BRIEF                     = 0000001B     D
CLI$V_BYTE                      = 0000000D     D
CLI$V_CLEAR                     = 00000002     D
CLI$V_DEC                       = 00000010     D
CLI$V_DEFAULT                   = 0000000C     D
CLI$V_DEPOSIT                   = 00000019     D
CLI$V_EVENT                     = 00000008     D
CLI$V_EXAM                      = 00000005     D
CLI$V_FLAGS                     = 00000009     D
CLI$V_HEX                       = 00000012     D
CLI$V_KERNEL                    = 00000017     D
CLI$V_LOAD                      = 00000006     D
CLI$V_LONG                      = 0000000F     D
CLI$V_NEXT                      = 00000001     D
CLI$V_NOALLOC                   = 00000000     D
CLI$V_NOTNUF                    = 00000001     D
CLI$V_OCT                       = 00000011     D
CLI$V_PREG                      = 0000001A     D
CLI$V_QA                        = 00000007     D
CLI$V_QACKLOOPLOOPS             = 0000001C     D
CLI$V_QAERRORPRINTS             = 0000001B     D
CLI$V_QAMULTIPLEPASS            = 0000001F     D
CLI$V_QASUBTESTLOOPS            = 0000001E     D
CLI$V_QATESTLOOPS               = 0000001D     D
CLI$V_REG                       = 00000014     D
CLI$V_REQUIRED                  = 00000000     D
CLI$V_RUN                       = 00000015     D
CLI$V_SET                       = 00000003     D
CLI$V_SHOW                      = 00000004     D
```

```
CLI$V_START_OR_RUN              = 00000003     D
CLI$V_VALSEC                    = 00000016     D
CLI$V_WORD                      = 0000000E     D
CLK$RE_INIT                       ********   X   04
CMK$RCONSOLE                      ********   X   04
CMK$REFRESH                       0000097B RG  D   04
CMK$SGIPR                         ********   X   04
CMK$_APBOOT                     = 00000004     D
CMK$_ASTEXIT                    = 00000000     D
CMK$_CANTIM                     = 0000000B     D
CMK$_HIBER                      = 00000007     D
CMK$_INITSCB                    = 00000008     D
CMK$_LAST                       = 0000000E     D
CMK$_MMENABLE                   = 00000003     D
CMK$_RCONSOLE                   = 00000001     D
CMK$_REFRESH                    = 00000005     D
CMK$_SCHDWK                     = 00000006     D
CMK$_SETIMR                     = 0000000C     D
CMK$_SETIPL                     = 00000009     D
CMK$_SETPRT                     = 0000000D     D
CMK$_SGIPR                      = 0000000A     D
CMK$_TCONSOLE                   = 00000002     D
COND_DEBUG                        ********   X   04
COND_HANDLR                       ********   X   04
CPUTIM                            00000415 R   D   03
CR                              = 0000000D     D
CRB$SIZE                        = 0000002C     D
CRD$K_CRD_INITIALIZATION        = 00000000   G D
CRD$K_DS_CONTROL_C              = 00000001   G D
CRD$K_DS_FLAGS                  = 00000000   G D
CRD$K_FAILURE                   = 00000000     D
CRD$K_HOOK_POINT                = 00000000   G D
CRD$K_LAST_ACCESS_CODE          = 00000002   G D
CRD$K_LAST_DS_VARIABLE          = 00000002   G D
CRD$K_LAST_FUNCTION             = 00000002   G D
CRD$K_LAST_HOOK_POINT           = 00000001   G D
CRD$K_READ                      = 00000000   G D
CRD$K_SUCCESS                   = 00000001     D
CRD$K_TYPECODE                  = 00000001   G D
CRD$K_WRITE                     = 00000001   G D
CRD_DESC                          00000058 R   D   03
CRD_DESC_BUF                      00000060 R   D   03
CRD_SWITCH_1                      00000000 R   D   02
CRD_SWITCH_2                      00000004 R   D   02
CRETVA$_ACMODE                  = 0000000C     D
CRETVA$_INADR                   = 00000004     D
CRETVA$_NARGS                   = 00000003     D
CRETVA$_RETADR                  = 00000008     D
CTL$GL_CCB                        0000042D RG  D   03
CTL$GL_CCBBASE                    0000082D RG  D   03
CTRL_STR                          00000BD3 R   D   03
DB_SIZ                          = 00000800     D
DDB$SIZE                        = 00000018     D
DEF$Q_DEV                         ********   X   04
DEF$Q_DIR                         ********   X   04
DEV$V_FOD                       = 0000000E     D
DEV$V_MBX                       = 00000014     D
DEVCHAR                           00000B8B R   D   03
DIB$K_LENGTH                    = 00000074     D
DIB$L_DEVCHAR                   = 00000000     D
DIB$L_DEVDEPEND                 = 00000008     D
DL_SIZ                          = 00000800     D
DM_SIZ                          = 00000A00     D
DR_SIZ                          = 00000800     D
DS$AQ_SSEND                       ********   X   02
DS$AQ_SYSSRV                      ********   X   02
DS$AT_DDEV                        000001E0 R   D   03
DS$AT_DDIR                        000001B8 R   D   03
DS$AX_ARB                         ********   X   04
DS$AX_JIB                         ********   X   04
DS$AX_SOFTPCB                     ********   X   03
DS$A_PRGBGN                     = 00000200   G D
DS$CLI                            ********   X   04
DS$CNTRLC                         ********   X   04
DS$FAB_INPUT                      0000006C RG  D   03
DS$FAB_OUTPUT                     00000100 RG  D   03
DS$GA_BUFPTR                      000008ED RG  D   03
DS$GA_CHKLPPC                     000008CD RG  D   03
DS$GA_CRD_DS_INTERFACE            ********   X   04
DS$GA_DS_CTRL_C_FIRST             00000194 RG  D   03
DS$GA_DS_CTRL_C_SECOND            00000198 RG  D   03
DS$GA_LASTADR                     00000895 RG  D   03
DS$GA_LOOPADR                     000008D1 RG  D   03
DS$GA_PTABLE                      ********   X   04
DS$GA_SELECTS                     ********   X   04
DS$GB_BYTEBUF                     000008F1 RG  D   03
DS$GB_INHIBIT_NAMING              000008F3 RG  D   03
DS$GB_MM_ENB                      ********   X   04
DS$GB_SYSTYPE                     0000040C RG  D   03
DS$GB_TYPECODE                    000008F2 RG  D   03
DS$GK_SID                         ********   X   04
DS$GL_BUFCNT                      ********   X   04
DS$GL_BUFLEN                      000008E9 RG  D   03
DS$GL_CLIBASE                     ********   X   04
DS$GL_DEVERR_COUNT                000008B1 RG  D   03
DS$GL_EFC0                        0000088D RG  D   03
DS$GL_EFC1                        00000891 RG  D   03
DS$GL_ERRCNT                      000008A1 RG  D   03
DS$GL_ERRSUP_COUNT                000008B9 RG  D   03
DS$GL_FLAGS                       00000899 RG  D   03
DS$GL_FSTTEST                     000008C1 RG  D   03
DS$GL_HARDERR_COUNT               000008A5 RG  D   03
DS$GL_LSTTEST                     000008C5 RG  D   03
DS$GL_NUMTEST                     000008BD RG  D   03
DS$GL_PCBVEC                      00000831 RG  D   03
DS$GL_PREPERR_COUNT               000008A9 RG  D   03
DS$GL_RADIX                       000008E1 RG  D   03
DS$GL_RUNTIM                      000008D5 RG  D   03
DS$GL_SIZE                        000008E5 RG  D   03
DS$GL_SOFTERR_COUNT               000008AD RG  D   03
DS$GL_SUBTEST                     000008C9 RG  D   03
DS$GL_SYSERR_COUNT                000008B5 RG  D   03
DS$GL_SYSTYPE                     0000040D R   D   03
DS$GL_TERMCHAR                    00000B83 RG  D   03
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DS$GL_TIMESEC                   000008D9 RG  D  03
DS$GL_WAITIM                    000008DD RG  D  03
DS$GQ_BUFQWD                    000008E9 RG  D  03
DS$GQ_CURYEAR                   ********   X    04
DS$GQ_DAYTIM                    ********   X    04
DS$GQ_EFL                       0000088D RG  D  03
DS$GT_ASCIBUF                   000008F4 RG  D  03
DS$GT_BUFFER                    00000903 RG  D  03
DS$GT_COPYEAR                   0000002E RG  D  03
DS$GT_COPYRIGHT                 00000000 RG  D  03
DS$GT_LEGAL                     0000006E RG  D  02
DS$GT_LEGAL_END                 0000004D RG  D  03
DS$GT_NEWYEAR                   ********   X    04
DS$GT_PROMPT                    ********   X    04
DS$GT_START                     ********   X    04
DS$GT_STRBUF                    00000B03 RG  D  03
DS$GW_TTIN                      0000089D RG  D  03
DS$GW_TTOUT                     0000089F RG  D  03
DS$INITSCB                      ********   X    04
DS$K_ASCIBUF                  = 0000000F   G  D
DS$K_BUFSIZ                   = 00000200   G  D
DS$K_CCB                      = 00000040   G  D
DS$K_ERROR                    = 00000002      D
DS$K_NORMAL                   = 00000001      D
DS$K_NYSIZ                      ********   X    04
DS$K_PRGSIZ                   = 0000F800   G  D
DS$K_PRINTB                   = 00000002      D
DS$K_PRINTF                   = 00000001      D
DS$K_PRINTI                   = 00000000      D
DS$K_PRINTX                   = 00000003      D
DS$K_SEVERE                   = 00000004      D
DS$K_SSSIZE                     ********   X    04
DS$K_STRBUF                   = 00000080   G  D
DS$K_SUBSYS                   = 00000066      D
DS$K_TYPE_ABORT_PROGRAM       = 00000014      D
DS$K_TYPE_ABORT_TEST          = 00000013      D
DS$K_TYPE_COMMAND_ERR         = 00000015      D
DS$K_TYPE_COMMAND_OUT         = 00000016      D
DS$K_TYPE_CRD_AUTOTEST        = 0000001A      D
DS$K_TYPE_DS_PROMPT           = 00000001      D
DS$K_TYPE_DS_START            = 0000001D      D
DS$K_TYPE_ERRDEV              = 00000008      D
DS$K_TYPE_ERRHARD             = 00000006      D
DS$K_TYPE_ERROR_BODY          = 00000009      D
DS$K_TYPE_ERROR_END           = 0000000A      D
DS$K_TYPE_ERRPREP             = 0000001B      D
DS$K_TYPE_ERRSOFT             = 00000007      D
DS$K_TYPE_ERRSUP              = 00000004      D
DS$K_TYPE_ERRSYS              = 00000005      D
DS$K_TYPE_ERR_HALT            = 0000000D      D
DS$K_TYPE_EXCEPTION           = 0000000C      D
DS$K_TYPE_EXCEPTION_HEAD      = 0000000B      D
DS$K_TYPE_FIRST_PASS          = 00000011      D
DS$K_TYPE_GENERAL             = 00000000      D
DS$K_TYPE_GENERAL_ERROR       = 00000003      D
DS$K_TYPE_NO_TESTS            = 00000012      D
DS$K_TYPE_PARAM_ERROR         = 0000001C      D
DS$K_TYPE_PROGRAM_END         = 00000010      D
DS$K_TYPE_PROGRAM_INFO        = 00000017      D
DS$K_TYPE_PROGRAM_START       = 0000000F      D
DS$K_TYPE_QIO_INVADP          = 00000024      D
DS$K_TYPE_QIO_NODRIVER        = 00000022      D
DS$K_TYPE_QIO_WRONGVER        = 00000023      D
DS$K_TYPE_SCRIPT_ECHO         = 00000021      D
DS$K_TYPE_SCRIPT_PNF          = 0000001E      D
DS$K_TYPE_SCRIPT_PROMPT       = 00000020      D
DS$K_TYPE_SCRIPT_SKIP         = 0000001F      D
DS$K_TYPE_SEQUENCE_ERROR      = 00000019      D
DS$K_TYPE_START_ERR           = 00000018      D
DS$K_TYPE_START_LIST          = 00000025      D
DS$K_TYPE_SUMMARY             = 0000000E      D
DS$K_TYPE_USER_PROMPT         = 00000002      D
DS$K_WARNING                  = 00000000      D
DS$LOADPCS                      ********   X    04
DS$L_USERCNTRLC                 0000019C RG  D  03
DS$M_ABRTFLG                  = 00000040      D
DS$M_BADTIME                  = 00100000      D
DS$M_BATCH                    = 00400000      D
DS$M_BRKCLR                   = 00001000      D
DS$M_BRKPT                    = 00000800      D
DS$M_CHARFLG                  = 00000100      D
DS$M_CMDFLG                   = 00000080      D
DS$M_CTRLC                    = 00000001      D
DS$M_CTRLO                    = 00010000      D
DS$M_DEVFLG                   = 00000200      D
DS$M_DISABLCC                 = 01000000      D
DS$M_DONFLG                   = 00002000      D
DS$M_ERRFLG                   = 00000010      D
DS$M_EXCEPT                   = 00080000      D
DS$M_EXETST                   = 00040000      D
DS$M_HLTFLG                   = 00000008      D
DS$M_LODFLG                   = 00000002      D
DS$M_MEMMGT                   = 00008000      D
DS$M_NI                       = 04000000      D
DS$M_OUTPUT                   = 00800000      D
DS$M_RUBFLG                   = 00000020      D
DS$M_SCRIPT                   = 00200000      D
DS$M_SETIMR                   = 02000000      D
DS$M_STRFLG                   = 00000004      D
DS$M_SUBT                     = 00004000      D
DS$M_SYSFLG                   = 00000400      D
DS$M_TIMED                    = 02000000      D
DS$M_TIMED_OUT                = 08000000      D
DS$M_TIMRON                   = 00020000      D
DS$RAB_INPUT                    000000BC RG  D  03
DS$RAB_OUTPUT                   00000150 RG  D  03
DS$SOFTIPL5                     000002C4 RG  D  04
DS$USERMODE                     000002CF RG  D  04
DS$USERMODE_X                   00000636 R   D  04
DS$V_ABRTFLG                  = 00000006      D
DS$V_BADTIME                  = 00000014      D
DS$V_BATCH                    = 00000016      D
DS$V_BRKCLR                   = 0000000C      D
DS$V_BRKPT                    = 0000000B      D
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DS$V_CHARFLG                    = 00000008    D
DS$V_CMDFLG                     = 00000007    D
DS$V_CTRLC                      = 00000000    D
DS$V_CTRLO                      = 00000010    D
DS$V_DEVFLG                     = 00000009    D
DS$V_DISABLCC                   = 00000018    D
DS$V_DONFLG                     = 0000000D    D
DS$V_ERRFLG                     = 00000004    D
DS$V_EXCEPT                     = 00000013    D
DS$V_EXETST                     = 00000012    D
DS$V_HLTFLG                     = 00000003    D
DS$V_LODFLG                     = 00000001    D
DS$V_MEMMGT                     = 0000000F    D
DS$V_NI                         = 0000001A    D
DS$V_OUTPUT                     = 00000017    D
DS$V_RUBFLG                     = 00000005    D
DS$V_SCRIPT                     = 00000015    D
DS$V_SETIMR                     = 00000019    D
DS$V_STRFLG                     = 00000002    D
DS$V_SUBT                       = 0000000E    D
DS$V_SYSFLG                     = 0000000A    D
DS$V_TIMED                      = 00000019    D
DS$V_TIMED_OUT                  = 0000001B    D
DS$V_TIMRON                     = 00000011    D
DS$_AP_NORMAL_BREAK             = 00660150    D
DS$_ARITH                       = 006600D0    D
DS$_ASBE                        = 00660118    D
DS$_BADLINK                     = 006600F0    D
DS$_BADTYPE                     = 006600E8    D
DS$_BIIC                        = 00660120    D
DS$_CHME                        = 006600A8    D
DS$_CHMK                        = 006600E0    D
DS$_DEVNAME                     = 00660108    D
DS$_ERROR                       = 00660002    D
DS$_FHWE                        = 00660068    D
DS$_FRAGBUF                     = 00660080    D
DS$_ICBUSY                      = 006600C8    D
DS$_ICERR                       = 006600C0    D
DS$_IHWE                        = 00660060    D
DS$_ILLCHAR                     = 00660018    D
DS$_ILLPAGCNT                   = 00660078    D
DS$_ILLUNIT                     = 00660100    D
DS$_INIT_FAIL                   = 00660140    D
DS$_INSFMEM                     = 00660050    D
DS$_INVCPU                      = 00660130    D
DS$_IPL2HI                      = 006600B8    D
DS$_IVADDR                      = 00660040    D
DS$_IVVECT                      = 00660038    D
DS$_KRNLSTK                     = 00660090    D
DS$_LOGIC                       = 00660070    D
DS$_MCHK                        = 00660088    D
DS$_MEM_ALLOC_ERR               = 00660138    D
DS$_MMOFF                       = 00660058    D
DS$_NEEDUNIT                    = 006600F8    D
DS$_NODE                        = 00660128    D
DS$_NOPCS                       = 00660110    D
DS$_NORMAL                      = 00660001    D
DS$_NOSUPPORT                   = 006600B1    D
DS$_NOTALLOWMP                  = 00660148    D
DS$_NOTDON                      = 00660030    D
DS$_NOTIMP                      = 006600B0    D
DS$_NULLSTR                     = 00660010    D
DS$_OVERFLOW                    = 00660008    D
DS$_POWER                       = 00660098    D
DS$_PROGERR                     = 00660020    D
DS$_SEVERE                      = 00660004    D
DS$_TRANSL                      = 006600A0    D
DS$_TRUNCATE                    = 00660028    D
DS$_UNEXPINT                    = 006600D8    D
DS$_UNSUPPDEV                   = 00660158    D
DS$_VASFULL                     = 00660048    D
DS$_WARNING                     = 00660000    D
DSA$AL_APTMAIL                    0000FE00    D
DSA$AT_APTTXT                     0000FA00    D
DSA$GL_APTCOM                     0000FE04    D
DSA$GL_DEVLEN                     0000FE58    D
DSA$GL_ERRNO                      0000FE44    D
DSA$GL_EVENT                      0000FE48    D
DSA$GL_FLAGS                      0000FE00    D
DSA$GL_MSGTYP                     0000FE40    D
DSA$GL_PASSES                     0000FE08    D
DSA$GL_PASSNO                     0000FE54    D
DSA$GL_SECTNO                     0000FE10    D
DSA$GL_SID                        0000FE14    D
DSA$GL_SUBTNO                     0000FE4C    D
DSA$GL_TESTNO                     0000FE50    D
DSA$GL_UNITS                      0000FE0C    D
DSA$GQ_MSGPTR                     0000FE68    D
DSA$GT_DEVNAM                     0000FE5C    D
DSA$M_APT                       = 80000000    D
DSA$M_BINARY                    = 00000002    D
DSA$M_CRD_AUTOTEST_OFF          = 00000800    D
DSA$M_CRD_MENUTEST_OFF          = 00010000    D
DSA$M_CRD_MENUTEST_ON           = 00040000    D
DSA$M_CRD_TRACE                 = 00020000    D
DSA$M_DFLTFLGS                  = 00003000  G D
DSA$M_OPER                      = 00001000    D
DSA$M_PROMPT                    = 00002000    D
DSA$M_USER                      = 10000000    D
DSA$V_APT                       = 0000001F    D
DSA$V_CRD_AUTOTEST_OFF          = 0000000B    D
DSA$V_CRD_MENUTEST_OFF          = 00000010    D
DSA$V_USER                      = 0000001C    D
DSI$ABORT                         ********  X   04
DSQA$K_DISPAT_AFTER_INIT        = 00000014    D
DSQA$K_DISPAT_BEFORE_INIT       = 00000013    D
DSQA$K_DISPAT_CALLTEST          = 00000015    D
DSQA$K_DISPAT_DONE_TESTS        = 00000018    D
DSQA$K_DISPAT_DSX$ENDPASS_BGN   = 00000001    D
DSQA$K_DISPAT_DSX$ENDPASS_END   = 00000002    D
DSQA$K_DISPAT_DSX$ENDPASS_MID   = 00000000    D
DSQA$K_DISPAT_DS_CLEANUP_BGN    = 00000003    D
DSQA$K_DISPAT_DS_CLEANUP_END    = 00000004    D
DSQA$K_DUMMY_1                  = 00000007    D
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DSQA$K_ERROR_ERROR_BGN          = 00000006     D
DSQA$K_ERROR_ERROR_END          = 00000005     D
DSQA$K_KERNEL_INIT_CONTEXT      = 00000008     D
DSQA$K_LOOP_DSX$BGNSUB          = 00000009     D
DSQA$K_LOOP_DSX$CKLOOP          = 0000000B     D
DSQA$K_LOOP_DSX$ENDSUB          = 0000000A     D
DSQA$K_PARAM_DSX$GETADDRESS     = 0000000E     D
DSQA$K_PARAM_DSX$GETDATA        = 0000000C     D
DSQA$K_PARAM_DSX$GETLOGICAL     = 0000000F     D
DSQA$K_PARAM_DSX$GETSTRING      = 00000010     D
DSQA$K_PARAM_DSX$GETVIELD       = 0000000D     D
DSQA$K_QA_DSX$BRANCH            = 00000011     D
DSQA$K_START_BEFORE_HEADER      = 00000017     D
DSQA$K_START_VRRESTART          = 00000012     D
DSQA$K_START_VRSTART            = 00000016     D
DSR$CHECK_AUTOTEST_OFF_SET        00000F14 RG  D   04
DSR$CHECK_MENUTEST_OFF_SET        00000EF0 RG  D   04
DSR$LOAD_CRD                      ********     X   04
DSR$RESTORE_CRD_VECTORS           ********     X   04
DSR$SETIMR_INI                    ********     X   04
DSR$UNLOAD_CRD                    ********     X   04
DSV$EXIT                          00000DF0 RG  D   04
DSV$SETLOAD                       ********     X   04
DSX$CNTRLC                        00000DC5 RG  D   04
DSX$GETTERM                       00000F33 RG  D   04
DSX$PRINT                         ********     X   04
DSX$PRINTI                        ********     X   04
DS_CLEANUP                        ********     X   04
DS_ERRSUP                         ********     X   04
DUE_TIME                          ********     X   04
ESTKPTR                           ********     X   04
EXE$GB_CPUTYPE                    ********     X   04
EXE$GL_TENUSEC                    ********     X   04
EXE$GL_UBDELAY                    ********     X   04
EXE$GQ_SYSTIME                    ********     X   04
EXIT$DESBLK                       000001A0 R   D   03
EXIT$HANDLR                       00000E71 R   D   04
FAB$C_BID                       = 00000003     D
FAB$C_BLN                       = 00000050     D
FAB$C_SEQ                       = 00000000     D
FAB$C_VAR                       = 00000002     D
FAB$L_ALQ                       = 00000010     D
FAB$L_FOP                       = 00000004     D
FAB$V_CHAN_MODE                 = 00000002     D
FAB$V_CIF                       = 00000019     D
FAB$V_FILE_MODE                 = 00000004     D
FAB$V_GET                       = 00000001     D
FAB$V_LNM_MODE                  = 00000000     D
FAB$V_PUT                       = 00000000     D
FAB$W_GBC                       = 00000048     D
FALSE                           = 00000000     D
FAOBUF                            00000BC3 R   D   03
FAOLEN                            00000BCF R   D   03
FCB$SIZE                        = 00000030     D
GET_TIME                          00000C9A RG  D   04
GLBL_SECT_AREA                    00000BBB R   D   03
GLBL_SECT_NAME                    00000BB3 R   D   03
GT_MENU_ERROR                     ********     X   04
HDW_CLOCK_SET                     ********     X   04
HP$A_DEPENDENT                    00000032     D
HP$A_DEVICE                       00000018     D
HP$A_DVA                          0000001C     D
HP$A_LINK                         00000020     D
HP$B_DRIVE                        0000000B     D
HP$B_FLAGS                        0000000A     D
HP$Q_DEVICE                       00000000     D
HP$T_DEVICE                       0000000C     D
HP$T_TYPE                         00000026     D
HP$V_ALLOC                      = 00000000     D
HP$V_WASALL                     = 00000001     D
HP$W_SIZE                         00000008     D
HP$W_VECTOR                       00000024     D
IDB$SIZE                        = 00000020     D
IMAGE_HEADER                      00000208 RG  D   03
IMAGE_HEADER_END                  00000408 RG  D   03
INI$BRK                           000002C2 RG  D   04
INI$LOAD_DEVICE                   ********     X   04
INI$PTABLE                        ********     X   04
INIT_COMMON                       000009A4 R   D   04
INIT_CONTEXT                      0000088A RG  D   04
INIT_USERMODE                     00000997 R   D   04
IO$M_CTRLCAST                     ********     X   04
IO$M_NOW                          ********     X   04
IO$_READVBLK                      ********     X   04
IO$_SETMODE                       ********     X   04
IOC$K_DIAGPID                   = 00660000   G  D
IOSB                              00000BAB R   D   03
IRP$SIZE                        = 00000050     D
ISTKPTR                           ********     X   04
ITEMS                             00000B9B R   D   03
JIB$L_ARB                       = 00000000     D
JPI$_CPUTIM                     = 00000407     D
JPI$_PID                        = 00000319     D
JPICPUTIM                         00000425 R   D   03
JPICPUTIMS                        00000429 R   D   03
KB_CHECK                          00000A88 RG  D   04
KB_CHECK_APT                      00000AE6 RG  D   04
KB_CHECK_X                        00000C99 R   D   04
KB_POLL                           ********     X   04
KSTKPTR                           ********     X   04
LF                              = 0000000A     D
MAPMEM                            ********     X   04
MASK                            = 0000000F     D
MEMPOOL$INIT                      ********     X   04
MP$GR_BOOTED_PROCESSORS           00000408 RG  D   03
MP$R_ACTIVE_SERVICES              ********W GX    00
MP$R_INTERLOCK_END                ********W GX    00
MP$_PRIMARY_CPU_CHECK             ********W GX    00
MP$_RESUME_ATTACHED_PROCESSORS    ********W GX    00
MP_CLEAR_END                      000006CB R   D   04
NDS$OPEN                          ********W GX    00
OFF                             = 00000000     D
ON                              = 00000001     D
ONLY$GL_TENUSEC                   ********     X   04
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```
ONLY$GL_UBDELAY                 ********  X   04
ONLY_CPU                        ********  X   04
P0PT_BASE                       ********  X   04
PCB$B_ASTACT                    0000000C    D
PCB$B_ASTEN                     0000000D    D
PCB$B_PRI                       0000000B    D
PCB$B_PRIB                      0000002F    D
PCB$B_TYPE                      0000000A    D
PCB$B_WEFC                      0000002E    D
PCB$C_LENGTH                    0000008C    D
PCB$K_LENGTH                    0000008C    D
PCB$L_ARB                       00000084    D
PCB$L_ASTQBL                    00000014    D
PCB$L_ASTQFL                    00000010    D
PCB$L_EFC2P                     00000058    D
PCB$L_EFC3P                     0000005C    D
PCB$L_EFCS                      00000050    D
PCB$L_EFCU                      00000054    D
PCB$L_EFWM                      0000004C    D
PCB$L_JIB                       00000078    D
PCB$L_OWNER                     0000001C    D
PCB$L_PHD                       00000064    D
PCB$L_PHYPCB                    00000018    D
PCB$L_PID                       00000060    D
PCB$L_PQB                       0000004C    D
PCB$L_SQBL                      00000004    D
PCB$L_SQFL                      00000000    D
PCB$L_STS                       00000024    D
PCB$L_UIC                       00000088    D
PCB$L_WSSWP                     00000020    D
PCB$L_WTIME                     00000028    D
PCB$Q_PRIV                      0000007C    D
PCB$T_LNAME                     00000068    D
PCB$T_TERMINAL                  00000044    D
PCB$W_APTCNT                    00000030    D
PCB$W_ASTCNT                    00000038    D
PCB$W_BIOCNT                    0000003A    D
PCB$W_BIOLM                     0000003C    D
PCB$W_DIOCNT                    0000003E    D
PCB$W_DIOLM                     00000040    D
PCB$W_GPGCNT                    00000034    D
PCB$W_GRP                       0000008A    D
PCB$W_MEM                       00000088    D
PCB$W_MTXCNT                    0000000E    D
PCB$W_PPGCNT                    00000036    D
PCB$W_PRCCNT                    00000042    D
PCB$W_SIZE                      00000008    D
PCB$W_STATE                     0000002C    D
PCB$W_TMBU                      00000032    D
PCB_BASE                        ********  X   04
PHD$B_ASTLVL                  = 000000CF    D
PHD$L_ESP                     = 0000007C    D
PHD$L_KSP                     = 00000078    D
PHD$L_P0BR                    = 000000C8    D
PHD$L_P0LRASTL                = 000000CC    D
PHD$L_P1BR                    = 000000D0    D
PHD$L_P1LR                    = 000000D4    D
PHD$L_PC                      = 000000C0    D
PHD$L_PSL                     = 000000C4    D
PHD$L_R0                      = 00000088    D
PHD$L_R12                     = 000000B8    D
PHD$L_SSP                     = 00000080    D
PHD$L_USP                     = 00000084    D
PHD_BASE                        ********  X   04
PID                             00000B8F R  D   03
PIDNO                           00000B93 R  D   03
PIDNOS                          00000B97 R  D   03
POLL_TIME                       ********  X   04
PPA$GB_CPU                      ********W GX   00
PPA$GB_MID                      ********W GX   00
PPA_SPID                      = 3FFFE400    D
PR$_ASTLVL                    = 00000013    D
PR$_ESP                       = 00000001    D
PR$_IPL                       = 00000012    D
PR$_ISP                       = 00000004    D
PR$_KSP                       = 00000000    D
PR$_MAPEN                     = 00000038    D
PR$_P0BR                      = 00000008    D
PR$_P0LR                      = 00000009    D
PR$_P1BR                      = 0000000A    D
PR$_P1LR                      = 0000000B    D
PR$_PCBB                      = 00000010    D
PR$_SCBB                      = 00000011    D
PR$_SID                       = 0000003E    D
PR$_SID_TYP8NN                = 00000006    D
PR$_SID_TYP8RR                = 00000011    D
PR$_SID_TYP8SS                = 00000005    D
PR$_SID_TYPRTUV2              = 00000010  G D
PR$_SID_TYPUV2                = 00000008    D
PR$_SSP                       = 00000002    D
PR$_SYS_TYP800                = 00000002  G D
PR$_SYS_TYP900                = 00000003  G D
PR$_SYS_TYP_LLL               = 0000000A  G D
PR$_TXCS                      = 00000022    D
PR$_TXDB                      = 00000023    D
PR$_USP                       = 00000003    D
PR780$_TODR                   = 0000001B    D
PR8SS$_BINID                  = 0000005E    D
PRGBUF                          000001A7 R  D   02
PSL$M_IPL                     = 001F0000    D
PSL$V_IS                      = 0000001A    D
PSL$V_TBIT                    = 00000004    D
PSL_SAVE                        00000993 R  D   04
QA$MAIN                         ********    X   04
QIO$INITIALIZE                  ********    X   04
QIO$MINCORE                   = 00005E3C  G D
RAB$B_RAC                     = 0000001E    D
RAB$C_BID                     = 00000001    D
RAB$C_BLN                     = 00000044    D
RAB$C_SEQ                     = 00000000    D
RAB$L_CTX                     = 00000018    D
RAB$L_ROP                     = 00000004    D
RAB$V_CCO                     = 0000001F    D
RAB$V_CVT                     = 0000001A    D
```

```
RCTRLC                          000009E9 RG D  04
RECEIVE_POLL                    ********W GX   00
RMS$INIT                        ********   X   04
RPB$B_DEVTYP                  = 00000066     D
RPB$L_ADPPHY                  = 0000005C     D
RPB$L_BOOTR1                  = 00000020     D
RPB$L_BOOTR2                  = 00000024     D
RPB$L_BOOTR4                  = 0000002C     D
RPB$L_BOOTR5                  = 00000030     D
RPB$L_CSRPHY                  = 00000054     D
RPB$M_MENUTEST                = 00000001     D
RPB$T_FILE                    = 00000068     D
RPB$V_AUTOTEST                = 0000000F     D
RPB$V_DIAG                    = 00000004     D
RPB$V_INIBPT                  = 00000002     D
RPB$V_MENUTEST                = 00000000     D
RPB$W_UNIT                    = 00000064     D
RX50_DISK_SELECT                00000885 RG D  03
SAVEFP                          000001B4 R  D  03
SCB$L_ACCESS                    00000020     D
SCB$L_ARITH                     00000034     D
SCB$L_BREAK                     0000002C     D
SCB$L_CHME                      00000044     D
SCB$L_CHMK                      00000040     D
SCB$L_CHMS                      00000048     D
SCB$L_CHMU                      0000004C     D
SCB$L_COMPAT                    00000030     D
SCB$L_KNLSTK                    00000008     D
SCB$L_MACHCHK                   00000004     D
SCB$L_OPCCUS                    00000014     D
SCB$L_OPCDEC                    00000010     D
SCB$L_POWER                     0000000C     D
SCB$L_RADRMOD                   0000001C     D
SCB$L_ROPRAND                   00000018     D
SCB$L_RXDB                      000000F8     D
SCB$L_SFTLVL1                   00000084     D
SCB$L_SFTLVL10                  000000A8     D
SCB$L_SFTLVL11                  000000AC     D
SCB$L_SFTLVL12                  000000B0     D
SCB$L_SFTLVL13                  000000B4     D
SCB$L_SFTLVL14                  000000B8     D
SCB$L_SFTLVL15                  000000BC     D
SCB$L_SFTLVL2                   00000088     D
SCB$L_SFTLVL3                   0000008C     D
SCB$L_SFTLVL4                   00000090     D
SCB$L_SFTLVL5                   00000094     D
SCB$L_SFTLVL6                   00000098     D
SCB$L_SFTLVL7                   0000009C     D
SCB$L_SFTLVL8                   000000A0     D
SCB$L_SFTLVL9                   000000A4     D
SCB$L_TBIT                      00000028     D
SCB$L_TIMER                     000000C0     D
SCB$L_TRANSL                    00000024     D
SCB$L_TXDB                      000000FC     D
SCB$L_VM                        00000038     D
SCB$L_ZERO                      00000000     D
SCB_IMAGE                       ********   X   04
SCH$GL_CURPCB                   00000831 RG D  03
SCRIPT$INIT                     ********     X   04
SCRIPT$STOP                     ********     X   04
SEC$M_GBL                     = 00000001     D
SEC$M_PAGFIL                  = 00080000     D
SEC$M_WRT                     = 00000008     D
SF$L_SAVE_PC                  = 00000010     D
SGN$C_IRPCNT                  = 00000040   G D
SGN$C_NPAGEDYN                = 0000263C   G D
SIZ...                        = 00000001     D
SIZE_TERM                       ********     X   04
SS$_NORMAL                    = 00000001     D
SSPROT                          0000017A R   D  02
SSTKPTR                         ********     X   04
START_RUN_PC                    00000411 R   D  03
SUPBUF                          0000019F R   D  02
SWI$GL_FQBL                     00000839 RG D  03
SWI$GL_FQFL                     00000835 RG D  03
SYI$_SID                      = 00001001     D
SYS$ASSIGN                      ********     X   04
SYS$BINTIM                      ********   GX   04
SYS$CLREF                       ********   GX   04
SYS$CONNECT                     ********   GX   04
SYS$CREATE                      ********   GX   04
SYS$CRELOG                      ********     X   04
SYS$CRETVA                    = 800000C8   G D
SYS$CRMPSC                      ********   GX   04
SYS$DALLOC                      ********   GX   04
SYS$DCLEXH                      ********   GX   04
SYS$DELTVA                    = 80000110   G D
SYS$DISK                        ********     X   04
SYS$DXLEXH                    = 800000F0     D
SYS$EXIT                        ********   GX   04
SYS$FAO                         ********     X   04
SYS$GETCHN                      ********   GX   04
SYS$GETJPI                      ********   GX   04
SYS$GETJPIW                     ********   GX   04
SYS$GETSYI                      ********   GX   04
SYS$INPUT                       0000018A R   D  02
SYS$OPEN                        ********   GX   04
SYS$OUTPUT                      00000194 R   D  02
SYS$QIOW                        ********   GX   04
SYS$SETAST                      ********   GX   04
SYS$SETDDIR                     ********     X   04
SYS$SETEXV                    = 80000208   G D
SYS$SETPRT                    = 80000230     D
SYS$TRNLOG                      ********     X   04
SYSVEC                          00000172 R   D  02
SYS_TYPE                      = 20040004     D
TICK_NS                         ********     X   04
TM_SIZ                        = 00001000     D
TODR_BIAS                       ********     X   04
TODR_BYTE_CNT                   ********W GX   00
TODR_STORE                      ********W GX   00
TRAN_ASSIGN                     00000637 R   D  04
TRUE                          = 00000001     D
TXCS$V_RDY                      ********W GX   00
```

```
T_BOTH_CRD_BITS_SET               0000003E R  D  02
T_WRONGCPU                        0000000E R  D  02
UCB$SIZE                        = 00000098    D
ULTRIX_END                        00000058 R  D  03
ULTRIX_FILE                       0000004D R  D  03
ULTRIX_PARTITION                  00000051 R  D  03
USTKPTR                           ********   X   04
VCB$SIZE                        = 00000050    D
V_ENV                           = 00000001    D
V_LVL                           = 00000000    D
WCB$SIZE                        = 00000030    D
XDELBPT                           ********W GX   00
XDELTBIT                          ********W GX   00
XF_SIZ                          = 00000600    D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000FE70 (65136.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
DATA	000001AF (431.)	02 (2.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC BYTE
WORK	00000BE2 (3042.)	03 (3.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC LONG
CODE	00000F41 (3905.)	04 (4.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

```
                                    +-------------------------+
                                    ! Symbol Cross Reference !
                                    +-------------------------+

SYMBOL                          VALUE        DEFINITION      REFERENCES...
------                          -----        ----------      -------------
$$.TAB                          =00000150-R  903    (1)      894    (1)      897    (1)      900    (1)      903    (1)
$$.TABEND                       =00000194-R  903    (1)      894    (1)      897    (1)      900    (1)      903    (1)
$$.TMP                          =80000000    903    (1)      894    (1)      897    (1)      900    (1)      903    (1)
$$.TMP1                         =00000001    1430   (5)      1424   (5)      1426   (5)      1428   (5)      1430   (5)
$$.TMP2                         =000000CF    1430   (5)      1424   (5)      1426   (5)      1428   (5)      1430   (5)
$$ARGS                          =00000003    1076   (1)      1076   (1)
$$N                             =00000001    1810   (6)      1264   (5)    #-1720   (5)    #-1771   (6)    #-1783   (6)
                                                           #-1788   (6)      1793   (6)    #-1810   (6)
$$T1                            =00000001    2238   (6)      1076   (1)      1379   (5)      1457   (5)      1468   (5)
                                                             1481   (5)      1542   (5)      1989   (6)      1992   (6)
                                                             2238   (6)
$$T2                            =00000004    1473   (5)      1473   (5)
$ER                             =00000003    2241   (6)    #-1984   (6)    #-2241   (6)
$MODULE                          0000016B-R  1072   (1)      1984   (6)      2241   (6)
A                                00000835-R  970    (1)      970    (1)      973    (1)
AP$B_PROMPT_BUFFER_COUNT         00000000-XR                #-2420   (6)      731    (1)
AP$B_PROMPT_COUNT                00000000-XR                #-2421   (6)      731    (1)
AP$GK_PROMPT_WAIT               =00FFFFFF    787    (1)
AP$GR_SHARED_DATA                00000000-XR                #-2413   (6)    #-2415   (6)
AP$GW_DATA                       00000000-XR                  2406   (6)    #-2417   (6)      2419   (6)      2423   (6)
AP$I_PROMPT_CHECK                00000000-XR                  2414   (6)      731    (1)
AP$M_AP_NODE_ID                 =000000F0    787    (1)
AP$M_AP_RUNNING                 =00000100    787    (1)
AP$M_BUFFER_FULL                =00000800    787    (1)
AP$M_DATA_READY                 =00000200    787    (1)
AP$M_PP_NODE_ID                 =0000000F    787    (1)
AP$M_REQUEST                    =00000400    787    (1)    #-2416   (6)
AP$S_AP_NODE_ID                 =00000004    787    (1)    #-2406   (6)
AP$S_PP_NODE_ID                 =00000004    787    (1)
AP$V_AP_NODE_ID                 =00000004    787    (1)    #-2406   (6)
AP$V_AP_RUNNING                 =00000008    787    (1)    #-2406   (6)    #-2423   (6)
AP$V_BUFFER_FULL                =0000000B    787    (1)
AP$V_DATA_READY                 =00000009    787    (1)
AP$V_PP_NODE_ID                 =00000000    787    (1)
AP$V_REQUEST                    =0000000A    787    (1)    #-2418   (6)
AP$_REQ_CONSRX                  =00000000    787    (1)
AP$_REQ_RXCDVEC                 =00000001    787    (1)    #-2412   (6)
APT                              000000D9-R  1187   (5)
AX_BUFF                          00000000-XR                  1224   (5)
BEGIN                            0000086D-R  1812   (6)    #-1809   (6)    #-1822   (6)    #-1936   (6)    #-2426   (6)
BEGIN0                           0000067F-R  1625   (5)    #-1339   (5)    #-1556   (5)
BEGIN_BLISS                      0000086D-R  1813   (6)
BEGIN_TIME                       00000000-XR                #-2158   (6)    #-2160   (6)      2168   (6)    #-2172   (6)
BIN_TIME                         00000000-XR                #-2155   (6)    #-2163   (6)    #-2165   (6)    #-2173   (6)
                                                           #-2175   (6)
BIT...                          =0000000C    787    (1)      757    (1)      779    (1)      781    (1)      783    (1)
                                                             785    (1)      786    (1)      787    (1)
BOOT                             00000000-R  1133   (5)
BOOT$A_CCA                       00000889-R  993    (1)    #-1160   (5)
BOOT$L_ADP                       00000865-R  980    (1)    #-1143   (5)    #-1149   (5)
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BOOT$L_CSR                      00000869-R  981  (1)  #-1150  (5)
BOOT$L_DEVTYP                   0000087D-R  986  (1)  #-1156  (5)
BOOT$L_R1                       00000871-R  983  (1)  #-1152  (5)
BOOT$L_R2                       00000875-R  984  (1)  #-1153  (5)
BOOT$L_R5                       00000879-R  985  (1)  #-1154  (5)    1164  (5)    1237  (5)    1672  (5)
                                                      1674  (5)    1676  (5)  #-1724  (5)    2559  (6)
                                                      2567  (6)    2634  (8)    2642  (8)
BOOT$L_SCORPIO_R3               00000881-R  988  (1)
BOOT$L_UNIT                     0000086D-R  982  (1)  #-1151  (5)
CCB$C_LENGTH                    00000010            955  (1)
CCB$SIZE                       =00000010    808  (1)  819  (1)
CLI$K_BUFSIZ                   =00000100    778  (1)  778  (1)
CLI$K_SIZE                      0000044C    778  (1)
CLI$L_ADDRESS                   00000018    778  (1)
CLI$L_COMMAND                   00000004    778  (1)
CLI$L_DATA                      0000001C    778  (1)
CLI$L_FLAGS                     00000000    778  (1)
CLI$L_FLAGS2                    00000444    778  (1)    2142  (6)  #-2179  (6)  #-2188  (6)
CLI$L_LAST                      00000024    778  (1)
CLI$L_NEXT                      00000030    778  (1)
CLI$L_PASS                      0000002C    778  (1)
CLI$L_SUBT                      00000028    778  (1)
CLI$L_TEMP_BASE                 00000448    778  (1)
CLI$L_TEST                      00000020    778  (1)
CLI$M_START_OR_RUN             =00000008    778  (1)  #-2178  (6)  #-2187  (6)
CLI$Q_BUFQWD                    00000034    778  (1)
CLI$Q_FILE                      00000008    778  (1)  #-1180  (5)
CLI$Q_SECTION                   00000010    778  (1)
CLI$Q_TIME                      0000043C    778  (1)
CLI$T_BUFFER                    0000003C    778  (1)
CLI$V_ADAPTER                  =00000018    778  (1)
CLI$V_ADR                      =0000000B    778  (1)
CLI$V_ASCII                    =00000013    778  (1)
CLI$V_BASE_QUAL                =00000002    778  (1)
CLI$V_BREAK                    =0000000A    778  (1)
CLI$V_BRIEF                    =0000001B    778  (1)
CLI$V_BYTE                     =0000000D    778  (1)
CLI$V_CLEAR                    =00000002    778  (1)
CLI$V_DEC                      =00000010    778  (1)
CLI$V_DEFAULT                  =0000000C    778  (1)
CLI$V_DEPOSIT                  =00000019    778  (1)
CLI$V_EVENT                    =00000008    778  (1)
CLI$V_EXAM                     =00000005    778  (1)
CLI$V_FLAGS                    =00000009    778  (1)
CLI$V_HEX                      =00000012    778  (1)
CLI$V_KERNEL                   =00000017    778  (1)
CLI$V_LOAD                     =00000006    778  (1)
CLI$V_LONG                     =0000000F    778  (1)
CLI$V_NEXT                     =00000001    778  (1)
CLI$V_NOALLOC                  =00000000    778  (1)
CLI$V_NOTNUF                   =00000001    778  (1)
CLI$V_OCT                      =00000011    778  (1)
CLI$V_PREG                     =0000001A    778  (1)
CLI$V_QA                       =00000007    778  (1)
CLI$V_QACKLOOPLOOPS            =0000001C    778  (1)
CLI$V_QAERRORPRINTS            =0000001B    778  (1)
CLI$V_QAMULTIPLEPASS           =0000001F    778  (1)
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CLI$V_QASUBTESTLOOPS            =0000001E     778    (1)
CLI$V_QATESTLOOPS               =0000001D     778    (1)
CLI$V_REG                       =00000014     778    (1)
CLI$V_REQUIRED                  =00000000     778    (1)
CLI$V_RUN                       =00000015     778    (1)
CLI$V_SET                       =00000003     778    (1)
CLI$V_SHOW                      =00000004     778    (1)
CLI$V_START_OR_RUN              =00000003     778    (1)    #-2141   (6)      778    (1)
CLI$V_VALSEC                    =00000016     778    (1)
CLI$V_WORD                      =0000000E     778    (1)
CLK$RE_INIT                      00000000-XR                 1307   (5)
CMK$RCONSOLE                     00000000-XR                 2291   (6)
CMK$REFRESH                      0000097B-R   1914   (6)     1884   (6)
CMK$SGIPR                        00000000-XR                 2260   (6)      2284   (6)      2289   (6)
CMK$_APBOOT                     =00000004     779    (1)
CMK$_ASTEXIT                    =00000000     779    (1)
CMK$_CANTIM                     =0000000B     779    (1)
CMK$_HIBER                      =00000007     779    (1)
CMK$_INITSCB                    =00000008     779    (1)
CMK$_LAST                       =0000000E     779    (1)
CMK$_MMENABLE                   =00000003     779    (1)
CMK$_RCONSOLE                   =00000001     779    (1)    #-2291   (6)
CMK$_REFRESH                    =00000005     779    (1)    #-1884   (6)
CMK$_SCHDWK                     =00000006     779    (1)
CMK$_SETIMR                     =0000000C     779    (1)
CMK$_SETIPL                     =00000009     779    (1)
CMK$_SETPRT                     =0000000D     779    (1)
CMK$_SGIPR                      =0000000A     779    (1)    #-2260   (6)    #-2284   (6)    #-2289   (6)
CMK$_TCONSOLE                   =00000002     779    (1)
COND_DEBUG                       00000000-XR                 1379   (5)
COND_HANDLR                      00000000-XR                 1380   (5)      1940   (6)
CPUTIM                           00000415-R   940    (1)     2238   (6)
CR                              =0000000D     798    (1)
CRB$SIZE                        =0000002C     805    (1)      816   (1)
CRD$K_CRD_INITIALIZATION        =00000000     786    (1)    #-1753   (6)
CRD$K_DS_CONTROL_C              =00000001     786    (1)
CRD$K_DS_FLAGS                  =00000000     786    (1)
CRD$K_FAILURE                   =00000000     786    (1)
CRD$K_HOOK_POINT                =00000000     786    (1)    #-1754   (6)
CRD$K_LAST_ACCESS_CODE          =00000002     786    (1)
CRD$K_LAST_DS_VARIABLE          =00000002     786    (1)
CRD$K_LAST_FUNCTION             =00000002     786    (1)
CRD$K_LAST_HOOK_POINT           =00000001     786    (1)
CRD$K_READ                      =00000000     786    (1)
CRD$K_SUCCESS                   =00000001     786    (1)
CRD$K_TYPECODE                  =00000001     786    (1)
CRD$K_WRITE                     =00000001     786    (1)
CRD_DESC                         00000058-R   886    (1)    #-1731   (5)
CRD_DESC_BUF                     00000060-R   890    (1)      889   (1)
CRD_SWITCH_1                     00000000-R   853    (1)
CRD_SWITCH_2                     00000004-R   855    (1)     1731   (5)
CRETVA$_ACMODE                  =0000000C    1076    (1)
CRETVA$_INADR                   =00000004    1076    (1)
CRETVA$_NARGS                   =00000003    1076    (1)
CRETVA$_RETADR                  =00000008    1076    (1)
CTL$GL_CCB                       0000042D-R   954    (1)
CTL$GL_CCBBASE                   0000082D-R   957    (1)      958   (1)
```

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CTRL_STR                        00000BD3-R  1065 (1)     1473 (5)
DB_SIZ                         =00000800    823 (1)      830 (1)
DDB$SIZE                       =00000018    804 (1)      815 (1)
DEF$Q_DEV                       00000000-XR              #-1510 (5)   #-1511 (5)   #-1512 (5)   #-1513 (5)
                                                         #-1514 (5)     1518 (5)
DEF$Q_DIR                       00000000-XR              #-1515 (5)     1527 (5)
DEV$V_FOD                      =0000000E                 #-1423 (5)
DEV$V_MBX                      =00000014                 #-1462 (5)   #-1985 (6)
DEVCHAR                         00000B8B-R  1047 (1)     #-1422 (5)     1462 (5)
DIB$K_LENGTH                   =00000074                 #-1977 (6)   #-1979 (6)
DIB$L_DEVCHAR                  =00000000                   1986 (6)
DIB$L_DEVDEPEND                =00000008                 #-1987 (6)
DL_SIZ                         =00000800    824 (1)      830 (1)
DM_SIZ                         =00000A00    825 (1)      830 (1)
DR_SIZ                         =00000800    826 (1)      830 (1)
DS$AQ_SSEND                     00000000-XR              1074 (1)   #-1407 (5)
DS$AQ_SYSSRV                    00000000-XR              1074 (1)     1385 (5)       1393 (5)
DS$AT_DDEV                      000001E0-R  926 (1)      1499 (5)     2482 (6)
DS$AT_DDIR                      000001B8-R  924 (1)      1523 (5)     1526 (5)       2491 (6)
DS$AX_ARB                       00000000-XR              1877 (6)
DS$AX_JIB                       00000000-XR              1875 (6)
DS$AX_SOFTPCB                   00000000-XR              1867 (6)   #-2059 (6)       962 (1)
DS$A_PRGBGN                    =00000200    795 (1)      1088 (5)     796 (1)
DS$CLI                          00000000-XR              1818 (6)     2149 (6)
DS$CNTRLC                       00000000-XR              1246 (5)     1801 (6)
DS$FAB_INPUT                    0000006C-R  893 (1)      1424 (5)     897 (1)
DS$FAB_OUTPUT                   00000100-R  899 (1)      1428 (5)     903 (1)
DS$GA_BUFPTR                    000008ED-R  1036 (1)
DS$GA_CHKLPPC                   000008CD-R  1027 (1)
DS$GA_CRD_DS_INTERFACE          00000000-XR              1755 (6)
DS$GA_DS_CTRL_C_FIRST           00000194-R  906 (1)    #-1248 (5)   #-2106 (6)   #-2108 (6)   #-2110 (6)
DS$GA_DS_CTRL_C_SECOND          00000198-R  909 (1)    #-1249 (5)   #-2127 (6)   #-2129 (6)   #-2131 (6)
DS$GA_LASTADR                   00000895-R  997 (1)
DS$GA_LOOPADR                   000008D1-R  1028 (1)
DS$GA_PTABLE                    00000000-XR              2467 (6)
DS$GA_SELECTS                   00000000-XR              2468 (6)
DS$GB_BYTEBUF                   000008F1-R  1037 (1)
DS$GB_INHIBIT_NAMING            000008F3-R  1039 (1)   #-1807 (6)
DS$GB_MM_ENB                    00000000-XR            #-1286 (5)
DS$GB_SYSTYPE                   0000040C-R  935 (1)    #-1208 (5)   #-1209 (5)
DS$GB_TYPECODE                  000008F2-R  1038 (1)   #-1931 (6)
DS$GK_SID                       00000000-XR            #-1255 (5)   #-1545 (5)   #-1628 (5)
DS$GL_BUFCNT                    00000000-XR            #-1283 (5)   #-1284 (5)
DS$GL_BUFLEN                    000008E9-R  1035 (1)
DS$GL_CLIBASE                   00000000-XR              1179 (5)     2140 (6)     2177 (6)     2186 (6)
DS$GL_DEVERR_COUNT              000008B1-R  1017 (1)
DS$GL_EFC0                      0000088D-R  995 (1)
DS$GL_EFC1                      00000891-R  996 (1)
DS$GL_ERRCNT                    000008A1-R  1010 (1)
DS$GL_ERRSUP_COUNT              000008B9-R  1021 (1)
DS$GL_FLAGS                     00000899-R  1007 (1)   #-1217 (5)   #-1376 (5)     1433 (5)     1483 (5)
                                                         1488 (5)   #-1489 (5)   #-1993 (6)     2035 (6)
                                                       #-2050 (6)   #-2051 (6)     2071 (6)     2075 (6)
                                                       #-2112 (6)   #-2122 (6)   #-2133 (6)   #-2138 (6)
                                                       #-2176 (6)     2253 (6)     2266 (6)     2352 (6)
                                                         2382 (6)     2464 (6)
DS$GL_FSTTEST                   000008C1-R  1024 (1)
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DS$GL_HARDERR_COUNT             000008A5-R   1011   (1)
DS$GL_LSTTEST                   000008C5-R   1025   (1)
DS$GL_NUMTEST                   000008BD-R   1023   (1)
DS$GL_PCBVEC                    00000831-R   961    (1)
DS$GL_PREPERR_COUNT             000008A9-R   1013   (1)
DS$GL_RADIX                     000008E1-R   1032   (1)    #-1218   (5)    #-1554   (5)
DS$GL_RUNTIM                    000008D5-R   1029   (1)
DS$GL_SIZE                      000008E5-R   1033   (1)
DS$GL_SOFTERR_COUNT             000008AD-R   1015   (1)
DS$GL_SUBTEST                   000008C9-R   1026   (1)
DS$GL_SYSERR_COUNT              000008B5-R   1019   (1)
DS$GL_SYSTYPE                   0000040D-R   936    (1)    #-1207   (5)    #-1208   (5)
DS$GL_TERMCHAR                  00000B83-R   1044   (1)    #-1454   (5)    #-2699   (8)
DS$GL_TIMESEC                   000008D9-R   1030   (1)
DS$GL_WAITIM                    000008DD-R   1031   (1)
DS$GQ_BUFQWD                    000008E9-R   1034   (1)
DS$GQ_CURYEAR                   00000000-XR                 #-1298   (5)    #-1300   (5)      1301   (5)    #-1302   (5)
                                                            #-2304   (6)    #-2305   (6)
DS$GQ_DAYTIM                    00000000-XR                 #-1296   (5)    #-1784   (6)
DS$GQ_EFL                       0000088D-R   994    (1)
DS$GT_ASCIBUF                   000008F4-R   1041   (1)
DS$GT_BUFFER                    00000903-R   1042   (1)      1989   (6)
DS$GT_COPYEAR                   0000002E-R   876    (1)    #-1785   (6)
DS$GT_COPYRIGHT                 00000000-R   873    (1)      1788   (6)
DS$GT_LEGAL                     0000006E-R   862    (1)      1783   (6)
DS$GT_LEGAL_END                 0000004D-R   879    (1)       874   (1)
DS$GT_NEWYEAR                   00000000-XR                 #-1297   (5)      1299   (5)
DS$GT_PROMPT                    00000000-XR                  1810   (6)
DS$GT_START                     00000000-XR                  1793   (6)
DS$GT_STRBUF                    00000B03-R   1043   (1)
DS$GW_TTIN                      0000089D-R   1008   (1)    #-1414   (5)    #-1457   (5)    #-1981   (6)    #-1989   (6)
                                                            #-1992   (6)
DS$GW_TTOUT                     0000089F-R   1009   (1)    #-1445   (5)
DS$INITSCB                      00000000-XR                  1273   (5)
DS$K_ASCIBUF                   =0000000F     1003   (1)      1041   (1)
DS$K_BUFSIZ                    =00000200     1004   (1)      1042   (1)
DS$K_CCB                       =00000040     952    (1)       955   (1)
DS$K_ERROR                     =00000002     757    (1)
DS$K_NORMAL                    =00000001     757    (1)
DS$K_NYSIZ                      00000000-XR                 #-1298   (5)
DS$K_PRGSIZ                    =0000F800     796    (1)      1088   (5)
DS$K_PRINTB                    =00000002     785    (1)
DS$K_PRINTF                    =00000001     785    (1)    #-1720   (5)    #-1771   (6)    #-1783   (6)    #-1788   (6)
                                                            #-1793   (6)
DS$K_PRINTI                    =00000000     785    (1)
DS$K_PRINTX                    =00000003     785    (1)
DS$K_SEVERE                    =00000004     757    (1)
DS$K_SSSIZE                     00000000-XR                 #-1384   (5)
DS$K_STRBUF                    =00000080     1005   (1)      1043   (1)
DS$K_SUBSYS                    =00000066     757    (1)       757   (1)       758   (1)
DS$K_TYPE_ABORT_PROGRAM        =00000014     785    (1)
DS$K_TYPE_ABORT_TEST           =00000013     785    (1)
DS$K_TYPE_COMMAND_ERR          =00000015     785    (1)
DS$K_TYPE_COMMAND_OUT          =00000016     785    (1)
DS$K_TYPE_CRD_AUTOTEST         =0000001A     785    (1)
DS$K_TYPE_DS_PROMPT            =00000001     785    (1)
DS$K_TYPE_DS_START             =0000001D     785    (1)    #-1783   (6)    #-1788   (6)    #-1793   (6)
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DS$K_TYPE_ERRDEV                =00000008     785     (1)
DS$K_TYPE_ERRHARD               =00000006     785     (1)
DS$K_TYPE_ERROR_BODY            =00000009     785     (1)
DS$K_TYPE_ERROR_END             =0000000A     785     (1)
DS$K_TYPE_ERRPREP               =0000001B     785     (1)
DS$K_TYPE_ERRSOFT               =00000007     785     (1)
DS$K_TYPE_ERRSUP                =00000004     785     (1)
DS$K_TYPE_ERRSYS                =00000005     785     (1)
DS$K_TYPE_ERR_HALT              =0000000D     785     (1)
DS$K_TYPE_EXCEPTION             =0000000C     785     (1)
DS$K_TYPE_EXCEPTION_HEAD        =0000000B     785     (1)
DS$K_TYPE_FIRST_PASS            =00000011     785     (1)
DS$K_TYPE_GENERAL               =00000000     785     (1)
DS$K_TYPE_GENERAL_ERROR         =00000003     785     (1)     #-1720   (5)     #-1771   (6)
DS$K_TYPE_NO_TESTS              =00000012     785     (1)
DS$K_TYPE_PARAM_ERROR           =0000001C     785     (1)
DS$K_TYPE_PROGRAM_END           =00000010     785     (1)
DS$K_TYPE_PROGRAM_INFO          =00000017     785     (1)
DS$K_TYPE_PROGRAM_START         =0000000F     785     (1)
DS$K_TYPE_QIO_INVADP            =00000024     785     (1)
DS$K_TYPE_QIO_NODRIVER          =00000022     785     (1)
DS$K_TYPE_QIO_WRONGVER          =00000023     785     (1)
DS$K_TYPE_SCRIPT_ECHO           =00000021     785     (1)
DS$K_TYPE_SCRIPT_PNF            =0000001E     785     (1)
DS$K_TYPE_SCRIPT_PROMPT         =00000020     785     (1)
DS$K_TYPE_SCRIPT_SKIP           =0000001F     785     (1)
DS$K_TYPE_SEQUENCE_ERROR        =00000019     785     (1)
DS$K_TYPE_START_ERR             =00000018     785     (1)
DS$K_TYPE_START_LIST            =00000025     785     (1)
DS$K_TYPE_SUMMARY               =0000000E     785     (1)
DS$K_TYPE_USER_PROMPT           =00000002     785     (1)
DS$K_WARNING                    =00000000     757     (1)
DS$LOADPCS                       00000000-XR                    1336    (5)
DS$L_USERCNTRLC                  0000019C-R    912     (1)     #-1250   (5)     #-2117   (6)     #-2119   (6)     #-2120   (6)
                                                               #-2348   (6)
DS$M_ABRTFLG                    =00000040     781     (1)
DS$M_BADTIME                    =00100000     781     (1)
DS$M_BATCH                      =00400000     781     (1)
DS$M_BRKCLR                     =00001000     781     (1)
DS$M_BRKPT                      =00000800     781     (1)
DS$M_CHARFLG                    =00000100     781     (1)
DS$M_CMDFLG                     =00000080     781     (1)     #-1216   (5)
DS$M_CTRLC                      =00000001     781     (1)     #-1993   (6)     #-2111   (6)     #-2121   (6)     #-2132   (6)
DS$M_CTRLO                      =00010000     781     (1)     #-2111   (6)     #-2121   (6)     #-2132   (6)
DS$M_DEVFLG                     =00000200     781     (1)
DS$M_DISABLCC                   =01000000     781     (1)
DS$M_DONFLG                     =00002000     781     (1)
DS$M_ERRFLG                     =00000010     781     (1)
DS$M_EXCEPT                     =00080000     781     (1)
DS$M_EXETST                     =00040000     781     (1)
DS$M_HLTFLG                     =00000008     781     (1)
DS$M_LODFLG                     =00000002     781     (1)     #-1216   (5)
DS$M_MEMMGT                     =00008000     781     (1)
DS$M_NI                         =04000000     781     (1)
DS$M_OUTPUT                     =00800000     781     (1)
DS$M_RUBFLG                     =00000020     781     (1)
DS$M_SCRIPT                     =00200000     781     (1)
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DS$M_SETIMR                     =02000000     781     (1)
DS$M_STRFLG                     =00000004     781     (1)
DS$M_SUBT                       =00004000     781     (1)
DS$M_SYSFLG                     =00000400     781     (1)
DS$M_TIMED                      =02000000     781     (1)     #-2050    (6)     #-2138    (6)     #-2176    (6)
DS$M_TIMED_OUT                  =08000000     781     (1)     #-2051    (6)
DS$M_TIMRON                     =00020000     781     (1)
DS$RAB_INPUT                     000000BC-R   896     (1)       1426    (5)
DS$RAB_OUTPUT                    00000150-R   902     (1)       1430    (5)
DS$SOFTIPL5                      000002C4-R   1344    (5)
DS$USERMODE                      000002CF-R   1375    (5)
DS$USERMODE_X                    00000636-R   1558    (5)     #-1440    (5)
DS$V_ABRTFLG                    =00000006     781     (1)
DS$V_BADTIME                    =00000014     781     (1)
DS$V_BATCH                      =00000016     781     (1)     #-1432    (5)
DS$V_BRKCLR                     =0000000C     781     (1)
DS$V_BRKPT                      =0000000B     781     (1)
DS$V_CHARFLG                    =00000008     781     (1)
DS$V_CMDFLG                     =00000007     781     (1)
DS$V_CTRLC                      =00000000     781     (1)     #-2070    (6)
DS$V_CTRLO                      =00000010     781     (1)
DS$V_DEVFLG                     =00000009     781     (1)
DS$V_DISABLCC                   =00000018     781     (1)     #-2074    (6)     #-2353    (6)     #-2354    (6)
DS$V_DONFLG                     =0000000D     781     (1)
DS$V_ERRFLG                     =00000004     781     (1)
DS$V_EXCEPT                     =00000013     781     (1)
DS$V_EXETST                     =00000012     781     (1)
DS$V_HLTFLG                     =00000003     781     (1)
DS$V_LODFLG                     =00000001     781     (1)     #-2382    (6)     #-2464    (6)
DS$V_MEMMGT                     =0000000F     781     (1)
DS$V_NI                         =0000001A     781     (1)     #-1483    (5)     #-1488    (5)     #-1489    (5)
DS$V_OUTPUT                     =00000017     781     (1)
DS$V_RUBFLG                     =00000005     781     (1)
DS$V_SCRIPT                     =00000015     781     (1)
DS$V_SETIMR                     =00000019     781     (1)
DS$V_STRFLG                     =00000002     781     (1)
DS$V_SUBT                       =0000000E     781     (1)
DS$V_SYSFLG                     =0000000A     781     (1)
DS$V_TIMED                      =00000019     781     (1)     #-2035    (6)     #-2266    (6)
DS$V_TIMED_OUT                  =0000001B     781     (1)
DS$V_TIMRON                     =00000011     781     (1)     #-2252    (6)
DS$_AP_NORMAL_BREAK             =00660150     757     (1)
DS$_ARITH                       =006600D0     757     (1)
DS$_ASBE                        =00660118     757     (1)
DS$_BADLINK                     =006600F0     757     (1)
DS$_BADTYPE                     =006600E8     757     (1)
DS$_BIIC                        =00660120     757     (1)
DS$_CHME                        =006600A8     757     (1)
DS$_CHMK                        =006600E0     757     (1)
DS$_DEVNAME                     =00660108     757     (1)
DS$_ERROR                       =00660002     757     (1)
DS$_FHWE                        =00660068     757     (1)
DS$_FRAGBUF                     =00660080     757     (1)
DS$_ICBUSY                      =006600C8     757     (1)
DS$_ICERR                       =006600C0     757     (1)
DS$_IHWE                        =00660060     757     (1)
DS$_ILLCHAR                     =00660018     757     (1)
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DS$_ILLPAGCNT                   =00660078     757    (1)
DS$_ILLUNIT                     =00660100     757    (1)
DS$_INIT_FAIL                   =00660140     757    (1)
DS$_INSFMEM                     =00660050     757    (1)
DS$_INVCPU                      =00660130     757    (1)
DS$_IPL2HI                      =006600B8     757    (1)
DS$_IVADDR                      =00660040     757    (1)
DS$_IVVECT                      =00660038     757    (1)
DS$_KRNLSTK                     =00660090     757    (1)
DS$_LOGIC                       =00660070     757    (1)
DS$_MCHK                        =00660088     757    (1)
DS$_MEM_ALLOC_ERR               =00660138     757    (1)
DS$_MMOFF                       =00660058     757    (1)
DS$_NEEDUNIT                    =006600F8     757    (1)
DS$_NODE                        =00660128     757    (1)
DS$_NOPCS                       =00660110     757    (1)
DS$_NORMAL                      =00660001     757    (1)
DS$_NOSUPPORT                   =006600B1     757    (1)
DS$_NOTALLOWMP                  =00660148     757    (1)
DS$_NOTDON                      =00660030     757    (1)
DS$_NOTIMP                      =006600B0     757    (1)      757    (1)
DS$_NULLSTR                     =00660010     757    (1)
DS$_OVERFLOW                    =00660008     757    (1)
DS$_POWER                       =00660098     757    (1)
DS$_PROGERR                     =00660020     757    (1)
DS$_SEVERE                      =00660004     757    (1)
DS$_TRANSL                      =006600A0     757    (1)
DS$_TRUNCATE                    =00660028     757    (1)
DS$_UNEXPINT                    =006600D8     757    (1)
DS$_UNSUPPDEV                   =00660158     757    (1)
DS$_VASFULL                     =00660048     757    (1)
DS$_WARNING                     =00660000     757    (1)      757    (1)
DSA$AL_APTMAIL                   0000FE00                     1085    (3)     1138    (5)
DSA$GL_EVENT                     0000FE48                   #-2055    (6)
DSA$GL_FLAGS                     0000FE00                   #-1141    (5)   #-1548    (5)   #-1656    (5)   #-1726    (5)
                                                            #-1728    (5)   #-1730    (5)   #-1734    (5)   #-1767    (6)
                                                            #-1779    (6)    1805    (6)    1809    (6)    1862    (6)
                                                             2058    (6)    2237    (6)    2404    (6)    2548    (6)
                                                             2623    (8)
DSA$GL_SID                       0000FE14                   #-1192    (5)   #-1196    (5)   #-1201    (5)   #-1256    (5)
                                                            #-1260    (5)   #-1264    (5)    1538    (5)   #-1545    (5)
                                                            #-1722    (5)   #-2246    (6)   #-2248    (6)
DSA$M_APT                       =80000000                   #-1777    (6)
DSA$M_BINARY                    =00000002                   #-1763    (6)
DSA$M_CRD_AUTOTEST_OFF          =00000800                   #-1652    (5)   #-1728    (5)   #-1765    (6)   #-1775    (6)
DSA$M_CRD_MENUTEST_OFF          =00010000                   #-1653    (5)   #-1726    (5)   #-1764    (6)   #-1776    (6)
DSA$M_CRD_MENUTEST_ON           =00040000                   #-1654    (5)   #-1730    (5)   #-1766    (6)   #-1778    (6)
DSA$M_CRD_TRACE                 =00020000                   #-1655    (5)   #-1734    (5)
DSA$M_DFLTFLGS                  =00003000     793    (1)    #-1141    (5)   #-1547    (5)
DSA$M_OPER                      =00001000                    793    (1)
DSA$M_PROMPT                    =00002000                    793    (1)
DSA$M_USER                      =10000000                   #-1547    (5)
DSA$V_APT                       =0000001F                   #-1804    (6)   #-1809    (6)
DSA$V_CRD_AUTOTEST_OFF          =0000000B                   #-2622    (8)
DSA$V_CRD_MENUTEST_OFF          =00000010                   #-2547    (6)
DSA$V_USER                      =0000001C                   #-1862    (6)   #-2057    (6)   #-2237    (6)   #-2404    (6)
DSI$ABORT                        00000000-XR                 2053    (6)
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DSQA$K_DISPAT_AFTER_INIT        =00000014     783    (1)
DSQA$K_DISPAT_BEFORE_INIT       =00000013     783    (1)
DSQA$K_DISPAT_CALLTEST          =00000015     783    (1)
DSQA$K_DISPAT_DONE_TESTS        =00000018     783    (1)
DSQA$K_DISPAT_DSX$ENDPASS_BGN   =00000001     783    (1)
DSQA$K_DISPAT_DSX$ENDPASS_END   =00000002     783    (1)
DSQA$K_DISPAT_DSX$ENDPASS_MID   =00000000     783    (1)
DSQA$K_DISPAT_DS_CLEANUP_BGN    =00000003     783    (1)
DSQA$K_DISPAT_DS_CLEANUP_END    =00000004     783    (1)
DSQA$K_DUMMY_1                  =00000007     783    (1)
DSQA$K_ERROR_ERROR_BGN          =00000006     783    (1)
DSQA$K_ERROR_ERROR_END          =00000005     783    (1)
DSQA$K_KERNEL_INIT_CONTEXT      =00000008     783    (1)    #-1861   (6)
DSQA$K_LOOP_DSX$BGNSUB          =00000009     783    (1)
DSQA$K_LOOP_DSX$CKLOOP          =0000000B     783    (1)
DSQA$K_LOOP_DSX$ENDSUB          =0000000A     783    (1)
DSQA$K_PARAM_DSX$GETADDRESS     =0000000E     783    (1)
DSQA$K_PARAM_DSX$GETDATA        =0000000C     783    (1)
DSQA$K_PARAM_DSX$GETLOGICAL     =0000000F     783    (1)
DSQA$K_PARAM_DSX$GETSTRING      =00000010     783    (1)
DSQA$K_PARAM_DSX$GETVIELD       =0000000D     783    (1)
DSQA$K_QA_DSX$BRANCH            =00000011     783    (1)
DSQA$K_START_BEFORE_HEADER      =00000017     783    (1)
DSQA$K_START_VRRESTART          =00000012     783    (1)
DSQA$K_START_VRSTART            =00000016     783    (1)
DSR$CHECK_AUTOTEST_OFF_SET       00000F14-R   2618   (8)
DSR$CHECK_MENUTEST_OFF_SET       00000EF0-R   2543   (6)
DSR$LOAD_CRD                     00000000-XR                1742   (6)
DSR$RESTORE_CRD_VECTORS          00000000-XR                1645   (5)
DSR$SETIMR_INI                   00000000-XR                1308   (5)
DSR$UNLOAD_CRD                   00000000-XR                2398   (6)
DSV$EXIT                         00000DF0-R   2381   (6)    1721   (5)    1773   (6)
DSV$SETLOAD                      00000000-XR                1181   (5)
DSX$CNTRLC                       00000DC5-R   2346   (6)
DSX$GETTERM                      00000F33-R   2697   (8)
DSX$PRINT                        00000000-XR                1720   (5)    1771   (6)    1783   (6)    1788   (6)
                                                            1793   (6)
DSX$PRINTI                       00000000-XR                1264   (5)    1810   (6)
DS_CLEANUP                       00000000-XR                2383   (6)    2465   (6)
DS_ERRSUP                        00000000-XR                1984   (6)    2241   (6)
DUE_TIME                         00000000-XR              #-2043   (6)  #-2047   (6)  #-2172   (6)  #-2173   (6)
                                                          #-2175   (6)
ESTKPTR                          00000000-XR              #-1889   (6)
EXE$GB_CPUTYPE                   00000000-XR              #-1202   (5)  #-1203   (5)  #-1205   (5)
EXE$GL_TENUSEC                   00000000-XR              #-1310   (5)
EXE$GL_UBDELAY                   00000000-XR              #-1311   (5)
EXE$GQ_SYSTIME                   00000000-XR              #-1302   (5)  #-2255   (6)  #-2272   (6)
EXIT$DESBLK                      000001A0-R   915    (1)    1383   (5)
EXIT$HANDLR                      00000E71-R   2462   (6)    917    (1)
FAB$C_BID                       =00000003                   894    (1)    900    (1)
FAB$C_BLN                       =00000050                   894    (1)    900    (1)
FAB$C_SEQ                       =00000000                   894    (1)    900    (1)
FAB$C_VAR                       =00000002                   894    (1)    900    (1)
FAB$L_ALQ                       =00000010                   894    (1)    900    (1)
FAB$L_FOP                       =00000004                   894    (1)    900    (1)
FAB$V_CHAN_MODE                 =00000002                   894    (1)    900    (1)
FAB$V_CIF                       =00000019                   900    (1)
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FAB$V_FILE_MODE                 =00000004                       894    (1)      900    (1)
FAB$V_GET                       =00000001                       894    (1)
FAB$V_LNM_MODE                  =00000000                       894    (1)      900    (1)
FAB$V_PUT                       =00000000                       900    (1)
FAB$W_GBC                       =00000048                       894    (1)      900    (1)
FALSE                           =00000000       786    (1)
FAOBUF                           00000BC3-R     1062   (1)     1059   (1)
FAOLEN                           00000BCF-R     1063   (1)     1473   (5)
FCB$SIZE                        =00000030       811    (1)      822   (1)
GET_TIME                         00000C9A-R     2236   (6)     2040   (6)      2169   (6)
GLBL_SECT_AREA                   00000BBB-R     1060   (1)    #-1474  (5)     #-1475  (5)      1481   (5)
GLBL_SECT_NAME                   00000BB3-R     1057   (1)     1473   (5)      1481   (5)
GT_MENU_ERROR                    00000000-XR                    1771   (6)
HDW_CLOCK_SET                    00000000-XR                    1303   (5)
HP$B_FLAGS                       0000000A                       2474   (6)      2476   (6)
HP$Q_DEVICE                      00000000                       2477   (6)
HP$V_ALLOC                      =00000000                      #-2473  (6)
HP$V_WASALL                     =00000001                      #-2475  (6)
IDB$SIZE                        =00000020       806    (1)      817   (1)
IMAGE_HEADER                     00000208-R     928    (1)
IMAGE_HEADER_END                 00000408-R     929    (1)
INI$BRK                          000002C2-R     1341   (5)    #-1238  (5)     #-1347  (5)
INI$LOAD_DEVICE                  00000000-XR                    1320   (5)
INI$PTABLE                       00000000-XR                    1316   (5)     #-1552  (5)
INIT_COMMON                      000009A4-R     1929   (6)    #-1913  (6)
INIT_CONTEXT                     0000088A-R     1860   (6)     1318   (5)     #-1814  (6)     #-2386  (6)
INIT_USERMODE                    00000997-R     1924   (6)    #-1864  (6)
IO$M_CTRLCAST                    00000000-XR                   #-1457  (5)     #-1992  (6)
IO$M_NOW                         00000000-XR                   #-1989  (6)
IO$_READVBLK                     00000000-XR                   #-1989  (6)
IO$_SETMODE                      00000000-XR                   #-1457  (5)     #-1992  (6)
IOC$K_DIAGPID                   =00660000       758    (1)    #-1868  (6)
IOSB                             00000BAB-R     1056   (1)     1468   (5)
IRP$SIZE                        =00000050       807    (1)      818   (1)
ISTKPTR                          00000000-XR                   #-1135  (5)     #-1190  (5)     #-1885  (6)
ITEMS                            00000B9B-R     1051   (1)     1468   (5)
JIB$L_ARB                       =00000000       764    (1)    #-1879  (6)
JPI$_CPUTIM                     =00000407                       941   (1)
JPI$_PID                        =00000319                      1052   (1)
JPICPUTIM                        00000425-R     945    (1)    #-2243  (6)      942    (1)
JPICPUTIMS                       00000429-R     946    (1)      943   (1)
KB_CHECK                         00000A88-R     2034   (6)
KB_CHECK_APT                     00000AE6-R     2056   (6)
KB_CHECK_X                       00000C99-R     2197   (6)    #-2061  (6)     #-2072  (6)     #-2077  (6)
KB_POLL                          00000000-XR                    2063   (6)
KSTKPTR                          00000000-XR                    1886   (6)
LF                              =0000000A       799    (1)
MAPMEM                           00000000-XR                    1280   (5)
MASK                            =0000000F       836    (1)
MEMPOOL$INIT                     00000000-XR                    1550   (5)
MP$GR_BOOTED_PROCESSORS          00000408-R     933    (1)    #-2065  (6)     #-2182  (6)
MP$R_ACTIVE_SERVICES             00000000-XR                    1630   (5)      727    (1)
MP$R_INTERLOCK_END               00000000-XR                    1631   (5)      729    (1)
MP$_PRIMARY_CPU_CHECK            00000000-XR                    2068   (6)      725    (1)      739    (1)
MP$_RESUME_ATTACHED_PROCESSORS   00000000-XR                    2184   (6)      726    (1)      740    (1)
MP_CLEAR_END                     000006CB-R     1636   (5)    #-1628  (5)
NDS$OPEN                         00000000-XR                   #-1490  (5)      724    (1)      737    (1)
```

```
OFF                             =00000000     786    (1)
ON                              =00000001     786    (1)
ONLY$GL_TENUSEC                  00000000-XR                  #-1310   (5)
ONLY$GL_UBDELAY                  00000000-XR                  #-1311   (5)
ONLY_CPU                         00000000-XR                    1268   (5)
POPT_BASE                        00000000-XR                  #-1226   (5)
PCB$B_ASTACT                     0000000C                     #-1871   (6)    #-2059   (6)
PCB$L_ARB                        00000084                     #-1878   (6)
PCB$L_ASTQBL                     00000014                     #-1870   (6)
PCB$L_ASTQFL                     00000010                       1869   (6)      1870   (6)
PCB$L_JIB                        00000078                     #-1876   (6)
PCB$L_PID                        00000060                     #-1868   (6)
PCB_BASE                         00000000-XR                  #-1220   (5)
PHD$B_ASTLVL                    =000000CF                     #-1906   (6)
PHD$L_ESP                       =0000007C                     #-1890   (6)
PHD$L_KSP                       =00000078                     #-1888   (6)
PHD$L_P0BR                      =000000C8                     #-1903   (6)
PHD$L_P0LRASTL                  =000000CC                     #-1904   (6)
PHD$L_P1BR                      =000000D0                     #-1907   (6)
PHD$L_P1LR                      =000000D4                     #-1908   (6)
PHD$L_PC                        =000000C0                     #-1882   (6)    #-1912   (6)
PHD$L_PSL                       =000000C4                     #-1902   (6)
PHD$L_R0                        =00000088                     #-1909   (6)
PHD$L_R12                       =000000B8                       1898   (6)
PHD$L_SSP                       =00000080                     #-1892   (6)
PHD$L_USP                       =00000084                     #-1894   (6)
PHD_BASE                         00000000-XR                    1881   (6)
PID                              00000B8F-R    1048    (1)      1468   (5)
PIDNO                            00000B93-R    1049    (1)      1053   (1)    #-1473   (5)
PIDNOS                           00000B97-R    1050    (1)      1054   (1)
POLL_TIME                        00000000-XR                    2039   (6)    #-2044   (6)    #-2047   (6)    #-2159   (6)
                                                              #-2161   (6)    #-2162   (6)    #-2164   (6)
PPA$GB_CPU                       00000000-XR                  #-1212   (5)      1213   (5)      732   (1)
PPA$GB_MID                       00000000-XR                  #-1214   (5)      732   (1)
PPA_SPID                        =3FFFE400      752    (1)    #-1211   (5)
PR$_ASTLVL                      =00000013                     #-1905   (6)
PR$_ESP                         =00000001                     #-1889   (6)    #-1890   (6)
PR$_IPL                         =00000012                     #-1134   (5)    #-1188   (5)    #-1910   (6)    #-1915   (6)
PR$_ISP                         =00000004                     #-1885   (6)
PR$_KSP                         =00000000                     #-1887   (6)    #-1888   (6)
PR$_MAPEN                       =00000038                     #-1285   (5)
PR$_P0BR                        =00000008                     #-1903   (6)
PR$_P0LR                        =00000009                     #-1904   (6)
PR$_P1BR                        =0000000A                     #-1907   (6)
PR$_P1LR                        =0000000B                     #-1908   (6)
PR$_PCBB                        =00000010                     #-1220   (5)
PR$_SCBB                        =00000011                     #-1219   (5)
PR$_SID                         =0000003E                     #-1145   (5)    #-1192   (5)
PR$_SID_TYP8NN                  =00000006      750    (1)    #-2246   (6)
PR$_SID_TYP8RR                  =00000011      749    (1)    #-2248   (6)
PR$_SID_TYP8SS                  =00000005                     #-1196   (5)    #-1722   (5)
PR$_SID_TYPRTUV2                =00000010      745    (1)    #-1203   (5)    #-1258   (5)
PR$_SID_TYPUV2                  =00000008                     #-1205   (5)    #-1260   (5)
PR$_SSP                         =00000002                     #-1891   (6)    #-1892   (6)
PR$_SYS_TYP800                  =00000002      746    (1)
PR$_SYS_TYP900                  =00000003      747    (1)    #-1209   (5)
PR$_SYS_TYP_LLL                 =0000000A      748    (1)    #-1158   (5)
```

```
PR$_TXCS                        =00000022                       #-2282  (6)
PR$_TXDB                        =00000023                       #-2288  (6)
PR$_USP                         =00000003                       #-1893  (6)     #-1894  (6)
PR780$_TODR                     =0000001B                       #-2258  (6)
PR8SS$_BINID                    =0000005E                       #-2406  (6)
PRGBUF                           000001A7-R     1088    (5)       1378  (5)       1461  (5)
PSL$M_IPL                       =001F0000                       #-1916  (6)
PSL$V_IS                        =0000001A       779     (1)     #-1884  (6)     #-2260  (6)     #-2284  (6)     #-2289  (6)
                                                                #-2291  (6)
PSL$V_TBIT                      =00000004                       #-1917  (6)     #-1918  (6)
PSL_SAVE                         00000993-R     1922    (6)     #-1883  (6)       1917  (6)
QA$MAIN                          00000000-XR                     1861  (6)
QIO$INITIALIZE                   00000000-XR                     1282  (5)
QIO$MINCORE                     =00005E3C       830     (1)
RAB$B_RAC                       =0000001E                       897     (1)       903   (1)
RAB$C_BID                       =00000001                       897     (1)       903   (1)
RAB$C_BLN                       =00000044                       897     (1)       903   (1)
RAB$C_SEQ                       =00000000                       897     (1)       903   (1)
RAB$L_CTX                       =00000018                       897     (1)       903   (1)
RAB$L_ROP                       =00000004                       897     (1)       903   (1)
RAB$V_CCO                       =0000001F                       903     (1)
RAB$V_CVT                       =0000001A                       897     (1)
RCTRLC                           000009E9-R     1976    (6)       1457  (5)       1992  (6)
RECEIVE_POLL                     00000000-XR                     1491  (5)       724   (1)       737   (1)
RMS$INIT                         00000000-XR                     1330  (5)
RPB$B_DEVTYP                    =00000066                       #-1155  (5)
RPB$L_ADPPHY                    =0000005C                       #-1149  (5)
RPB$L_BOOTR1                    =00000020                       #-1152  (5)
RPB$L_BOOTR2                    =00000024                       #-1153  (5)
RPB$L_BOOTR4                    =0000002C                       #-1160  (5)
RPB$L_BOOTR5                    =00000030                       #-1154  (5)
RPB$L_CSRPHY                    =00000054                       #-1150  (5)
RPB$M_MENUTEST                  =00000001       754     (1)     #-1724  (5)
RPB$T_FILE                      =00000068                       1161  (5)
RPB$V_AUTOTEST                  =0000000F                       #-1676  (5)     #-2641  (8)
RPB$V_DIAG                      =00000004                       #-1672  (5)     #-2558  (6)     #-2633  (8)
RPB$V_INIBPT                    =00000002                       #-1237  (5)
RPB$V_MENUTEST                  =00000000       753     (1)     #-1674  (5)     #-2566  (6)       754   (1)
RPB$W_UNIT                      =00000064                       #-1151  (5)
RX50_DISK_SELECT                 00000885-R     991     (1)     #-1198  (5)     #-1200  (5)
SAVEFP                           000001B4-R     922     (1)     #-1555  (5)     #-1926  (6)
SCB$L_BREAK                      0000002C                       #-1236  (5)
SCB$L_TBIT                       00000028                       #-1235  (5)
SCB_IMAGE                        00000000-XR                    #-1219  (5)       1234  (5)
SCH$GL_CURPCB                    00000831-R     960     (1)
SCRIPT$INIT                      00000000-XR                     1795  (6)
SCRIPT$STOP                      00000000-XR                     2079  (6)
SEC$M_GBL                       =00000001                       #-1481  (5)
SEC$M_PAGFIL                    =00080000                       #-1481  (5)
SEC$M_WRT                       =00000008                       #-1481  (5)
SF$L_SAVE_PC                    =00000010                       #-2052  (6)
SGN$C_IRPCNT                    =00000040       813     (1)       818   (1)
SGN$C_NPAGEDYN                  =0000263C       822     (1)       830   (1)
SIZ...                          =00000001       787     (1)       781   (1)       787   (1)
SIZE_TERM                        00000000-XR                     1325  (5)
SS$_NORMAL                      =00000001       756     (1)     #-2700  (8)
SSPROT                           0000017A-R     1076    (1)       1381  (5)       1382  (5)
```

```
SSTKPTR                         00000000-XR                     #-1891  (6)
START_RUN_PC                    00000411-R      938     (1)     #-2143  (6)     #-2151  (6)
SUPBUF                          0000019F-R      1085    (3)       1377  (5)       1460  (5)
SWI$GL_FQBL                     00000839-R      972     (1)
SWI$GL_FQFL                     00000835-R      969     (1)
SYI$_SID                        =00001001                       #-1539  (5)
SYS$ASSIGN                      00000000-XR                       1590  (5)
SYS$BINTIM                      00000000-XR                       1301  (5)
SYS$CLREF                       00000000-XR                       1798  (6)
SYS$CONNECT                     00000000-XR                       1426  (5)       1430  (5)
SYS$CREATE                      00000000-XR                       1428  (5)
SYS$CRELOG                      00000000-XR                       1521  (5)       2489  (6)
SYS$CRETVA                      =800000C8       842     (1)       1377  (5)       1378  (5)       1382  (5)       1460  (5)
                                                                  1461  (5)
SYS$CRMPSC                      00000000-XR                       1481  (5)
SYS$DALLOC                      00000000-XR                       2477  (6)
SYS$DCLEXH                      00000000-XR                       1383  (5)
SYS$DELTVA                      =80000110       844     (1)       1381  (5)
SYS$DISK                        00000000-XR                       1507  (5)       1519  (5)       2487  (6)
SYS$DXLEXH                      =800000F0       843     (1)
SYS$EXIT                        00000000-XR                       2432  (6)
SYS$FAO                         00000000-XR                       1473  (5)
SYS$GETCHN                      00000000-XR                       1419  (5)       1451  (5)       1981  (6)
SYS$GETJPI                      00000000-XR                       1468  (5)
SYS$GETJPIW                     00000000-XR                       2238  (6)
SYS$GETSYI                      00000000-XR                       1542  (5)
SYS$INPUT                       0000018A-R      1079    (2)       1409  (5)       894     (1)
SYS$OPEN                        00000000-XR                       1424  (5)
SYS$OUTPUT                      00000194-R      1082    (3)       1436  (5)       900     (1)
SYS$QIOW                        00000000-XR                       1457  (5)       1989  (6)       1992  (6)
SYS$SETAST                      00000000-XR                       1933  (6)
SYS$SETDDIR                     00000000-XR                       1528  (5)       2496  (6)
SYS$SETEXV                      =80000208       845     (1)       1379  (5)
SYS$SETPRT                      =80000230       846     (1)
SYS$TRNLOG                      00000000-XR                       1508  (5)       1578  (5)
SYSVEC                          00000172-R      1074    (1)       1076  (1)
SYS_TYPE                        =20040004       751     (1)     #-1207  (5)
TICK_NS                         00000000-XR                     #-2302  (6)
TM_SIZ                          =00001000       827     (1)       830   (1)
TODR_BIAS                       00000000-XR                     #-2299  (6)
TODR_BYTE_CNT                   00000000-XR                     #-2280  (6)     #-2292  (6)       733   (1)
TODR_STORE                      00000000-XR                     #-2297  (6)       733   (1)
TRAN_ASSIGN                     00000637-R      1566    (5)     #-1410  (5)     #-1437  (5)
TRUE                            =00000001       786     (1)
TXCS$V_RDY                      00000000-XR                     #-2285  (6)       733   (1)
T_BOTH_CRD_BITS_SET             0000003E-R      860     (1)       1720  (5)
T_WRONGCPU                      0000000E-R      857     (1)       1264  (5)
UCB$SIZE                        =00000098       803     (1)       814   (1)
ULTRIX_END                      00000058-R      885     (1)       881   (1)
ULTRIX_FILE                     0000004D-R      880     (1)       1166  (5)
ULTRIX_PARTITION                00000051-R      883     (1)     #-1165  (5)
USTKPTR                         00000000-XR                     #-1893  (6)
VCB$SIZE                        =00000050       809     (1)       820   (1)
V_ENV                           =00000001       782     (1)
V_LVL                           =00000000       782     (1)
WCB$SIZE                        =00000030       810     (1)       821   (1)
XDELBPT                         00000000-XR                       1236  (5)     #-1345  (5)       724   (1)
```

```
XDELTBIT                    00000000-XR                 #-1232   (5)      724    (1)
XF_SIZ                     =00000600     828    (1)      830    (1)
```

```
                                        +-------------------------+
                                        ! Performance indicators !
                                        +-------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    22    00:00:00.01    00:00:00.19
Command processing               891    00:00:00.30    00:00:00.89
Pass 1                          1555    00:00:07.03    00:00:12.21
Symbol table sort                  0    00:00:00.66    00:00:00.66
Pass 2                           168    00:00:02.15    00:00:04.77
Symbol table output                2    00:00:00.11    00:00:00.42
Psect synopsis output              2    00:00:00.01    00:00:00.01
Cross-reference output             8    00:00:00.67    00:00:01.02
Assembler run totals            2650    00:00:10.94    00:00:20.17

The working set limit was 3900 pages.
429806 bytes (840 pages) of virtual memory were used to buffer the intermediate code.
There were 130 pages of symbol table space allocated to hold 2357 non-local and 116 local symbols.
2703 source lines were read in Pass 1, producing 174 object records in Pass 2.
111 pages of virtual memory were used to define 89 macros.

                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              12
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                20
DISK$DS:[DS.LOCAL.RELEASE.WORK]CRD.MLB;1                1
SYS$COMMON:[SYSLIB]LIB.MLB;2                            4
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                 0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1               0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1              0
SYS$COMMON:[SYSLIB]LIB.MLB;2                            0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       49
SYS$COMMON:[SYSLIB]STARLET.MLB;2                        0
TOTALS (all libraries)                                 86

2830 GETS were required to define 86 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

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(1) 141 Libraries, Equated Symbols
(1) 165 Work Psect Declarations
(1) 179 Data Psect Declarations
(1) 196 DSV$SETLOAD SET THE DEFAULT LOAD DEVICE/DIRECTORY
(1) 322 DSV$SHOWLOAD Display default load device
(1) 356 DSR$IFLOADDEV Is it the load device?
(1) 404 DSV$LOAD PROGRAM IMAGE LOAD SUBROUTINE

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element LOAD.MAR
0000     2 ; *3    12-JUN-1987 09:49:59 FORTUNA "FIXED IDENT FIELD GENERATION NUMBER ERROR"
0000     3 ; *2    12-JUN-1987 09:23:36 FORTUNA "ADD THE FEATURE OF DOING A SET LOAD COMMAND WI
0000     4 ; *1     6-FEB-1986 15:19:21 DS ""
0000     5 ; DEC/CMS REPLACEMENT HISTORY, Element LOAD.MAR
0000     6         .Title  LOAD    *** LOAD Set/Show load
0000     7         .Ident  '10.9-03'                                                ;G:3
0000     8         .NoShow Conditionals
0000     9 ;
0000    10 ; COPYRIGHT (C) 1977, 1980, 1982, 1985, 1986, 1987                       ;G:2
0000    11 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    12 ;
0000    13 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0000    14 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
0000    15 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
0000    16 ; MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
0000    17 ; EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
0000    18 ; TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
0000    19 ; REMAIN IN DEC.
0000    20 ;
0000    21 ; THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
0000    22 ; AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
0000    23 ; CORPORATION.
0000    24 ;
0000    25 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0000    26 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    27
0000    28 ;++
0000    29 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR
0000    30 ;
0000    31 ; ABSTRACT:
0000    32 ;                This routine is designed to read diagonostic
0000    33 ;       programs into memory.  It removes ALL breakpoints from
0000    34 ;       the previous program and opens the file specified by
0000    35 ;       the LOAD command and reads it starting at memory address
0000    36 ;       DS$GA_PRGBGN (^X200).
0000    37 ;
0000    38 ; ENVIRONMENT:
0000    39 ;       Loads programs in user mode
0000    40 ; and   Loads from floppy and RMS disks in stand-alone
0000    41 ;
0000    42 ; AUTHOR:       TOM SOUTTER     10-NOV-77       VERSION 01
0000    43 ;
0000    44 ; MODIFIED BY:
0000    45 ;                TOM SOUTTER     21-NOV-77       VERSION 02
0000    46 ;       01       SPR #16  "N.Y.I." MESSAGES FOR STAND-ALONE 'RUN' OR 'LOAD'.
0000    47 ;
0000    48 ;                TOM SOUTTER     24-MAR-78       VERSION 03 (ESSAA-4.01)
0000    49 ;       02       FIX TO LOAD ALGORITHM TO READ FILE BLOCKS "IN USE" ONLY
0000    50 ;
0000    51 ;                Roger Riggs     06-Jul-78       Version 04 (ESSAA-4.03)
0000    52 ;       03       Modify load sequence to use $READ and to read whole
0000    53 ;                file in one operation. verification is equivalent
0000    54 ;
0000    55 ;       04       Eliminate message for successful program load.  /TLS
0000    56 ;                Roger Riggs     26-Oct-78       Version 05 (ESSAA-5.01)
0000    57 ;       05       Add DSX$LOAD to allow diagnostic to read files into memory
```

```
0000     58 ;                  Include facility for stand alone load from ODS-1/ODS-2 structures
0000     59 ;          06      Add floppy support in stand alone
0000     60 ;          07      Add SET LOAD and SHOW LOAD commands
0000     61 ;          08      Add DSR$IFLOADDEV to let attach(select) know if it is
0000     62 ;                  dealing with the load device.
0000     63 ;          09      REMOVE W^ from calls to DSP$XX_READ
0000     64 ;
0000     65 ;                  JOHN CIUKAJ     NOV-79
0000     66 ;          10      Modify DSX$LOAD for loadable drivers. BOO$QIO is used for
0000     67 ;                  resident driver. Pseudo restart parameter block is developed
0000     68 ;                  for use in BOO$QIO.
0000     69 ;
0000     70 ;          11      John Ciukaj     2-15-80
0000     71 ;                  Change RPB block building in LOADFILE_SA to reflect new
0000     72 ;                  structure of BOOTDRIVER module.
0000     73 ;                  Roger Riggs     29-FEB-80
0000     74 ;          12      Added code to support 7th argument to DS$LOAD allowing
0000     75 ;                  the program to read sections of the file, the LOAD$_LBN
0000     76 ;                  argument supplies the starting logical block number of the
0000     77 ;                  first block to be read from the file.
0000     78 ;                  Roger Riggs, 5-June-1980, Version 5.4
0000     79 ;          13      Moved code to reset stacks and mode to before DS_CLEANUP is
0000     80 ;                  called.
0000     81 ;
0000     82 ;                  Dave Butenhof, 27-aug-1980
0000     83 ;          14      Define DEF$Q_DIR to be global, so it is accessible to
0000     84 ;                  new standalone RMS routines.
0000     85 ;                  Also deleted DSX$LOAD routine it has been moved to DSLOAD.
0000     86 ;                  Roger Riggs, 17-Sep-1980, Version 6.0
0000     87 ;          15      Deleted Reference to L$A_LASTADR in DSV$LOAD, MAPFREE
0000     88 ;                  now checks the loaded bit and L$A_LASTADR
0000     89 ;
0000     90 ;          16      - Jack Stansbury, 26-Oct-1981, Version 6.-
0000     91 ;                  Added .LIBRARY statements for $DS and $DIAG.
0000     92 ;                  Also fixed truncation errors.
0000     93 ;
0000     94 ;          17      Marion Baggett, 31-Mar-1982, Version 6.7
0000     95 ;                  Added sys$library:lib .
0000     96 ;
0000     97 ;          18      Marion Baggett, 7-Apr-1982, Version 6.7
0000     98 ;                  Added $DS_TYPEDEF to define type def codes.
0000     99 ;
0000    100 ;          19      Jack Stansbury, 13-April-1982, Version 6.7
0000    101 ;                  Fixed truncation error.
0000    102 ;
0000    103 ;          20      Richard Brown, 15-June-82, Version 6.8
0000    104 ;                  Clear image header storage buffer before loading diag.
0000    105 ;                  Then save the name of the file being loaded, so the debugger
0000    106 ;                  can use it later.
0000    107 ;                  Also, clear debugger-resident flag before loading diag.
0000    108 ;
0000    109 ;          21      Richard Brown, 8-Mar-84, Version 6.15
0000    110 ;                  Add code to clear all event flags before a new program
0000    111 ;                  is loaded.
0000    112 ;
0000    113 ;          22      RE MUSE         15-MAY-84       VERSION 7.0
0000    114 ;                  added support for longfile names
```

```
                                0000    115 ;
                                0000    116 ;       23      M. Baggett      19-FEB-1985     VERSION 8.1
                                0000    117 ;               Added support for ULTRIX set load.
                                0000    118 ;
                                0000    119 ;       24      M. Baggett      21-May-1985     Version 8.2
                                0000    120 ;               Added more flags for ULTRIX operations
                                0000    121 ;
                                0000    122 ;       25      M. Baggett      3-Jun-1985      Version 8.3
                                0000    123 ;               Changes to set load to support ULTRIX, remove unneed flags,
                                0000    124 ;               and change [23].
                                0000    125 ;
                                0000    126 ;       26      Bob Bergazzi    7-Jan-1986      Version 9.1
                                0000    127 ;               Removed DEF$Q_DEV, DEF$Q_DIR, SYS$SYSROOT, and SYS$DISK
                                0000    128 ;               from this module to the ONLY modules,
                                0000    129 ;               so that the default directory for each system could differ.
                                0000    130 ;                                                                       ;G:2
                                0000    131 ;               Steven Fortuna  22-May-1987     Version  10.9           ;G:2
                                0000    132 ;               Add the capablity for giving a SET LOAD command to a device ;G:2
                                0000    133 ;               name or logical path name without the need for the input ;G:2
                                0000    134 ;               string to be terminated with a ':'.  Symptom was the    ;G:2
                                0000    135 ;               SET LOAD command would accept input without a ':' but the ;G:2
                                0000    136 ;               default directory did not change nor was an error reported ;G:2
                                0000    137 ;               to the user.                                            ;G:2
                                0000    138 ;                                                                       ;G:2
                                0000    139 ;--
```

```
                     0000   141          .SBTTL  Libraries, Equated Symbols
                     0000   142 ;
                     0000   143 ; INCLUDE FILES:
                     0000   144 ;
                     0000   145          .LIBRARY        /SYS$LIBRARY:LIB/                ;               [17]
                     0000   146          .LIBRARY        /$DS/                            ;               [16]
                     0000   147          .LIBRARY        /$DIAG/                          ;               [16]
                     0000   148
                     0000   149 ;
                     0000   150 ; EQUATED SYMBOLS:
                     0000   151 ;
                     0000   152
                     0000   153          $DS_HDRDEF                      ; PROGRAM HEADER BLOCK SYMBOLS
                     0000   154          CLIDEF                          ; CLI COMMAND BLOCK OFFSETS
                     0000   155          DSFDEF                          ; CONTROL FLAG DEFINITIONS
                     0000   156          $DS_DSADEF                      ; CONTROL FLAG DEFINITIONS
                     0000   157          $DS_TYPEDEF                     ; DEFINE TYPE CODES             [18]
                     0000   158
                     0000   159 ;Global References                                                       [20]
                     0000   160
                     0000   161          .GLOBAL IMAGE_HEADER            ;IMAGE HEADER STORAGE BUFFER    [20]
                     0000   162          .GLOBAL IMAGE_HEADER_END        ;                               [20]
                     0000   163
```

```
                 0000          .Subtitle       Work Psect Declarations
                 0000   ;
                 0000   ; OWN STORAGE:
                 0000   ;
                 0000
             00000000          .PSECT  WORK, NOSHR, NOEXE, WRT, LONG
                 0000   ULTRIX_FLAGS::                          ;                                [24]
         00000001 0000          .BLKB   1                       ; FLAG FOR ULTRIX                [23]
         00000000 0001   ULTRIX_V_MODE == 0                      ; BIT POSITION FOR ULTRIX        [24]
         00000056 0001   DIAG_FILE_NAME::.BLKB 39+39+5+2         ; PLACE TO SAVE FILENAME OF LAST[22]
                 0056                                            ; DIAGNOSTIC LOADED              [20]
                 0056
                 0056          .ALIGN  LONG                    ; VMS REQUIREMENT
```

```
                                        0058   179          .Subtitle       Data Psect Declarations
                                        0058   180
                                 00000000   181          .PSECT  DATA, SHR, NOEXE, NOWRT, BYTE
                                        0000   182 DEF_EXE:
30 3B 45 58 45 2E 00000008'010E0000'    0000   183          .ASCID  \.EXE;0\                 ; Default for loaded files
                                        000E   184 FIL$GT_DDDEV::
                                     00'000E   185          .ASCIC  \\                       ; NO DEFAULT DEVICE
                                     00 000E
                                        000F   186 FIL$GT_DDSTRING::
   5D 54 4E 49 41 4D 53 59 53 5B 00'    000F   187          .ASCIC  \[SYSMAINT]\            ; DEFAULT DIRECTORY IN STAND ALONE
                                     0A 000F
                                        001A   188 T_SHOWLOAD:
         2F 21 53 41 21 53 41 21 00'    001A   189          .ASCIC  "!AS!AS!/"
                                     08 001A
                                        0023   190 T_TRUNCATED:
61 6C 20 6F 6F 74 20 65 6C 69 46 00'    0023   191          .ASCIC  "File too large = !XL, max = !XL!/"
6D 20 2C 4C 58 21 20 3D 20 65 67 72     002F
      2F 21 4C 58 21 20 3D 20 78 61     003B
                                     21 0023
                                        0045   192 CLREF_ERROR_TEXT:                                   ; [21]
6C 63 20 72 6F 72 72 45 20 3F 3F 00'    0045   193          .ASCIC  "?? Error clearing event flags."  ; [21]
74 6E 65 76 65 20 67 6E 69 72 61 65     0051
               2E 73 67 61 6C 66 20     005D
                                     1E 0045
                                        0064   194
```

```
                     0064   196          .SBTTL  DSV$SETLOAD     SET THE DEFAULT LOAD DEVICE/DIRECTORY
                 00000000   197          .PSECT  CODE, SHR, EXE, NOWRT, BYTE
                     0000   198 ;++
                     0000   199 ; FUNCTIONAL DESCRIPTION:
                     0000   200 ;
                     0000   201 ;       This routine is called form CLI to process a "SET LOAD <filespec>"
                     0000   202 ;       command.  It saves the string pointed to by CLI$Q_FILE(R2) in
                     0000   203 ;       DEF$Q_DEV and DEF$Q_DIR if applicable.
                     0000   204 ;
                     0000   205 ; CALLING SEQUCENCE:
                     0000   206 ;
                     0000   207 ;       BSBW    DSV$SETLOAD
                     0000   208 ;
                     0000   209 ; INPUT PARAMETERS:     NONE
                     0000   210 ;
                     0000   211 ; IMPLICIT INPUTS:
                     0000   212 ;
                     0000   213 ;       R2      Base of CLI DATA BASE
                     0000   214 ;       +       CLI DATA BASE
                     0000   215 ;
                     0000   216 ; OUTPUT PARAMETERS:    NONE
                     0000   217 ;
                     0000   218 ; IMPLICIT OUTPUTS:
                     0000   219 ;
                     0000   220 ;       DEF$Q_DEV gets descriptor of device type
                     0000   221 ;               after device is copied to local storage.
                     0000   222 ;       DEF$Q_DIR gets descriptor of spec typed.
                     0000   223 ;               after spec is copied to local storage
                     0000   224 ;
                     0000   225 ; COMPLETION CODES:     N/A
```

```
                                 0000   DSV$SETLOAD::
                     3C   BB     0000           PUSHR   #^M<R2,R3,R4,R5>          ; Save
                 50  05   D0     0002           MOVL    #5, R0                    ; Setup to clear 5 quadwords
                                 0005
                     7E   7C     0005   10$:    CLRQ    -(SP)                     ; Clear a quadword
                 FB  50   F5     0007           SOBGTR  R0, 10$                   ; Count and Branch if more
                                 000A
                     6E   7F     000A           PUSHAQ  (SP)                      ; Address of descriptors
             7E  08  A2   7D     000C           MOVQ    CLI$Q_FILE(R2), -(SP)     ; length, address of new default
      00000000'EF    03   FB     0010           CALLS   #3, BREAKUP_FILE          ; Merge in new fields
                                 0017
                 50  8E   7D     0017           MOVQ    (SP)+,R0                  ; Get length/address of new device
                     11   13     001A           BEQL    20$                       ; Branch if none
      00000000'EF    50   D0     001C           MOVL    R0,DEF$Q_DEV              ; Set length of new device name
      54  00000000'EF    7D     0023           MOVQ    DEF$Q_DEV,R4              ; Length/Address to save device
                   0106   30     002A           BSBW    90$                       ; Copy the device name
                                 002D
                 50  8E   7D     002D   20$:    MOVQ    (SP)+, R0                 ; Length/addr of directory or partition
                     11   13     0030           BEQL    25$                       ; Branch if none                        ;G:2
      00000000'EF    50   D0     0032           MOVL    R0,DEF$Q_DIR              ; Set new length of default directory
      54  00000000'EF    7D     0039           MOVQ    DEF$Q_DIR,R4              ; Length/Address to save directory
                   00F0   30     0040           BSBW    90$                       ; Copy directory name in                [25]
                                 0043                                                                                   ;G:2
                                 0043   25$:                                      ; Assume file name is a device name     ;G:2
                                 0043                                             ; due to the fact the device name       ;G:2
                 50  6E   7D     0043           MOVQ    (SP),R0                   ; was entered with out a ':'.           ;G:2
                     34   13     0046           BEQL    30$                       ; Branch if no filename                 ;G:2
                     0C   BB     0048           PUSHR   #^M<R2,R3>                ; Save register                         ;G:2
             52  10  AE   7D     004A           MOVQ    16(SP),R2                 ; Check for file type part              ;G:2
                     2A   12     004E           BNEQ    26$                       ; If present, error, branch out         ;G:2
             52  18  AE   7D     0050           MOVQ    24(SP),R2                 ; Check for file version                ;G:2
                     24   12     0054           BNEQ    26$                       ; If present, error, branch out         ;G:2
                     52   D4     0056           CLRL    R2                        ;                                       ;G:2
                     53   D4     0058           CLRL    R3                        ; Clear R2 and R3 for temporary usage   ;G:2
                 52  50   B0     005A           MOVW    R0,R2                     ; Get the length of the input string.   ;G:2
          53     51  52   C1     005D           ADDL3   R2,R1,R3                  ; Find the byte one past the end of     ;G:2
                 63  3A   90     0061           MOVB    #^A":",(R3)               ; string and append a ':'.              ;G:2
                     52   B6     0064           INCW    R2                        ; Increment the string's length         ;G:2
                 50  52   B0     0066           MOVW    R2,R0                     ; and move it back to R0.               ;G:2
      00000000'EF    50   D0     0069           MOVL    R0,DEF$Q_DEV              ; Set length of new device name         ;G:2
      54  00000000'EF    7D     0070           MOVQ    DEF$Q_DEV,R4              ; Length/Address to save device         ;G:2
                   00B9   30     0077           BSBW    90$                       ; Copy the device name                  ;G:2
                                 007A                                                                                   ;G:2
                     0C   BA     007A   26$:    POPR    #^M<R2,R3>                ; Restore register                      ;G:2
                                 007C   30$:
      54  00000000'EF    7D     007C           MOVQ    DEF$Q_DIR,R4              ; Length/Address to save directory        [25]
                     77   13     0083           BEQL    40$                       ; Branch if none                          [25]
          65     54  29   3A     0085           LOCC    #^A")",R4,(R5)            ; Check for ultrix                        [25]
                     69   13     0089           Beql    38$                       ; Branch if not ULTRIX format and         [25]
                                 008B                                             ; Default to ODS                          [25]
   0E 00000000'EF    00   E2     008B           BBSS    #ULTRIX_V_MODE,ULTRIX_FLAGS,35$ ; Branch if currently Ultrix     [25]
                                 0093                                             ; Reset LC only on change over            [25]
                 52  6E   7D     0093           MOVQ    (SP), R2                  ; Get length/address of directory         [25]
             04  83  06   E1     0096   31$:    BBC     #6, (R3)+, 32$            ; Branch if not alpha char                [25]
             FF  A3  20   88     009A           BISB2   #32, -1(R3)               ; Set to lower case                       [25]
                 F5  52   F4     009E   32$:    SOBGEQ  R2, 31$                   ; Reset all                               [25]
                                 00A1
```

```
                    6E   D5  00A1   284 35$:   TSTL    (SP)                      ;                                      [25]
                    1E   13  00A3   285        BEQL    37$                       ; Branch if not present                [25]
  00000000'EF   51  55   C3  00A5   286        SUBL3   R5,R1,DEF$Q_DIR           ; Retain length of partition only      [24]
          00000000'EF    D6  00AD   287        INCL    DEF$Q_DIR                 ; Plus ')'                             [24]
            55   01 A1   9E  00B3   288        MOVAB   1(R1),R5                  ; Address  of ')' plus 1               [24]
     00000000'EF   6E   C0  00B7   289        ADDL2   (SP),DEF$Q_DIR            ; Update length of parti/direc ULTRIX  [23]
                50   6E   7D  00BE   290        MOVQ    (SP),R0                   ; Get ULTRIX directory  --/--/--       [24]
                    70   10  00C1   291        BSBB    90$                       ; Copy directory                       [23]
                             00C3   292
                 08 AE   D5  00C3   293 37$:   TSTL    8(SP)                     ; Check if 'file' only given           [25]
                    62   13  00C6   294        BEQL    70$                       ; Branch if not present                [25]
  00000000'EF   51  55   C3  00C8   295        SUBL3   R5,R1,DEF$Q_DIR           ; Retain length of partition only      [25]
          00000000'EF    D6  00D0   296        INCL    DEF$Q_DIR                 ; Plus ')'                             [25]
            55   01 A1   9E  00D6   297        MOVAB   1(R1),R5                  ; Address  of ')' plus 1               [25]
   00000000'EF   08 AE   C0  00DA   298        ADDL2   8(SP),DEF$Q_DIR           ; Update length of parti/direc ULTRIX  [25]
          00000000'EF    D7  00E2   299        DECL    DEF$Q_DIR                 ; Do not include '/' prefixed          [25]
            50   08 AE   7D  00E8   300        MOVQ    8(SP),R0                  ; Get ULTRIX directory  ----           [25]
                    51   D6  00EC   301        INCL    R1                        ; Do not include '/' prefixed by the   [25]
                    50   D7  00EE   302        DECL    R0                        ; Breakup routine                      [25]
                    41   10  00F0   303        BSBB    90$                       ; Copy directory                       [25]
                             00F2   304
                    36   11  00F2   305        BRB     70$                       ; EXIT                                 [23]
   00 00000000'EF   00   E5  00F4   306 38$:   BBcc    #ULTRIX_V_MODE,ULTRIX_FLAGS,40$ ; Clear ultrix flag            [25]
                             00FC   307 40$:   Br_If_Not_User  70$               ; Branch if not running in user-mode.  [18]
     0000FE00'EF   1C   E1  00FC               BBC     #DSA$V_User, -                    ; If bit not set, branch
                    26       0103                         L^DSA$GL_Flags, 70$            ;
                             0104   308
                             0104   309        $CRELOG_S #2,SYS$DISK,DEF$Q_DEV ; Set new SYS$DISK
                    00   DD  0104                       PUSHL   #0
          00000000'EF   7F  0106                       PUSHAQ  DEF$Q_DEV
          00000000'EF   7F  010C                       PUSHAQ  SYS$DISK
                    02   DD  0112                       PUSHL   #2
     00000000'GF   04   FB  0114                       CALLS   #4,G^SYS$CRELOG
                    7E   7C  011B   310        CLRQ    -(SP)                     ; Last two parameters null
          00000000'EF   9F  011D   311        PUSHAB  DEF$Q_DIR                 ; Address of new default directory
     00000000'EF   03   FB  0123   312        CALLS   #3,SYS$SETDDIR            ; Set new default directory
                             012A   313
            5E   18   C0  012A   314 70$:   ADDL    #3*8, SP                  ; Remove rest of parameters
                    3C   BA  012D   315        POPR    #^M<R2,R3,R4,R5>          ; Restore
                    05       012F   316        RSB
                             0130   317
            85   81   90  0130   318 80$:   MOVB    (R1)+, (R5)+              ; Copy a character
              FA 50   F4  0133   319 90$:   SOBGEQ  R0,80$                    ; Count and copy if more
                    05       0136   320        RSB
```

```
                        0137   322          .SBTTL  DSV$SHOWLOAD    Display default load device
                        0137   323 ;++
                        0137   324 ; FUNCTIONAL DESCRIPTION:
                        0137   325 ;
                        0137   326 ;       This routine is called from CLI to display the current defaults
                        0137   327 ;       for device and directory.
                        0137   328 ;
                        0137   329 ; CALLING SEQUENCE:
                        0137   330 ;
                        0137   331 ;       BSBW    DSV$SHOWLOAD
                        0137   332 ;
                        0137   333 ; INPUT PARAMETERS:     NONE
                        0137   334 ;
                        0137   335 ; IMPLICIT INPUTS:
                        0137   336 ;
                        0137   337 ;       R2      Address of CLI data base
                        0137   338 ;       +       contents of CLI$Q_FILE
                        0137   339 ;
                        0137   340 ; OUTPUT PARAMETERS:    NONE
                        0137   341 ;
                        0137   342 ; IMPLICIT OUTPUTS:     NONE
                        0137   343 ;
                        0137   344 ; COMPLETION CODES:     N/A
                        0137   345 ;--
                        0137   346
                        0137   347 DSV$SHOWLOAD::
     00000000'EF    9F  0137   348          PUSHAB  L^DEF$Q_DIR                             ;                       [16]
     00000000'EF    7F  013D   349          PUSHAQ  L^DEF$Q_DEV                             ;                       [16]
     0000001A'EF    9F  0143   350          PUSHAB  L^T_SHOWLOAD                            ;                       [16]
           7E    01    9A  0149   351          movzbl  #DS$K_PRINTF,-(sp)                      ;                       [17]
           7E    16    98  014C   352          cvtbl   #DS$K_TYPE_COMMAND_OUT,-(sp)            ;                       [17]
00000000'EF    05    FB  014F   353          CALLS   #5,DSX$PRINT                            ;                       [17]
                     05  0156   354          RSB
```

```
                     0157   356          .SBTTL  DSR$IFLOADDEV   Is it the load device?
                     0157   357 ;++
                     0157   358 ; FUNCTIONAL DESCRIPTION:
                     0157   359 ;
                     0157   360 ;       This routine is called to determine if the device described
                     0157   361 ;       is the load device or not.
                     0157   362 ;
                     0157   363 ; CALLING SEQUENCE:
                     0157   364 ;
                     0157   365 ;       BSBW    DSR$IFLOADDEV
                     0157   366 ;
                     0157   367 ; INPUT PARAMETERS:     NONE
                     0157   368 ;
                     0157   369 ; IMPLICIT INPUTS:
                     0157   370 ;
                     0157   371 ;       R0      Length of device name
                     0157   372 ;       R1      Address of device name
                     0157   373 ;
                     0157   374 ; OUTPUT PARAMETERS:    NONE
                     0157   375 ;
                     0157   376 ; IMPLICIT OUTPUTS:     NONE
                     0157   377 ;
                     0157   378 ; COMPLETION CODES:
                     0157   379 ;
                     0157   380 ;       0       if device was not load device
                     0157   381 ;       1       If device was the load device
                     0157   382 ;
                     0157   383 ;--
                     0157   384
                     0157   385 DSR$IFLOADDEV::
          3F   BB    0157   386          PUSHR   #^M<R0,R1,R2,R3,R4,R5>  ; Save descriptor and regs
54 00000000'EF 7D    0159   387          MOVQ    L^DEF$Q_DEV,R4          ; Point to load device          [16]
     00000000'EF 16  0160   388          Jsb     L^SCAN$DEVICE           ; Extract device name           [18]
          0C   BA    0166   389          POPR    #^M<R2,R3>              ; Restore desciptor desired
          12   13    0168   390          BEQL    40$                     ; Branch if no device present
     52   50   B1    016A   391          CMPW    R0,R2                   ; length match?
          0D   12    016D   392          BNEQ    40$                     ; Branch if not
                     016F   393
     83   81   91    016F   394 20$:     CMPB    (R1)+,(R3)+             ; Character match?
          08   12    0172   395          BNEQ    40$                     ; Branch if not
        F8 52   F5    0174   396          SOBGTR  R2,20$                  ; Branch if more to compare
     50   01   D0    0177   397          MOVL    #1,R0                   ; Success
          02   11    017A   398          BRB     50$                     ; Restore regs and exit
          50   D4    017C   399 40$:     CLRL    R0                      ; Not load device
                     017E   400
          3C   BA    017E   401 50$:     POPR    #^M<R2,R3,R4,R5>        ; Restore rest of registers
               05    0180   402          RSB
```

```
                     0181    404          .SBTTL  DSV$LOAD        PROGRAM IMAGE LOAD SUBROUTINE
                 00000181    405          .PSECT  CODE, SHR, EXE, NOWRT, BYTE
                     0181    406 ;++
                     0181    407 ; FUNCTIONAL DESCRIPTION:
                     0181    408 ;
                     0181    409 ;       READS AN PROGRAM IMAGE FILE ('.EXE/-HD') FROM A DISK
                     0181    410 ;       INTO A MEMORY OVERLAY AREA DEFINED BY 'DS$A_PRGBGN' AND
                     0181    411 ;       'DS$K_PRGSIZ'
                     0181    412 ;                                                                    ;G:2
                     0181    413 ; CALLING SEQUENCE:
                     0181    414 ;
                     0181    415 ;       BSBW    DSV$RUN                 TO LOAD THEN START
                     0181    416 ;       BSBW    DSV$LOAD
                     0181    417 ;
                     0181    418 ; INPUT PARAMETERS:     NONE
                     0181    419 ;
                     0181    420 ; IMPLICIT INPUTS:
                     0181    421 ;
                     0181    422 ;       CLI$Q_FILE = FILE SPEC (QUADWORD STRING DESCRIPTOR)
                     0181    423 ;
                     0181    424 ; OUTPUT PARAMETERS:    NONE
                     0181    425 ;
                     0181    426 ; IMPLICIT OUTPUTS:     NONE
                     0181    427 ;
                     0181    428 ; COMPLETION CODES:
                     0181    429 ;
                     0181    430 ;       R0      SS$_NORMAL      or failure  from DSX$LOAD
                     0181    431 ;
                     0181    432 ; SIDE EFFECTS:
                     0181    433 ;
                     0181    434 ;       PROGRAM AREA IS CLEARED BEFORE OVERLAY
                     0181    435 ;           (BREAKPOINT TABLE MUST ALSO BE CLEARED)
                     0181    436 ;--
```

```
                        0181    438 DSV$RUN::
                     01 0181    439         NOP                             ; 1 Inst so DSV$LOAD NEQ DSV$RUN
                        0182    440
                        0182    441 DSV$LOAD::
        00000000'EF  16 0182    442         Jsb     SCRIPT$FLUSH            ; Flush scripts if console command      [18]
                        0188    443
        00000000'EF  16 0188    444         Jsb     L^INIT_CONTEXT          ; Reinit stacks, PCB...etc              [18]
00000000'EF  01  E5 018E    445         BBCC    #DS$V_LODFLG, -                                                 ;G:2
                 06 0195    446                 L^DS$GL_FLAGS,5$        ; INDICATE NO IMAGE LOADED              [16]
        00000000'EF  16 0196    447         Jsb     L^DS_CLEANUP            ; Cleanup if necessary                  [18]
                        019C    448
                        019C    449 5$:     Br_If_User      10$             ; Branch if in user-mode                [18]
0000FE00'EF  1C  E0 019C            BBS     #DSA$V_User, -                      ; If bit set, branch            [28]
                 07 01A3                      L^DSA$GL_Flags, 10$            ;                               [28]
00000000'EF  6C  FA 01A4    450         CALLG   (AP),MAPFREE            ; Re-map free memory
                        01AB    451
                        01AB    452 10$:
52   00000000'EF  9E 01AB    453         MOVAB   IMAGE_HEADER,R2         ; GET IMAGE HEADER STORAGE AREA ADDR.[20]
53   00000000'EF  9E 01B2    454         MOVAB   IMAGE_HEADER_END,R3     ; END OF AREA                           [20]
          53   52  D1 01B9    455 100$:   CMPL    R2,R3                   ; WHILE NOT END OF BUFFER               [20]
               04  13 01BC    456         BEQL    200$                    ; DO                                    [20]
               82  D4 01BE    457         CLRL    (R2)+                   ;   CLEAR THE BUFFER                    [20]
               F7  11 01C0    458         BRB     100$                    ;   CHECK FOR DONE                      [20]
                        01C2    459 200$:                                   ;                                       [20]
52   00000000'EF  DE 01C2    460         MOVAL   L^DS$GL_CLIBASE,R2      ; Reset R2 to point to cli database     [16]
   7E   0000'8F  3C 01C9    461         MOVZWL  #DS$A_PRGBGN,-(SP)      ; Address to load file
   7E   0000'8F  3C 01CE    462         MOVZWL  #DS$K_PRGSIZ,-(SP)      ; Length of load area
                        01D3    463                                     ; NOW SAVE DIAG. FILENAME FOR DEBUGGER[20]
               38  BB 01D3    464         PUSHR   #^M<R3,R4,R5>           ; SAVE SOME REGISTERS                   [20]
     53   08 A2  DE 01D5    465         MOVAL   CLI$Q_FILE(R2),R3       ; GET FILENAME DESCRIPTOR               [20]
54   00000001'EF  DE 01D9    466         MOVAL   DIAG_FILE_NAME,R4       ; GET STORAGE AREA                      [20]
        64   63  90 01E0    467         MOVB    (R3),(R4)               ; GET CHAR. COUNT                       [20]
        53   04  C0 01E3    468         ADDL2   #4,R3                   ; GET STRING POINTER                    [20]
        53   63  D0 01E6    469         MOVL    (R3),R3                 ; GET STRING                            [20]
        55   84  90 01E9    470         MOVB    (R4)+,R5                ; SET UP COUNTER OF CHARS TO MOVE[20]
                        01EC    471 300$:                                   ; REPEAT                                [20]
        84   83  90 01EC    472         MOVB    (R3)+,(R4)+             ;   MOVE A CHAR. TO SAVE AREA           [20]
               55  97 01EF    473         DECB    R5                      ;   COUNT A CHARACTER                   [20]
               F9  14 01F1    474         BGTR    300$                    ; UNTIL ENTIRE STRING COPIED            [20]
               38  BA 01F3    475         POPR    #^M<R3,R4,R5>           ; RESTORE SOME REGISTERS                [20]
     04000000  8F  CA 01F5    476         BICL    #1@DSA$V_DEBUG,-        ; CLEAR THE DEBUGGER-RESIDENT           [20]
     0000FE00'EF          01FB    477                 DSA$GL_FLAGS            ;   FLAG                            [20]
                        0200    478 ;
                        0200    479 ; Now clear all event flags.                                                    [21]
                        0200    480 ;
               08  BB 0200    481         PUSHR   #^M<R3>                 ; Use R3 to hold EF Number              [21]
          53   01  D0 0202    482         MOVL    #1, R3                  ; Start with EFN 1; VDS uses 0          [21]
               1C  E1 0205    483 400$:   BBC     #DSA$V_USER,-           ; IF user mode                          [21]
  0C 0000FE00'EF          0207    484                 DSA$GL_FLAGS,410$       ; THEN                              [21]
          18   53  D1 020D    485         CMPL    R3, #24                 ;   IF EFN >= 24                        [21]
               07  19 0210    486         BLSS    410$                    ;   AND EFN <= 31                       [21]
          1F   53  D1 0212    487         CMPL    R3, #31                 ;   THEN                                [21]
               02  14 0215    488         BGTR    410$                    ;       Skip this EFN                   [21]
               0C  11 0217    489         BRB     420$                    ;                                       [21]
               53  DD 0219    490 410$:   PUSHL   R3                      ; Put EFN on stack                      [21]
00000000'EF    01  FB 021B    491         CALLS   #1, SYS$CLREF           ; Call service                          [21]
          08   50  E9 0222    492         BLBC    R0, 425$                ; Branch on error                       [21]
```

```
                DC 53    3F   F3   0225    493 420$:   AOBLEQ  #63, R3, 400$           ; Next EFN                          [21]
                         08   BA   0229    494         POPR    #^M<R3>                 ; Restore R3                        [21]
                         17   11   022B    495         BRB     430$                    ; Continue                          [21]
                                   022D    496
                                   022D    497 425$:                                   ; Come here on $CLREF error         [21]
                         08   BA   022D    498         POPR    #^M<R3>                 ; Restore R3                        [21]
          00000045'EF    9F   022F    499         PUSHAB  CLREF_ERROR_TEXT        ; Put address of msg. on stack      [21]
                7E   01   9A   0235    500         movzbl  #DS$K_PRINTF,-(sp)      ;                                   [21]
                7E   16   98   0238    501         cvtbl   #DS$K_TYPE_COMMAND_OUT,-(sp);                               [21]
      00000000'EF    03   FB   023B    502         CALLS   #3,DSX$PRINTF           ; Print error message               [21]
                         47   11   0242    503         BRB     DSV$LOAD_X              ; And leave.                        [21]
                                   0244    504
                                   0244    505 430$:
          00000000'EF    7F   0244    506         PUSHAQ  L^DEF_EXE               ; Address of defaults for file              [16]
                   08 A2 7F   024A    507         PUSHAQ  CLI$Q_FILE(R2)          ; Address of file descriptor
      00000000'EF    04   FB   024D    508         CALLS   #4,L^DSX$LOAD           ; Load the file specified           [16]
          00000000'EF    16   0254    509         Jsb     DSR$COMPLETION          ; Type error text if necessary      [18]
                                   025A    510
                   2E 50   E9   025A    511 30$:    BLBC    R0,DSV$LOAD_X           ; Branch if it failed
                                   025D    512         Set_LodFlg                      ; Indicate an image is loaded       [18]
      00000000'EF    01   E2   025D            BBSS    #DS$V_LodFlg, -             ; Branch if LODFLG bit is set to    [29]
                         00   0264                      L^DS$GL_Flags, 30000$   ; ...                                 [29]
                                   0265    30000$:                                 ; ... here. Set bit regardless.     [29]
             53   0200'8F   3C   0265    513         MOVZWL  #DS$K_PRGSIZ+512,R3     ; Save max size
      51     00000214'EF    D0   026A    514         MOVL    L$A_LASTADR,R1          ; Get last address
                   51   53   D1   0271    515         CMPL    R3,R1                   ; Compare max to current
                         15   1E   0274    516         BGEQU   DSV$LOAD_X              ; Small enough, continue
                         0A   BB   0276    517         PUSHR   #^M<R1,R3>              ; Push Max size then current size
          00000023'EF    9F   0278    518         PUSHAB  T_TRUNCATED             ; Text of message
                7E   01   9A   027E    519         movzbl  #DS$K_PRINTF,-(sp)      ;                                   [17]
                7E   16   98   0281    520         cvtbl   #DS$K_TYPE_COMMAND_OUT,-(sp)    ;                           [17]
      00000000'EF    05   FB   0284    521         CALLS   #5,DSX$PRINT            ; Tell the operator                 [17]
                                   028B    522
                                   028B    523 DSV$LOAD_X:
          00000000'EF    9F   028B    524         PUSHAB  L^BEGIN                 ; Fake JSB for VRSTART or error     [18]
                   0D 50   E9   0291    525         BLBC    R0,10$                  ; If load failed, go back to BEGIN
00000181'8F        04 A2   D1   0294    526         CMPL    CLI$L_COMMAND(R2), -
                                   029C    527                 #DSV$RUN            ; Was it run command?
                         03   12   029C    528         BNEQ    10$                     ; Branch if not run command
                    FD5F'   31   029E    529         BRW     VRSTART                 ; Now issue START command
                         05   02A1    530 10$:    RSB                             ; Return to BEGIN
                                   02A2    531
                                   02A2    532         .END
```

```
$$T1                            = 00000000    D
BEGIN                             ********  X   04
BIT...                          = 00000004    D
BREAKUP_FILE                      ********  X   04
CLI$K_BUFSIZ                    = 00000100    D
CLI$K_SIZE                        0000044C    D
CLI$L_ADDRESS                     00000018    D
CLI$L_COMMAND                     00000004    D
CLI$L_DATA                        0000001C    D
CLI$L_FLAGS                       00000000    D
CLI$L_FLAGS2                      00000444    D
CLI$L_LAST                        00000024    D
CLI$L_NEXT                        00000030    D
CLI$L_PASS                        0000002C    D
CLI$L_SUBT                        00000028    D
CLI$L_TEMP_BASE                   00000448    D
CLI$L_TEST                        00000020    D
CLI$M_START_OR_RUN              = 00000008    D
CLI$Q_BUFQWD                      00000034    D
CLI$Q_FILE                        00000008    D
CLI$Q_SECTION                     00000010    D
CLI$Q_TIME                        0000043C    D
CLI$T_BUFFER                      0000003C    D
CLI$V_ADAPTER                   = 00000018    D
CLI$V_ADR                       = 0000000B    D
CLI$V_ASCII                     = 00000013    D
CLI$V_BASE_QUAL                 = 00000002    D
CLI$V_BREAK                     = 0000000A    D
CLI$V_BRIEF                     = 0000001B    D
CLI$V_BYTE                      = 0000000D    D
CLI$V_CLEAR                     = 00000002    D
CLI$V_DEC                       = 00000010    D
CLI$V_DEFAULT                   = 0000000C    D
CLI$V_DEPOSIT                   = 00000019    D
CLI$V_EVENT                     = 00000008    D
CLI$V_EXAM                      = 00000005    D
CLI$V_FLAGS                     = 00000009    D
CLI$V_HEX                       = 00000012    D
CLI$V_KERNEL                    = 00000017    D
CLI$V_LOAD                      = 00000006    D
CLI$V_LONG                      = 0000000F    D
CLI$V_NEXT                      = 00000001    D
CLI$V_NOALLOC                   = 00000000    D
CLI$V_NOTNUF                    = 00000001    D
CLI$V_OCT                       = 00000011    D
CLI$V_PREG                      = 0000001A    D
CLI$V_QA                        = 00000007    D
CLI$V_QACKLOOPLOOPS             = 0000001C    D
CLI$V_QAERRORPRINTS             = 0000001B    D
CLI$V_QAMULTIPLEPASS            = 0000001F    D
CLI$V_QASUBTESTLOOPS            = 0000001E    D
CLI$V_QATESTLOOPS               = 0000001D    D
CLI$V_REG                       = 00000014    D
CLI$V_REQUIRED                  = 00000000    D
CLI$V_RUN                       = 00000015    D
CLI$V_SET                       = 00000003    D
CLI$V_SHOW                      = 00000004    D
CLI$V_START_OR_RUN              = 00000003    D
CLI$V_VALSEC                    = 00000016    D
CLI$V_WORD                      = 0000000E    D
CLREF_ERROR_TEXT                  00000045 R  D   03
DEF$Q_DEV                         ********    X   04
DEF$Q_DIR                         ********    X   04
DEF_EXE                           00000000 R  D   03
DIAG_FILE_NAME                    00000001 RG D   02
DS$A_PRGBGN                       ********    X   04
DS$GL_CLIBASE                     ********    X   04
DS$GL_FLAGS                       ********    X   04
DS$K_PRGSIZ                       ********    X   04
DS$K_PRINTB                     = 00000002    D
DS$K_PRINTF                     = 00000001    D
DS$K_PRINTI                     = 00000000    D
DS$K_PRINTX                     = 00000003    D
DS$K_TYPE_ABORT_PROGRAM         = 00000014    D
DS$K_TYPE_ABORT_TEST            = 00000013    D
DS$K_TYPE_COMMAND_ERR           = 00000015    D
DS$K_TYPE_COMMAND_OUT           = 00000016    D
DS$K_TYPE_CRD_AUTOTEST          = 0000001A    D
DS$K_TYPE_DS_PROMPT             = 00000001    D
DS$K_TYPE_DS_START              = 0000001D    D
DS$K_TYPE_ERRDEV                = 00000008    D
DS$K_TYPE_ERRHARD               = 00000006    D
DS$K_TYPE_ERROR_BODY            = 00000009    D
DS$K_TYPE_ERROR_END             = 0000000A    D
DS$K_TYPE_ERRPREP               = 0000001B    D
DS$K_TYPE_ERRSOFT               = 00000007    D
DS$K_TYPE_ERRSUP                = 00000004    D
DS$K_TYPE_ERRSYS                = 00000005    D
DS$K_TYPE_ERR_HALT              = 0000000D    D
DS$K_TYPE_EXCEPTION             = 0000000C    D
DS$K_TYPE_EXCEPTION_HEAD        = 0000000B    D
DS$K_TYPE_FIRST_PASS            = 00000011    D
DS$K_TYPE_GENERAL               = 00000000    D
DS$K_TYPE_GENERAL_ERROR         = 00000003    D
DS$K_TYPE_NO_TESTS              = 00000012    D
DS$K_TYPE_PARAM_ERROR           = 0000001C    D
DS$K_TYPE_PROGRAM_END           = 00000010    D
DS$K_TYPE_PROGRAM_INFO          = 00000017    D
DS$K_TYPE_PROGRAM_START         = 0000000F    D
DS$K_TYPE_QIO_INVADP            = 00000024    D
DS$K_TYPE_QIO_NODRIVER          = 00000022    D
DS$K_TYPE_QIO_WRONGVER          = 00000023    D
DS$K_TYPE_SCRIPT_ECHO           = 00000021    D
DS$K_TYPE_SCRIPT_PNF            = 0000001E    D
DS$K_TYPE_SCRIPT_PROMPT         = 00000020    D
DS$K_TYPE_SCRIPT_SKIP           = 0000001F    D
DS$K_TYPE_SEQUENCE_ERROR        = 00000019    D
DS$K_TYPE_START_ERR             = 00000018    D
DS$K_TYPE_START_LIST            = 00000025    D
DS$K_TYPE_SUMMARY               = 0000000E    D
DS$K_TYPE_USER_PROMPT           = 00000002    D
DS$M_ABRTFLG                    = 00000040    D
DS$M_BADTIME                    = 00100000    D
DS$M_BATCH                      = 00400000    D
```

```
DS$M_BRKCLR                     = 00001000     D        DSA$GL_APTCOM                     0000FE04     D
DS$M_BRKPT                      = 00000800     D        DSA$GL_DEVLEN                     0000FE58     D
DS$M_CHARFLG                    = 00000100     D        DSA$GL_ERRNO                      0000FE44     D
DS$M_CMDFLG                     = 00000080     D        DSA$GL_EVENT                      0000FE48     D
DS$M_CTRLC                      = 00000001     D        DSA$GL_FLAGS                      0000FE00     D
DS$M_CTRLO                      = 00010000     D        DSA$GL_MSGTYP                     0000FE40     D
DS$M_DEVFLG                     = 00000200     D        DSA$GL_PASSES                     0000FE08     D
DS$M_DISABLCC                   = 01000000     D        DSA$GL_PASSNO                     0000FE54     D
DS$M_DONFLG                     = 00002000     D        DSA$GL_SECTNO                     0000FE10     D
DS$M_ERRFLG                     = 00000010     D        DSA$GL_SID                        0000FE14     D
DS$M_EXCEPT                     = 00080000     D        DSA$GL_SUBTNO                     0000FE4C     D
DS$M_EXETST                     = 00040000     D        DSA$GL_TESTNO                     0000FE50     D
DS$M_HLTFLG                     = 00000008     D        DSA$GL_UNITS                      0000FE0C     D
DS$M_LODFLG                     = 00000002     D        DSA$GQ_MSGPTR                     0000FE68     D
DS$M_MEMMGT                     = 00008000     D        DSA$GT_DEVNAM                     0000FE5C     D
DS$M_NI                         = 04000000     D        DSA$V_DEBUG                     = 0000001A     D
DS$M_OUTPUT                     = 00800000     D        DSA$V_USER                      = 0000001C     D
DS$M_RUBFLG                     = 00000020     D        DSR$COMPLETION                    ********     X    04
DS$M_SCRIPT                     = 00200000     D        DSR$IFLOADDEV                     00000157 RG  D    04
DS$M_SETIMR                     = 02000000     D        DSV$LOAD                          00000182 RG  D    04
DS$M_STRFLG                     = 00000004     D        DSV$LOAD_X                        0000028B R   D    04
DS$M_SUBT                       = 00004000     D        DSV$RUN                           00000181 RG  D    04
DS$M_SYSFLG                     = 00000400     D        DSV$SETLOAD                       00000000 RG  D    04
DS$M_TIMED                      = 02000000     D        DSV$SHOWLOAD                      00000137 RG  D    04
DS$M_TIMED_OUT                  = 08000000     D        DSX$LOAD                          ********     X    04
DS$M_TIMRON                     = 00020000     D        DSX$PRINT                         ********     X    04
DS$V_ABRTFLG                    = 00000006     D        DSX$PRINTF                        ********     X    04
DS$V_BADTIME                    = 00000014     D        DS_CLEANUP                        ********     X    04
DS$V_BATCH                      = 00000016     D        FIL$GT_DDDEV                      0000000E RG  D    03
DS$V_BRKCLR                     = 0000000C     D        FIL$GT_DDSTRING                   0000000F RG  D    03
DS$V_BRKPT                      = 0000000B     D        IMAGE_HEADER                      ********    GX    00
DS$V_CHARFLG                    = 00000008     D        IMAGE_HEADER_END                  ********    GX    00
DS$V_CMDFLG                     = 00000007     D        INIT_CONTEXT                      ********     X    04
DS$V_CTRLC                      = 00000000     D        L$A_CCP                           00000240     D
DS$V_CTRLO                      = 00000010     D        L$A_DEVP                          0000021C     D
DS$V_DEVFLG                     = 00000009     D        L$A_DREG                          00000224     D
DS$V_DISABLCC                   = 00000018     D        L$A_DTP                           00000218     D
DS$V_DONFLG                     = 0000000D     D        L$A_ICP                           0000023C     D
DS$V_ERRFLG                     = 00000004     D        L$A_LASTADR                       00000214     D
DS$V_EXCEPT                     = 00000013     D        L$A_NAME                          00000208     D
DS$V_EXETST                     = 00000012     D        L$A_REPP                          00000244     D
DS$V_HLTFLG                     = 00000003     D        L$A_SECNAM                        00000250     D
DS$V_LODFLG                     = 00000001     D        L$A_STATAB                        00000248     D
DS$V_MEMMGT                     = 0000000F     D        L$A_TSTCNT                        00000254     D
DS$V_NI                         = 0000001A     D        L$L_ENVIRON                       00000204     D
DS$V_OUTPUT                     = 00000017     D        L$L_ERRTYP                        0000024C     D
DS$V_RUBFLG                     = 00000005     D        L$L_HEADLENGTH                    00000200     D
DS$V_SCRIPT                     = 00000015     D        L$L_REV                           0000020C     D
DS$V_SETIMR                     = 00000019     D        L$L_UNIT                          00000220     D
DS$V_STRFLG                     = 00000002     D        L$L_UNUSED                        00000228     D
DS$V_SUBT                       = 0000000E     D        L$L_UPDATE                        00000210     D
DS$V_SYSFLG                     = 0000000A     D        MAPFREE                           ********     X    04
DS$V_TIMED                      = 00000019     D        SCAN$DEVICE                       ********     X    04
DS$V_TIMED_OUT                  = 0000001B     D        SCRIPT$FLUSH                      ********     X    04
DS$V_TIMRON                     = 00000011     D        SIZ...                          = 00000001     D
DSA$AL_APTMAIL                    0000FE00     D        SYS$CLREF                         ********     X    04
DSA$AT_APTTXT                     0000FA00     D        SYS$CRELOG                        ********    GX    04
```

```
SYS$DISK                        ********   X   04
SYS$SETDDIR                     ********   X   04
T_SHOWLOAD                      0000001A R   D   03
T_TRUNCATED                     00000023 R   D   03
ULTRIX_FLAGS                    00000000 RG  D   02
ULTRIX_V_MODE                 = 00000000   G  D
VRSTART                         ********   X   04
```

+-----------------+
! Psect synopsis !
+-----------------+

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000FE70 (65136.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
WORK	00000058 (88.)	02 (2.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC LONG
DATA	00000064 (100.)	03 (3.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC BYTE
CODE	000002A2 (674.)	04 (4.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC BYTE

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$T1	=00000000	309 (1)	309 (1)
BEGIN	00000000-XR		524 (1)
BIT...	=00000004	157 (1)	155 (1) 157 (1)
BREAKUP_FILE	00000000-XR		236 (1)
CLI$K_BUFSIZ	=00000100	154 (1)	154 (1)
CLI$K_SIZE	0000044C	154 (1)	
CLI$L_ADDRESS	00000018	154 (1)	
CLI$L_COMMAND	00000004	154 (1)	#-526 (1)
CLI$L_DATA	0000001C	154 (1)	
CLI$L_FLAGS	00000000	154 (1)	
CLI$L_FLAGS2	00000444	154 (1)	
CLI$L_LAST	00000024	154 (1)	
CLI$L_NEXT	00000030	154 (1)	
CLI$L_PASS	0000002C	154 (1)	
CLI$L_SUBT	00000028	154 (1)	
CLI$L_TEMP_BASE	00000448	154 (1)	
CLI$L_TEST	00000020	154 (1)	
CLI$M_START_OR_RUN	=00000008	154 (1)	
CLI$Q_BUFQWD	00000034	154 (1)	
CLI$Q_FILE	00000008	154 (1)	#-235 (1) 465 (1) 507 (1)
CLI$Q_SECTION	00000010	154 (1)	
CLI$Q_TIME	0000043C	154 (1)	
CLI$T_BUFFER	0000003C	154 (1)	
CLI$V_ADAPTER	=00000018	154 (1)	
CLI$V_ADR	=0000000B	154 (1)	
CLI$V_ASCII	=00000013	154 (1)	
CLI$V_BASE_QUAL	=00000002	154 (1)	
CLI$V_BREAK	=0000000A	154 (1)	
CLI$V_BRIEF	=0000001B	154 (1)	
CLI$V_BYTE	=0000000D	154 (1)	
CLI$V_CLEAR	=00000002	154 (1)	
CLI$V_DEC	=00000010	154 (1)	
CLI$V_DEFAULT	=0000000C	154 (1)	
CLI$V_DEPOSIT	=00000019	154 (1)	
CLI$V_EVENT	=00000008	154 (1)	
CLI$V_EXAM	=00000005	154 (1)	
CLI$V_FLAGS	=00000009	154 (1)	
CLI$V_HEX	=00000012	154 (1)	
CLI$V_KERNEL	=00000017	154 (1)	
CLI$V_LOAD	=00000006	154 (1)	
CLI$V_LONG	=0000000F	154 (1)	
CLI$V_NEXT	=00000001	154 (1)	
CLI$V_NOALLOC	=00000000	154 (1)	
CLI$V_NOTNUF	=00000001	154 (1)	
CLI$V_OCT	=00000011	154 (1)	
CLI$V_PREG	=0000001A	154 (1)	
CLI$V_QA	=00000007	154 (1)	
CLI$V_QACKLOOPLOOPS	=0000001C	154 (1)	
CLI$V_QAERRORPRINTS	=0000001B	154 (1)	
CLI$V_QAMULTIPLEPASS	=0000001F	154 (1)	

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CLI$V_QASUBTESTLOOPS            =0000001E     154    (1)
CLI$V_QATESTLOOPS               =0000001D     154    (1)
CLI$V_REG                       =00000014     154    (1)
CLI$V_REQUIRED                  =00000000     154    (1)
CLI$V_RUN                       =00000015     154    (1)
CLI$V_SET                       =00000003     154    (1)
CLI$V_SHOW                      =00000004     154    (1)
CLI$V_START_OR_RUN              =00000003     154    (1)     154    (1)
CLI$V_VALSEC                    =00000016     154    (1)
CLI$V_WORD                      =0000000E     154    (1)
CLREF_ERROR_TEXT                 00000045-R   192    (1)     499    (1)
DEF$Q_DEV                        00000000-XR                #-240    (1)     #-241    (1)     #-266    (1)     #-267    (1)
                                                             309    (1)       349    (1)     #-387    (1)
DEF$Q_DIR                        00000000-XR                #-246    (1)     #-247    (1)     #-272    (1)     #-286    (1)
                                                           #-287    (1)     #-289    (1)     #-295    (1)     #-296    (1)
                                                           #-298    (1)     #-299    (1)       311    (1)       348    (1)
DEF_EXE                          00000000-R   182    (1)     506    (1)
DIAG_FILE_NAME                   00000001-R   174    (1)     466    (1)
DS$A_PRGBGN                      00000000-XR                #-461    (1)
DS$GL_CLIBASE                    00000000-XR                 460    (1)
DS$GL_FLAGS                      00000000-XR                 446    (1)       512    (1)
DS$K_PRGSIZ                      00000000-XR                #-462    (1)     #-513    (1)
DS$K_PRINTB                     =00000002     157    (1)
DS$K_PRINTF                     =00000001     157    (1)     #-351    (1)     #-500    (1)     #-519    (1)
DS$K_PRINTI                     =00000000     157    (1)
DS$K_PRINTX                     =00000003     157    (1)
DS$K_TYPE_ABORT_PROGRAM         =00000014     157    (1)
DS$K_TYPE_ABORT_TEST            =00000013     157    (1)
DS$K_TYPE_COMMAND_ERR           =00000015     157    (1)
DS$K_TYPE_COMMAND_OUT           =00000016     157    (1)     #-352    (1)     #-501    (1)     #-520    (1)
DS$K_TYPE_CRD_AUTOTEST          =0000001A     157    (1)
DS$K_TYPE_DS_PROMPT             =00000001     157    (1)
DS$K_TYPE_DS_START              =0000001D     157    (1)
DS$K_TYPE_ERRDEV                =00000008     157    (1)
DS$K_TYPE_ERRHARD               =00000006     157    (1)
DS$K_TYPE_ERROR_BODY            =00000009     157    (1)
DS$K_TYPE_ERROR_END             =0000000A     157    (1)
DS$K_TYPE_ERRPREP               =0000001B     157    (1)
DS$K_TYPE_ERRSOFT               =00000007     157    (1)
DS$K_TYPE_ERRSUP                =00000004     157    (1)
DS$K_TYPE_ERRSYS                =00000005     157    (1)
DS$K_TYPE_ERR_HALT              =0000000D     157    (1)
DS$K_TYPE_EXCEPTION             =0000000C     157    (1)
DS$K_TYPE_EXCEPTION_HEAD        =0000000B     157    (1)
DS$K_TYPE_FIRST_PASS            =00000011     157    (1)
DS$K_TYPE_GENERAL               =00000000     157    (1)
DS$K_TYPE_GENERAL_ERROR         =00000003     157    (1)
DS$K_TYPE_NO_TESTS              =00000012     157    (1)
DS$K_TYPE_PARAM_ERROR           =0000001C     157    (1)
DS$K_TYPE_PROGRAM_END           =00000010     157    (1)
DS$K_TYPE_PROGRAM_INFO          =00000017     157    (1)
DS$K_TYPE_PROGRAM_START         =0000000F     157    (1)
DS$K_TYPE_QIO_INVADP            =00000024     157    (1)
DS$K_TYPE_QIO_NODRIVER          =00000022     157    (1)
DS$K_TYPE_QIO_WRONGVER          =00000023     157    (1)
DS$K_TYPE_SCRIPT_ECHO           =00000021     157    (1)
DS$K_TYPE_SCRIPT_PNF            =0000001E     157    (1)
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DS$K_TYPE_SCRIPT_PROMPT         =00000020      157     (1)
DS$K_TYPE_SCRIPT_SKIP           =0000001F      157     (1)
DS$K_TYPE_SEQUENCE_ERROR        =00000019      157     (1)
DS$K_TYPE_START_ERR             =00000018      157     (1)
DS$K_TYPE_START_LIST            =00000025      157     (1)
DS$K_TYPE_SUMMARY               =0000000E      157     (1)
DS$K_TYPE_USER_PROMPT           =00000002      157     (1)
DS$M_ABRTFLG                    =00000040      155     (1)
DS$M_BADTIME                    =00100000      155     (1)
DS$M_BATCH                      =00400000      155     (1)
DS$M_BRKCLR                     =00001000      155     (1)
DS$M_BRKPT                      =00000800      155     (1)
DS$M_CHARFLG                    =00000100      155     (1)
DS$M_CMDFLG                     =00000080      155     (1)
DS$M_CTRLC                      =00000001      155     (1)
DS$M_CTRLO                      =00010000      155     (1)
DS$M_DEVFLG                     =00000200      155     (1)
DS$M_DISABLCC                   =01000000      155     (1)
DS$M_DONFLG                     =00002000      155     (1)
DS$M_ERRFLG                     =00000010      155     (1)
DS$M_EXCEPT                     =00080000      155     (1)
DS$M_EXETST                     =00040000      155     (1)
DS$M_HLTFLG                     =00000008      155     (1)
DS$M_LODFLG                     =00000002      155     (1)
DS$M_MEMMGT                     =00008000      155     (1)
DS$M_NI                         =04000000      155     (1)
DS$M_OUTPUT                     =00800000      155     (1)
DS$M_RUBFLG                     =00000020      155     (1)
DS$M_SCRIPT                     =00200000      155     (1)
DS$M_SETIMR                     =02000000      155     (1)
DS$M_STRFLG                     =00000004      155     (1)
DS$M_SUBT                       =00004000      155     (1)
DS$M_SYSFLG                     =00000400      155     (1)
DS$M_TIMED                      =02000000      155     (1)
DS$M_TIMED_OUT                  =08000000      155     (1)
DS$M_TIMRON                     =00020000      155     (1)
DS$V_ABRTFLG                    =00000006      155     (1)
DS$V_BADTIME                    =00000014      155     (1)
DS$V_BATCH                      =00000016      155     (1)
DS$V_BRKCLR                     =0000000C      155     (1)
DS$V_BRKPT                      =0000000B      155     (1)
DS$V_CHARFLG                    =00000008      155     (1)
DS$V_CMDFLG                     =00000007      155     (1)
DS$V_CTRLC                      =00000000      155     (1)
DS$V_CTRLO                      =00000010      155     (1)
DS$V_DEVFLG                     =00000009      155     (1)
DS$V_DISABLCC                   =00000018      155     (1)
DS$V_DONFLG                     =0000000D      155     (1)
DS$V_ERRFLG                     =00000004      155     (1)
DS$V_EXCEPT                     =00000013      155     (1)
DS$V_EXETST                     =00000012      155     (1)
DS$V_HLTFLG                     =00000003      155     (1)
DS$V_LODFLG                     =00000001      155     (1)     #-445     (1)     #-512     (1)
DS$V_MEMMGT                     =0000000F      155     (1)
DS$V_NI                         =0000001A      155     (1)
DS$V_OUTPUT                     =00000017      155     (1)
DS$V_RUBFLG                     =00000005      155     (1)
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DS$V_SCRIPT                     =00000015      155    (1)
DS$V_SETIMR                     =00000019      155    (1)
DS$V_STRFLG                     =00000002      155    (1)
DS$V_SUBT                       =0000000E      155    (1)
DS$V_SYSFLG                     =0000000A      155    (1)
DS$V_TIMED                      =00000019      155    (1)
DS$V_TIMED_OUT                  =0000001B      155    (1)
DS$V_TIMRON                     =00000011      155    (1)
DSA$GL_FLAGS                     0000FE00                    307    (1)      449    (1)    #-477    (1)      484    (1)
DSA$V_DEBUG                     =0000001A                  #-476    (1)
DSA$V_USER                      =0000001C                  #-307    (1)    #-449    (1)    #-483    (1)
DSR$COMPLETION                   00000000-XR                509    (1)
DSR$IFLOADDEV                    00000157-R     385    (1)
DSV$LOAD                         00000182-R     441    (1)
DSV$LOAD_X                       0000028B-R     523    (1)  #-503    (1)    #-511    (1)    #-516    (1)
DSV$RUN                          00000181-R     438    (1)  #-527    (1)
DSV$SETLOAD                      00000000-R     227    (1)
DSV$SHOWLOAD                     00000137-R     347    (1)
DSX$LOAD                         00000000-XR                508    (1)
DSX$PRINT                        00000000-XR                353    (1)      521    (1)
DSX$PRINTF                       00000000-XR                502    (1)
DS_CLEANUP                       00000000-XR                447    (1)
FIL$GT_DDDEV                     0000000E-R     184    (1)
FIL$GT_DDSTRING                  0000000F-R     186    (1)
IMAGE_HEADER                     00000000-XR                161    (1)      453    (1)
IMAGE_HEADER_END                 00000000-XR                162    (1)      454    (1)
INIT_CONTEXT                     00000000-XR                444    (1)
L$A_LASTADR                      00000214                  #-514    (1)
MAPFREE                          00000000-XR                450    (1)
SCAN$DEVICE                      00000000-XR                388    (1)
SCRIPT$FLUSH                     00000000-XR                442    (1)
SIZ...                          =00000001       155    (1)      155    (1)
SYS$CLREF                        00000000-XR                491    (1)
SYS$CRELOG                       00000000-XR                309    (1)
SYS$DISK                         00000000-XR                309    (1)
SYS$SETDDIR                      00000000-XR                312    (1)
T_SHOWLOAD                       0000001A-R     188    (1)      350    (1)
T_TRUNCATED                      00000023-R     190    (1)      518    (1)
ULTRIX_FLAGS                     00000000-R     171    (1)      277    (1)      306    (1)
ULTRIX_V_MODE                   =00000000       173    (1)  #-277    (1)    #-306    (1)
VRSTART                          00000000-XR               #-529    (1)
```

+-------------------------+
! Performance indicators !
+-------------------------+

Phase	Page faults	CPU Time	Elapsed Time
Initialization	26	00:00:00.01	00:00:00.21
Command processing	937	00:00:00.28	00:00:00.90
Pass 1	559	00:00:01.53	00:00:03.80
Symbol table sort	0	00:00:00.08	00:00:00.08
Pass 2	22	00:00:00.36	00:00:00.78
Symbol table output	2	00:00:00.03	00:00:00.12
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	5	00:00:00.13	00:00:00.15
Assembler run totals	1555	00:00:02.43	00:00:06.05

```
The working set limit was 2400 pages.
71473 bytes (140 pages) of virtual memory were used to buffer the intermediate code.
There were 20 pages of symbol table space allocated to hold 290 non-local and 30 local symbols.
532 source lines were read in Pass 1, producing 35 object records in Pass 2.
30 pages of virtual memory were used to define 21 macros.
```

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	3
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	5
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	8
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	16

```
360 GETS were required to define 16 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 75 LOAD MASSBUS ADAPTER MAP REGISTERS
(1) 120 LOAD UNIBUS ADAPTER MAP REGISTERS
(1) 197 GET PFN FROM INVALID PTE

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element LODMAP.MAR
0000     2 ; *1     6-FEB-1986 15:19:25 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element LODMAP.MAR
0000     4         .TITLE  LODMAP  *** LODMAP load adapter map registers
0000     5         .IDENT  /05-02/
0000     6         .LIST   MEB
0000     7         .NLIST  CND
0000     8
0000     9 ;
0000    10 ;*****************************************************************************
0000    11 ;*                                                                           *
0000    12 ;*  COPYRIGHT (c) 1977, 1978, 1979, 1980                                     *
0000    13 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
0000    14 ;*                                                                           *
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0000    23 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT  *
0000    24 ;*  CORPORATION.                                                             *
0000    25 ;*                                                                           *
0000    26 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS   *
0000    27 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    28 ;*                                                                           *
0000    29 ;*****************************************************************************
0000    30 ;
0000    31 ; D. N. CUTLER 1-NOV-77
0000    32 ;
0000    33 ; LOAD MBA MAP REGISTERS
0000    34 ;
0000    35 ; MODIFIED BY:
0000    36 ;
0000    37 ;       ADAPTED TO DIAGNOSTIC SUPERVISOR ENVIRONMENT
0000    38 ;
0000    39 ; LOAD MBA AND UBA MAP REGISTERS
0000    40 ;               Dave Butenhof   15-may-1980, Version 5.4
0000    41 ;       02      Modify VMS V2.0 source to Supervisor Environment
0000    42 ;
0000    43 ;       V04     RLR-TS04        Robert L. Rappaport     7-DEC-1979
0000    44 ;               Added an alternate entrypoint to IOC$LOADUBAMAP to
0000    45 ;               support byte aligned UNIBUS DMA devices
0000    46 ;
0000    47 ;       V03     NPKCOMET        N. KRONENBERG   11-JUN-1979
0000    48 ;               RETURNED IOC$LOADUBAMAP TO MODULE LOADMREG.
0000    49 ;
0000    50 ;       V02     NPKCOMET        N. KRONENBERG   1-FEB-1979
0000    51 ;               REMOVED IOC$LOADUBAMAP TO MODULE LIOSUB.
0000    52 ;
```

```
                        0000     54 ;
                        0000     55 ; MACRO LIBRARY CALLS
                        0000     56 ;
                        0000     57
                        0000     58
                        0000     62
                        0000     63          $CRBDEF                             ;DEFINE CRB OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .IIF    NB,CRB$L_WQFL,  CRB$L_WQFL:
00000004                0000                         .BLKL   1
                        0004                 .IIF    NB,CRB$L_WQBL,  CRB$L_WQBL:
00000008                0004                         .BLKL   1
                        0008                 .IIF    NB,CRB$W_SIZE,  CRB$W_SIZE:
0000000A                0008                         .BLKW   1
                        000A                 .IIF    NB,CRB$B_TYPE,  CRB$B_TYPE:
0000000B                000A                         .BLKB   1
0000000C                000B                         .BLKB   1
                        000C                 .IIF    NB,CRB$W_REFC,  CRB$W_REFC:
0000000E                000C                         .BLKW   1
                        000E                 .IIF    NB,CRB$B_MASK,  CRB$B_MASK:
0000000F                000E                         .BLKB   1
00000010                000F                         .BLKB   1
                        0010                 .IIF    NB,CRB$L_LINK,  CRB$L_LINK:
00000014                0010                         .BLKL   1
                        0014                 .IIF    NB,CRB$L_INTD,  CRB$L_INTD:
00000038                0014                         .BLKL   9
                        0038                 .IIF    NB,CRB$C_LENGTH,        CRB$C_LENGTH:
                        0038                 .IIF    NB,CRB$K_LENGTH,        CRB$K_LENGTH:
                        0038                 .IIF    NB,CRB$L_INTD2, CRB$L_INTD2:
0000005C                0038                         .BLKL   9
                        0000                 .RESTORE
                        0000     64          $MBADEF                             ;DEFINE MBA REGISTER OFFSET DEFINITIONS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
00000000                005C                 .=0
                        0000                 .RESTORE
                        0000     65          $PTEDEF                             ;DEFINE PAGE TABLE ENTRY FIELDS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
00000000                005C                 .=0
                        0000                 .RESTORE
                        0000     66          $UBADEF                             ;DEFINE UCB OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
00000000                005C                 .=0
                        0000                 .RESTORE
                        0000     67          $UCBDEF                             ;DEFINE UCB OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
00000000                005C                 .=0
                        0000                 .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                        0000                 .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
00000004                0000                         .BLKL   1
                        0004                 .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                        0004                 .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
00000008                0004                         .BLKL   1
                        0008                 .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
```

```
                    0000000A  0008                            .BLKW   1
                              000A          .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
                    0000000B  000A                            .BLKB   1
                              000B          .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
                    0000000C  000B                            .BLKB   1
                              000C          .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                              000C          .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                              000C          .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
                    0000000D  000C                            .BLKB   1
                    00000010  000D                            .BLKB   3
                              0010          .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                              0010          .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
                    00000014  0010                            .BLKL   1
                              0014          .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                              0014          .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                              0014          .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
                    00000016  0014                            .BLKW   1
                              0016          .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
                    00000018  0016                            .BLKW   1
                              0018          .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                              0018          .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
                    0000001A  0018                            .BLKW   1
                              001A          .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                              001A          .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
                    0000001C  001A                            .BLKW   1
                              001C          .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
                    00000020  001C                            .BLKL   1
                              0020          .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
                    00000024  0020                            .BLKL   1
                              0024          .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
                    00000028  0024                            .BLKL   1
                              0028          .IIF    NB,UCB$L_PID,   UCB$L_PID:
                    0000002C  0028                            .BLKL   1
                              002C          .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
                    00000030  002C                            .BLKL   1
                              0030          .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
                    00000034  0030                            .BLKL   1
                              0034          .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
                    00000038  0034                            .BLKL   1
                              0038          .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
                    00000039  0038                            .BLKB   1
                              0039          .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
                    0000003A  0039                            .BLKB   1
                              003A          .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
                    0000003C  003A                            .BLKW   1
                              003C          .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
                              003C          .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
                              003C          .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
                    0000003D  003C                            .BLKB   1
                              003D          .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
                              003D          .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
                    0000003E  003D                            .BLKB   1
                              003E          .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
                              003E          .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
                    0000003F  003E                            .BLKB   1
                              003F          .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
                    00000040  003F                            .BLKB   1
```

```
                        0040            .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
00000044                0040                    .BLKL   1
                        0044            .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
00000048                0044                    .BLKL   1
                        0048            .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
0000004A                0048                    .BLKW   1
                        004A            .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
                        004A            .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
0000004B                004A                    .BLKB   1
                        004B            .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
0000004C                004B                    .BLKB   1
                        004C            .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
00000050                004C                    .BLKL   1
                        0050            .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
00000052                0050                    .BLKW   1
                        0052            .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
                        0052            .IIF    NB,UCB$B_STATE, UCB$B_STATE:
00000053                0052                    .BLKB   1
                        0053            .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
00000054                0053                    .BLKB   1
                        0054            .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
00000058                0054                    .BLKL   1
                        0058            .IIF    NB,UCB$W_STS,   UCB$W_STS:
0000005A                0058                    .BLKW   1
                        005A            .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
0000005C                005A                    .BLKW   1
                        005C            .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
                        005C            .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
00000060                005C                    .BLKL   1
                        0060            .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
00000064                0060                    .BLKL   1
                        0064            .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
                        0064            .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
00000068                0064                    .BLKL   1
                        0068            .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
0000006C                0068                    .BLKL   1
                        006C            .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
0000006E                006C                    .BLKW   1
                        006E            .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
00000070                006E                    .BLKW   1
                        0070            .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
00000071                0070                    .BLKB   1
                        0071            .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
00000072                0071                    .BLKB   1
                        0072            .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074                0072                    .BLKW   1
                        0074            .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
                        0074            .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000                0074            . = 0
                        0000            .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002                0000                    .BLKW   1
00000074                0002            . = 116
                        0074            .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078                0074                    .BLKL   1
                        0078            .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C                0078                    .BLKL   1
                        007C            .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
```

```
00000080  007C                                  .BLKL   1
          0080                .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084  0080                                  .BLKL   1
          0084                .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088  0084                                  .BLKL   1
          0088                .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C  0088                                  .BLKL   1
          008C                .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090  008C                                  .BLKL   1
          0090                .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
          0090                .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074  0090                . = 116
          0074                .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075  0074                                  .BLKB   1
          0075                .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076  0075                                  .BLKB   1
          0076                .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077  0076                                  .BLKB   1
          0077                .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078  0077                                  .BLKB   1
          0078                .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C  0078                                  .BLKL   1
0000007E  007C                                  .BLKW   1
          007E                .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080  007E                                  .BLKW   1
          0080                .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084  0080                                  .BLKL   1
00000080  0084                . = 128
00000084  0080                                  .BLKL   1
          0084                .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088  0084                                  .BLKL   1
          0088                .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A  0088                                  .BLKW   1
          008A                .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C  008A                                  .BLKW   1
          008C                .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
          008C                .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E  008C                                  .BLKW   1
          008E                .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090  008E                                  .BLKW   1
          0090                .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092  0090                                  .BLKW   1
          0092                .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
00000094  0092                                  .BLKW   1
          0094                .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095  0094                                  .BLKB   1
          0095                .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096  0095                                  .BLKB   1
          0096                .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098  0096                                  .BLKW   1
00000096  0098                . = 150
00000098  0096                                  .BLKW   1
          0098                .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C  0098                                  .BLKL   1
          009C                .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0  009C                                  .BLKL   1
          00A0                .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
```

```
                    000000A4  00A0                          .BLKL   1
                              00A4          .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
                    000000A6  00A4                          .BLKW   1
                              00A6          .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
                    000000A7  00A6                          .BLKB   1
                    000000A8  00A7                          .BLKB   1
                    00000074  00A8          . = 116
                    00000078  0074                          .BLKL   1
                    0000007C  0078                          .BLKL   1
                    00000080  007C                          .BLKL   1
                    00000084  0080                          .BLKL   1
                    00000088  0084                          .BLKL   1
                    0000008C  0088                          .BLKL   1
                              008C          .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
                    00000090  008C                          .BLKL   1
                    00000094  0090                          .BLKL   1
                    00000098  0094                          .BLKL   1
                    0000009C  0098                          .BLKL   1
                              009C          .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
                    0000009D  009C                          .BLKB   1
                              009D          .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
                    0000009E  009D                          .BLKB   1
                              009E          .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
                    0000009F  009E                          .BLKB   1
                    000000A0  009F                          .BLKB   1
                              00A0          .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
                    000000A1  00A0                          .BLKB   1
                              00A1          .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
                    000000A2  00A1                          .BLKB   1
                              00A2          .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
                    000000A3  00A2                          .BLKB   1
                    000000A4  00A3                          .BLKB   1
                              00A4          .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
                    000000A5  00A4                          .BLKB   1
                              00A5          .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
                    000000A7  00A5                          .BLKW   1
                    000000A8  00A7                          .BLKB   1
                              00A8          .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
                    000000AC  00A8                          .BLKL   1
                    000000B0  00AC                          .BLKL   1
                    000000B4  00B0                          .BLKL   1
                    000000B8  00B4                          .BLKL   1
                              00B8          .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
                    000000BC  00B8                          .BLKL   1
                              00BC          .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
                              00BC          .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
                    00000074  00BC          . = 116
                              0074          .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
                    00000078  0074                          .BLKL   1
                              0078          .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
                    0000007C  0078                          .BLKL   1
                              007C          .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
                    0000007E  007C                          .BLKW   1
                    00000080  007E                          .BLKW   1
                              0000          .RESTORE
                              0000    68    $VECDEF                         ;DEFINE CRB TRANSFER VECTOR OFFSETS
                              0000          .SAVE   LOCAL_BLOCK
```

```
                    0000            .PSECT  $ABS$,ABS
          00000000  00BC            .=0
                    0000            .IIF    NB,VEC$Q_DISPATCH,      VEC$Q_DISPATCH:
          00000008  0000                    .BLKQ   1
                    0008            .IIF    NB,VEC$L_IDB,   VEC$L_IDB:
          0000000C  0008                    .BLKL   1
                    000C            .IIF    NB,VEC$L_INITIAL,       VEC$L_INITIAL:
          00000010  000C                    .BLKL   1
                    0010            .IIF    NB,VEC$W_MAPREG,        VEC$W_MAPREG:
          00000012  0010                    .BLKW   1
                    0012            .IIF    NB,VEC$B_NUMREG,        VEC$B_NUMREG:
          00000013  0012                    .BLKB   1
                    0013            .IIF    NB,VEC$B_DATAPATH,      VEC$B_DATAPATH:
          00000014  0013                    .BLKB   1
                    0014            .IIF    NB,VEC$L_ADP,   VEC$L_ADP:
          00000018  0014                    .BLKL   1
                    0018            .IIF    NB,VEC$L_UNITINIT,      VEC$L_UNITINIT:
          0000001C  0018                    .BLKL   1
                    001C            .IIF    NB,VEC$L_START, VEC$L_START:
          00000020  001C                    .BLKL   1
                    0020            .IIF    NB,VEC$L_UNITDISC,      VEC$L_UNITDISC:
          00000024  0020                    .BLKL   1
                    0024            .IIF    NB,VEC$C_LENGTH,        VEC$C_LENGTH:
                    0024            .IIF    NB,VEC$K_LENGTH,        VEC$K_LENGTH:
                    0000            .RESTORE
```

```
                        00000000     73          .PSECT  SEP, SHR, EXE, WRT, LONG
                            0000     74
                            0000     75          .SBTTL  LOAD MASSBUS ADAPTER MAP REGISTERS
                            0000     76 ;+
                            0000     77 ; IOC$LOADMBAMAP - LOAD MASSBUS ADAPTER MAP REGISTERS
                            0000     78 ;
                            0000     79 ; THIS ROUTINE IS CALLED TO LOAD THE MASSBUS ADAPTER MAP REGISTERS, THE
                            0000     80 ; BYTE COUNT REGISTER, AND THE VIRTUAL ADDRESS REGISTER.
                            0000     81 ;
                            0000     82 ; INPUTS:
                            0000     83 ;
                            0000     84 ;       R4 = ADDRESS OF MBA CONFIGURATION STATUS REGISTER.
                            0000     85 ;       R5 = UCB ADDRESS OF UNIT TRANSFER IS TO OCCUR ON.
                            0000     86 ;
                            0000     87 ; OUTPUTS:
                            0000     88 ;
                            0000     89 ;       THE TRANSFER BYTE COUNT, STARTING PAGE OFFSET, AND ADDRESS OF THE
                            0000     90 ;       PAGE TABLE ENTIRES THAT DESCRIBE THE TRANSFER ARE RETRIEVED FROM
                            0000     91 ;       THE SPECIFED UCB AND USED TO LOAD THE MBA BYTE COUNT, VIRTUAL ADDRESS,
                            0000     92 ;       AND MAP REGISTERS. ONE ADDITIONAL MAP REGISTER IS LOADED AS INVALID
                            0000     93 ;       TO STOP THE TRANSFER IF A HARDWARE FAILURE SHOULD OCCUR.
                            0000     94 ;
                            0000     95 ;       R3 IS PRESERVED ACROSS CALL.
                            0000     96 ;-
                            0000     97
                            0000     98 IOC$LOADMBAMAP::                             ;LOAD MASSBUS ADAPTER MAP REGISTERS
                     53     DD  0000     99          PUSHL   R3                      ;SAVE REGISTERS
                52   6E A5   3C  0002    100          MOVZWL  UCB$W_BCNT(R5),R2       ;GET TRANSFER BYTE COUNT
                10 A4   52   CE  0006    101          MNEGL   R2,MBA$L_BCR(R4)        ;LOAD BYTE COUNT REGISTER
                51   6C A5   3C  000A    102          MOVZWL  UCB$W_BOFF(R5),R1       ;GET BYTE OFFSET IN PAGE
                0C A4   51   D0  000E    103          MOVL    R1,MBA$L_VAR(R4)        ;LOAD STARTING VIRTUAL ADDRESS
                0C A4   51   D0  0012    104          MOVL    R1,MBA$L_VAR(R4)        ;*****TEMP UNTIL MBA ECO ******
             52   01FF C241   9E  0016    105          MOVAB   ^X1FF(R2)[R1],R2        ;CALCULATE HIGHEST RELATIVE BYTE AND ROUND
          52   52   F7 8F     78  001C    106          ASHL    #-9,R2,R2               ;CALCULATE NUMBER OF MAP REGISTERS TO LOAD
             51   0800 C4     DE  0021    107          MOVAL   MBA$L_MAP(R4),R1        ;GET ADDRESS OF MBA MAP REGISTERS
                50   68 A5   D0  0026    108          MOVL    UCB$L_SVAPTE(R5),R0     ;GET ADDRESS OF PAGE TABLE
                   81   80   D0  002A    109 10$:     MOVL    (R0)+,(R1)+             ;LOAD MAP REGISTER
                        09   18  002D    110          BGEQ    30$                     ;IF GEQ PTE INVALID
                     F8 52   F5  002F    111 20$:     SOBGTR  R2,10$                  ;ANY MORE TO LOAD?
                        61   D4  0032    112          CLRL    (R1)                    ;LOAD INVALID MAP ENTRY
                   53   8E   D0  0034    113          MOVL    (SP)+,R3                ;RESTORE REGISTER
                        05   0037    114          RSB                             ;
                53   FC A0   D0  0038    115 30$:     MOVL    -4(R0),R3               ;GET THE PTE (NOT FROM MAP REGISTER!)
                     009E   30  003C    116          BSBW    IOC$PTETOPFN            ;GET PFN FROM INVALID PTE
FC A1   53   80000000 8F   C9  003F    117          BISL3   #^X80000000,R3,-4(R1)   ;AND LOAD THE MAP REGISTER
                        E5   11  0048    118          BRB     20$                     ;
```

```
                                004A   120          .SBTTL  LOAD UNIBUS ADAPTER MAP REGISTERS
                                004A   121 ;+
                                004A   122 ; IOC$LOADUBAMAP  - LOAD UNIBUS ADAPTER MAP REGISTERS
                                004A   123 ; IOC$LOADUBAMAPA - LOAD UNIBUS ADAPTER MAP REGISTERS ALTERNATE ENTRY FOR
                                004A   124 ;       BYTE ALIGNED UNIBUS DMA DEVICES WHICH NEVER WISH TO SET THE BYTE
                                004A   125 ;       OFFSET BIT IN MAP REGISTERS.  IN ALL OTHER RESPECTS THESE TWO
                                004A   126 ;       ENTRYPOINTS PRODUCE IDENTICAL RESULTS.
                                004A   127 ;
                                004A   128 ; THIS ROUTINE IS CALLED TO LOAD THE UNIBUS ADAPTER MAP REGISTERS.
                                004A   129 ;
                                004A   130 ; INPUTS:
                                004A   131 ;
                                004A   132 ;       R5 = UCB ADDRESS OF UNIT TRANSFER IS TO OCCUR ON.
                                004A   133 ;
                                004A   134 ;       IT IS ASSUMED THAT THE DATAPATH AND MAP REGISTERS HAVE BEEN PREVIOUSLY
                                004A   135 ;       ASSIGNED.
                                004A   136 ;
                                004A   137 ; OUTPUTS:
                                004A   138 ;
                                004A   139 ;       EACH MAP REGISTER IS LOADED WITH THE APPROPRIATE PAGE FRAME NUMBER
                                004A   140 ;       MERGED WITH THE DATAPATH DESIGNATOR AND BYTE OFFSET BIT. ONE ADDITIONAL
                                004A   141 ;       MAP REGISTER IS LOADED AS INVALID TO STOP THE TRANSFER IF A HARDWARE
                                004A   142 ;       FAILURE SHOULD OCCUR.
                                004A   143 ;
                                004A   144 ;       R3 IS PRESERVED ACROSS CALL.
                                004A   145 ;-
                                004A   146
                                004A   147          .ENABL  LSB
                                004A   148 IOC$LOADUBAMAPA::                      ;LOAD UNIBUS ADAPTER MAP REGISTERS - ALTERNATE
                                004A   149                                       ; HERE WE DUPLICATE THE CODE IN THE OTHER ENTRY
                                004A   150                                       ;  EXCEPT THAT WE DO NOT CHECK WHETHER THE BYTE
                                004A   151                                       ;  OFFSET IS ODD.  INSTEAD WE BRANCH DIRECTLY
                                004A   152                                       ;   PAST THE SETTING OF THE BYTE OFFSET BIT.
          7E    53    7D      004A   153          MOVQ    R3,-(SP)                 ;SAVE REGISTERS
    51    6C    A5    3C      004D   154          MOVZWL  UCB$W_BOFF(R5),R1        ;GET BYTE OFFSET IN PAGE
    52    6E    A5    3C      0051   155          MOVZWL  UCB$W_BCNT(R5),R2        ;GET TRANSFER BYTE COUNT
    53    20    A5    D0      0055   156          MOVL    UCB$L_CRB(R5),R3         ;GET ADDRESS OF CRB
                00    EF      0059   157          EXTZV   #VEC$V_DATAPATH,-        ;GET DATAPATH
                05            005B   158                  #VEC$S_DATAPATH,-        ; NUMBER
    54    27    A3            005C   159                  CRB$L_INTD+VEC$B_DATAPATH(R3),R4
                1B    11      005F   160          BRB     10$                      ; BRANCH AROUND TO JOIN COMMON CODE
                              0061   161 IOC$LOADUBAMAP::                         ;LOAD UNIBUS ADAPTER MAP REGISTERS
          7E    53    7D      0061   162          MOVQ    R3,-(SP)                 ;SAVE REGISTERS
    51    6C    A5    3C      0064   163          MOVZWL  UCB$W_BOFF(R5),R1        ;GET BYTE OFFSET IN PAGE
    52    6E    A5    3C      0068   164          MOVZWL  UCB$W_BCNT(R5),R2        ;GET TRANSFER BYTE COUNT
    53    20    A5    D0      006C   165          MOVL    UCB$L_CRB(R5),R3         ;GET ADDRESS OF CRB
                00    EF      0070   166          EXTZV   #VEC$V_DATAPATH,-        ;GET DATAPATH
                05            0072   167                  #VEC$S_DATAPATH,-        ; NUMBER
    54    27    A3            0073   168                  CRB$L_INTD+VEC$B_DATAPATH(R3),R4
                03    51      E9     0076   169          BLBC    R1,10$           ;IF LBC WORD ALIGNED TRANSFER
          54    10            88     0079   170          BISB    #^X10,R4         ;SET BYTE OFFSET BIT
    54    0400  8F            A8     007C   171 10$:     BISW    #^X400,R4        ;MERGE VALID WITH BYTE OFFSET AND DATAPATH
                05            E1     0081   172          BBC     #VEC$V_LWAE,-    ;BRANCH IF LONGWORD ACCESS NOT ENABLED
          03 27 A3                   0083   173                  CRB$L_INTD+VEC$B_DATAPATH(R3),15$
          54    20            88     0086   174          BISB    #^X20,R4         ;ELSE SET LWAE FOR MAP REG
    52    01FF  C241          9E     0089   175 15$:     MOVAB   ^X1FF(R2)[R1],R2 ;CALCULATE HIGHEST RELATIVE BYTE AND ROUND
52  52    F7    8F      78     008F   176          ASHL    #-9,R2,R2                ;CALCULATE NUMBER OF MAP REGISTERS TO LOAD
```

```
                     26 A3    52    91  0094   177          CMPB    R2,CRB$L_INTD+VEC$B_NUMREG(R3) ;ENOUGH MAP REGISTERS ASSIGNED?
                              2C    1E  0098   178          BGEQU   40$                            ;IF GEQU NO
                     51   28 B3    D0  009A   179          MOVL    @CRB$L_INTD+VEC$L_ADP(R3),R1 ;GET ADDRESS OF CONFIGURATION REGISTER
                              00    EF  009E   180          EXTZV   #VEC$V_MAPREG,-                ;GET STARTING REGISTER
                              0F        00A0   181                  #VEC$S_MAPREG,-
                     50   24 A3        00A1   182                  CRB$L_INTD+VEC$W_MAPREG(R3),R0
                  51    0800 C140    DE  00A4   183          MOVAL   UBA$L_MAP(R1)[R0],R1           ;GET ADDRESS OF FIRST MAP REGISTER TO LOAD
                     50   68 A5    D0  00AA   184          MOVL    UCB$L_SVAPTE(R5),R0            ;GET ADDRESS OF PAGE TABLE
                        53    80    D0  00AE   185 20$:     MOVL    (R0)+,R3                       ;GET NEXT PAGE TABLE ENTRY
                              02    19  00B1   186          BLSS    30$                            ;IF LSS VALID PAGE TABLE ENTRY
                              28    10  00B3   187          BSBB    IOC$PTETOPFN                   ;GET PFN FROM INVALID PTE
               53    0B   15    54    F0  00B5   188 30$:     INSV    R4,#21,#11,R3                  ;INSERT VALID, BYTE OFFSET, AND DATAPATH
                        81    53    D0  00BA   189          MOVL    R3,(R1)+                       ;LOAD UBA MAP REGISTER
                           EE 52    F5  00BD   190          SOBGTR  R2,20$                         ;ANY MORE TO LOAD?
                              61    D4  00C0   191          CLRL    (R1)                           ;LOAD INVALID MAP ENTRY
                        53    8E    7D  00C2   192          MOVQ    (SP)+,R3                       ;RESTORE REGISTERS
                              05    00C5   193          RSB                                    ;
                                    00C6   194 40$:     BUG_CHECK UBMAPEXCED,FATAL             ;UNIBUS MAP REGISTER ALLOCATION EXCEEDED
                  00000000'9F       16  00C6           JSB     @#BUG$CHECK
2C 44 45 43 58 45 50 41 4D 42 55 00' 00CC           .ASCIC  "UBMAPEXCED,FATAL"
                     4C 41 54 41 46  00D8
                                 10  00CC
                                     00DD   195          .DSABL  LSB
```

```
                                00DD   197          .SBTTL  GET PFN FROM INVALID PTE
                                00DD   198 ;+
                                00DD   199 ; IOC$PTETOPFN - GET PFN FROM INVALID PTE
                                00DD   200 ;
                                00DD   201 ; THIS ROUTINE IS CALLED TO RETURN THE PAGE FRAME NUMBER FROM A
                                00DD   202 ; PAGE TABLE ENTRY WHICH HAS ALREADY BEEN DETERMINED TO BE NOT VALID.
                                00DD   203 ;
                                00DD   204 ; INPUTS:
                                00DD   205 ;
                                00DD   206 ;       R3 = PAGE TABLE ENTRY
                                00DD   207 ;
                                00DD   208 ; OUTPUTS:
                                00DD   209 ;
                                00DD   210 ;       R3 = PAGE FRAME NUMBER AND MAY INCLUDE THE FOLLOWING FIELDS
                                00DD   211 ;               VALID BIT, MODIFY BIT, PROTECTION FIELD, OWNER FIELD
                                00DD   212 ;
                                00DD   213 ;       ALL OTHER REGISTERS PRESERVED
                                00DD   214 ;-
                                00DD   215
                                00DD   216          .ENABL  LSB
                                00DD   217 IOC$PTETOPFN::
          53   FB800000 8F    CA  00DD   218          BICL    #^C<PTE$M_TYP1 ! PTE$M_TYP0 !- ;PTE TYPE BITS
                                00E4   219                  PTE$M_GPTX>,R3          ;AND GPTX/PFN
           01 53    1A    E0  00E4   220          BBS     #PTE$V_TYP1,R3,20$      ;BRANCH IF BAD PTE FOR I/O
                             05  00E8   221 10$:    RSB
                                00E9   222 20$:    BUG_CHECK INVPTEFMT,FATAL       ;INVALID PAGE TABLE ENTRY FORMAT
         00000000'9F    16  00E9           JSB     @#BUG$CHECK
46 2C 54 4D 46 45 54 50 56 4E 49 00' 00EF          .ASCIC  "INVPTEFMT,FATAL"
                     4C 41 54 41  00FB
                              0F  00EF
                                00FF   223          .DSABL  LSB
                                00FF   224
                                00FF   225          .END
```

```
BUG$CHECK           ********    X   02      UCB$C_TT_LENGTH  000000BC    D       UCB$W_CHARGE     0000004A    D
CRB$B_MASK          0000000E      D         UCB$K_LENGTH     00000074    D       UCB$W_CYLINDERS  0000003E    D
CRB$B_TYPE          0000000A      D         UCB$K_MB_LENGTH  00000090    D       UCB$W_DA         0000008C    D
CRB$C_LENGTH        00000038      D         UCB$K_TT_LENGTH  000000BC    D       UCB$W_DC         0000008E    D
CRB$K_LENGTH        00000038      D         UCB$L_AMB        00000054    D       UCB$W_DEVBUFSIZ  0000003A    D
CRB$L_INTD          00000014      D         UCB$L_ASTQBL     00000010    D       UCB$W_DEVSTS     0000005A    D
CRB$L_INTD2         00000038      D         UCB$L_ASTQFL     0000000C    D       UCB$W_DIRSEQ     00000088    D
CRB$L_LINK          00000010      D         UCB$L_CPID       0000005C    D       UCB$W_DSTADDR    00000018    D
CRB$L_WQBL          00000004      D         UCB$L_CRB        00000020    D       UCB$W_DX_BCR     000000A4    D
CRB$L_WQFL          00000000      D         UCB$L_DDB        00000024    D       UCB$W_EC1        00000090    D
CRB$W_REFC          0000000C      D         UCB$L_DEVCHAR    00000034    D       UCB$W_EC2        00000092    D
CRB$W_SIZE          00000008      D         UCB$L_DEVDEPEND  0000003C    D       UCB$W_ERRCNT     00000072    D
IOC$LOADMBAMAP      00000000  RG  D   02      UCB$L_DPC        00000080    D       UCB$W_FUNC       0000007E    D
IOC$LOADUBAMAP      00000061  RG  D   02      UCB$L_DUETIM     0000005C    D       UCB$W_MB_SEED    00000000    D
IOC$LOADUBAMAPA     0000004A  RG  D   02      UCB$L_DX_BFPNT   0000009C    D       UCB$W_MSGCNT     00000016    D
IOC$PTETOPFN        000000DD  RG  D   02      UCB$L_DX_BUF     00000098    D       UCB$W_MSGMAX     00000014    D
MBA$L_BCR       =   00000010      D         UCB$L_DX_RXDB    000000A0    D       UCB$W_NT_CHAN    0000007C    D
MBA$L_MAP       =   00000800      D         UCB$L_EMB        00000078    D       UCB$W_OFFSET     0000008A    D
MBA$L_VAR       =   0000000C      D         UCB$L_FIRST      00000014    D       UCB$W_REFC       00000050    D
PTE$M_GPTX      =   003FFFFF      D         UCB$L_FPC        0000000C    D       UCB$W_SIZE       00000008    D
PTE$M_TYP0      =   00400000      D         UCB$L_FQBL       00000004    D       UCB$W_SRCADDR    0000001A    D
PTE$M_TYP1      =   04000000      D         UCB$L_FQFL       00000000    D       UCB$W_STS        00000058    D
PTE$V_TYP1      =   0000001A      D         UCB$L_FR3        00000010    D       UCB$W_TT_DESIZE  000000A5    D
SIZ...          =   00000001      D         UCB$L_FR4        00000014    D       UCB$W_UNIT       00000048    D
UBA$L_MAP       =   00000800      D         UCB$L_IOQBL      00000044    D       UCB$W_VPROT      0000001A    D
UCB$B_AMOD          00000053      D         UCB$L_IOQFL      00000040    D       VEC$B_DATAPATH   00000013    D
UCB$B_CEX           00000077      D         UCB$L_IRP        0000004C    D       VEC$B_NUMREG     00000012    D
UCB$B_CM1           0000004A      D         UCB$L_LINK       0000002C    D       VEC$C_LENGTH     00000024    D
UCB$B_CM2           0000004B      D         UCB$L_LOGADR     00000064    D       VEC$K_LENGTH     00000024    D
UCB$B_DEVCLASS      00000038      D         UCB$L_MAXBLOCK   00000084    D       VEC$L_ADP        00000014    D
UCB$B_DEVTYPE       00000039      D         UCB$L_MB_MBX     0000007C    D       VEC$L_IDB        00000008    D
UCB$B_DIPL          00000052      D         UCB$L_MB_PORT    0000008C    D       VEC$L_INITIAL    0000000C    D
UCB$B_DX_SCTCNT     000000A6      D         UCB$L_MB_RAST    00000078    D       VEC$L_START      0000001C    D
UCB$B_ERTCNT        00000070      D         UCB$L_MB_SHB     00000080    D       VEC$L_UNITDISC   00000020    D
UCB$B_ERTMAX        00000071      D         UCB$L_MB_WAST    00000074    D       VEC$L_UNITINIT   00000018    D
UCB$B_FEX           00000076      D         UCB$L_MB_WIOQBL  00000088    D       VEC$Q_DISPATCH   00000000    D
UCB$B_FIPL          0000000B      D         UCB$L_MB_WIOQFL  00000084    D       VEC$S_DATAPATH  =00000005    D
UCB$B_LOCSRV        0000003C      D         UCB$L_MEDIA      0000008C    D       VEC$S_MAPREG    =0000000F    D
UCB$B_OFFNDX        00000094      D         UCB$L_NT_DATSSB  00000074    D       VEC$V_DATAPATH  =00000000    D
UCB$B_OFFRTC        00000095      D         UCB$L_NT_INTSSB  00000078    D       VEC$V_LWAE      =00000005    D
UCB$B_REMSRV        0000003D      D         UCB$L_OPCNT      00000060    D       VEC$V_MAPREG    =00000000    D
UCB$B_SECTORS       0000003C      D         UCB$L_OWNUIC     0000001C    D       VEC$W_MAPREG     00000010    D
UCB$B_SLAVE         00000074      D         UCB$L_PID        00000028    D
UCB$B_SPR           00000075      D         UCB$L_RQBL       00000004    D
UCB$B_STATE         00000052      D         UCB$L_RQFL       00000000    D
UCB$B_TRACKS        0000003D      D         UCB$L_SVAPTE     00000068    D
UCB$B_TT_CRFILL     0000009D      D         UCB$L_SVPN       00000064    D
UCB$B_TT_DECRF      000000A1      D         UCB$L_TT_DECHAR  000000A8    D
UCB$B_TT_DELFF      000000A2      D         UCB$L_TT_RDUE    0000008C    D
UCB$B_TT_DESPEE     000000A0      D         UCB$L_TT_RTIMOU  000000B8    D
UCB$B_TT_DETYPE     000000A4      D         UCB$L_VCB        00000030    D
UCB$B_TT_LFFILL     0000009E      D         UCB$T_PARTNER    0000000C    D
UCB$B_TT_SPEED      0000009C      D         UCB$W_BCNT       0000006E    D
UCB$B_TYPE          0000000A      D         UCB$W_BCR        00000096    D
UCB$B_VERTSZ        0000003F      D         UCB$W_BOFF       0000006C    D
UCB$C_LENGTH        00000074      D         UCB$W_BUFQUO     00000018    D
UCB$C_MB_LENGTH     00000090      D         UCB$W_BYTESTOGO  0000003E    D
```

```
                                    +----------------+
                                    ! Psect synopsis !
                                    +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           000000BC  (  188.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
SEP                             000000FF  (  255.)  02 (  2.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD    WRT NOVEC LONG
```

```
                                        +-------------------------+
                                        ! Symbol Cross Reference !
                                        +-------------------------+

SYMBOL          VALUE        DEFINITION      REFERENCES...
------          -----        ----------      -------------
BUG$CHECK       00000000-XR                  194    (1)      222    (1)
CRB$L_INTD      00000014                     159    (1)      168    (1)      173    (1)    #-177    (1)    #-179    (1)
                                             182    (1)
IOC$LOADMBAMAP  00000000-R   98     (1)
IOC$LOADUBAMAP  00000061-R   161    (1)
IOC$LOADUBAMAPA 0000004A-R   148    (1)
IOC$PTETOPFN    000000DD-R   217    (1)    #-116    (1)    #-187    (1)
MBA$L_BCR      =00000010                   #-101    (1)
MBA$L_MAP      =00000800                     107    (1)
MBA$L_VAR      =0000000C                   #-103    (1)    #-104    (1)
PTE$M_GPTX     =003FFFFF                   #-219    (1)
PTE$M_TYP0     =00400000                   #-218    (1)
PTE$M_TYP1     =04000000                   #-218    (1)
PTE$V_TYP1     =0000001A                   #-220    (1)
UBA$L_MAP      =00000800                     183    (1)
UCB$L_CRB       00000020                   #-156    (1)    #-165    (1)
UCB$L_SVAPTE    00000068                   #-108    (1)    #-184    (1)
UCB$W_BCNT      0000006E                   #-100    (1)    #-155    (1)    #-164    (1)
UCB$W_BOFF      0000006C                   #-102    (1)    #-154    (1)    #-163    (1)
VEC$B_DATAPATH  00000013                     159    (1)      168    (1)      173    (1)
VEC$B_NUMREG    00000012                   #-177    (1)
VEC$L_ADP       00000014                   #-179    (1)
VEC$S_DATAPATH =00000005                   #-158    (1)    #-167    (1)
VEC$S_MAPREG   =0000000F                   #-181    (1)
VEC$V_DATAPATH =00000000                   #-157    (1)    #-166    (1)
VEC$V_LWAE     =00000005                   #-172    (1)
VEC$V_MAPREG   =00000000                   #-180    (1)
VEC$W_MAPREG    00000010                     182    (1)

                                        +-------------------------+
                                        ! Performance indicators !
                                        +-------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    39    00:00:00.02    00:00:00.22
Command processing               933    00:00:00.30    00:00:00.99
Pass 1                           409    00:00:01.25    00:00:02.52
Symbol table sort                  0    00:00:00.13    00:00:00.13
Pass 2                            19    00:00:00.38    00:00:00.87
Symbol table output                2    00:00:00.02    00:00:00.02
Psect synopsis output              0    00:00:00.00    00:00:00.00
Cross-reference output             3    00:00:00.03    00:00:00.06
Assembler run totals            1407    00:00:02.13    00:00:04.81

The working set limit was 2900 pages.
82994 bytes (163 pages) of virtual memory were used to buffer the intermediate code.
There were 30 pages of symbol table space allocated to hold 481 non-local and 10 local symbols.
225 source lines were read in Pass 1, producing 39 object records in Pass 2.
17 pages of virtual memory were used to define 16 macros.
```

```
                                  +----------------------------+
                                  ! Macro library statistics !
                                  +----------------------------+

Macro library name                                 Macros defined
------------------                                 --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                         1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1                       3
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1                      0
SYS$COMMON:[SYSLIB]LIB.MLB;2                                    3
SYS$COMMON:[SYSLIB]STARLET.MLB;2                                5
SYS$COMMON:[SYSLIB]STARLET.MLB;2                                0
TOTALS (all libraries)                                         12

709 GETS were required to define 12 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1)	109	Declarations
(1)	150	DSX$Escape Routine
(1)	195	DSX$BgnSub Routine
(2)	301	DSX$EndSub Routine
(2)	491	DSX$CkLoop Routine
(3)	552	DSX$InLoop Routine

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element LOOP.MAR
0000     2 ; *1     6-FEB-1986 15:19:27 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element LOOP.MAR
0000     4         .Title  LOOP    *** LOOP Loop control
0000     5         .Ident  /07-19/
0000     6         .NoShow Conditionals
0000     7
0000     8 ;
0000     9 ; Copyright (c) 1977, 1981, 1982
0000    10 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    11 ;
0000    12 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0000    13 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
0000    14 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
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0000    16 ; EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
0000    17 ; TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
0000    18 ; REMAIN IN DEC.
0000    19 ;
0000    20 ; THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
0000    21 ; AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
0000    22 ; CORPORATION.
0000    23 ;
0000    24 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0000    25 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    26
0000    27 ;++
0000    28 ; FACILITY:
0000    29 ;       VAX DIAGNOSTIC SUPERVISOR.
0000    30 ;
0000    31 ; ABSTRACT:
0000    32 ;
0000    33 ; ENVIRONMENT:
0000    34 ;
0000    35 ; AUTHOR:
0000    36 ;       KEN CHAPMAN     10-NOV-77       VERSION 01.
0000    37 ;
```

```
                     0000     39 ; MODIFICATIONS:
                     0000     40 ;
                     0000     41 ;                 9-Mar-1978      Roger Riggs
                     0000     42 ;         01      Fixed DS$INLOOP and DS$CKLOOP
                     0000     43 ;         02      Fixed BGNSUB and ENDSUB to use .entry and .vector
                     0000     44 ;                 also changed names to DSX$...
                     0000     45 ;                 12-Jun-1979     Roger Riggs
                     0000     46 ;         03      Turn off ^O before typing final loop pass message
                     0000     47 ;                 Dave Butenhof, 1-Mar-1980
                     0000     48 ;         04      Changed all references to APT mailbox to use longword
                     0000     49 ;                 offsets.
                     0000     50 ;                 Roger Riggs, 18-Mar-1980
                     0000     51 ;         05      Changed loop on subtest to execute the subtest the
                     0000     52 ;                 specified number of times instead of the previous +1.
                     0000     53 ;                 also made post loop on subtest processing call DS_CLEANUP
                     0000     54 ;                 - Dave Butenhof, 22-Jun-1981, version 6.4
                     0000     55 ;         06      Fix edit 5: delete explicit setting of DS$V_DONFLG, which
                     0000     56 ;                 prevented DS_CLEANUP from actually executing the diagnostic's
                     0000     57 ;                 cleanup code.
                     0000     58 ;         07      Fix /subtest to work right with /test:n:m.  It will only loop
                     0000     59 ;                 on the last test selected.
                     0000     60 ;
                     0000     61 ;         08      - Jack Stansbury, 21-Oct-1981, Version 6.-
                     0000     62 ;                 Added calls to QA$MAIN for the QA enhancement.
                     0000     63 ;                 Also added .LIBRARY statements for $DS and $DIAG.
                     0000     64 ;                 Also changed the case of some of the error messages.
                     0000     65 ;
                     0000     66 ;         09      - Dave Butenhof, 02-Nov-1981, version 6.-
                     0000     67 ;                 Fix truncation errors throughout.
                     0000     68 ;
                     0000     69 ;         10      - Jack Stansbury, 21-Nov-1981, Version 6.5
                     0000     70 ;                 Commented out a call to QA_MAIN because it appears that it
                     0000     71 ;                 will not be needed for the 6.5 DS version.
                     0000     72 ;
                     0000     73 ;         11      - Jack Stansbury, 13-Jan-1982, Version 6.6
                     0000     74 ;                 Added comments galore to make things easier to understand.
                     0000     75 ;
                     0000     76 ;         12      - Jack Stansbury, 14-Jan-1982, Version 6.6
                     0000     77 ;                 Added a call to the Summary Code routine in the EndSub routine.
                     0000     78 ;                 The diagnostic's summary code will now be executed when
                     0000     79 ;                 the requested number of loops on subtest have been done.
                     0000     80 ;                 This is more consistent with the EndPass routine.
                     0000     81 ;
                     0000     82 ;         13      - Jack Stansbury, 15-Jan-1982, Version 6.6
                     0000     83 ;                 Changed the FMTLOOPDON message to make it more like the
                     0000     84 ;                 EndPass message. Also added "Test x.y" to the message.
                     0000     85 ;
                     0000     86 ;         14      - Jack Stansbury, 20-Jan-1982, Version 6.6
                     0000     87 ;                 Changed the code in the EndSub routine to not print the
                     0000     88 ;                 header line when the Loop_On_Subtest QA check routine is
                     0000     89 ;                 executing. This is for QA.
                     0000     90 ;
                     0000     91 ;         15      - Jack Stansbury, 29-Mar-1982, Version 6.?
                     0000     92 ;                 Added some typecoding.
                     0000     93 ;
                     0000     94 ;         16      Marion Baggett, 30-mar-1982,    Version 6.7
                     0000     95 ;                 Changed all $DS_PRINT statements to the new form $PRINT.
```

```
                                0000     96 ;
                                0000     97 ;          17      Dave Butenhof, 08-Apr-1982, version 6.7
                                0000     98 ;                  Fix truncation error.
                                0000     99 ;
                                0000    100 ;          18      Jack Stansbury, 13-April-1982, Version 6.7
                                0000    101 ;                  Fix two truncation errors.
                                0000    102 ;
                                0000    103 ;          19      Peter Green, 18-JUL-1983, Version 6.12
                                0000    104 ;                  Changed $DS_INLOOP to return correct status
                                0000    105 ;                  returns, (DS$_ERROR or DS$_NORMAL)
                                0000    106 ;
                                0000    107 ;--
```

```
                 0000          .SBTTL  Declarations
                 0000   ;
                 0000   ; INCLUDE FILES:
                 0000   ;
                 0000          .LIBRARY        /SYS$LIBRARY:LIB/       ;                       [16]
                 0000          .LIBRARY        /$DS/                   ;                       [08]
                 0000          .LIBRARY        /$DIAG/                 ;                       [08]
                 0000
                 0000   ;
                 0000   ; MACROS:
                 0000   ;
                 0000
                 0000   ;
                 0000   ; EQUATED SYMBOLS:
                 0000   ;
        00000003 0000          BPTCODE = 03            ; BREAKPOINT OPCODE
                 0000          $DS_DSADEF
                 0000          $DS_DSDEF
                 0000          $DS_HDRDEF
                 0000          APTDEF
                 0000          DSFDEF
                 0000          DSQA                    ; DSQA$K constant definitions           [08]
                 0000          DS_QADEFS               ; Other QA$K constant definitions       [14]
                 0000          $DS_TypeDef             ; Define the TypeCodes                  [15]
```

```
                                00000000   134          .PSECT  Data, Shr, NoExe, NoWrt, Byte
                                    0000   135
                                    0000   136 ;
                                    0000   137 ; OWN STORAGE:
                                    0000   138 ;
                                    0000   139
                                    0000   140          MODNAM  LOOP
                     50 4F 4F 4C 00'0000       $MODULE:        .ASCIC  \LOOP\
                                    04  0000
                                    0005   141
                                    0005   142 FMTSEQERR:
6E 65 75 71 65 53 20 3F 3F 2F 21 00'0005   143          .ASCIC  "!/?? Sequencing error. Should be in test !UW.!UW,"-    ;       [08]
20 2E 72 6F 72 72 65 20 67 6E 69 63 0011
6E 69 20 65 62 20 64 6C 75 6F 68 53 001D
55 21 2E 57 55 21 20 74 73 65 74 20 0029
74 20 64 65 68 63 61 65 72 20 2C 57 0035
2E 57 55 21 2E 57 55 21 20 74 73 65 0041
                        2F 21       004D
                                    49  0005
                                    004F   144                  " reached test !UW.!UW.!/"                              ;       [08]
                                    004F   145 FMTLOOPDON:
66 6F 20 64 6E 45 20 2E 2E 2F 21 00'004F   146          .ASCIC  "!/.. End of run, !UW error!%S detected, !UL loop!%S,"- ;       [13]
72 65 20 57 55 21 20 2C 6E 75 72 20 005B
63 65 74 65 64 20 53 25 21 72 6F 72 0067
6F 6F 6C 20 4C 55 21 20 2C 64 65 74 0073
                     2C 53 25 21 70 007F
55 21 2E 4C 55 21 20 74 73 65 74 20 0084   147                  " test !UL.!UL,!/"-                                     ;       [13]
                        2F 21 2C 4C 0090
21 20 73 69 20 65 6D 69 74 20 20 20 0094   148                  "   time is !%D!/"                                      ;       [13]
                        2F 21 44 25 00A0
                                    54  004F
```

```
                     00A4    150          .SBTTL  DSX$Escape Routine
                  00000000   151          .PSECT  Code, Shr, Exe, NoWrt, Byte
                     0000    152 ;++
                     0000    153 ; FUNCTIONAL DESCRIPTION:
                     0000    154 ;
                     0000    155 ;
                     0000    156 ; CALLING SEQUENCE:
                     0000    157 ;
                     0000    158 ;       $ESCAPE ARG
                     0000    159 ;
                     0000    160 ; INPUT PARAMETERS:
                     0000    161 ;
                     0000    162 ;       AP      = Address of where to escape
                     0000    163 ;
                     0000    164 ; IMPLICIT INPUTS:
                     0000    165 ;
                     0000    166 ;       DS$GL_FLAGS <DS$V_ERRFLG>
                     0000    167 ;
                     0000    168 ; OUTPUT PARAMETERS:
                     0000    169 ;
                     0000    170 ;       NONE
                     0000    171 ;
                     0000    172 ; IMPLICIT OUTPUTS:
                     0000    173 ;
                     0000    174 ;       NONE
                     0000    175 ;
                     0000    176 ; COMPLETION CODES:
                     0000    177 ;
                     0000    178 ;       NONE
                     0000    179 ;
                     0000    180 ; SIDE EFFECTS:
                     0000    181 ;
                     0000    182 ;       NONE
                     0000    183 ;
                     0000    184 ;--
```

```
                          0000  0000   186          .ENTRY  DSX$ESCAPE,^M<>
                                0002   187
                00000000'EF   16  0002   188          Jsb     L^KB_CHECK              ; ^C check.                                  [18]
                                0008   189          Br_If_Not_ErrFlg  REscapeX      ; Exit if no error has occurred              [18]
             00000000'EF    04  E1  0008            BBC     #DS$V_ErrFlg, -                 ; If bit not set, branch              [29]
                            04      000F                      L^DS$GL_Flags, REscapeX               ;
                   10 AD    5C  D0  0010   190          MOVL    AP, 16(FP)              ; Replace return PC with ESCAPE address [11]
                                0014   191
                                0014   192 RESCAPEX:
                            04  0014   193          RET                             ; Return to diagnostic
```

```
0015   195          .SBTTL  DSX$BgnSub Routine
0015   196 ;++
0015   197 ; FUNCTIONAL DESCRIPTION:
0015   198 ;
0015   199 ;       This routine insures that the diagnostic program is sequencing
0015   200 ;       through its subtests in numerical order.  If an error is detected
0015   201 ;       the operator is notified and the command mode is entered as if
0015   202 ;       "Halt On Error" was selected. This means that the operator may
0015   203 ;       examine the general purpose registers and continue at the next
0015   204 ;       instruction of the program, if desired.
0015   205 ;
0015   206 ; CALLING SEQUENCE:
0015   207 ;
0015   208 ;       $BGNSUB
0015   209 ;               CALLG   $$$, a#DS$BGNSUB
0015   210 ;
0015   211 ; INPUT PARAMETERS:
0015   212 ;
0015   213 ;       4(AP)   = CURRENT TEST NUMBER (PROGRAM)
0015   214 ;       8(AP)   = NEW SUBTEST NUMBER (PROGRAM)
0015   215 ;
0015   216 ; IMPLICIT INPUTS:
0015   217 ;
0015   218 ;       DSA$GL_TESTNO           = CURRENT TEST NUMBER (SUPERVISOR).
0015   219 ;       DS$GL_FLAGS <DS$V_SUBT> = SUBTEST FLAG.
0015   220 ;
0015   221 ; OUTPUT PARAMETERS:
0015   222 ;
0015   223 ;       NONE
0015   224 ;
0015   225 ; IMPLICIT OUTPUTS:
0015   226 ;
0015   227 ;       DSA$GL_SUBTNO               = SUBTEST NUMBER.
0015   228 ;       DS$GA_LOOPADR               = LOOP ADDRESS.
0015   229 ;       DS$GL_FLAGS <DS$V_ERRFLG>   = ERROR FLAG.
0015   230 ;       DS$GL_FLAGS <DS$V_SUBT>     = SUBTEST FLAG.
0015   231 ;
0015   232 ; COMPLETION CODES:
0015   233 ;
0015   234 ;       NONE
0015   235 ;
0015   236 ; SIDE EFFECTS:
0015   237 ;
0015   238 ;       NONE
0015   239 ;
0015   240 ;--
```

```
                        0000  0015   242          .ENTRY  DSX$BGNSUB,^M<>
                              0017   243
                              0017   244          QA_MAIN Loop_DSX$BgnSub          ; Call QA$Main                          [08]
                    09   DD   0017                PUSHL   #DSQA$K_Loop_DSX$BgnSub
      00000000'9F   01   FB   0019                CALLS   #1, @#QA$MAIN
                              0020   245
      00000000'EF   0E   E2   0020   246          BBSS    #DS$V_SUBT, -            ; Set subtest flag. If it was already   [11]
                    1A        0027   247                    L^DS$GL_FLAGS, 20$     ; set, print sequence error.            [11]
                              0028   248
                              0028   249          Clear_ErrFlg                     ; Clear the error flag.                 [18]
      00000000'EF   04   E4   0028                BBSC    #DS$V_ErrFlg, -          ; Branch if ERRFLG bit is set to        [29]
                    00        002F                         L^DS$GL_Flags, 30000$ ; ...                                   [29]
                              0030       30000$:                                  ; ... here. Clear bit regardless.       [29]
                              0030   250
                              0030   251          ;+
                              0030   252          ; Save the PC that is stored in the call frame. This PC is for the      [11]
                              0030   253          ; first instruction after the $DS_BgnSub routine. Save it in            [11]
                              0030   254          ; DS$GA_LoopAdr so that the EndSub routine can branch back to this      [11]
                              0030   255          ; address if it needs to (because of looping on subtest, etc.).         [11]
                              0030   256          ;-
                              0030   257
   00000000'EF   10 AD   D0   0030   258          MOVL    16 (FP), -               ; Save return address of this subtest.  [11]
                              0038   259                    L^DS$GA_LOOPADR        ; LoopAdr is the address of where to    [11]
                              0038   260                                           ; loop back to from the EndSub routine. [11]
                              0038   261
   04 AC   0000FE50'EF   D1   0038   262          CMPL    L^DSA$GL_TESTNO, 4 (AP) ; Compare DS's TestNo with the progs.   [11]
                    62   13   0040   263          BEQL    50$                      ; Branch if they are the same (okay).   [11]
```

```
                                0042   265          ;+
                                0042   266          ; Sequencing error. The Supervisor's TestNo does not agree with the     [11]
                                0042   267          ; test number that the diagnostic passed to this routine (i.e., 16(AP)) [11]
                                0042   268          ; OR else the SubT flag was not set (indicating that two BgnSubs        [11]
                                0042   269          ; occurred without an intervening EndSub.                               [11]
                                0042   270          ;-
                                0042   271
                                0042   272 20$:     $Print  #DS$K_Type_Sequence_Error, -    ; There is a sequence error     [15]
                                0042   273                 #DS$K_PrintF, -             ; ... use printf                [15]
                                0042   274                 L^FMTSEQERR, -              ; ... the format string         [15]
                                0042   275                 L^DSA$GL_TESTNO,-           ; ... rest of parameters        [15]
                                0042   276                 L^DSA$GL_SUBTNO,-
                                0042   277                 4(AP), 8(AP)
                    08 AC   DD  0042                       PUSHL   8(AP)
                    04 AC   DD  0045                       PUSHL   4(AP)
          0000FE4C'EF   DD      0048                       PUSHL   L^DSA$GL_SUBTNO
          0000FE50'EF   DD      004E                       PUSHL   L^DSA$GL_TESTNO
          00000005'EF   9F      0054                       PUSHAB  L^FMTSEQERR
              7E   01   9A      005A                       movzbl  #DS$K_PrintF, -(sp)
              7E   19   98      005D                       cvtbl   #DS$K_Type_Sequence_Error, -(sp)
      00000000'GF   07   FB      0060                       CALLS   #$$N+2, G^DSX$PRINT
                                0067   278
                                0067   279          Set_Halt                            ; Set the HALT flag to halt on error.   [18]
      0000FE00'EF   00   E2     0067                 BBSS    #DSA$V_Halt, -             ; Branch if Halt bit is set to          [29]
                    00          006E                   L^DSA$GL_Flags, 30001$           ; ...
                                006F           30001$:                                 ; ... here. Set bit regardless.         [29]
      00000000'EF   07   E3     006F   280           BBCS    #DS$V_CMDFLG, -            ; Set the command flag. If not set,     [11]
                    11          0076   281             L^DS$GL_FLAGS, 40$               ; branch (okay).                        [09]
                                0077   282          ERRSUP_S                            ; The command flag was already set.     [09]
           00000000'EF   DF     0077                       PUSHAL  $MODULE
                    00   DD     007D                       PUSHL   #0
                    01   DD     007F                       PUSHL   #$ER
         00000000'EF    03   FB  0081                       CALLS   #3, DS_ERRSUP
                                0088   283
      00000000'EF   10 BD   DE  0088   284 40$:     MOVAL   a16(FP), L^DS$AA_BPTADDR; Save return PC.                       [09]
      00000000'EF   10 BD   90  0090   285          MOVB    a16(FP), L^DS$AB_BPTINST; Save the opcode located there.        [09]
               10 BD   03   90  0098   286          MOVB    #BPTCODE, a16(FP)         ; Store a breakpoint instruction at the [11]
                                009C   287                                            ; return location.                      [11]
      0000FE50'EF   04 AC   D0  009C   288          MOVL    4(AP), DSA$GL_TESTNO      ; Reset the test number.                [11]
```

```
                                00A4   290          ;+
                                00A4   291          ; Fall through to here if there was a sequencing error, or branch to    [11]
                                00A4   292          ; here if there was not a sequence error.                               [11]
                                00A4   293          ;-
                                00A4   294
      0000FE4C'EF    08 AC     D0   00A4   295 50$:     MOVL    8 (AP), DSA$GL_SUBTNO   ; Reset the subtest nunmber.          [11]
            00000000'EF       16   00AC   296          Jsb     L^KB_CHECK              ; Check for TTY input.                 [18]
                                00B2   297
                                00B2   298 RBGNSUBX:
                              04   00B2   299          RET                             ; Return to next subtest.              [11]
```

```
00B3    301          .SBTTL  DSX$EndSub Routine
00B3    302 ;++
00B3    303 ; FUNCTIONAL DESCRIPTION:
00B3    304 ;
00B3    305 ;       The end of subtest routine checks both test and subtest numbers
00B3    306 ;       to assure that the program sequence is correct.
00B3    307 ;
00B3    308 ; CALLING SEQUENCE:
00B3    309 ;
00B3    310 ;       $ENDSUB
00B3    311 ;               CALLG   $$$, a#DS$ENDSUB
00B3    312 ;
00B3    313 ; INPUT PARAMETERS:
00B3    314 ;
00B3    315 ;       4(AP)   = CURRENT TEST NUMBER (PROGRAM).
00B3    316 ;       8(AP)   = CURRENT SUBTEST NUMBER (PROGRAM).
00B3    317 ;
00B3    318 ; IMPLICIT INPUTS:
00B3    319 ;
00B3    320 ;       DSA$GL_TESTNO              = TEST NUMBER (SUPERVISOR).
00B3    321 ;       DSA$GL_SUBTNO              = SUBTEST NUMBER (SUPERVISOR).
00B3    322 ;       DSA$GL_FLAGS <DSA$V_LOOP>  = LOOP FLAG.
00B3    323 ;       DS$GL_SUBTEST              = SUBTEST NUMBER FOR LOOPING.
00B3    324 ;       DS$GA_LOOPADR              = LOOP ADDRESS.
00B3    325 ;       DS$GL_FLAGS <DS$V_SUBT>    = SUBTEST FLAG.
00B3    326 ;       DS$GL_FLAGS <DS$V_ERRFLG>  = ERROR FLAG.
00B3    327 ;
00B3    328 ; OUTPUT PARAMETERS:
00B3    329 ;
00B3    330 ;       NONE
00B3    331 ;
00B3    332 ; IMPLICIT OUTPUTS:
00B3    333 ;
00B3    334 ;       DS$GL_FLAGS<DS$V_SUBT>   = SUBTEST FLAG.
00B3    335 ;
00B3    336 ; COMPLETION CODES:
00B3    337 ;
00B3    338 ;       NONE
00B3    339 ;
00B3    340 ; SIDE EFFECTS:
00B3    341 ;
00B3    342 ;       NONE
00B3    343 ;
00B3    344 ;--
```

```
                        0000  00B3   346          .ENTRY  DSX$ENDSUB,^M<>
                              00B5   347
                              00B5   348          QA_MAIN Loop_DSX$EndSub          ; Call QA$Main                          [08]
                   0A   DD    00B5               PUSHL   #DSQA$K_Loop_DSX$EndSub
      00000000'9F  01   FB    00B7               CALLS   #1, a#QA$MAIN
           00000000'EF  16    00BE   349         Jsb     L^KB_CHECK               ; Check for TTY input.                  [18]
                              00C4   350
                              00C4   351         ;+
                              00C4   352         ; Compare the Supervisor's test and subtest numbers with those of       [11]
                              00C4   353         ; the diagnostics (i.e., those that are passed). If they are not the    [11]
                              00C4   354         ; same, it is a Sequence Error.                                         [11]
                              00C4   355         ;-
                              00C4   356
 04 AC     0000FE50'EF   D1    00C4   357         CMPL    L^DSA$GL_TESTNO, 4(AP)   ; Compare DS's TestNo with the progs.  [11]
                     0A   12    00CC   358         BNEQ    3$                       ; Branch if they are not equal.        [11]
 08 AC     0000FE4C'EF   D1    00CE   359         CMPL    L^DSA$GL_SUBTNO, 8(AP)   ; Compare DS's SubtNo with the progs.  [11]
                     03   13    00D6   360         BEQL    4$                       ; Branch if no error                   [11]
                              00D8   361
                   00DE   31    00D8   362 3$:     BRW     30$                      ; Branch if error in test or subtest
                              00DB   363
                              00DB   364         ;+
                              00DB   365         ; Check various flags.                                                  [11]
                              00DB   366         ;-
                              00DB   367
                              00DB   368 4$:                                      ; TestNo and SubtNo are both okay.     [11]
           00000000'EF   0E   E5    00DB   369         BBCC    #DS$V_SUBT, -            ; Branch if there was no BgnSub.       [11]
                     50         00E2   370                   L^DS$GL_FLAGS, 17$     ;                                      [09]
      0000FE00'EF  02   E1    00E3   371         BBC     #DSA$V_LOOP, -           ; If Loop on Error flag not set,       [11]
                     08         00EA   372                   L^DSA$GL_FLAGS, 5$     ; branch.                              [11]
                              00EB   373         Br_If_ErrFlg    10$              ; If error occurred, branch.           [18]
           00000000'EF   04   E0    00EB               BBS     #DS$V_ErrFlg, -          ; If bit set, branch                   [29]
                     2F         00F2                         L^DS$GL_Flags, 10$       ;                                      [29]
```

```
                                00F3   375          ;+
                                00F3   376          ; Come to here if the Loop on Error flag is not set OR                  [11]
                                00F3   377          ;                  if no errors have occurred.                          [11]
                                00F3   378          ;-
                                00F3   379
00000000'EF    08 AC    D1      00F3   380 5$:       CMPL    8 (AP), L^DS$GL_SUBTEST ; Is this the subtest to loop on?       [11]
                  35    12      00FB   381          BNEQ    15$                     ; If not, branch.                       [11]
00000000'EF    04 AC    D1      00FD   382          CMPL    4 (AP), L^DS$GL_LSTTEST ; Are we on the correct test?           [09]
                  2B    12      0105   383          BNEQ    15$                     ; If not on correct test, exit.         [07]
                                0107   384
                                0107   385          ;+
                                0107   386          ; Add one to the PassNo count. Thus, keep track of the number of times  [11]
                                0107   387          ; this subtest has been executed. Execute it only 'x' times, where x is [11]
                                0107   388          ; /PASS:x.                                                              [11]
                                0107   389          ;-
                                0107   390
   50   0000FE54'EF    DE      0107   391          MOVAL   L^DSA$GL_PASSNO, R0     ; Point to pass number.
0C 60   0000FE08'EF    F3      010E   392          AOBLEQ  L^DSA$GL_PASSES, (R0), 10$ ; Count and branch if not done.
                                0116   393
                                0116   394          ;+
                                0116   395          ; Are all done the requested number of passes. However, if the pass     [11]
                                0116   396          ; request is 0, keep chugging forever.                                  [11]
                                0116   397          ;-
                                0116   398
          0000FE08'EF    D5      0116   399          TSTL    L^DSA$GL_PASSES         ; If pass count 0
                    04    13      011C   400          BEQL    10$                     ; Continue forever
                    60    D7      011E   401          DECL    (R0)                    ; Make true count of passes
                    14    11      0120   402          BRB     20$                     ; Branch to done code
```

```
                          0122   404          ;+
                          0122   405          ; Come to here (if the Loop on Error flag is not set AND                [11]
                          0122   406          ;                if an Error has occurred)                              [11]
                          0122   407          ;             OR (if the pass count has not reached its limit).         [11]
                          0122   408          ; Cause the loop to occur. That is, loop back to the instruction       [11]
                          0122   409          ; following the CALL to BgnSub.                                        [11]
                          0122   410          ;-
                          0122   411
    10 AD   00000000'EF   D0     0122   412 10$:     MOVL    L^DS$GA_LOOPADR, 16 (FP); Set PC to the saved LoopAdr.  [09]
                          012A   413          Set_SubT                              ; Set the SubT flag.             [18]
       00000000'EF   0E   E2     012A                BBSS    #DS$V_Subt, -         ; Branch if SUBT bit is set to   [29]
                     00           0131                  L^DS$GL_Flags, 30002$ ; ...                                  [29]
                          0132        30002$:                                    ; ... here. Set bit regardless.  [29]
                          0132   414
                     04   0132   415 15$:     RET                                ; Return with changed PC.        [11]
                          0133   416
                0083 31   0133   417 17$:     BRW     30$                        ; Branch on                      [09]
```

```
                        0136   419          ;+
                        0136   420          ; Loop on subtest w/pass count exhausted. This should mirror the        [11]
                        0136   421          ; DSX$EndPass routine.                                                  [11]
                        0136   422          ;-
                        0136   423
 50   00000000'EF   DE  0136   424 20$:     MOVAL   L^DS$GL_FLAGS,R0          ; Point to flags.                    [09]
60   01   07   01   F0  013D   425          INSV    #1, #DS$V_CMDFLG, #1, -   ; Set Command mode.                   [06]
                        0142   426            (R0)                            ;                                    [11]
60   01   10   00   F0  0142   427          INSV    #0, #DS$V_CTRLO, #1, -    ; Clear Cntrl-O flag.                [06]
                        0147   428            (R0)                            ;                                    [11]
                        0147   429
                        0147   430          Br_If_Not_QA    23$               ; If not running under QA, branch    [18]
 0000FE00'EF   0F   E1  0147                 BBC     #DSA$V_QA, -                    ; If bit not set, branch     [29]
                0A      014E                   L^DSA$GL_Flags, 23$             ;                                    [29]
                03   E1 014F   431          BBC     #QA$K_LOOP_ON_SUBTEST, -; If not running Loop on Subtest check, [14]
                        0151   432            L^QA$AOB_CHECK_STATE,-; branch.                                      [14]
   02 00000000'EF       0151   433            23$                             ;                                    [14]
                2D   11 0157   434          BRB     24$                       ; Otherwise, do not print ending line. [14]
                        0159   435
                        0159   436 23$:     $PRINT  #DS$K_TYPE_PROGRAM_END,- ; PRINT "End of run ...".             [16]
                        0159   437            #DS$K_PRINTF,-                  ; Use printf.                        [16]
                        0159   438            L^FMTLOOPDON, -                 ;                                    [14]
                        0159   439            L^DS$GL_ERRCNT, -               ; Current number of errors.          [09]
                        0159   440            L^DSA$GL_PASSNO, -              ; Number of loops done.              [11]
                        0159   441            L^DSA$GL_TESTNO, -              ; The test looped on.                [13]
                        0159   442            L^DSA$GL_SUBTNO, -              ; The subtest looped on.             [13]
                        0159   443            #0                              ; Print current time.                [11]
                00   DD 0159                 PUSHL   #0
      0000FE4C'EF   DD  015B                 PUSHL   L^DSA$GL_SUBTNO
      0000FE50'EF   DD  0161                 PUSHL   L^DSA$GL_TESTNO
      0000FE54'EF   DD  0167                 PUSHL   L^DSA$GL_PASSNO
      00000000'EF   DD  016D                 PUSHL   L^DS$GL_ERRCNT
      0000004F'EF   9F  0173                 PUSHAB  L^FMTLOOPDON
         7E   01   9A  0179                 movzbl  #DS$K_PRINTF, -(sp)
         7E   10   98  017C                 cvtbl   #DS$K_TYPE_PROGRAM_END, -(sp)
00000000'GF   08   FB  017F                 CALLS   #$$N+2, G^DSX$PRINT
                        0186   444
      00000000'EF   16  0186   445 24$:     Jsb     L^INIT_CONTEXT            ; Reset stacks and processor mode.   [17]
                        018C   446          $DS_SUMMARY_S                     ; Exexcute the diagnostics summary code.[12]
00000000'9F   00   FB  018C                 CALLS   #0, a#DS$SUMMARY
      00000000'EF   16  0193   447          Jsb     L^DS_CLEANUP              ; Execute users cleanup code.
                        0199   448
                        0199   449          Clear_CtrlO                       ; Clear the Control-O flag. This makes [18]
00000000'EF   10   E4  0199                 BBSC    #DS$V_CtrlO, -            ; Branch if CTRLO bit is set to
                00      01A0                   L^DS$GL_Flags, 30003$ ; ...
                        01A1      30003$:                                    ; ... here. Clear bit regardless.
                        01A1   450                                           ; ... sure it is off after the summary. [18]
0000FE40'EF   0A   D0  01A1   451          MOVL    #APM$_DONE, -             ; Tell APT we're all done.           [11]
                        01A8   452            L^DSA$GL_MSGTYP                 ;                                    [11]
                        01A8   453          Br_If_Not_QA    25$               ; If not running under QA, branch.   [18]
0000FE00'EF   0F   E1  01A8                 BBC     #DSA$V_QA, -                    ; If bit not set, branch     [29]
                03      01AF                   L^DSA$GL_Flags, 25$             ;                                    [29]
            FE4D'   31  01B0   454          BRW     VRRESTART                 ; If running QA, branch to the START [11]
                        01B3   455                                           ; routine. This should only happen on [11]
                        01B3   456                                           ; the Loop_On_Subtest check routine. [11]
      00000000'EF   16  01B3   457 25$:     Jsb     L^Begin                   ; Clean up the world. Go back to CLI. [17]
```

```
                                01B9          ;+
                                01B9          ; Got here because not in subtest OR test or subtest numbers did not match.
                                01B9          ;-
                                01B9
                                01B9    30$:  $PRINT  #DS$K_TYPE_SEQUENCE_ERROR,-     ; PRINT "Sequencing error..."   [16]
                                01B9                  #DS$K_PRINTF,-          ; Use printf.                          [16]
                                01B9                  L^FMTSEQERR,-           ; ... the format string.               [18]
                                01B9                  L^DSA$GL_TESTNO,-       ; Current test number.                 [11]
                                01B9                  L^DSA$GL_SUBTNO,-       ; Current subtest number.              [11]
                                01B9                  4(AP), 8(AP)            ; User's test and subtest number.      [11]
                08 AC     DD    01B9                PUSHL   8(AP)
                04 AC     DD    01BC                PUSHL   4(AP)
          0000FE4C'EF     DD    01BF                PUSHL   L^DSA$GL_SUBTNO
          0000FE50'EF     DD    01C5                PUSHL   L^DSA$GL_TESTNO
          00000005'EF     9F    01CB                PUSHAB  L^FMTSEQERR
              7E   01     9A    01D1                movzbl  #DS$K_PRINTF, -(sp)
              7E   19     98    01D4                cvtbl   #DS$K_TYPE_SEQUENCE_ERROR, -(sp)
     00000000'GF   07     FB    01D7                CALLS   #$$N+2, G^DSX$PRINT
                                01DE
                                01DE          Set_Halt                        ; Set the Halt flag.                   [18]
     0000FE00'EF   00     E2    01DE          BBSS    #DSA$V_Halt, -          ; Branch if Halt bit is set to         [29]
                   00           01E5                  L^DSA$GL_Flags, 30004$        ; ...
                                01E6    30004$:                               ; ... here. Set bit regardless.        [29]
     00000000'EF   07     E3    01E6          BBCS    #DS$V_CMDFLG, -         ; Set command flag.                    [11]
                   11           01ED                  L^DS$GL_FLAGS, 45$      ;                                      [09]
                                01EE          ERRSUP_S                        ; Supervisor error: command flag set.  [11]
          00000000'EF     DF    01EE                PUSHAL  $MODULE
                   00     DD    01F4                PUSHL   #0
                   02     DD    01F6                PUSHL   #$ER
     00000000'EF   03     FB    01F8                CALLS   #3, DS_ERRSUP
                                01FF
                                01FF          ;+
                                01FF          ; Save the return PC in BptAddr. Save the opcode located at the return [11]
                                01FF          ; PC location. Store a BPT instruction at that location. Reset the     [11]
                                01FF          ; test and subtest numbers. Return to the diagnostic, and execute the  [11]
                                01FF          ; breakpoint instruction, causing the Cli to take over.                [11]
                                01FF          ;-
                                01FF
  00000000'EF   10 BD     DE    01FF    45$:  MOVAL   @16 (FP), -             ; Save return PC.                      [09]
                                0207                  L^DS$AA_BPTADDR         ;                                      [11]
  00000000'EF   10 BD     90    0207          MOVB    @16 (FP), -             ; Save the opcode located there.       [09]
                                020F                  L^DS$AB_BPTINST         ;                                      [11]
          10 BD   03     90    020F          MOVB    #BPTCODE, @16 (FP)      ; Set a breakpoint at the return PC.   [11]
  0000FE50'EF   04 AC     D0    0213          MOVL    4 (AP), L^DSA$GL_TESTNO ; Set TestNo to the user's test number. [11]
  0000FE4C'EF   08 AC     D0    021B          MOVL    8 (AP), L^DSA$GL_SUBTNO ; Set SubtNo to the user's subtest no. [11]
                         04     0223          RET                             ; Return to the diagnostic.            [11]
```

```
0224    491          .SBTTL  DSX$CkLoop Routine
0224    492 ;++
0224    493 ; FUNCTIONAL DESCRIPTION:
0224    494 ;
0224    495 ;       Check for loop flag AND an error flag, and loop if both
0224    496 ;       conditions are met.  Also keep track of previous loop conditions
0224    497 ;       and modify the loop if a new error occurs.
0224    498 ;
0224    499 ; CALLING SEQUENCE:
0224    500 ;
0224    501 ;       $CKLOOP ADR
0224    502 ;               CALLG   ADR, a#DS$CKLOOP
0224    503 ;
0224    504 ; INPUT PARAMETERS:
0224    505 ;
0224    506 ;       AP      = LOOP ADDRESS
0224    507 ;
0224    508 ; IMPLICIT INPUTS:
0224    509 ;
0224    510 ;       DS$GA_CHKLPPC               = CHECK LOOP PC.
0224    511 ;       DSA$GL_FLAGS <DSA$V_LOOP>   = LOOP FLAG.
0224    512 ;       DS$GL_FLAGS <DS$V_ERRFLG>   = ERROR FLAG.
0224    513 ;
0224    514 ; OUTPUT PARAMETERS:
0224    515 ;
0224    516 ;       NONE
0224    517 ;
0224    518 ; IMPLICIT OUTPUTS:
0224    519 ;
0224    520 ;       NONE
0224    521 ;
0224    522 ; COMPLETION CODES:
0224    523 ;
0224    524 ;       NONE
0224    525 ;
0224    526 ; SIDE EFFECTS:
0224    527 ;
0224    528 ;       NONE
0224    529 ;
0224    530 ;--
```

```
                        0000  0224   532          .ENTRY  DSX$CKLOOP, ^M<>
                              0226   533
                              0226   534          QA_MAIN Loop_DSX$CkLoop          ; Call QaMain.                          [08]
                    0B   DD   0226                PUSHL   #DSQA$K_Loop_DSX$CkLoop
     00000000'9F    01   FB   0228                CALLS   #1, @#QA$MAIN
                              022F   535
          00000000'EF   16   022F   536          Jsb     L^KB_CHECK               ; Check for TTY input.                  [09]
     0000FE00'EF    02   E1   0235   537          BBC     #DSA$V_LOOP, -           ; If not looping on error, branch.      [11]
                    26        023C   538                    DSA$GL_FLAGS, RCKLOOPX
                              023D   539          Br_If_Not_ErrFlg  RCkLoopX       ; If no errors, branch.                 [18]
     00000000'EF    04   E1   023D                BBC     #DS$V_ErrFlg, -                  ; If bit not set, branch        [29]
                    1E        0244                        L^DS$GL_Flags, RCkLoopX                  ;
          00000000'EF   D5   0245   540          TSTL    L^DS$GA_CHKLPPC          ; Is this the first CHKLOOP after an    [09]
                              024B   541                                           ;   ERROR call?
                    0A   13   024B   542          BEQL    10$                      ; Branch if it is.                      [11]
  10 AD   00000000'EF   D1   024D   543          CMPL    L^DS$GA_CHKLPPC, 16(FP)  ; Is this the correct CHKLOOP.          [09]
                    0C   12   0255   544          BNEQ    RCKLOOPX                 ; Exit if not right call.               [11]
                              0257   545
  00000000'EF   10 AD   D0   0257   546 10$:     MOVL    16(FP), L^DS$GA_CHKLPPC  ; Save PC of this CHKLOOP.              [09]
           10 AD   5C   D0   025F   547          MOVL    AP, 16(FP)               ; Replace return PC with loop address.  [11]
                              0263   548
                              0263   549 RCKLOOPX:
                         04   0263   550          RET                              ; Return to the diagnostic.             [11]
```

```
                     552          .SBTTL  DSX$InLoop Routine
                     553 ;++
                     554 ; FUNCTIONAL DESCRIPTION:
                     555 ;
                     556 ;       This routine returns successfully if the diagnostic has
                     557 ;       encountered an error AND the loop flag is set.
                     558 ;
                     559 ; CALLING SEQUENCE:
                     560 ;
                     561 ;       DS$INLOOP()
                     562 ;
                     563 ; INPUT PARAMETERS:     NONE
                     564 ;
                     565 ; IMPLICIT INPUTS:
                     566 ;
                     567 ;       DS$V_ERR in DS$GL_FLAGS
                     568 ;       DSA$V_LOOP in DSA$GL_FLAGS
                     569 ;
                     570 ; OUTPUT PARAMETERS:    NONE
                     571 ;
                     572 ; IMPLICIT OUTPUTS:     NONE
                     573 ;
                     574 ; COMPLETION CODES:
                     575 ;
                     576 ;       R0=1 if looping and error else 0
                     577 ;
                     578 ; SIDE EFFECTS:         NONE
                     579 ;--
```

```
                        0000  0264   581          .ENTRY  DSX$INLOOP,^M<>
                              0266   582
          00000000'EF   16    0266   583          Jsb     L^KB_CHECK                ; Check for TTY input.
     50   00660002 8F   D0    026C   584          MOVL    #DS$_ERROR,R0             ; CORRECT ERROR STATUS CODE                [19]
                              0273   585 ;        CLRL    R0                        ; Assume failure.                          [11]
                              0273   586          Br_If_Not_ErrFlg        10$       ; If error flag not set, branch.          [18]
00000000'EF   04    E1        0273                BBC     #DS$V_ErrFlg, -           ;  If bit not set, branch                  [29]
                    0F        027A                  L^DS$GL_Flags, 10$              ;                                          [29]
0000FE00'EF   02    E1        027B   587          BBC     #DSA$V_LOOP, -            ; If not looping on error, branch.         [11]
                    07        0282   588            L^DSA$GL_FLAGS, 10$
     50   00660001 8F   D0    0283   589          MOVL    #DS$_NORMAL,R0            ; CORRECT NORMAL STATUS CODE               [19]
                              028A   590 ;        INCL    R0                        ; Error and LOOP on error set.             [11]
                              028A   591
                        04    028A   592 10$:     RET                               ; Return to diagnostic.                    [11]
                              028B   593
                              028B   594          .END
```

```
ZZ-ECSAA-10.11  Symbol table                                    3-MAY-1988       Fiche 12 Frame F13        Sequence 2427
LOOP                        *** LOOP Loop control                21-MAR-1988 17:55:03  VAX/VMS Macro V04-00        Page  22
Symbol table                                                      3-JAN-1985 16:52:39  LOOP.MAR;1                  (3)

$$N                             = 00000005     D          DS$K_BLEQU_B                    = 00000003  G D
$ER                             = 00000003     D          DS$K_BLEQU_M                    = 0000000F  G D
$MODULE                           00000000 R   D  02       DS$K_BLEQ_B                     = 00000002  G D
APC$_ABORT                      = 00000006     D          DS$K_BLEQ_M                     = 0000000E  G D
APC$_CONTINUE                   = 00000009     D          DS$K_BLSSU_B                    = 00000001  G D
APC$_DUMP                       = 00000003     D          DS$K_BLSSU_M                    = 0000000D  G D
APC$_NOP                        = 00000000     D          DS$K_BLSS_B                     = 00000000  G D
APC$_START                      = 00000005     D          DS$K_BLSS_M                     = 0000000C  G D
APC$_ZERO                       = 00000004     D          DS$K_BNEQU_B                    = 0000000B  G D
APM$_ABTDON                     = 00000006     D          DS$K_BNEQU_M                    = 00000017  G D
APM$_DEVERR                     = 00000002     D          DS$K_BNEQ_B                     = 0000000A  G D
APM$_DONE                       = 0000000A     D          DS$K_BNEQ_M                     = 00000016  G D
APM$_EXCEPT                     = 0000000B     D          DS$K_BNERROR                    = 00000027  G D
APM$_HARDERR                    = 00000003     D          DS$K_BVC_M                      = 00000019  G D
APM$_MORE                       = 00000008     D          DS$K_BVS_M                      = 00000018  G D
APM$_NOMES                      = 00000000     D          DS$K_DS_STARTING_LOCATION       = 00010000    D
APM$_PREPERR                    = 0000000C     D          DS$K_ERROR                      = 00000002    D
APM$_PRGERR                     = 00000005     D          DS$K_NORMAL                     = 00000001    D
APM$_SOFTERR                    = 00000004     D          DS$K_PRINTB                     = 00000002    D
APM$_SPOOL                      = 00000009     D          DS$K_PRINTF                     = 00000001    D
APM$_SYSERR                     = 00000001     D          DS$K_PRINTI                     = 00000000    D
BEGIN                             ********   X   03       DS$K_PRINTX                     = 00000003    D
BIT...                          = 00000004     D          DS$K_SEVERE                     = 00000004    D
BPTCODE                         = 00000003     D          DS$K_SUBSYS                     = 00000066    D
DS$AA_BPTADDR                     ********   X   03       DS$K_TYPE_ABORT_PROGRAM         = 00000014    D
DS$AB_BPTINST                     ********   X   03       DS$K_TYPE_ABORT_TEST            = 00000013    D
DS$GA_CHKLPPC                     ********   X   03       DS$K_TYPE_COMMAND_ERR           = 00000015    D
DS$GA_LOOPADR                     ********   X   03       DS$K_TYPE_COMMAND_OUT           = 00000016    D
DS$GL_ERRCNT                      ********   X   03       DS$K_TYPE_CRD_AUTOTEST          = 0000001A    D
DS$GL_FLAGS                       ********   X   03       DS$K_TYPE_DS_PROMPT             = 00000001    D
DS$GL_LSTTEST                     ********   X   03       DS$K_TYPE_DS_START              = 0000001D    D
DS$GL_SUBTEST                     ********   X   03       DS$K_TYPE_ERRDEV                = 00000008    D
DS$K_BBC                        = 0000001D   G  D          DS$K_TYPE_ERRHARD               = 00000006    D
DS$K_BBCC                       = 00000021   G  D          DS$K_TYPE_ERROR_BODY            = 00000009    D
DS$K_BBCCI                      = 00000023   G  D          DS$K_TYPE_ERROR_END             = 0000000A    D
DS$K_BBCS                       = 0000001F   G  D          DS$K_TYPE_ERRPREP               = 0000001B    D
DS$K_BBS                        = 0000001C   G  D          DS$K_TYPE_ERRSOFT               = 00000007    D
DS$K_BBSC                       = 00000020   G  D          DS$K_TYPE_ERRSUP                = 00000004    D
DS$K_BBSS                       = 0000001E   G  D          DS$K_TYPE_ERRSYS                = 00000005    D
DS$K_BBSSI                      = 00000022   G  D          DS$K_TYPE_ERR_HALT              = 0000000D    D
DS$K_BCC_M                      = 0000001B   G  D          DS$K_TYPE_EXCEPTION             = 0000000C    D
DS$K_BCS_M                      = 0000001A   G  D          DS$K_TYPE_EXCEPTION_HEAD        = 0000000B    D
DS$K_BEQLU_B                    = 00000005   G  D          DS$K_TYPE_FIRST_PASS            = 00000011    D
DS$K_BEQLU_M                    = 00000011   G  D          DS$K_TYPE_GENERAL               = 00000000    D
DS$K_BEQL_B                     = 00000004   G  D          DS$K_TYPE_GENERAL_ERROR         = 00000003    D
DS$K_BEQL_M                     = 00000010   G  D          DS$K_TYPE_NO_TESTS              = 00000012    D
DS$K_BERROR                     = 00000026   G  D          DS$K_TYPE_PARAM_ERROR           = 0000001C    D
DS$K_BGEQU_B                    = 00000007   G  D          DS$K_TYPE_PROGRAM_END           = 00000010    D
DS$K_BGEQU_M                    = 00000013   G  D          DS$K_TYPE_PROGRAM_INFO          = 00000017    D
DS$K_BGEQ_B                     = 00000006   G  D          DS$K_TYPE_PROGRAM_START         = 0000000F    D
DS$K_BGEQ_M                     = 00000012   G  D          DS$K_TYPE_QIO_INVADP            = 00000024    D
DS$K_BGTRU_B                    = 00000009   G  D          DS$K_TYPE_QIO_NODRIVER          = 00000022    D
DS$K_BGTRU_M                    = 00000015   G  D          DS$K_TYPE_QIO_WRONGVER          = 00000023    D
DS$K_BGTR_B                     = 00000008   G  D          DS$K_TYPE_SCRIPT_ECHO           = 00000021    D
DS$K_BGTR_M                     = 00000014   G  D          DS$K_TYPE_SCRIPT_PNF            = 0000001E    D
DS$K_BLBC                       = 00000025   G  D          DS$K_TYPE_SCRIPT_PROMPT         = 00000020    D
DS$K_BLBS                       = 00000024   G  D          DS$K_TYPE_SCRIPT_SKIP           = 0000001F    D
```

```
DS$K_TYPE_SEQUENCE_ERROR        = 00000019    D
DS$K_TYPE_START_ERR             = 00000018    D
DS$K_TYPE_START_LIST            = 00000025    D
DS$K_TYPE_SUMMARY               = 0000000E    D
DS$K_TYPE_USER_PROMPT           = 00000002    D
DS$K_WARNING                    = 00000000    D
DS$M_ABRTFLG                    = 00000040    D
DS$M_BADTIME                    = 00100000    D
DS$M_BATCH                      = 00400000    D
DS$M_BRKCLR                     = 00001000    D
DS$M_BRKPT                      = 00000800    D
DS$M_CHARFLG                    = 00000100    D
DS$M_CMDFLG                     = 00000080    D
DS$M_CTRLC                      = 00000001    D
DS$M_CTRLO                      = 00010000    D
DS$M_DEVFLG                     = 00000200    D
DS$M_DISABLCC                   = 01000000    D
DS$M_DONFLG                     = 00002000    D
DS$M_ERRFLG                     = 00000010    D
DS$M_EXCEPT                     = 00080000    D
DS$M_EXETST                     = 00040000    D
DS$M_HLTFLG                     = 00000008    D
DS$M_LODFLG                     = 00000002    D
DS$M_MEMMGT                     = 00008000    D
DS$M_NI                         = 04000000    D
DS$M_OUTPUT                     = 00800000    D
DS$M_RUBFLG                     = 00000020    D
DS$M_SCRIPT                     = 00200000    D
DS$M_SETIMR                     = 02000000    D
DS$M_STRFLG                     = 00000004    D
DS$M_SUBT                       = 00004000    D
DS$M_SYSFLG                     = 00000400    D
DS$M_TIMED                      = 02000000    D
DS$M_TIMED_OUT                  = 08000000    D
DS$M_TIMRON                     = 00020000    D
DS$SUMMARY                        ********    X    03
DS$V_ABRTFLG                    = 00000006    D
DS$V_BADTIME                    = 00000014    D
DS$V_BATCH                      = 00000016    D
DS$V_BRKCLR                     = 0000000C    D
DS$V_BRKPT                      = 0000000B    D
DS$V_CHARFLG                    = 00000008    D
DS$V_CMDFLG                     = 00000007    D
DS$V_CTRLC                      = 00000000    D
DS$V_CTRLO                      = 00000010    D
DS$V_DEVFLG                     = 00000009    D
DS$V_DISABLCC                   = 00000018    D
DS$V_DONFLG                     = 0000000D    D
DS$V_ERRFLG                     = 00000004    D
DS$V_EXCEPT                     = 00000013    D
DS$V_EXETST                     = 00000012    D
DS$V_HLTFLG                     = 00000003    D
DS$V_LODFLG                     = 00000001    D
DS$V_MEMMGT                     = 0000000F    D
DS$V_NI                         = 0000001A    D
DS$V_OUTPUT                     = 00000017    D
DS$V_RUBFLG                     = 00000005    D
DS$V_SCRIPT                     = 00000015    D
DS$V_SETIMR                     = 00000019    D
DS$V_STRFLG                     = 00000002    D
DS$V_SUBT                       = 0000000E    D
DS$V_SYSFLG                     = 0000000A    D
DS$V_TIMED                      = 00000019    D
DS$V_TIMED_OUT                  = 0000001B    D
DS$V_TIMRON                     = 00000011    D
DS$_AP_NORMAL_BREAK             = 00660150    D
DS$_ARITH                       = 006600D0    D
DS$_ASBE                        = 00660118    D
DS$_BADLINK                     = 006600F0    D
DS$_BADTYPE                     = 006600E8    D
DS$_BIIC                        = 00660120    D
DS$_CHME                        = 006600A8    D
DS$_CHMK                        = 006600E0    D
DS$_DEVNAME                     = 00660108    D
DS$_ERROR                       = 00660002    D
DS$_FHWE                        = 00660068    D
DS$_FRAGBUF                     = 00660080    D
DS$_ICBUSY                      = 006600C8    D
DS$_ICERR                       = 006600C0    D
DS$_IHWE                        = 00660060    D
DS$_ILLCHAR                     = 00660018    D
DS$_ILLPAGCNT                   = 00660078    D
DS$_ILLUNIT                     = 00660100    D
DS$_INIT_FAIL                   = 00660140    D
DS$_INSFMEM                     = 00660050    D
DS$_INVCPU                      = 00660130    D
DS$_IPL2HI                      = 006600B8    D
DS$_IVADDR                      = 00660040    D
DS$_IVVECT                      = 00660038    D
DS$_KRNLSTK                     = 00660090    D
DS$_LOGIC                       = 00660070    D
DS$_MCHK                        = 00660088    D
DS$_MEM_ALLOC_ERR               = 00660138    D
DS$_MMOFF                       = 00660058    D
DS$_NEEDUNIT                    = 006600F8    D
DS$_NODE                        = 00660128    D
DS$_NOPCS                       = 00660110    D
DS$_NORMAL                      = 00660001    D
DS$_NOSUPPORT                   = 006600B1    D
DS$_NOTALLOWMP                  = 00660148    D
DS$_NOTDON                      = 00660030    D
DS$_NOTIMP                      = 006600B0    D
DS$_NULLSTR                     = 00660010    D
DS$_OVERFLOW                    = 00660008    D
DS$_POWER                       = 00660098    D
DS$_PROGERR                     = 00660020    D
DS$_SEVERE                      = 00660004    D
DS$_TRANSL                      = 006600A0    D
DS$_TRUNCATE                    = 00660028    D
DS$_UNEXPINT                    = 006600D8    D
DS$_UNSUPPDEV                   = 00660158    D
DS$_VASFULL                     = 00660048    D
DS$_WARNING                     = 00660000    D
DSA$AL_APTMAIL                    0000FE00    D
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DSA$AT_APTTXT                   0000FA00    D
DSA$GL_APTCOM                   0000FE04    D
DSA$GL_DEVLEN                   0000FE58    D
DSA$GL_ERRNO                    0000FE44    D
DSA$GL_EVENT                    0000FE48    D
DSA$GL_FLAGS                    0000FE00    D
DSA$GL_MSGTYP                   0000FE40    D
DSA$GL_PASSES                   0000FE08    D
DSA$GL_PASSNO                   0000FE54    D
DSA$GL_SECTNO                   0000FE10    D
DSA$GL_SID                      0000FE14    D
DSA$GL_SUBTNO                   0000FE4C    D
DSA$GL_TESTNO                   0000FE50    D
DSA$GL_UNITS                    0000FE0C    D
DSA$GQ_MSGPTR                   0000FE68    D
DSA$GT_DEVNAM                   0000FE5C    D
DSA$V_HALT                  =   00000000    D
DSA$V_LOOP                  =   00000002    D
DSA$V_QA                    =   0000000F    D
DSQA$K_DISPAT_AFTER_INIT    =   00000014    D
DSQA$K_DISPAT_BEFORE_INIT   =   00000013    D
DSQA$K_DISPAT_CALLTEST      =   00000015    D
DSQA$K_DISPAT_DONE_TESTS    =   00000018    D
DSQA$K_DISPAT_DSX$ENDPASS_BGN   =   00000001    D
DSQA$K_DISPAT_DSX$ENDPASS_END   =   00000002    D
DSQA$K_DISPAT_DSX$ENDPASS_MID   =   00000000    D
DSQA$K_DISPAT_DS_CLEANUP_BGN    =   00000003    D
DSQA$K_DISPAT_DS_CLEANUP_END    =   00000004    D
DSQA$K_DUMMY_1              =   00000007    D
DSQA$K_ERROR_ERROR_BGN      =   00000006    D
DSQA$K_ERROR_ERROR_END      =   00000005    D
DSQA$K_KERNEL_INIT_CONTEXT  =   00000008    D
DSQA$K_LOOP_DSX$BGNSUB      =   00000009    D
DSQA$K_LOOP_DSX$CKLOOP      =   0000000B    D
DSQA$K_LOOP_DSX$ENDSUB      =   0000000A    D
DSQA$K_PARAM_DSX$GETADDRESS     =   0000000E    D
DSQA$K_PARAM_DSX$GETDATA    =   0000000C    D
DSQA$K_PARAM_DSX$GETLOGICAL     =   0000000F    D
DSQA$K_PARAM_DSX$GETSTRING  =   00000010    D
DSQA$K_PARAM_DSX$GETVIELD   =   0000000D    D
DSQA$K_QA_DSX$BRANCH        =   00000011    D
DSQA$K_START_BEFORE_HEADER  =   00000017    D
DSQA$K_START_VRRESTART      =   00000012    D
DSQA$K_START_VRSTART        =   00000016    D
DSX$BGNSUB                      00000015 RG  D   03
DSX$CKLOOP                      00000224 RG  D   03
DSX$ENDSUB                      000000B3 RG  D   03
DSX$ESCAPE                      00000000 RG  D   03
DSX$INLOOP                      00000264 RG  D   03
DSX$PRINT                       ********    X   03
DS_CLEANUP                      ********    X   03
DS_ERRSUP                       ********    X   03
FALSE                       =   00000000      D
FMTLOOPDON                      0000004F R    D   02
FMTSEQERR                       00000005 R    D   02
INIT_CONTEXT                    ********    X   03
KB_CHECK                        ********    X   03
L$A_CCP                             00000240    D
L$A_DEVP                            0000021C    D
L$A_DREG                            00000224    D
L$A_DTP                             00000218    D
L$A_ICP                             0000023C    D
L$A_LASTADR                         00000214    D
L$A_NAME                            00000208    D
L$A_REPP                            00000244    D
L$A_SECNAM                          00000250    D
L$A_STATAB                          00000248    D
L$A_TSTCNT                          00000254    D
L$L_ENVIRON                         00000204    D
L$L_ERRTYP                          0000024C    D
L$L_HEADLENGTH                      00000200    D
L$L_REV                             0000020C    D
L$L_UNIT                            00000220    D
L$L_UNUSED                          00000228    D
L$L_UPDATE                          00000210    D
OFF                             =   00000000    D
ON                              =   00000001    D
QA$AOB_CHECK_STATE                  ********    X   03
QA$K_ABORT_NOW                  =   00000007    D
QA$K_APT_PHASE_ONE              =   0000000B    D
QA$K_APT_PHASE_TWO              =   0000000C    D
QA$K_BAD_ADDRESS                =   00000009    D
QA$K_CONTROL_C_CONT             =   0000000A    D
QA$K_DEALLOCATION               =   0000000E    D
QA$K_ERROR_PHASE_ONE            =   00000005    D
QA$K_ERROR_PHASE_THREE          =   00000007    D
QA$K_ERROR_PHASE_TWO            =   00000006    D
QA$K_FAILURE                    =   00000000    D
QA$K_FIRST_BRANCH_CODE          =   00000000    D
QA$K_FIRST_TIME                 =   00000005    D
QA$K_INIT_CONTEXT_DONE          =   00000003    D
QA$K_LAST_BRANCH_CODE           =   00000025    D
QA$K_LOOP_ON_SUBTEST            =   00000003    D
QA$K_LOOP_ON_TEST               =   00000002    D
QA$K_LOOP_TEST_DONE             =   00000004    D
QA$K_MEMORY_MANAGE              =   0000000D    D
QA$K_MULTIPLE_PASS              =   00000001    D
QA$K_NODEF                      =   00000000    D
QA$K_NORMAL_START               =   00000000    D
QA$K_NO_HEADER                  =   00000006    D
QA$K_NUMBER_OF_CHECKS           =   0000000F    D
QA$K_NUMBER_QA_FLAGS            =   00000008    D
QA$K_NUMB_ROUTINE_STATES        =   00000004    D
QA$K_QA_DEBUG                   =   00000001    D
QA$K_QA_DONE                    =   00000002    D
QA$K_RUN_BACKWARDS              =   00000004    D
QA$K_SECTION                    =   00000008    D
QA$K_SUCCESS                    =   00000001    D
QA$MAIN                             ********    X   03
QA$V_CHECK_DONE                 =   00000003    D
QA$V_DOING_CLEANUP              =   00000002    D
QA$V_ERROR_FOUND                =   00000001    D
QA$V_INIT_DONE                  =   00000000    D
RBGNSUBX                            000000B2 R  D   03
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RCKLOOPX                    00000263 R  D  03
RESCAPEX                    00000014 R  D  03
SIZ...                    = 00000001    D
TRUE                      = 00000001    D
VRRESTART                   ********   X   03

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                                        ! Psect synopsis !
                                        +----------------+

PSECT name                  Allocation          PSECT No.  Attributes
----------                  ----------          ---------  ----------
.  ABS  .                   00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                       0000FE70  (65136.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
DATA                        000000A4  (  164.)  02 (  2.)  NOPIC   USR   CON   REL   LCL   SHR NOEXE   RD  NOWRT NOVEC BYTE
CODE                        0000028B  (  651.)  03 (  3.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD  NOWRT NOVEC BYTE
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$N	=00000005	468 (2)	277 (1) 443 (2) 468 (2)
$ER	=00000003	473 (2)	#-282 (1) #-473 (2)
$MODULE	00000000-R	140 (1)	282 (1) 473 (2)
APC$_ABORT	=00000006	128 (1)	
APC$_CONTINUE	=00000009	128 (1)	
APC$_DUMP	=00000003	128 (1)	
APC$_NOP	=00000000	128 (1)	
APC$_START	=00000005	128 (1)	
APC$_ZERO	=00000004	128 (1)	
APM$_ABTDON	=00000006	128 (1)	
APM$_DEVERR	=00000002	128 (1)	
APM$_DONE	=0000000A	128 (1)	#-451 (2)
APM$_EXCEPT	=0000000B	128 (1)	
APM$_HARDERR	=00000003	128 (1)	
APM$_MORE	=00000008	128 (1)	
APM$_NOMES	=00000000	128 (1)	
APM$_PREPERR	=0000000C	128 (1)	
APM$_PRGERR	=00000005	128 (1)	
APM$_SOFTERR	=00000004	128 (1)	
APM$_SPOOL	=00000009	128 (1)	
APM$_SYSERR	=00000001	128 (1)	
BEGIN	00000000-XR		457 (2)
BIT...	=00000004	132 (1)	126 (1) 129 (1) 130 (1) 131 (1)
			132 (1)
BPTCODE	=00000003	124 (1)	#-286 (1) #-486 (2)
DS$AA_BPTADDR	00000000-XR		#-284 (1) #-483 (2)
DS$AB_BPTINST	00000000-XR		#-285 (1) #-485 (2)
DS$GA_CHKLPPC	00000000-XR		#-540 (2) #-543 (2) #-546 (2)
DS$GA_LOOPADR	00000000-XR		#-259 (1) #-412 (2)
DS$GL_ERRCNT	00000000-XR		#-443 (2)
DS$GL_FLAGS	00000000-XR		189 (1) 247 (1) 249 (1) 281 (1)
			370 (2) 373 (2) 413 (2) 424 (2)
			449 (2) 472 (2) 539 (2) 586 (3)
DS$GL_LSTTEST	00000000-XR		#-382 (2)
DS$GL_SUBTEST	00000000-XR		#-380 (2)
DS$K_BBC	=0000001D	131 (1)	
DS$K_BBCC	=00000021	131 (1)	
DS$K_BBCCI	=00000023	131 (1)	
DS$K_BBCS	=0000001F	131 (1)	
DS$K_BBS	=0000001C	131 (1)	
DS$K_BBSC	=00000020	131 (1)	
DS$K_BBSS	=0000001E	131 (1)	
DS$K_BBSSI	=00000022	131 (1)	
DS$K_BCC_M	=0000001B	131 (1)	
DS$K_BCS_M	=0000001A	131 (1)	
DS$K_BEQLU_B	=00000005	131 (1)	
DS$K_BEQLU_M	=00000011	131 (1)	
DS$K_BEQL_B	=00000004	131 (1)	
DS$K_BEQL_M	=00000010	131 (1)	
DS$K_BERROR	=00000026	131 (1)	

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DS$K_BGEQU_B                    =00000007     131     (1)
DS$K_BGEQU_M                    =00000013     131     (1)
DS$K_BGEQ_B                     =00000006     131     (1)
DS$K_BGEQ_M                     =00000012     131     (1)
DS$K_BGTRU_B                    =00000009     131     (1)
DS$K_BGTRU_M                    =00000015     131     (1)
DS$K_BGTR_B                     =00000008     131     (1)
DS$K_BGTR_M                     =00000014     131     (1)
DS$K_BLBC                       =00000025     131     (1)       131     (1)
DS$K_BLBS                       =00000024     131     (1)
DS$K_BLEQU_B                    =00000003     131     (1)
DS$K_BLEQU_M                    =0000000F     131     (1)
DS$K_BLEQ_B                     =00000002     131     (1)
DS$K_BLEQ_M                     =0000000E     131     (1)
DS$K_BLSSU_B                    =00000001     131     (1)
DS$K_BLSSU_M                    =0000000D     131     (1)
DS$K_BLSS_B                     =00000000     131     (1)       131     (1)
DS$K_BLSS_M                     =0000000C     131     (1)
DS$K_BNEQU_B                    =0000000B     131     (1)
DS$K_BNEQU_M                    =00000017     131     (1)
DS$K_BNEQ_B                     =0000000A     131     (1)
DS$K_BNEQ_M                     =00000016     131     (1)
DS$K_BNERROR                    =00000027     131     (1)
DS$K_BVC_M                      =00000019     131     (1)
DS$K_BVS_M                      =00000018     131     (1)
DS$K_DS_STARTING_LOCATION       =00010000     131     (1)
DS$K_ERROR                      =00000002     126     (1)
DS$K_NORMAL                     =00000001     126     (1)
DS$K_PRINTB                     =00000002     132     (1)
DS$K_PRINTF                     =00000001     132     (1)     #-277     (1)     #-443     (2)     #-468     (2)
DS$K_PRINTI                     =00000000     132     (1)
DS$K_PRINTX                     =00000003     132     (1)
DS$K_SEVERE                     =00000004     126     (1)
DS$K_SUBSYS                     =00000066     126     (1)       126     (1)
DS$K_TYPE_ABORT_PROGRAM         =00000014     132     (1)
DS$K_TYPE_ABORT_TEST            =00000013     132     (1)
DS$K_TYPE_COMMAND_ERR           =00000015     132     (1)
DS$K_TYPE_COMMAND_OUT           =00000016     132     (1)
DS$K_TYPE_CRD_AUTOTEST          =0000001A     132     (1)
DS$K_TYPE_DS_PROMPT             =00000001     132     (1)
DS$K_TYPE_DS_START              =0000001D     132     (1)
DS$K_TYPE_ERRDEV                =00000008     132     (1)
DS$K_TYPE_ERRHARD               =00000006     132     (1)
DS$K_TYPE_ERROR_BODY            =00000009     132     (1)
DS$K_TYPE_ERROR_END             =0000000A     132     (1)
DS$K_TYPE_ERRPREP               =0000001B     132     (1)
DS$K_TYPE_ERRSOFT               =00000007     132     (1)
DS$K_TYPE_ERRSUP                =00000004     132     (1)
DS$K_TYPE_ERRSYS                =00000005     132     (1)
DS$K_TYPE_ERR_HALT              =0000000D     132     (1)
DS$K_TYPE_EXCEPTION             =0000000C     132     (1)
DS$K_TYPE_EXCEPTION_HEAD        =0000000B     132     (1)
DS$K_TYPE_FIRST_PASS            =00000011     132     (1)
DS$K_TYPE_GENERAL               =00000000     132     (1)
DS$K_TYPE_GENERAL_ERROR         =00000003     132     (1)
DS$K_TYPE_NO_TESTS              =00000012     132     (1)
DS$K_TYPE_PARAM_ERROR           =0000001C     132     (1)
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DS$K_TYPE_PROGRAM_END           =00000010     132     (1)     #-443     (2)
DS$K_TYPE_PROGRAM_INFO          =00000017     132     (1)
DS$K_TYPE_PROGRAM_START         =0000000F     132     (1)
DS$K_TYPE_QIO_INVADP            =00000024     132     (1)
DS$K_TYPE_QIO_NODRIVER          =00000022     132     (1)
DS$K_TYPE_QIO_WRONGVER          =00000023     132     (1)
DS$K_TYPE_SCRIPT_ECHO           =00000021     132     (1)
DS$K_TYPE_SCRIPT_PNF            =0000001E     132     (1)
DS$K_TYPE_SCRIPT_PROMPT         =00000020     132     (1)
DS$K_TYPE_SCRIPT_SKIP           =0000001F     132     (1)
DS$K_TYPE_SEQUENCE_ERROR        =00000019     132     (1)     #-277     (1)     #-468     (2)
DS$K_TYPE_START_ERR             =00000018     132     (1)
DS$K_TYPE_START_LIST            =00000025     132     (1)
DS$K_TYPE_SUMMARY               =0000000E     132     (1)
DS$K_TYPE_USER_PROMPT           =00000002     132     (1)
DS$K_WARNING                    =00000000     126     (1)
DS$M_ABRTFLG                    =00000040     129     (1)
DS$M_BADTIME                    =00100000     129     (1)
DS$M_BATCH                      =00400000     129     (1)
DS$M_BRKCLR                     =00001000     129     (1)
DS$M_BRKPT                      =00000800     129     (1)
DS$M_CHARFLG                    =00000100     129     (1)
DS$M_CMDFLG                     =00000080     129     (1)
DS$M_CTRLC                      =00000001     129     (1)
DS$M_CTRLO                      =00010000     129     (1)
DS$M_DEVFLG                     =00000200     129     (1)
DS$M_DISABLCC                   =01000000     129     (1)
DS$M_DONFLG                     =00002000     129     (1)
DS$M_ERRFLG                     =00000010     129     (1)
DS$M_EXCEPT                     =00080000     129     (1)
DS$M_EXETST                     =00040000     129     (1)
DS$M_HLTFLG                     =00000008     129     (1)
DS$M_LODFLG                     =00000002     129     (1)
DS$M_MEMMGT                     =00008000     129     (1)
DS$M_NI                         =04000000     129     (1)
DS$M_OUTPUT                     =00800000     129     (1)
DS$M_RUBFLG                     =00000020     129     (1)
DS$M_SCRIPT                     =00200000     129     (1)
DS$M_SETIMR                     =02000000     129     (1)
DS$M_STRFLG                     =00000004     129     (1)
DS$M_SUBT                       =00004000     129     (1)
DS$M_SYSFLG                     =00000400     129     (1)
DS$M_TIMED                      =02000000     129     (1)
DS$M_TIMED_OUT                  =08000000     129     (1)
DS$M_TIMRON                     =00020000     129     (1)
DS$SUMMARY                       00000000-XR                    446     (2)
DS$V_ABRTFLG                    =00000006     129     (1)
DS$V_BADTIME                    =00000014     129     (1)
DS$V_BATCH                      =00000016     129     (1)
DS$V_BRKCLR                     =0000000C     129     (1)
DS$V_BRKPT                      =0000000B     129     (1)
DS$V_CHARFLG                    =00000008     129     (1)
DS$V_CMDFLG                     =00000007     129     (1)     #-280     (1)     #-425     (2)     #-471     (2)
DS$V_CTRLC                      =00000000     129     (1)
DS$V_CTRLO                      =00000010     129     (1)     #-427     (2)     #-449     (2)
DS$V_DEVFLG                     =00000009     129     (1)
DS$V_DISABLCC                   =00000018     129     (1)
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DS$V_DONFLG                     =0000000D     129     (1)
DS$V_ERRFLG                     =00000004     129     (1)     #-189     (1)     #-249     (1)     #-373     (2)     #-539     (2)
                                                              #-586     (3)
DS$V_EXCEPT                     =00000013     129     (1)
DS$V_EXETST                     =00000012     129     (1)
DS$V_HLTFLG                     =00000003     129     (1)
DS$V_LODFLG                     =00000001     129     (1)
DS$V_MEMMGT                     =0000000F     129     (1)
DS$V_NI                         =0000001A     129     (1)
DS$V_OUTPUT                     =00000017     129     (1)
DS$V_RUBFLG                     =00000005     129     (1)
DS$V_SCRIPT                     =00000015     129     (1)
DS$V_SETIMR                     =00000019     129     (1)
DS$V_STRFLG                     =00000002     129     (1)
DS$V_SUBT                       =0000000E     129     (1)     #-246     (1)     #-369     (2)     #-413     (2)
DS$V_SYSFLG                     =0000000A     129     (1)
DS$V_TIMED                      =00000019     129     (1)
DS$V_TIMED_OUT                  =0000001B     129     (1)
DS$V_TIMRON                     =00000011     129     (1)
DS$_AP_NORMAL_BREAK             =00660150     126     (1)
DS$_ARITH                       =006600D0     126     (1)
DS$_ASBE                        =00660118     126     (1)
DS$_BADLINK                     =006600F0     126     (1)
DS$_BADTYPE                     =006600E8     126     (1)
DS$_BIIC                        =00660120     126     (1)
DS$_CHME                        =006600A8     126     (1)
DS$_CHMK                        =006600E0     126     (1)
DS$_DEVNAME                     =00660108     126     (1)
DS$_ERROR                       =00660002     126     (1)     #-584     (3)
DS$_FHWE                        =00660068     126     (1)
DS$_FRAGBUF                     =00660080     126     (1)
DS$_ICBUSY                      =006600C8     126     (1)
DS$_ICERR                       =006600C0     126     (1)
DS$_IHWE                        =00660060     126     (1)
DS$_ILLCHAR                     =00660018     126     (1)
DS$_ILLPAGCNT                   =00660078     126     (1)
DS$_ILLUNIT                     =00660100     126     (1)
DS$_INIT_FAIL                   =00660140     126     (1)
DS$_INSFMEM                     =00660050     126     (1)
DS$_INVCPU                      =00660130     126     (1)
DS$_IPL2HI                      =006600B8     126     (1)
DS$_IVADDR                      =00660040     126     (1)
DS$_IVVECT                      =00660038     126     (1)
DS$_KRNLSTK                     =00660090     126     (1)
DS$_LOGIC                       =00660070     126     (1)
DS$_MCHK                        =00660088     126     (1)
DS$_MEM_ALLOC_ERR               =00660138     126     (1)
DS$_MMOFF                       =00660058     126     (1)
DS$_NEEDUNIT                    =006600F8     126     (1)
DS$_NODE                        =00660128     126     (1)
DS$_NOPCS                       =00660110     126     (1)
DS$_NORMAL                      =00660001     126     (1)     #-589     (3)
DS$_NOSUPPORT                   =006600B1     126     (1)
DS$_NOTALLOWMP                  =00660148     126     (1)
DS$_NOTDON                      =00660030     126     (1)
DS$_NOTIMP                      =006600B0     126     (1)       126     (1)
DS$_NULLSTR                     =00660010     126     (1)
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DS$_OVERFLOW                    =00660008      126     (1)
DS$_POWER                       =00660098      126     (1)
DS$_PROGERR                     =00660020      126     (1)
DS$_SEVERE                      =00660004      126     (1)
DS$_TRANSL                      =006600A0      126     (1)
DS$_TRUNCATE                    =00660028      126     (1)
DS$_UNEXPINT                    =006600D8      126     (1)
DS$_UNSUPPDEV                   =00660158      126     (1)
DS$_VASFULL                     =00660048      126     (1)
DS$_WARNING                     =00660000      126     (1)      126     (1)
DSA$GL_FLAGS                     0000FE00                       279     (1)      372     (2)      430     (2)      453     (2)
                                                                470     (2)      538     (2)      588     (3)
DSA$GL_MSGTYP                    0000FE40                     #-452     (2)
DSA$GL_PASSES                    0000FE08                     #-392     (2)    #-399     (2)
DSA$GL_PASSNO                    0000FE54                       391     (2)    #-443     (2)
DSA$GL_SUBTNO                    0000FE4C                     #-277     (1)    #-295     (1)    #-359     (2)    #-443     (2)
                                                              #-468     (2)    #-488     (2)
DSA$GL_TESTNO                    0000FE50                     #-262     (1)    #-277     (1)    #-288     (1)    #-357     (2)
                                                              #-443     (2)    #-468     (2)    #-487     (2)
DSA$V_HALT                      =00000000                    #-279     (1)    #-470     (2)
DSA$V_LOOP                      =00000002                    #-371     (2)    #-537     (2)    #-587     (3)
DSA$V_QA                        =0000000F                    #-430     (2)    #-453     (2)
DSQA$K_DISPAT_AFTER_INIT        =00000014      130     (1)
DSQA$K_DISPAT_BEFORE_INIT       =00000013      130     (1)
DSQA$K_DISPAT_CALLTEST          =00000015      130     (1)
DSQA$K_DISPAT_DONE_TESTS        =00000018      130     (1)
DSQA$K_DISPAT_DSX$ENDPASS_BGN   =00000001      130     (1)
DSQA$K_DISPAT_DSX$ENDPASS_END   =00000002      130     (1)
DSQA$K_DISPAT_DSX$ENDPASS_MID   =00000000      130     (1)
DSQA$K_DISPAT_DS_CLEANUP_BGN    =00000003      130     (1)
DSQA$K_DISPAT_DS_CLEANUP_END    =00000004      130     (1)
DSQA$K_DUMMY_1                  =00000007      130     (1)
DSQA$K_ERROR_ERROR_BGN          =00000006      130     (1)
DSQA$K_ERROR_ERROR_END          =00000005      130     (1)
DSQA$K_KERNEL_INIT_CONTEXT      =00000008      130     (1)
DSQA$K_LOOP_DSX$BGNSUB          =00000009      130     (1)    #-244     (1)
DSQA$K_LOOP_DSX$CKLOOP          =0000000B      130     (1)    #-534     (2)
DSQA$K_LOOP_DSX$ENDSUB          =0000000A      130     (1)    #-348     (2)
DSQA$K_PARAM_DSX$GETADDRESS     =0000000E      130     (1)
DSQA$K_PARAM_DSX$GETDATA        =0000000C      130     (1)
DSQA$K_PARAM_DSX$GETLOGICAL     =0000000F      130     (1)
DSQA$K_PARAM_DSX$GETSTRING      =00000010      130     (1)
DSQA$K_PARAM_DSX$GETVIELD       =0000000D      130     (1)
DSQA$K_QA_DSX$BRANCH            =00000011      130     (1)
DSQA$K_START_BEFORE_HEADER      =00000017      130     (1)
DSQA$K_START_VRRESTART          =00000012      130     (1)
DSQA$K_START_VRSTART            =00000016      130     (1)
DSX$BGNSUB                       00000015-R    242     (1)
DSX$CKLOOP                       00000224-R    532     (2)
DSX$ENDSUB                       000000B3-R    346     (2)
DSX$ESCAPE                       00000000-R    186     (1)
DSX$INLOOP                       00000264-R    581     (3)
DSX$PRINT                        00000000-XR                  277     (1)      443     (2)      468     (2)
DS_CLEANUP                       00000000-XR                  447     (2)
DS_ERRSUP                        00000000-XR                  282     (1)      473     (2)
FALSE                           =00000000      131     (1)
FMTLOOPDON                       0000004F-R    145     (1)      443     (2)
```

```
FMTSEQERR                       00000005-R   142  (1)      277  (1)      468  (2)
INIT_CONTEXT                    00000000-XR               445  (2)
KB_CHECK                        00000000-XR               188  (1)      296  (1)      349  (2)      536  (2)
                                                          583  (3)
OFF                             =00000000    131  (1)
ON                              =00000001    131  (1)
QA$AOB_CHECK_STATE               00000000-XR              432  (2)
QA$K_ABORT_NOW                  =00000007    131  (1)
QA$K_APT_PHASE_ONE              =0000000B    131  (1)
QA$K_APT_PHASE_TWO              =0000000C    131  (1)
QA$K_BAD_ADDRESS                =00000009    131  (1)
QA$K_CONTROL_C_CONT             =0000000A    131  (1)
QA$K_DEALLOCATION               =0000000E    131  (1)
QA$K_ERROR_PHASE_ONE            =00000005    131  (1)
QA$K_ERROR_PHASE_THREE          =00000007    131  (1)
QA$K_ERROR_PHASE_TWO            =00000006    131  (1)
QA$K_FAILURE                    =00000000    131  (1)
QA$K_FIRST_BRANCH_CODE          =00000000    131  (1)
QA$K_FIRST_TIME                 =00000005    131  (1)
QA$K_INIT_CONTEXT_DONE          =00000003    131  (1)
QA$K_LAST_BRANCH_CODE           =00000025    131  (1)
QA$K_LOOP_ON_SUBTEST            =00000003    131  (1)  #-431    (2)
QA$K_LOOP_ON_TEST               =00000002    131  (1)
QA$K_LOOP_TEST_DONE             =00000004    131  (1)
QA$K_MEMORY_MANAGE              =0000000D    131  (1)
QA$K_MULTIPLE_PASS              =00000001    131  (1)
QA$K_NODEF                      =00000000    131  (1)
QA$K_NORMAL_START               =00000000    131  (1)
QA$K_NO_HEADER                  =00000006    131  (1)
QA$K_NUMBER_OF_CHECKS           =0000000F    131  (1)
QA$K_NUMBER_QA_FLAGS            =00000008    131  (1)
QA$K_NUMB_ROUTINE_STATES        =00000004    131  (1)
QA$K_QA_DEBUG                   =00000001    131  (1)
QA$K_QA_DONE                    =00000002    131  (1)
QA$K_RUN_BACKWARDS              =00000004    131  (1)
QA$K_SECTION                    =00000008    131  (1)
QA$K_SUCCESS                    =00000001    131  (1)
QA$MAIN                          00000000-XR              244  (1)      348  (2)      534  (2)
QA$V_CHECK_DONE                 =00000003    131  (1)
QA$V_DOING_CLEANUP              =00000002    131  (1)
QA$V_ERROR_FOUND                =00000001    131  (1)
QA$V_INIT_DONE                  =00000000    131  (1)
RBGNSUBX                         000000B2-R  298  (1)
RCKLOOPX                         00000263-R  549  (2)  #-538    (2)  #-539    (2)  #-544    (2)
RESCAPEX                         00000014-R  192  (1)  #-189    (1)
SIZ...                          =00000001    129  (1)    129    (1)
TRUE                            =00000001    131  (1)
VRRESTART                        00000000-XR             #-454    (2)
```

+-------------------------+
! Performance indicators !
+-------------------------+

Phase	Page faults	CPU Time	Elapsed Time
Initialization	22	00:00:00.02	00:00:00.19
Command processing	894	00:00:00.24	00:00:02.35

```
ZZ-ECSAA-10.11  VAX-11 Macro Run Statistics                    3-MAY-1988       Fiche 12 Frame C14        Sequence 2437
LOOP                          *** LOOP Loop control              21-MAR-1988 17:55:03  VAX/VMS Macro V04-00        Page  32
VAX-11 Macro Run Statistics                                       3-JAN-1985 16:52:39  LOOP.MAR;1                  (3)

Pass 1                                726     00:00:02.14    00:00:04.59
Symbol table sort                       0     00:00:00.10    00:00:00.10
Pass 2                                 30     00:00:00.55    00:00:01.10
Symbol table output                     2     00:00:00.05    00:00:00.16
Psect synopsis output                   2     00:00:00.00    00:00:00.00
Cross-reference output                  6     00:00:00.22    00:00:00.41
Assembler run totals                 1684     00:00:03.32    00:00:08.90

The working set limit was 2400 pages.
135589 bytes (265 pages) of virtual memory were used to buffer the intermediate code.
There were 30 pages of symbol table space allocated to hold 401 non-local and 22 local symbols.
594 source lines were read in Pass 1, producing 54 object records in Pass 2.
44 pages of virtual memory were used to define 31 macros.

                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                       Macros defined
------------------                       --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              7
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1               15
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       6
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                28

591 GETS were required to define 28 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1)   66   MASSBUS ADAPTER INTERRUPT DISPATCHER
(1)   152   MASSBUS ADAPTER INITIALIZATION

```
                     0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element MBAINT.MAR
                     0000     2 ; *1     6-FEB-1986 15:19:30 DS ""
                     0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element MBAINT.MAR
                     0000     4         .TITLE  MBAINT - MASSBUS ADAPTER INTERRUPT DISPATCHER
                     0000     5         .IDENT  /01/
                00000000     6         .PSECT  SEP, SHR, WRT, EXE, LONG
                     0000     7
                     0000     8 ;
                     0000     9 ;*****************************************************************************
                     0000    10 ;*                                                                           *
                     0000    11 ;*  COPYRIGHT (c) 1977, 1978, 1979, 1980                                     *
                     0000    12 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
                     0000    13 ;*                                                                           *
                     0000    14 ;*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND  COPIED   *
                     0000    15 ;*  ONLY  IN  ACCORDANCE  WITH  THE  TERMS  OF  SUCH  LICENSE AND WITH THE  *
                     0000    16 ;*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE OR  ANY  OTHER    *
                     0000    17 ;*  COPIES  THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY    *
                     0000    18 ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE  IS  HEREBY    *
                     0000    19 ;*  TRANSFERRED.                                                             *
                     0000    20 ;*                                                                           *
                     0000    21 ;*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE    *
                     0000    22 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT   *
                     0000    23 ;*  CORPORATION.                                                             *
                     0000    24 ;*                                                                           *
                     0000    25 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS   *
                     0000    26 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
                     0000    27 ;*                                                                           *
                     0000    28 ;*****************************************************************************
                     0000    29 ;
                     0000    30 ; D. N. CUTLER 30-JAN-77
                     0000    31 ;
                     0000    32 ; MASSBUS ADAPTER INTERRUPT DISPATCHER
                     0000    33 ; R. S. RIGGS  14-Jun-1980 Minor mods to accomodate SUPERVISOR
                     0000    34 ;
                     0000    35 ; MASSBUS ADAPTER INTERRUPT DISPATCHER
                     0000    36 ;
                     0000    37 ; MODIFIED BY:
                     0000    38 ;
                     0000    39 ;       V03     RLR0001         Robert L. Rappaport     15-NOV-1979
                     0000    40 ;               Changed attention summary bit clearing logic to allow
                     0000    41 ;               support of TM78 Tape Controller.  Specifically, for
                     0000    42 ;               all MASSBUS multi-device controllers (currently TM03
                     0000    43 ;               and TM78), the responsibility for clearing the attention
                     0000    44 ;               summary bit for the device has been removed from this
                     0000    45 ;               module and placed in the individual Device Drivers.
                     0000    46 ;               For MASSBUS single device controllers (DISKS) the
                     0000    47 ;               logic remains as it was.  That is the attention summary
                     0000    48 ;               bit is cleared here before dispatching to the specific Driver.
                     0000    49 ;
                     0000    50 ;
                     0000    51 ;       V02     NPK0001         N. KRONENBERG           4-NOV-1979
                     0000    52 ;               ADDED CHECK FOR CBHUNG ON MBA INTERRUPT
                     0000    53 ;
```

```
                        0000     55 ;
                        0000     56 ; MACRO LIBRARY CALLS
                        0000     57 ;
                        0000     58
                        0000     59          $ADPDEF                                 ;DEFINE ADP OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .IIF    NB,ADP$L_CSR,   ADP$L_CSR:
                00000004 0000                        .BLKL   1
                        0004                 .IIF    NB,ADP$L_LINK,  ADP$L_LINK:
                00000008 0004                        .BLKL   1
                        0008                 .IIF    NB,ADP$W_SIZE,  ADP$W_SIZE:
                0000000A 0008                        .BLKW   1
                        000A                 .IIF    NB,ADP$B_TYPE,  ADP$B_TYPE:
                0000000B 000A                        .BLKB   1
                        000B                 .IIF    NB,ADP$B_NUMBER,        ADP$B_NUMBER:
                0000000C 000B                        .BLKB   1
                        000C                 .IIF    NB,ADP$W_TR,    ADP$W_TR:
                0000000E 000C                        .BLKW   1
                        000E                 .IIF    NB,ADP$W_ADPTYPE,       ADP$W_ADPTYPE:
                00000010 000E                        .BLKW   1
                        0010                 .IIF    NB,ADP$L_VECTOR,        ADP$L_VECTOR:
                        0010                 .IIF    NB,ADP$L_CRB,   ADP$L_CRB:
                00000014 0010                        .BLKL   1
                        0014                 .IIF    NB,ADP$C_MBAADPLEN,     ADP$C_MBAADPLEN:
                        0014                 .IIF    NB,ADP$K_MBAADPLEN,     ADP$K_MBAADPLEN:
                        0014                 .IIF    NB,ADP$C_DRADPLEN,      ADP$C_DRADPLEN:
                        0014                 .IIF    NB,ADP$K_DRADPLEN,      ADP$K_DRADPLEN:
                        0014                 .IIF    NB,ADP$L_DPQFL, ADP$L_DPQFL:
                        0014                 .IIF    NB,ADP$L_PRQQFL,        ADP$L_PRQQFL:
                00000018 0014                        .BLKL   1
                        0018                 .IIF    NB,ADP$L_DPQBL, ADP$L_DPQBL:
                        0018                 .IIF    NB,ADP$L_PRQQBL,        ADP$L_PRQQBL:
                0000001C 0018                        .BLKL   1
                        001C                 .IIF    NB,ADP$L_MRQFL, ADP$L_MRQFL:
                        001C                 .IIF    NB,ADP$L_SMB,   ADP$L_SMB:
                00000020 001C                        .BLKL   1
                        0020                 .IIF    NB,ADP$L_MRQBL, ADP$L_MRQBL:
                        0020                 .IIF    NB,ADP$B_PORT,  ADP$B_PORT:
                00000021 0020                        .BLKB   1
                00000024 0021                        .BLKB   3
                        0024                 .IIF    NB,ADP$W_DPBITMAP,      ADP$W_DPBITMAP:
                00000026 0024                        .BLKW   1
                        0026                 .IIF    NB,ADP$W_MRBITMAP,      ADP$W_MRBITMAP:
                00000064 0026                        .BLKW   31
                        0064                 .IIF    NB,ADP$L_INTD,  ADP$L_INTD:
                00000070 0064                        .BLKL   3
                        0070                 .IIF    NB,ADP$C_MPMADPLEN,     ADP$C_MPMADPLEN:
                        0070                 .IIF    NB,ADP$K_MPMADPLEN,     ADP$K_MPMADPLEN:
                        0070                 .IIF    NB,ADP$C_UBAADPLEN,     ADP$C_UBAADPLEN:
                        0070                 .IIF    NB,ADP$K_UBAADPLEN,     ADP$K_UBAADPLEN:
                00000000                     .RESTORE
                        0000     60          $DDBDEF                                 ;DEFINE DDB OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 0070                .=0
                        0000                 .IIF    NB,DDB$L_LINK,  DDB$L_LINK:
                00000004 0000                        .BLKL   1
```

```
                     0004                .IIF    NB,DDB$L_UCB,   DDB$L_UCB:
          00000008   0004                        .BLKL   1
                     0008                .IIF    NB,DDB$W_SIZE,  DDB$W_SIZE:
          0000000A   0008                        .BLKW   1
                     000A                .IIF    NB,DDB$B_TYPE,  DDB$B_TYPE:
          0000000B   000A                        .BLKB   1
          0000000C   000B                        .BLKB   1
                     000C                .IIF    NB,DDB$L_DDT,   DDB$L_DDT:
          00000010   000C                        .BLKL   1
                     0010                .IIF    NB,DDB$L_ACPD,  DDB$L_ACPD:
          00000013   0010                        .BLKB   3
                     0013                .IIF    NB,DDB$B_ACPCLASS,      DDB$B_ACPCLASS:
          00000014   0013                        .BLKB   1
                     0014                .IIF    NB,DDB$T_NAME,  DDB$T_NAME:
          00000015   0014                        .BLKB   1
          00000024   0015                        .BLKB   15
                     0024                .IIF    NB,DDB$T_DRVNAME,       DDB$T_DRVNAME:
          00000025   0024                        .BLKB   1
          00000034   0025                        .BLKB   15
                     0034                .IIF    NB,DDB$C_LENGTH,        DDB$C_LENGTH:
                     0034                .IIF    NB,DDB$K_LENGTH,        DDB$K_LENGTH:
                00000000                 .RESTORE
                     0000          61    $DDTDEF                         ;DEFINE DDT OFFSETS
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
          00000000   0070                .=0
                     0000                .IIF    NB,DDT$L_START, DDT$L_START:
          00000004   0000                        .BLKL   1
                     0004                .IIF    NB,DDT$L_UNSOLINT,      DDT$L_UNSOLINT:
          00000008   0004                        .BLKL   1
                     0008                .IIF    NB,DDT$L_FDT,   DDT$L_FDT:
          0000000C   0008                        .BLKL   1
                     000C                .IIF    NB,DDT$L_CANCEL,        DDT$L_CANCEL:
          00000010   000C                        .BLKL   1
                     0010                .IIF    NB,DDT$L_REGDUMP,       DDT$L_REGDUMP:
          00000014   0010                        .BLKL   1
                     0014                .IIF    NB,DDT$W_DIAGBUF,       DDT$W_DIAGBUF:
          00000016   0014                        .BLKW   1
                     0016                .IIF    NB,DDT$W_ERRORBUF,      DDT$W_ERRORBUF:
          00000018   0016                        .BLKW   1
                     0018                .IIF    NB,DDT$L_UNITINIT,      DDT$L_UNITINIT:
          0000001C   0018                        .BLKL   1
                     001C                .IIF    NB,DDT$L_ALTSTART,      DDT$L_ALTSTART:
          00000020   001C                        .BLKL   1
                00000000                 .RESTORE
                     0000          62    $MBADEF                         ;DEFINE MBA REGISTER OFFSETS
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
          00000000   0070                .=0
                00000000                 .RESTORE
                     0000          63    $IDBDEF                         ;DEFINE IDB OFFSETS
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
          00000000   0070                .=0
                     0000                .IIF    NB,IDB$L_CSR,   IDB$L_CSR:
          00000004   0000                        .BLKL   1
                     0004                .IIF    NB,IDB$L_OWNER, IDB$L_OWNER:
```

```
00000008  0004                          .BLKL   1
          0008              .IIF    NB,IDB$W_SIZE,  IDB$W_SIZE:
0000000A  0008                          .BLKW   1
          000A              .IIF    NB,IDB$B_TYPE,  IDB$B_TYPE:
0000000B  000A                          .BLKB   1
0000000C  000B                          .BLKB   1
          000C              .IIF    NB,IDB$W_UNITS, IDB$W_UNITS:
0000000E  000C                          .BLKW   1
00000010  000E                          .BLKW   1
          0010              .IIF    NB,IDB$L_ADP,   IDB$L_ADP:
00000014  0010                          .BLKL   1
          0014              .IIF    NB,IDB$L_UCBLST,        IDB$L_UCBLST:
00000034  0014                          .BLKL   8
          0034              .IIF    NB,IDB$C_LENGTH,        IDB$C_LENGTH:
          0034              .IIF    NB,IDB$K_LENGTH,        IDB$K_LENGTH:
      00000000              .RESTORE
          0000      64      $UCBDEF                         ;DEFINE UCB OFFSETS
          0000              .SAVE   LOCAL_BLOCK
          0000              .PSECT  $ABS$,ABS
00000000  0070              .=0
          0000              .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
          0000              .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
00000004  0000                          .BLKL   1
          0004              .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
          0004              .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
00000008  0004                          .BLKL   1
          0008              .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
0000000A  0008                          .BLKW   1
          000A              .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
0000000B  000A                          .BLKB   1
          000B              .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
0000000C  000B                          .BLKB   1
          000C              .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
          000C              .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
          000C              .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
0000000D  000C                          .BLKB   1
00000010  000D                          .BLKB   3
          0010              .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
          0010              .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
00000014  0010                          .BLKL   1
          0014              .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
          0014              .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
          0014              .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
00000016  0014                          .BLKW   1
          0016              .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
00000018  0016                          .BLKW   1
          0018              .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
          0018              .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
0000001A  0018                          .BLKW   1
          001A              .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
          001A              .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
0000001C  001A                          .BLKW   1
          001C              .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
00000020  001C                          .BLKL   1
          0020              .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
00000024  0020                          .BLKL   1
          0024              .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
```

```
00000028  0024                                  .BLKL   1
          0028                  .IIF    NB,UCB$L_PID,   UCB$L_PID:
0000002C  0028                                  .BLKL   1
          002C                  .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
00000030  002C                                  .BLKL   1
          0030                  .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
00000034  0030                                  .BLKL   1
          0034                  .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
00000038  0034                                  .BLKL   1
          0038                  .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
00000039  0038                                  .BLKB   1
          0039                  .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
0000003A  0039                                  .BLKB   1
          003A                  .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
0000003C  003A                                  .BLKW   1
          003C                  .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
          003C                  .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
          003C                  .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
0000003D  003C                                  .BLKB   1
          003D                  .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
          003D                  .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
0000003E  003D                                  .BLKB   1
          003E                  .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
          003E                  .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
0000003F  003E                                  .BLKB   1
          003F                  .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
00000040  003F                                  .BLKB   1
          0040                  .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
00000044  0040                                  .BLKL   1
          0044                  .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
00000048  0044                                  .BLKL   1
          0048                  .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
0000004A  0048                                  .BLKW   1
          004A                  .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
          004A                  .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
0000004B  004A                                  .BLKB   1
          004B                  .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
0000004C  004B                                  .BLKB   1
          004C                  .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
00000050  004C                                  .BLKL   1
          0050                  .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
00000052  0050                                  .BLKW   1
          0052                  .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
          0052                  .IIF    NB,UCB$B_STATE, UCB$B_STATE:
00000053  0052                                  .BLKB   1
          0053                  .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
00000054  0053                                  .BLKB   1
          0054                  .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
00000058  0054                                  .BLKL   1
          0058                  .IIF    NB,UCB$W_STS,   UCB$W_STS:
0000005A  0058                                  .BLKW   1
          005A                  .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
0000005C  005A                                  .BLKW   1
          005C                  .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
          005C                  .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
00000060  005C                                  .BLKL   1
          0060                  .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
```

```
00000064  0060                                  .BLKL   1
          0064                  .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
          0064                  .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
00000068  0064                                  .BLKL   1
          0068                  .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
0000006C  0068                                  .BLKL   1
          006C                  .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
0000006E  006C                                  .BLKW   1
          006E                  .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
00000070  006E                                  .BLKW   1
          0070                  .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
00000071  0070                                  .BLKB   1
          0071                  .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
00000072  0071                                  .BLKB   1
          0072                  .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074  0072                                  .BLKW   1
          0074                  .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
          0074                  .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000  0074                  . = 0
          0000                  .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002  0000                                  .BLKW   1
00000074  0002                  . = 116
          0074                  .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078  0074                                  .BLKL   1
          0078                  .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C  0078                                  .BLKL   1
          007C                  .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080  007C                                  .BLKL   1
          0080                  .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084  0080                                  .BLKL   1
          0084                  .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088  0084                                  .BLKL   1
          0088                  .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C  0088                                  .BLKL   1
          008C                  .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090  008C                                  .BLKL   1
          0090                  .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
          0090                  .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074  0090                  . = 116
          0074                  .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075  0074                                  .BLKB   1
          0075                  .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076  0075                                  .BLKB   1
          0076                  .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077  0076                                  .BLKB   1
          0077                  .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078  0077                                  .BLKB   1
          0078                  .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C  0078                                  .BLKL   1
0000007E  007C                                  .BLKW   1
          007E                  .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080  007E                                  .BLKW   1
          0080                  .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084  0080                                  .BLKL   1
00000080  0084                  . = 128
00000084  0080                                  .BLKL   1
          0084                  .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
```

```
00000088  0084                                  .BLKL   1
          0088                  .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A  0088                                  .BLKW   1
          008A                  .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C  008A                                  .BLKW   1
          008C                  .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
          008C                  .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E  008C                                  .BLKW   1
          008E                  .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090  008E                                  .BLKW   1
          0090                  .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092  0090                                  .BLKW   1
          0092                  .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
00000094  0092                                  .BLKW   1
          0094                  .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095  0094                                  .BLKB   1
          0095                  .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096  0095                                  .BLKB   1
          0096                  .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098  0096                                  .BLKW   1
00000096  0098                  . = 150
00000098  0096                                  .BLKW   1
          0098                  .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C  0098                                  .BLKL   1
          009C                  .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0  009C                                  .BLKL   1
          00A0                  .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
000000A4  00A0                                  .BLKL   1
          00A4                  .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
000000A6  00A4                                  .BLKW   1
          00A6                  .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
000000A7  00A6                                  .BLKB   1
000000A8  00A7                                  .BLKB   1
00000074  00A8                  . = 116
00000078  0074                                  .BLKL   1
0000007C  0078                                  .BLKL   1
00000080  007C                                  .BLKL   1
00000084  0080                                  .BLKL   1
00000088  0084                                  .BLKL   1
0000008C  0088                                  .BLKL   1
          008C                  .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
00000090  008C                                  .BLKL   1
00000094  0090                                  .BLKL   1
00000098  0094                                  .BLKL   1
0000009C  0098                                  .BLKL   1
          009C                  .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
0000009D  009C                                  .BLKB   1
          009D                  .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
0000009E  009D                                  .BLKB   1
          009E                  .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
0000009F  009E                                  .BLKB   1
000000A0  009F                                  .BLKB   1
          00A0                  .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
000000A1  00A0                                  .BLKB   1
          00A1                  .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
000000A2  00A1                                  .BLKB   1
          00A2                  .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
```

```
000000A3  00A2                          .BLKB   1
000000A4  00A3                          .BLKB   1
          00A4          .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
000000A5  00A4                          .BLKB   1
          00A5          .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
000000A7  00A5                          .BLKW   1
000000A8  00A7                          .BLKB   1
          00A8          .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
000000AC  00A8                          .BLKL   1
000000B0  00AC                          .BLKL   1
000000B4  00B0                          .BLKL   1
000000B8  00B4                          .BLKL   1
          00B8          .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
000000BC  00B8                          .BLKL   1
          00BC          .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
          00BC          .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
00000074  00BC          . = 116
          0074          .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
00000078  0074                          .BLKL   1
          0078          .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
0000007C  0078                          .BLKL   1
          007C          .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
0000007E  007C                          .BLKW   1
00000080  007E                          .BLKW   1
        00000000        .RESTORE
```

```
                     0000     66          .SBTTL  MASSBUS ADAPTER INTERRUPT DISPATCHER
                     0000     67 ;+
                     0000     68 ; MBA$INT - MASSBUS ADAPTER INTERRUPT DISPATCHER
                     0000     69 ;
                     0000     70 ; THIS ROUTINE IS ENTERED VIA A JSB INSTRUCTION WHEN AN INTERRUPT OCCURS
                     0000     71 ; ON A MASSBUS ADAPTER. THE STATE OF THE STACK ON ENTRY IS:
                     0000     72 ;
                     0000     73 ;       00(SP) = ADDRESS OF IDB ADDRESS.
                     0000     74 ;       04(SP) = SAVED R2.
                     0000     75 ;       08(SP) = SAVED R3.
                     0000     76 ;       12(SP) = SAVED R4.
                     0000     77 ;       16(SP) = SAVED R5.
                     0000     78 ;       20(SP) = INTERRUPT PC.
                     0000     79 ;       24(SP) = INTERRUPT PSL.
                     0000     80 ;
                     0000     81 ; INTERRUPT DISPATCHING OCCURS AS FOLLOWS:
                     0000     82 ;
                     0000     83 ;       IF THE INTERRUPTING ADAPTER IS CURRENTLY OWNED AND THE OWNER UNIT
                     0000     84 ;       IS EXPECTING AN INTERRUPT, THEN THAT UNIT IS DISPATCHED FIRST. ALL
                     0000     85 ;       OTHER UNITS ARE DISPATCHED BY READING THE ATTENTION SUMMARY REG-
                     0000     86 ;       ISTER AND SCANNING FOR UNITS THAT HAVE ATTENTION SET. AS EACH UNIT
                     0000     87 ;       IS FOUND, ITS ATTENTION SUMMARY BIT IS CLEARED AND THEN A TEST IS
                     0000     88 ;       MADE TO DETERMINE IF AN INTERRUPT IS EXPECTED ON THE UNIT. IF YES,
                     0000     89 ;       THEN THE DRIVER IS CALLED AT ITS INTERRUPT RETURN ADDRESS. ELSE
                     0000     90 ;       THE DRIVER IS CALLED AT ITS UNSOLICITED INTERRUPT ADDRESS. AS EACH
                     0000     91 ;       CALL TO THE DRIVER RETURNS, THE ATTENTION SUMMARY REGISTER IS RE-
                     0000     92 ;       READ AND AN ATTEMPT IS MADE TO FIND ANOTHER UNIT TO DISPATCH. WHEN
                     0000     93 ;       NO UNITS REQUESTING ATTENTION REMAIN, THE INTERRUPT IS DISMISSED.
                     0000     94 ;-
                     0000     95
                     0000     96 MBA$INT::                                    ;MASSBUS ADAPTER INTERRUPT DISPATCHER
          53    00 BE    D0   0000     97          MOVL    @(SP),R3           ;GET ADDRESS OF IDB
             54    63    D0   0004     98          MOVL    IDB$L_CSR(R3),R4   ;GET ADDRESS OF CONFIGURATION STATUS REGISTE
 08 A4    00800000 8F    D3   0007     99          BITL    #MBA$M_SR_CBHUNG,MBA$L_SR(R4)   ;CHECK FOR MBA HUNG
                6D    12   000F    100          BNEQ    50$                        ;BRANCH IF HUNG
          55    04 A3    D0   0011    101          MOVL    IDB$L_OWNER(R3),R5 ;GET OWNER UNIT UCB ADDRESS
                09    13   0015    102          BEQL    10$                ;IF EQL NO OWNER
          52    74 A5    9A   0017    103          MOVZBL  UCB$B_SLAVE(R5),R2 ;GET OWNER SLAVE CONTROLLER NUMBER
       21 58 A5    01    E0   001B    104          BBS     #UCB$V_INT,UCB$W_STS(R5),20$ ;IF SET, INTERRUPT EXPECTED
          53    00 BE    D0   0020    105 10$:     MOVL    @(SP),R3           ;RETRIEVE ADDRESS OF IDB
             54    63    D0   0024    106          MOVL    IDB$L_CSR(R3),R4   ;RETRIEVE MBA CONFIGURATION REGISTER ADDRESS
          08 A4    00    D2   0027    107          MCOML   #0,MBA$L_SR(R4)    ;CLEAR ALL MBA STATUS BITS
       52    0410 C4    D0   002B    108          MOVL    MBA$L_AS(R4),R2    ;READ ATTENTION SUMMARY REGISTER
 52    52    08    00    EA   0030    109          FFS     #0,#8,R2,R2        ;FIND FIRST UNIT REQUESTING ATTENTION
                0A    12   0035    110          BNEQ    20$                ;IF NEQ UNIT FOUND
             5E    04    C0   0037    111          ADDL    #4,SP              ;REMOVE IDB ADDRESS FROM STACK
             52    8E    7D   003A    112          MOVQ    (SP)+,R2           ;RESTORE REGISTERS
             54    8E    7D   003D    113          MOVQ    (SP)+,R4           ;
                02    00   0040    114          REI                        ;
       55    14 A342    D0   0041    115 20$:     MOVL    IDB$L_UCBLST(R3)[R2],R5 ;GET ADDRESS OF UCB OR INTERRUPT DISPATCHER
                2F 55    E8   0046    116          BLBS    R5,40$             ;IF LBS INTERRUPT DISPATCHER FOR MULTI-
                           0049    117                                     ; DEVICE CONTROLLER
 0410 C4    01    52    78   0049    118          ASHL    R2,#1,MBA$L_AS(R4) ;CLEAR ATTENTION SUMMARY BIT
                55    D5   004F    119          TSTL    R5                 ;SEE IF UCB DEFINED
                CD    13   0051    120          BEQL    10$                ;IF EQL NONE DEFINED
       09 58 A5    01    E5   0053    121          BBCC    #UCB$V_INT,UCB$W_STS(R5),30$ ;IF CLR, INTERRUPT NOT EXPECTED
          53    10 A5    7D   0058    122          MOVQ    UCB$L_FR3(R5),R3   ;RESTORE DRIVER CONTEXT
```

```
                     0C B5    16  005C   123          JSB     @UCB$L_FPC(R5)          ;CALL DRIVER AT INTERRUPT RETURN ADDRESS
                        BF    11  005F   124          BRB     10$                     ;
               53    24 A5    D0  0061   125 30$:     MOVL    UCB$L_DDB(R5),R3        ;GET ADDRESS OF DDB
               53    0C A3    D0  0065   126          MOVL    DDB$L_DDT(R3),R3        ;GET ADDRESS OF DDT
               52    04 A3    D0  0069   127          MOVL    DDT$L_UNSOLINT(R3),R2   ;CALCULATE ADDRESS OF UNSOLICITED INTERRUPT
               03 52    10    E0  006D   128          BBS     #16,R2,35$              ;**** BRANCH IF SUPERVISOR ADDR
                  52    53    C0  0071   129          ADDL    R3,R2                   ;**** MAKE ABSOLUTE ADDRESS
                        62    16  0074   130 35$:     JSB     (R2)                    ;CALL UNSOLICITED INTERRUPT ROUTINE
                        A8    11  0076   131          BRB     10$                     ;
                        7E    DC  0078   132 40$:     MOVPSL  -(SP)                   ;READ CURRENT PSL
                        75    16  007A   133          JSB     -(R5)                   ;CALL SLAVE CONTROLLER INTERRUPT DISPATCHER
                        A2    11  007C   134          BRB     10$                     ;
                              007E   135
                              007E   136 ;
                              007E   137 ; IN CASE OF CBHUNG SAVE MBA INFORMATIION FOR BUGCHECK LOG AND
                              007E   138 ; BUGCHECK.  CBHUNG IS IMPLEMENTED ONLY ON THE VAX 11/750 CPU.
                              007E   139 ; IT MEANS THAT AN ACCESS TO A REGISTER OF AN EXISTENT CONTROLLER
                              007E   140 ; FAILED TO COMPLETE IN 1.5 USEC.
                              007E   141 ;
                              007E   142
               55    04 A3    D0  007E   143 50$:     MOVL    IDB$L_OWNER(R3),R5          ;SAVE OWNER UCB IF ANY
               50    08 A4    D0  0082   144          MOVL    MBA$L_SR(R4),R0             ;SAVE MBA STATUS REGISTER,
                  51    64    D0  0086   145          MOVL    MBA$L_CSR(R4),R1            ; CONFIGURATION REGISTER,
               52    14 A4    D0  0089   146          MOVL    MBA$L_DR(R4),R2             ; DIAGNOSTIC REGISTER,
               53    10 A3    D0  008D   147          MOVL    IDB$L_ADP(R3),R3            ;GET ADP ADDRESS
               53    0C A3    3C  0091   148          MOVZWL  ADP$W_TR(R3),R3             ;SAVE NEXUS NUMBER TO IDENTIFY
                              0095   149                                              ; OFFENDING MBA
                              0095   150          BUG_CHECK MBACBHUNG,FATAL           ;FATAL ERROR
                  00000000'9F    16  0095                JSB     @#BUG$CHECK
46 2C 47 4E 55 48 42 43 41 42 4D 00' 009B                .ASCIC  "MBACBHUNG,FATAL"
                        4C 41 54 41  00A7
                              0F     009B
```

```
                        00AB    152          .SBTTL  MASSBUS ADAPTER INITIALIZATION
                        00AB    153 ;+
                        00AB    154 ; MBA$INITIAL - MASSBUS ADAPTER INITIALIZATION
                        00AB    155 ;
                        00AB    156 ; THIS ROUTINE IS CALLED VIA A JSB INSTRUCTION AT SYSTEM STARTUP AND AFTER
                        00AB    157 ; A POWER RECOVERY RESTART TO ALLOW INITIALIZATION OF MASSBUS ADAPTERS.
                        00AB    158 ;
                        00AB    159 ; INPUTS:
                        00AB    160 ;
                        00AB    161 ;       R4 = CSR ADDRESS OF MASSBUS ADAPTER.
                        00AB    162 ;       R5 = ADDRESS OF ADAPTER IDB.
                        00AB    163 ;
                        00AB    164 ;       ALL INTERRUPTS ARE LOCKED OUT.
                        00AB    165 ;
                        00AB    166 ; OUTPUTS:
                        00AB    167 ;
                        00AB    168 ;       THE MASSBUS ADAPTER IS INITIALIZED AND INTERRUPTS ARE ENABLED.
                        00AB    169 ;-
                        00AB    170
                        00AB    171 MBA$INITIAL::                               ;MASSBUS ADAPTER INITIALIZATION
04 A4   01   D0         00AB    172          MOVL    #MBA$M_CR_INIT,MBA$L_CR(R4) ;INITIALIZE MASSBUS ADAPTER
04 A4   04   D0         00AF    173          MOVL    #MBA$M_CR_IE,MBA$L_CR(R4) ;ENABLE INTERRUPTS
                05      00B3    174          RSB                                 ;
                        00B4    175
                        00B4    176          .END
```

```
ADP$B_NUMBER      0000000B    D          IDB$W_UNITS       0000000C    D          UCB$L_DUETIM      0000005C    D
ADP$B_PORT        00000020    D          MBA$INITIAL       000000AB RG D  01      UCB$L_DX_BFPNT    0000009C    D
ADP$B_TYPE        0000000A    D          MBA$INT           00000000 RG D  01      UCB$L_DX_BUF      00000098    D
ADP$C_DRADPLEN    00000014    D          MBA$L_AS        = 00000410    D          UCB$L_DX_RXDB     000000A0    D
ADP$C_MBAADPLEN   00000014    D          MBA$L_CR        = 00000004    D          UCB$L_EMB         00000078    D
ADP$C_MPMADPLEN   00000070    D          MBA$L_CSR       = 00000000    D          UCB$L_FIRST       00000014    D
ADP$C_UBAADPLEN   00000070    D          MBA$L_DR        = 00000014    D          UCB$L_FPC         0000000C    D
ADP$K_DRADPLEN    00000014    D          MBA$L_SR        = 00000008    D          UCB$L_FQBL        00000004    D
ADP$K_MBAADPLEN   00000014    D          MBA$M_CR_IE     = 00000004    D          UCB$L_FQFL        00000000    D
ADP$K_MPMADPLEN   00000070    D          MBA$M_CR_INIT   = 00000001    D          UCB$L_FR3         00000010    D
ADP$K_UBAADPLEN   00000070    D          MBA$M_SR_CBHUNG= 00800000    D          UCB$L_FR4         00000014    D
ADP$L_CRB         00000010    D          SIZ...          = 00000002    D          UCB$L_IOQBL       00000044    D
ADP$L_CSR         00000000    D          UCB$B_AMOD        00000053    D          UCB$L_IOQFL       00000040    D
ADP$L_DPQBL       00000018    D          UCB$B_CEX         00000077    D          UCB$L_IRP         0000004C    D
ADP$L_DPQFL       00000014    D          UCB$B_CM1         0000004A    D          UCB$L_LINK        0000002C    D
ADP$L_INTD        00000064    D          UCB$B_CM2         0000004B    D          UCB$L_LOGADR      00000064    D
ADP$L_LINK        00000004    D          UCB$B_DEVCLASS    00000038    D          UCB$L_MAXBLOCK    00000084    D
ADP$L_MRQBL       00000020    D          UCB$B_DEVTYPE     00000039    D          UCB$L_MB_MBX      0000007C    D
ADP$L_MRQFL       0000001C    D          UCB$B_DIPL        00000052    D          UCB$L_MB_PORT     0000008C    D
ADP$L_PRQQBL      00000018    D          UCB$B_DX_SCTCNT   000000A6    D          UCB$L_MB_RAST     00000078    D
ADP$L_PRQQFL      00000014    D          UCB$B_ERTCNT      00000070    D          UCB$L_MB_SHB      00000080    D
ADP$L_SHB         0000001C    D          UCB$B_ERTMAX      00000071    D          UCB$L_MB_WAST     00000074    D
ADP$L_VECTOR      00000010    D          UCB$B_FEX         00000076    D          UCB$L_MB_WIOQBL   00000088    D
ADP$W_ADPTYPE     0000000E    D          UCB$B_FIPL        0000000B    D          UCB$L_MB_WIOQFL   00000084    D
ADP$W_DPBITMAP    00000024    D          UCB$B_LOCSRV      0000003C    D          UCB$L_MEDIA       0000008C    D
ADP$W_MRBITMAP    00000026    D          UCB$B_OFFNDX      00000094    D          UCB$L_NT_DATSSB   00000074    D
ADP$W_SIZE        00000008    D          UCB$B_OFFRTC      00000095    D          UCB$L_NT_INTSSB   00000078    D
ADP$W_TR          0000000C    D          UCB$B_REMSRV      0000003D    D          UCB$L_OPCNT       00000060    D
BUG$CHECK         ********  X   01       UCB$B_SECTORS     0000003C    D          UCB$L_OWNUIC      0000001C    D
DDB$B_ACPCLASS    00000013    D          UCB$B_SLAVE       00000074    D          UCB$L_PID         00000028    D
DDB$B_TYPE        0000000A    D          UCB$B_SPR         00000075    D          UCB$L_RQBL        00000004    D
DDB$C_LENGTH      00000034    D          UCB$B_STATE       00000052    D          UCB$L_RQFL        00000000    D
DDB$K_LENGTH      00000034    D          UCB$B_TRACKS      0000003D    D          UCB$L_SVAPTE      00000068    D
DDB$L_ACPD        00000010    D          UCB$B_TT_CRFILL   0000009D    D          UCB$L_SVPN        00000064    D
DDB$L_DDT         0000000C    D          UCB$B_TT_DECRF    000000A1    D          UCB$L_TT_DECHAR   000000A8    D
DDB$L_LINK        00000000    D          UCB$B_TT_DELFF    000000A2    D          UCB$L_TT_RDUE     0000008C    D
DDB$L_UCB         00000004    D          UCB$B_TT_DESPEE   000000A0    D          UCB$L_TT_RTIMOU   000000B8    D
DDB$T_DRVNAME     00000024    D          UCB$B_TT_DETYPE   000000A4    D          UCB$L_VCB         00000030    D
DDB$T_NAME        00000014    D          UCB$B_TT_LFFILL   0000009E    D          UCB$T_PARTNER     0000000C    D
DDB$W_SIZE        00000008    D          UCB$B_TT_SPEED    0000009C    D          UCB$V_INT       = 00000001    D
DDT$L_ALTSTART    0000001C    D          UCB$B_TYPE        0000000A    D          UCB$W_BCNT        0000006E    D
DDT$L_CANCEL      0000000C    D          UCB$B_VERTSZ      0000003F    D          UCB$W_BCR         00000096    D
DDT$L_FDT         00000008    D          UCB$C_LENGTH      00000074    D          UCB$W_BOFF        0000006C    D
DDT$L_REGDUMP     00000010    D          UCB$C_MB_LENGTH   00000090    D          UCB$W_BUFQUO      00000018    D
DDT$L_START       00000000    D          UCB$C_TT_LENGTH   000000BC    D          UCB$W_BYTESTOGO   0000003E    D
DDT$L_UNITINIT    00000018    D          UCB$K_LENGTH      00000074    D          UCB$W_CHARGE      0000004A    D
DDT$L_UNSOLINT    00000004    D          UCB$K_MB_LENGTH   00000090    D          UCB$W_CYLINDERS   0000003E    D
DDT$W_DIAGBUF     00000014    D          UCB$K_TT_LENGTH   000000BC    D          UCB$W_DA          0000008C    D
DDT$W_ERRORBUF    00000016    D          UCB$L_AMB         00000054    D          UCB$W_DC          0000008E    D
IDB$B_TYPE        0000000A    D          UCB$L_ASTQBL      00000010    D          UCB$W_DEVBUFSIZ   0000003A    D
IDB$C_LENGTH      00000034    D          UCB$L_ASTQFL      0000000C    D          UCB$W_DEVSTS      0000005A    D
IDB$K_LENGTH      00000034    D          UCB$L_CPID        0000005C    D          UCB$W_DIRSEQ      00000088    D
IDB$L_ADP         00000010    D          UCB$L_CRB         00000020    D          UCB$W_DSTADDR     00000018    D
IDB$L_CSR         00000000    D          UCB$L_DDB         00000024    D          UCB$W_DX_BCR      000000A4    D
IDB$L_OWNER       00000004    D          UCB$L_DEVCHAR     00000034    D          UCB$W_EC1         00000090    D
IDB$L_UCBLST      00000014    D          UCB$L_DEVDEPEND   0000003C    D          UCB$W_EC2         00000092    D
IDB$W_SIZE        00000008    D          UCB$L_DPC         00000080    D          UCB$W_ERRCNT      00000072    D
```

```
UCB$W_FUNC        0000007E    D
UCB$W_MB_SEED     00000000    D
UCB$W_MSGCNT      00000016    D
UCB$W_MSGMAX      00000014    D
UCB$W_NT_CHAN     0000007C    D
UCB$W_OFFSET      0000008A    D
UCB$W_REFC        00000050    D
UCB$W_SIZE        00000008    D
UCB$W_SRCADDR     0000001A    D
UCB$W_STS         00000058    D
UCB$W_TT_DESIZE   000000A5    D
UCB$W_UNIT        00000048    D
UCB$W_VPROT       0000001A    D
```

```
                                        +----------------+
                                        ! Psect synopsis !
                                        +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
SEP                             000000B4  (  180.)  01 (  1.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD    WRT NOVEC LONG
$ABS$                           000000BC  (  188.)  02 (  2.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
ADP$W_TR	0000000C		#-148 (1)
BUG$CHECK	00000000-XR		150 (1)
DDB$L_DDT	0000000C		#-126 (1)
DDT$L_UNSOLINT	00000004		#-127 (1)
IDB$L_ADP	00000010		#-147 (1)
IDB$L_CSR	00000000		#-106 (1) #-98 (1)
IDB$L_OWNER	00000004		#-101 (1) #-143 (1)
IDB$L_UCBLST	00000014		#-115 (1)
MBA$INITIAL	000000AB-R	171 (1)	
MBA$INT	00000000-R	96 (1)	
MBA$L_AS	=00000410		#-108 (1) #-118 (1)
MBA$L_CR	=00000004		#-172 (1) #-173 (1)
MBA$L_CSR	=00000000		#-145 (1)
MBA$L_DR	=00000014		#-146 (1)
MBA$L_SR	=00000008		#-107 (1) #-144 (1) #-99 (1)
MBA$M_CR_IE	=00000004		#-173 (1)
MBA$M_CR_INIT	=00000001		#-172 (1)
MBA$M_SR_CBHUNG	=00800000		#-99 (1)
UCB$B_SLAVE	00000074		#-103 (1)
UCB$L_DDB	00000024		#-125 (1)
UCB$L_FPC	0000000C		123 (1)
UCB$L_FR3	00000010		#-122 (1)
UCB$V_INT	=00000001		#-104 (1) #-121 (1)
UCB$W_STS	00000058		104 (1) 121 (1)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	26	00:00:00.00	00:00:00.19
Command processing	928	00:00:00.26	00:00:01.09
Pass 1	457	00:00:01.14	00:00:02.32
Symbol table sort	0	00:00:00.08	00:00:00.08
Pass 2	26	00:00:00.30	00:00:00.69
Symbol table output	2	00:00:00.02	00:00:00.02
Psect synopsis output	2	00:00:00.00	00:00:00.04
Cross-reference output	2	00:00:00.02	00:00:00.02
Assembler run totals	1445	00:00:01.82	00:00:04.45

The working set limit was 1900 pages.
61016 bytes (120 pages) of virtual memory were used to buffer the intermediate code.
There were 20 pages of symbol table space allocated to hold 328 non-local and 6 local symbols.
176 source lines were read in Pass 1, producing 31 object records in Pass 2.
17 pages of virtual memory were used to define 16 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	5
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	1
SYS$COMMON:[SYSLIB]STARLET.MLB;2	5
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	12

590 GETS were required to define 12 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(2) 56 DECLARATIONS
(3) 209 RM03/5/80, RP04/5/6/7 Bootstrap driver code
(4) 357 ECC - PERFORM ECC ERROR CORRECTION
(5) 444 SSERROR - RM80 SKIP SECTOR ERROR ROUTINE

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element MBBTDRIVR.MAR
0000     2 ; *1     6-FEB-1986 15:19:33 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element MBBTDRIVR.MAR
0000     4         .TITLE  MBBTDRIVR - MASSBUS DISK BOOT DRIVER
0000     5         .IDENT  'V02-004'
0000     6
0000     7 ;
0000     8 ;*****************************************************************************
0000     9 ;*                                                                           *
0000    10 ;*  COPYRIGHT (c) 1979, 1980, 1982                                           *
0000    11 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
0000    12 ;*                                                                           *
0000    13 ;*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND  COPIED   *
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0000    15 ;*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE OR  ANY  OTHER   *
0000    16 ;*  COPIES  THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY   *
0000    17 ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE  IS  HEREBY   *
0000    18 ;*  TRANSFERRED.                                                             *
0000    19 ;*                                                                           *
0000    20 ;*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE   *
0000    21 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT  *
0000    22 ;*  CORPORATION.                                                             *
0000    23 ;*                                                                           *
0000    24 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS   *
0000    25 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    26 ;*                                                                           *
0000    27 ;*****************************************************************************
0000    28 ;
0000    29
0000    30 ;++
0000    31 ; FACILITY:     BOOTS
0000    32 ;
0000    33 ; ABSTRACT:
0000    34 ;       This module contains the bootstrap device driver for
0000    35 ;       MASSBUS disks.  It supports the RP04/5/6 and RM03/5/80.
0000    36 ;
0000    37 ; ENVIRONMENT:  IPL 31, kernel mode, code must be PIC
0000    38 ;
0000    39 ; AUTHOR:  Steve Beckhardt,     CREATION DATE:  31-Oct-1979
0000    40 ;       (Original authors:  Carol Peters and Charlie Franks)
0000    41 ;
0000    42 ; MODIFIED BY:
0000    43 ;       [1]     Marion Baggett, June 15 1982
0000    44 ;               Initialize massbus and clear interrupt enable so
0000    45 ;               loading in still possible after running EVMAC.
0000    46 ;
0000    47 ;       02-03   CAS0002         C.A. Samuelson          08-May-1980
0000    48 ;               Fix driver size calculation so entire driver is copied
0000    49 ;               into non-paged pool
0000    50 ;
0000    51 ;       02-02   CAS0001         C.A. Samuelson          30-Apr-1980
0000    52 ;               Change interface to BOOTDRIVR for UBA purge datapath
0000    53 ;
0000    54 ;--
```

```
                     0000     56          .SBTTL  DECLARATIONS
                     0000     57 ;
                     0000     58 ; INCLUDE FILES:
                     0000     59 ;
                     0000     60
                     0000     61          $BTDDEF                         ; Define boot device types
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     62          $IODEF                          ; Define I/O function codes
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     63          $MBADEF                         ; Define MASSBUS adapter registers
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     64          $NDTDEF                         ; Define NEXUS device types
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     65          $PRDEF                          ; Define processor registers
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     66          $RPBDEF                         ; Define RPB offsets
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     67          $SSDEF                          ; Define system status codes
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     68
                     0000     69 ;
                     0000     70 ; MACROS:
                     0000     71 ;
                     0000     72
                     0000     73          .MACRO  MBADEV,TYPE,SPC,SPT
                     0000     74          .BYTE   TYPE                    ; MASSBUS DEVICE CODE
                     0000     75          .WORD   SPC                     ; SECTORS PER CYLINDER
                     0000     76          .BYTE   SPT                     ; SECTORS PER TRACK
                     0000     77          .ENDM   MBADEV                  ;
                     0000     78
                     0000     79 ;
                     0000     80 ; EQUATED SYMBOLS:
                     0000     81 ;
                     0000     82
                     0000     83 ;
                     0000     84 ; RP04/05/06 MASSBUS REGISTER OFFSETS
                     0000     85 ;
                     0000     86
                     0000     87          $DEFINI RP
                     0000                 .SAVE   LOCAL_BLOCK
                     0000     88
                     0000     89 $DEF     RP_CS1              .BLKL   1       ;DRIVE CONTROL REGISTER
                     0000                 .IIF    NB,RP_CS1,      RP_CS1:
            00000004 0000                 .IIF    NB,,BLKL,       .BLKL   1
                     0004     90          _VIELD  RP_CS1,0,<-                 ; DRIVE CONTROL REGISTER BIT DEFINITIONS
                     0004     91                  <GO,,M>,-                   ; GO BIT
                     0004     92                  <FCODE,5>-                  ; FUNCTION CODE
                     0004     93                  >                           ;
                     0004     94 $DEF     RP_DS               .BLKL   1       ;DRIVE STATUS REGISTER
                     0004                 .IIF    NB,RP_DS,       RP_DS:
```

```
00000008  0004                .IIF    NB,.BLKL,       .BLKL   1
          0008    95          _VIELD  RP_DS,6,<-              ; DRIVE STATUS REGISTER BIT DEFINITIONS
          0008    96                  <VV,,M>,-               ; VOLUME VALID
          0008    97                  <DRY,,M>,-              ; DRIVE READY
          0008    98                  <DPR,,M>,-              ; DRIVE PRESENT
          0008    99                  <PGM,,M>,-              ; PROGRAMMABLE
          0008   100                  <LST,,M>,-              ; LAST SECTOR TRANSFERRED
          0008   101                  <WRL,,M>,-              ; DRIVE WRITE LOCKED
          0008   102                  <MOL,,M>,-              ; MEDIUM ONLINE
          0008   103                  <PIP,,M>,-              ; POSITIONING IN PROGRESS
          0008   104                  <ERR,,M>,-              ; COMPOSITE ERROR
          0008   105                  <ATA,,M>-               ; ATTENTION ACTIVE
          0008   106          >                               ;
          0008   107 $DEF     RP_ER1          .BLKL   1       ;ERROR REGISTER 1
          0008                .IIF    NB,RP_ER1,      RP_ER1:
0000000C  0008                .IIF    NB,.BLKL,       .BLKL   1
          000C   108          _VIELD  RP_ER1,0,<-             ; ERROR REGISTER 1 BIT DEFINITIONS
          000C   109                  <ILF,,M>,-              ; ILLEGAL FUNCTION
          000C   110                  <ILR,,M>,-              ; ILLEGAL REGISTER
          000C   111                  <RMR,,M>,-              ; REGISTER MODIFY REFUSED
          000C   112                  <PAR,,M>,-              ; PARITY ERROR
          000C   113                  <FER,,M>,-              ; FORMAT ERROR
          000C   114                  <WCF,,M>,-              ; WRITE CLOCK FAIL
          000C   115                  <ECH,,M>,-              ; ECC HARD ERROR
          000C   116                  <HCE,,M>,-              ; HEADER COMPARE ERROR
          000C   117                  <HCRC,,M>,-             ; HEADER CRC ERROR
          000C   118                  <AOE,,M>,-              ; ADDRESS OVERFLOW ERROR
          000C   119                  <IAE,,M>,-              ; ILLEGAL ADDRESS ERROR
          000C   120                  <WLE,,M>,-              ; WRITE LOCK ERROR
          000C   121                  <DTE,,M>,-              ; DRIVE TIMING ERROR
          000C   122                  <OPI,,M>,-              ; OPERATION INCOMPLETE
          000C   123                  <UNS,,M>,-              ; DRIVE UNSAFE
          000C   124                  <DCK,,M>-               ; DATA CHECK ERROR
          000C   125          >                               ;
          000C   126 $DEF     RP_MR           .BLKL   1       ;MAINTENANCE REGISTER
          000C                .IIF    NB,RP_MR,       RP_MR:
00000010  000C                .IIF    NB,.BLKL,       .BLKL   1
          0010   127 $DEF     RP_AS           .BLKL   1       ;ATTENTION SUMMARY REGISTER
          0010                .IIF    NB,RP_AS,       RP_AS:
00000014  0010                .IIF    NB,.BLKL,       .BLKL   1
          0014   128 $DEF     RP_DA           .BLKL   1       ;DESIRED SECTOR/TRACK ADDRESS REGISTER
          0014                .IIF    NB,RP_DA,       RP_DA:
00000018  0014                .IIF    NB,.BLKL,       .BLKL   1
          0018   129          _VIELD  RP_DA,0,<-              ; DESIRED ADDRESS FIELD DEFINITIONS
          0018   130                  <SA,5>,-                ; DESIRED SECTOR ADDRESS
          0018   131                  <,3>,-                  ; RESERVED BITS
          0018   132                  <TA,5>-                 ; DESIRED TRACK ADDRESS
          0018   133          >                               ;
          0018   134 $DEF     RP_DT           .BLKL   1       ;DRIVE TYPE REGISTER
          0018                .IIF    NB,RP_DT,       RP_DT:
0000001C  0018                .IIF    NB,.BLKL,       .BLKL   1
          001C   135          _VIELD  RP_DT,0,<-              ; DRIVE TYPE REGISTER FIELD DEFINITIONS
          001C   136                  <DTN,9>,-               ; DRIVE TYPE NUMBER
          001C   137                  <,2>,-                  ; RESERVED BITS
          001C   138                  <DRQ,,M>-               ; DRIVE REQUEST REQUIRED
          001C   139          >                               ;
          001C   140 $DEF     RP_LA           .BLKL   1       ;LOOKAHEAD REGISTER
```

```
                     001C                   .IIF    NB,RP_LA,       RP_LA:
00000020             001C                   .IIF    NB,,BLKL,       .BLKL   1
                     0020    141 $DEF       RP_ER2          .BLKL   1       ;ERROR REGISTER 2
                     0020                   .IIF    NB,RP_ER2,      RP_ER2:
00000024             0020                   .IIF    NB,,BLKL,       .BLKL   1
                     0024    142 $DEF       RP_OF           .BLKL   1       ;OFFSET REGISTER
                     0024                   .IIF    NB,RP_OF,       RP_OF:
00000028             0024                   .IIF    NB,,BLKL,       .BLKL   1
                     0028    143            _VIELD  RP_OF,0,<-              ; OFFSET REGISTER BIT DEFINITIONS
                     0028    144                    <OFF,8>,-               ; OFFSET VALUE
                     0028    145                    <DCK,,M>,-              ; DATA CHECK IN PROGRESS (SOFTWARE)
                     0028    146                    <,1>,-                  ; RESERVED BIT
                     0028    147                    <HCI,,M>,-              ; HEADER COMPARE INHIBIT
                     0028    148                    <ECI,,M>,-              ; ECC INHIBIT
                     0028    149                    <FMT,,M>-               ; 16-BIT FORMAT
                     0028    150            >                               ;
                     0028    151 $DEF       RP_DC           .BLKL   1       ;DESIRED CYLINDER ADDRESS
                     0028                   .IIF    NB,RP_DC,       RP_DC:
0000002C             0028                   .IIF    NB,,BLKL,       .BLKL   1
                     002C    152 $DEF       RP_CC           .BLKL   1       ;CURRENT CYLINDER ADDRESS
                     002C                   .IIF    NB,RP_CC,       RP_CC:
00000030             002C                   .IIF    NB,,BLKL,       .BLKL   1
                     0030    153 $DEF       RP_SN           .BLKL   1       ;DRIVE SERIAL NUMBER
                     0030                   .IIF    NB,RP_SN,       RP_SN:
00000034             0030                   .IIF    NB,,BLKL,       .BLKL   1
                     0034    154 $DEF       RP_ER3          .BLKL   1       ;ERROR REGISTER 3
                     0034                   .IIF    NB,RP_ER3,      RP_ER3:
00000038             0034                   .IIF    NB,,BLKL,       .BLKL   1
                     0038    155            _VIELD  RP_ER3,14,<-            ; ERROR REGISTER 3 BIT DEFINITIONS
                     0038    156                    <SKI,,M>-               ; SEEK INCOMPLETE
                     0038    157            >                               ;
                     0038    158 $DEF       RP_EC1          .BLKL   1       ;ECC POSITION REGISTER
                     0038                   .IIF    NB,RP_EC1,      RP_EC1:
0000003C             0038                   .IIF    NB,,BLKL,       .BLKL   1
                     003C    159            VIELD   RP_EC1,0,<<POS,13>>     ; ECC POSITION FIELD
                     003C    160 $DEF       RP_EC2          .BLKL   1       ;ECC PATTERN REGISTER
                     003C                   .IIF    NB,RP_EC2,      RP_EC2:
00000040             003C                   .IIF    NB,,BLKL,       .BLKL   1
                     0040    161            _VIELD  RP_EC2,0,<<PAT,11>>     ; ECC PATTERN FIELD
                     0040    162
                     0040    163            $DEFEND RP
                     0000                   .RESTORE
                     0000    164
                     0000    165 ;
                     0000    166 ; RM80 ADDITIONAL MASSBUS REGISTER BIT DEFINITIONS
                     0000    167 ;
                     0000    168
00000200             0000    169 RM_OF_M_SSEI    = ^X200                     ; SKIP SECTOR ERROR INHIBIT (RP_ER3)
00000020             0000    170 RM_ER2_M_SSE    = ^X20                      ; SKIP SECTOR ERROR (RP_OF)
00000005             0000    171 RM_ER2_V_SSE    = 5                         ; ...
                     0000    172
                     0000    173 ;
                     0000    174 ; OWN STORAGE:
                     0000    175 ;
                     0000    176
                     0000    177 ;
                     0000    178 ; BOOT DRIVER TABLE ENTRY
```

```
                                0000   179 ;
                                0000   180
                                0000   181          $BOOT_DRIVER    DEVTYPE = BTD$K_MB,-     ; Device type (MASSBUS)
                                0000   182                          SIZE = MBA_DRVSIZ,-      ; Driver size
                                0000   183                          ADDR = DRIVERNAME,-      ; Driver address
                                0000   184                          ENTRY = MBA_DISK_DRIVER,- ; Entry point
                                0000   185                          DRIVRNAME = DRIVERNAME   ; Driver name
                            00000000            .PSECT  BOOTDRIVR_4
                                FFFF    0000    .WORD   -1
                                0000    0002    .WORD   BTD$K_MB
                            00000000    0004    .LONG   0
                            000001A3'   0008    .LONG   MBA_DRVSIZ
                            00000000'   000C    .LONG   DRIVERNAME-$TABLE
                            0000002E'   0010    .LONG   MBA_DISK_DRIVER-DRIVERNAME
                            00000000'   0014    .LONG   DRIVERNAME-DRIVERNAME
                            00000000            .PSECT  BOOTDRIVR_2
                                0000   186
                                0000   187
                                0000   188 DRIVERNAME:                                    ; Boot device driver name
58 45 2E 52 45 56 49 52 44 52 44 00'    0000   189          .ASCIC  /DRDRIVER.EXE/          ; Assume DRDRIVER
                                45      000C
                                0C      0000
                                000D   190
                                000D   191
                                000D   192 ;
                                000D   193 ;       GEOMETRY TABLE FOR MASSBUS DISKS
                                000D   194 ;
                                000D   195
                                000D   196          .SHOW   BINARY                  ; Show MACRO expansions.
                                000D   197
                                000D   198 MBAGEOM:                                 ;
                                000D   199          MBADEV  <^X10>,<22*19>,22       ; RP04
                                  10    000D          .BYTE   ^X10                    ; MASSBUS DEVICE CODE
                                01A2    000E          .WORD   22*19                   ; SECTORS PER CYLINDER
                                  16    0010          .BYTE   22                      ; SECTORS PER TRACK
                                0011   200          MBADEV  <^X11>,<22*19>,22       ; RP05
                                  11    0011          .BYTE   ^X11                    ; MASSBUS DEVICE CODE
                                01A2    0012          .WORD   22*19                   ; SECTORS PER CYLINDER
                                  16    0014          .BYTE   22                      ; SECTORS PER TRACK
                                0015   201          MBADEV  <^X12>,<22*19>,22       ; RP06
                                  12    0015          .BYTE   ^X12                    ; MASSBUS DEVICE CODE
                                01A2    0016          .WORD   22*19                   ; SECTORS PER CYLINDER
                                  16    0018          .BYTE   22                      ; SECTORS PER TRACK
                                0019   202          MBADEV  <^X14>,<5*32>,32        ; RM03
                                  14    0019          .BYTE   ^X14                    ; MASSBUS DEVICE CODE
                                00A0    001A          .WORD   5*32                    ; SECTORS PER CYLINDER
                                  20    001C          .BYTE   32                      ; SECTORS PER TRACK
                                001D   203          MBADEV  <^X16>,<14*31>,31       ; RM80
                                  16    001D          .BYTE   ^X16                    ; MASSBUS DEVICE CODE
                                01B2    001E          .WORD   14*31                   ; SECTORS PER CYLINDER
                                  1F    0020          .BYTE   31                      ; SECTORS PER TRACK
                                0021   204          MBADEV  <^X17>,<19*32>,32       ; RM05
                                  17    0021          .BYTE   ^X17                    ; MASSBUS DEVICE CODE
                                0260    0022          .WORD   19*32                   ; SECTORS PER CYLINDER
                                  20    0024          .BYTE   32                      ; SECTORS PER TRACK
                                0025   205          MBADEV  <^X22>,<50*32>,50       ; RP07 (W/O HEAD PER TRACK)
                                  22    0025          .BYTE   ^X22                    ; MASSBUS DEVICE CODE
```

```
0640  0026                .WORD   50*32                   ; SECTORS PER CYLINDER
  32  0028                .BYTE   50                      ; SECTORS PER TRACK
      0029   206  MBADEV   <^X21>,<50*32>,50             ; RP07 (WITH HEAD PER TRACK OPTION)
  21  0029                .BYTE   ^X21                    ; MASSBUS DEVICE CODE
0640  002A                .WORD   50*32                   ; SECTORS PER CYLINDER
  32  002C                .BYTE   50                      ; SECTORS PER TRACK
  00  002D   207           .BYTE   0                       ; TERMINATE LIST
```

```
                     002E    209          .SBTTL  RM03/5/80, RP04/5/6/7 Bootstrap driver code
                     002E    210
                     002E    211 ;++
                     002E    212 ;
                     002E    213 ; Inputs:
                     002E    214 ;
                     002E    215 ;       R3      - base address of adapter's register space
                     002E    216 ;       R5      - LBN for current piece of transfer
                     002E    217 ;       R6      - contains 0
                     002E    218 ;       R8      - size of transfer in bytes
                     002E    219 ;       R9      - address of the RPB
                     002E    220 ;       R10     - starting address of transfer (byte offset in first
                     002E    221 ;                 page ORed with starting map register number)
                     002E    222 ;       R11     - Block number at start of transfer
                     002E    223 ;
                     002E    224 ;       FUNC(AP)- I/O operation (IO$_READLBLK or IO$_WRITELBLK only)
                     002E    225 ;       MODE(AP)- Address interpretation mode (0 = physical, 1 = virtual)
                     002E    226 ;       SIZE(AP)- Size of buffer in bytes
                     002E    227 ;       BUF(AP) - Address of buffer
                     002E    228 ;
                     002E    229 ; Implicit inputs:
                     002E    230 ;
                     002E    231 ;       RPB$W_UNIT      - RPB field containing boot device unit number
                     002E    232 ;
                     002E    233 ;       MBAGEOM         - a table describe the geometries of the
                     002E    234 ;                         MASSBUS disks
                     002E    235 ;
                     002E    236 ; Outputs:
                     002E    237 ;
                     002E    238 ;       R0 - status code
                     002E    239 ;
                     002E    240 ;               SS$_NORMAL      - successful transfer
                     002E    241 ;               SS$_NOSUCHDEV   - unsupported device
                     002E    242 ;               SS$_CTRLERR     - fatal controller error on transfer
                     002E    243 ;
                     002E    244 ;       This routine destroys R1, R5, R6, and R7. Within the routine,
                     002E    245 ;       register usage is as follows:
                     002E    246 ;
                     002E    247 ;               R0      - drive type from the geometry table
                     002E    248 ;                         MASSBUS device function code
                     002E    249 ;                         status code
                     002E    250 ;               R1      - address of an entry in the MBA geometry table
                     002E    251 ;               R5      - used in logical to physical calculation
                     002E    252 ;               R6      - drive type according to device register
                     002E    253 ;                         used in logical to physical calculation
                     002E    254 ;               R7      - address of the 1st MBA external register for
                     002E    255 ;                         this unit on the MBA
                     002E    256 ;
                     002E    257 ;--
                     002E    258
00000004             002E    259 BUF = 4
00000008             002E    260 SIZE = 8
0000000C             002E    261 LBN = 12
00000010             002E    262 FUNC = 16
00000014             002E    263 MODE = 20
                     002E    264
                     002E    265 MBA_DISK_DRIVER:                    ; RM03/5/80, RP04/5/6/7 Boot driver.
```

```
                04 A3    04    CA   002E    266          BICL2   #MBA$M_CR_IE,MBA$L_CR(R3) ; DISABLE INTERRUPTS                          [1]
                04 A3    01    CA   0032    267          BICL2   #MBA$M_CR_INIT,MBA$L_CR(R3) ; INIT MASSBUS TO CLEAR HUNG STATE.       [1]
                57    64 A9    3C   0036    268          MOVZWL  RPB$W_UNIT(R9),R7          ; GET UNIT NUMBER OF BOOT DEVICE
             57    57    07    78   003A    269          ASHL    #7,R7,R7                   ; ALIGN TO UNIT NUMBER FIELD
          57    0400 C347    9E   003E    270          MOVAB   MBA$L_ERB(R3)[R7],R7       ; FORM ADDRESS OF DRIVE REGISTERS
                67    13     D0   0044    271          MOVL    #<9*2>+1,RP_CS1(R7)        ; SET VOLUME VALID
       08 A3    00040000 8F    D3   0047    272          BITL    #MBA$M_SR_NED,MBA$L_SR(R3) ; DOES DRIVE EXIST?
                      03     13   004F    273          BEQL    15$                        ; YES, CONTINUE
                    0096     31   0051    274          BRW     NOSUCHDEV                  ; NO, ERROR
                56    18 A7    D0   0054    275 15$:     MOVL    RP_DT(R7),R6               ; GET DRIVE TYPE
                   12    56    91   0058    276          CMPB    R6,#^X12                   ; IS IT RP04/5/6?
                         06     1A   005B    277          BGTRU   17$                        ; NO
             9E AF    4244 8F    B0   005D    278          MOVW    #^A/DB/,DRIVERNAME+1       ; YES, CHANGE DRIVERNAME
                51    A4 AF    9E   0063    279 17$:     MOVAB   MBAGEOM-3,R1               ; POINT TO START OF GEOMETRY TABLE
                   51    03     C0   0067    280 20$:     ADDL    #3,R1                      ; ADVANCE TO NEXT TYPE CODE
                   50    81     90   006A    281          MOVB    (R1)+,R0                   ; GET TYPE CODE
                         03     12   006D    282          BNEQ    30$                        ; IF NEQ, LEGAL TYPE FOUND - CONTINUE
                      0078     31   006F    283          BRW     NOSUCHDEV                  ; TYPE NOT FOUND, UNSUPPORTED DEVICE
                   50    56     91   0072    284 30$:     CMPB    R6,R0                      ; CHECK FOR MATCH
                         F0     12   0075    285          BNEQ    20$                        ; NO, TRY ANOTHER
             24 A7    1000 8F    3C   0077    286          MOVZWL  #RP_OF_M_FMT,RP_OF(R7)     ; SELECT 16 BIT FORMAT
                                  007D    287
                                  007D    288 ;
                                  007D    289 ; Convert LBN to physical device address. Start the transfer.
                                  007D    290 ;
                                  007D    291
                         56     D4   007D    292          CLRL    R6                         ; CLEAR HIGH ORDER BITS OF DISK ADDRESS
                   50    81     3C   007F    293          MOVZWL  (R1)+,R0                   ; GET SECTORS PER CYLINDER
          55    28 A7    55    50   7B   0082    294          EDIV    R0,R5,RP_DC(R7),R5         ; CALCULATE AND SET CYLINDER ADDRESS
                   50    81     9A   0088    295          MOVZBL  (R1)+,R0                   ; GET SECTORS PER TRACK
             56    55    55    50   7B   008B    296          EDIV    R0,R5,R5,R6                ; CALCULATE SECTOR AND TRACK ADDRESS
                                  0090    297 MBCOMMON:                                   ;
             56    08    08    55   F0   0090    298          INSV    R5,#8,#8,R6                ; MERGE SECTOR AND TRACK ADDRESS
                   14 A7    56    D0   0095    299          MOVL    R6,RP_DA(R7)               ; SET DESIRED SECTOR AND TRACK ADDRESS
                   10 A3    58    CE   0099    300          MNEGL   R8,MBA$L_BCR(R3)           ; SET TRANSFER BYTE COUNT
                   0C A3    5A    D0   009D    301          MOVL    R10,MBA$L_VAR(R3)          ; AND SET AS VIRTUAL STARTING ADDRESS
                   50    39     D0   00A1    302          MOVL    #<28*2>+1,R0               ; ASSUME READ
                   20    10 AC    D1   00A4    303          CMPL    FUNC(AP),#IO$_WRITELBLK    ; IS FUNCTION WRITE?
                         03     12   00A8    304          BNEQ    10$                        ; NO, THEN READ
                   50    31     D0   00AA    305          MOVL    #<24*2>+1,R0               ; SET WRITE FUNCTION
                   67    50     D0   00AD    306 10$:     MOVL    R0,RP_CS1(R7)              ; START TRANSFER
                                  00B0    307
                                  00B0    308 ;
                                  00B0    309 ; Loop until the transfer completes.
                                  00B0    310 ;
                                  00B0    311
                08 A3    D5   00B0    312 20$:     TSTL    MBA$L_SR(R3)               ; DATA TRANSFER BUSY?
                   FB    19     00B3    313          BLSS    20$                        ; IF LSS YES
                                  00B5    314
                                  00B5    315 ;
                                  00B5    316 ; If the boot device is an RM80, check for a skip sector error.
                                  00B5    317 ;
                                  00B5    318
             56    18 A7    D0   00B5    319          MOVL    RP_DT(R7),R6               ; GET DEVICE TYPE
                56    16     91   00B9    320          CMPB    #^X16,R6                   ; IS BOOT DEVICE = RM80?
                         09     12   00BC    321          BNEQ    30$                        ; IF NEQ, NO
             34 A7    20     D3   00BE    322          BITL    #RM_ER2_M_SSE,RP_ER3(R7)   ; SKIP SECTOR ERROR?
```

```
                  03   13  00C2          BEQL    30$                     ; IF EQL, NO
                008E   31  00C4          BRW     SSERROR                 ; SKIP SECTOR ERROR
                           00C7
                           00C7  ;
                           00C7  ; See if the transfer was a success.
                           00C7  ;
                           00C7
            50    01   D0  00C7  30$:    MOVL    #SS$_NORMAL,R0          ; ASSUME NORMAL
  08 A3   000E5FFF 8F   D3  00CA          BITL    #MBA$M_ERROR,MBA$L_SR(R3) ;ANY CONTROLLER ERRORS?
                  1B   13  00D2          BEQL    RETURN                  ; IF EQL NO
                           00D4
                           00D4  ;
                           00D4  ; An error occurred in the transfer. Prepare 4 input registers and call
                           00D4  ; the ECC correction routine.
                           00D4  ;
                           00D4
        50    08 A7   D0  00D4          MOVL    RP_ER1(R7),R0           ; GET ERROR STATUS
        51    10 A3   D0  00D8          MOVL    MBA$L_BCR(R3),R1        ; AND BYTE COUNT REMAINING
            51    51   32  00DC          CVTWL   R1,R1                   ; EXTEND SIGN
        55    38 A7   D0  00DF          MOVL    RP_EC1(R7),R5           ; GET ECC POSITION
        56    3C A7   D0  00E3          MOVL    RP_EC2(R7),R6           ; AND PATTERN
                0006   31  00E7          BRW     ECC                     ; ATTEMPT ECC CORRECTION
                           00EA
                           00EA  ;
                           00EA  ; The specified boot device unit does not exist, or it is of an
                           00EA  ; unsupported drive type.
                           00EA  ;
                           00EA
                           00EA  NOSUCHDEV:                              ; UNSUPPORTED DEVICE
      50    0908 8F   3C  00EA          MOVZWL  #SS$_NOSUCHDEV,R0       ; SET ERROR CODE
                           00EF
                           00EF  RETURN:
                      05  00EF          RSB                             ; AND RETURN
```

```
                        00F0   357          .SBTTL  ECC - PERFORM ECC ERROR CORRECTION
                        00F0   358
                        00F0   359 ;++
                        00F0   360 ;
                        00F0   361 ; Functional description:
                        00F0   362 ;
                        00F0   363 ;       ATTEMPT ECC ERROR CORRECTION
                        00F0   364 ;
                        00F0   365 ; INPUTS:
                        00F0   366 ;
                        00F0   367 ;       R0      - RP_ER1        ERROR STATUS REGISTER
                        00F0   368 ;       R1      - NEGATIVE BYTE COUNT REMAINING
                        00F0   369 ;       R5      - ECC POSITION
                        00F0   370 ;       R6      - ECC PATTERN
                        00F0   371 ;       R8      - BYTE COUNT REMAINING AT START OF LAST TRANSFER
                        00F0   372 ;       R10     - starting address of transfer
                        00F0   373 ;       R11     - BLOCK NUMBER AT START OF TRANSFER
                        00F0   374 ;
                        00F0   375 ; Outputs:
                        00F0   376 ;
                        00F0   377 ;--
                        00F0   378
                        00F0   379 ECC:                                 ; ATTEMPT ECC CORRECTION
                        00F0   380
                        00F0   381 ;
                        00F0   382 ; Don't attempt an ECC correction if any of the following conditions apply:
                        00F0   383 ;
                        00F0   384 ;       the error was not a data check
                        00F0   385 ;       the error was a hard ECC error
                        00F0   386 ;       the transfer mode does not match the map-enabled position, i.e.,
                        00F0   387 ;               transfer is virtual, and mapping is not enabled, or v.v.
                        00F0   388 ;       no bytes have been transferred yet
                        00F0   389 ;
                        00F0   390
      5B 50    0F   E1  00F0   391          BBC     #RP_ER1_V_DCK,R0,RETRY  ; NOT DATA CHECK, RETRY
      57 50    06   E0  00F4   392          BBS     #RP_ER1_V_ECH,R0,RETRY  ; HARD ECC ERROR, RETRY
         50    38   DB  00F8   393          MFPR    #PR$_MAPEN,R0           ; GET MAP ENABLE STATE
      14 AC    50   D1  00FB   394          CMPL    R0,MODE(AP)             ; SAME AS I/O MODE
               4E   12  00FF   395          BNEQ    RETRY                   ; NO, CANT DO SIMPLE ECC
         51    58   C0  0101   396          ADDL    R8,R1                   ; COMPUTE BYTES TRANSFERRED
               49   13  0104   397          BEQL    RETRY                   ; NONE, RETRY
                        0106   398
                        0106   399 ;
                        0106   400 ; Appears to be a correctable data check. Attempt the correction.
                        0106   401 ;
                        0106   402
50    51    F7   8F   78  0106   403          ASHL    #-9,R1,R0               ; CONVERT TO PAGE COUNT
         5B    50   C0  010B   404          ADDL    R0,R11                  ; UPDATE BLOCK NUMBER
         5A    51   C0  010E   405          ADDL    R1,R10                  ; UPDATE BYTE ADDRESS
         58    51   C2  0111   406          SUBL    R1,R8                   ; DECREASE BYTES REMAINING
               55   D7  0114   407          DECL    R5                      ; MAKE POSITION 1 ORIGIN
   50    0200 C8   9E  0116   408          MOVAB   512(R8),R0              ; REMAINING BYTES AT START OF BAD SECTOR
52    08 AC    50   C3  011B   409          SUBL3   R0,SIZE(AP),R2          ; BYTES TRANSFERRED AT START OF ERROR SECTOR
         50    08   C4  0120   410          MULL    #8,R0                   ; CONVERT BYTE COUNT TO BIT COUNT
         50    55   C2  0123   411          SUBL    R5,R0                   ; COMPUTE CORRECTION FIELD WIDTH
               19   15  0126   412          BLEQ    20$                     ; BR IF NO CORRECTION NEEDED
         0D    50   D1  0128   413          CMPL    R0,#RP_EC1_S_POS        ; MINIMUM OF 13 AND BUFFER REMAINING
```

```
                    03   15  012B          BLEQ    10$                     ; KEEP MINIMUM VALUE
                50  0D   D0  012D          MOVL    #RP_EC1_S_POS,R0        ; LIMIT FIELD TO RP_EC1_S_POS BITS
   51   04 BC42  50  55   EF  0130  10$:    EXTZV   R5,R0,@BUF(AP)[R2],R1   ; GET FIELD TO BE CORRECTED
                51  56   CC  0137          XORL    R6,R1                   ; APPLY CORRECTION CODE
   04 BC42   50  55  51   F0  013A          INSV    R1,R5,R0,@BUF(AP)[R2]   ; AND STORE IN BUFFER
                            0141
                            0141  ;
                            0141  ; If the transfer is not complete, branch back to retry it.
                            0141  ;
                            0141
                    58   D5  0141  20$:    TSTL    R8                      ; CHECK FOR COUNT REMAINING
                    06   15  0143          BLEQ    30$                     ; NONE, EXIT
                55  5B   D0  0145          MOVL    R11,R5                  ; GET WORKING COPY OF LBN
                  FEE3   31  0148          BRW     MBA_DISK_DRIVER         ; CONTINUE TRANSFER
                            014B
                            014B  ;
                            014B  ; Transfer is complete. Return with success status code.
                            014B  ;
                            014B
                50  01   3C  014B  30$:    MOVZWL  #SS$_NORMAL,R0          ; SET COMPLETION CODE
                         05  014E          RSB                             ; AND RETURN
                            014F
                            014F  ;
                            014F  ; No ECC correction was possible.  Return and retry.
                            014F  ;
                            014F
                            014F  RETRY:
           50   0054 8F  3C  014F          MOVZWL  #SS$_CTRLERR,R0         ; SET FAILURE
                         05  0154          RSB                             ; RETURN
```

```
                                0155   444          .SBTTL  SSERROR - RM80 SKIP SECTOR ERROR ROUTINE
                                0155   445
                                0155   446 ;++
                                0155   447 ; FUNCTIONAL DESCRIPTION:
                                0155   448 ;
                                0155   449 ;       SSERROR is entered if an RM80 boot device encounters a skip
                                0155   450 ;       sector error (SSE).  SSE's are inhibited for the remainder of
                                0155   451 ;       the current track, transfer parameters are updated to the last
                                0155   452 ;       successful sector, and the sector address is incremented to skip
                                0155   453 ;       the error sector.  The transfer is the allowed to continue.
                                0155   454 ;
                                0155   455 ;       Note:   The first bad spot on each track of an RM80 is marked at
                                0155   456 ;               manufacturing time as a "skipped sector", and causes an
                                0155   457 ;               SSE.  Data for the remaining sectors on that track are
                                0155   458 ;               incremented by one physical sector, the last (31st) sector
                                0155   459 ;               mapping into a 32nd sector reserved for this use.
                                0155   460 ;
                                0155   461 ; INPUTS:
                                0155   462 ;
                                0155   463 ;       R3      - base address of the adapter's register space
                                0155   464 ;       R7      - address of the first external MBA register for this unit
                                0155   465 ;       R8      - byte count remaining at start of last transfer
                                0155   466 ;       R10     - starting address of transfer
                                0155   467 ;       R11     - updated block number (LBN)
                                0155   468 ;
                                0155   469 ; OUTPUTS:
                                0155   470 ;
                                0155   471 ;       Skip sector error is cleared in the error register (RP_ER3).
                                0155   472 ;       Skip sector error inhibit is set in the offset register (RP_OF).
                                0155   473 ;       R5      - current track address
                                0155   474 ;       R6      - sector address incremented past skipped sector
                                0155   475 ;       R8      - updated byte count remaining to transfer
                                0155   476 ;       R10     - updated starting address
                                0155   477 ;       R11     - updated block number (LBN)
                                0155   478 ;
                                0155   479 ;--
                                0155   480
                                0155   481 SSERROR:                                       ; RM80 SKIP SECTOR ERROR ROUTINE
24 A7   00000200 8F     C8      0155   482          BISL    #RM_OF_M_SSEI,RP_OF(R7) ; Set skip sector error inhibit
            67   09     D0      015D   483          MOVL    #<4*2>+1,RP_CS1(R7)     ; Clear drive errors
                                0160   484
                                0160   485 ;
                                0160   486 ; Update transfer parameters
                                0160   487 ;
                                0160   488
        51    10 A3     D0      0160   489          MOVL    MBA$L_BCR(R3),R1        ; Get negative bytes remaining
           51    51     32      0164   490          CVTWL   R1,R1                   ; Extend sign
                 07     12      0167   491          BNEQ    10$                     ; If NEQ, partial transfer
    51   FFFFFFFF 8F     D0      0169   492          MOVL    #-1,R1                  ; Force a partial transfer
           51    58     C0      0170   493 10$:     ADDL    R8,R1                   ; Calculate bytes transferred
        51   01FF 8F     AA      0173   494          BICW    #^X1FF,R1               ; Truncate start of sector
     50    51     F7 8F     78      0178   495          ASHL    #-9,R1,R0               ; Convert to page count
           5B    50     C0      017D   496          ADDL    R0,R11                  ; Update LBN
           5A    51     C0      0180   497          ADDL    R1,R10                  ; Update starting address
           58    51     C2      0183   498          SUBL    R1,R8                   ; Decrease bytes remaining
                                0186   499
                                0186   500 ;
```

```
                                0186   501 ; Convert updated LBN to physical device address.
                                0186   502 ; Increment past skipped sector and re-start.
                                0186   503 ;
                                0186   504
                     55   5B    D0  0186   505          MOVL    R11,R5                      ; Get working copy of LBN
                          56    D4  0189   506          CLRL    R6                          ; Clear high order bits of disk address
                50   01B2 8F    3C  018B   507          MOVZWL  #<14*31>,R0                 ; Get sectors per cylinder
           55   28 A7   55    50  7B  0190   508          EDIV    R0,R5,RP_DC(R7),R5          ; Calculate and set cylinder address
                50    1F    9A  0196   509          MOVZBL  #31,R0                      ; Get sectors per track
              56   55   55    50  7B  0199   510          EDIV    R0,R5,R5,R6                 ; Calculate R5=track R6=sector
                          56    96  019E   511          INCB    R6                          ; Increment sector address
                                01A0   512
                        FEED    31  01A0   513          BRW     MBCOMMON                    ; Restart the function
                                01A3   514
                    000001A3    01A3   515 MBA_DRVSIZ=.-DRIVERNAME
                                01A3   516
                                01A3   517          .END
```

```
$TABLE                          = 00000000 R   D   02
BTD$K_MB                        = 00000000     D
BUF                             = 00000004     D
DRIVERNAME                        00000000 R   D   03
ECC                               000000F0 R   D   03
FUNC                            = 00000010     D
IO$_WRITELBLK                   = 00000020     D
LBN                             = 0000000C     D
MBA$L_BCR                       = 00000010     D
MBA$L_CR                        = 00000004     D
MBA$L_ERB                       = 00000400     D
MBA$L_SR                        = 00000008     D
MBA$L_VAR                       = 0000000C     D
MBA$M_CR_IE                     = 00000004     D
MBA$M_CR_INIT                   = 00000001     D
MBA$M_ERROR                     = 000E5FFF     D
MBA$M_SR_NED                    = 00040000     D
MBAGEOM                           0000000D R   D   03
MBA_DISK_DRIVER                   0000002E R   D   03
MBA_DRVSIZ                      = 000001A3     D
MBCOMMON                          00000090 R   D   03
MODE                            = 00000014     D
NOSUCHDEV                         000000EA R   D   03
PR$_MAPEN                       = 00000038     D
RETRY                             0000014F R   D   03
RETURN                            000000EF R   D   03
RM_ER2_M_SSE                    = 00000020     D
RM_ER2_V_SSE                    = 00000005     D
RM_OF_M_SSEI                    = 00000200     D
RPB$W_UNIT                      = 00000064     D
RP_AS                             00000010     D
RP_CC                             0000002C     D
RP_CS1                            00000000     D
RP_DA                             00000014     D
RP_DC                             00000028     D
RP_DS                             00000004     D
RP_DT                             00000018     D
RP_EC1                            00000038     D
RP_EC1_S_POS                    = 0000000D     D
RP_EC2                            0000003C     D
RP_ER1                            00000008     D
RP_ER1_V_DCK                    = 0000000F     D
RP_ER1_V_ECH                    = 00000006     D
RP_ER2                            00000020     D
RP_ER3                            00000034     D
RP_LA                             0000001C     D
RP_MR                             0000000C     D
RP_OF                             00000024     D
RP_OF_M_FMT                     = 00001000     D
RP_SN                             00000030     D
SIZ...                          = 0000000B     D
SIZE                            = 00000008     D
SS$_CTRLERR                     = 00000054     D
SS$_NORMAL                      = 00000001     D
SS$_NOSUCHDEV                   = 00000908     D
SSERROR                           00000155 R   D   03
```

```
                                    +-----------------+
                                    ! Psect synopsis !
                                    +-----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           00000040  (   64.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
BOOTDRIVR_4                     00000018  (   24.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
BOOTDRIVR_2                     000001A3  (  419.)  03 (  3.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$TABLE	=00000000-R	185 (2)	185 (2)
BTD$K_MB	=00000000		185 (2)
BUF	=00000004	259 (3)	416 (4) 418 (4)
DRIVERNAME	00000000-R	188 (2)	185 (2) #-278 (3) 515 (5)
ECC	000000F0-R	379 (4)	#-344 (3)
FUNC	=00000010	262 (3)	#-303 (3)
IO$_WRITELBLK	=00000020		#-303 (3)
LBN	=0000000C	261 (3)	
MBA$L_BCR	=00000010		#-300 (3) #-340 (3) #-489 (5)
MBA$L_CR	=00000004		#-266 (3) #-267 (3)
MBA$L_ERB	=00000400		270 (3)
MBA$L_SR	=00000008		#-272 (3) #-312 (3) #-331 (3)
MBA$L_VAR	=0000000C		#-301 (3)
MBA$M_CR_IE	=00000004		#-266 (3)
MBA$M_CR_INIT	=00000001		#-267 (3)
MBA$M_ERROR	=000E5FFF		#-331 (3)
MBA$M_SR_NED	=00040000		#-272 (3)
MBAGEOM	0000000D-R	198 (2)	279 (3)
MBA_DISK_DRIVER	0000002E-R	265 (3)	185 (2) #-427 (4)
MBA_DRVSIZ	=000001A3	515 (5)	185 (2)
MBCOMMON	00000090-R	297 (3)	#-513 (5)
MODE	=00000014	263 (3)	#-394 (4)
NOSUCHDEV	000000EA-R	351 (3)	#-274 (3) #-283 (3)
PR$_MAPEN	=00000038		#-393 (4)
RETRY	0000014F-R	440 (4)	#-391 (4) #-392 (4) #-395 (4) #-397 (4)
RETURN	000000EF-R	354 (3)	#-332 (3)
RM_ER2_M_SSE	=00000020	170 (2)	#-322 (3)
RM_ER2_V_SSE	=00000005	171 (2)	
RM_OF_M_SSEI	=00000200	169 (2)	#-482 (5)
RPB$W_UNIT	=00000064		#-268 (3)
RP_CS1	00000000		#-271 (3) #-306 (3) #-483 (5)
RP_DA	00000014		#-299 (3)
RP_DC	00000028		#-294 (3) #-508 (5)
RP_DT	00000018		#-275 (3) #-319 (3)
RP_EC1	00000038		#-342 (3)
RP_EC1_S_POS	=0000000D		#-413 (4) #-415 (4)
RP_EC2	0000003C		#-343 (3)
RP_ER1	00000008		#-339 (3)
RP_ER1_V_DCK	=0000000F		#-391 (4)
RP_ER1_V_ECH	=00000006		#-392 (4)
RP_ER3	00000034		#-322 (3)
RP_OF	00000024		#-286 (3) #-482 (5)
RP_OF_M_FMT	=00001000		#-286 (3)
SIZE	=00000008	260 (3)	#-409 (4)
SS$_CTRLERR	=00000054		#-441 (4)
SS$_NORMAL	=00000001		#-330 (3) #-433 (4)
SS$_NOSUCHDEV	=00000908		#-352 (3)
SSERROR	0000155-R	481 (5)	#-324 (3)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.03	00:00:00.19
Command processing	891	00:00:00.30	00:00:00.97
Pass 1	668	00:00:02.38	00:00:03.49
Symbol table sort	0	00:00:00.35	00:00:00.35
Pass 2	87	00:00:00.68	00:00:01.23
Symbol table output	2	00:00:00.03	00:00:00.06
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	3	00:00:00.03	00:00:00.03
Assembler run totals	1680	00:00:03.80	00:00:06.32

The working set limit was 2400 pages.
136309 bytes (267 pages) of virtual memory were used to buffer the intermediate code.
There were 70 pages of symbol table space allocated to hold 1209 non-local and 11 local symbols.
517 source lines were read in Pass 1, producing 77 object records in Pass 2.
18 pages of virtual memory were used to define 17 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	4
SYS$COMMON:[SYSLIB]STARLET.MLB;2	7
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	12

1205 GETS were required to define 12 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1)	68	External Symbols, Libraries, and Macros
(1)	103	Data Psect Declarations
(1)	200	Chr$Mchk Routine
(1)	429	DSR$Fault_Clear Routine - Initialize COMET CMI
(1)	521	UnexpInterrupt Routine - Otherwise undefined SCB vectors

```
0000    ; DEC/CMS REPLACEMENT HISTORY, Element MCHK750.MAR
0000    ; *1     6-FEB-1986 15:19:38 DS ""
0000    ; DEC/CMS REPLACEMENT HISTORY, Element MCHK750.MAR
0000            .TITLE  MCHK750 *** MCHK750 Machine Check formatter
0000            .IDENT  /02-09/
0000            .NoShow Conditionals                    ;                    [08]
0000            .DSABL  GBL
0000
0000    ;
0000    ; Copyright (c) 1977, 1982
0000    ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
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0000
0000    ;++
0000    ; FACILITY:
0000    ;
0000    ; ABSTRACT:
0000    ;
0000    ; ENVIRONMENT:
0000    ;
0000    ; AUTHOR:        ROGER RIGGS     15-AUG-78       VERSION 01.
0000    ;++
0000    ;                NICK HOWGATE    13-NOV-78       VERSION 02 (ESSAA-5.01)
0000    ;       01       SUPPORT 11/750 MACHINE CHECK
0000    ;
0000    ;                NICK HOWGATE    15-MAY-79
0000    ;       02       CORRECT MACHINE CHECK LOGOUT DISPLAY
0000    ;
0000    ;                N. HOWGATE      18-JUN-79
0000    ;       03       SUPPORT FOR CORRECTED MEMORY DATA AND WRITE BUS ERROR
0000    ;                INTERRUPTS
0000    ;
0000    ;                Roger Riggs     9-OCT-1979
0000    ;       04       Added support for single SCB, defined unused SCB offsets
0000    ;
0000    ;                Roger Riggs, 19-June-1980
0000    ;       05       Changed argument list to CHR$MCHK, to include
0000    ;                print routine addresses for header and text.
0000    ;
0000    ;                Roger Riggs, 13-Sep-80, Version 6.0
0000    ;       06       Fix bug pointing to MCHK args in CHR$MCHK
0000    ;
0000    ;       07       - Dave Butenhof, 07-Jan-1982, version 6.6
```

```
                        0000     58 ;                Fix truncation error.
                        0000     59 ;
                        0000     60 ;        08      - Jack Stansbury, 19-Mar-1982, Version 6.?
                        0000     61 ;                Added typecoding to all the print statements. Also fooled
                        0000     62 ;                around with the .LIST directives.
                        0000     63 ;
                        0000     64 ;        09      Bob Bergazzi    Aug. 29,1984    Version 7.1
                        0000     65 ;                Made INT_CMD and INT_WBTO use interrupt stack.
                        0000     66 ;--
```

```
                        0000     68          .SBTTL  External Symbols, Libraries, and Macros
                        0000     69 ;
                        0000     70 ; INCLUDE FILES:
                        0000     71 ;
                        0000     72
                        0000     73          .Library        /SYS$Library:Lib/                        ;               [08]
                        0000     74          .Library        /$DS/                                   ;               [08]
                        0000     75          .Library        /$DIAG/                                 ;               [08]
                        0000     76
                        0000     77 ;
                        0000     78 ; EXTERNAL SYMBOLS
                        0000     79 ;
                        0000     80          .EXTRN  DS$CLI,         DS$CVTREG                       ;               [08]
                        0000     81          .EXTRN  DS$GL_FLAGS,    APSLMNE,        APT_MSG
                        0000     82          .Extrn  EXE_UNEXPINT,   AAT_ARITH                       ;               [08]
                        0000     83          .Extrn  DS$GB_TypeCode, DSX$Print,      MODELST         ;               [08]
                        0000     84
                        0000     85 ;
                        0000     86 ; EQUATED SYMBOLS
                        0000     87 ;
                        0000     88
                        0000     89          $DS_CVTREG_DEF
                        0000     90          $PRDEF
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .RESTORE
                        0000     91          APTDEF
                        0000     92          $DS_DSADEF
                        0000     93          $DS_BITDEF
                        0000     94          $DS_TypeDef                             ;               [08]
                        0000     95
                00000026 0000    96          PR$_MCESR       = ^X26          ; MACHINE CHECK ERROR SUMMARY REGISTER
                00000001 0000    97          IS              = 1
                00000080 0000    98          BUFSIZ          = 128
                        0000     99
                0000000D 0000   100          CR              = 13
                0000000A 0000   101          LF              = 10
```

```
                            0000   103          .SBTTL  Data Psect Declarations
                         00000000  104          .PSECT  DATA, SHR, NOEXE, NOWRT, BYTE
                            0000   105
                            0000   106 ;+
                            0000   107 ; Leave this first one without the print routine constant and the typecode      [08]
                            0000   108 ; because the routine will set the typecode explicitly and call the            [08]
                            0000   109 ; appropriate routine directly (without calling PRINT).                        [08]
                            0000   110 ;-
                            0000   111
                            0000   112 MSG_MCHK:        $PRINTI_L       FMT_EXCEPT, T_MCHK, T_EXCEPT, <<^X04>>
                00000004    0000                       .LONG   $$N
                0000004C'   0004                       .LONG   FMT_EXCEPT
                00000209'   0008                       .LONG   T_MCHK
                000001FF'   000C                       .LONG   T_EXCEPT
                00000004    0010                       .LONG   ^X04
                            0014   113
                            0014   114 ;+
                            0014   115 ; These two are Exception Header messages. They are printed by the appropriate  [08]
                            0014   116 ; interrupt routine.                                                           [08]
                            0014   117 ;-
                            0014   118
                            0014   119 MSG_CMD:         $Print_L        DS$K_Type_Exception_Head, DS$K_PrintI, -   ;    [08]
                            0014   120                                  FMT_EXCEPT, T_CMD, T_EXCEPT, <<^X54>>      ;    [08]
                00000006    0014                       .LONG   $$N                     ; Number of args
                0000000B    0018                       .Long   DS$K_Type_Exception_Head                ; Typecode byte
                00000000    001C                       .Long   DS$K_PrintI             ; DS$K_PrintI constant
                0000004C'   0020                       .Long   FMT_EXCEPT              ; FAO FMT_EXCEPT
                000001D7'   0024                       .Long   T_CMD
                000001FF'   0028                       .Long   T_EXCEPT
                00000054    002C                       .Long   ^X54
                            0030   121
                            0030   122 MSG_WBTO:        $Print_L        DS$K_Type_Exception_Head, DS$K_PrintI, -   ;    [08]
                            0030   123                                  FMT_EXCEPT, T_WBTO, T_EXCEPT, <<^X60>>     ;    [08]
                00000006    0030                       .LONG   $$N                     ; Number of args
                0000000B    0034                       .Long   DS$K_Type_Exception_Head                ; Typecode byte
                00000000    0038                       .Long   DS$K_PrintI             ; DS$K_PrintI constant
                0000004C'   003C                       .Long   FMT_EXCEPT              ; FAO FMT_EXCEPT
                000001ED'   0040                       .Long   T_WBTO
                000001FF'   0044                       .Long   T_EXCEPT
                00000060    0048                       .Long   ^X60
```

```
20 43 41 21 20 3F 3F 2F 21 2F 21 00'  004C   125 FMT_EXCEPT:     .ASCIC  '!/!/?? !AC !AC THROUGH VECTOR: !XB(X).!/'
20 48 47 55 4F 52 48 54 20 43 41 21   0058
28 42 58 21 20 3A 52 4F 54 43 45 56   0064
                  2F 21 2E 29 58      0070
                              28      004C
                                      0075   126
21 5F 21 5F 21 3A 54 4E 55 4F 43 00'  0075   127 FMT_MCHK_CNT:   .ASCIC  'COUNT:!_!_!_!XL(X)!/'
         2F 21 29 58 28 4C 58 21 5F   0081
                                 14   0075
                                      008A   128
52 41 50 20 59 52 41 4D 4D 55 53 00'  008A   129 FMT_MCHK_SUM:   .ASCIC  'SUMMARY PARAMETER:!_!XL(X)!/'
4C 58 21 5F 21 3A 52 45 54 45 4D 41   0096
                  2F 21 29 58 28      00A2
                              1C      008A
                                      00A7   130
41 4D 4D 55 53 20 52 4F 52 52 45 00'  00A7   131 FMT_MCHK_MCESR: .ASCIC  'ERROR SUMMARY REGISTER:!_!XL(X)!_;!AC!/'
3A 52 45 54 53 49 47 45 52 20 59 52   00B3
21 3B 5F 21 29 58 28 4C 58 21 5F 21   00BF
                     2F 21 43 41      00CB
                              27      00A7
                                      00CF   132
58 21 5F 21 5F 21 5F 21 3A 41 56 00'  00CF   133 FMT_MCHK_VA:    .ASCIC  'VA:!_!_!_!XL(X)!/'
                  2F 21 29 58 28 4C   00DB
                              11      00CF
                                      00E1   134
52 4F 52 52 45 20 54 41 20 43 50 00'  00E1   135 FMT_MCHK_PCAE:  .ASCIC  'PC AT ERROR:!_!_!XL(X)!/'
21 29 58 28 4C 58 21 5F 21 5F 21 3A   00ED
                              2F      00F9
                              18      00E1
                                      00FA   136
21 5F 21 5F 21 5F 21 3A 52 44 4D 00'  00FA   137 FMT_MCHK_MDR:   .ASCIC  'MDR:!_!_!_!XL(X)!/'
               2F 21 29 58 28 4C 58   0106
                              12      00FA
```

```
54 20 4B 43 4F 4C 20 44 41 45 52 00' 010D   139 FMT_MCHK_RLTO:  .ASCIC  'READ LOCK TIMEOUT:!_!XL(X)!_;!AC!/'
4C 58 21 5F 21 3A 54 55 4F 45 4D 49  0119
   2F 21 43 41 21 3B 5F 21 29 58 28  0125
                                 22  010D
                                     0130   140
41 50 20 50 55 4F 52 47 20 42 54 00' 0130   141 FMT_MCHK_TBGPER:.ASCIC  'TB GROUP PARITY:!_!XL(X)!_;!AC!/'
58 28 4C 58 21 5F 21 3A 59 54 49 52  013C
         2F 21 43 41 21 3B 5F 21 29  0148
                                 20  0130
                                     0151   142
52 4F 52 52 45 20 45 48 43 41 43 00' 0151   143 FMT_MCHK_CER:   .ASCIC  'CACHE ERROR REGISTER:!_!XL(X)!_;!AC!/'
5F 21 3A 52 45 54 53 49 47 45 52 20  015D
43 41 21 3B 5F 21 29 58 28 4C 58 21  0169
                              2F 21  0175
                                 25  0151
                                     0177   144
20 45 44 4F 4D 20 44 45 56 41 53 00' 0177   145 FMT_MCHK_SMR:   .ASCIC  'SAVED MODE REGISTER:!_!XL(X)!_;!AC!/'
21 5F 21 3A 52 45 54 53 49 47 45 52  0183
21 43 41 21 3B 5F 21 29 58 28 4C 58  018F
                                 2F  019B
                                 24  0177
                                     019C   146
52 20 52 4F 52 52 45 20 53 55 42 00' 019C   147 FMT_MCHK_BER:   .ASCIC  'BUS ERROR REGISTER:!_!XL(X)!_;!AC!/'
58 21 5F 21 3A 52 45 54 53 49 47 45  01A8
2F 21 43 41 21 3B 5F 21 29 58 28 4C  01B4
                                 23  019C
                                     01C0   148
50 20 54 50 55 52 52 45 54 4E 49 00' 01C0   149 FMT_INTPC:      .ASCIC  .INTERRUPT PC: !XL(X)!/.
   2F 21 29 58 28 4C 58 21 20 3A 43  01CC
                                 16  01C0
```

```
4D 20 44 45 54 43 45 52 52 4F 43 00'  01D7   151 T_CMD:          .ASCIC  'CORRECTED MEMORY DATA'
      41 54 41 44 20 59 52 4F 4D 45    01E3
                                 15    01D7
                                       01ED   152
54 20 53 55 42 20 45 54 49 52 57 00'  01ED   153 T_WBTO:         .ASCIC  'WRITE BUS TIMEOUT'
                  54 55 4F 45 4D 49    01F9
                                 11    01ED
                                       01FF   154
      4E 4F 49 54 50 45 43 58 45 00'  01FF   155 T_EXCEPT:       .ASCIC  'EXCEPTION'
                                 09    01FF
                                       0209   156
45 48 43 20 45 4E 49 48 43 41 4D 00'  0209   157 T_MCHK:         .ASCIC  'MACHINE CHECK'
                              4B 43    0215
                                 0D    0209
                                       0217   158
45 48 43 20 45 4E 49 48 43 41 4D 00'  0217   159 T_MCHK_HDR:     .ASCIC  'MACHINE CHECK LOGOUT:'<CR><LF>
0A 0D 3A 54 55 4F 47 4F 4C 20 4B 43    0223
                                 17    0217
                                       022F   160
43 41 4D 20 4E 57 4F 4E 4B 4E 55 00'  022F   161 T_CDERR:        .ASCIC  'UNKNOWN MACHINE CHECK CODE'<CR><LF>
43 20 4B 43 45 48 43 20 45 4E 49 48    023B
                     0A 0D 45 44 4F    0247
                                 1C    022F
                                       024C   162
45 20 59 54 49 52 41 50 20 53 43 00'  024C   163 T_CSPE:         .ASCIC  'CS PARITY ERROR ABORT'<CR><LF>
0A 0D 54 52 4F 42 41 20 52 4F 52 52    0258
                                 17    024C
```

```
45 20 59 54 49 52 41 50 20 42 54 00'  0264   165 T_TBPE:          .ASCIC  'TB PARITY ERROR ABORT'<CR><LF>
0A 0D 54 52 4F 42 41 20 52 4F 52 52   0270
                                17    0264
                                      027C   166
0A 0D 52 4F 52 52 45 20 53 55 42 00'  027C   167 T_BUSE:          .ASCIC  'BUS ERROR'<CR><LF>
                                0B    027C
                                      0288   168
54 49 52 41 50 20 45 48 43 41 43 00'  0288   169 T_CAPE:          .ASCIC  'CACHE PARITY ERROR INTERRUPT'<CR><LF>
45 54 4E 49 20 52 4F 52 52 45 20 59   0294
                0A 0D 54 50 55 52 52  02A0
                                1E    0288
                                      02A7   170
45 20 53 55 42 20 45 54 49 52 57 00'  02A7   171 T_WBE:           .ASCIC  'WRITE BUS ERROR INTERRUPT'<CR><LF>
55 52 52 45 54 4E 49 20 52 4F 52 52   02B3
                      0A 0D 54 50     02BF
                                1B    02A7
                                      02C3   172
4D 20 44 45 54 43 45 52 52 4F 43 00'  02C3   173 T_CRD:           .ASCIC  'CORRECTED MEMORY DATA INTERRUPT'<CR><LF>
49 20 41 54 41 44 20 59 52 4F 4D 45   02CF
      0A 0D 54 50 55 52 52 45 54 4E   02DB
                                21    02C3
                                      02E5   174
20 45 44 4F 43 20 4F 52 43 49 4D 00'  02E5   175 T_UPE:           .ASCIC  'MICRO CODE SEQUENCE ERROR ABORT'<CR><LF>
52 52 45 20 45 43 4E 45 55 51 45 53   02F1
      0A 0D 54 52 4F 42 41 20 52 4F   02FD
                                21    02E5
                                      0307   176
20 44 52 49 20 44 45 53 55 4E 55 00'  0307   177 T_IRD:           .ASCIC  'UNUSED IRD ROM SLOT'<CR><LF>
      0A 0D 54 4F 4C 53 20 4D 4F 52   0313
                                15    0307
```

```
                                031D   179 AAT_REF_MSK:
                        00000002  031D   180                  .LONG   2
                        00000329' 0321   181                  .ADDRESS        1$
                        00000331' 0325   182                  .ADDRESS        2$
     4C 41 55 54 52 49 56 00'     0329   183 1$:              .ASCIC  .VIRTUAL.
                              07  0329
  4C 41 43 49 53 59 48 50 00'     0331   184 2$:              .ASCIC  .PHYSICAL.
                              08  0331
```

```
54 2C 52 4F 52 52 45 20 53 55 42 00' 033A   186 BIT_MCESR:      .ASCIC  .BUS ERROR,TB ERROR,UNALIGNED UNIBUS DATA,XB.
4C 41 4E 55 2C 52 4F 52 52 45 20 42  0346
53 55 42 49 4E 55 20 44 45 4E 47 49  0352
            42 58 2C 41 54 41 44 20  035E
                                 2B  033A
                                     0366   187
4D 20 4E 49 20 52 4F 54 43 45 56 00' 0366   188 BIT_RLTO:      .ASCIC  .VECTOR IN MDR.
                              52 44  0372
                                 0D  0366
                                     0374   189
52 45 20 47 41 54 20 31 50 52 47 00' 0374   190 BIT_TBGPER:    .ASCIC  .GRP1 TAG ERROR,GRP0 TAG ERROR,GRP1 DATA ERROR,GRP0 DATA ERR
47 41 54 20 30 50 52 47 2C 52 4F 52  0380
20 31 50 52 47 2C 52 4F 52 52 45 20  038C
47 2C 52 4F 52 52 45 20 41 54 41 44  0398
52 52 45 20 41 54 41 44 20 30 50 52  03A4
                              52 4F  03B0
                                 3D  0374
                                     03B2   191
44 2C 52 4F 52 52 45 20 47 41 54 00' 03B2   192 BIT_CER:       .ASCIC  .TAG ERROR,DATA ERROR,LOST ERROR,HIT.
4F 4C 2C 52 4F 52 52 45 20 41 54 41  03BE
54 49 48 2C 52 4F 52 52 45 20 54 53  03CA
                                 23  03B2
                                     03D6   193
52 45 20 47 41 54 20 31 50 52 47 00' 03D6   194 BIT_CAGPER:    .ASCIC  .GRP1 TAG ERROR,GRP0 TAG ERROR,GRP1 DATA ERROR,GRP0 DATA ERR
47 41 54 20 30 50 52 47 2C 52 4F 52  03E2
20 31 50 52 47 2C 52 4F 52 52 45 20  03EE
47 2C 52 4F 52 52 45 20 41 54 41 44  03FA
52 52 45 20 41 54 41 44 20 30 50 52  0406
                              52 4F  0412
                                 3D  03D6
                                     0414   195
31 3D 45 43 4E 45 52 45 46 45 52 00' 0414   196 BIT_SMR:       .ASCIC  .REFERENCE=1a,MODE=2a.
            40 32 3D 45 44 4F 4D 2C  0420
                                 14  0414
                                     0429   197
53 4F 4C 2C 45 43 55 2C 4D 58 4E 00' 0429   198 BIT_BER:       .ASCIC  .NXM,UCE,LOST ERROR,CRD.
   44 52 43 2C 52 4F 52 52 45 20 54  0435
                                 16  0429
```

```
                        0440   200          .SBTTL  Chr$Mchk Routine
                    00000000   201          .Psect  Code, Shr, Exe, NoWrt, Long     ;                                [07]
                        0000   202 ;**
                        0000   203 ; FUNCTIONAL DESCRIPTION:
                        0000   204 ;
                        0000   205 ;       ROUTINE TO HANDLE MACHINE CHECK TRAP
                        0000   206 ;
                        0000   207 ; CALLING SEQUENCE:
                        0000   208 ;
                        0000   209 ;       CHR$MCHK (signal_array, hdr_print, txt_print)
                        0000   210 ;
                        0000   211 ; CALLED BY:
                        0000   212 ;
                        0000   213 ;       DSX$PrintSig  - Except module
                        0000   214 ;       DSX$PrintSigi - Except module
                        0000   215 ;
                        0000   216 ; INPUT PARAMETERS:
                        0000   217 ;
                        0000   218 ;       4(AP)   Address of signal array
                        0000   219 ;       8(AP)   Print routine address for headers
                        0000   220 ;       12(AP)  Print routine address for text
                        0000   221 ;
                        0000   222 ;       4(AP) -> Address of signal args for machine check
                        0000   223 ;       8(A)    =       NUMBER OF ARGS
                        0000   224 ;       12(A)   =       SUMMARY PARAMETER
                        0000   225 ;       16(A)   =       VA REGISTER
                        0000   226 ;       20(A)   =       PC AT TIME OF ERROR
                        0000   227 ;       24(A)   =       MDR
                        0000   228 ;       28(A)   =       SAVED MODE REGISTER
                        0000   229 ;       32(A)   =       READ LOCK TIMEOUT
                        0000   230 ;       36(A)   =       TB GROUP PARITY ERROR REGISTER
                        0000   231 ;       40(A)   =       CACHE ERROR REGISTER
                        0000   232 ;       44(A)   =       BUS ERROR REGISTER
                        0000   233 ;       48(A)   =       MACHINE CHECK ERROR SUMMARY REGISTER
                        0000   234 ;       52(A)   =       PC
                        0000   235 ;       56(A)   =       PSL
```

```
0000   ;
0000   ; IMPLICIT INPUTS:
0000   ;
0000   ;       NONE
0000   ;
0000   ; OUTPUT PARAMETERS:
0000   ;
0000   ;       NONE
0000   ;
0000   ; IMPLICIT OUTPUTS:
0000   ;
0000   ;       NONE
0000   ;
0000   ;
0000   ; REGISTER USAGE:
0000   ;
0000   ;       R5      Address of header print routine
0000   ;       R6      Address of text print routine
0000   ;
0000   ; COMPLETION CODES:
0000   ;
0000   ;       NONE
0000   ;
0000   ; SIDE EFFECTS:
0000   ;
0000   ;       NONE
0000   ;
0000   ;--
```

```
                    046C  0000   266          .ENTRY  CHR$MCHK,^M<R2,R3,R5,R6,R10>
                          0002   267
            55   08 AC    7D   0002   268          MOVQ    8(AP),R5                ; Set addresses of print routines
            5E   80 AD    9E   0006   269          MOVAB   -BUFSIZ(FP),SP          ; Allocate space for CVTREG buffer
               53   6E    9E   000A   270          MOVAB   (SP),R3                 ; SAVE ADDRESS OF BUFFER
                          000D   271
         5A   04 AC    08   C1   000D   272          ADDL3   #8,4(AP),R10            ; Point to machine check logout area
                          0012   273
        00000000'EF    0B   90   0012   274          MovB    #DS$K_Type_Exception_Head, - ; Set the type code number ...     [08]
                          0019   275                    L^DS$GB_TypeCode        ; ... explicitly.                               [08]
        65   00000000'EF    FA   0019   276          CALLG   MSG_MCHK,(R5)           ; Print the header for the machine check[08]
        00000000'EF    0C   90   0020   277          MovB    #DS$K_Type_Exception, - ; Set the type code number explicitly   [08]
                          0027   278                    L^DS$GB_TypeCode        ; ... for the rest of the messages.     [08]
                          0027   279
            50   04 AA    9A   0027   280          MOVZBL  4(R10),R0               ; GET THE CHECK CODE
                          002B   281          CASE    R0,LIMIT=#0,TYPE=B,<-
                          002B   282            INVALID,-                     ; 00- INVALID
                          002B   283            CSPE,-                        ; 01- CONTROL STORE PARITY ERROR
                          002B   284            TBPE,-                        ; 02-   TB PARITY ERROR
                          002B   285            -                             ;       BUS ERROR
                          002B   286            -                             ;       UNALIGNED UNIBUS REFERENCE
                          002B   287            CAPE,-                        ; 03- CACHE PARITY ERROR
                          002B   288            WBE,-                         ; 04- WRITE BUS ERROR
                          002B   289            CRD,-                         ; 05- CORRECTED READ DATA
                          002B   290            UPE,-                         ; 06- UNUSED CONTROL STORE TRAP
                          002B   291            IRD,-                         ; 07- UNUSED IRD ROM SLOT
                          002B   292          >
      07'   00    50    8F   002B                CASEB   R0,#0,S^#<<30001$-30000$>/2>-1
                          002F          30000$:
                0010'     002F                      .SIGNED_WORD    INVALID-30000$
                001C'     0031                      .SIGNED_WORD    CSPE-30000$
                0028'     0033                      .SIGNED_WORD    TBPE-30000$
                0044'     0035                      .SIGNED_WORD    CAPE-30000$
                004F'     0037                      .SIGNED_WORD    WBE-30000$
                005B'     0039                      .SIGNED_WORD    CRD-30000$
                0067'     003B                      .SIGNED_WORD    UPE-30000$
                0072'     003D                      .SIGNED_WORD    IRD-30000$
                          003F          30001$:
```

```
                       003F   294 INVALID:
0000022F'EF   9F       003F   295         PUSHAB  T_CDERR                 ; MESSAGE
    66   01   FB       0045   296         CALLS   #1,(R6)
      005F   31       0048   297         BRW     LOGOUT
                       004B   298
                       004B   299 CSPE:
0000024C'EF   9F       004B   300         PUSHAB  T_CSPE                  ; MESSAGE
    66   01   FB       0051   301         CALLS   #1,(R6)
      0053   31       0054   302         BRW     LOGOUT
                       0057   303
                       0057   304 TBPE:
 28 AA   08   93       0057   305         BITB    #8,40(R10)              ; IS THIS A BUS ERROR ?
         0B   13       005B   306         BEQL    10$                     ; NO -
0000027C'EF   9F       005D   307         PUSHAB  T_BUSE                  ; YES-
    66   01   FB       0063   308         CALLS   #1,(R6)
         42   11       0066   309         BRB     LOGOUT                  ; EXIT
                       0068   310 10$:
00000264'EF   9F       0068   311         PUSHAB  T_TBPE                  ;  MESSAGE
    66   01   FB       006E   312         CALLS   #1,(R6)
         37   11       0071   313         BRB     LOGOUT
                       0073   314 CAPE:
00000288'EF   9F       0073   315         PUSHAB  T_CAPE                  ;  MESSAGE
    66   01   FB       0079   316         CALLS   #1,(R6)
         2C   11       007C   317         BRB     LOGOUT
                       007E   318
                       007E   319 WBE:
000002A7'EF   9F       007E   320         PUSHAB  T_WBE                   ; MESSAGE
    66   01   FB       0084   321         CALLS   #1,(R6)
      0020   31       0087   322         BRW     LOGOUT
                       008A   323
                       008A   324 CRD:
000002C3'EF   9F       008A   325         PUSHAB  T_CRD                   ; MESSAGE
    66   01   FB       0090   326         CALLS   #1,(R6)
      0014   31       0093   327         BRW     LOGOUT
                       0096   328
                       0096   329 UPE:
000002E5'EF   9F       0096   330         PUSHAB  T_UPE                   ;  MESSAGE
    66   01   FB       009C   331         CALLS   #1,(R6)
         09   11       009F   332         BRB     LOGOUT
                       00A1   333
                       00A1   334 IRD:
00000307'EF   9F       00A1   335         PUSHAB  T_IRD                   ;  MESSAGE
    66   01   FB       00A7   336         CALLS   #1,(R6)
                       00AA   337
                       00AA   338 LOGOUT:
00000217'EF   9F       00AA   339         PUSHAB  T_MCHK_HDR              ; MESSAGE
    66   01   FB       00B0   340         CALLS   #1,(R6)
         6A   DD       00B3   341         PUSHL   (R10)
00000075'EF   9F       00B5   342         PUSHAB  FMT_MCHK_CNT
    66   02   FB       00BB   343         CALLS   #2,(R6)
      04 AA   DD       00BE   344         PUSHL   4(R10)
0000008A'EF   9F       00C1   345         PUSHAB  FMT_MCHK_SUM
    66   02   FB       00C7   346         CALLS   #2,(R6)
                       00CA   347 CHKVA:
      08 AA   DD       00CA   348         PUSHL   8(R10)
000000CF'EF   9F       00CD   349         PUSHAB  FMT_MCHK_VA
    66   02   FB       00D3   350         CALLS   #2,(R6)
```

```
                                00D6
                                00D6  CHKMA:
                  0C AA    DD   00D6          PUSHL   12(R10)
          000000E1'EF      9F   00D9          PUSHAB  FMT_MCHK_PCAE
                66   02    FB   00DF          CALLS   #2,(R6)
                                00E2
                                00E2  CHKMDR:
                  10 AA    DD   00E2          PUSHL   16(R10)
          000000FA'EF      9F   00E5          PUSHAB  FMT_MCHK_MDR
                66   02    FB   00EB          CALLS   #2,(R6)
                                00EE
                                00EE  CHKSMR:
                                00EE          $DS_CVTREG_S    -
                                00EE                  MSB     =       #3,-
                                00EE                  DATA    =       20(R10),-
                                00EE                  MNEADR  =       BIT_SMR,-
                                00EE                  STRBUF  =       (R3),-
                                00EE                  MAXLEN  =       #BUFSIZ,-
                                00EE                  V1      =       AAT_REF_MSK,-
                                00EE                  V2      =       MODELST
                     00    DD   00EE                  PUSHL   #0
                     00    DD   00F0                  PUSHL   #0
                     00    DD   00F2                  PUSHL   #0
                     00    DD   00F4                  PUSHL   #0
          00000000'EF      DF   00F6                  PUSHAL  MODELST
          0000031D'EF      DF   00FC                  PUSHAL  AAT_REF_MSK
          00000080 8F      DD   0102                  PUSHL   #BUFSIZ
                     63    9F   0108                  PUSHAB  (R3)
          00000414'EF      9F   010A                  PUSHAB  BIT_SMR
                  14 AA    DD   0110                  PUSHL   20(R10)
                     03    DD   0113                  PUSHL   #3
     00000000'9F     0B    FB   0115                  CALLS   #11, a#DS$CVTREG
                     53    DD   011C          PUSHL   R3
                  14 AA    DD   011E          PUSHL   20(R10)
          00000177'EF      9F   0121          PUSHAB  FMT_MCHK_SMR
                66   03    FB   0127          CALLS   #3,(R6)
                                012A
                                012A  CHKRLTO:
           51     18 AA    D0   012A          MOVL    24(R10),R1              ; READ LOCK TIMEOUT
     52    00000366'EF      9E   012E          MOVAB   BIT_RLTO,R2             ; BIT DEFINITION
                50   00    9A   0135          MOVZBL  #0,R0                   ; STARTING POSITION
                   0095    30   0138          BSBW    CVT                     ; CONVERT
                     53    DD   013B          PUSHL   R3
                  18 AA    DD   013D          PUSHL   24(R10)
          0000010D'EF      9F   0140          PUSHAB  FMT_MCHK_RLTO
                66   03    FB   0146          CALLS   #3,(R6)
                                0149
                                0149  CHKTBGPER:
           51     1C AA    D0   0149          MOVL    28(R10),R1              ; TB GROUP PARITY ERROR REGISTER
     52    00000374'EF      9E   014D          MOVAB   BIT_TBGPER,R2           ; BIT DEFINITION
                50   03    9A   0154          MOVZBL  #3,R0                   ; STARING POSITION
                   0076    30   0157          BSBW    CVT                     ; CONVERT
                     53    DD   015A          PUSHL   R3
                  1C AA    DD   015C          PUSHL   28(R10)
          00000130'EF      9F   015F          PUSHAB  FMT_MCHK_TBGPER
                66   03    FB   0165          CALLS   #3,(R6)
                                0168
```

```
                        0168   396 CHKCER:
      51    20 AA   D0  0168   397          MOVL    32(R10),R1              ; CACHE ERROR REGISTER
52    000003B2'EF   9E  016C   398          MOVAB   BIT_CER,R2              ; BIT DEFINITION
      50    03      9A  0173   399          MOVZBL  #3,R0                   ; STARTING POSITION
            0057    30  0176   400          BSBW    CVT                     ; CONVERT
              53    DD  0179   401          PUSHL   R3
          20 AA     DD  017B   402          PUSHL   32(R10)
    00000151'EF     9F  017E   403          PUSHAB  FMT_MCHK_CER
        66  03      FB  0184   404          CALLS   #3,(R6)
                        0187   405
                        0187   406 CHKBER:
      51    24 AA   D0  0187   407          MOVL    36(R10),R1              ; BUS ERROR REGISTER
52    00000429'EF   9E  018B   408          MOVAB   BIT_BER,R2              ; BIT DEFINITION
      50    03      9A  0192   409          MOVZBL  #3,R0                   ; STARTING POSITION
            0038    30  0195   410          BSBW    CVT                     ; CONVERT
              53    DD  0198   411          PUSHL   R3
          24 AA     DD  019A   412          PUSHL   36(R10)
    0000019C'EF     9F  019D   413          PUSHAB  FMT_MCHK_BER
        66  03      FB  01A3   414          CALLS   #3,(R6)
                        01A6   415
                        01A6   416 CHKMCESR:
      51    28 AA   D0  01A6   417          MOVL    40(R10),R1              ; MACHINE CHECK ERROR SUMARRY REGISTER
52    0000033A'EF   9E  01AA   418          MOVAB   BIT_MCESR,R2            ; BIT DEFINITION
      50    03      9A  01B1   419          MOVZBL  #3,R0                   ; STARTING POSITION
            0019    30  01B4   420          BSBW    CVT                     ; CONVERT
              53    DD  01B7   421          PUSHL   R3
          28 AA     DD  01B9   422          PUSHL   40(R10)
    000000A7'EF     9F  01BC   423          PUSHAB  FMT_MCHK_MCESR
        66  03      FB  01C2   424          CALLS   #3,(R6)
                        01C5   425
    00000000'EF     94  01C5   426          ClrB    L^DS$GB_TypeCode        ; Clear out the typecode number         [08]
                    04  01CB   427          RET                             ; Return to caller
```

```
                     01CC   429          .SBTTL  DSR$Fault_Clear Routine - Initialize COMET CMI
                     01CC   430 ;**
                     01CC   431 ; FUNCTIONAL DESCRIPTION:
                     01CC   432 ;
                     01CC   433 ;       This routine clears the CMI fault status
                     01CC   434 ;
                     01CC   435 ; CALLING SEQUENCE:
                     01CC   436 ;
                     01CC   437 ;       BSBW    DSR$FAULT_CLEAR
                     01CC   438 ;
                     01CC   439 ; INPUT PARAMETERS:     NONE
                     01CC   440 ;
                     01CC   441 ; IMPLICIT INPUTS:      NONE
                     01CC   442 ;
                     01CC   443 ; OUTPUT PARAMETERS:    NONE
                     01CC   444 ;
                     01CC   445 ; IMPLICIT OUTPUTS:     NONE
                     01CC   446 ;
                     01CC   447 ; COMPLETION CODES:     NONE
                     01CC   448 ;
                     01CC   449 ; SIDE EFFECTS:
                     01CC   450 ;
                     01CC   451 ;       RE-INITIALIZES THE CMI MACHINE CHECK, TB, AND CACHE ERROR REGISTERS
                     01CC   452 ;--
                     01CC   453
                     01CC   454 DSR$FAULT_CLEAR::
 26    0F    DA      01CC   455          MTPR    #BIT0! -                    ; CLEAR - XB
                     01CF   456                  BIT1! -                     ; UNALIGNED UNIBUS DATA
                     01CF   457                  BIT2! -                     ; TB ERROR
                     01CF   458                  BIT3,#PR$_MCESR             ; AND BUS ERROR IN THE
                     01CF   459                                              ; MACHINE CHECK ERROR SUMMARY REGISTER
                05   01CF   460          RSB                                ; RETURN
```

```
                                01D0    462 ;+
                                01D0    463 ; GENERALIZED $DS_CVTREG_L
                                01D0    464 ; R0 = STARTING BIT POSITION
                                01D0    465 ; R1 = BIT STRING
                                01D0    466 ; R2 = BIT DEFINITION ADDRESS
                                01D0    467 ; R3 = BUFFER ADDRESS FOR CVTREG
                                01D0    468 ;-
                                01D0    469
                                01D0    470 CVT:
                          7E    7C    01D0    471         CLRQ    -(SP)
                          7E    7C    01D2    472         CLRQ    -(SP)
                          7E    7C    01D4    473         CLRQ    -(SP)
                    7E    80  8F    9A    01D6    474         MOVZBL  #BUFSIZ, -(SP)
                          0F    BB    01DA    475         PUSHR   #^M<R0,R1,R2,R3>        ; PUSHR R3,R2,R1,R0
          00000000'9F       0B    FB    01DC    476         CALLS   #11, @#DS$CVTREG
                          05    01E3    477         RSB                             ; RETURN
                                01E4    478
                                01E4    479 ;+
                                01E4    480 ; CORRECTED MEMORY DATA INTERRUPT
                                01E4    481 ;-
                                01E4    482
                                01E4    483         .ALIGN  LONG
                                01E4    484
                                01E4    485 INT_CMD::
                     000001E5   01E4    486 SCBVECTOR_054==.+IS                      ; Use interrupt stack                   [09]
                       03   BB    01E4    487         PUSHR   #^M<R0,R1>              ; SAVE R0,R1
                                01E6    488         $Print_G        Msg_Cmd         ; Print the header message              [08]
00000000'GF    00000014'EF    FA    01E6                CallG   Msg_Cmd, G^DSX$Print
                       03   BA    01F1    489         POPR    #^M<R0,R1>              ; RESTORE R0,R1
                       12   11    01F3    490         BRB     INT_WORK                ; COMMON CODE
                                01F5    491
                                01F5    492 ;+
                                01F5    493 ; WRITE BUS TIMEOUT INTERRUPT
                                01F5    494 ;-
                                01F5    495
                                01F5    496         .ALIGN  LONG
                                01F8    497
                                01F8    498 INT_WBTO::
                     000001F9   01F8    499 SCBVECTOR_060==.+IS                      ; Use interrupt stack                   [09]
                       03   BB    01F8    500         PUSHR   #^M<R0,R1>              ; SAVE R0,R1
                                01FA    501         $Print_G        Msg_WBTO        ; Print the header message              [08]
00000000'GF    00000030'EF    FA    01FA                CallG   Msg_WBTO, G^DSX$Print
                       03   BA    0205    502         POPR    #^M<R0,R1>              ; RESTORE R0,R1
                                0207    503                                         ; Fall into common code ...
                                0207    504
                                0207    505 ;+
                                0207    506 ; COMMON INTERRUPT SERVICE
                                0207    507 ;-
                                0207    508
                                0207    509 INT_WORK:
                    7FFF  8F    BB    0207    510         PUSHR   #^X7FFF                 ; SAVE R0 - SP FOR CLI
                                020B    511         $Print_S        -               ; Print the PC at the interrupt         [08]
                                020B    512                 #DS$K_Type_Exception,-  ; ... use type exception                [08]
                                020B    513                 #DS$K_PrintI, -         ; ... use a PrintI                      [08]
                                020B    514                 Fmt_IntPC, -            ; ... use the PC message                [08]
                                020B    515                 60 (SP)                 ; ... print the PC                      [08]
                          6E    DD    020B                PUSHL   (SP)
```

```
                0000003C'EF   DD  020D                          PUSHL   60
                000001C0'EF   9F  0213                          PUSHAB  Fmt_IntPC
                    7E    00  9A  0219                          movzbl  #DS$K_PrintI, -(sp)
                    7E    0C  98  021C                          cvtbl   #DS$K_Type_Exception, -(sp)
          00000000'GF     05  FB  021F                          CALLS   #$$N+2, G^DSX$PRINT
                              0226   516
          00000000'EF   6E  FA  0226   517          CALLG   (SP),DS$CLI             ; HALT ON ERROR
                  7FFF  8F  BA  022D   518          POPR    #^X7FFF                 ; RESTORE REGISTERS
                            02  0231   519          REI                             ; RETURN FROM INTERRUPT
```

```
                     0232   521          .SBTTL  UnexpInterrupt Routine - Otherwise undefined SCB vectors
                     0232   522 ;++
                     0232   523 ; FUNCTIONAL DESCRIPTION:
                     0232   524 ;
                     0232   525 ;       These interrupt entry points declare unexpected exceptions
                     0232   526 ;       for all unused SCB vectors.
                     0232   527 ;
                     0232   528 ;--
                     0232   529
                     0232   530          .MACRO  SPAREVECTOR     OFFSET
                     0232   531          .ALIGN  LONG
                     0232   532 SCBVECTOR_'OFFSET'==.+IS
                     0232   533          BSBB    UNEXPINTERRUPT          ; Enter common handler
                     0232   534          .WORD   ^X'OFFSET'
                     0232   535          .ENDM
                     0232   536
                     0232   537          SPAREVECTOR     000
                     0232                .ALIGN  LONG
                72   10 0234                BSBB    UNEXPINTERRUPT          ; Enter common handler
                  0000  0236                .WORD   ^X000
                     0238   538          SPAREVECTOR     038
                6E   10 0238                BSBB    UNEXPINTERRUPT          ; Enter common handler
                  0038  023A                .WORD   ^X038
                     023C   539          SPAREVECTOR     03C
                6A   10 023C                BSBB    UNEXPINTERRUPT          ; Enter common handler
                  003C  023E                .WORD   ^X03C
                     0240   540          SPAREVECTOR     050
                66   10 0240                BSBB    UNEXPINTERRUPT          ; Enter common handler
                  0050  0242                .WORD   ^X050
                     0244   541          SPAREVECTOR     058
                62   10 0244                BSBB    UNEXPINTERRUPT          ; Enter common handler
                  0058  0246                .WORD   ^X058
                     0248   542          SPAREVECTOR     05C
                5E   10 0248                BSBB    UNEXPINTERRUPT          ; Enter common handler
                  005C  024A                .WORD   ^X05C
                     024C   543          SPAREVECTOR     064
                5A   10 024C                BSBB    UNEXPINTERRUPT          ; Enter common handler
                  0064  024E                .WORD   ^X064
                     0250   544          SPAREVECTOR     068
                56   10 0250                BSBB    UNEXPINTERRUPT          ; Enter common handler
                  0068  0252                .WORD   ^X068
                     0254   545          SPAREVECTOR     06C
                52   10 0254                BSBB    UNEXPINTERRUPT          ; Enter common handler
                  006C  0256                .WORD   ^X06C
                     0258   546          SPAREVECTOR     070
                4E   10 0258                BSBB    UNEXPINTERRUPT          ; Enter common handler
                  0070  025A                .WORD   ^X070
                     025C   547          SPAREVECTOR     074
                4A   10 025C                BSBB    UNEXPINTERRUPT          ; Enter common handler
                  0074  025E                .WORD   ^X074
                     0260   548          SPAREVECTOR     078
                46   10 0260                BSBB    UNEXPINTERRUPT          ; Enter common handler
                  0078  0262                .WORD   ^X078
                     0264   549          SPAREVECTOR     07C
                42   10 0264                BSBB    UNEXPINTERRUPT          ; Enter common handler
                  007C  0266                .WORD   ^X07C
                     0268   550          SPAREVECTOR     080
```

```
                     3E   10  0268                BSBB    UNEXPINTERRUPT          ; Enter common handler
                       0080  026A                .WORD   ^X080
                             026C    551         $SPAREVECTOR    0C4
                     3A   10  026C                BSBB    UNEXPINTERRUPT          ; Enter common handler
                       00C4  026E                .WORD   ^X0C4
                             0270    552         $SPAREVECTOR    0C8
                     36   10  0270                BSBB    UNEXPINTERRUPT          ; Enter common handler
                       00C8  0272                .WORD   ^X0C8
                             0274    553         $SPAREVECTOR    0CC
                     32   10  0274                BSBB    UNEXPINTERRUPT          ; Enter common handler
                       00CC  0276                .WORD   ^X0CC
                             0278    554         $SPAREVECTOR    0D0
                     2E   10  0278                BSBB    UNEXPINTERRUPT          ; Enter common handler
                       00D0  027A                .WORD   ^X0D0
                             027C    555         $SPAREVECTOR    0D4
                     2A   10  027C                BSBB    UNEXPINTERRUPT          ; Enter common handler
                       00D4  027E                .WORD   ^X0D4
                             0280    556         $SPAREVECTOR    0D8
                     26   10  0280                BSBB    UNEXPINTERRUPT          ; Enter common handler
                       00D8  0282                .WORD   ^X0D8
                             0284    557         $SPAREVECTOR    0DC
                     22   10  0284                BSBB    UNEXPINTERRUPT          ; Enter common handler
                       00DC  0286                .WORD   ^X0DC
                             0288    558         $SPAREVECTOR    0E0
                     1E   10  0288                BSBB    UNEXPINTERRUPT          ; Enter common handler
                       00E0  028A                .WORD   ^X0E0
                             028C    559         $SPAREVECTOR    0E4
                     1A   10  028C                BSBB    UNEXPINTERRUPT          ; Enter common handler
                       00E4  028E                .WORD   ^X0E4
                             0290    560         $SPAREVECTOR    0E8
                     16   10  0290                BSBB    UNEXPINTERRUPT          ; Enter common handler
                       00E8  0292                .WORD   ^X0E8
                             0294    561         $SPAREVECTOR    0EC
                     12   10  0294                BSBB    UNEXPINTERRUPT          ; Enter common handler
                       00EC  0296                .WORD   ^X0EC
                             0298    562         $SPAREVECTOR    0F0
                     0E   10  0298                BSBB    UNEXPINTERRUPT          ; Enter common handler
                       00F0  029A                .WORD   ^X0F0
                             029C    563         $SPAREVECTOR    0F4
                     0A   10  029C                BSBB    UNEXPINTERRUPT          ; Enter common handler
                       00F4  029E                .WORD   ^X0F4
                             02A0    564         $SPAREVECTOR    0F8
                     06   10  02A0                BSBB    UNEXPINTERRUPT          ; Enter common handler
                       00F8  02A2                .WORD   ^X0F8
                             02A4    565         $SPAREVECTOR    0FC
                     02   10  02A4                BSBB    UNEXPINTERRUPT          ; Enter common handler
                       00FC  02A6                .WORD   ^X0FC
                             02A8    566
                             02A8    567 UNEXPINTERRUPT:
                      6E    00 BE    3C  02A8    568         MOVZWL  @(SP),(SP)      ; Get vector offset
                00000000'EF    16  02AC    569         JSB     L^EXE_UNEXPINT  ; Generate unexpected interrupt
                             02B2    570
                             02B2    571         .END
```

```
$$ARGS                          = 0000000B     D
$$N                             = 00000003     D
$$T1                            = 00000030     D
AAT_ARITH                         ********   X    00
AAT_REF_MSK                       0000031D R   D    02
APC$_ABORT                      = 00000006     D
APC$_CONTINUE                   = 00000009     D
APC$_DUMP                       = 00000003     D
APC$_NOP                        = 00000000     D
APC$_START                      = 00000005     D
APC$_ZERO                       = 00000004     D
APM$_ABTDON                     = 00000006     D
APM$_DEVERR                     = 00000002     D
APM$_DONE                       = 0000000A     D
APM$_EXCEPT                     = 0000000B     D
APM$_HARDERR                    = 00000003     D
APM$_MORE                       = 00000008     D
APM$_NOMES                      = 00000000     D
APM$_PREPERR                    = 0000000C     D
APM$_PRGERR                     = 00000005     D
APM$_SOFTERR                    = 00000004     D
APM$_SPOOL                      = 00000009     D
APM$_SYSERR                     = 00000001     D
APSLMNE                           ********   X    00
APT_MSG                           ********   X    00
BIT...                          = 00000004     D
BIT0                            = 00000001     D
BIT1                            = 00000002     D
BIT10                           = 00000400     D
BIT11                           = 00000800     D
BIT12                           = 00001000     D
BIT13                           = 00002000     D
BIT14                           = 00004000     D
BIT15                           = 00008000     D
BIT16                           = 00010000     D
BIT17                           = 00020000     D
BIT18                           = 00040000     D
BIT19                           = 00080000     D
BIT2                            = 00000004     D
BIT20                           = 00100000     D
BIT21                           = 00200000     D
BIT22                           = 00400000     D
BIT23                           = 00800000     D
BIT24                           = 01000000     D
BIT25                           = 02000000     D
BIT26                           = 04000000     D
BIT27                           = 08000000     D
BIT28                           = 10000000     D
BIT29                           = 20000000     D
BIT3                            = 00000008     D
BIT30                           = 40000000     D
BIT31                           = 80000000     D
BIT4                            = 00000010     D
BIT5                            = 00000020     D
BIT6                            = 00000040     D
BIT7                            = 00000080     D
BIT8                            = 00000100     D
BIT9                            = 00000200     D
BIT_BER                           00000429 R   D    02
BIT_CAGPER                        000003D6 R   D    02
BIT_CER                           000003B2 R   D    02
BIT_MCESR                         0000033A R   D    02
BIT_RLTO                          00000366 R   D    02
BIT_SMR                           00000414 R   D    02
BIT_TBGPER                        00000374 R   D    02
BUFSIZ                          = 00000080     D
CAPE                              00000073 R   D    03
CHKBER                            00000187 R   D    03
CHKCER                            00000168 R   D    03
CHKMA                             000000D6 R   D    03
CHKMCESR                          000001A6 R   D    03
CHKMDR                            000000E2 R   D    03
CHKRLTO                           0000012A R   D    03
CHKSMR                            000000EE R   D    03
CHKTBGPER                         00000149 R   D    03
CHKVA                             000000CA R   D    03
CHR$MCHK                          00000000 RG  D    03
CR                              = 0000000D     D
CRD                               0000008A R   D    03
CSPE                              0000004B R   D    03
CVT                               000001D0 R   D    03
CVTREG$_DATA                    = 00000008     D
CVTREG$_MAXLEN                  = 00000014     D
CVTREG$_MNEADR                  = 0000000C     D
CVTREG$_MSB                     = 00000004     D
CVTREG$_NARGS                   = 0000000B     D
CVTREG$_STRBUF                  = 00000010     D
CVTREG$_V1                      = 00000018     D
CVTREG$_V2                      = 0000001C     D
CVTREG$_V3                      = 00000020     D
CVTREG$_V4                      = 00000024     D
CVTREG$_V5                      = 00000028     D
CVTREG$_V6                      = 0000002C     D
DS$CLI                            ********   X    00
DS$CVTREG                         ********   X    00
DS$GB_TYPECODE                    ********   X    00
DS$GL_FLAGS                       ********   X    00
DS$K_PRINTB                     = 00000002     D
DS$K_PRINTF                     = 00000001     D
DS$K_PRINTI                     = 00000000     D
DS$K_PRINTX                     = 00000003     D
DS$K_TYPE_ABORT_PROGRAM         = 00000014     D
DS$K_TYPE_ABORT_TEST            = 00000013     D
DS$K_TYPE_COMMAND_ERR           = 00000015     D
DS$K_TYPE_COMMAND_OUT           = 00000016     D
DS$K_TYPE_CRD_AUTOTEST          = 0000001A     D
DS$K_TYPE_DS_PROMPT             = 00000001     D
DS$K_TYPE_DS_START              = 0000001D     D
DS$K_TYPE_ERRDEV                = 00000008     D
DS$K_TYPE_ERRHARD               = 00000006     D
DS$K_TYPE_ERROR_BODY            = 00000009     D
DS$K_TYPE_ERROR_END             = 0000000A     D
DS$K_TYPE_ERRPREP               = 0000001B     D
DS$K_TYPE_ERRSOFT               = 00000007     D
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DS$K_TYPE_ERRSUP                = 00000004     D
DS$K_TYPE_ERRSYS                = 00000005     D
DS$K_TYPE_ERR_HALT              = 0000000D     D
DS$K_TYPE_EXCEPTION             = 0000000C     D
DS$K_TYPE_EXCEPTION_HEAD        = 0000000B     D
DS$K_TYPE_FIRST_PASS            = 00000011     D
DS$K_TYPE_GENERAL               = 00000000     D
DS$K_TYPE_GENERAL_ERROR         = 00000003     D
DS$K_TYPE_NO_TESTS              = 00000012     D
DS$K_TYPE_PARAM_ERROR           = 0000001C     D
DS$K_TYPE_PROGRAM_END           = 00000010     D
DS$K_TYPE_PROGRAM_INFO          = 00000017     D
DS$K_TYPE_PROGRAM_START         = 0000000F     D
DS$K_TYPE_QIO_INVADP            = 00000024     D
DS$K_TYPE_QIO_NODRIVER          = 00000022     D
DS$K_TYPE_QIO_WRONGVER          = 00000023     D
DS$K_TYPE_SCRIPT_ECHO           = 00000021     D
DS$K_TYPE_SCRIPT_PNF            = 0000001E     D
DS$K_TYPE_SCRIPT_PROMPT         = 00000020     D
DS$K_TYPE_SCRIPT_SKIP           = 0000001F     D
DS$K_TYPE_SEQUENCE_ERROR        = 00000019     D
DS$K_TYPE_START_ERR             = 00000018     D
DS$K_TYPE_START_LIST            = 00000025     D
DS$K_TYPE_SUMMARY               = 0000000E     D
DS$K_TYPE_USER_PROMPT           = 00000002     D
DSA$AL_APTMAIL                    0000FE00     D
DSA$AT_APTTXT                     0000FA00     D
DSA$GL_APTCOM                     0000FE04     D
DSA$GL_DEVLEN                     0000FE58     D
DSA$GL_ERRNO                      0000FE44     D
DSA$GL_EVENT                      0000FE48     D
DSA$GL_FLAGS                      0000FE00     D
DSA$GL_MSGTYP                     0000FE40     D
DSA$GL_PASSES                     0000FE08     D
DSA$GL_PASSNO                     0000FE54     D
DSA$GL_SECTNO                     0000FE10     D
DSA$GL_SID                        0000FE14     D
DSA$GL_SUBTNO                     0000FE4C     D
DSA$GL_TESTNO                     0000FE50     D
DSA$GL_UNITS                      0000FE0C     D
DSA$GQ_MSGPTR                     0000FE68     D
DSA$GT_DEVNAM                     0000FE5C     D
DSR$FAULT_CLEAR                   000001CC  RG  D   03
DSX$PRINT                         ********    X   00
EXE_UNEXPINT                      ********    X   00
FMT_EXCEPT                        0000004C  R   D   02
FMT_INTPC                         000001C0  R   D   02
FMT_MCHK_BER                      0000019C  R   D   02
FMT_MCHK_CER                      00000151  R   D   02
FMT_MCHK_CNT                      00000075  R   D   02
FMT_MCHK_MCESR                    000000A7  R   D   02
FMT_MCHK_MDR                      000000FA  R   D   02
FMT_MCHK_PCAE                     000000E1  R   D   02
FMT_MCHK_RLTO                     0000010D  R   D   02
FMT_MCHK_SMR                      00000177  R   D   02
FMT_MCHK_SUM                      0000008A  R   D   02
FMT_MCHK_TBGPER                   00000130  R   D   02
FMT_MCHK_VA                                         000000CF  R   D   02
INT_CMD                                             000001E4  RG  D   03
INT_WBTO                                            000001F8  RG  D   03
INT_WORK                                            00000207  R   D   03
INVALID                                             0000003F  R   D   03
IRD                                                 000000A1  R   D   03
IS                                            =     00000001      D
LF                                            =     0000000A      D
LOGOUT                                              000000AA  R   D   03
MODELST                                             ********    X     00
MSG_CMD                                             00000014  R   D   02
MSG_MCHK                                            00000000  R   D   02
MSG_WBTO                                            00000030  R   D   02
PR$_MCESR                                     =     00000026      D
SCBVECTOR_000                                 =     00000235  RG  D   03
SCBVECTOR_038                                 =     00000239  RG  D   03
SCBVECTOR_03C                                 =     0000023D  RG  D   03
SCBVECTOR_050                                 =     00000241  RG  D   03
SCBVECTOR_054                                 =     000001E5  RG  D   03
SCBVECTOR_058                                 =     00000245  RG  D   03
SCBVECTOR_05C                                 =     00000249  RG  D   03
SCBVECTOR_060                                 =     000001F9  RG  D   03
SCBVECTOR_064                                 =     0000024D  RG  D   03
SCBVECTOR_068                                 =     00000251  RG  D   03
SCBVECTOR_06C                                 =     00000255  RG  D   03
SCBVECTOR_070                                 =     00000259  RG  D   03
SCBVECTOR_074                                 =     0000025D  RG  D   03
SCBVECTOR_078                                 =     00000261  RG  D   03
SCBVECTOR_07C                                 =     00000265  RG  D   03
SCBVECTOR_080                                 =     00000269  RG  D   03
SCBVECTOR_0C4                                 =     0000026D  RG  D   03
SCBVECTOR_0C8                                 =     00000271  RG  D   03
SCBVECTOR_0CC                                 =     00000275  RG  D   03
SCBVECTOR_0D0                                 =     00000279  RG  D   03
SCBVECTOR_0D4                                 =     0000027D  RG  D   03
SCBVECTOR_0D8                                 =     00000281  RG  D   03
SCBVECTOR_0DC                                 =     00000285  RG  D   03
SCBVECTOR_0E0                                 =     00000289  RG  D   03
SCBVECTOR_0E4                                 =     0000028D  RG  D   03
SCBVECTOR_0E8                                 =     00000291  RG  D   03
SCBVECTOR_0EC                                 =     00000295  RG  D   03
SCBVECTOR_0F0                                 =     00000299  RG  D   03
SCBVECTOR_0F4                                 =     0000029D  RG  D   03
SCBVECTOR_0F8                                 =     000002A1  RG  D   03
SCBVECTOR_0FC                                 =     000002A5  RG  D   03
SIZ...                                        =     00000001      D
TBPE                                                00000057  R   D   03
T_BUSE                                              0000027C  R   D   02
T_CAPE                                              00000288  R   D   02
T_CDERR                                             0000022F  R   D   02
T_CMD                                               000001D7  R   D   02
T_CRD                                               000002C3  R   D   02
T_CSPE                                              0000024C  R   D   02
T_EXCEPT                                            000001FF  R   D   02
T_IRD                                               00000307  R   D   02
T_MCHK                                              00000209  R   D   02
T_MCHK_HDR                                          00000217  R   D   02
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T_TBPE                          00000264 R  D  02
T_UPE                           000002E5 R  D  02
T_WBE                           000002A7 R  D  02
T_WBTO                          000001ED R  D  02
UNEXPINTERRUPT                  000002A8 R  D  03
UPE                             00000096 R  D  03
WBE                             0000007E R  D  03

                                          +----------------+
                                          ! Psect synopsis !
                                          +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (     0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           0000FE70  (65136.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
DATA                            00000440  ( 1088.)  02 (  2.)  NOPIC   USR   CON   REL   LCL   SHR NOEXE   RD  NOWRT NOVEC BYTE
CODE                            000002B2  (  690.)  03 (  3.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD  NOWRT NOVEC LONG
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$ARGS	=0000000B	89 (1)	89 (1)
$$N	=00000003	515 (1)	112 (1) 120 (1) 123 (1) 515 (1)
$$T1	=00000030	89 (1)	89 (1)
AAT_ARITH	00000000-XR		82 (1)
AAT_REF_MSK	0000031D-R	179 (1)	370 (1)
APC$_ABORT	=00000006	91 (1)	
APC$_CONTINUE	=00000009	91 (1)	
APC$_DUMP	=00000003	91 (1)	
APC$_NOP	=00000000	91 (1)	
APC$_START	=00000005	91 (1)	
APC$_ZERO	=00000004	91 (1)	
APM$_ABTDON	=00000006	91 (1)	
APM$_DEVERR	=00000002	91 (1)	
APM$_DONE	=0000000A	91 (1)	
APM$_EXCEPT	=0000000B	91 (1)	
APM$_HARDERR	=00000003	91 (1)	
APM$_MORE	=00000008	91 (1)	
APM$_NOMES	=00000000	91 (1)	
APM$_PREPERR	=0000000C	91 (1)	
APM$_PRGERR	=00000005	91 (1)	
APM$_SOFTERR	=00000004	91 (1)	
APM$_SPOOL	=00000009	91 (1)	
APM$_SYSERR	=00000001	91 (1)	
APSLMNE	00000000-XR		81 (1)
APT_MSG	00000000-XR		81 (1)
BIT...	=00000004	94 (1)	94 (1)
BIT0	=00000001	93 (1)	#-455 (1)
BIT1	=00000002	93 (1)	#-456 (1)
BIT10	=00000400	93 (1)	
BIT11	=00000800	93 (1)	
BIT12	=00001000	93 (1)	
BIT13	=00002000	93 (1)	
BIT14	=00004000	93 (1)	
BIT15	=00008000	93 (1)	
BIT16	=00010000	93 (1)	
BIT17	=00020000	93 (1)	
BIT18	=00040000	93 (1)	
BIT19	=00080000	93 (1)	
BIT2	=00000004	93 (1)	#-457 (1)
BIT20	=00100000	93 (1)	
BIT21	=00200000	93 (1)	
BIT22	=00400000	93 (1)	
BIT23	=00800000	93 (1)	
BIT24	=01000000	93 (1)	
BIT25	=02000000	93 (1)	
BIT26	=04000000	93 (1)	
BIT27	=08000000	93 (1)	
BIT28	=10000000	93 (1)	
BIT29	=20000000	93 (1)	
BIT3	=00000008	93 (1)	#-458 (1)

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BIT30                           =40000000      93      (1)
BIT31                           =80000000      93      (1)
BIT4                            =00000010      93      (1)
BIT5                            =00000020      93      (1)
BIT6                            =00000040      93      (1)
BIT7                            =00000080      93      (1)
BIT8                            =00000100      93      (1)
BIT9                            =00000200      93      (1)
BIT_BER                          00000429-R    198     (1)     408     (1)
BIT_CAGPER                       000003D6-R    194     (1)
BIT_CER                          000003B2-R    192     (1)     398     (1)
BIT_MCESR                        0000033A-R    186     (1)     418     (1)
BIT_RLTO                         00000366-R    188     (1)     378     (1)
BIT_SMR                          00000414-R    196     (1)     370     (1)
BIT_TBGPER                       00000374-R    190     (1)     388     (1)
BUFSIZ                          =00000080      98      (1)     269     (1)     #-370   (1)     #-474   (1)
CAPE                             00000073-R    314     (1)     292     (1)
CHKBER                           00000187-R    406     (1)
CHKCER                           00000168-R    396     (1)
CHKMA                            000000D6-R    352     (1)
CHKMCESR                         000001A6-R    416     (1)
CHKMDR                           000000E2-R    357     (1)
CHKRLTO                          0000012A-R    376     (1)
CHKSMR                           000000EE-R    362     (1)
CHKTBGPER                        00000149-R    386     (1)
CHKVA                            000000CA-R    347     (1)
CHR$MCHK                         00000000-R    266     (1)
CR                              =0000000D      100     (1)     159     (1)     161     (1)     163     (1)     165     (1)
                                                                167     (1)     169     (1)     171     (1)     173     (1)
                                                                175     (1)     177     (1)
CRD                              0000008A-R    324     (1)     292     (1)
CSPE                             0000004B-R    299     (1)     292     (1)
CVT                              000001D0-R    470     (1)     #-380   (1)     #-390   (1)     #-400   (1)     #-410   (1)
                                                                #-420   (1)
CVTREG$_DATA                    =00000008      89      (1)
CVTREG$_MAXLEN                  =00000014      89      (1)
CVTREG$_MNEADR                  =0000000C      89      (1)
CVTREG$_MSB                     =00000004      89      (1)
CVTREG$_NARGS                   =0000000B      89      (1)
CVTREG$_STRBUF                  =00000010      89      (1)
CVTREG$_V1                      =00000018      89      (1)
CVTREG$_V2                      =0000001C      89      (1)
CVTREG$_V3                      =00000020      89      (1)
CVTREG$_V4                      =00000024      89      (1)
CVTREG$_V5                      =00000028      89      (1)
CVTREG$_V6                      =0000002C      89      (1)
DS$CLI                           00000000-XR           517     (1)     80      (1)
DS$CVTREG                        00000000-XR           370     (1)     476     (1)     80      (1)
DS$GB_TYPECODE                   00000000-XR           #-275   (1)     #-278   (1)     #-426   (1)     83      (1)
DS$GL_FLAGS                      00000000-XR           81      (1)
DS$K_PRINTB                     =00000002      94      (1)
DS$K_PRINTF                     =00000001      94      (1)
DS$K_PRINTI                     =00000000      94      (1)     120     (1)     123     (1)     #-515   (1)
DS$K_PRINTX                     =00000003      94      (1)
DS$K_TYPE_ABORT_PROGRAM         =00000014      94      (1)
DS$K_TYPE_ABORT_TEST            =00000013      94      (1)
DS$K_TYPE_COMMAND_ERR           =00000015      94      (1)
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DS$K_TYPE_COMMAND_OUT           =00000016     94     (1)
DS$K_TYPE_CRD_AUTOTEST          =0000001A     94     (1)
DS$K_TYPE_DS_PROMPT             =00000001     94     (1)
DS$K_TYPE_DS_START              =0000001D     94     (1)
DS$K_TYPE_ERRDEV                =00000008     94     (1)
DS$K_TYPE_ERRHARD               =00000006     94     (1)
DS$K_TYPE_ERROR_BODY            =00000009     94     (1)
DS$K_TYPE_ERROR_END             =0000000A     94     (1)
DS$K_TYPE_ERRPREP               =0000001B     94     (1)
DS$K_TYPE_ERRSOFT               =00000007     94     (1)
DS$K_TYPE_ERRSUP                =00000004     94     (1)
DS$K_TYPE_ERRSYS                =00000005     94     (1)
DS$K_TYPE_ERR_HALT              =0000000D     94     (1)
DS$K_TYPE_EXCEPTION             =0000000C     94     (1)    #-277    (1)    #-515    (1)
DS$K_TYPE_EXCEPTION_HEAD        =0000000B     94     (1)     120     (1)     123     (1)    #-274    (1)
DS$K_TYPE_FIRST_PASS            =00000011     94     (1)
DS$K_TYPE_GENERAL               =00000000     94     (1)
DS$K_TYPE_GENERAL_ERROR         =00000003     94     (1)
DS$K_TYPE_NO_TESTS              =00000012     94     (1)
DS$K_TYPE_PARAM_ERROR           =0000001C     94     (1)
DS$K_TYPE_PROGRAM_END           =00000010     94     (1)
DS$K_TYPE_PROGRAM_INFO          =00000017     94     (1)
DS$K_TYPE_PROGRAM_START         =0000000F     94     (1)
DS$K_TYPE_QIO_INVADP            =00000024     94     (1)
DS$K_TYPE_QIO_NODRIVER          =00000022     94     (1)
DS$K_TYPE_QIO_WRONGVER          =00000023     94     (1)
DS$K_TYPE_SCRIPT_ECHO           =00000021     94     (1)
DS$K_TYPE_SCRIPT_PNF            =0000001E     94     (1)
DS$K_TYPE_SCRIPT_PROMPT         =00000020     94     (1)
DS$K_TYPE_SCRIPT_SKIP           =0000001F     94     (1)
DS$K_TYPE_SEQUENCE_ERROR        =00000019     94     (1)
DS$K_TYPE_START_ERR             =00000018     94     (1)
DS$K_TYPE_START_LIST            =00000025     94     (1)
DS$K_TYPE_SUMMARY               =0000000E     94     (1)
DS$K_TYPE_USER_PROMPT           =00000002     94     (1)
DSR$FAULT_CLEAR                  000001CC-R   454     (1)
DSX$PRINT                        00000000-XR                488     (1)     501     (1)     515     (1)      83     (1)
EXE_UNEXPINT                     00000000-XR                569     (1)      82     (1)
FMT_EXCEPT                       0000004C-R   125     (1)   112     (1)     120     (1)     123     (1)
FMT_INTPC                        000001C0-R   149     (1)   515     (1)
FMT_MCHK_BER                     0000019C-R   147     (1)   413     (1)
FMT_MCHK_CER                     00000151-R   143     (1)   403     (1)
FMT_MCHK_CNT                     00000075-R   127     (1)   342     (1)
FMT_MCHK_MCESR                   000000A7-R   131     (1)   423     (1)
FMT_MCHK_MDR                     000000FA-R   137     (1)   359     (1)
FMT_MCHK_PCAE                    000000E1-R   135     (1)   354     (1)
FMT_MCHK_RLTO                    0000010D-R   139     (1)   383     (1)
FMT_MCHK_SMR                     00000177-R   145     (1)   373     (1)
FMT_MCHK_SUM                     0000008A-R   129     (1)   345     (1)
FMT_MCHK_TBGPER                  00000130-R   141     (1)   393     (1)
FMT_MCHK_VA                      000000CF-R   133     (1)   349     (1)
INT_CMD                          000001E4-R   485     (1)
INT_WBTO                         000001F8-R   498     (1)
INT_WORK                         00000207-R   509     (1)   #-490    (1)
INVALID                          0000003F-R   294     (1)   292     (1)
IRD                              000000A1-R   334     (1)   292     (1)
IS                              =00000001     97     (1)   486     (1)     499     (1)     537     (1)      538     (1)
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                                                  539    (1)     540    (1)     541    (1)     542    (1)
                                                  543    (1)     544    (1)     545    (1)     546    (1)
                                                  547    (1)     548    (1)     549    (1)     550    (1)
                                                  551    (1)     552    (1)     553    (1)     554    (1)
                                                  555    (1)     556    (1)     557    (1)     558    (1)
                                                  559    (1)     560    (1)     561    (1)     562    (1)
                                                  563    (1)     564    (1)     565    (1)
LF                      =0000000A     101    (1)    159    (1)     161    (1)     163    (1)     165    (1)
                                                  167    (1)     169    (1)     171    (1)     173    (1)
                                                  175    (1)     177    (1)
LOGOUT                   000000AA-R   338    (1)  #-297    (1)   #-302    (1)   #-309    (1)   #-313    (1)
                                                 #-317    (1)   #-322    (1)   #-327    (1)   #-332    (1)
MODELST                  00000000-XR                370    (1)      83    (1)
MSG_CMD                  00000014-R   119    (1)    488    (1)
MSG_MCHK                 00000000-R   112    (1)    276    (1)
MSG_WBTO                 00000030-R   122    (1)    501    (1)
PR$_MCESR               =00000026     96     (1)  #-458    (1)
SCBVECTOR_000           =00000235-R   537    (1)
SCBVECTOR_038           =00000239-R   538    (1)
SCBVECTOR_03C           =0000023D-R   539    (1)
SCBVECTOR_050           =00000241-R   540    (1)
SCBVECTOR_054           =000001E5-R   486    (1)
SCBVECTOR_058           =00000245-R   541    (1)
SCBVECTOR_05C           =00000249-R   542    (1)
SCBVECTOR_060           =000001F9-R   499    (1)
SCBVECTOR_064           =0000024D-R   543    (1)
SCBVECTOR_068           =00000251-R   544    (1)
SCBVECTOR_06C           =00000255-R   545    (1)
SCBVECTOR_070           =00000259-R   546    (1)
SCBVECTOR_074           =0000025D-R   547    (1)
SCBVECTOR_078           =00000261-R   548    (1)
SCBVECTOR_07C           =00000265-R   549    (1)
SCBVECTOR_080           =00000269-R   550    (1)
SCBVECTOR_0C4           =0000026D-R   551    (1)
SCBVECTOR_0C8           =00000271-R   552    (1)
SCBVECTOR_0CC           =00000275-R   553    (1)
SCBVECTOR_0D0           =00000279-R   554    (1)
SCBVECTOR_0D4           =0000027D-R   555    (1)
SCBVECTOR_0D8           =00000281-R   556    (1)
SCBVECTOR_0DC           =00000285-R   557    (1)
SCBVECTOR_0E0           =00000289-R   558    (1)
SCBVECTOR_0E4           =0000028D-R   559    (1)
SCBVECTOR_0E8           =00000291-R   560    (1)
SCBVECTOR_0EC           =00000295-R   561    (1)
SCBVECTOR_0F0           =00000299-R   562    (1)
SCBVECTOR_0F4           =0000029D-R   563    (1)
SCBVECTOR_0F8           =000002A1-R   564    (1)
SCBVECTOR_0FC           =000002A5-R   565    (1)
TBPE                     00000057-R   304    (1)    292    (1)
T_BUSE                   0000027C-R   167    (1)    307    (1)
T_CAPE                   00000288-R   169    (1)    315    (1)
T_CDERR                  0000022F-R   161    (1)    295    (1)
T_CMD                    000001D7-R   151    (1)    120    (1)
T_CRD                    000002C3-R   173    (1)    325    (1)
T_CSPE                   0000024C-R   163    (1)    300    (1)
T_EXCEPT                 000001FF-R   155    (1)    112    (1)     120    (1)     123    (1)
T_IRD                    00000307-R   177    (1)    335    (1)
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```
T_MCHK                          00000209-R   157   (1)      112   (1)
T_MCHK_HDR                      00000217-R   159   (1)      339   (1)
T_TBPE                          00000264-R   165   (1)      311   (1)
T_UPE                           000002E5-R   175   (1)      330   (1)
T_WBE                           000002A7-R   171   (1)      320   (1)
T_WBTO                          000001ED-R   153   (1)      123   (1)
UNEXPINTERRUPT                  000002A8-R   567   (1)    #-537   (1)    #-538   (1)    #-539   (1)    #-540   (1)
                                                          #-541   (1)    #-542   (1)    #-543   (1)    #-544   (1)
                                                          #-545   (1)    #-546   (1)    #-547   (1)    #-548   (1)
                                                          #-549   (1)    #-550   (1)    #-551   (1)    #-552   (1)
                                                          #-553   (1)    #-554   (1)    #-555   (1)    #-556   (1)
                                                          #-557   (1)    #-558   (1)    #-559   (1)    #-560   (1)
                                                          #-561   (1)    #-562   (1)    #-563   (1)    #-564   (1)
                                                          #-565   (1)
UPE                             00000096-R   329   (1)      292   (1)
WBE                             0000007E-R   319   (1)      292   (1)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	36	00:00:00.03	00:00:00.20
Command processing	958	00:00:00.27	00:00:01.11
Pass 1	499	00:00:01.55	00:00:03.37
Symbol table sort	0	00:00:00.09	00:00:00.09
Pass 2	17	00:00:00.46	00:00:00.83
Symbol table output	2	00:00:00.03	00:00:00.09
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	4	00:00:00.14	00:00:00.24
Assembler run totals	1520	00:00:02.58	00:00:05.94

The working set limit was 2900 pages.
88335 bytes (173 pages) of virtual memory were used to buffer the intermediate code.
There were 20 pages of symbol table space allocated to hold 396 non-local and 5 local symbols.
571 source lines were read in Pass 1, producing 44 object records in Pass 2.
34 pages of virtual memory were used to define 27 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	9
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	6
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	8
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	23

474 GETS were required to define 23 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(2)   156   ALLOCATE MEMORY AND CONDITIONALLY WAIT
(2)   273   ALLOCATE NONPAGED DYNAMIC MEMORY
(2)   338   GENERAL ALLOCATE MEMORY SUBROUTINE
(2)   376   DEALLOCATE NONPAGED DYNAMIC MEMORY
(2)   431   CHECK BLOCK PARAMETERS SUBROUTINE
(2)   447   GENERAL DEALLOCATION SUBROUTINE
(2)   489   MEMPOOL$INIT   ;USER MODE MEMORY INITIALIZATION
(2)   590   RETURN SIZE OF PHYSICAL MEMORY   ;[07]

```
                     1 ; DEC/CMS REPLACEMENT HISTORY, Element MEMALC.MAR
                     2 ; *2    24-MAR-1986 10:20:09 BAGGETT "REPLACE VERSION WITH ULTRIX BUFFER ALLOCATION"
                     3 ; *1     6-FEB-1986 15:19:58 DS ""
                     4 ; DEC/CMS REPLACEMENT HISTORY, Element MEMALC.MAR
                     5         .TITLE  MEMALC  *** MEMALC dynamic memory allocation
                     6         .IDENT  /07-09/                                              ;G:2
                     7         .NLIST  CND
                     8
                     9 ;
                    10 ;*****************************************************************************
                    11 ;*                                                                           *
                    12 ;*  Copyright (c) 1977, 1982, 1986                                           * ;G:2
                    13 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
                    14 ;*                                                                           *
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                    22 ;*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE   *
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                    24 ;*  CORPORATION.                                                             *
                    25 ;*                                                                           *
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                    27 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
                    28 ;*                                                                           *
                    29 ;*****************************************************************************
                    30 ;
                    31 ; D. N. CUTLER 3-AUG-76
                    32 ;       V0206   LMK0003         LEN KAWELL                  02-NOV-1979
                    33 ;               ADD RESOURCE REPORTING TO SHARED MEMORY DEALLOCATION.
                    34 ;
                    35 ;
                    36 ;
                    37 ;               N. HOWGATE      20-FEB-78       VERSION 02 (ESSAA-4.00).
                    38 ;       01      DIAGNOSTIC SUPERVISOR INTEGRATION
                    39 ;               Roger Riggs     05-Jul-78                   (ESSAA-4.03)
                    40 ;       02      Removed REMQUE/INSQUE instructions and made
                    41 ;               corresponding DSBINT/ENBINT macros execute only if in S/A
                    42 ;               in EXE$ALONONPAGED/EXE$DEANONPAGED
                    43 ;               Roger Riggs             20-NOV-1979
                    44 ;       03      Removed L^ from REF to DS$GL_MEMSIZE
                    45 ;               Dave Butenhof   15-may-1980, Version 5.4
                    46 ;       04      Create .UPD file to modify VMS V2.0 source to supervisor
                    47 ;               environment.
                    48 ;
                    49 ;       05      - Jack Stansbury, 10-Nov-1981, Version 6.-
                    50 ;               Fixed truncation errors by replacing all W^ with L^.
                    51 ;               Added .LIBRARY statements for $DIAG and $DS.
                    52 ;
                    53 ;       06      - Dave Butenhof, 05-Feb-1982, version 6.6
                    54 ;               Make EXE$GL_SPLITADR global for access by SHOW MEMORY,
                    55 ;               and add DS$GL_LOOKASIDE to remember start of lookaside
                    56 ;               list (if any).
                    57 ;
```

```
                        0000     58 ;       07      Jim Shelhamer   01-AUG-1984
                        0000     59 ;               Added routine to return the size of physical memory,
                        0000     60 ;               DS$MEMSIZE.
                        0000     61 ;
                        0000     62 ;       08      Ted Salem       March 22, 1985
                        0000     63 ;               Added code to interlock EXE$ALLONONPAGED and EXE$DEALNONPAGED.
                        0000     64 ;
                        0000     65 ;                                                                          ;G:2
                        0000     66 ;       09      M. Baggett      7-March-1986                               ;G:2
                        0000     67 ;               Added buffer space for ULTRIX use.                         ;G:2
                        0000     68 ;                                                                          ;G:2
                        0000     69 ;       V0205   RIH0031         RICHARD I. HUSTVEDT     08-AUG-1979
                        0000     70 ;               ADD ALLOCATE ROUTINE FOR JIB AND CHANGE USE OF LOOKASIDE
                        0000     71 ;               LIST TO SATISFY IRP-SIZE AND SMALLER REQUESTS.
                        0000     72 ;
                        0000     73 ;       V0204   KDM0034         KATHLEEN D. MORSE       22-MAY-1979
                        0000     74 ;               ADD ASSUMPTIONS FOR COMMON EVENT BLOCK SIZES.
                        0000     75 ;
                        0000     76 ;       V0203   LMK0002         LEN KAWELL              18-MAY-1979
                        0000     77 ;               ADDED DEALLOCATION OF "SPECIAL" TYPES OF NON-PAGED
                        0000     78 ;               POOL BLOCKS.
                        0000     79 ;
                        0000     80 ;       V0202   LMK0001         LEN KAWELL              25-FEB-1979
                        0000     81 ;               ADDED SHARED MEMORY POOL ALLOCATION/DEALLOCATION
                        0000     82 ;
                        0000     83 ; DYNAMIC MEMORY ALLOCATION
```

```
                                0000     85 ;
                                0000     86 ; LIBRARYS
                                0000     87 ;
                                0000     88          .Library        /Sys$Library:Lib/
                                0000     89          .LIBRARY        /$DS/           ;                                       [05]
                                0000     90          .LIBRARY        /$DIAG/         ;                                       [05]
                                0000     91
                                0000     92 ;
                                0000     93 ; MACRO LIBRARY CALLS
                                0000     94 ;
                                0000     95
                                0000     96          $DS_DSDEF                       ; define return codes                   [07]
                                0000     97          $DS_DSADEF                      ;DEFINE BITS IN DSA$GL_FLAGS
                                0000     98          $CEBDEF                         ;DEFINE COMMON EVENT BLOCKS
                                0000                 .SAVE   LOCAL_BLOCK
                                0000                 .PSECT  $ABS$,ABS
                    00000000    FE70                 .=0
                                0000                 .RESTORE
                                0000     99          $DYNDEF                         ;DEFINE DATA STRUCTURE TYPE CODES
                                0000                 .SAVE   LOCAL_BLOCK
                                0000                 .PSECT  $ABS$,ABS
                    00000000    FE70                 .=0
                                0000                 .RESTORE
                                0000    100          $IPLDEF                         ;DEFINE INTERRUPT PRIORITY LEVELS
                                0000                 .SAVE   LOCAL_BLOCK
                                0000                 .PSECT  $ABS$,ABS
                    00000000    FE70                 .=0
                                0000                 .RESTORE
                                0000    101          $IRPDEF                                 ;DEFINE IRP OFFSETS
                                0000                 .SAVE   LOCAL_BLOCK
                                0000                 .PSECT  $ABS$,ABS
                    00000000    FE70                 .=0
                                0000                 .IIF    NB,IRP$L_IOQFL, IRP$L_IOQFL:
                    00000004    0000                         .BLKL   1
                                0004                 .IIF    NB,IRP$L_IOQBL, IRP$L_IOQBL:
                    00000008    0004                         .BLKL   1
                                0008                 .IIF    NB,IRP$W_SIZE,  IRP$W_SIZE:
                    0000000A    0008                         .BLKW   1
                                000A                 .IIF    NB,IRP$B_TYPE,  IRP$B_TYPE:
                    0000000B    000A                         .BLKB   1
                                000B                 .IIF    NB,IRP$B_RMOD,  IRP$B_RMOD:
                    0000000C    000B                         .BLKB   1
                                000C                 .IIF    NB,IRP$L_PID,   IRP$L_PID:
                    00000010    000C                         .BLKL   1
                                0010                 .IIF    NB,IRP$L_AST,   IRP$L_AST:
                    00000014    0010                         .BLKL   1
                                0014                 .IIF    NB,IRP$L_ASTPRM,        IRP$L_ASTPRM:
                    00000018    0014                         .BLKL   1
                                0018                 .IIF    NB,IRP$L_WIND,  IRP$L_WIND:
                    0000001C    0018                         .BLKL   1
                                001C                 .IIF    NB,IRP$L_UCB,   IRP$L_UCB:
                    00000020    001C                         .BLKL   1
                                0020                 .IIF    NB,IRP$W_FUNC,  IRP$W_FUNC:
                    00000022    0020                         .BLKW   1
                                0022                 .IIF    NB,IRP$B_EFN,   IRP$B_EFN:
                    00000023    0022                         .BLKB   1
                                0023                 .IIF    NB,IRP$B_PRI,   IRP$B_PRI:
```

```
00000024  0023                                  .BLKB   1
          0024                  .IIF    NB,IRP$L_IOSB,  IRP$L_IOSB:
00000028  0024                                  .BLKL   1
          0028                  .IIF    NB,IRP$W_CHAN,  IRP$W_CHAN:
0000002A  0028                                  .BLKW   1
          002A                  .IIF    NB,IRP$W_STS,   IRP$W_STS:
0000002C  002A                                  .BLKW   1
          002C                  .IIF    NB,IRP$L_SVAPTE,        IRP$L_SVAPTE:
00000030  002C                                  .BLKL   1
          0030                  .IIF    NB,IRP$W_BOFF,  IRP$W_BOFF:
00000032  0030                                  .BLKW   1
          0032                  .IIF    NB,IRP$W_BCNT,  IRP$W_BCNT:
00000034  0032                                  .BLKW   1
          0034                  .IIF    NB,IRP$L_IOST1, IRP$L_IOST1:
          0034                  .IIF    NB,IRP$L_MEDIA, IRP$L_MEDIA:
00000038  0034                                  .BLKL   1
          0038                  .IIF    NB,IRP$L_IOST2, IRP$L_IOST2:
          0038                  .IIF    NB,IRP$L_TT_TERM,       IRP$L_TT_TERM:
          0038                  .IIF    NB,IRP$B_CARCON,        IRP$B_CARCON:
00000039  0038                                  .BLKB   1
0000003C  0039                                  .BLKB   3
          003C                  .IIF    NB,IRP$Q_NT_PRVMSK,     IRP$Q_NT_PRVMSK:
          003C                  .IIF    NB,IRP$W_ABCNT, IRP$W_ABCNT:
          003C                  .IIF    NB,IRP$W_TT_PRMPT,      IRP$W_TT_PRMPT:
0000003E  003C                                  .BLKW   1
          003E                  .IIF    NB,IRP$W_OBCNT, IRP$W_OBCNT:
00000040  003E                                  .BLKW   1
          0040                  .IIF    NB,IRP$L_SEGVBN,        IRP$L_SEGVBN:
00000044  0040                                  .BLKL   1
          0044                  .IIF    NB,IRP$L_DIAGBUF,       IRP$L_DIAGBUF:
00000048  0044                                  .BLKL   1
          0048                  .IIF    NB,IRP$L_SEQNUM,        IRP$L_SEQNUM:
0000004C  0048                                  .BLKL   1
          004C                  .IIF    NB,IRP$L_EXTEND,        IRP$L_EXTEND:
00000050  004C                                  .BLKL   1
          0050                  .IIF    NB,IRP$L_ARB,   IRP$L_ARB:
00000054  0050                                  .BLKL   1
00000058  0054                                  .BLKL   1
0000005C  0058                                  .BLKL   1
          005C                  .IIF    NB,IRP$C_LENGTH,        IRP$C_LENGTH:
          005C                  .IIF    NB,IRP$K_LENGTH,        IRP$K_LENGTH:
          0000                  .RESTORE
          0000    102           $JIBDEF                         ;DEFINE JIB OFFSETS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  FE70                  .=0
          0000                  .RESTORE
          0000    103           $PCBDEF                         ;DEFINE PCB OFFSETS
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  FE70                  .=0
          0000                  .IIF    NB,PCB$L_SQFL,  PCB$L_SQFL:
00000004  0000                                  .BLKL   1
          0004                  .IIF    NB,PCB$L_SQBL,  PCB$L_SQBL:
00000008  0004                                  .BLKL   1
          0008                  .IIF    NB,PCB$W_SIZE,  PCB$W_SIZE:
0000000A  0008                                  .BLKW   1
```

```
                    000A            .IIF    NB,PCB$B_TYPE,  PCB$B_TYPE:
0000000B  000A                              .BLKB   1
                    000B            .IIF    NB,PCB$B_PRI,   PCB$B_PRI:
0000000C  000B                              .BLKB   1
                    000C            .IIF    NB,PCB$B_ASTACT,        PCB$B_ASTACT:
0000000D  000C                              .BLKB   1
                    000D            .IIF    NB,PCB$B_ASTEN, PCB$B_ASTEN:
0000000E  000D                              .BLKB   1
                    000E            .IIF    NB,PCB$W_MTXCNT,        PCB$W_MTXCNT:
00000010  000E                              .BLKW   1
                    0010            .IIF    NB,PCB$L_ASTQFL,        PCB$L_ASTQFL:
00000014  0010                              .BLKL   1
                    0014            .IIF    NB,PCB$L_ASTQBL,        PCB$L_ASTQBL:
00000018  0014                              .BLKL   1
                    0018            .IIF    NB,PCB$L_PHYPCB,        PCB$L_PHYPCB:
0000001C  0018                              .BLKL   1
                    001C            .IIF    NB,PCB$L_OWNER, PCB$L_OWNER:
00000020  001C                              .BLKL   1
                    0020            .IIF    NB,PCB$L_WSSWP, PCB$L_WSSWP:
00000024  0020                              .BLKL   1
                    0024            .IIF    NB,PCB$L_STS,   PCB$L_STS:
00000028  0024                              .BLKL   1
                    0028            .IIF    NB,PCB$L_WTIME, PCB$L_WTIME:
0000002C  0028                              .BLKL   1
                    002C            .IIF    NB,PCB$W_STATE, PCB$W_STATE:
0000002E  002C                              .BLKW   1
                    002E            .IIF    NB,PCB$B_WEFC,  PCB$B_WEFC:
0000002F  002E                              .BLKB   1
                    002F            .IIF    NB,PCB$B_PRIB,  PCB$B_PRIB:
00000030  002F                              .BLKB   1
                    0030            .IIF    NB,PCB$W_APTCNT,        PCB$W_APTCNT:
00000032  0030                              .BLKW   1
                    0032            .IIF    NB,PCB$W_TMBU,  PCB$W_TMBU:
00000034  0032                              .BLKW   1
                    0034            .IIF    NB,PCB$W_GPGCNT,        PCB$W_GPGCNT:
00000036  0034                              .BLKW   1
                    0036            .IIF    NB,PCB$W_PPGCNT,        PCB$W_PPGCNT:
00000038  0036                              .BLKW   1
                    0038            .IIF    NB,PCB$W_ASTCNT,        PCB$W_ASTCNT:
0000003A  0038                              .BLKW   1
                    003A            .IIF    NB,PCB$W_BIOCNT,        PCB$W_BIOCNT:
0000003C  003A                              .BLKW   1
                    003C            .IIF    NB,PCB$W_BIOLM, PCB$W_BIOLM:
0000003E  003C                              .BLKW   1
                    003E            .IIF    NB,PCB$W_DIOCNT,        PCB$W_DIOCNT:
00000040  003E                              .BLKW   1
                    0040            .IIF    NB,PCB$W_DIOLM, PCB$W_DIOLM:
00000042  0040                              .BLKW   1
                    0042            .IIF    NB,PCB$W_PRCCNT,        PCB$W_PRCCNT:
00000044  0042                              .BLKW   1
                    0044            .IIF    NB,PCB$T_TERMINAL,      PCB$T_TERMINAL:
0000004C  0044                              .BLKB   8
                    004C            .IIF    NB,PCB$L_PQB,   PCB$L_PQB:
                    004C            .IIF    NB,PCB$L_EFWM,  PCB$L_EFWM:
00000050  004C                              .BLKL   1
                    0050            .IIF    NB,PCB$L_EFCS,  PCB$L_EFCS:
00000054  0050                              .BLKL   1
```

```
                        0054                .IIF    NB,PCB$L_EFCU,  PCB$L_EFCU:
00000058                0054                        .BLKL   1
                        0058                .IIF    NB,PCB$L_EFC2P, PCB$L_EFC2P:
0000005C                0058                        .BLKL   1
                        005C                .IIF    NB,PCB$L_EFC3P, PCB$L_EFC3P:
00000060                005C                        .BLKL   1
                        0060                .IIF    NB,PCB$L_PID,   PCB$L_PID:
00000064                0060                        .BLKL   1
                        0064                .IIF    NB,PCB$L_PHD,   PCB$L_PHD:
00000068                0064                        .BLKL   1
                        0068                .IIF    NB,PCB$T_LNAME, PCB$T_LNAME:
00000078                0068                        .BLKB   16
                        0078                .IIF    NB,PCB$L_JIB,   PCB$L_JIB:
0000007C                0078                        .BLKL   1
                        007C                .IIF    NB,PCB$Q_PRIV,  PCB$Q_PRIV:
00000084                007C                        .BLKQ   1
                        0084                .IIF    NB,PCB$L_ARB,   PCB$L_ARB:
00000088                0084                        .BLKL   1
                        0088                .IIF    NB,PCB$L_UIC,   PCB$L_UIC:
                        0088                .IIF    NB,PCB$W_MEM,   PCB$W_MEM:
0000008A                0088                        .BLKW   1
                        008A                .IIF    NB,PCB$W_GRP,   PCB$W_GRP:
0000008C                008A                        .BLKW   1
                        008C                .IIF    NB,PCB$C_LENGTH,        PCB$C_LENGTH:
                        008C                .IIF    NB,PCB$K_LENGTH,        PCB$K_LENGTH:
                        0000                .RESTORE
                        0000    104         $PQBDEF                         ;DEFINE PQB OFFSETS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000                FE70                .=0
                        0000                .RESTORE
                        0000    105         $PRDEF                          ;DEFINE PROCESSOR REGISTERS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000                FE70                .=0
                        0000                .RESTORE
                        0000    106         $RSNDEF                         ;DEFINE RESOURCE WAIT NUMBERS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000                FE70                .=0
                        0000                .RESTORE
                        0000    107         $SHBDEF                         ;DEFINE SHARED MEM CONTROL BLOCK
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000                FE70                .=0
                        0000                .RESTORE
                        0000    108         $SHDDEF                         ;DEFINE SHARED MEM DATAPAGE
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000                FE70                .=0
                        0000                .RESTORE
                        0000    109         $SSDEF                          ;DEFINE SYSTEM STATUS VALUES
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000                FE70                .=0
                        0000                .RESTORE
                        0000    110         $TQEDEF                         ;DEFINE TQE OFFSETS
```

```
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
                00000000  FE70            .=0
                        0000              .RESTORE
                        0000    111       $MP_ILDEFS                          ;DEFINE THE MP$R_ACTIVE_ROUTINES  [08]
                        0000    112 ;
                        0000    113 ; EXTERNALS:
                        0000    114 ;
                        0000    115       .EXTRN  DS$SERVICE_DISPATCHER
                        0000    116
                        0000    117 ;
                        0000    118 ; LOCAL SYMBOLS
                        0000    119 ;
                        0000    120 ; ALLOCATION GRANULARITY MASK
                        0000    121 ;
                        0000    122
                0000000F  0000  123 MASK=^XF                                    ;16 BYTE ALLOCATION GRANULARITY
                        0000    124
                      00000000  125       .PSECT  WORK,   NOSHR,  NOEXE,  WRT,    LONG
                        0000    126 ;
                        0000    127 ;OWN STORAGE
                        0000    128 ;
                        0000    129
                        0000    130       .ALIGN  LONG
                        0000    131 EXE$GL_NONPAGED:
                0000000B  0000  132       .LONG   11                          ;DISABLE FORK IPL
                00000000  0004  133       .LONG   0                           ;ADDRESS OF FIRST FREE BLOCK
                00000000  0008  134       .LONG   0                           ;NO BYTES IN BLOCK
                        000C    135
                        000C    136 EXE$GL_SPLITADR::                           ;LOOKASIDE I/O PACKET LIST SPLIT ADDRESS
                00000000  000C  137       .LONG   0                           ;ADDRESS OF LOWEST IRP
                        0010    138 DS$GL_LOOKASIDE::                           ; Address of lookaside start
                00000000  0010  139       .LONG   0
                        0014    140
                        0014    141
                        0014    142 ;
                        0014    143 ;I/O PACKET LOOK ASIDE LISTHEAD
                        0014    144 ;
                        0014    145
                        0014    146 IOC$GL_IRPFL::
      00000014'00000014'  0014  147       .LONG   IOC$GL_IRPFL,IOC$GL_IRPFL   ;BACKWARD LINK
                00000018  001C  148 IOC$GL_IRPBL=IOC$GL_IRPFL+4
                        001C    149
                        001C    150
                      00000000  151       .PSECT  DATA, SHR, NOEXE, NOWRT, BYTE
                        0000    152       MODNAM  MEMALC
      43 4C 41 4D 45 4D 00'  0000  $MODULE:       .ASCIC  \MEMALC\
                        06  0000
                        0007    153 T_CGF:
20 54 45 47 20 54 4F 4E 4E 41 43 00'  0007  154       .ASCIC  .CANNOT GET FREE CORE.
   45 52 4F 43 20 45 45 52 46  0013
                        14  0007
```

```
                        001C   156          .SBTTL  ALLOCATE MEMORY AND CONDITIONALLY WAIT
                     00000000  157 .PSECT  CODE    SHR,    EXE,    NOWRT,  BYTE
                        0000   158
                        0000   159 ;+
                        0000   160 ; EXE$ALLOCBUF - ALLOCATE BUFFERED I/O BUFFER AND CONDITIONALLY WAIT
                        0000   161 ;
                        0000   162 ; THIS ROUTINE IS CALLED TO ALLOCATE A BUFFERED I/O BUFFER. IF SUFFICIENT
                        0000   163 ; MEMORY IS NOT AVAILABLE, THEN A RESOURCE WAIT STATE IS CONDITIONALLY
                        0000   164 ; ENTERED DEPENDING ON THE CURRENT PROCESS' RESOURCE WAIT MODE.
                        0000   165 ;
                        0000   166 ; EXE$ALLOCCEB - ALLOCATE COMMON EVENT BLOCK AND CONDITIONALLY WAIT
                        0000   167 ;
                        0000   168 ; THIS ROUTINE IS CALLED TO ALLOCATE A COMMON EVENT BLOCK. IF SUFFICIENT
                        0000   169 ; MEMORY IS NOT AVAILABLE, THEN A RESOURCE WAIT STATE IS CONDITIONALLY
                        0000   170 ; ENTERED DEPENDING ON THE CURRENT PROCESS' RESOURCE WAIT MODE.
                        0000   171 ;
                        0000   172 ; EXE$ALLOCJIB - ALLOCATE JOB INFORMATION BLOCK AND CONDITIONALLY WAIT
                        0000   173 ;
                        0000   174 ; THIS ROUTINE IS CALLED TO ALLOCATE A JOB INFORMATION BLOCK. IF SUFFICIENT
                        0000   175 ; MEMORY IS NOT AVAILABLE, THEN A RESOURCE WAIT STATE IS CONDITIONALLY ENTERED
                        0000   176 ; DEPENDING ON THE CURRENT PROCESS' RESOURCE WAIT MODE.
                        0000   177 ;
                        0000   178 ; EXE$ALLOCIRP - ALLOCATE I/O REQUEST PACKET AND CONDITIONALLY WAIT
                        0000   179 ;
                        0000   180 ; THIS ROUTINE IS CALLED TO ALLOCATE AN I/O PACKET. IF SUFFICIENT MEMORY
                        0000   181 ; IS NOT AVAILABLE, THEN A RESOURCE WAIT STATE IS CONDITIONALLY ENTERED
                        0000   182 ; DEPENDING ON THE CURRENT PROCESS' RESOURCE WAIT MODE.
                        0000   183 ;
                        0000   184 ; EXE$ALLOCPCB - ALLOCATE PROCESS CONTROL BLOCK AND CONDITIONALLY WAIT
                        0000   185 ;
                        0000   186 ; THIS ROUTINE IS CALLED TO ALLOCATE A PROCESS CONTROL BLOCK WHEN
                        0000   187 ; CREATING A NEW PROCESS.  IF SUFFICIENT MEMORY IS NOT AVAILABLE, THEN
                        0000   188 ; A RESOURCE WAIT STATE IS CONDITIONALLY ENTERED DEPENDING ON THE CURRENT
                        0000   189 ; PROCESS' RESOURCE WAIT MODE.
                        0000   190 ;
                        0000   191 ; EXE$ALLOCPQB - ALLOCATE PROCESS QUOTA BLOCK AND CONDITIONALLY WAIT
                        0000   192 ;
                        0000   193 ; THIS ROUTINE IS CALLED TO ALLOCATE A PROCESS QUOTA BLOCK WHEN CREATING
                        0000   194 ; A NEW PROCESS.  IF SUFFICIENT MEMORY IS NOT AVAILABLE, THEN A RESOURCE
                        0000   195 ; WAIT STATE IS ENTERED DEPENDING ON THE CURRENT PROCESS' RESOURCE WAIT
                        0000   196 ; MODE.
                        0000   197 ;
                        0000   198 ; EXE$ALLOCTQE - ALLOCATE TIME QUEUE ENTRY AND CONDITIONALLY WAIT
                        0000   199 ;
                        0000   200 ; THIS ROUTINE IS CALLED TO ALLOCATE A TIME QUEUE ENTRY. IF SUFFICIENT
                        0000   201 ; MEMORY IS NOT AVAILABLE, THEN A RESOURCE WAIT STATE IS CONDITIONALLY
                        0000   202 ; ENTERED DEPENDING ON THE CURRENT PROCESS' RESOURCE WAIT MODE.
                        0000   203 ;
                        0000   204 ; INPUTS:
                        0000   205 ;
                        0000   206 ;       R4 = NORMALLY CURRENT PROCESS PCB ADDRESS, BUT NOT REQUIRED.
                        0000   207 ;
                        0000   208 ; IF ENTRY AT EXE$ALLOCBUF, THEN
                        0000   209 ;
                        0000   210 ;       R1 = SIZE OF REQUESTED BUFFER IN BYTES.
                        0000   211 ;
                        0000   212 ; OUTPUTS:
```

```
                                0000   213 ;
                                0000   214 ;       R0 = LOW BIT CLEAR IF ALLOCATION FAILURE WITH CALLING IPL PRESERVED.
                                0000   215 ;
                                0000   216 ;               R0 = SS$_INSFMEM = INSUFFICIENT MEMORY AVAILABLE TO ALLOCATE
                                0000   217 ;                    BUFFER.
                                0000   218 ;
                                0000   219 ;       R0 = LOW BIT SET IF SUCCESSFUL ALLOCATION WITH:
                                0000   220 ;
                                0000   221 ;               R1 = SIZE OF REQUESTED BUFFER IN BYTES.
                                0000   222 ;               R2 = ADDRESS OF ALLOCATED BUFFER WITH SIZE AND TYPE FIELDS
                                0000   223 ;                    FILLED IN.
                                0000   224 ;
                                0000   225 ;               AND IPL SET TO AST DELIVERY LEVEL.
                                0000   226 ;
                                0000   227 ;       R4 = ORIGINAL R4 OR CURRENT PCB IF A WAIT OCCURRED.
                                0000   228 ;-
                                0000   229
                                0000   230          .ENABL  LSB
                                0000   231 EXE$ALLOCBUF::                          ;ALLOCATE BUFFERED I/O BUFFER
                          13    0000   232          PUSHL   #DYN$C_BUFIO            ;SET DATA STRUCTURE TYPE
                          28    0002   233          BRB     20$                     ;
                                0004   234 EXE$ALLOCCEB::                          ;ALLOCATE COMMON EVENT BLOCK
                          04    0004   235          PUSHL   #DYN$C_CEB              ;SET DATA STRUCTURE TYPE
                                0006   236          ASSUME  CEB$C_LENGTH LE IRP$C_LENGTH ;IRP SIZE PACKETS ARE ALLOCATED
                                0006   237          ASSUME  CEB$C_SLAVLNG LE IRP$C_LENGTH ;FOR CEB'S TO LIMIT FRAGMENTATION
                          20    0006   238          BRB     10$                     ;
                                0008   239 EXE$ALLOCJIB::                          ;ALLOCATE JOB INFORMATION BLOCK - COND WAIT
                          2F    0008   240          PUSHL   #DYN$C_JIB              ;SET STRUCTURE TYPE
                  51    0074    0008   241          MOVZWL  #JIB$C_LENGTH,R1        ;AND LENGTH OF BLOCK
                          1B    000F   242          BRB     20$                     ;MERGE WITH COMMON ALLOCATE CODE
                                0011   243 EXE$ALLOCIRP::                          ;ALLOCATE I/O PACKET - CONDITIONAL WAIT
                          0A    0011   244          PUSHL   #DYN$C_IRP              ;SET DATA STRUCTURE TYPE
                          13    0013   245          BRB     10$                     ;
                                0015   246 EXE$ALLOCPCB::                          ;ALLOCATE PROCESS CONTROL BLOCK
                          0C    0015   247          PUSHL   #DYN$C_PCB              ;SET DATA STRUCTURE TYPE
                    51    8C    0017   248          MOVZBL  #PCB$C_LENGTH,R1        ;AND STRUCTURE SIZE
                          0F    001B   249          BRB     20$                     ;
                                001D   250 EXE$ALLOCPQB::                          ;ALLOCATE PROCESS QUOTA BLOCK
                          0D    001D   251          PUSHL   #DYN$C_PQB              ;SET DATA STRUCTURE TYPE
                  51    08C8    001F   252          MOVZWL  #PQB$C_LENGTH,R1        ;AND STRUCTURE SIZE
                          06    0024   253          BRB     20$                     ;
                                0026   254 EXE$ALLOCTQE::                          ;ALLOCATE TIME QUEUE ENTRY
                          0F    0026   255          PUSHL   #DYN$C_TQE              ;SET DATA STRUCTURE TYPE
                    51    60    0028   256 10$:     MOVZBL  #<IRP$C_LENGTH+MASK>&<^C<MASK>>,R1 ;SET SIZE OF BUFFER REQUIRED
                          7E    002C   257 20$:     MOVPSL  -(SP)                   ;READ CURRENT PSL
                          51    002E   258          PUSHL   R1                      ;SAVE REQUEST SIZE
                          2E    0030   259          BSBB    EXE$ALONONPAGED         ;ATTEMPT TO ALLOCATE PACKET
                          0A    0032   260          POPR    #^M<R1,R3>              ;RETRIEVE REQUEST SIZE AND PREVIOUS IPL
                       0C 50    0034   261          BLBC    R0,40$                  ;IF LBC NO PACKET ALLOCATED
                    08 A2  51    0037   262          MOVW    R1,IRP$W_SIZE(R2)       ;INSERT SIZE OF ALLOCATED BLOCK
                0A A2  04 AE    003B   263          MOVZBW  4(SP),IRP$B_TYPE(R2)    ;INSERT DATA STRUCTURE TYPE
                                0040   264                                          ;AND CLEAR MISCELLANEOUS BYTE
                          8E    0040   265          TSTL    (SP)+                   ;Remove Type from stack
                          05    0042   266          RSB                             ;
                  50    0124    0043   267 40$:     MOVZWL  #SS$_INSFMEM,R0         ;SET INSUFFICIENT MEMORY
                                0048   268          ERRSUP_S        MSGADR=T_CGF    ;CANNOT GET FREE CORE
                 00000000'EF    0048                PUSHAL  $MODULE
```

```
                00000007'EF   DF  004E                        PUSHAL  T_CGF
                          01  DD  0054                        PUSHL   #$ER
           00000000'EF    03  FB  0056                        CALLS   #3, DS_ERRSUP
                              00  005D   269        HALT                            ;HALT FOR NOW
                          E3  11  005E   270        BRB     40$                     ;Prevent CONTINUE
                              0060   271        .DSABL  LSB
```

```
                                0060          .SBTTL  ALLOCATE NONPAGED DYNAMIC MEMORY
                                0060  ;+
                                0060  ; EXE$ALONONPAGED - ALLOCATE NONPAGED DYNAMIC MEMORY
                                0060  ;
                                0060  ; THIS ROUTINE IS CALLED TO ALLOCATE A BLOCK OF MEMORY FROM THE NONPAGED POOL.
                                0060  ; IF THE BLOCK IS THE SAME SIZE AS AN I/O PACKET, AN ATTEMPT IS MADE TO ALLO-
                                0060  ; CATE IT FROM THE LOOKASIDE LIST.
                                0060  ;
                                0060  ; INPUTS:
                                0060  ;
                                0060  ;       R1 = SIZE OF BLOCK REQUIRED IN BYTES.
                                0060  ;
                                0060  ; OUTPUTS:
                                0060  ;
                                0060  ;       R0 = LOW BIT CLEAR IF MEMORY IS NOT AVAILABLE.
                                0060  ;
                                0060  ;       R0 = LOW BIT SET IF MEMORY ALLOCATED WITH:
                                0060  ;
                                0060  ;               R1 = SIZE OF ALLOCATED BLOCK.
                                0060  ;               R2 = ADDRESS OF ALLOCATED BLOCK.
                                0060  ;-
                                0060
                                0060          .ENABL  LSB
                                0060  EXE$ALONONPAGED::                       ;ALLOCATE NONPAGED MEMORY
                                0060          $MP_SET_INTERLOCK #MP$V_IL_ALLN ; INTERLOCK ROUTINE          [08]
                    04    DD    0060                  PUSHL   #MP$V_IL_ALLN
                    08    DD    0062                  PUSHL   #$SRVCODE_SET_INTERLOCK
        00000000'9F 02    FB    0064                  CALLS   #2, @#DS$SERVICE_DISPATCHER
                                006B
                51  0F    C0    006B          ADDL    #MASK,R1                ;ROUND SIZE UP TO NEXT BOUNDRY
                51  0F    CA    006E          BICL    #MASK,R1                ;TRUNCATE SIZE BACK TO MULTIPLE
                    4B    13    0071          BEQL    60$                     ;IF EQL BAD ALLOCATION REQUEST
        0000FE00'EF 1C    E0    0073          BBS     #DSA$V_USER, -
                    06          007A                  DSA$GL_FLAGS,15$        ;SKIP DSBINT IF IN USER MODE
                                007B          DSBINT  #^X1F
                7E  12    DB    007B                  MFPR    S^#PR$_IPL,-(SP)
                12  1F    DA    007E                  MTPR    #^X1F,S^#PR$_IPL
                                0081  15$:
            51  0060 8F   B1    0081          CMPW    #<IRP$C_LENGTH+MASK>&<^C<MASK>>,R1 ;SIZE EQUAL TO I/O PACKET?
                    1E    1F    0086          BLSSU   10$                     ;IF NEQ NO
                                0088  ;+
                                0088  ;       Replaced        REMQUE  @L^IOC$GL_IRPFL,R2
                                0088  ;-
        52  00000014'FF    DE    0088          MOVAL   @L^IOC$GL_IRPFL,R2      ;FIRST ENTRY IN QUEUE
              04 A2 52    D1    008F          CMPL    R2,4(R2)                ;QUEUE EMPTY?
                    11    13    0093          BEQL    10$                     ;YES,
              04 B2 62    D0    0095          MOVL    (R2),@4(R2)             ;COPY PREDECESSOR LINK
                50  62    D0    0099          MOVL    (R2),R0                 ;COPY LINK TO SUCCESSOR
           04 A0  04 A2   D0    009C          MOVL    4(R2),4(R0)             ;COPY PREDECESOR LINK
                50  01    D0    00A1          MOVL    #SS$_NORMAL,R0          ;SET SUCCESSFUL COMPLETION
                    0B    11    00A4          BRB     40$                     ;ENABLE AND EXIT
        53  00000000'EF    9E    00A6  10$:    MOVAB   L^EXE$GL_NONPAGED,R3    ;GET ADDRESS OF NONPAGED MEMORY LISTHEAD
                    83    D5    00AD          TSTL    (R3)+                   ;Skip IPL for list
                    2D    10    00AF          BSBB    EXE$ALLOCATE            ;ALLOCATE BLOCK
                                00B1  40$:
        0000FE00'EF 1C    E0    00B1          BBS     #DSA$V_USER, -
                    03          00B8                  DSA$GL_FLAGS,50$        ;SKIP ENBINT IF IN USER MODE
```

```
                                  00B9   325          ENBINT
                    12    8E   DA  00B9                        MTPR    (SP)+,S^#PR$_IPL
                                  00BC   326 50$:
                          14   11  00BC   327          BRB     70$                     ; JUMP TO CLEAR INTERLOCK AND RSB  [08]
                                  00BE   328
                                  00BE   329 60$:     BUG_CHECK BADALORQSZ            ;BAD ALLOCATION REQUEST SIZE
                 00000000'9F   16  00BE               JSB     @#BUG$CHECK
2C 5A 53 51 52 4F 4C 41 44 41 42 00' 00C4               .ASCIC  "BADALORQSZ,"
                                0B  00C4
                          50   D4  00D0   330          CLRL    R0                      ;INDICATE NO BLOCK ALLOCATED
                                  00D2   331
                                  00D2   332 70$:
                                  00D2   333          $MP_CLEAR_INTERLOCK #MP$V_IL_ALLN ; CLEAR INTERLOCK            [08]
                          04   DD  00D2                        PUSHL   #MP$V_IL_ALLN
                          09   DD  00D4                        PUSHL   #$SRVCODE_CLEAR_INTERLOCK
              00000000'9F   02   FB  00D6                        CALLS   #2, @#DS$SERVICE_DISPATCHER
                                05  00DD   334          RSB
                                  00DE   335
                                  00DE   336          .DSABL  LSB
```

```
                        00DE   338          .SBTTL  GENERAL ALLOCATE MEMORY SUBROUTINE
                        00DE   339 ;+
                        00DE   340 ; EXE$ALLOCATE - ALLOCATE MEMORY SUBROUTINE
                        00DE   341 ;
                        00DE   342 ; THIS ROUTINE IS CALLED TO ALLOCATE A BLOCK OF MEMORY FROM A POOL WHOSE ENTRIES
                        00DE   343 ; ARE MAINTAINED IN A MEMORY ORDER SORTED LIST.
                        00DE   344 ;
                        00DE   345 ; INPUTS:
                        00DE   346 ;
                        00DE   347 ;       R1 = SIZE OF BLOCK REQUIRED IN BYTES.
                        00DE   348 ;       R3 = ADDRESS OF ALLOCATION REGION LISTHEAD.
                        00DE   349 ;
                        00DE   350 ; OUTPUTS:
                        00DE   351 ;
                        00DE   352 ;       R0 = LOW BIT CLEAR IF MEMORY IS NOT AVAILABLE.
                        00DE   353 ;
                        00DE   354 ;       R0 = LOW BIT SET IF MEMORY ALLOCATED WITH:
                        00DE   355 ;
                        00DE   356 ;               R1 = SIZE OF ALLOCATED BLOCK.
                        00DE   357 ;               R2 = ADDRESS OF ALLOCATED BLOCK.
                        00DE   358 ;-
                        00DE   359
                        00DE   360 EXE$ALLOCATE::                          ;ALLOCATE MEMORY
          50    53  D0  00DE   361          MOVL    R3,R0                 ;COPY ADDRESS OF FIRST FREE BLOCK ADDRESS
          52    50  D0  00E1   362 10$:     MOVL    R0,R2                 ;SAVE ADDRESS OF PREVIOUS FREE BLOCK
          50    62  D0  00E4   363          MOVL    (R2),R0               ;GET ADDRESS OF NEXT FREE BLOCK
                1C  13  00E7   364          BEQL    30$                   ;IF EQL NO MEMORY AVAILABLE
       04 A0    51  D1  00E9   365          CMPL    R1,4(R0)              ;FREE BLOCK BIG ENOUGH?
                F2  1A  00ED   366          BGTRU   10$                   ;IF GTRU NO
                0E  13  00EF   367          BEQL    20$                   ;IF EQL FREE BLOCK IS EXACT SIZE
    53  51      50  C1  00F1   368          ADDL3   R0,R1,R3              ;CALCULATE ADDRESS OF NEW FREE BLOCK
        83      80  D0  00F5   369          MOVL    (R0)+,(R3)+           ;COPY LINK TO NEXT FREE BLOCK
    63  60      51  C3  00F8   370          SUBL3   R1,(R0),(R3)          ;CALCULATE SIZE OF NEW FREE BLOCK
        70      73  DE  00FC   371          MOVAL   -(R3),-(R0)           ;SET LINK TO NEW FREE BLOCK
        62      60  D0  00FF   372 20$:     MOVL    (R0),(R2)             ;COPY LINK TO NEW FREE BLOCK
        52      80  9E  0102   373          MOVAB   (R0)+,R2              ;SET ADR OF ALLOCATED BLOCK, INDICATE SUCCES
                    05  0105   374 30$:     RSB                           ;
```

```
                                0106   376          .SBTTL  DEALLOCATE NONPAGED DYNAMIC MEMORY
                                0106   377 ;+
                                0106   378 ; EXE$DEANONPAGED - DEALLOCATE NONPAGED DYNAMIC MEMORY
                                0106   379 ;
                                0106   380 ; THIS ROUTINE IS CALLED TO DEALLOCATE A BLOCK OF MEMORY TO A NONPAGED POOL.
                                0106   381 ; IF THE BLOCK IS A SHARED MEMORY BLOCK TYPE, THE BLOCK IS DEALLOCATED TO
                                0106   382 ; THE SHARED MEMORY POOL.  OTHERWISE, THE BLOCK'S ADDRESS IS CHECKED TO SEE
                                0106   383 ; IF IT WAS ALLOCATED FROM THE I/O PACKET LOOKASIDE LIST AND IF SO,
                                0106   384 ; IT IS RETURNED TO THAT LIST.  OTHERWISE IT IS MERGED INTO THE NORMAL
                                0106   385 ; NONPAGED POOL.
                                0106   386 ;
                                0106   387 ; INPUTS:
                                0106   388 ;
                                0106   389 ;       R0 = ADDRESS OF BLOCK TO BE DEALLOCATED.
                                0106   390 ;       IRP$W_SIZE(R0) = SIZE OF BLOCK TO BE DEALLOCATED.
                                0106   391 ;       IRP$B_TYPE(R0) = TYPE OF BLOCK TO BE DEALLOCATED.
                                0106   392 ;
                                0106   393 ; OUTPUTS:
                                0106   394 ;
                                0106   395 ;       THE SPECIFIED BLOCK IS RETURNED TO THE APPROPRIATE POOL.
                                0106   396 ;-
                                0106   397
                                0106   398          .ENABL  LSB
                                0106   399 EXE$DEANONPAGED::                          ;DEALLOCATE NONPAGED DYNAMIC MEMORY
                                0106   400          $MP_SET_INTERLOCK #MP$V_IL_DELN ; Set interlock bit                [08]
                     05   DD    0106                 PUSHL   #MP$V_IL_DELN
                     08   DD    0108                 PUSHL   #$SRVCODE_SET_INTERLOCK
          00000000'9F    02   FB 010A                 CALLS   #2, a#DS$SERVICE_DISPATCHER
                                0111   401
                     56   10    0111   402          BSBB    CHECKBLOCK                 ;CHECK DEALLOCATION PARAMETERS
          53   00000000'EF    9E 0113   403          MOVAB   L^EXE$GL_NONPAGED,R3       ;GET ADDRESS OF NONPAGED MEMORY LISTHEAD
                     83   D5    011A   404          TSTL    (R3)+                      ;Skip IPL for list
                     1C   E0    011C   405          BBS     #DSA$V_USER -
            06 0000FE00'EF           011E   406                  ,DSA$GL_FLAGS, 7$     ;DISABLE ONLY IF IN S/A
                                0124   407          DSBINT  #^X1F
                  7E   12   DB  0124                 MFPR    S^#PR$_IPL,-(SP)
                  12   1F   DA  0127                 MTPR    #^X1F,S^#PR$_IPL
                                012A   408 7$:
          0000000C'EF    50   D1 012A   409          CMPL    R0,L^EXE$GL_SPLITADR       ;I/O PACKET?
                     1A   1F    0131   410          BLSSU   10$                        ;IF LSSU NO
                                0133   411 ;+
                                0133   412 ;       Replaced        INSQUE  (R0),@L^IOC$GL_IRPBL
                                0133   413 ;-
          53   00000018'FF    DE 0133   414          MOVAL   @L^IOC$GL_IRPBL,R3         ;WHERE TO INSERT IT
                  60   63    D0  013A   415          MOVL    (R3),(R0)
                04 A0   63    DE  013D   416          MOVAL   (R3),4(R0)
                  63   60    DE  0141   417          MOVAL   (R0),(R3)
          00000018'EF    60   DE 0144   418          MOVAL   (R0),L^IOC$GL_IRPBL
                     02   11    014B   419          BRB     20$                        ;
                     40   10    014D   420 10$:      BSBB    EXE$DEALLOCATE             ;DEALLOCATE BLOCK
                  50   03   3C  014F   421 20$:      MOVZWL  #RSN$_NPDYNMEM,R0          ;SET NONPAGED DYNAMIC MEMORY RESOURCE NUMBER
                     1C   E0    0152   422          BBS     #DSA$V_USER -
            03 0000FE00'EF           0154   423                  ,DSA$GL_FLAGS, 30$    ;ENBINT IF IN S/A
                                015A   424          ENBINT                             ;ENABLE INTERRUPTS
                  12   8E   DA  015A                 MTPR    (SP)+,S^#PR$_IPL
                                015D   425 30$:
                                015D   426          $MP_CLEAR_INTERLOCK #MP$V_IL_DELN ; CLEAR interlock bit            [08]
```

```
                    05   DD  015D                          PUSHL   #MP$V_IL_DELN
                    09   DD  015F                          PUSHL   #$SRVCODE_CLEAR_INTERLOCK
          00000000'9F   02  FB  0161                      CALLS   #2, a#DS$SERVICE_DISPATCHER
                            0168   427
                        05  0168   428 31$:    RSB                             ;RETURN
                            0169   429          .DSABL  LSB
```

```
                                  0169          .SBTTL  CHECK BLOCK PARAMETERS SUBROUTINE
                                  0169  ;
                                  0169  ; CHECKBLOCK - CHECK BLOCK PARAMETERS SUBROUTINE
                                  0169  ;
                                  0169
                                  0169  CHECKBLOCK:                                   ;CHECK BLOCK PARAMETERS
                 50    0F    D3   0169          BITL    #MASK,R0                      ;BLOCK ALIGNED ON BOUNDRY?
                       0C    12   016C          BNEQ    10$                           ;IF NEQ NO - BAD DEALLOCATION
              51    08 A0    3C   016E          MOVZWL  IRP$W_SIZE(R0),R1             ;GET SIZE OF BLOCK IN BYTES
                 51    0F    C0   0172          ADDL    #MASK,R1                      ;ROUND SIZE UP TO NEXT BOUNDRY
                 51    0F    CA   0175          BICL    #MASK,R1                      ;TRUNCATE SIZE BACK TO MULTIPLE
                       14    12   0178          BNEQ    20$                           ;IF NEQ OKAY
                                  017A  10$:    BUG_CHECK BADDALRQSZ                  ;BAD DEALLOCATION REQUEST SIZE OR ADDRESS
              00000000'9F    16   017A          JSB     @#BUG$CHECK
2C 5A 53 51 52 4C 41 44 44 41 42 00'  0180          .ASCIC  "BADDALRQSZ,"
                             0B   0180
                       8E    D5   018C          TSTL    (SP)+                         ;REMOVE RETURN FROM STACK
                             05   018E  20$:    RSB                                   ;
```

```
                                018F    447          .SBTTL  GENERAL DEALLOCATION SUBROUTINE
                                018F    448 ;+
                                018F    449 ; EXE$DEALLOCATE - DEALLOCATION SUBROUTINE
                                018F    450 ;
                                018F    451 ; INPUTS:
                                018F    452 ;
                                018F    453 ;       R0 = ADDRESS OF BLOCK TO BE DEALLOCATED.
                                018F    454 ;       R1 = SIZE OF BLOCK IN BYTES
                                018F    455 ;       R3 = ADDRESS OF ALLOCATION REGION LISTHEAD.
                                018F    456 ;
                                018F    457 ; OUTPUTS:
                                018F    458 ;
                                018F    459 ;       NONE
                                018F    460 ;-
                                018F    461
                                018F    462 EXE$DEALLOCATE::                            ;DEALLOCATE BLOCK
          52    53    D0        018F    463 10$:    MOVL    R3,R2                       ;SAVE ADDRESS OF PREVIOUS FREE BLOCK
          53    62    D0        0192    464         MOVL    (R2),R3                     ;GET ADDRESS OF NEXT FREE BLOCK
                07    13        0195    465         BEQL    20$                         ;IF EQL END OF LIST
          53    50    D1        0197    466         CMPL    R0,R3                       ;BLOCK LOGICALLY GO HERE?
                F3    1A        019A    467         BGTRU   10$                         ;IF GTRU NO
                2D    13        019C    468         BEQLU   50$                         ;IF EQLU DOUBLE DEALLOCATION
          60    53    D0        019E    469 20$:    MOVL    R3,(R0)                     ;ASSUME NO AGGLOMERATION
       7E 51    50    C1        01A1    470         ADDL3   R0,R1,-(SP)                 ;CALCULATE ADDRESS OF END OF BLOCK
          8E    53    D1        01A5    471         CMPL    R3,(SP)+                    ;END OF BLOCK EQUAL TO NEXT IN LIST?
                06    12        01A8    472         BNEQ    30$                         ;IF NEQ DO NOT AGGLOMERATE
          60    83    D0        01AA    473         MOVL    (R3)+,(R0)                  ;MOVE LINK TO BLOCK BEING RELEASED
          51    63    C0        01AD    474         ADDL    (R3),R1                     ;ACCUMULATE LENGTH OF NEW FREE BLOCK
                52    DD        01B0    475 30$:    PUSHL   R2                          ;CALCULATE ENDING ADDRESS OF PREVIOUS BLOCK
          82    50    D0        01B2    476         MOVL    R0,(R2)+                    ;ASSUME NO AGGLOMERATION
          6E    62    C0        01B5    477         ADDL    (R2),(SP)                   ;ADD LENGTH TO BLOCK BASE ADDRESS
          8E    50    D1        01B8    478         CMPL    R0,(SP)+                    ;END ADDRESS EQUAL TO BLOCK BEING RELEASED?
                09    12        01BB    479         BNEQ    40$                         ;IF NEQ DO NOT AGGLOMERATE BLOCKS
          51    62    C0        01BD    480         ADDL    (R2),R1                     ;ACCUMULATE SIZE OF NEW FREE BLOCK
          72    60    D0        01C0    481         MOVL    (R0),-(R2)                  ;MOVE LINK TO PREVIOUS FREE BLOCK
          50    52    D0        01C3    482         MOVL    R2,R0                       ;SET ADDRESS OF NEW FREE BLOCK
    04 A0 51    D0        01C6    483 40$:    MOVL    R1,4(R0)                    ;SET SIZE OF FREE BLOCK
                      05    01CA    484         RSB                                 ;
                            01CB    485 50$:    BUG_CHECK DOUBLDEALO,FATAL          ;DOUBLE DEALLOCATION OF MEMORY BLOCK
          00000000'9F   16  01CB                JSB     @#BUG$CHECK
2C 4F 4C 41 45 44 4C 42 55 4F 44 00'  01D1                .ASCIC  "DOUBLDEALO,FATAL"
                4C 41 54 41 46        01DD
                      10    01D1
                      00    01E2    486         HALT                                ;HALT FOR NOW
                E6    11    01E3    487         BRB     50$
```

```
                        01E5   489          .SBTTL  MEMPOOL$INIT                    ;USER MODE MEMORY INITIALIZATION
                    000001E5   490 .PSECT  CODE,   SHR,    EXE,    NOWRT,  BYTE
                        01E5   491
                        01E5   492 ;++
                        01E5   493 ;FUNCTIONAL DESCRIPTION:
                        01E5   494 ;
                        01E5   495 ;       This routine allocates how must scratch memory is required and
                        01E5   496 ;       expands the program region to get it. This memory is optionally
                        01E5   497 ;       split between IRP's and other free memory
                        01E5   498 ;
                        01E5   499 ;CALLING SEQUENCING:
                        01E5   500 ;
                        01E5   501 ;       BSBW    USER$MEMINIT
                        01E5   502 ;
                        01E5   503 ;INPUT PARAMETERS:
                        01E5   504 ;
                        01E5   505 ;IMPLICIT INPUTS:
                        01E5   506 ;
                        01E5   507 ;OUTPUT PARAMETERS:     NONE
                        01E5   508 ;
                        01E5   509 ;IMPLICIT OUTPUTS:      NONE
                        01E5   510 ;
                        01E5   511 ;COMPLETION CODES:      NONE
                        01E5   512 ;
                        01E5   513 ;SIDE EFFECTS:          NONE
                        01E5   514 ;--
                        01E5   515
                        01E5   516 MEMPOOL$INIT::
                  0C    BB    01E5   517          PUSHR   #^M<R2,R3>              ; Save working registers
        50  00000000'8F   D0    01E7   518          MOVL    #SCRIPT$MINCORE,R0      ;SPACE NEEDED FOR SCRIPTS
        50  00000000'8F   C0    01EE   519          ADDL2   #QIO$MINCORE,R0         ;PLUS QIO SPACE
            51    50    0A    C7    01F5   520          DIVL3   #10,R0,R1               ;PLUS 10%
                  50    51    C0    01F9   521          ADDL2   R1,R0
            51    50    05    C5    01FC   522          MULL3   #5,R0,R1                ;IN USER MODE USE 5 TIMES MINIMUM
        50  00000000'8F   C0    0200   523          ADDL2   #ULTRIX$IOB+ULTRIX$B,R0 ; Added space for ULTRIX buf [09]     ;G:2
  0000FE00'EF     1C    E0    0207   524          BBS     #DSA$V_USER,DSA$GL_FLAGS -
                        0F          020E   525                  . 10$                   ;SKIP CALCULATION IN USER MODE
                        020F   526
00000000'EF 00000000'EF   C3    020F   527          SUBL3   DS$GA_LASTADR,DS$GL_MEMSIZE -
                        51          021A   528                  , R1                    ;ROOM ABOVE SUPERVISOR
                  51    0A    C6    021B   529          DIVL2   #10,R1                  ;10% OF THAT
                        021E   530 10$:
        0003 51   00    50    F1    021E   531          ACBL    R0,#0,R1,20$            ;MAX (MIN NECESSARY, AVAILABLE)
                  50    51    D0    0224   532          MOVL    R1,R0
            50    01FF  8F    AA    0227   533 20$:     BISW2   #^X1FF,R0               ;PAGE ALIGN
                  50    D6    022C   534          INCL    R0
  0000FE00'EF     1C    E0    022E   535          BBS     #DSA$V_USER,DSA$GL_FLAGS -
                        0D          0235   536                  . 30$                   ;USER ALLOCATIONS ARE DIFFERENT
                        0236   537
        51  00000000'EF   D0    0236   538          MOVL    DS$GA_LASTADR,R1        ;SAVE START ADDRESS OF SPACE
              50    6041  9E    023D   539          MOVAB   (R0)[R1],R0             ;HIGHEST+1 ADDRESS OF SPACE
                        23    11    0241   540          BRB     40$                     ;JOIN COMMON CODE
                        0243   541 30$:
              51    7E    7E    0243   542          MOVAQ   -(SP),R1                ;WHERE VMS WILL RETURN THE ADDRESSES
       50   50     F7  8F    78    0246   543          ASHL    #-9,R0,R0               ;MAKE PAGE COUNT
                        024B   544          $EXPREG_S R0,(R1)                       ;ALLOCATE THE SPACE
                        00    DD    024B                PUSHL   #0
```

```
                        00   DD  024D                        PUSHL   #0
                        61   7F  024F                        PUSHAQ  (R1)
                        50   DD  0251                        PUSHL   R0
        00000000'GF     04   FB  0253                        CALLS   #4,G^SYS$EXPREG
                        02   BA  025A   545          POPR    #^M<R1>                 ;GET START ADDRESS
   50   8E   000001FF  8F   C9  025C   546          BISL3   #^X1FF,(SP)+,R0          ;GET END ADDRESS
                        50   D6  0264   547          INCL    R0                      ;+1
                                 0266   548 40$:
                                 0266   549 ;+
                                 0266   550 ;        R0      Highest address allocated + 1
                                 0266   551 ;        R1      Lowest address allocated
                                 0266   552 ;-
        00000000'EF     51   D0  0266   553          Movl    R1, L^ULTRIX_IOB_ADD    ; Address of IOB buffer                 [09]
00000000'EF   0000'C1   9E  026D   554          Movab   ULTRIX$IOB(R1),L^ULTRIX_B_ADD ; ADDRESS OF B BUFFER              [09]
        51    0000'C1   9E  0276   555          MOVAB   ULTRIX$IOB+ULTRIX$B(R1),R1 ; RESERVED FOR ULTRIX                [09]
        51    01FF  C1  DE  027B   556          MOVAL   511(R1),R1              ; Insure page alignment                 [09]
     51    000001FF  8F  CA  0280   557          BICL2   #^X1FF,R1               ; for look-aside buffer                 [09]
                                 0287   558                                                                          ;G:2
        00000010'EF     51   D0  0287   559          MovL    R1, L^Ds$GL_LookAside   ; Store start of look-aside            [06]
        00000000'EF     50   D0  028E   560          MovL    R0, L^DS$GA_LASTADR     ;PUT BACK NEW AVAILABLE ADDR
        00000004'EF     51   D0  0295   561          MOVL    R1,EXE$GL_NONPAGED+4    ;SET ADDRESS OF CHUNK
                        61   D4  029C   562          CLRL    (R1)                    ;THIS IS FIRST AND LAST CHUNK
                                 029E   563
     52   00000014'EF     9E  029E   564          MOVAB   L^IOC$GL_IRPFL,R2       ;ADDR OF LIST HEAD
             62   52   D0  02A5   565          MOVL    R2,(R2)                 ;INIT LISTHEAD
           04 A2   52   D0  02A8   566          MOVL    R2,4(R2)                ;AND TAIL
53   50   00000000'8F   C3  02AC   567          SUBL3   #<SGN$C_IRPCNT*<IRP$C_LENGTH+15>&-16>,R0 -
                                 02B4   568                  , R3                ;ADDR OF FIRST IRP, LOW LIMIT
                        11   11  02B4   569          BRB     60$                     ;COUNT FIRST
                                 02B6   570 50$:
                                 02B6   571 ;+
                                 02B6   572 ;        Replaced        INSQUE (R0),(R2)
                                 02B6   573 ;-
             53   62   D0  02B6   574          MOVL    (R2),R3                 ;Address of next
             60   53   D0  02B9   575          MOVL    R3,(R0)                 ;Make flink of new point to next
          04 A0   52   D0  02BC   576          MOVL    R2,4(R0)                ;Make blink of new point to current
             62   50   D0  02C0   577          MOVL    R0,(R2)                 ;Make flink of curr point to new
          04 A3   50   D0  02C3   578          MOVL    R0,4(R3)                ;Make blink of old point to new
                                 02C7   579 60$:
FFE5 50   FFFFFFA0 8F   53  F1  02C7   580          ACBL    R3,#-<<IRP$C_LENGTH+15>&-16>,R0 -
                                 02D1   581                  ,50$                ;DECREMENT ADDR BY LENGTH AND MAKE ONE
                                 02D1   582
          04 A1   50   51  C3  02D1   583          SUBL3   R1,R0,4(R1)             ;SET LENGTH OF REMAINING CHUNK
        0000000C'EF   53   D0  02D6   584          MOVL    R3,EXE$GL_SPLITADR      ;SET ADDRESS OF LOWEST IRP
                                 02DD   585
                        0C   BA  02DD   586          POPR    #^M<R2,R3>              ; Restore registers
                        05   05  02DF   587          RSB                             ;RETURN
                                 02E0   588
```

```
                                02E0    590          .SBTTL  RETURN SIZE OF PHYSICAL MEMORY                                  ;[07
                                02E0    591 ;++                                                                              [07]
                                02E0    592 ;FUNCTIONAL DESCRIPTION                                                          [07]
                                02E0    593 ;                                                                                [07]
                                02E0    594 ;       This routine can be called to return the size of physical memory.        [07]
                                02E0    595 ;       The size returned is given in number of pages. A check is made to        [07]
                                02E0    596 ;       to see if VDS is ryunning standalone. If not, an error return code       [07]
                                02E0    597 ;       is given.                                                                [07]
                                02E0    598 ;                                                                                [07]
                                02E0    599 ;CALLING SEQUENCE                                                                [07]
                                02E0    600 ;                                                                                [07]
                                02E0    601 ;       CALLS   #1,DS$MEMSIZE                                                    [07]
                                02E0    602 ;                                                                                [07]
                                02E0    603 ;INPUT PARAMETERS:                                                               [07]
                                02E0    604 ;                                                                                [07]
                                02E0    605 ;       4(AP) - Address of longword to receive page count                        [07]
                                02E0    606 ;                                                                                [07]
                                02E0    607 ;IMPLICIT INPUTS:                                                                [07]
                                02E0    608 ;                                                                                [07]
                                02E0    609 ;       NONE                                                                     [07]
                                02E0    610 ;                                                                                [07]
                                02E0    611 ;OUTPUT PARAMETERS:                                                              [07]
                                02E0    612 ;                                                                                [07]
                                02E0    613 ;       a4(AP) - Page count of physical memory                                   [07]
                                02E0    614 ;                                                                                [07]
                                02E0    615 ;IMPLICIT OUPUTS:                                                                [07]
                                02E0    616 ;                                                                                [07]
                                02E0    617 ;       NONE                                                                     [07]
                                02E0    618 ;                                                                                [07]
                                02E0    619 ;COMPLETION CODES:                                                               [07]
                                02E0    620 ;                                                                                [07]
                                02E0    621 ;       SS$_NORMAL - Successful completion                                       [07]
                                02E0    622 ;       DS$_NOSUPPORT - VDS is online, no value returned                         [07]
                                02E0    623 ;                                                                                [07]
                                02E0    624 ;SIDE EFFECTS:                                                                   [07]
                                02E0    625 ;                                                                                [07]
                                02E0    626 ;       NONE                                                                     [07]
                                02E0    627 ;--                                                                              [07]
                          0000  02E0    628          .ENTRY  DSX$MEMSIZE,^M<>        ;ENTRY POINT - RETURN MEMORY SIZE       [07]
                                02E2    629
          50    006600B1 8F     D0  02E2    630          MOVL    #DS$_NOSUPPORT,R0       ;Prepare to return error code           [07]
                                02E9    631          BR_IF_USER DS$MEMSIZE_X         ;Is VDS in user-mode?                   [07]
          0000FE00'EF   1C      E0  02E9                 BBS     #DSA$V_User, -                  ; If bit set, branch            [28]
                        10          02F0                   L^DSA$GL_Flags, DS$MEMSIZE_X          ;
00000000'EF     00000200 8F     C7  02F1    632          DIVL3   #512,DS$GL_MEMSIZE,a4(AP)   ;Get the memory size in pages      [07]
                      04 BC         02FC
                50    01      D0  02FE    633          MOVL    #SS$_NORMAL,R0          ;Set normal return code                 [07]
                                0301    634 DS$MEMSIZE_X:                                                                    ;[07
                          04    0301    635          RET                             ;return to caller                       [07]
                                0302    636
                                0302    637
                                0302    638          .END
```

```
$$T1                            = 00000000     D
$ER                             = 00000002     D
$MODULE                           00000000 R   D   03
$SRVCODE_BOOTATTACHED           = 00000000     D
$SRVCODE_CLEAR_INTERLOCK        = 00000009     D
$SRVCODE_GETSYSBUF              = 00000004     D
$SRVCODE_HALTATTACHED           = 00000002     D
$SRVCODE_INTERLOCK_TEST         = 00000007     D
$SRVCODE_PPSCB                  = 0000000A     D
$SRVCODE_PRINTREV               = 00000006     D
$SRVCODE_RELSYSBUF              = 00000005     D
$SRVCODE_SET_INTERLOCK          = 00000008     D
$SRVCODE_SHOWIDLE               = 00000003     D
$SRVCODE_STARTATTACHED          = 00000001     D
BUG$CHECK                         ********   X   04
CEB$C_LENGTH                    = 00000038     D
CEB$C_SLAVLNG                   = 00000044     D
CHECKBLOCK                        00000169 R   D   04
DS$GA_LASTADR                     ********   X   04
DS$GL_LOOKASIDE                   00000010 RG  D   02
DS$GL_MEMSIZE                     ********   X   04
DS$K_ERROR                      = 00000002     D
DS$K_NORMAL                     = 00000001     D
DS$K_SEVERE                     = 00000004     D
DS$K_SUBSYS                     = 00000066     D
DS$K_WARNING                    = 00000000     D
DS$MEMSIZE_X                      00000301 R   D   04
DS$SERVICE_DISPATCHER             ********   X   00
DS$_AP_NORMAL_BREAK             = 00660150     D
DS$_ARITH                       = 006600D0     D
DS$_ASBE                        = 00660118     D
DS$_BADLINK                     = 006600F0     D
DS$_BADTYPE                     = 006600E8     D
DS$_BIIC                        = 00660120     D
DS$_CHME                        = 006600A8     D
DS$_CHMK                        = 006600E0     D
DS$_DEVNAME                     = 00660108     D
DS$_ERROR                       = 00660002     D
DS$_FHWE                        = 00660068     D
DS$_FRAGBUF                     = 00660080     D
DS$_ICBUSY                      = 006600C8     D
DS$_ICERR                       = 006600C0     D
DS$_IHWE                        = 00660060     D
DS$_ILLCHAR                     = 00660018     D
DS$_ILLPAGCNT                   = 00660078     D
DS$_ILLUNIT                     = 00660100     D
DS$_INIT_FAIL                   = 00660140     D
DS$_INSFMEM                     = 00660050     D
DS$_INVCPU                      = 00660130     D
DS$_IPL2HI                      = 006600B8     D
DS$_IVADDR                      = 00660040     D
DS$_IVVECT                      = 00660038     D
DS$_KRNLSTK                     = 00660090     D
DS$_LOGIC                       = 00660070     D
DS$_MCHK                        = 00660088     D
DS$_MEM_ALLOC_ERR               = 00660138     D
DS$_MMOFF                       = 00660058     D
DS$_NEEDUNIT                    = 006600F8     D
DS$_NODE                        = 00660128     D
DS$_NOPCS                       = 00660110     D
DS$_NORMAL                      = 00660001     D
DS$_NOSUPPORT                   = 006600B1     D
DS$_NOTALLOWMP                  = 00660148     D
DS$_NOTDON                      = 00660030     D
DS$_NOTIMP                      = 006600B0     D
DS$_NULLSTR                     = 00660010     D
DS$_OVERFLOW                    = 00660008     D
DS$_POWER                       = 00660098     D
DS$_PROGERR                     = 00660020     D
DS$_SEVERE                      = 00660004     D
DS$_TRANSL                      = 006600A0     D
DS$_TRUNCATE                    = 00660028     D
DS$_UNEXPINT                    = 006600D8     D
DS$_UNSUPPDEV                   = 00660158     D
DS$_VASFULL                     = 00660048     D
DS$_WARNING                     = 00660000     D
DSA$AL_APTMAIL                    0000FE00     D
DSA$AT_APTTXT                     0000FA00     D
DSA$GL_APTCOM                     0000FE04     D
DSA$GL_DEVLEN                     0000FE58     D
DSA$GL_ERRNO                      0000FE44     D
DSA$GL_EVENT                      0000FE48     D
DSA$GL_FLAGS                      0000FE00     D
DSA$GL_MSGTYP                     0000FE40     D
DSA$GL_PASSES                     0000FE08     D
DSA$GL_PASSNO                     0000FE54     D
DSA$GL_SECTNO                     0000FE10     D
DSA$GL_SID                        0000FE14     D
DSA$GL_SUBTNO                     0000FE4C     D
DSA$GL_TESTNO                     0000FE50     D
DSA$GL_UNITS                      0000FE0C     D
DSA$GQ_MSGPTR                     0000FE68     D
DSA$GT_DEVNAM                     0000FE5C     D
DSA$V_USER                      = 0000001C     D
DSX$MEMSIZE                       000002E0 RG  D   04
DS_ERRSUP                         ********   X   04
DYN$C_BUFIO                     = 00000013     D
DYN$C_CEB                       = 00000004     D
DYN$C_IRP                       = 0000000A     D
DYN$C_JIB                       = 0000002F     D
DYN$C_PCB                       = 0000000C     D
DYN$C_PQB                       = 0000000D     D
DYN$C_TQE                       = 0000000F     D
EXE$ALLOCATE                      000000DE RG  D   04
EXE$ALLOCBUF                      00000000 RG  D   04
EXE$ALLOCCEB                      00000004 RG  D   04
EXE$ALLOCIRP                      00000011 RG  D   04
EXE$ALLOCJIB                      00000008 RG  D   04
EXE$ALLOCPCB                      00000015 RG  D   04
EXE$ALLOCPQB                      0000001D RG  D   04
EXE$ALLOCTQE                      00000026 RG  D   04
EXE$ALONONPAGED                   00000060 RG  D   04
EXE$DEALLOCATE                    0000018F RG  D   04
EXE$DEANONPAGED                   00000106 RG  D   04
```

```
EXE$GL_NONPAGED                 00000000 R  D  02        PCB$B_WEFC                      0000002E    D
EXE$GL_SPLITADR                 0000000C RG D  02        PCB$C_LENGTH                    0000008C    D
IOC$GL_IRPBL                  = 00000018 R  D  02        PCB$K_LENGTH                    0000008C    D
IOC$GL_IRPFL                    00000014 RG D  02        PCB$L_ARB                       00000084    D
IRP$B_CARCON                    00000038    D            PCB$L_ASTQBL                    00000014    D
IRP$B_EFN                       00000022    D            PCB$L_ASTQFL                    00000010    D
IRP$B_PRI                       00000023    D            PCB$L_EFC2P                     00000058    D
IRP$B_RMOD                      0000000B    D            PCB$L_EFC3P                     0000005C    D
IRP$B_TYPE                      0000000A    D            PCB$L_EFCS                      00000050    D
IRP$C_LENGTH                    0000005C    D            PCB$L_EFCU                      00000054    D
IRP$K_LENGTH                    0000005C    D            PCB$L_EFWM                      0000004C    D
IRP$L_ARB                       00000050    D            PCB$L_JIB                       00000078    D
IRP$L_AST                       00000010    D            PCB$L_OWNER                     0000001C    D
IRP$L_ASTPRM                    00000014    D            PCB$L_PHD                       00000064    D
IRP$L_DIAGBUF                   00000044    D            PCB$L_PHYPCB                    00000018    D
IRP$L_EXTEND                    0000004C    D            PCB$L_PID                       00000060    D
IRP$L_IOQBL                     00000004    D            PCB$L_PQB                       0000004C    D
IRP$L_IOQFL                     00000000    D            PCB$L_SQBL                      00000004    D
IRP$L_IOSB                      00000024    D            PCB$L_SQFL                      00000000    D
IRP$L_IOST1                     00000034    D            PCB$L_STS                       00000024    D
IRP$L_IOST2                     00000038    D            PCB$L_UIC                       00000088    D
IRP$L_MEDIA                     00000034    D            PCB$L_WSSWP                     00000020    D
IRP$L_PID                       0000000C    D            PCB$L_WTIME                     00000028    D
IRP$L_SEGVBN                    00000040    D            PCB$Q_PRIV                      0000007C    D
IRP$L_SEQNUM                    00000048    D            PCB$T_LNAME                     00000068    D
IRP$L_SVAPTE                    0000002C    D            PCB$T_TERMINAL                  00000044    D
IRP$L_TT_TERM                   00000038    D            PCB$W_APTCNT                    00000030    D
IRP$L_UCB                       0000001C    D            PCB$W_ASTCNT                    00000038    D
IRP$L_WIND                      00000018    D            PCB$W_BIOCNT                    0000003A    D
IRP$Q_NT_PRVMSK                 0000003C    D            PCB$W_BIOLM                     0000003C    D
IRP$W_ABCNT                     0000003C    D            PCB$W_DIOCNT                    0000003E    D
IRP$W_BCNT                      00000032    D            PCB$W_DIOLM                     00000040    D
IRP$W_BOFF                      00000030    D            PCB$W_GPGCNT                    00000034    D
IRP$W_CHAN                      00000028    D            PCB$W_GRP                       0000008A    D
IRP$W_FUNC                      00000020    D            PCB$W_MEM                       00000088    D
IRP$W_OBCNT                     0000003E    D            PCB$W_MTXCNT                    0000000E    D
IRP$W_SIZE                      00000008    D            PCB$W_PPGCNT                    00000036    D
IRP$W_STS                       0000002A    D            PCB$W_PRCCNT                    00000042    D
IRP$W_TT_PRMPT                  0000003C    D            PCB$W_SIZE                      00000008    D
JIB$C_LENGTH                  = 00000074    D            PCB$W_STATE                     0000002C    D
MASK                          = 0000000F    D            PCB$W_TMBU                      00000032    D
MEMPOOL$INIT                    000001E5 RG D  04        PQB$C_LENGTH                  = 000008C8    D
MP$V_IL_ALLN                  = 00000004    D            PR$_IPL                       = 00000012    D
MP$V_IL_CNDB                  = 00000007    D            QIO$MINCORE                     ********  X   04
MP$V_IL_CNHN                  = 00000006    D            RSN$_NPDYNMEM                 = 00000003    D
MP$V_IL_DELN                  = 00000005    D            SCRIPT$MINCORE                  ********  X   04
MP$V_IL_DSBK                  = 00000008    D            SGN$C_IRPCNT                    ********  X   04
MP$V_IL_ERSP                  = 00000003    D            SIZ...                        = 00000001    D
MP$V_IL_GTLN                  = 00000009    D            SS$_INSFMEM                   = 00000124    D
MP$V_IL_NUMT                  = 00000000    D            SS$_NORMAL                    = 00000001    D
MP$V_IL_PRNT                  = 00000001    D            SYS$EXPREG                      ******** GX   04
MP$V_IL_RRPT                  = 00000002    D            T_CGF                           00000007 R  D 03
PCB$B_ASTACT                    0000000C    D            ULTRIX$B                        ********  X   04
PCB$B_ASTEN                     0000000D    D            ULTRIX$IOB                      ********  X   04
PCB$B_PRI                       0000000B    D            ULTRIX_B_ADD                    ********  X   04
PCB$B_PRIB                      0000002F    D            ULTRIX_IOB_ADD                  ********  X   04
PCB$B_TYPE                      0000000A    D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000FE70 (65136.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
WORK	0000001C (28.)	02 (2.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC LONG
DATA	0000001C (28.)	03 (3.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC BYTE
CODE	00000302 (770.)	04 (4.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC BYTE

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$T1	=00000000	544 (2)	544 (2)
$ER	=00000002	268 (2)	#-268 (2)
$MODULE	00000000-R	152 (2)	268 (2)
$SRVCODE_BOOTATTACHED	=00000000	426 (2)	
$SRVCODE_CLEAR_INTERLOCK	=00000009	426 (2)	#-333 (2) #-426 (2)
$SRVCODE_GETSYSBUF	=00000004	426 (2)	
$SRVCODE_HALTATTACHED	=00000002	426 (2)	
$SRVCODE_INTERLOCK_TEST	=00000007	426 (2)	
$SRVCODE_PPSCB	=0000000A	426 (2)	
$SRVCODE_PRINTREV	=00000006	426 (2)	
$SRVCODE_RELSYSBUF	=00000005	426 (2)	
$SRVCODE_SET_INTERLOCK	=00000008	426 (2)	#-297 (2) #-400 (2)
$SRVCODE_SHOWIDLE	=00000003	426 (2)	
$SRVCODE_STARTATTACHED	=00000001	426 (2)	
BIT...	=00000018	96 (2)	96 (2)
BUG$CHECK	00000000-XR		329 (2) 443 (2) 485 (2)
CEB$C_LENGTH	=00000038		236 (2)
CEB$C_SLAVLNG	=00000044		237 (2)
CHECKBLOCK	00000169-R	436 (2)	#-402 (2)
DS$GA_LASTADR	00000000-XR		#-527 (2) #-538 (2) #-560 (2)
DS$GL_LOOKASIDE	00000010-R	138 (2)	#-559 (2)
DS$GL_MEMSIZE	00000000-XR		#-527 (2) #-632 (2)
DS$K_ERROR	=00000002	96 (2)	
DS$K_NORMAL	=00000001	96 (2)	
DS$K_SEVERE	=00000004	96 (2)	
DS$K_SUBSYS	=00000066	96 (2)	96 (2)
DS$K_WARNING	=00000000	96 (2)	
DS$MEMSIZE_X	00000301-R	634 (2)	#-631 (2)
DS$SERVICE_DISPATCHER	00000000-XR		115 (2) 297 (2) 333 (2) 400 (2) 426 (2)
DS$_AP_NORMAL_BREAK	=00660150	96 (2)	
DS$_ARITH	=006600D0	96 (2)	
DS$_ASBE	=00660118	96 (2)	
DS$_BADLINK	=006600F0	96 (2)	
DS$_BADTYPE	=006600E8	96 (2)	
DS$_BIIC	=00660120	96 (2)	
DS$_CHME	=006600A8	96 (2)	
DS$_CHMK	=006600E0	96 (2)	
DS$_DEVNAME	=00660108	96 (2)	
DS$_ERROR	=00660002	96 (2)	
DS$_FHWE	=00660068	96 (2)	
DS$_FRAGBUF	=00660080	96 (2)	
DS$_ICBUSY	=006600C8	96 (2)	
DS$_ICERR	=006600C0	96 (2)	
DS$_IHWE	=00660060	96 (2)	
DS$_ILLCHAR	=00660018	96 (2)	
DS$_ILLPAGCNT	=00660078	96 (2)	
DS$_ILLUNIT	=00660100	96 (2)	
DS$_INIT_FAIL	=00660140	96 (2)	
DS$_INSFMEM	=00660050	96 (2)	

```
DS$_INVCPU                      =00660130      96      (2)
DS$_IPL2HI                      =006600B8      96      (2)
DS$_IVADDR                      =00660040      96      (2)
DS$_IVVECT                      =00660038      96      (2)
DS$_KRNLSTK                     =00660090      96      (2)
DS$_LOGIC                       =00660070      96      (2)
DS$_MCHK                        =00660088      96      (2)
DS$_MEM_ALLOC_ERR               =00660138      96      (2)
DS$_MMOFF                       =00660058      96      (2)
DS$_NEEDUNIT                    =006600F8      96      (2)
DS$_NODE                        =00660128      96      (2)
DS$_NOPCS                       =00660110      96      (2)
DS$_NORMAL                      =00660001      96      (2)
DS$_NOSUPPORT                   =006600B1      96      (2)     #-630     (2)
DS$_NOTALLOWMP                  =00660148      96      (2)
DS$_NOTDON                      =00660030      96      (2)
DS$_NOTIMP                      =006600B0      96      (2)       96      (2)
DS$_NULLSTR                     =00660010      96      (2)
DS$_OVERFLOW                    =00660008      96      (2)
DS$_POWER                       =00660098      96      (2)
DS$_PROGERR                     =00660020      96      (2)
DS$_SEVERE                      =00660004      96      (2)
DS$_TRANSL                      =006600A0      96      (2)
DS$_TRUNCATE                    =00660028      96      (2)
DS$_UNEXPINT                    =006600D8      96      (2)
DS$_UNSUPPDEV                   =00660158      96      (2)
DS$_VASFULL                     =00660048      96      (2)
DS$_WARNING                     =00660000      96      (2)       96      (2)
DSA$GL_FLAGS                     0000FE00                         303     (2)       324     (2)       406     (2)       423     (2)
                                                                  524     (2)       535     (2)       631     (2)
DSA$V_USER                      =0000001C                       #-302     (2)     #-323     (2)     #-405     (2)     #-422     (2)
                                                                #-524     (2)     #-535     (2)     #-631     (2)
DSX$MEMSIZE                      000002E0-R    628     (2)
DS_ERRSUP                        00000000-XR                      268     (2)
DYN$C_BUFIO                     =00000013                       #-232     (2)
DYN$C_CEB                       =00000004                       #-235     (2)
DYN$C_IRP                       =0000000A                       #-244     (2)
DYN$C_JIB                       =0000002F                       #-240     (2)
DYN$C_PCB                       =0000000C                       #-247     (2)
DYN$C_PQB                       =0000000D                       #-251     (2)
DYN$C_TQE                       =0000000F                       #-255     (2)
EXE$ALLOCATE                     000000DE-R    360     (2)     #-321     (2)
EXE$ALLOCBUF                     00000000-R    231     (2)
EXE$ALLOCCEB                     00000004-R    234     (2)
EXE$ALLOCIRP                     00000011-R    243     (2)
EXE$ALLOCJIB                     00000008-R    239     (2)
EXE$ALLOCPCB                     00000015-R    246     (2)
EXE$ALLOCPQB                     0000001D-R    250     (2)
EXE$ALLOCTQE                     00000026-R    254     (2)
EXE$ALONONPAGED                  00000060-R    296     (2)     #-259     (2)
EXE$DEALLOCATE                   0000018F-R    462     (2)     #-420     (2)
EXE$DEANONPAGED                  00000106-R    399     (2)
EXE$GL_NONPAGED                  00000000-R    131     (2)       319     (2)       403     (2)     #-561     (2)
EXE$GL_SPLITADR                  0000000C-R    136     (2)     #-409     (2)     #-584     (2)
IOC$GL_IRPBL                    =00000018-R    148     (2)       414     (2)     #-418     (2)
IOC$GL_IRPFL                     0000C014-R    146     (2)       147     (2)       148     (2)       311     (2)       564     (2)
IRP$B_TYPE                       0000000A                       #-263     (2)
```

```
IRP$C_LENGTH                 0000005C                    236    (2)     237    (2)    #-256    (2)    #-306    (2)
                                                       #-567    (2)   #-580    (2)
IRP$W_SIZE                   00000008                  #-262    (2)   #-439    (2)
JIB$C_LENGTH                =00000074                  #-241    (2)
MASK                        =0000000F     123    (2)  #-256    (2)   #-299    (2)    #-300    (2)    #-306    (2)
                                                       #-437    (2)   #-440    (2)    #-441    (2)
MEMPOOL$INIT                 000001E5-R   516    (2)
MP$V_IL_ALLN                =00000004     111    (2)  #-297    (2)   #-333    (2)
MP$V_IL_CNDB                =00000007     111    (2)
MP$V_IL_CNHN                =00000006     111    (2)
MP$V_IL_DELN                =00000005     111    (2)  #-400    (2)   #-426    (2)
MP$V_IL_DSBK                =00000008     111    (2)
MP$V_IL_ERSP                =00000003     111    (2)
MP$V_IL_GTLN                =00000009     111    (2)
MP$V_IL_NUMT                =00000000     111    (2)
MP$V_IL_PRNT                =00000001     111    (2)
MP$V_IL_RRPT                =00000002     111    (2)
PCB$C_LENGTH                 0000008C                  #-248    (2)
PQB$C_LENGTH                =000008C8                  #-252    (2)
PR$_IPL                     =00000012                  #-304    (2)   #-325    (2)    #-407    (2)    #-424    (2)
QIO$MINCORE                  00000000-XR               #-519    (2)
RSN$_NPDYNMEM               =00000003                  #-421    (2)
SCRIPT$MINCORE               00000000-XR               #-518    (2)
SGN$C_IRPCNT                 00000000-XR               #-567    (2)
SS$_INSFMEM                 =00000124                  #-267    (2)
SS$_NORMAL                  =00000001                  #-317    (2)   #-633    (2)
SYS$EXPREG                   00000000-XR                 544    (2)
T_CGF                        00000007-R   153    (2)     268    (2)
ULTRIX$B                     00000000-XR               #-523    (2)     555    (2)
ULTRIX$IOB                   00000000-XR               #-523    (2)     554    (2)      555    (2)
ULTRIX_B_ADD                 00000000-XR               #-554    (2)
ULTRIX_IOB_ADD               00000000-XR               #-553    (2)

                                          +-------------------------+
                                          ! Performance indicators !
                                          +-------------------------+

Phase                     Page faults    CPU Time       Elapsed Time
-----                     -----------    --------       ------------
Initialization                     25    00:00:00.03    00:00:00.19
Command processing                908    00:00:00.28    00:00:01.00
Pass 1                            894    00:00:03.18    00:00:06.12
Symbol table sort                   0    00:00:00.32    00:00:00.32
Pass 2                             61    00:00:00.86    00:00:01.78
Symbol table output                 2    00:00:00.02    00:00:00.22
Psect synopsis output               2    00:00:00.01    00:00:00.01
Cross-reference output              5    00:00:00.08    00:00:00.11
Assembler run totals             1899    00:00:04.79    00:00:09.76

The working set limit was 2900 pages.
208285 bytes (407 pages) of virtual memory were used to buffer the intermediate code.
There were 60 pages of symbol table space allocated to hold 1159 non-local and 30 local symbols.
638 source lines were read in Pass 1, producing 83 object records in Pass 2.
38 pages of virtual memory were used to define 37 macros.
```

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	10
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	7
SYS$COMMON:[SYSLIB]LIB.MLB;2	9
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	11
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	37

1516 GETS were required to define 37 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1)	230	Libraries, Macros, and External Symbols	
(1)	292	Own Storage	
(1)	337	Data Storage	
(1)	346	MapMem Routine - Map all of memory	
(1)	622	MAPMEM$IOSPACE Setup page tables for I/O space	
(3)	699	ACCESSABLE check a page for accessability	
(4)	749	STACKPROT	
(5)	807	MAP FREE MEMORY PROCEDURE.	
(7)	907	GET A BLOCK OF VIRTUAL MEMORY.	
(9)	1085	RELEASE A BLOCK OF VIRTUAL MEMORY.	
(12)	1290	TURN MEMORY MANAGEMENT ON.	
(13)	1342	TURN MEMORY MANAGEMENT OFF.	
(14)	1397	DSR$MMENABLE Enable to disable memory management	
(15)	1447	SET PROTECTION ON PAGES.	
(18)	1607	CALCULATE PTE ADDRESS SUBROUTINE	
(20)	1691	DSX$MAPDBGBLOCK - MAP A BLOCK OF MEMORY FOR THE DEBUGGER	[23]
(21)	1732	DSX$FREEDBGSYM - FREE MEMORY MAPPED TO DEBUGGER SYMTABS	
(22)	1762	MAP_DEBUGGER - MAP THE DEBUGGER'S MEMORY SPACE	[23]
(23)	1787	UNMAP_DEBUGGER - UNMAP THE DEBUGGER'S MEMORY SPACE	[23]

```
0000  ; DEC/CMS REPLACEMENT HISTORY, Element MEMMGT.MAR
0000  ;  11   15-MAR-1988 13:45:28 MI "Defined external symbols for macro CMK"
0000  ;  10    7-MAR-1988 15:42:22 MEIER "symbol name changed from 9cc to 6200"
0000  ; *9     1-FEB-1988 08:26:35 MEIER "Made pr$_sys_typ9cc .weak."
0000  ; *8    26-JAN-1988 07:57:00 MEIER "Insured that page tables are built and validated
0000  ; *7    11-DEC-1986 14:11:28 BAGGETT "MM FINISHED FOR RT-VAX"
0000  ; *6     8-AUG-1986 13:39:52 SILVER "FASTER TO CREATE PAGE TABLES"
0000  ; *5    24-JUL-1986 15:49:11 SILVER "<no reason given>"
0000  ; *4    23-JUL-1986 14:26:35 SALEM "DONE"
0000  ; *3     5-JUN-1986 14:17:31 BAGGETT "<no reason given>"
0000  ; *2     3-APR-1986 11:05:55 ANDELLA "<no reason given>"
0000  ; *1     6-FEB-1986 15:20:00 DS ""
0000  ; DEC/CMS REPLACEMENT HISTORY, Element MEMMGT.MAR
0000                                                                                  ;G:7
0000          .TITLE  MEMMGT  *** MEMMGT Memory management setup/control
0000          .IDENT  /10.11-9/                                                       ;G:9
0000          .NoShow Conditionals
0000          .DSABL  GBL
0000
0000  ;
0000  ; COPYRIGHT (C) 1977, 1981, 1983, 1984, 1985, 1986, 1987                        ;G:8
0000  ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000  ;
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0000
0000  ;++
0000  ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR.
0000  ;
0000  ; ABSTRACT:
0000  ;
0000  ; ENVIRONMENT:
0000  ;
0000  ; AUTHOR:       KEN CHAPMAN     10-NOV-77       VERSION 01.
0000  ;
0000  ; MODIFIED BY:
0000  ;               KEN CHAPMAN     30-NOV-77       VERSION 02
0000  ;       01      DSPR #63 - FIXED $DS_GETBUF_L OVERLAYING HARDWARE P-TABLES.
0000  ;
0000  ;               NICK HOWGATE    09-JAN-78       VERSION 03 (ESSAA-3.06)
0000  ;       02      DSPR #41 - TURN ON MEMORY MANAGEMENT FIX.
0000  ;       03      ADDED $SETPRT ROUTINE.
0000  ;
0000  ;               KEN CHAPMAN     26-JAN-78       VERSION 04 (ESSAA-3.07)
0000  ;       04      MORE FIXES TO MEMORY MANAGEMENT PAGE TABLES.
```

```
0000  ;
0000  ;                KEN CHAPMAN     06-APR-78       VERSION 05 (ESSAA-4.01)
0000  ;        05      ADDED P1 AND SYSTEM BUFFER ALLOCATION CAPABILITY.
0000  ;                Roger Riggs     12-Jun-78       Version 06 (ESSAA-4.03)
0000  ;        06      Fixed Release of P1 or SYS space conflict of PTE's
0000  ;        07      MAPMEM cleanup and set DS$GL_MEMSIZE to bytes of physical
0000  ;                memory.
0000  ;                N. HOWGATE      14-NOV-78       VERSION 07 (ESSAA-5.01)
0000  ;        08      CLEAR MACHINE CHECKS CORRECTLY
0000  ;        09      FIX BUG IN $DS_SETPRT
0000  ;        10      Removed dependence of MAPFREE on L$L_UNITS
0000  ;
0000  ;        11      Added processor dependent I/O space mapping
0000  ;                Roger Riggs     6-Sept-1979
0000  ;        12      Added IO$GQ_PHYSICAL, used to determine where to map
0000  ;                I/O space in P1 space.
0000  ;                Roger Riggs, 24-Jan-1980,  Version 5.2
0000  ;        12      Re-arranged system page table to allow system space addresses
0000  ;                to map 1 for 1 P0 addresses in the range %X10000 to the
0000  ;                top of the P0 page tables.  References to this range will
0000  ;                reference the same addresses with or without memory management
0000  ;                enabled.
0000  ;                Roger Riggs, 5-Mar-1980, Version 5.3
0000  ;        13      Made page at APT$AT_APTTXT valid, affects APT when
0000  ;                Memory Management is on.
0000  ;                Roger Riggs, 12-Mar-1980, Version 5.3
0000  ;        14      Added byte to save state of memory managment, allows
0000  ;                Memory managment to be enabled or disabled after cleanup
0000  ;                to restore it to what the operator indicated.
0000  ;                Also if the operator enabled memory managment then the program
0000  ;                is not allowed to turn it off.  DS$GB_MM_ENB is set
0000  ;                by CLI command SET MM ON and SET MM OFF.
0000  ;                Also added routines and support for XDELTA
0000  ;                Roger Riggs, 21-May-1980, Version 5.4
0000  ;        15      Removed upper limit on amount of memory checked
0000  ;                Fix DS$EXPREG to set the protection of pages allocated to UW,
0000  ;                In DS$MMON AND DS$MMOFF return the previous state of MM as
0000  ;                SS$_WASSET OR SS$_WASCLR and return DS$_WARNING from
0000  ;                DS$MMOFF if operator set MMON and program is disallowed from
0000  ;                turning it off, Add code to flush the translation buffer
0000  ;                before turning MM ON, Set protections on stacks so
0000  ;                underflows will can be caught by MM.
0000  ;
0000  ;                Dave Butenhof   17-jul-1980
0000  ;        16      Call MAPFREE from MAPMEM to free up memory; to allow
0000  ;                GETBUF from Supervisor before program is loaded.
0000  ;                Specifically, for HELP utility.
0000  ;
0000  ;                Roger Riggs, 17-Sep-1980, Version 6.0
0000  ;        17      Changed MAPFREE to check program loaded flag to determine
0000  ;                how much of low memory to map.
0000  ;
0000  ;                Dave Butenhof, 23-feb-1981, version 6.3
0000  ;        18      Change a word-relative to longword-relative.
0000  ;        19      Fix two bugs: in EXE$SETPRT, correct return address array
0000  ;                start address--BICL3 first two operands were reversed.
0000  ;                in EXE$CNTREG, Comparison of P0 and P1/SYS PTE resulted in
```

```
0000   115 ;               ERRSUP if M bit was altered, and ignored V and PFN; fix the
0000   116 ;               compare mask.
0000   117 ;
0000   118 ;               - Dave Butenhof, 08-Jun-1981, version 6.4
0000   119 ;       20      Fix SETPRT some more.  Do a CHMK to force cpu
0000   120 ;               to KERNEL mode, so we can use MFPR.
0000   121 ;
0000   122 ;       21      - dave butenhof, 3-sep-1981, version 6.5
0000   123 ;               alter to use DS with new XDELTA
0000   124 ;
0000   125 ;       22      Jack Stansbury, Version 6.8, May 28, 1982
0000   126 ;               Add an entry point to the ExpReg routine for use by CRD.
0000   127 ;               In stand-alone, ExpReg was allocating space beginning at 200,
0000   128 ;               which is a no-no! Fix it to expand above the Supervisor (as it
0000   129 ;               does on-line).
0000   130 ;
0000   131 ;       23      Richard Brown, Version 6.8, 25-June-82
0000   132 ;               Addition of routines which map a block
0000   133 ;               of memory for the debugger to use.
0000   134 ;
0000   135 ;       24      Richard Brown, Version 6.9, 4-August-82
0000   136 ;               Addition of routine to deallocate memory assigned
0000   137 ;               to the debugger's symbol tables.
0000   138 ;
0000   139 ;       25      Bob Bergazzi    5-Aug-82        Version 6.9
0000   140 ;               Changed MAPFREE to call DSR$CheckLoad (SHOWMEM)
0000   141 ;               to see if a program is loaded - fixes "SET MM ON,
0000   142 ;               ATTACH, Translation not valid fault" bug.
0000   143 ;
0000   144 ;       26      Jack Stansbury  25-Aug-1982     Version 6.9
0000   145 ;               Added two other vaiables: DS$GL_Actual_MemSize and
0000   146 ;               DS$GL_Set_MemSize. The former is the actual size of the memory
0000   147 ;               of the machine. The latter is the size that the operator wishes
0000   148 ;               to set the memory. Also added .Library statements, and changed
0000   149 ;               the PSect from SEP to what they should be. Also changed the
0000   150 ;               insufficient memory message from a PrintF to a Print.
0000   151 ;
0000   152 ;       27      Jack Stansbury  25-Aug-1982     Version 6.9
0000   153 ;               Fixed several truncation errors.
0000   154 ;
0000   155 ;       28      Bob Bergazzi    2-Nov-1982      Version 6.9
0000   156 ;               Changed the ACCESSABLE routine so that it only copies the
0000   157 ;               first quadword of a page rather than every quadword on the
0000   158 ;               page. This results in considerable savings of startup time,
0000   159 ;               especially for NEBULA systems with large amounts of memory
0000   160 ;               (greater than 3 Meg took longer than 10 seconds, causing
0000   161 ;               APT to consider the supervisor hung).
0000   162 ;
0000   163 ;       29      Bob Bergazzi    29-Aug-1983     Version 6.13
0000   164 ;               Changed the value of the minimum memory size required from
0000   165 ;               256K to 512K bytes.
0000   166 ;
0000   167 ;       30      Bob Bergazzi    26-Dec-1984     Version 8.0
0000   168 ;               Turned interrupts off during the STACKPROT routine. If
0000   169 ;               a clock interrupt (or any other interrupt) happened
0000   170 ;               while memory management was turned on in this routine,
0000   171 ;               the console detects an interrupt stack not valid and halts,
```

```
0000    172 ;               because this routine sets protection no access before it
0000    173 ;               resets it correctly.
0000    174 ;
0000    175 ;       31      Domenic Andella 30-Jan-1985     Version 8.1
0000    176 ;               Modified routine EXE$EXPREG to receive additional
0000    177 ;               argument when called via $DS_GETBUF or $DS_GETSYSBUF.
0000    178 ;               Each pages PTE will be marked to indicate which service
0000    179 ;               was called.
0000    180 ;               Modified routine EXE$CNTREG to receive additional
0000    181 ;               argument when called via $DS_RELBUF or $DS_GETSYSBUF
0000    182 ;               in order to control deallocation of pages.
0000    183 ;
0000    184 ;       32      Domenic Andella 28-May-1985     Version 8.2
0000    185 ;               Modified routines DSX$MMON/OFF to prohibit
0000    186 ;               use if active mp system.
0000    187 ;
0000    188 ;       33      Ted Salem       18-September-1985  Version 8.2
0000    189 ;               Modified above change (#32) to prohibit
0000    190 ;               the change of status of memory management rather
0000    191 ;               than prohibit the use of DSX$MMON/OFF services.
0000    192 ;
0000    193 ;       34      Bob Bergazzi    21-NOV-85       Version 9.0
0000    194 ;               Changed first SOBGTR in the EXE$EXPREG routine so that a
0000    195 ;               GETBUF which asks for all memory wil get it. It was off
0000    196 ;               by one.
0000    197 ;                                                                       ;G:2
0000    198 ;       35      Domenic Andella 4-Apr-1986      Version 10.0            ;G:2
0000    199 ;               For DS$_RELSYSBUF service reset prot of deallocated     ;G:2
0000    200 ;               page to full access (UW). This is necessary for mp      ;G:2
0000    201 ;               systems that use the service and modify protection      ;G:2
0000    202 ;               codes for an Attached processors SCB and stacks.        ;G:2
0000    203 ;                                                                       ;G:2
0000    204 ;       36      M. Baggett      5-Jun-1986      Version 10.1            ;G:3
0000    205 ;               Do not allow set memory management on RT-VAX.           ;G:3
0000    206 ;                                                                       ;G:4
0000    207 ;       37      Ted Salem       27-June-1986    Version 10.1            ;G:4
0000    208 ;               Changed the method used to Map PO space for Andromeda   ;G:4
0000    209 ;               Also commented out change #36 for temp fix.             ;G:4
0000    210 ;                                                                       ;G:6
0000    211 ;       38      Doug Silver     8-Aug-1986      Version 10.1            ;G:6
0000    212 ;               Changed MAPMEM to check increments of 1 Meg until no    ;G:6
0000    213 ;               access and then check from last good memory access in   ;G:6
0000    214 ;               increments of 1 K.  This way, each full Meg will only   ;G:6
0000    215 ;               have to be checked 1 time for accessability instead of  ;G:6
0000    216 ;               1024 times.                                             ;G:6
0000    217 ;                                                                       ;G:7
0000    218 ;       39      M. Baggett      7-Oct-1986      Version 10.3            ;G:7
0000    219 ;               Set special case for RTUVAX memory management.          ;G:7
0000    220 ;                                                                       ;G:9
0000    221 ;       8       Stephen Meier   29-Dec-1987     Version 10.11           ;G:8
0000    222 ;               Make sure that Page tables are built at the end of memory for ;G:8
0000    223 ;               LLL's CCA.                                              ;G:8
0000    224 ;                                                                       ;G:9
0000    225 ;       9       Stephen Meier   1-Feb-1987      Version 10.11           ;G:9
0000    226 ;               Made pr$_sys_typ_9cc .weak rather than .external        ;G:9
0000    227 ;               LLL's CCA.                                              ;G:9
0000    228 ;--
```

```
                     0000   230          .SubTitle       Libraries, Macros, and External Symbols
                     0000   231
                     0000   232 ;
                     0000   233 ; INCLUDE FILES:
                     0000   234 ;
                     0000   235
                     0000   236          .Library        /Sys$Library:Lib/                                    ;[26
                     0000   237          .Library        /$DS/                                               ;[26
                     0000   238          .Library        /$Diag/                                             ;[26
                     0000   239
                     0000   240 ;
                     0000   241 ; EQUATED SYMBOLS:
                     0000   242 ;
                     0000   243
                     0000   244          CMKDEF                                                              ;G:9
                     0000   245          DSFDEF
                     0000   246
                     0000   247          $CNTREGDEF
                     0000   248          $DS_BITDEF
                     0000   249          $DS_CFDEF
                     0000   250          $DS_DSADEF
                     0000   251          $DS_DSDEF
                     0000   252          $DS_ENVDEF
                     0000   253          $DS_GETBUF_DEF
                     0000   254          $DS_GETMEM_DEF
                     0000   255          $DS_HDRDEF
                     0000   256          $DS_RELBUF_DEF
                     0000   257          $DS_RELMEM_DEF
                     0000   258          $DS_SCBDEF
                     0000   259          $DS_TypeDef                         ; The typecodes                 [26]
                     0000   260
                     0000   261          $EXPREGDEF
                     0000   262          $IRPDEF
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
                     FE70                .=0
                     0000                .IIF    NB,IRP$L_IOQFL, IRP$L_IOQFL:
                     0000                        .BLKL   1
                     0004                .IIF    NB,IRP$L_IOQBL, IRP$L_IOQBL:
                     0004                        .BLKL   1
                     0008                .IIF    NB,IRP$W_SIZE,  IRP$W_SIZE:
                     0008                        .BLKW   1
                     000A                .IIF    NB,IRP$B_TYPE,  IRP$B_TYPE:
                     000A                        .BLKB   1
                     000B                .IIF    NB,IRP$B_RMOD,  IRP$B_RMOD:
                     000B                        .BLKB   1
                     000C                .IIF    NB,IRP$L_PID,   IRP$L_PID:
                     000C                        .BLKL   1
                     0010                .IIF    NB,IRP$L_AST,   IRP$L_AST:
                     0010                        .BLKL   1
                     0014                .IIF    NB,IRP$L_ASTPRM,        IRP$L_ASTPRM:
                     0014                        .BLKL   1
                     0018                .IIF    NB,IRP$L_WIND,  IRP$L_WIND:
                     0018                        .BLKL   1
                     001C                .IIF    NB,IRP$L_UCB,   IRP$L_UCB:
                     001C                        .BLKL   1
                     0020                .IIF    NB,IRP$W_FUNC,  IRP$W_FUNC:
```

```
                    00000022  0020                        .BLKW   1
                              0022              .IIF    NB,IRP$B_EFN,   IRP$B_EFN:
                    00000023  0022                        .BLKB   1
                              0023              .IIF    NB,IRP$B_PRI,   IRP$B_PRI:
                    00000024  0023                        .BLKB   1
                              0024              .IIF    NB,IRP$L_IOSB,  IRP$L_IOSB:
                    00000028  0024                        .BLKL   1
                              0028              .IIF    NB,IRP$W_CHAN,  IRP$W_CHAN:
                    0000002A  0028                        .BLKW   1
                              002A              .IIF    NB,IRP$W_STS,   IRP$W_STS:
                    0000002C  002A                        .BLKW   1
                              002C              .IIF    NB,IRP$L_SVAPTE,        IRP$L_SVAPTE:
                    00000030  002C                        .BLKL   1
                              0030              .IIF    NB,IRP$W_BOFF,  IRP$W_BOFF:
                    00000032  0030                        .BLKW   1
                              0032              .IIF    NB,IRP$W_BCNT,  IRP$W_BCNT:
                    00000034  0032                        .BLKW   1
                              0034              .IIF    NB,IRP$L_IOST1, IRP$L_IOST1:
                              0034              .IIF    NB,IRP$L_MEDIA, IRP$L_MEDIA:
                    00000038  0034                        .BLKL   1
                              0038              .IIF    NB,IRP$L_IOST2, IRP$L_IOST2:
                              0038              .IIF    NB,IRP$L_TT_TERM,       IRP$L_TT_TERM:
                              0038              .IIF    NB,IRP$B_CARCON,        IRP$B_CARCON:
                    00000039  0038                        .BLKB   1
                    0000003C  0039                        .BLKB   3
                              003C              .IIF    NB,IRP$Q_NT_PRVMSK,     IRP$Q_NT_PRVMSK:
                              003C              .IIF    NB,IRP$W_ABCNT, IRP$W_ABCNT:
                              003C              .IIF    NB,IRP$W_TT_PRMPT,      IRP$W_TT_PRMPT:
                    0000003E  003C                        .BLKW   1
                              003E              .IIF    NB,IRP$W_OBCNT, IRP$W_OBCNT:
                    00000040  003E                        .BLKW   1
                              0040              .IIF    NB,IRP$L_SEGVBN,        IRP$L_SEGVBN:
                    00000044  0040                        .BLKL   1
                              0044              .IIF    NB,IRP$L_DIAGBUF,       IRP$L_DIAGBUF:
                    00000048  0044                        .BLKL   1
                              0048              .IIF    NB,IRP$L_SEQNUM,        IRP$L_SEQNUM:
                    0000004C  0048                        .BLKL   1
                              004C              .IIF    NB,IRP$L_EXTEND,        IRP$L_EXTEND:
                    00000050  004C                        .BLKL   1
                              0050              .IIF    NB,IRP$L_ARB,   IRP$L_ARB:
                    00000054  0050                        .BLKL   1
                    00000058  0054                        .BLKL   1
                    0000005C  0058                        .BLKL   1
                              005C              .IIF    NB,IRP$C_LENGTH,        IRP$C_LENGTH:
                              005C              .IIF    NB,IRP$K_LENGTH,        IRP$K_LENGTH:
                              0000              .RESTORE
                              0000    263       $PHDDEF
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  FE70              .=0
                              0000              .RESTORE
                              0000    264       $PRDEF
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  FE70              .=0
                              0000              .RESTORE
                              0000    265       $PRTDEF
```

```
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
                00000000  FE70           .=0
                     0000                .RESTORE
                     0000    266         $PSLDEF
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
                00000000  FE70           .=0
                     0000                .RESTORE
                     0000    267         $PTEDEF
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
                00000000  FE70           .=0
                     0000                .RESTORE
                     0000    268           $VIELD  PTE,<29-9>,<<IO,,M>>
                     0000    269         $SETPRTDEF
                     0000    270         $SSDEF                                                          ;G:9
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
                00000000  FE70           .=0
                     0000                .RESTORE
                     0000    271
                     0000    272
                0000007E     0000    273 K_P1PAGES=126                           ; Number of P1 pages to create
                     0000    274
                     0000    275         .EXTRN  POPT_BASE,      MAP$IOSPACE,    MEMPOOL$INIT
                     0000    276         .EXTRN  MMG$GL_SPTBASE, DS$AQ_SYSSRV,   DS$GA_LASTADR
                     0000    277         .EXTRN  SYS$UNWIND,     DS$GL_BUFCNT,   DSR$SETIMR_INI
                     0000    278         .EXTRN  DS$GQ_PHYADR,   DS_ERRSUP,      DSX$Print                ;[26
                     0000    279         .EXTRN  IO$GQ_PHYSICAL
                     0000    280         .EXTRN  SCB_UNKINT,STACK_BASE,ISTKPTR,KSTKPTR,ESTKPTR,SSTKPTR,USTKPTR
                     0000    281         .EXTRN  DS$K_PRGSIZ,    DS$A_PRGBGN,    DS$GL_FLAGS
                     0000    282         .EXTRN  DEBUG_LO,       DEBUG_HI                                 ;[23
                     0000    283         .EXTRN  SYMTAB_HI                                                ;[24
                     0000    284         .EXTRN  DSR$CheckLoad                                            ;[25
                     0000    285         .EXTRN  MP$GR_BOOTED_PROCESSORS                                  ;[32
                     0000    286         .EXTRN  PR$_SID_TYPRTUV2                                         ;[36
                     0000    287         .EXTRN  DS$GB_SYSTYPE                                            ;[37
                     0000    288         .EXTRN  PR$_SYS_TYP900                                           ;[37
                     0000    289         .WEAK   BOOT$A_CCA,PR$_SYS_TYP9CC                              ;G:9
                     0000    290                                                                        ;G:4
```

```
                 0000          .Subtitle       Own Storage
              00000000          .PSect          Work, NoShr, NoExe, Wrt, Long                                  ;[26
                 0000
                 0000  ;
                 0000  ; OWN STORAGE:
                 0000  ;
                 0000
        00000004 0000  L_P0LEN:          .BLKL   1       ; P0 (PHYSICAL MEMORY) LENGTH.
        00000008 0004  A_P1BUFPTE:       .BLKL   1       ; P0 ADDRESS OF P1 BUFFER PTE'S.
        0000000C 0008  A_P1BUFVA:        .BLKL   1       ; P1 BUFFER VIRTUAL ADDRESS.
        00000010 000C  A_SPTEND:         .BLKL   1       ; SYS PAGE TABLE END.
        00000014 0010  DS$GL_MEMSIZE::   .BLKL   1       ; BYTES OF PHYSICAL MEMORY
                 0014
                 0014  DS$GL_Actual_MemSize::             ; The actual size of memory                          [26]
        00000018 0014                    .BlkL   1       ;                                                    [26]
                 0018
                 0018  DS$GL_Set_MemSize::                ; The 'SET' memory size                              [26]
        00000000 0018                    .Long   0       ; Initialized to zero                                [26]
                 001C
        0000001D 001C  DS$GB_MM_ENB::    .BLKB   1       ; 0 if MM OFF, 1 if ON
                 001D
                 001D  ;
                 001D  ; Symbols used to give initial values to X6 thru XD.
                 001D  ;
                 001D
        00000000 001D  PFN$AW_SWPVBN    == L_P0LEN              ; X6                                          [21]
        00000004 001D  PFN$AL_PTE       == A_P1BUFPTE           ; X7
        00000008 001D  PFN$AL_BAK       == A_P1BUFVA            ; X8
        0000000C 001D  PFN$AW_REFCNT    == A_SPTEND             ; X9
        00000000 001D  PFN$AW_FLINK     == 0                    ; XA                                          [21]
        00000000 001D  PFN$AW_BLINK     == 0                    ; XB                                          [21]
        00000010 001D  PFN$AB_STATE     == DS$GL_MEMSIZE        ; XC Bytes physical memory
        00000000 001D  PFN$AB_TYPE      == 0                    ; XD                                          [21]
        00000000 001D  XDS$INIT         == 0                    ; Address of command string NOP
                 001D
                 001D  ;
                 001D  ; LOCAL SYMBOLS
                 001D  ;
                 001D
        00000014 001D  EXPREG$_PTE_OWNER_CODE = ^X14   ; Offset to extract PTE ownership code [31]
        00000014 001D  CNTREG$_VA             = ^X14   ; Offset to extract starting VA       [31]
        20040010 001D  PPA_CONSRV4            = ^X20040010 ; Highest Sys Memory Address      [37]   ;G:4
                 001D                                                                                  ;G:4
                 001D                                                                                  ;G:4
```

```
ZZ-ECSAA-10.11  Data Storage                                        3-MAY-1988       Fiche 13 Frame D6          Sequence 2540
MEMMGT                          *** MEMMGT Memory management setup/contr 21-MAR-1988 17:55:38  VAX/VMS Macro V04-00          Page   9
10.11-9                         Data Storage                              1-FEB-1988 08:25:10  MEMMGT.MAR;1                  (1)

                                     001D   337          .Subtitle       Data Storage
                                00000000    338          .PSect          Data, Shr, NoExe, NoWrt, Long
                                     0000   339
                                     0000   340          MODNAM  MEMMGT
                  54 47 4D 4D 45 4D 00'  0000       $MODULE:            .ASCIC  \MEMMGT\
                                    06   0000
                                     0007   341
                                     0007   342 T_INSFMEM:
4C 55 21 20 79 6C 6E 4F 20 3F 3F 00'  0007   343          .ASCIC  "?? Only !UL pages memory present, 1024 are required.!/"        ;[29
72 6F 6D 65 6D 20 73 65 67 61 70 20   0013
31 20 2C 74 6E 65 73 65 72 70 20 79   001F
75 71 65 72 20 65 72 61 20 34 32 30   002B
                  2F 21 2E 64 65 72 69   0037
                                    36   0007
                                     003E   344
```

```
                     003E   346          .SBTTL  MapMem Routine - Map all of memory
                    00000000   347          .PSect  Code, Shr, Exe, NoWrt, Long
                     0000   348
                     0000   349 ;++
                     0000   350 ; FUNCTIONAL DESCRIPTION:
                     0000   351 ;
                     0000   352 ;       MAPS AVAILABLE MEMORY AND SETS UP MEMORY MANAGEMENT PAGE TABLES.
                     0000   353 ;
                     0000   354 ; Note:
                     0000   355 ;       ESKAZ (memory management testing) expects the length register
                     0000   356 ;       for each addressing space to exclude 1 valid PTE. As a result
                     0000   357 ;       there is a more valid PTE just beyond the length register.
                     0000   358 ;
                     0000   359 ; Note:
                     0000   360 ;       This allows a value to be inserted in the longword DS$GL_Set_MemSize
                     0000   361 ;       that will be used as the memory size, rather than the actual memory
                     0000   362 ;       size. This way, the operator can, for example, set up the memory for
                     0000   363 ;       a 256K machine in a machine that actually has 2M (or whatever). Note
                     0000   364 ;       that this user-set memory size must fulfill the following two
                     0000   365 ;       conditions:
                     0000   366 ;               1. Must be greater than 0. 0 is the default.
                     0000   367 ;               2. Must be less than or equal to the actual memory size.
                     0000   368 ;
                     0000   369 ; CALLING SEQUENCE:
                     0000   370 ;
                     0000   371 ;       BSBW    MAPMEM
                     0000   372 ;
                     0000   373 ; INPUT PARAMETERS:     NONE
                     0000   374 ;
                     0000   375 ; IMPLICIT INPUTS:      NONE
                     0000   376 ;
                     0000   377 ; OUTPUT PARAMETERS:    NONE
                     0000   378 ;
                     0000   379 ; IMPLICIT OUTPUTS:     NONE
                     0000   380 ;
                     0000   381 ; COMPLETION CODES:     NONE
                     0000   382 ;
                     0000   383 ; SIDE EFFECTS:
                     0000   384 ;
                     0000   385 ;       Plenty!
                     0000   386 ;--
```

```
                                0000   388 MAPMEM::
                                0000   389
                                0000   390 ;+                                                                    ;G:9
                                0000   391 ; Determine how much memory is present and create page table for it.
                                0000   392 ; The last page/PTE is outside the length register and reserved for
                                0000   393 ; ESKAZ.
                                0000   394 ;-
                     007C 8F    BB  0000   395         PUSHR   #^M<R2,R3,R4,R5,R6>     ; Save all the registers that are used  [26]
                          53    D4  0004   396         CLRL    R3                      ; Start with 0 MEG                      [38]
                          55    D4  0006   397         CLRL    R5                      ; Start with 0 index                    [38]
          00'8F   00000000'EF   91  0008   398         CMPB    DS$GB_SYSTYPE, -        ; Is this an Andromeda?                 [37]
                                0010   399                   #PR$_SYS_TYP900         ;                                       [37]
                          32    12  0010   400         BNEQ    10$                     ; NO, then branch                       [37]
            55    00000000'EF   DE  0012   401         MOVAL   P0PT_BASE,R5            ; Base page table                       ;G:6
            56    20040010 9F   D0  0019   402         MOVL    a#PPA_CONSRV4,R6        ; ELSE, copy Highest Sys Memory Address [37]
             54     56    F7 8F   78  0020   403         ASHL    #-9,R6,R4               ; COMPUTE # OF PAGES IN THE SYSTEM      [37]
    00000018'EF    00000400 8F   D0  0025   404         MOVL    #1024,DS$GL_Set_MemSize ; Set memory size to be maped at 512K   [37]
                                0030   405 5$:                                                                   ;G:6
          6543     6543     C2  0030   406         SUBL2   (R5)[R3],(R5)[R3]       ; CLEAR PTE                             [37]
        6543    A1800000 E3   9E  0035   407         MOVAB   PTE$M_VALID ! PTE$M_OWN ! PTE$C_UW(R3), -                       ;G:6
                                003D   408                 (R5)[R3]                ; Make page valid                       [37]
             EF 53     54     F2  003D   409         AOBLSS  R4,R3,5$                ; Repeat for the total # of pages       [37]
                     0093     31  0041   410         BRW     27$                     ; and continue                          [37]
                                0044   411 10$:                                                                  ;G:6
            7E   53     14     78  0044   412         ASHL    #20,R3,-(SP)            ; Get 1st MEG adress                    [38]
      00000323'EF       01     FB  0048   413         CALLS   #1,L^ACCESSABLE         ; Is it accessable?                     [38]
                  08    50     E9  004F   414         BLBC    R0,12$                  ; If not, branch                        [38]
EA 53     00000FFF 8F     F2  0052   415         AOBLSS  #^XFFF,R3,10$           ; Repeat for all of memory              [38]
                                005A   416 12$:                                                                  ;G:6
                          53    D7  005A   417         DECL    R3                      ; Get last good MEG                     [38]
          54    53      14    78  005C   418         ASHL    #20,R3,R4               ; Get starting address                  [38]
                                0060   419                                                                       ;G:6
                                0060   420         ;+                                                            ;G:6
                                0060   421         ; Now determine size of remaining memory after last full MEG  ;G:6
                                0060   422         ; R3 = number of full MEGs                                    ;G:6
                                0060   423         ;-                                                            ;G:6
                                0060   424                                                                       ;G:6
                                0060   425 14$:                                                                  ;G:6
          56    55      09    78  0060   426         ASHL    #9,R5,R6                ; Next page address                     [38]
          7E    56      54    C1  0064   427         ADDL3   R4,R6,-(SP)             ; Finish building address               [38]
      00000323'EF       01    FB  0068   428         CALLS   #1,L^ACCESSABLE         ; Is it accessable?                     [38]
                  08    50    E9  006F   429         BLBC    R0,16$                  ; If not, branch                        [38]
E6 55     00000800 8F     F2  0072   430         AOBLSS  #^X800,R5,14$           ; Repeat for remaining memory           [38]
                                007A   431 16$:                                                                  ;G:6
          53    53      0B    78  007A   432         ASHL    #11,R3,R3               ; How many pages in remaining memory?   [38]
                53      55    C0  007E   433         ADDL2   R5,R3                   ; Total number of pages?                [38]
    55    00000000'EF       DE  0081   434         MOVAL   P0PT_BASE,R5            ; Base page table                       [38]
                          54    D4  0088   435         CLRL    R4                      ; Start with PTE 0                      [38]
                                008A   436 18$:                                                                  ;G:6
          6544     6544     C2  008A   437         SUBL2   (R5)[R4],(R5)[R4]       ; Clear PTE                             [38]
  6544    A1800000 E4     9E  008F   438         MOVAB   PTE$M_VALID ! PTE$M_OWN ! PTE$C_UW(R4), -                       ;G:6
                                0097   439                 (R5)[R4]                ; Make page valid                       [38]
           EF 54     53     F3  0097   440         AOBLEQ  R3,R4,18$               ; Do for all pages                      [38]
                                009B   441 ;+                                                                    ;G:8
                                009B   442 ;    In an LLL system, Page tables must be built at the end of memory for the ;G:
                                009B   443 ;    Console communications area (CCA). We must insure that these ae built. ;G:8
                                009B   444 ;-                                                                    ;G:8
```

```
                0000FE17'EF   91  009B          CMPB    DSA$GL_SID+3,-          ; Is this an LLL system                ;G:8
                      00'8F       00A1                    #PR$_SYS_TYP9CC       ;                                      ;G:9
                         32   12  00A3          BNEQ    27$                     ; continue                             ;G:8
   50   00000000'EF   F7 8F   78  00A5          ASHL    #-9,BOOT$A_CCA,R0       ; VPN of the CCA                       ;G:8
              51   50   07   C1  00AE          ADDL3   #7,R0,R1                ; VPN of end of CCA                    ;G:8
                   50   54   D1  00B2          CMPL    R4,R0                   ; Are page tables built up to the CCA? ;G:8
                         0C   14  00B5          BGTR    21$                     ; if already built, then branch        ;G:8
                21800000 E4   9E  00B7  19$:    MOVAB   PTE$M_OWN ! PTE$C_UW(R4),-                                     ;G:8
                      6544        00BD                  (R5)[R4]                ; Make page INVALID                    ;G:8
                 F4 54   50   F2  00BF          AOBLSS  R0,R4,19$               ; Do up to the CCA                     ;G:8
                   51   54   D1  00C3  21$:    CMPL    R4,R1                   ; Are page tables built up thru the CCA? ;G:
                         0F   14  00C6          BGTR    27$                     ; if already built, then branch        ;G:8
         6544   A1800000 E4   9E  00C8          MOVAB   PTE$M_VALID ! PTE$M_OWN ! PTE$C_UW(R4), -                      ;G:8
                                  00D0                  (R5)[R4]                ; Make page valid                      ;G:8
                 EF 54   51   F2  00D0          AOBLSS  R1,R4,21$               ; Do up thru the CCA                   ;G:8
                   53   51   D0  00D4          MOVL    R1,R3                   ; Memory is at least this big          ;G:9
                                  00D7          ;+
                                  00D7          ; R3 now equals the number of pages in memory (i.e., number of K Bytes  [26]
                                  00D7          ; equal to R3 / 2).                                                     [26]
                                  00D7          ;-
                                  00D7
      00000014'EF   53   09   78  00D7  27$:    AshL    #9, R3, -               ; Use the value in R3 (^9) as the       [26]
                                  00DF                    DS$GL_Actual_MemSize  ; ... actual memory size                [26]
           56   00000018'EF   D0  00DF          MovL    DS$GL_Set_MemSize, R6   ; Get the user-set memory size (pages)  [26]
                         08   13  00E6          Beql    30$                     ; If = 0, then branch                   [26]
                   53   56   D1  00E8          CmpL    R6, R3                  ; Compare user-set and actual           [26]
                         03   14  00EB          Bgtr    30$                     ; If user-set > actual, use actual      [26]
                                  00ED
                                  00ED          ;+
                                  00ED          ; Now the user-set memory size (in R6) satisfies the following:         [26]
                                  00ED          ;       0 < R6 <= R3                                                    [26]
                                  00ED          ; Remember that both of these quanities are number of pages.            [26]
                                  00ED          ;-
                                  00ED
                   53   56   D0  00ED          MovL    R6, R3                  ; Use the user-set - not the actual     [26]
                                  00F0
      00000010'EF   53   09   78  00F0  30$:    ASHL    #9,R3,DS$GL_MEMSIZE     ; Set memory size                       [26]
           00000400 8F   53   D1  00F8          CMPL    R3,#1024                ; 512K memory present?                  [26]
                         15   18  00FF          BGEQ    33$                     ; Branch if enough memory              ;G:8
                                  0101
                                  0101          $Print  -                       ; Print an error message                [26]
                                  0101                    #DS$K_Type_General_Error, -; ... a general error              [26]
                                  0101                    #DS$K_PrintF, -       ; ... use PrintF                        [26]
                                  0101                    T_InsfMem, -          ; ... the error message                 [26]
                                  0101                    R3                    ; ... the number of pages               [26]
                         53   DD  0101                  PUSHL   R3
                00000007'EF   9F  0103                  PUSHAB  T_InsfMem
                   7E   01   9A  0109                  movzbl  #DS$K_PrintF, -(sp)
                   7E   03   98  010C                  cvtbl   #DS$K_Type_General_Error, -(sp)
           00000000'GF   04   FB  010F                  CALLS   #$$N+2, G^DSX$PRINT
                                  0116
           65   78000000 8F   CA  0116  33$:    BICL    #PTE$M_PROT,(R5)        ; No access to page zero               ;G:8
              50   53   01   C3  011D          SUBL3   #1,R3,R0                ; Reserve last 1 PTE'S for ESKAZ
           00000000'EF   50   D0  0121          MOVL    R0,L_P0LEN              ; Length in longwords of P0PT
                   09   50   DA  0128          MTPR    R0, #PR$_P0LR           ; SET UP P0 LENGTH REGISTER.
                                  012B
                 53   7F 8F   93  012B  35$:    BITB    #^X7F,R3                ; Offset page aligned                  ;G:8
```

```
                    0C   13  012F   497          BEQL    40$                      ; Branch if so
              6543   63   9E  0131   498          MOVAB   PTE$C_NA(R3),(R5)[R3]    ; Make invalid page
      EE 53  000FFFFF 8F   F2  0135   499          AOBLSS  #^XFFFFF,R3,35$          ; Repeat until aligned                ;G:8
                                013D   500
              55   6543   DE  013D   501 40$:     MOVAL   (R5)[R3],R5              ; Point to SPT base
```

```
                                0141   503
                                0141   504 ;+
                                0141   505 ; Setup system page tables
                                0141   506 ; Map the normal system service vectors to their supervisor counterparts
                                0141   507 ; but do not allow access to catch programming errors.
                                0141   508 ; Map pages from 80000800 to 80010000 N/A and invalid, available for expreg
                                0141   509 ; in system space.
                                0141   510 ; Map pages from 80010000 to 80000000+end of P0 Page table user read, kernel
                                0141   511 ; writeable. Makes system space map to physical memory.
                                0141   512 ; Map each page allocated to the P0 page tables and set the P0 Base and
                                0141   513 ; Length registers.
                                0141   514 ; Allocate 16 System PTEs for EXPREG to use in allocating SYSTEM space.
                                0141   515 ; Allocate 32 PTEs to map P1 page tables and set the P1 base and length
                                0141   516 ; registers. Also allocate 1 PTE for the space allocated by EXPREG in P1 space.
                                0141   517 ; And reserve two PTEs, one inside the length register and one outside for
                                0141   518 ; ESKAZ.
                                0141   519 ;-
                                0141   520
                                0141   521
                                0141   522 50$:
            0C    55    DA    0141   523          MTPR    R5, #PR$_SBR                ; SET SYSTEM BASE REGISTER.
 00000000'EF    55    D0    0144   524          MOVL    R5, MMG$GL_SPTBASE          ; Save pointer to system page table
                  53    D4    014B   525          CLRL    R3                          ; Start with PFN 0 in system space
          51   00'8F    9A    014D   526          MOVZBL  #DS$AQ_SYSSRV a-9, R1       ; SYSTEM SERVICE PAGE NUMBER.
                                0151   527
        6543  81800000 E1    9E    0151   528 60$:     MOVAB   PTE$M_VALID ! PTE$C_NA ! PTE$M_OWN(R1), -
                                0159   529                 (R5)[R3]                    ; Set no access to  virtural 80000000
                  51    D6    0159   530          INCL    R1                          ; Next page
             F2 53    04    F2    015B   531          AOBLSS  #4,R3,60$                   ; Fill 4 pages
                                015F   532
                6543    D4    015F   533 65$:     CLRL    (R5)[R3]                    ; Clear next PTE
      F5 53   00000080 8F    F2    0162   534          AOBLSS  #128,R3,65$                 ; Fill rest of page with avail SPTE's
                                016A   535
51    00000010'EF    F7 8F    78    016A   536          ASHL    #-9,DS$GL_MEMSIZE,R1        ; Get PFN of last page + 1
 6543   F1800000 E3    9E    0173   537 70$:     MOVAB   PTE$M_VALID ! PTE$C_URKW ! PTE$M_OWN (R3), -
                                017B   538                 (R5)[R3]                    ; Map 1 for 1 valid and user readable
             F4 53    51    F2    017B   539          AOBLSS  R1,R3,70$                   ; Map up to end of P0 PT
        08   80000000'8F    DA    017F   540          MTPR    #^X80000000 ! P0PT_BASE, -
                                0186   541                  #PR$_P0BR                  ; Set P0 Base register
```

```
                                0186   543
                                0186   544 ;+
                                0186   545 ; Setup PTE's to map P1 page tables
                                0186   546 ;-
                                0186   547
          50   53   09   78   0186   548          ASHL    #9,R3,R0                ; SVA for this PFN
       50   80000000 8F   C8   018A   549          BISL    #^X80000000,R0          ; Make SVA of first P1 PTE
                                0191   550
54  00000000'EF   15   09   EF   0191   551          EXTZV   #9,#21,IO$GQ_PHYSICAL,R4; Get PFN of lowest I/O space
                                019A   552
       54   0000007F 8F   C2   019A   553          SUBL    #127,R4                 ; PFN of scratch area
            0B   54   DA   01A1   554          MTPR    R4,#PR$_P1LR            ; Set length register
                 54   D7   01A4   555          DECL    R4                      ; Base is really 128 pages away
                                01A6   556
          51   54   04   C5   01A6   557          MULL3   #4,R4,R1                ; Make byte offset
               50   51   C2   01AA   558          SUBL    R1,R0                   ; byte address of P1 base
               0A   50   DA   01AD   559          MTPR    R0, #PR$_P1BR           ; Set P1 base register
                                01B0   560
       52   01800000 8F   D0   01B0   561          MOVL    #PTE$M_OWN,R2           ; Initial PTE protection
                                01B7   562
             6543   52   D0   01B7   563          MOVL    R2,(R5)[R3]             ; Free SPTE for P1 scratch
                    53   D6   01BB   564          INCL    R3                      ; Update free PTE pointer
                                01BD   565
       50   00000000'EF   7D   01BD   566          MOVQ    IO$GQ_PHYSICAL,R0       ; Get I/O space address range
               51   50   C2   01C4   567          SUBL    R0,R1                   ; Length of I/O space
    50   51   0E   10   EF   01C7   568          EXTZV   #16,#14,R1,R0           ; Get SPTE's required
         50   02 A340   9E   01CC   569          MOVAB   2(R3)[R0],R0            ; Final PTE * 2 for ESKAZ
                                01D1   570
             6543   52   D0   01D1   571 80$:     MOVL    R2,(R5)[R3]             ; Set PTE protection
          F8 53   50   F2   01D5   572          AOBLSS  R0,R3,80$               ; For each page of P1 page tables
                                01D9   573
 0000000C'EF    6543   DE   01D9   574          MOVAL   (R5)[R3], A_SPTEND      ; SAVE END OF TABLE ADDRESS.
       50   53   01   C3   01E1   575          SUBL3   #1,R3,R0                ; Decrease for base register
            0D   50   DA   01E5   576          MTPR    R0, #PR$_SLR            ; SET SYSTEM LENGTH REGISTER
                                01E8   577
          53   7F 8F   93   01E8   578 90$:     BITB    #^X7F,R3                ; End of page?
                    0B   13   01EC   579          BEQL    100$                    ; Branch if so
                  6543   D4   01EE   580          CLRL    (R5)[R3]                ; Invalid PTE and no access
EF 53    000FFFFF 8F   F3   01F1   581          AOBLEQ  #^XFFFFF,R3,90$         ; Increment and branch
                                01F9   582
          55   6543   DE   01F9   583 100$:     MOVAL   (R5)[R3],R5             ; First free
00'8F    0000FE17'EF   91   01FD   584          CMPB    DSA$GL_SID+3,#PR$_SID_TYPRTUV2 ; Is it RT-VAX                  [39]
                    37   12   0205   585          BNEQ    120$                    ; set for RT-VAX                       [39]
               50   0B   DB   0207   586          MFPR    #PR$_P1LR,R0            ; Get length of P1                     [39]
                    50   D7   020A   587          DECL    R0                      ; BASE IS REALLY 128 PAGES AWAY        [39]
          50   50   04   C5   020C   588          MULL3   #4,R0,R0                ; Make byte offset                     [39]
          50   55   50   C3   0210   589          SUBL3   R0,R5,R0                ; Compute P1 physical base value      [39]
               0A   50   DA   0214   590          MTPR    R0,#PR$_P1BR            ; Set P1 base register.                [39]
    08   00000000'8F   DA   0217   591          MTPR    #P0PT_BASE,#PR$_P0BR    ; Set P0 Base register                 [39]
    50   00000000'EF   7D   021E   592          MOVQ    IO$GQ_PHYSICAL,R0       ; Get I/O space address range         [39]
          50   51   50   C3   0225   593          SUBL3   R0,R1,R0                ; Length of I/O space                 [39]
    50   00000200 8F   C6   0229   594          DIVL2   #512,R0                 ; Get # of PTE's to set up             [39]
               51   54   D0   0230   595          MOVL    R4,R1                   ; P1 address                           [39]
               52   55   D0   0233   596          MOVL    R5,R2                   ; Address of P1 PTE table              [39]
               82   51   D0   0236   597 110$:     MOVL    R1,(R2)+                ; PFN of P1                            [39]
                    51   D6   0239   598          INCL    R1                      ; Next PFN                             [39]
                 F8 50   F4   023B   599          SOBGEQ  R0,110$                 ; Set up all of P1 space               [39]
```

```
                                  023E   600 120$:                                                                  ;G:7
                 51   54   09   78  023E   601          ASHL    #9,R4,R1                  ; P1 address
00000008'EF   51   40000400 8F   C9  0242   602          BISL3   #^X40000400,R1,A_P1BUFVA; Virtural address of P1 scratch area
                                  024E   603
                      51   54   D0  024E   604          MOVL    R4,R1                     ; P1 PFN to map for scratch area
              52   01800000 8F   D0  0251   605          MOVL    #PTE$M_OWN ! PTE$C_NA,R2; No access to these pages
                   50   7E 8F   9A  0258   606          MOVZBL  #K_P1PAGES,R0             ; Map K_P1PAGES pages
                                  025C   607
                           39   10  025C   608          BSBB    MAPMEM$IOSPACE            ; setup that page and the other 127
              51   00000008'EF   D0  025E   609          MOVL    A_P1BUFVA,R1              ; Get P1 virtural address
                   00000865'EF   16  0265   610          Jsb     RPTEADR                   ; Get address of PTE                [27]
              00000004'EF   51   D0  026B   611          MOVL    R1,A_P1BUFPTE             ; Address of first P1 PTE
                   00000000'EF   16  0272   612          Jsb     MAP$IOSPACE               ; Map I/O space                     [27]
              00000000'EF   55   D0  0278   613          MOVL    R5,DS$GA_LASTADR          ; Record last available
                                  027F   614
                   00000000'EF   16  027F   615          JSB     MEMPOOL$INIT              ; Initialize memory pool
                                  0285   616
                   0000035E'EF   16  0285   617          Jsb     STACKPROT                 ; Set protections on stack pages    [27]
              000003CF'EF   00   FB  028B   618          CALLS   #0,MAPFREE                ; Free memory
                      007C 8F   BA  0292   619          POPR    #^M<R2,R3,R4,R5,R6>       ; Restore the saved registers       [26]
                                  05  0296   620          RSB
```

```
                        0297    622          .SBTTL  MAPMEM$IOSPACE  Setup page tables for I/O space
                        0297    623 ;++
                        0297    624 ; FUNCTIONAL DESCRIPTION:
                        0297    625 ;
                        0297    626 ;       This routine is called by MAP$IOSPACE to setup a PTE
                        0297    627 ;       for an I/O space address. If necessary a page is allocated for the
                        0297    628 ;       corresponding SPTE and filled with invalid no access PTE's.
                        0297    629 ;       The particular address desired is then given the specified
                        0297    630 ;       protection.
                        0297    631 ;
                        0297    632 ; CALLING SEQUENCE:
                        0297    633 ;
                        0297    634 ;       BSBW    MAPMEM$IOSPACE
                        0297    635 ;
                        0297    636 ; INPUT PARAMETERS:     NONE
                        0297    637 ;
                        0297    638 ; IMPLICIT INPUTS:
                        0297    639 ;
                        0297    640 ;       R0      Count of pages to setup
                        0297    641 ;       R1      P1 PFN to map
                        0297    642 ;       R2      PTE format protection and valid bits (pte format)
                        0297    643 ;       R5      Address of free space pointer
                        0297    644 ;
                        0297    645 ; OUTPUT PARAMETERS:    NONE
                        0297    646 ;
                        0297    647 ; IMPLICIT OUTPUTS:
                        0297    648 ;
                        0297    649 ;       R5      Possibly update free page pointer
                        0297    650 ;--
```

```
                        0297   652 MAPMEM$IOSPACE::
00'8F  0000FE17'EF  91  0297   653          CMPB    DSA$GL_SID+3,#PR$_SID_TYPRTUV2 ; Is it RT-VAX                [39]
                58  13  029F   654          BEQL    RTVAX                          ; Skip if RT-VAX              [39]
                18  BB  02A1   655          PUSHR   #^M<R3,R4>                     ; Save
            53  0A  DB  02A3   656          MFPR    #PR$_P1BR,R3                   ; P1 base register
          53  6341  DE  02A6   657          MOVAL   (R3)[R1],R3                    ; VA of P1 PTE
    54  53  15  09  EF  02AA   658          EXTZV   #9,#21,R3,R4                   ; PFN of SVA
            7E  0C  DB  02AF   659          MFPR    #PR$_SBR,-(SP)                 ; Get system base register
          54  9E44  DE  02B2   660          MOVAL   @(SP)+[R4],R4                  ; Physical address of SPTE
        23 64  1F  E0  02B6   661          BBS     #31,(R4),20$                   ; Branch if already valid
                        02BA   662
                03  BB  02BA   663          PUSHR   #^M<R0,R1>                     ; Save 2
     50  55  F7 8F  78  02BC   664          ASHL    #-9,R5,R0                      ; PFN of free page
   64  F1800000 E0  9E  02C1   665          MOVAB   PTE$M_VALID ! PTE$C_URKW ! PTE$M_OWN(R0),(R4)
        51  7F 8F  8A  02C8   666          BICB    #^X7F,R1                       ; Lowest PFN this page of PTE's
        50  7F A1  9E  02CC   667          MOVAB   127(R1),R0                     ; Final PFN
   85  01800000 E1  9E  02D0   668 10$:     MOVAB   PTE$M_OWN ! PTE$C_NA(R1), -
                        02D7   669                  (R5)+                          ; Fill invalid no access PTE's
        F5 51  50  F3  02D7   670          AOBLEQ  R0,R1,10$                      ; Count and continue
                03  BA  02DB   671          POPR    #^M<R0,R1>                     ; Restore 2
                        02DD   672
   7E  64  15  00  EF  02DD   673 20$:     EXTZV   #0,#21,(R4),-(SP)              ; Get Physical PFN of P1 PTE
   53  17  09  8E  F0  02E2   674          INSV    (SP)+,#9,#23,R3                ; Now have Physical addr of PTE
    63  F8000000 8F  CA  02E7   675          BICL    #PTE$M_PROT!PTE$M_VALID,(R3) ; Clear protection
            63  52  C8  02EE   676          BISL    R2,(R3)                        ; Set protection
                        02F1   677
                18  BA  02F1   678          POPR    #^M<R3,R4>                     ; Restore
                51  D6  02F3   679          INCL    R1                             ; Update PFN
             9F 50  F5  02F5   680          SOBGTR  R0,MAPMEM$IOSPACE              ; Repeat until done all pages
                05  02F8   681          RSB
                        02F9   682                                                                          ;G:7
                08  BB  02F9   683 RTVAX:  PUSHR   #^M<R3>                        ; Save                        [39]
            53  0A  DB  02FB   684 10$:    MFPR    #PR$_P1BR,R3                   ; P1 base register            [39]
          53  6341  DE  02FE   685          MOVAL   (R3)[R1],R3                    ; Physical address of P1 PTE  [39]
            55  53  D1  0302   686          CMPL    R3,R5                          ; Check if allocated yet      [39]
                0A  19  0305   687          BLSS    20$                            ; Skip if allocated           [39]
            55  53  D0  0307   688          MOVL    R3,R5                          ; Set pointer to cover        [39]
85  F1800000 E1  9E  030A   689          MOVAB   PTE$M_VALID ! PTE$C_URKW ! PTE$M_OWN (R1), - ;                [39]
                        0311   690                  (R5)+                          ;                             ;G:8
63  F8000000 8F  CA  0311   691 20$:     BICL    #PTE$M_PROT!PTE$M_VALID,(R3) ; Clear protection               [39]
            63  52  C8  0318   692          BISL2   R2,(R3)                        ; Set protection              [39]
                        031B   693                                                                          ;G:7
                51  D6  031B   694          INCL    R1                             ; Update PFN                  [39]
             DB 50  F5  031D   695          SOBGTR  R0,10$                         ; Repeat until done all pages [39]
                08  BA  0320   696          POPR    #^M<R3>                        ; Restore                     [39]
                05  0322   697          RSB                                                                 ;G:7
```

```
                                  0323          .SBTTL  ACCESSABLE      check a page for accessability
                                  0323  ;++
                                  0323  ; FUNCTIONAL DESCRIPTION:
                                  0323  ;
                                  0323  ;       This routine is used to determine if every word on a page
                                  0323  ;       can be read and written. specificially by writing each
                                  0323  ;       QUADWORD to itself.
                                  0323  ;
                                  0323  ; CALLING SEQUENCE:
                                  0323  ;
                                  0323  ;       ACCESSABLE(address)
                                  0323  ;
                                  0323  ; INPUT PARAMETERS:     NONE
                                  0323  ;
                                  0323  ;       address Page address to check bits 0-8 are ignored
                                  0323  ;
                                  0323  ; IMPLICIT INPUTS:      NONE
                                  0323  ;
                                  0323  ; OUTPUT PARAMETERS:    NONE
                                  0323  ;
                                  0323  ; IMPLICIT OUTPUTS:     NONE
                                  0323  ;
                                  0323  ; COMPLETION CODES:
                                  0323  ;
                                  0323  ;       SS$_NORMAL      if page ok
                                  0323  ;       SS$_MCHK        if machine check occured during processing
                                  0323  ;
                                  0323  ;--
                                  0323
                                  0323  ACCESSABLE:
                            0000  0323          .WORD   ^M<>                    ; Save no registers
                6D   39'AF    9E  0325          MOVAB   B^30$,(FP)              ; Set condition handler
51   04 AC   000001FF 8F    CB  0329          BICL3   #^X1FF,4(AP),R1         ; Address to start
                                  0332
                  61   61    7D  0332          MOVQ    (R1),(R1)               ; Copy quadword to self                [28]
                  50   01    D0  0335          MOVL    S^#SS$_NORMAL,R0        ; Success
                            04  0338          RET
                                  0339
                            0000  0339  30$:    .WORD   ^M<>                    ; Save no registers
                50   04 AC    7D  033B          MOVQ    4(AP),R0                ; Signal and mechanism pointers
     04 A0   00660088 8F    D1  033F          CMPL    #DS$_MCHK,4(R0)         ; Machine check?
                      0F    12  0347          BNEQ    40$                     ; Branch if not
          0C A1   04 A0    D0  0349          MOVL    4(R0),12(R1)            ; Change routine R0
                      7E    7C  034E          CLRQ    -(SP)                   ; No args to unwind
       00000000'EF   02    FB  0350          CALLS   #2,SYS$UNWIND           ; Unwind stack
                            04  0357          RET                             ; Return
                                  0358
            50   0918 8F    3C  0358  40$:    MOVZWL  #SS$_RESIGNAL,R0        ; Let someone else have it
                            04  035D          RET                             ; Return
```

```
                        035E   749          .SBTTL  STACKPROT
                        035E   750 ;++
                        035E   751 ; FUNCTIONAL DESCRIPTION:
                        035E   752 ;
                        035E   753 ;       This routine is used to set the protections on stack pages so
                        035E   754 ;       that underflows of each stack will cause access violations.
                        035E   755 ;       The user stack underflows into the SUPER stack, the SUPER stack
                        035E   756 ;       underflows into the EXEC stack, the EXEC stack underflows into
                        035E   757 ;       the INTERRUT stack (protected KW), the KERNEL stack underflows into
                        035E   758 ;       SCB_UNKINT which is read only.
                        035E   759 ;
                        035E   760 ; CALLING SEQUENCE:
                        035E   761 ;
                        035E   762 ;       BSBW    STACKPROT
                        035E   763 ;
                        035E   764 ; INPUT PARAMETERS:     NONE
                        035E   765 ;
                        035E   766 ; IMPLICIT INPUTS:
                        035E   767 ;
                        035E   768 ;       The page tables and stack addresses
                        035E   769 ;
                        035E   770 ; OUTPUT PARAMETERS:    NONE
                        035E   771 ;
                        035E   772 ; IMPLICIT OUTPUTS:     NONE
                        035E   773 ;
                        035E   774 ; COMPLETION CODES:     NONE
                        035E   775 ;
                        035E   776 ; SIDE EFFECTS:         NONE
                        035E   777 ;--
                        035E   778
                        035E   779 STACKPROT:
                        035E   780          DSBINT  #31                         ; Turn off interrupts                   [30]
          7E   12   DB  035E                MFPR    S^#PR$_IPL,-(SP)
          12   1F   DA  0361                MTPR    #31,S^#PR$_IPL
    51  00000000'EF   DE  0364   781          MOVAL   P0PT_BASE,R1                ; Base P0 page table
        50   0000'8F   3C  036B   782          MOVZWL  #STACK_BASE@-9,R0           ; PFN of read only section
                        0370   783
  6140   78000000 8F   CA  0370   784 10$:     BICL2   #PTE$M_PROT,(R1)[R0]        ; Clear protections in all pte's
F0 50   00000000'8F   F2  0378   785          AOBLSS  #USTKPTR@-9,R0,10$          ; Branch if more to clear
                        0380   786
        50   0000'8F   3C  0380   787          MOVZWL  #STACK_BASE@-9,R0           ; PFN of read only section
                        0385   788
           6140   00   C8  0385   789          BISL    #PTE$C_NA, (R1)[R0]         ; Set protection to no access
                  50   D6  0389   790          INCL    R0                          ; 1 page protects bottom of stack
                        038B   791
  6140   70000000 8F   C8  038B   792 30$:     BISL    #PTE$C_URKW, (R1)[R0]       ; Set protection to KERNEL Write
F0 50   00000000'8F   F2  0393   793          AOBLSS  #ISTKPTR@-9,R0,30$          ; Protect KW thru INTERRUPT stack
                        039B   794
  6140   68000000 8F   C8  039B   795 40$:     BISL    #PTE$C_UREW, (R1)[R0]       ; Set protection to EXEC write
F0 50   00000000'8F   F2  03A3   796          AOBLSS  #ESTKPTR@-9,R0,40$          ; Protect EW thru EXEC stack
                        03AB   797
  6140   60000000 8F   C8  03AB   798 50$:     BISL    #PTE$C_URSW, (R1)[R0]       ; Set protection to SUPER write
F0 50   00000000'8F   F2  03B3   799          AOBLSS  #SSTKPTR@-9,R0,50$          ; Protect SW thru SUPER stack
                        03BB   800
  6140   20000000 8F   C8  03BB   801 60$:     BISL    #PTE$C_UW, (R1)[R0]         ; Set protection to USER write
F0 50   00000000'8F   F2  03C3   802          AOBLSS  #USTKPTR@-9,R0,60$          ; Protect UW thru USER stack
                        03CB   803
```

```
                    03CB   804        ENBINT                          ; Allow interrupts again
        12   8E   DA 03CB                     MTPR    (SP)+,S^#PR$_IPL
                  05 03CE   805        RSB                             ; Return
```

```
03CF    807          .SBTTL  MAP FREE MEMORY PROCEDURE.
03CF    808 ;++
03CF    809 ; FUNCTIONAL DESCRIPTION:
03CF    810 ;
03CF    811 ;       MAPS ALL FREE MEMORY BEFORE STARTING A PROGRAM.
03CF    812 ;
03CF    813 ; CALLING SEQUENCE:
03CF    814 ;
03CF    815 ;       PROCEDURE CALL.
03CF    816 ;
03CF    817 ; INPUT PARAMETERS:
03CF    818 ;
03CF    819 ;       NONE
03CF    820 ;
03CF    821 ; IMPLICIT INPUTS:
03CF    822 ;
03CF    823 ;       L$L_HPTL        - LENGTH OF EACH HARDWARE PARAMETER TABLE.
03CF    824 ;       L$A_LASTADR     - LAST ADDRESS OF USER PROGRAM.
03CF    825 ;       DSA$GL_UNITS    - NUMBER OF UNITS CURRENTLY SELECTED.
03CF    826 ;       L_POLEN         - LENGTH OF P0 PAGE TABLE.
03CF    827 ;
03CF    828 ; OUTPUT PARAMETERS:
03CF    829 ;
03CF    830 ;       NONE
03CF    831 ;
03CF    832 ; IMPLICIT OUTPUTS:
03CF    833 ;
03CF    834 ;       NONE
03CF    835 ;
03CF    836 ; COMPLETION CODES:
03CF    837 ;
03CF    838 ;       NONE
03CF    839 ;
03CF    840 ; SIDE EFFECTS:
03CF    841 ;
03CF    842 ;       EFFECTIVE $DS_RELBUF_L OF ALL USER BUFFER SPACE.
03CF    843 ;
03CF    844 ;--
```

```
                                 003C  03CF   846 .ENTRY  MAPFREE,^M<R2,R3,R4,R5>          ; ENTRY POINT
                                       03D1   847
            54   00000000'EF     9E   03D1   848         MOVAB   DS$K_PRGSIZ+DS$A_PRGBGN,R4 ; Assume no program loaded
                 00000000'EF     16   03D8   849         JSB     DSR$CheckLoad            ; Find out, check program hdr          [25]
                       11 50     E9   03DE   850         BLBC    R0, 5$                   ; Branch if no program loaded          [25]
                                       03E1   851
                                       03E1   852         IFNORD  #4,L$A_LASTADR,5$        ; Branch if can't read it
       00000214'EF   04   00     0C   03E1                         PROBER  #0,#4,L$A_LASTADR
                          07     13   03E9                         BEQL    5$
            54   00000214'EF     D0   03EB   853         MOVL    L$A_LASTADR, R4          ; Use size of program instead
                                       03F2   854 5$:
                          53     D4   03F2   855         CLRL    R3                       ; CLEAR R3.
50   00000000'EF   00000E00 8F   C1   03F4   856         ADDL3   #^XE00,BOOT$A_CCA,R0     ; last addr of LLL's  CCA              ;G:8
                 52   53   09     78   0400   857 10$:    ASHL    #9,R3,R2                 ; MAKE VIRTURAL ADDRESS THIS PAGE
                      54   52     D1   0404   858         CMPL    R2, R4                   ; CHECK FOR END OF USER CODE.
                          38     19   0407   859         BLSS    30$
            0000FA00 8F   52     D1   0409   860         CMPL    R2, #DSA$AT_APTTXT       ; Bottom of APT text area?
                          21     19   0410   861         BLSS    20$
            00000000'EF   52     D1   0412   862         CMPL    R2, L^DS$GA_LASTADR      ; Check for start of buffers
                          26     19   0419   863         BLSS    30$
                 0000FE17'EF     91   041B   864         CMPB    DSA$GL_SID+3,-           ; Is this an LLL system                ;G:8
                       00'8F          0421   865                   #PR$_SYS_TYP9CC        ;                                      ;G:9
                          0E     12   0423   866         BNEQ    20$                      ; continue                             ;G:8
            00000000'EF   52     D1   0425   867         CMPL    R2, BOOT$A_CCA           ; Insure that CCA is validated         ;G:8
                          05     19   042C   868         BLSS    20$                      ;                                      ;G:8
                      50   52     D1   042E   869         CMPL    R2,R0                    ;                                      ;G:8
                          0E     19   0431   870         BLSS    30$                      ;                                      ;G:8
   00000000'EF43   81800000 8F   CA   0433   871 20$:    BICL2   #PTE$M_VALID + PTE$M_OWN, -      ; INVALIDATE PAGE.
                                       043F   872                   P0PT_BASE[R3]
                          0C     11   043F   873         BRB     40$
   00000000'EF43   81800000 8F   C8   0441   874 30$:    BISL2   #PTE$M_VALID + PTE$M_OWN, -      ; VALIDATE PAGE.
                                       044D   875                   P0PT_BASE[R3]
                                       044D   876
         AB 53   00000000'EF     F2   044D   877 40$:    AOBLSS  L^L_P0LEN, R3, 10$               ; CHECK FOR ALL DONE.          [27]
                                       0455   878
                                       0455   879 ;
                                       0455   880 ; INIT P1 SPACE BUFFER.
                                       0455   881 ;
                                       0455   882
                 52   7E 8F     9A   0455   883         MOVZBL  #K_P1PAGES,R2            ; P1 PTE's to clear
            53   00000004'EF     D0   0459   884         MOVL    A_P1BUFPTE, R3                   ; PAGE TABLE ENTRY POINTER.
                                       0460   885
                          83     D4   0460   886 50$:    CLRL    (R3)+                            ; FREE PAGE.
                       FB 52     F5   0462   887         SOBGTR  R2,50$
                                       0465   888
                                       0465   889 ;
                                       0465   890 ; INIT SYSTEM SPACE BUFFER.
                                       0465   891 ;
                                       0465   892
            53   00000000'EF     D0   0465   893         MOVL    MMG$GL_SPTBASE,R3                ; System page table pointer.
                                       046C   894
          03   63   02   17     ED   046C   895 60$:    CMPZV   #PTE$V_OWN, #PTE$S_OWN, (R3), #3  ; SUPERVISOR PAGE?
                          02     13   0471   896         BEQL    70$
                          63     D4   0473   897         CLRL    (R3)                             ; FREE PAGE.
                                       0475   898
   FFED 53   04   0000000C'EF     F1   0475   899 70$:    ACBL    A_SPTEND, #4, R3, 60$            ; LOOP TO END.
            50   00000000'EF     7E   047F   900         MOVAQ   DS$GL_BUFCNT,R0                  ; Address of buffer counts
```

```
          80   7C  0486   901        CLRQ    (R0)+                          ; Reset P0, P1 buffer counts
          80   7C  0488   902        CLRQ    (R0)+                          ; RESET SYS AND SUP BUFFER CNTS.
                   048A   903
     FED0 CF   16  048A   904        Jsb     STACKPROT                ; Re-protect stacks                    [27]
               04  048E   905        RET
```

```
                        048F    907          .SBTTL  GET A BLOCK OF VIRTUAL MEMORY.
                        048F    908 ;++
                        048F    909 ; FUNCTIONAL DESCRIPTION:
                        048F    910 ;
                        048F    911 ;       THIS PROCEDURE EMULATES THE STARLET SYSTEM SERVICE "EXPREG",
                        048F    912 ;       EXPAND PROGRAM REGION.
                        048F    913 ;
                        048F    914 ;       IF THIS ROUTINE IS CALLED VIA $DS_GETSYSBUF, EACH PAGES PTE<21> WILL
                        048F    915 ;       BE SET TO A ONE TO INDICATE INTERNAL VDS OWNERSHIP. THIS SPECIAL
                        048F    916 ;       MARKING WILL PROHIBIT THE PAGES FROM BEING DEALLOCATED BY AN EXTERNAL
                        048F    917 ;       USERS DIAGNOSTIC INVOKING A $DS_RELBUF.
                        048F    918 ;
                        048F    919 ;       EACH PAGE THAT IS ALLOCATED HAS ITS PTE SET AS FOLLOWS:
                        048F    920 ;
                        048F    921 ;               PTE<31>, THE VALID BIT IS SET
                        048F    922 ;               PTE<30:27>, THE PROT CODE IS SET FOR USER WRITE (FULL ACCESS)
                        048F    923 ;               PTE<24:23>, STORES THE REGION CODE
                        048F    924 ;               PTE<21>, THIS BIT IS USED TO DENOTE PAGE OWNERSHIP (1=VDS
                        048F    925 ;                       INTERNAL, 0=EXTERNAL USER)
                        048F    926 ;               PTE<20:00> PAGE FRAME NUMBER
                        048F    927 ;
                        048F    928 ;
                        048F    929 ; CALLING SEQUENCE:
                        048F    930 ;
                        048F    931 ;       STARLET PROCEDURE CALL.
                        048F    932 ;
                        048F    933 ; INPUT PARAMETERS:
                        048F    934 ;
                        048F    935 ;       EXPREG$_PAGCNT(AP) =    NUMBER OF PAGES TO ADD TO THE END OF THE PROGRAM
                        048F    936 ;                               REGION.
                        048F    937 ;       EXPREG$_RETADR(AP) =    ADDRESS OF A 2-LONGWORD ARRAY IN WHICH TO RETURN
                        048F    938 ;                               THE VIRTUAL ADDRESSES OF THE STARTING PAGE AND
                        048F    939 ;                               ENDING PAGE OF THE EXPANTION AREA.
                        048F    940 ;       EXPREG$_ACMODE =        ACCESS MODE.  NOT USED.
                        048F    941 ;       EXPREG$_REGION(AP) =    REGION CODE:
                        048F    942 ;                                       0 = PROGRAM (P0) REGION.
                        048F    943 ;                                       1 = CONTROL (P1) REGION.
                        048F    944 ;                                       2 = SYSTEM REGION.
                        048F    945 ;                                       3 = USED BY DIAGNOSTIC SUPERVISOR AND
                        048F    946 ;                                           CRD
                        048F    947 ;
                        048F    948 ;       EXPREG$_PTE_OWNER_CODE(AP) = MASK TO WRITE INTO EACH PAGES PTE
                        048F    949 ;                                       DENOTING OWNER.                 [31]
                        048F    950 ;                                       000000 = CALLED VIA $DS_GETBUF
                        048F    951 ;                                                (EXTERNAL DIAGNOSTIC USER)
                        048F    952 ;                                       200000 = CALLED VIA $DS_GETSYSBUF
                        048F    953 ;                                                (INTERNAL VDS USER)     [31]
                        048F    954 ; IMPLICIT INPUTS:
                        048F    955 ;
                        048F    956 ;       NONE
                        048F    957 ;
                        048F    958 ; OUTPUT PARAMETERS:
                        048F    959 ;
                        048F    960 ;       @EXPREG$_RETADR(AP) =   2-LONGWORD ARRAY CONTAINING THE STARTING AND
                        048F    961 ;                               ENDING ADDRESSES OF THE EXPANDED REGION.
                        048F    962 ;
                        048F    963 ; IMPLICIT OUTPUTS:
```

```
                        048F    964 ;
                        048F    965 ;       NONE
                        048F    966 ;
                        048F    967 ; COMPLETION CODES:
                        048F    968 ;
                        048F    969 ;       SS$_NORMAL =    SERVICE SUCESSFULLY COMPLETED.
                        048F    970 ;       SS$_ILLPAGCNT = PAGE COUNT < 1.
                        048F    971 ;       SS$_VASFULL =   VIRTUAL ADDRESS SPACE FULL.
                        048F    972 ;
                        048F    973 ; SIDE EFFECTS:
                        048F    974 ;
                        048F    975 ;       NONE
                        048F    976 ;
                        048F    977 ; REGISTER USAGE:
                        048F    978 ;
                        048F    979 ;       R0 =    RETURN STATUS.
                        048F    980 ;       R1 =    BEGINNING P0 PTE POINTER.
                        048F    981 ;       R2 =    P0 PTE POINTER LIMIT.
                        048F    982 ;       R3 =    COUNT / 'REGION' PTE POINTER.
                        048F    983 ;       R4 =    COUNT / 'REGION' PTE LIMIT.
                        048F    984 ;       R5 =    VIRTUAL ADDRESS.
                        048F    985 ;       R6 =    PTE DATA.
                        048F    986 ;--
```

```
                        007C  048F   988 .Entry  Crd$ExpReg,^M<R2,R3,R4,R5,R6>          ; CRD entry point                [22]
                              0491   989
     52   00000000'EF   F7 8F   78  0491   990          AshL    #-9, L^DS$GA_LastAdr, R2      ; Calculate PFN of LastAdr       [22]
        54   00000000'EF   52   C3  049A   991          SubL3   R2, L^L_P0Len, R4             ; Get remaining length of table  [22]
           52   00000000'EF42   DE  04A2   992          MovAL   P0PT_Base [R2], R2            ; Get new starting address       [22]
                         10   11  04AA   993          Brb     ExpReg_Common                 ; Skip to the common stuff       [22]
                              04AC   994
                        007C  04AC   995 .ENTRY  EXE$EXPREG,^M<R2,R3,R4,R5,R6>   ; ENTRY POINT
                              04AE   996
           52   00000000'EF   DE  04AE   997          MOVAL   P0PT_BASE, R2                 ; START OF P0 PAGE TABLES.
           54   00000000'EF   D0  04B5   998          MOVL    L^L_P0LEN, R4                 ; P0 PAGE TABLE LENGTH.          [27]
                              04BC   999
                              04BC  1000 ExpReg_Common:                                    ; Common point                   [22]
                              04BC  1001
                   51   52   D0  04BC  1002 10$:     MOVL    R2, R1                        ; SAVE PAGE NUMBER IN CASE FREE.
                     53   04 AC   D0  04BF  1003          MOVL    EXPREG$_PAGCNT(AP), R3        ; GET PAGE LIMIT.
                          08   14  04C3  1004          BGTR    20$                           ; BR IF > 1.
                50   00FC 8F   3C  04C5  1005          MOVZWL  #SS$_ILLPAGCNT, R0            ; ILLEGAL PAGE COUNT.
                        00F9   31  04CA  1006          BRW     EXE$EXPREG_X
                     07 54   F4  04CD  1007 20$:     SOBGEQ  R4, 30$                       ; COUNT PAGES.                   ;G:8
                50   0244 8F   3C  04D0  1008          MOVZWL  #SS$_VASFULL, R0              ; OUT OF MEMORY.
                          0A   11  04D5  1009          BRB     40$
                          82   D5  04D7  1010 30$:     TSTL    (R2)+                         ; LOOK FOR EXISTS BUT NOT VALID.
                          E1   15  04D9  1011          BLEQ    10$                           ; BR ON NO GOOD.
                        EF 53   F5  04DB  1012          SOBGTR  R3, 20$                       ; LOOP TILL ENOUGH PAGES.
                     50   01   D0  04DE  1013          MOVL    #SS$_NORMAL, R0               ; NORMAL RETURN.
55   61   FFE00000 8F   CB  04E1  1014 40$:     BICL3   #^CPTE$M_PFN,(R1),R5          ; ISOLATE PFN       [31]
        55   55   09   78  04E9  1015          ASHL    #9,R5,R5                      ; GENERATE P0 VA    [31]
     00000000'EF   55   D0  04ED  1016          MOVL    R5,DS$GQ_PHYADR               ; SAVE THE PHYSICAL ADDR.
                   7E   7C  04F4  1017          CLRQ    -(SP)                         ; SPACE FOR VIRTUAL ADRS.
      03   00   10 AC   CF  04F6  1018          CASEL   EXPREG$_REGION(AP), #0, #3    ; SET UP FOR REGION.
                        000D' 04FB  1019 50$:     .WORD   60$ - 50$                     ; P0            (0)
                        0012' 04FD  1020          .WORD   70$ - 50$                     ; P1            (1)
                        0027' 04FF  1021          .WORD   80$ - 50$                     ; SYS           (2)
                        000D' 0501  1022          .WORD   60$ - 50$                     ; SUPERVISOR. (3)
                              0503  1023
                     50   D4  0503  1024          CLRL    R0                            ; RETURN ERROR STATUS.
                   00BE   31  0505  1025          BRW     EXE$EXPREG_X
                              0508  1026
                53   51   7D  0508  1027 60$:     MOVQ    R1, R3                        ; COPY P0 PAGE TABLE POINTERS.
                          3D   11  050B  1028          BRB     110$                          ; BR TO COMMON CODE.
                              050D  1029
     53   00000004'EF   D0  050D  1030 70$:     MOVL    A_P1BUFPTE, R3                ; P1 PAGE TABLE POINTER.
        54   01F8 C3   DE  0514  1031          MOVAL   K_P1PAGES*4(R3), R4           ; End of P1 page table
     55   00000008'EF   D0  0519  1032          MOVL    A_P1BUFVA, R5                 ; P1 BUFFER VIRTUAL ADDRESS.
                          12   11  0520  1033          BRB     100$                          ; BR TO COMMON CODE.
                              0522  1034
     53   00000000'EF   D0  0522  1035 80$:     MOVL    MMG$GL_SPTBASE,R3             ; System page table pointer
     54   0000000C'EF   D0  0529  1036          MOVL    A_SPTEND, R4                  ; END OF SYS PAGE TABLE.
        55   01   1F   78  0530  1037          ASHL    #31, #1, R5                   ; SYSTEM VIRTUAL ADDRESS.
                              0534  1038
                          63   D5  0534  1039 100$:    TSTL    (R3)                          ; LOOK FOR VALID BIT.
                          12   18  0536  1040          BGEQ    110$                          ; BR IF NOT VALID.
      55   00000200 8F   C0  0538  1041          ADDL    #512, R5                      ; NEXT VIRTUAL PAGE.
   FFEF 53   04   54   F1  053F  1042          ACBL    R4, #4, R3, 100$              ; LOOP TO END OF PT.
                     6E   55   D0  0545  1043          MOVL    R5, (SP)                      ; SAVE FIRST ADR.
                          3A   11  0548  1044          BRB     130$
```

```
                                  054A
                  6E   55   D0    054A  110$:   MOVL    R5, (SP)                          ; SAVE FIRST ADR.
             56   01   1F   78    054D          ASHL    #PTE$V_VALID, #1, R6              ; GET VALID BIT.
      56   02   17   10 AC   F0    0551          INSV    EXPREG$_REGION(AP), -             ; INSERT REGION CODE
                                  0557                    #PTE$V_OWN, #PTE$S_OWN, R6      ;  INTO OWN FIELD.
         56   20000000 8F   C8    0557          BISL2   #PTE$C_UW, R6                     ; User writeable
                                  055E
              56   14 AC   C8    055E          BISL    EXPREG$_PTE_OWNER_CODE(AP),R6     ; Set page owner code    [31]
         61   78000000 8F   CA    0562  120$:   BICL2   #PTE$M_PROT, (R1)                 ; Clear old protection
                  61   56   C8    0569          BISL2   R6, (R1)                          ; Set valid, prot,region, and
                                  056C                                                    ; owner code.            [31]
                  83   81   D0    056C          MOVL    (R1)+, (R3)+                      ; COPY TO 'REGION' PTE.
         55   00000200 8F   C0    056F          ADDL    #512, R5                          ; NEXT PHYSICAL PAGE.
                  52   51   D1    0576          CMPL    R1, R2                            ; CHECK FOR END OF BUFFER.
                       0E   18    0579          BGEQ    140$
                  54   53   D1    057B          CMPL    R3, R4                            ; CHECK FOR END OF REGION.
                       04   18    057E          BGEQ    130$                              ; ERROR EXIT.
                       63   D5    0580          TSTL    (R3)                              ; CHECK NEXT PAGE FOR FREE.
                       DE   18    0582          BGEQ    120$                              ; LOOP TIL ENOUGH.
                                  0584
             50   0244 8F   3C    0584  130$:   MOVZWL  #SS$_VASFULL, R0                  ; VIRTUAL ADDRESS SPACE FULL.
                                  0589
          04 AE   55   01   C3    0589  140$:   SUBL3   #1, R5, 4(SP)                     ; STORE END ADDRESS.
    00000004'EF   71   09   78    058E          ASHL    #9, -(R1), DS$GQ_PHYADR+4         ; SAVE END PHYSICAL ADR.
00000004'EF   40000000 8F   CA    0596          BICL    #^X40000000,DS$GQ_PHYADR+4        ; STRIP OFF SHIFTED PTE<21>
                                  05A1                                                    ; OWNER BIT IF GETSYSBUF.[31]
    00000004'EF   01FF 8F   A8    05A1          BISW2   #^X1FF, DS$GQ_PHYADR+4            ; SET TO LAST BYTE ON PAGE
                    08 AC   D5    05AA          TSTL    EXPREG$_RETADR(AP)                ; CHECK IF RETURN ADR REQUESED.
                       17   13    05AD          BEQL    EXE$EXPREG_X                      ; SKIP IF NOT.
          04 AE   01FF 8F   A8    05AF          BISW2   #^X1FF, 4(SP)                     ; SET TO HIGHEST BYTE ADDR
              10 AC   01   D1    05B5          CMPL    #1,EXPREG$_REGION(AP)             ; P1 space?
                       07   12    05B9          BNEQ    150$                              ; Branch if not
                  51   8E   7D    05BB          MOVQ    (SP)+,R1                          ; Get low, high
                       51   DD    05BE          PUSHL   R1                                ; put low in first
                       52   DD    05C0          PUSHL   R2                                ; put high in second
                                  05C2
              08 BC   8E   7D    05C2  150$:   MOVQ    (SP)+, @EXPREG$_RETADR(AP)        ; STORE VIRTUAL ADDRESSES.
                                  05C6  EXE$EXPREG_X:
                            04    05C6          RET                                       ; RETURN.
```

```
                        05C7  1085          .SBTTL  RELEASE A BLOCK OF VIRTUAL MEMORY.
                        05C7  1086 ;++
                        05C7  1087 ; FUNCTIONAL DESCRIPTION:
                        05C7  1088 ;
                        05C7  1089 ;       THIS PROCEDURE EMULATES THE STARLET SYSTEM SERVICE "CNTREG",
                        05C7  1090 ;       CONTRACT PROGRAM REGION.
                        05C7  1091 ;
                        05C7  1092 ;       IF CALLED VIA $DS_RELBUF, ANY PTE WITH BIT<21> SET WILL BE BYPASSED
                        05C7  1093 ;       AS THIS INDICATES PAGES BELONGING TO  VDS INTERNAL CODE.
                        05C7  1094 ;
                        05C7  1095 ;       IF CALLED VIA $DS_RELSYSBUF, PAGES WILL BE DEALLOCATED STARTING
                        05C7  1096 ;       WITH THE VIRTUAL ADDRESS PASSED, AND SUBJECT TO PTE<21>=1.
                        05C7  1097 ;
                        05C7  1098 ; CALLING SEQUENCE:
                        05C7  1099 ;
                        05C7  1100 ;       STARLET PROCEDURE CALL.
                        05C7  1101 ;
                        05C7  1102 ; INPUT PARAMETERS:
                        05C7  1103 ;
                        05C7  1104 ;       CNTREG$_PAGCNT(AP) =    NUMBER OF PAGES TO REMOVE FROM THE END OF THE
                        05C7  1105 ;                               PROGRAM REGION.
                        05C7  1106 ;       CNTREG$_RETADR(AP) =    ADDRESS OF A 2-LONGWORD ARRAY IN WHICH  TO RETURN
                        05C7  1107 ;                               THE VIRTUAL ADDRESSES OF THE STARTING PAGE AND
                        05C7  1108 ;                               ENDING PAGE OF THE REMOVED AREA.
                        05C7  1109 ;       CNTREG$_ACMODE(AP) =    ACCESS MODE. IGNORED.
                        05C7  1110 ;       CNTREG$_REGION(AP) =    REGION CODE:
                        05C7  1111 ;                                       0 = PROGRAM (P0) REGION.
                        05C7  1112 ;                                       1 = CONTROL (P1) REGION.
                        05C7  1113 ;                                       2 = SYSTEM REGION.
                        05C7  1114 ;                                       3 = USED BY DIAGNOSTIC SUPERVISOR AND
                        05C7  1115 ;                                           CRD
                        05C7  1116 ;
                        05C7  1117 ;       CNTREG$_VA(AP)     =    FOR DS$_RELSYSBUF, CONTAINS THE STARTING VA TO
                        05C7  1118 ;                               DEALL FROM                                  [31]
                        05C7  1119 ;                               FOR DS$_RELBUF, WILL CONTAIN ZERO           [31]
                        05C7  1120 ;
                        05C7  1121 ; IMPLICIT INPUTS:
                        05C7  1122 ;
                        05C7  1123 ;       NONE
                        05C7  1124 ;
                        05C7  1125 ; OUTPUT PARAMETERS:
                        05C7  1126 ;
                        05C7  1127 ;       @CNTREG$_RETADR(AP) =   2-LONGWORD ARRAY CONTAINING THE STARTING AND
                        05C7  1128 ;                               ENDING ADDRESSES OF THE REMOVEDED REGION.
                        05C7  1129 ;
                        05C7  1130 ; IMPLICIT OUTPUTS:
                        05C7  1131 ;
                        05C7  1132 ;       NONE
                        05C7  1133 ;
                        05C7  1134 ; COMPLETION CODES:
                        05C7  1135 ;
                        05C7  1136 ;       SS$_NORMAL =    SERVICE SUCESSFULLY COMPLETED.
                        05C7  1137 ;       SS$_ILLPAGCNT = PAGE COUNT < 1.
                        05C7  1138 ;       SS$_PAGOWNVIO = PAGE OWNED BY MORE PRIVILAGED ACCESS MODE.
                        05C7  1139 ;
                        05C7  1140 ; SIDE EFFECTS:
                        05C7  1141 ;
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                        05C7  1142 ;       NONE
                        05C7  1143 ;
                        05C7  1144 ; REGISTER USAGE:
                        05C7  1145 ;
                        05C7  1146 ;       R0 =    RETURN STATUS CODE.
                        05C7  1147 ;       R1 =    'REGION' END PTE.
                        05C7  1148 ;       R2 =    'REGION' BEGINNING PTE.
                        05C7  1149 ;       R3 =    VIRTUAL ADDRESS.
                        05C7  1150 ;       R4 =    PAGE COUNTER.
                        05C7  1151 ;       R5 =    POPT POINTER.
                        05C7  1152 ;--
```

```
                     003C  05C7  1154          .ENTRY  EXE$CNTREG,^M<R2,R3,R4,R5>      ; ENTRY POINT
                           05C9  1155
                50   01   D0  05C9  1156          MOVL    #SS$_NORMAL, R0                 ; START ASSUMING THE BEST!
          03    00   10 AC   CF  05CC  1157          CASEL   CNTREG$_REGION(AP), #0, #3      ; DISPATCH ON REGION CODE.
                           05D1  1158
                     000C' 05D1  1159 10$:     .WORD   15$ - 10$                       ; P0            (0)     [31]
                     0049' 05D3  1160          .WORD   30$ - 10$                       ; P1            (1)
                     0063' 05D5  1161          .WORD   40$ - 10$                       ; SYS           (2)
                     0031' 05D7  1162          .WORD   20$ - 10$                       ; SUPERVISOR.   (3)
                           05D9  1163
             3D 10 AC   E8  05D9  1164          BLBS    CNTREG$_REGION(AP), 30$         ; REGION INDICATOR.
                           05DD  1165
                           05DD  1166 ;++                                                                  [31]begin
                           05DD  1167 ; Arrival here means a $DS_RELBUF request of P0 pages, or a $DS_RELSYSBUF
                           05DD  1168 ; request from internal use.
                           05DD  1169 ; The normal action is to set the P0PT POINTER to the address following
                           05DD  1170 ; the end of the P0PT, and to have a pointer targeted to one beyond the
                           05DD  1171 ; last VA of the P0PT. From here the code works its way up from the bottom
                           05DD  1172 ; of the P0PT, blindly deallocated the last allocated pages of P0 space.
                           05DD  1173 ;
                           05DD  1174 ; The following Algorithm modifies pointers using the starting VA argument
                           05DD  1175 ; supplied from a $DS_RELSYSBUF
                           05DD  1176 ; service:
                           05DD  1177 ;
                           05DD  1178 ;       IF CNTREG$_VA(AP) = 0      ! no VA was passed
                           05DD  1179 ;             THEN PROCESS AS NORMAL $DS_RELBUF P0 REQUEST
                           05DD  1180 ;              ELSE TARGET P0PT PTR TO BEYOND LAST REQUESTED PAGES PTE
                           05DD  1181 ;                   SET VA POINTER TO BEYOND LAST REQUESTED PAGE   [31]end
                           05DD  1182 ;       ENDIF
                           05DD  1183 ;--
                           05DD  1184
                     14 AC   D5  05DD  1185 15$:     TSTL    CNTREG$_VA(AP)  ; CHECK FOR VA                          [31]
                        20   13  05E0  1186          BEQL    20$             ; GO SERVICE $DS_RELBUF                 [31]
                52   00000000'EF  DE  05E2  1187          MOVAL   P0PT_BASE, R2   ; POINTER TO TOP OF PAGE TABLE.         [31]
          53    04 AC   00000200 8F  C5  05E9  1188          MULL3   #^X200,CNTREG$_PAGCNT(AP),R3 ; NUMBER OF BYTES TO DEALLOCATE [31]
                 53   14 AC   C0  05F2  1189          ADDL    CNTREG$_VA(AP),R3       ; POINTER TO LAST ENDING VA +1  [31]
              51   53   F7 8F   78  05F6  1190          ASHL    #-9,R3,R1               ; GENERATE OFFSET INTO P0PT [31]
                51   6241   DE  05FB  1191          MOVAL   (R2)[R1],R1             ; P0PT PTR TO PTE BEYOND LAST REQUESTED [31]
                     004D   31  05FF  1192          BRW     50$                     ; BRANCH TO COMMON      [31]
                           0602  1193
              51   00000000'EF  D0  0602  1194 20$:     MOVL    L_P0LEN, R1                     ; P0 PAGE COUNT.
                53   51   09 78  0609  1195          ASHL    #9, R1, R3                      ; END VIRTUAL ADDRESS.
              52   00000000'EF  DE  060D  1196          MOVAL   P0PT_BASE, R2                   ; POINTER TO TOP OF PAGE TABLE.
                51   6241   DE  0614  1197          MOVAL   (R2)[R1], R1                    ; POINTER TO END OF PAGE TABLE.
                     35   11  0618  1198          BRB     50$                             ; BR TO COMMON CODE.
                           061A  1199
              52   00000004'EF  D0  061A  1200 30$:     MOVL    A_P1BUFPTE, R2                  ; START OF P1 PTE.
                51   01F8 C2  DE  0621  1201          MOVAL   K_P1PAGES*4(R2), R1             ; End of P1 page table
53  00000008'EF   0000FC00 8F  C1  0626  1202          ADDL3   #K_P1PAGES@9,A_P1BUFVA,R3       ; LAST VIRTURAL ADDRESS
                     1B   11  0632  1203          BRB     50$                             ; BR TO COMMON CODE.
                           0634  1204
              51   0000000C'EF  D0  0634  1205 40$:     MOVL    L^A_SPTEND, R1                  ; END OF SYS PAGE TABLE.        [27]
              52   00000000'EF  D0  063B  1206          MOVL    MMG$GL_SPTBASE, R2              ; Start of SYS page table
                53   01   1F 78  0642  1207          ASHL    #31, #1, R3                     ; START OF SYS VIRTUAL ADR.
                7E   51   52 C3  0646  1208          SUBL3   R2, R1, -(SP)                   ; SPT LENGTH.
           53   16   07   8E  F0  064A  1209          INSV    (SP)+, #9-2, #20+2, R3          ; COMPUTE LAST VIRTUAL ADDRESS.
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```
                        53   D7  064F  1211 50$:    DECL    R3                                      ; END OF PREVIOUS PAGE.
                        54   D4  0651  1212          CLRL    R4                                      ; INIT PAGE COUNTER.
                                 0653  1213
                        71   D5  0653  1214 60$:    TSTL    -(R1)                                   ; LOOK FOR VALID BIT.
                        72   18  0655  1215          BGEQ    100$                                    ; BR IF NOT VALID.
                                 0657  1216
              10 AC  61   02   17  0657  1217          CMPZV   #PTE$V_OWN, #PTE$S_OWN, (R1), -         ; CHECK 'OWN' CODE
                                 065D  1218                    CNTREG$_REGION(AP)                      ;  FOR REGION.
                        6A   12  065D  1219          BNEQ    100$                                    ; WRONG OWNER.
                                 065F  1220
                                 065F  1221 ;++
                                 065F  1222 ; The deallocation algorithm follows:                        begin[31]
                                 065F  1223 ;
                                 065F  1224 ;       IF DS$RELBUF SERVICE    (VA = zero)
                                 065F  1225 ;          THEN
                                 065F  1226 ;               IF PTE<21> EQL 1
                                 065F  1227 ;                  THEN DO NOT DEALL, GET NEXT PTE
                                 065F  1228 ;                  ELSE CONTINUE NORMAL PROCESSING
                                 065F  1229 ;          ELSE
                                 065F  1230 ;               IF PTE<21> EQL 1
                                 065F  1231 ;                  THEN DEALLOCATE PAGE
                                 065F  1232 ;                  ELSE REPORT SUPERVISOR ERROR (ERRSUP).
                                 065F  1233 ;               ! This would be the result of an incorrect supplied VA,
                                 065F  1234 ;               ! page count, region, or blown page tables.
                                 065F  1235 ;--
                                 065F  1236
                     14 AC   D5  065F  1237          TSTL    CNTREG$_VA(AP)                          ; IS THIS A $DS_RELSYSBUF REQUEST?
                        07   12  0662  1238          BNEQ    62$                                     ; YES, BRANCH
                  61 61    15   E0  0664  1239          BBS     #21,(R1),100$                           ; NOT THE RIGHT PTE, GET THE NEXT ONE
                      0007  31   0668  1240          BRW     65$                                     ; BRANCH FOR NORMAL DEALLOCATION
                  03 61    15   E0  066B  1241 62$:    BBS     #21,(R1),65$                            ; DEALLOCATE INTERNAL_VDS PAGE
                      0022  31   066F  1242          BRW     67$                                     ; BAD PAGE TABLES, POSSIBLY WRONG VA,
                                 0672  1243                                                          ; PAGCNT, OR REGION!
55   61    FFF00000 8F   CB   0672  1244 65$:    BICL3   #^CPTE$M_PFN!^X100000, (R1), R5 ; ISOLATE PFN                   end[31]
   55   00000000'EF45   DE   067A  1245          MOVAL   P0PT_BASE[R5], R5                       ; GET P0 PTE, SAME PAGE.
           55   51   D1   0682  1246          CMPL    R1, R5                                  ; CHECK FOR P0 REGION.
                        22   13  0685  1247          BEQL    80$                                     ; BR IF P0.
        7E   65   61   CD   0687  1248          XORL3   (R1),(R5), -(SP)                        ; GET DIFFERENCE BETWEEN PTE'S
     8E   827FFFFF 8F   D3   068B  1249          BITL    #^C<PTE$M_MODIFY ! -            ; Ignore MODIFY,                [19]
                                 0692  1250                    PTE$M_PROT !    -       ; PROT,                         [19]
                                 0692  1251                    PTE$M_OWN>,     -       ;  and OWN fields               [19]
                                 0692  1252                    (SP)+                           ; Do any useful fields differ?
                        13   13  0692  1253          BEQL    70$                             ; NO, RELEASE IT
                                 0694  1254 67$:    ERRSUP_S                                ; BUM PAGE TABLES.
                00000000'EF   DF   0694                        PUSHAL  $MODULE
                        00   DD   069A                        PUSHL   #0
                        01   DD   069C                        PUSHL   #$ER
              00000000'EF   03   FB   069E                        CALLS   #3, DS_ERRSUP
                        3E   11   06A5  1255          BRB     120$
                                 06A7  1256
                        61   D4  06A7  1257 70$:    CLRL    (R1)                                    ; RELEASE 'REGION' PAGE.
                                 06A9  1258
     65   81800000 8F   CA   06A9  1259 80$:    BICL2   #PTE$M_VALID ! PTE$M_OWN,(R5)    ; RELEASE P0 PAGE.
     65   00200000 8F   CA   06B0  1260          BICL    #^X200000,(R5)                  ; CLEAR PTE<21>, IN CASE SET.[31]
   65   04   1B   04   F0   06B7  1261          INSV    #4,#27,#4,(R5)                  ; Set prot to full access [35] ;G:2
                        54   D5  06BC  1262          TSTL    R4                                      ; FIRST PAGE?
                        02   12  06BE  1263          BNEQ    90$                                     ; BR OF NOT.
```

```
                  53   DD  06C0  1264          PUSHL   R3                                  ; SAVE VIRTUAL ADDR.
                           06C2  1265
     0D 54    04 AC   F2  06C2  1266 90$:     AOBLSS  CNTREG$_PAGCNT(AP), R4, 110$        ; COUNT PAGES.
                  23   11  06C7  1267          BRB     130$                                ; SUCCESS EXIT.
                           06C9  1268
                  54   D5  06C9  1269 100$:    TSTL    R4                                  ; FIRST PAGE?
                  07   13  06CB  1270          BEQL    110$                                ; SKIP IF SO.
  50   00660080 8F   D0  06CD  1271          MOVL    #DS$_FRAGBUF, R0                    ; WARN CALLER.
                           06D4  1272
  53   00000200 8F   C2  06D4  1273 110$:    SUBL    #512, R3                            ; ADJUST VITRUAL ADR.
            52   51   D1  06DB  1274          CMPL    R1, R2                              ; CHECK FOR OUT OF PAGE TABLE.
                  02   1A  06DE  1275          BGTRU   115$                                ; BR IF MORE.
                  03   11  06E0  1276          BRB     120$                                ; NO MORE
                FF6E   31  06E2  1277 115$:    BRW     60$                                 ; GO GET MORE
                           06E5  1278
  50   000001EC 8F   D0  06E5  1279 120$:    MOVL    #SS$_PAGOWNVIO, R0                  ; RAN OUT OF PAGES.
                           06EC  1280
              08 AC   D5  06EC  1281 130$:    TSTL    CNTREG$_RETADR(AP)                  ; CHECK FOR RETURN REQUESTED.
                  0B   13  06EF  1282          BEQL    EXE$CNTREG_X                        ; EXIT IF NOT.
     53    01FF 8F   AA  06F1  1283          BICW2   #^X1FF, R3                          ; BEGINNING OF PAGE.
                  53   DD  06F6  1284          PUSHL   R3                                  ; SAVE FIRST VIRTUAL ADR.
        08 BC     8E   7D  06F8  1285          MOVQ    (SP)+, @CNTREG$_RETADR(AP)          ; RETURN VIRTUAL ADDRESSES.
                           06FC  1286
                           06FC  1287 EXE$CNTREG_X:
                       04  06FC  1288          RET                                         ; RETURN.
```

```
                                        06FD  1290          .SBTTL  TURN MEMORY MANAGEMENT ON.
                                        06FD  1291 ;++
                                        06FD  1292 ; FUNCTIONAL DESCRIPTION:
                                        06FD  1293 ;
                                        06FD  1294 ;       This routine can be called by the program to enable memory management.
                                        06FD  1295 ;       All memory mapping, page tables and base and length registers
                                        06FD  1296 ;       must be setup prior to calling this routine.
                                        06FD  1297 ;
                                        06FD  1298 ; CALLING SEQUENCE:
                                        06FD  1299 ;
                                        06FD  1300 ;       NONE
                                        06FD  1301 ;       CALLS   #0,DS$MMON
                                        06FD  1302 ;
                                        06FD  1303 ; INPUT PARAMETERS:
                                        06FD  1304 ;
                                        06FD  1305 ;       NONE
                                        06FD  1306 ;
                                        06FD  1307 ; IMPLICIT INPUTS:
                                        06FD  1308 ;
                                        06FD  1309 ;       NONE
                                        06FD  1310 ;
                                        06FD  1311 ; OUTPUT PARAMETERS:
                                        06FD  1312 ;
                                        06FD  1313 ;       NONE
                                        06FD  1314 ;
                                        06FD  1315 ; IMPLICIT OUTPUTS:
                                        06FD  1316 ;
                                        06FD  1317 ;       NONE
                                        06FD  1318 ;
                                        06FD  1319 ; COMPLETION CODES:
                                        06FD  1320 ;
                                        06FD  1321 ;       SS$_WASSET      If was enabled before
                                        06FD  1322 ;       SS$_WASCLR      If was not enabled
                                        06FD  1323 ;       DS$_NOTALLOWMP  Service not allowed if active mp system
                                        06FD  1324 ;
                                        06FD  1325 ; SIDE EFFECTS:
                                        06FD  1326 ;
                                        06FD  1327 ;       Memory management is enabled
                                        06FD  1328 ;
                                        06FD  1329 ;--
                                        06FD  1330
                                0000    06FD  1331 .ENTRY  DSX$MMON,^M<>                    ; ENTRY POINT
                     50   01    D0    06FF  1332         MOVL    #1,R0                    ; Enable memory managment
                          39    10    0702  1333         BSBB    DSR$MMENABLE             ; Do it
                50   50   03    78    0704  1334         ASHL    #3,R0,R0                 ; Position old enabled bit to bit 3
                          50    D6    0708  1335         INCL    R0                       ; Make it success return code
           51   00660148  8F    D1    070A  1336         CMPL    #DS$_NOTALLOWMP,R1       ; Change of MM status in mp system? [33]
                          03    12    0711  1337         BNEQ    DSX$MMON_X               ; No, then Normal return            [33]
                     50   51    D0    0713  1338         MOVL    R1,R0                    ; else, Return error                [33]
                                      0716  1339 DSX$MMON_X:
                                04    0716  1340         RET
```

```
                                0717          .SBTTL  TURN MEMORY MANAGEMENT OFF.
                                0717  ;++
                                0717  ; FUNCTIONAL DESCRIPTION:
                                0717  ;
                                0717  ;       This routine can be called to disable memory managment
                                0717  ;       However, if the operator enabled memory management with the
                                0717  ;       SET  MM ON command, it will not disable memory management.
                                0717  ;
                                0717  ; CALLING SEQUENCE:
                                0717  ;
                                0717  ;       CALLS   #0,DS$MMOFF
                                0717  ;
                                0717  ; INPUT PARAMETERS:
                                0717  ;
                                0717  ;       NONE
                                0717  ;
                                0717  ; IMPLICIT INPUTS:
                                0717  ;
                                0717  ;       NONE
                                0717  ;
                                0717  ; OUTPUT PARAMETERS:
                                0717  ;
                                0717  ;       NONE
                                0717  ;
                                0717  ; IMPLICIT OUTPUTS:
                                0717  ;
                                0717  ;       NONE
                                0717  ;
                                0717  ; COMPLETION CODES:
                                0717  ;
                                0717  ;       SS$_WASSET      If was enabled before
                                0717  ;       SS$_WASCLR      If was not enabled
                                0717  ;       DS$_WARNING     If was set by operator and you can't disable it
                                0717  ;       DS$_NOTALLOWMP  Service not allowed if active mp system
                                0717  ;
                                0717  ; SIDE EFFECTS:
                                0717  ;
                                0717  ;       NONE
                                0717  ;       Memory management is disabled unless the operator explicitly
                                0717  ;       enabled it.
                                0717  ;
                                0717  ;--
                          0000  0717  .ENTRY  DSX$MMOFF,^M<>                  ; ENTRY POINT
50   00660000 8F          D0    0719          MOVL    #DS$_WARNING,R0         ; Prepare for can't disable return
     0000001C'EF          95    0720          TSTB    DS$GB_MM_ENB            ; Was MM enabled by operator?
                14        12    0726          BNEQ    DSX$MMOFF_X             ; Yes, Do not disable it
                13        10    0728          BSBB    DSR$MMENABLE            ; and do it
     50    50   03        78    072A          ASHL    #3,R0,R0                ; Position old enable bit to bit 3
                50        D6    072E          INCL    R0                      ; Make it success return code
51   00660148 8F          D1    0730          CMPL    #DS$_NOTALLOWMP,R1      ; Change of MM status in mp system? [33]
                03        12    0737          BNEQ    DSX$MMOFF_X             ; No, then Normal return            [33]
          50    51        D0    0739          MOVL    R1,R0                   ; else, Return error                [33]
                                073C  DSX$MMOFF_X:
                          04    073C          RET
```

```
                                073D          .SBTTL  DSR$MMENABLE    Enable to disable memory management
                                073D  ;++
                                073D  ; FUNCTION DESCRIPTION:
                                073D  ;
                                073D  ;       This routine is called to enable or disable memory managment.
                                073D  ;
                                073D  ; CALLING SEQUENCE:
                                073D  ;
                                073D  ;       BSBW    DSR$MMENABLE
                                073D  ;
                                073D  ; INPUT PARAMETERS:
                                073D  ;
                                073D  ;       R0      value to be written in to PR$_MAPEN
                                073D  ;
                                073D  ; IMPLICIT INPUTS:      NONE
                                073D  ;
                                073D  ; OUTPUT PARAMETERS:
                                073D  ;
                                073D  ;       R0      Previous contents of PR$_MAPEN
                                073D  ;       R1      Completion code : DS$_NOTALLOWMP,
                                073D  ;                                 SS$_NORMAL
                                073D  ;
                                073D  ; IMPLICIT OUTPUTS:     NONE
                                073D  ;
                                073D  ; COMPLETION CODES:     NONE
                                073D  ;
                                073D  ; SIDE EFFECTS:
                                073D  ;
                                073D  ;       Memory management is enabled or disabled.
                                073D  ;--
                                073D
                                073D  DSR$MMENABLE::
                                073D          CMK     MMENABLE                ; Change to Kernel mode
                  7E    DC    073D          MOVPSL  -(SP)
          06 6E   1A    E0    073F          BBS     #PSL$V_IS, (SP), 30000$
                  8E    D4    0743          CLRL    (SP)+
                  03    BC    0745          CHMK    #CMK$_MMENABLE
                  06    11    0747          BRB     30001$
        00000750'EF     16    0749  30000$: JSB     CMK$MMENABLE
                                074F  30001$:
                        05    074F          RSB                             ; Return to caller
                                0750
                                0750  CMK$MMENABLE::
             39   00    DA    0750          MTPR    #0,#PR$_TBIA            ; Invalidate the TB before enabling MM
             7E   38    DB    0753          MFPR    #PR$_MAPEN,-(SP)        ; Get current state of memory managment
  50   50   01   00    EF    0756          EXTZV   #0,#1,R0,R0             ; Only 1 bit
        00000000'EF     D5    075B          TSTL    MP$GR_BOOTED_PROCESSORS ; Are we an mp system?          [32][33]
                  0E    13    0761          Beql    10$                     ; Branch if not mp system       [32][33]
             6E   50    D1    0763          CMPL    R0,(SP)                 ; Compare desired state with old[33]
                  0C    13    0766          Beql    15$                     ; Same state so don't change    [33]
  51   00660148 8F     D0    0768          MOVL    #DS$_NOTALLOWMP,R1      ; State change not allowed in mp[33]
                  06    11    076F          BRB     20$                     ; Continue                      [33]
             38   50    DA    0771  10$:    MTPR    R0,#PR$_MAPEN           ; Set new desired state
             51   01    D0    0774  15$:    MOVL    #SS$_NORMAL,R1          ; Successful status             [33]
                  01    BA    0777  20$:    POPR    #^MR0                   ; Get old state
                        02    0779          REI                             ; Return to previous mode
```

```
                        077A  1447          .SBTTL  SET PROTECTION ON PAGES.
                        077A  1448 ;++
                        077A  1449 ; FUNCTIONAL DESCRIPTION:
                        077A  1450 ; SET THE ACCESS PROTECTION ON A VIRTUAL PAGE
                        077A  1451 ;
                        077A  1452 ; CALLING SEQUENCE:
                        077A  1453 ;
                        077A  1454 ;       PROCEDURE CALL.
                        077A  1455 ;
                        077A  1456 ; INPUT PARAMETERS:
                        077A  1457 ;
                        077A  1458 ;       SETPRT$_INADR(AP) =     ARAY ADDRESS (INPUT)
                        077A  1459 ;       SETPRT$_RETADR(AP) =    ARAY ADDRESS (OUTPUT)
                        077A  1460 ;       SETPRT$_ACMODE(AP) =    ACCESS MODE (OPTIONAL)
                        077A  1461 ;       SETPRT$_PROT(AP) =      NEW PROTECTION (BITS <3:0>)
                        077A  1462 ;       SETPRT$_PRVPRT(AP) =    ADDRESS TO STORE PREVIOUS PROTECTION
                        077A  1463 ;
                        077A  1464 ; IMPLICIT INPUTS:
                        077A  1465 ;
                        077A  1466 ;       NONE
                        077A  1467 ;
                        077A  1468 ; OUTPUT PARAMETERS:
                        077A  1469 ;
                        077A  1470 ;       R0 = COMPLETION CODE
                        077A  1471 ;
                        077A  1472 ; IMPLICIT OUTPUTS:
                        077A  1473 ;
                        077A  1474 ;       NONE
                        077A  1475 ;
                        077A  1476 ; COMPLETION CODES:
                        077A  1477 ;
                        077A  1478 ;       DS$_NORMAL = SERVICE SUCCESSFULLY COMPLETED
                        077A  1479 ;       SS$_ACCVIO = ACCESS VIOLATION
                        077A  1480 ;       SS$_LENVIO = LENGTH VIOLATION
                        077A  1481 ;
                        077A  1482 ; SIDE EFFECTS:
                        077A  1483 ;
                        077A  1484 ;       NONE
                        077A  1485 ;
                        077A  1486 ;--
```

```
                     007C  077A  1488 .ENTRY  EXE$SETPRT,^M<R2,R3,R4,R5,R6>   ; ENTRY POINT
                           077C  1489
                           077C  1490          CMK     SETPRT              ; Do set protection                    [20]
                        7E   DC  077C          MOVPSL  -(SP)
                  06 6E    1A   E0  077E          BBS     #PSL$V_IS, (SP), 30002$
                        8E   D4  0782          CLRL    (SP)+
                        0D   BC  0784          CHMK    #CMK$_SETPRT
                        06   11  0786          BRB     30003$
                0000078F'EF    16  0788  30002$: JSB     CMK$SETPRT
                           078E  30003$:
                        04   078E  1491          RET                         ; Return home                          [20]
                           078F  1492
                           078F  1493 CMK$SETPRT::
                  50    08 AC    D0  078F  1494          MOVL    SETPRT$_RETADR(AP), R0          ; INIT THE RETURN ARAY
                        06   13  0793  1495          BEQL    5$              ; IF THERE IS ONE
                     80    00   D2  0795  1496          MCOML   #0,(R0)+        ;
                     60    00   D2  0798  1497          MCOML   #0,(R0)
                           079B  1498 5$:
                  50    04 AC    D0  079B  1499          MOVL    SETPRT$_INADR(AP), R0           ; INPUT ARAY
               53 80    F7 8F    78  079F  1500          ASHL    #-9,(R0)+,R3            ; STARTING VA PFN
               54 60    F7 8F    78  07A4  1501          ASHL    #-9,(R0),R4             ; ENDING VA PFN
            55    54    53   C3  07A9  1502          SUBL3   R3,R4,R5                ; PAGES MINUS 1
                        0A   18  07AD  1503          BGEQ    10$             ; BETTER BE ONE
            50  00660020 8F    D0  07AF  1504          MOVL    #DS$_PROGERR,R0         ; INVALID ARGUMENT
                     0031   31  07B6  1505          BRW     SETPRT_XIT              ; RETURN
                           07B9  1506 10$:
                  54    08 AC    D0  07B9  1507          MOVL    SETPRT$_RETADR(AP), R4          ; RETURN ADDRESS ARAY
                        55   D6  07BD  1508          INCL    R5                      ; NUMBER OF PAGES
                           07BF  1509 20$:
               56   53   02   15   EF  07BF  1510          EXTZV   #21,#2,R3,R6            ; ADDRESS SPACE INDEX
                     D3'AF    9F  07C4  1511          PUSHAB  B^30$                   ; Setup return address
                           07C7  1512          CASE    R6,LIMIT=#0,TYPE=L, -
                           07C7  1513                  DISPLIST=<PZERO,PONE,SYSTEM,RESERVD>
                  03'  00   56   CF  07C7          CASEL   R6,#0,S^#<<30005$-30004$>/2>-1
                           07CB  30004$:
                        0020' 07CB          .SIGNED_WORD    PZERO-30004$
                        0036' 07CD          .SIGNED_WORD    PONE-30004$
                        004C' 07CF          .SIGNED_WORD    SYSTEM-30004$
                        0062' 07D1          .SIGNED_WORD    RESERVD-30004$
                           07D3  30005$:
                           07D3  1514
                     14 50    E9  07D3  1515 30$:    BLBC    R0,SETPRT_XIT           ; IF ERROR EXIT
                        53   D6  07D6  1516          INCL    R3                      ; INCREMENT THE PFN
                     E4 55    F5  07D8  1517          SOBGTR  R5,20$                  ; DO THE NEXT PAGE
                     08 AC    D5  07DB  1518          TSTL    SETPRT$_RETADR(AP)      ; IS THERE A RETURN ADDRESS ?
                        0A   13  07DE  1519          BEQL    SETPRT_XIT              ; NO -
08 BC    04 BC    000001FF 8F    CB  07E0  1520          BICL3   #^X1FF, @SETPRT$_INADR(AP), -   ; YES-INDICATE THE STARTING     [19]
                           07EA  1521                    @SETPRT$_RETADR(AP)     ; VIRTUAL ADDRESS
                           07EA  1522 SETPRT_XIT:
                        02   07EA  1523          REI                         ; Return from exception                [20]
```

```
                                07EB  1525 ;+
                                07EB  1526 ; SET PROTECTION FOR P0 ADDRESS SPACE <3FFFFFFF:00000000>
                                07EB  1527 ; R3 = VIRTUAL PAGE FRAME NUMBER
                                07EB  1528 ; R4 = ENDING RETURN VIRTUAL ADDRESS
                                07EB  1529 ;-
                                07EB  1530 PZERO:
51   53   15   00   EF   07EB  1531          EXTZV   #0,#21,R3,R1                    ; PFN <29:9>
          50   09   DB   07F0  1532          MFPR    #PR$_P0LR,R0                    ; P0 LENGTH REGISTER
          51   50   D1   07F3  1533          CMPL    R0,R1                           ; VA<29:9> GEQ P0LR ?
               06   14   07F6  1534          BGTR    10$                             ; NO - LENGTH WITHIN RANGE
     50   018C 8F   3C   07F8  1535          MOVZWL  #SS$_LENVIO,R0                  ; YES- LENGTH FAULT
               05   10   07FD  1536          RSB                                     ; RETURN
          31   10   07FE  1537 10$:    BSBB    SET                             ; SET THE PROTECTION
               05   0800  1538          RSB                                     ; RETURN
                     0801  1539
                     0801  1540 ;+
                     0801  1541 ; SET PROTECTION FOR P1 ADDRESS SPACE <7FFFFFFF:40000000>
                     0801  1542 ; R3 = VIRTUAL PAGE FRAME NUMBER
                     0801  1543 ; R4 = RETURN ENDING VIRTUAL ADDRESS
                     0801  1544 ;-
                     0801  1545 PONE:
51   53   15   00   EF   0801  1546          EXTZV   #0,#21,R3,R1                    ; PFN <29:9>
          50   0B   DB   0806  1547          MFPR    #PR$_P1LR,R0                    ; P1 LENGTH REGISTER
          51   50   D1   0809  1548          CMPL    R0,R1                           ; VA<29:9> LSS P1LR
               06   15   080C  1549          BLEQ    10$                             ; NO - LENGTH WITHIN RANGE
     50   018C 8F   3C   080E  1550          MOVZWL  #SS$_LENVIO,R0                  ; YES- LENGTH VIOLATION
               05   0813  1551          RSB                                     ; RETURN
          1B   10   0814  1552 10$:    BSBB    SET                             ; SET PROTECTION
               05   0816  1553          RSB                                     ; RETURN
                     0817  1554
                     0817  1555 ;+
                     0817  1556 ; SET PROTECTION FOR SYSTEM ADDRESS SPACE <BFFFFFFF:80000000>
                     0817  1557 ; R3 = VIRTUAL PAGE FRAME NUMBER
                     0817  1558 ; R4 = RETURN ENDING VIRTUAL ADDRESS
                     0817  1559 ;-
                     0817  1560 SYSTEM:
51   53   15   00   EF   0817  1561          EXTZV   #0,#21,R3,R1                    ; PFN <30:9>
          50   0D   DB   081C  1562          MFPR    #PR$_SLR,R0                     ; SYSTEM LENGTH REGISTER
          51   50   D1   081F  1563          CMPL    R0,R1                           ; VA<30:9> GTR SLR
               06   14   0822  1564          BGTR    10$                             ; NO - LENGTH WITHIN RANGE
     50   018C 8F   3C   0824  1565          MOVZWL  #SS$_LENVIO,R0                  ; YES- LENGTH VIOLATION
               05   0829  1566          RSB                                     ; RETURN
          05   10   082A  1567 10$:    BSBB    SET                             ; SET PROTECTION
               05   082C  1568          RSB                                     ; RETURN
                     082D  1569
                     082D  1570 ;+
                     082D  1571 ; SET PROTECTION FOR RESERVED ADDRESS SPACE <FFFFFFFF:C0000000>
                     082D  1572 ; THIS FUNCTION IS ILLEGAL
                     082D  1573 ; R3 = VIRTUAL PAGE FRAME NUMBER
                     082D  1574 ; R4 = RETURN ENDING VIRTUAL ADDRESS
                     082D  1575 ;-
                     082D  1576 RESERVD:
          50   0C   D0   082D  1577          MOVL    #SS$_ACCVIO,R0                  ; INDICATE ACCESS VIOLATION
               05   0830  1578          RSB                                     ; RETURN
                     0831  1579
                     0831  1580 ;+
                     0831  1581 ; SUBROUTINE TO SET PAGE PROTECTION
```

```
                                0831  1582 ; R3 = VIRTUAL PAGE FRAME NUMBER
                                0831  1583 ; R4 = RETURN ENDING VIRTUAL ADDRESS
                                0831  1584 ;-
                                0831  1585 SET:
            51   53   09   78  0831  1586         ASHL    #9,R3,R1                ; MAKE ADDRESS OF PAGE FROM PFN
                      2E   10  0835  1587         BSBB    RPTEADR                 ; GET ADDRESS OF PTE
                   14 AC   D5  0837  1588         TSTL    SETPRT$_PRVPRT(AP)      ; IS THERE A PREVIOUS
                                083A  1589                                         ; PROTECTION ADDRESS?
                      09   13  083A  1590         BEQL    10$                     ; NO -
        50   61    04   1B  EF  083C  1591         EXTZV   #27, #4, (R1), R0       ; Get old protection            [20]
             14 BC   50   90  0841  1592         MOVB    R0, @SETPRT$_PRVPRT(AP) ; Store it                      [20]
                                0845  1593                                         ; YES- PASS TO CALLER
                                0845  1594                                         ; AS PREVIOUS PROTECTION
                                0845  1595 10$:
      61   04   1B   10 AC   F0  0845  1596         INSV    SETPRT$_PROT(AP),#27,#4,(R1)  ; INSERT NEW PROTECTION
            51   53   09   78  084B  1597         ASHL    #9, R3, R1              ; FORM ADDRESS
                 3A   51   DA  084F  1598         MTPR    R1, #PR$_TBIS           ; FLUSH TRANSLATION BUF.
                   50   08 AC   D0  0852  1599         MOVL    SETPRT$_RETADR(AP),R0   ; IS THERE A RETURN ADDRESS ?
                      09   13  0856  1600         BEQL    20$                     ; NO -
   04 A0    51   000001FF 8F   C9  0858  1601         BISL3   #^X1FF,R1,4(R0)         ; RETURN HIGHEST ADDRESS OF PAGE
                                0861  1602 20$:
                      50   01   D0  0861  1603         MOVL    #SS$_NORMAL,R0          ; INDICATE SUCCESS
                                05  0864  1604         RSB                             ; RETURN
                                0865  1605
```

```
                                  0865          .SBTTL  CALCULATE PTE ADDRESS SUBROUTINE
                                  0865  ;++
                                  0865  ; RPTEADR - CALCULATE PTE ADDRESS SUBROUTINE
                                  0865  ;
                                  0865  ; THIS SUBROUTINE IS CALLED TO CALCULATE THE ADDRESS OF A PAGE TABLE
                                  0865  ; ENTRY, GIVEN A VIRTUAL ADDRESS
                                  0865  ;
                                  0865  ; INPUTS:
                                  0865  ;
                                  0865  ;       R1 = VIRTUAL ADDRESS
                                  0865  ;
                                  0865  ; OUTPUTS:
                                  0865  ;
                                  0865  ;       R1 = PTE ADDRESS
                                  0865  ;--
                                  0865
                                  0865  RPTEADR::                                 ;
          36 51    1F    E0       0865          BBS     #31,R1,100$               ; IF C, P0 OR P1 ADDRESS                ;G:7
          05 51    1E    E0       0869          BBS     #30,R1,20$                ; IF S, P1 ADDRESS                      ;G:7
             7E    08    DB       086D          MFPR    #PR$_P0BR,-(SP)           ; ELSE, GET P0PT SVA BASE
                   03    11       0870          BRB     30$                       ;  AND PROCEED
             7E    0A    DB       0872  20$:    MFPR    #PR$_P1BR,-(SP)           ; GET P1PT SVA BASE
   51    51  15    09    EF       0875  30$:    EXTZV   #9,#21,R1,R1              ; PVA PFN
         51  51    02    78       087A          ASHL    #2,R1,R1                  ; SPT'PxPT OFFSET
             51    8E    C0       087E          ADDL2   (SP)+,R1                  ; SVA ( PHYSICAL ADD FOR RTUVAX)        ;G:7
00'8F   0000FE17'EF    91       0881          CMPB    DSA$GL_SID+3,#PR$_SID_TYPRTUV2 ; Is it RT-VAX                   [39]
                   13    13       0889          BEQL    50$                       ; Skip if RT-VAX                        [39]
   7E    51  09    00    EF       088B          EXTZV   #0,#9,R1,-(SP)            ; SAVE PxPT OFFSET
                   0D    10       0890          BSBB    100$                      ; CALCULATE SPTE ADDRESS
   51    61  15    00    EF       0892          EXTZV   #0,#21,(R1),R1            ; PHYSICAL PxPT ADDRESS
         51  51    09    78       0897          ASHL    #9,R1,R1                  ; SHIFT TO PFN POSITION
             51    8E    C0       089B          ADDL2   (SP)+,R1                  ; PxPTE ADDRESS
                         05       089E  50$:    RSB                               ; RETURN                                ;G:7
                                  089F  ;
                                  089F  ; CALCULATE SPTE PHYSICAL ADDRESS
                                  089F  ;
                                  089F
             7E    0C    DB       089F  100$:   MFPR    #PR$_SBR,-(SP)            ; SPT BASE
   51    51  15    09    EF       08A2          EXTZV   #9,#21,R1,R1              ; SVA PFN
         51  51    02    78       08A7          ASHL    #2,R1,R1                  ; SPT OFFSET
             51    8E    C0       08AB          ADDL2   (SP)+,R1                  ; SPTE ADDRESS
                         05       08AE          RSB                               ; RETURN
```

```
                        08AF  1650 ;++
                        08AF  1651 ; FUNCTIONAL DESCRIPTION:
                        08AF  1652 ;
                        08AF  1653 ;       These entry points are here only to satify unneeded
                        08AF  1654 ;       functionality.
                        08AF  1655 ;
                        08AF  1656 ;       MMG$IOLOCK      Routine to lock page(s) in memory, returns PTE addr
                        08AF  1657 ;       MMG$UNLOCK      Routine to unlock page(s)
                        08AF  1658 ;       INI$RDONLY      Routine to make read only parts of DS readonly
                        08AF  1659 ;       INI$WRITEABLE   Routine to make DS writeable
                        08AF  1660 ;
                        08AF  1661 ; CALLING SEQUENCE:
                        08AF  1662 ;
                        08AF  1663 ;       BSBW    ???
                        08AF  1664 ;
                        08AF  1665 ; INPUT PARAMETERS:
                        08AF  1666 ;
                        08AF  1667 ;       Varied but all unused
                        08AF  1668 ;
                        08AF  1669 ; IMPLICIT INPUTS:      NONE
                        08AF  1670 ;
                        08AF  1671 ; OUTPUT PARAMETERS:
                        08AF  1672 ;
                        08AF  1673 ;       MMG$IOLOCK      R1 - Address of PTE for address in R0 on entry
                        08AF  1674 ;
                        08AF  1675 ; IMPLICIT OUTPUTS:     NONE
                        08AF  1676 ;
                        08AF  1677 ; SIDE EFFECTS:         NONE
                        08AF  1678 ;
                        08AF  1679 ; COMPLETION CODES:     SS$_NORMAL - Always
                        08AF  1680 ;--
                        08AF  1681
                        08AF  1682 MMG$IOLOCK::
   51    50    D0       08AF  1683          MOVL    R0,R1                       ; Copy starting virtural address
     B0  AF    16       08B2  1684          Jsb     RPTEADR                     ; Get address of First PTE      [27]
00  51    1F    E2       08B5  1685          BBSS    #31,R1,MMG$UNLOCK           ; Make it a system virtural address also
                        08B9  1686
                        08B9  1687 MMG$UNLOCK::
   50    01    D0       08B9  1688          MOVL    #SS$_NORMAL,R0              ; Set success
                 05       08BC  1689          RSB
```

```
                                  08BD  .SBTTL DSX$MAPDBGBLOCK - MAP A BLOCK OF MEMORY FOR THE DEBUGGER          [23]
                                  08BD
                                  08BD  ;++                                                                      [23]
                                  08BD  ; FUNCTIONAL DESCRIPTION                                                 [23]
                                  08BD  ;       This routine will map a section of memory space and add the      [23]
                                  08BD  ; space to the debugger's total memory allocation.  The new space is     [23]
                                  08BD  ; allocated just below that which has already been allocated, resulting [23]
                                  08BD  ; in contiguous downward growth of memory space assigned to the debug-   [23]
                                  08BD  ; ger.  This routine is for standalone use only.                         [23]
                                  08BD  ;                                                                        [23]
                                  08BD  ; INPUTS:                                                                [23]
                                  08BD  ;       4(AP) - size of requested memory block                           [23]
                                  08BD  ;       8(AP) - address of location to return starting address of        [23]
                                  08BD  ;               new buffer space.                                        [23]
                                  08BD  ;                                                                        [23]
                                  08BD  ; OUTPUTS:                                                               [23]
                                  08BD  ;       @8(AP) - starting addr. of new buffer space                      [23]
                                  08BD  ;       R0 - 1 if memory space allocated                                 [23]
                                  08BD  ;            0 if insufficient free memory to allow allocation           [23]
                                  08BD  ;--
                                  08BD
                            000C  08BD  .ENTRY  DSX$MAPDBGBLOCK, ^M<R2,R3>;                                      [23]
                                  08BF
                        1C    E0  08BF          BBS     #DSA$V_USER,-           ;IF USER MODE                    [23]
                43 0000FE00'EF    08C1                  DSA$GL_FLAGS,1000$      ;THEN JUST RETURN                [23]
                    52   04 AC    D0  08C7          MOVL    4(AP),R2                ;GET REQUESTED SIZE              [23]
            52   000001FF 8F    D3  08CB          BITL    #^X1FF,R2               ;IF NOT A PAGE BOUNDARY          [23]
                        0E    13  08D2          BEQL    10$                     ;THEN                            [23]
            52   000001FF 8F    CA  08D4          BICL    #^X1FF,R2               ;   CLEAR PAGE OFFSET            [23]
            52   00000200 8F    C0  08DB          ADDL2   #^X200,R2               ;   MAKE IT ONE PAGE BIGGER      [23]
        52   00000000'EF    52  C3  08E2  10$:    SUBL3   R2,DEBUG_LO,R2          ;CALC. NEW LOW BUFFER LIMIT      [23]
            53   00000000'EF    D0  08EA          MOVL    DEBUG_LO,R3             ;SET TOP OF NEW AREA             [23]
                        52    DD  08F1          PUSHL   R2                      ;SAVE R2 FOR LATER               [23]
                 00000975'EF    16  08F3          Jsb     MAP_BLK                 ;CALL ROUTINE TO DO THE MAP      [27]
                        52  8ED0  08F9          POPL    R2                      ;RESTORE LOW BUFFER LIMIT        [23]
                     0B 50    E9  08FC          BLBC    R0,1000$                ;IF NO ERROR FROM MAP_BLK        [23]
            00000000'EF    52  D0  08FF          MOVL    R2,DEBUG_LO             ;THEN SET NEW LOW LIMIT          [23]
                  08 BC    52  D0  0906          MOVL    R2,@8(AP)               ;PASS IT TO CALLER ALSO          [23]
                                04  090A  1000$:  RET                             ;RETURN (R0 EITHER SET OR CLEARED)[23]
                                  090B
```

```
                                090B  1732 .SBTTL DSX$FREEDBGSYM - FREE MEMORY MAPPED TO DEBUGGER SYMTABS
                                090B  1733
                                090B  1734 ;++
                                090B  1735 ; FUNCTIONAL DESCRIPTION                                              [24]
                                090B  1736 ;       This routine will deallocate the memory which has been       [24]
                                090B  1737 ; assigned to the debugger's symbol tables.                          [24]
                                090B  1738 ;                                                                    [24]
                                090B  1739 ; INPUTS                                                             [24]
                                090B  1740 ;       none                                                         [24]
                                090B  1741 ;                                                                    [24]
                                090B  1742 ; OUTPUTS                                                            [24]
                                090B  1743 ;       none                                                         [24]
                                090B  1744 ;                                                                    [24]
                                090B  1745 ; IMPLICIT INPUTS                                                    [24]
                                090B  1746 ;       DEBUG_LO - Bottom of debugger's memory allocation, i. e.,    [24]
                                090B  1747 ;                  bottom of symbol table                            [24]
                                090B  1748 ;       SYMTAB_HI- Top of symbol table                               [24]
                                090B  1749 ;--                                                                  [24]
                                090B  1750
                       000C     090B  1751 .ENTRY  DSX$FREEDBGSYM, ^M<R2,R3>       ;                           [24]
                                090D  1752
                     1C   E0    090D  1753         BBS     #DSA$V_USER,-           ;IF USER MODE               [24]
                1F 0000FE00'EF          090F  1754                 DSA$GL_FLAGS,1000$      ;THEN JUST RETURN   [24]
              52 00000000'EF   D0  0915  1755         MOVL    DEBUG_LO,R2             ;GET BOTTOM OF TABLES       [24]
              53 00000000'EF   D0  091C  1756         MOVL    SYMTAB_HI,R3            ;GET TOP OF TABLES          [24]
                 000009CD'EF   16  0923  1757         Jsb     UNMAP_BLK               ;DEALLOCATE THE AREA        [27]
00000000'EF      00000000'EF   D0  0929  1758         MOVL    SYMTAB_HI,DEBUG_LO      ;ADJUST DEBUGGER LOW ADDRESS [24]
                               04  0934  1759 1000$:  RET                             ;THAT'S ALL                 [24]
                                   0935  1760
```

```
                                0935  .SBTTL MAP_DEBUGGER - MAP THE DEBUGGER'S MEMORY SPACE                    [23]
                                0935
                                0935  ;++                                                                      [23]
                                0935  ; FUNCTIONAL DESCRIPTION                                                [23]
                                0935  ;       This routine will map all memory allocated to the debugger      [23]
                                0935  ; This includes memory space allocated both for the debugger's          [23]
                                0935  ; executable code and for the buffer space assigned for symbol table    [23]
                                0935  ; construction.                                                         [23]
                                0935  ;                                                                       [23]
                                0935  ; INPUTS                                                                [23]
                                0935  ;       NONE                                                            [23]
                                0935  ;                                                                       [23]
                                0935  ; OUTPUTS                                                               [23]
                                0935  ;       R0 = 1 if space mapped successfully                             [23]
                                0935  ;          = 0 if space already mapped (this may not be an error)       [23]
                                0935  ;--
                                0935
                                0935  MAP_DEBUGGER::                                ;                         [23]
                     0C   BB    0935          PUSHR   #^M<R2,R3>                    ;SAVE REGISTERS           [23]
  52   00000000'EF     D0      0937          MOVL    DEBUG_LO,R2                   ;GET LOW LIMIT OF ALLOCATION  [23]
  53   00000000'EF     D0      093E          MOVL    DEBUG_HI,R3                   ;GET HIGH LIMIT OF ALLOCATION [23]
       00000975'EF     16      0945          Jsb     MAP_BLK                       ;DO THE MAP               [27]
                     0C   BA    094B          POPR    #^M<R2,R3>                    ;RESTORE REGISTERS        [23]
                          05    094D          RSB                                   ;RETURN                   [23]
```

```
                                094E  1787 .SBTTL UNMAP_DEBUGGER - UNMAP THE DEBUGGER'S MEMORY SPACE                [23]
                                094E  1788
                                094E  1789 ;++                                                                     [23]
                                094E  1790 ; FUNCTIONAL DESCRIPTION                                                [23]
                                094E  1791 ;       This routine will unmap the pages of memory previously          [23]
                                094E  1792 ; allocated to the debugger.                                            [23]
                                094E  1793 ;                                                                       [23]
                                094E  1794 ; INPUTS                                                                [23]
                                094E  1795 ;       NONE                                                            [23]
                                094E  1796 ;                                                                       [23]
                                094E  1797 ; OUTPUTS                                                               [23]
                                094E  1798 ;       NONE                                                            [23]
                                094E  1799 ;--                                                                     [23]
                                094E  1800
                                094E  1801 UNMAP_DEBUGGER::                         ;                              [23]
                     0C   BB    094E  1802         PUSHR   #^M<R2,R3>            ;SAVE REGISTERS                [23]
          52  00000000'EF   D0  0950  1803         MOVL    DEBUG_LO,R2           ;GET LOW LIMIT OF ALLOCATION   [23]
          52  000001FF  8F   CA  0957  1804         BICL2   #^X1FF,R2             ;MAKE SURE IT'S A PAGE BOUNDARY [23]
          53  00000000'EF   D0  095E  1805         MOVL    DEBUG_HI,R3           ;GET HIGH LIMIT OF ALLOCATION  [23]
          53  000001FF  8F   CA  0965  1806         BICL2   #^X1FF,R3             ;MAKE SURE IT'S A PAGE BOUNDARY [23]
              000009CD'EF   16  096C  1807         Jsb     UNMAP_BLK             ;DO THE MAP                    [27]
                     0C   BA  0972  1808         POPR    #^M<R2,R3>            ;RESTORE REGISTERS             [23]
                          05  0974  1809         RSB                           ;RETURN                        [23]
                              0975  1810
```

```
                     0975  1812 ; ROUTINE TO MAP A SPECIFIED BLOCK OF MEMORY.  IF THE BLOCK HAS ALREADY [23]
                     0975  1813 ; BEEN MAPPED, INDICATE ERROR RETURN.                                   [23]
                     0975  1814 ;                                                                       [23]
                     0975  1815 ; INPUTS                                                               [23]
                     0975  1816 ;       R2 = BOTTOM ADDR. OF NEW BUFFER                               [23]
                     0975  1817 ;       R3 = TOP ADDR. OF NEW BUFFER                                  [23]
                     0975  1818 ;                                                                       [23]
                     0975  1819 ; OUTPUTS                                                              [23]
                     0975  1820 ;       R0 = 0 IF SPACE MAPPED SUCCESSFULLY                           [23]
                     0975  1821 ;          = 1 IF SPACE ALREADY ALLOCATED                             [23]
                     0975  1822 ;                                                                       [23]
                     0975  1823
                     0975  1824 MAP_BLK:
              54 DD  0975  1825         PUSHL   R4                      ;SAVE A REGISTER              [23]
        54    52 D0  0977  1826         MOVL    R2,R4                   ;SAVE IT FOR LATER            [23]
                     097A  1827                                         ;NOW TEST REQUESTED BUFFER AREA [23]
                     097A  1828                                         ;TO MAKE SURE IT HASN'T ALREADY [23]
                     097A  1829                                         ;BEEN ALLOCATED TO SOMEONE ELSE [23]
                     097A  1830 100$:                                   ;REPEAT                       [23]
           51    52 D0  097A  1831         MOVL    R2,R1                   ;   GET NEXT PAGE         [23]
           FEE4 CF 16  097D  1832         Jsb     RPTEADR                 ;   GET PTE OF PAGE       [27]
        43 61    1F E0  0981  1833         BBS     #PTE$V_VALID,(R1),1000$ ;   IF PAGE ALLOCATED, LEAVE [23]
     52 00000200 8F C0  0985  1834         ADDL2   #512,R2                 ;   ADDR. OF NEXT PAGE    [23]
           53    52 D1  098C  1835         CMPL    R2,R3                   ;   SEE IF TOP OF NEW BUFFER AREA[23]
                 E9 19  098F  1836         BLSS    100$                    ;UNTIL ENTIRE NEW BUFFER CHECKED[23]
                     0991  1837                                         ;IT'S OK TO ALLOCATE THE SPACE  [23]
           52    54 D0  0991  1838         MOVL    R4,R2                   ;GET BOTTOM OF BUFFER         [23]
                     0994  1839 200$:                                   ;REPEAT                       [23]
           51    52 D0  0994  1840         MOVL    R2,R1                   ;   GET NEXT PAGE         [23]
           FECA CF 16  0997  1841         Jsb     RPTEADR                 ;   GET PTE OF PAGE       [27]
        54 01    1F 78  099B  1842         ASHL    #PTE$V_VALID,#1,R4      ;   CREATE BIT MASK - SET VALID [23]
     54 02    17 00 F0  099F  1843         INSV    #0,#PTE$V_OWN,#PTE$S_OWN,R4;SET OWNER BITS TO ZERO    [23]
      54  20000000 8F C8  09A4  1844         BISL2   #PTE$C_UW,R4            ;   SET USER-WRITABLE IN MASK [23]
      61  78000000 8F CA  09AB  1845         BICL2   #PTE$M_PROT,(R1)        ;   CLEAR PROTECTION IN PTE [23]
           61    54 C8  09B2  1846         BISL2   R4,(R1)                 ;   SET BITS IN PTE       [23]
      52  00000200 8F C0  09B5  1847         ADDL2   #512,R2                 ;   ADDR. OF NEXT PAGE    [23]
           53    52 D1  09BC  1848         CMPL    R2,R3                   ;   SEE IF TOP OF NEW BUFFER AREA[23]
                 D3 19  09BF  1849         BLSS    200$                    ;UNTIL ENTIRE NEW BUFFER MAPPED [23]
           50    01 D0  09C1  1850         MOVL    #1,R0                   ;SET SUCCESS                  [23]
              54 8ED0  09C4  1851 900$:     POPL    R4                      ;RESTORE A REGISTER           [23]
                 05 09C7  1852         RSB                             ;RETURN                       [23]
           50    00 D0  09C8  1853 1000$:  MOVL    #0,R0                   ;SET ERROR                    [23]
                 F7 11  09CB  1854         BRB     900$                    ;RETURN                       [23]
                     09CD  1855
                     09CD  1856
                     09CD  1857 ; ROUTINE TO UNMAP A SPECIFIED BLOCK OF MEMORY.                        [23]
                     09CD  1858 ;                                                                       [23]
                     09CD  1859 ; INPUTS:                                                               [23]
                     09CD  1860 ;       R2 = BOTTOM ADDR. OF AREA TO UNMAP                            [23]
                     09CD  1861 ;       R3 = TOP ADDR. OF AREA TO UNMAP                               [23]
                     09CD  1862 ;                                                                       [23]
                     09CD  1863 ; OUTPUTS:                                                              [23]
                     09CD  1864 ;       NONE                                                          [23]
                     09CD  1865 ;                                                                       [23]
                     09CD  1866
                     09CD  1867 UNMAP_BLK:                              ;                             [23]
                     09CD  1868 100$:                                   ;REPEAT                       [23]
```

```
          51    52   D0  09CD          MOVL    R2,R1                    ;   GET A PAGE                [23]
          FE91  CF   16  09D0          Jsb     RPTEADR                  ;   GET ADDR. OF PTE          [27]
61   81800000  8F   CA  09D4          BICL2   #PTE$M_VALID+PTE$M_OWN,(R1);MAKE PAGE INVALID         [23]
52   00000200  8F   C0  09DB          ADDL2   #512,R2                  ;   GET NEXT PAGE             [23]
          53    52   D1  09E2          CMPL    R2,R3                    ;   SEE IF TOP OF AREA YET    [23]
                E6   19  09E5          BLSS    100$                     ;UNTIL TOP OF AREA REACHED    [23]
                     05  09E7          RSB                              ;RETURN                       [23]
                         09E8
                         09E8  ; Referenced by XDELTA
                         09E8  ;
                         09E8  INI$RDONLY::
                         09E8  INI$WRITABLE::
                     05  09E8          RSB
                         09E9
                         09E9          .END
```

```
$$ARGS                          = 00000005     D
$$N                             = 00000002     D
$$T1                            = 00000018     D
$ER                             = 00000002     D
$MODULE                           00000000 R   D   03
ACCESSABLE                        00000323 R   D   04
A_P1BUFPTE                        00000004 R   D   02
A_P1BUFVA                         00000008 R   D   02
A_SPTEND                          0000000C R   D   02
BIT...                          = 00000015     D
BIT0                            = 00000001     D
BIT1                            = 00000002     D
BIT10                           = 00000400     D
BIT11                           = 00000800     D
BIT12                           = 00001000     D
BIT13                           = 00002000     D
BIT14                           = 00004000     D
BIT15                           = 00008000     D
BIT16                           = 00010000     D
BIT17                           = 00020000     D
BIT18                           = 00040000     D
BIT19                           = 00080000     D
BIT2                            = 00000004     D
BIT20                           = 00100000     D
BIT21                           = 00200000     D
BIT22                           = 00400000     D
BIT23                           = 00800000     D
BIT24                           = 01000000     D
BIT25                           = 02000000     D
BIT26                           = 04000000     D
BIT27                           = 08000000     D
BIT28                           = 10000000     D
BIT29                           = 20000000     D
BIT3                            = 00000008     D
BIT30                           = 40000000     D
BIT31                           = 80000000     D
BIT4                            = 00000010     D
BIT5                            = 00000020     D
BIT6                            = 00000040     D
BIT7                            = 00000080     D
BIT8                            = 00000100     D
BIT9                            = 00000200     D
BOOT$A_CCA                        ********W G      00
CEP_FUNCTIONAL                  = 00000000     D
CEP_REPAIR                      = 00000001     D
CF$L_AP                           00000008     D
CF$L_FP                           0000000C     D
CF$L_ONCOND                       00000000     D
CF$L_PC                           00000010     D
CF$L_REG                          00000014     D
CF$W_MASK                         00000006     D
CF$W_PSW                          00000004     D
CMK$MMENABLE                      00000750 RG  D   04
CMK$SETPRT                        0000078F RG  D   04
CMK$_APBOOT                     = 00000004     D
CMK$_ASTEXIT                    = 00000000     D
CMK$_CANTIM                     = 0000000B     D
CMK$_HIBER                      = 00000007     D
CMK$_INITSCB                    = 00000008     D
CMK$_LAST                       = 0000000E     D
CMK$_MMENABLE                   = 00000003     D
CMK$_RCONSOLE                   = 00000001     D
CMK$_REFRESH                    = 00000005     D
CMK$_SCHDWK                     = 00000006     D
CMK$_SETIMR                     = 0000000C     D
CMK$_SETIPL                     = 00000009     D
CMK$_SETPRT                     = 0000000D     D
CMK$_SGIPR                      = 0000000A     D
CMK$_TCONSOLE                   = 00000002     D
CNTREG$_ACMODE                  = 0000000C     D
CNTREG$_NARGS                   = 00000004     D
CNTREG$_PAGCNT                  = 00000004     D
CNTREG$_REGION                  = 00000010     D
CNTREG$_RETADR                  = 00000008     D
CNTREG$_VA                      = 00000014     D
CRD$EXPREG                        0000048F RG  D   04
DEBUG_HI                          ********     X   00
DEBUG_LO                          ********     X   00
DS$AQ_SYSSRV                      ********     X   00
DS$A_PRGBGN                       ********     X   00
DS$GA_LASTADR                     ********     X   00
DS$GB_MM_ENB                      0000001C RG  D   02
DS$GB_SYSTYPE                     ********     X   00
DS$GL_ACTUAL_MEMSIZE              00000014 RG  D   02
DS$GL_BUFCNT                      ********     X   00
DS$GL_FLAGS                       ********     X   00
DS$GL_MEMSIZE                     00000010 RG  D   02
DS$GL_SET_MEMSIZE                 00000018 RG  D   02
DS$GQ_PHYADR                      ********     X   00
DS$K_ERROR                      = 00000002     D
DS$K_NORMAL                     = 00000001     D
DS$K_PRGSIZ                       ********     X   00
DS$K_PRINTB                     = 00000002     D
DS$K_PRINTF                     = 00000001     D
DS$K_PRINTI                     = 00000000     D
DS$K_PRINTX                     = 00000003     D
DS$K_SEVERE                     = 00000004     D
DS$K_SUBSYS                     = 00000066     D
DS$K_TYPE_ABORT_PROGRAM         = 00000014     D
DS$K_TYPE_ABORT_TEST            = 00000013     D
DS$K_TYPE_COMMAND_ERR           = 00000015     D
DS$K_TYPE_COMMAND_OUT           = 00000016     D
DS$K_TYPE_CRD_AUTOTEST          = 0000001A     D
DS$K_TYPE_DS_PROMPT             = 00000001     D
DS$K_TYPE_DS_START              = 0000001D     D
DS$K_TYPE_ERRDEV                = 00000008     D
DS$K_TYPE_ERRHARD               = 00000006     D
DS$K_TYPE_ERROR_BODY            = 00000009     D
DS$K_TYPE_ERROR_END             = 0000000A     D
DS$K_TYPE_ERRPREP               = 0000001B     D
DS$K_TYPE_ERRSOFT               = 00000007     D
DS$K_TYPE_ERRSUP                = 00000004     D
DS$K_TYPE_ERRSYS                = 00000005     D
DS$K_TYPE_ERR_HALT              = 0000000D     D
```

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DS$K_TYPE_EXCEPTION             = 0000000C  D     DS$V_CHARFLG                    = 00000008  D
DS$K_TYPE_EXCEPTION_HEAD        = 0000000B  D     DS$V_CMDFLG                     = 00000007  D
DS$K_TYPE_FIRST_PASS            = 00000011  D     DS$V_CTRLC                      = 00000000  D
DS$K_TYPE_GENERAL               = 00000000  D     DS$V_CTRLO                      = 00000010  D
DS$K_TYPE_GENERAL_ERROR         = 00000003  D     DS$V_DEVFLG                     = 00000009  D
DS$K_TYPE_NO_TESTS              = 00000012  D     DS$V_DISABLCC                   = 00000018  D
DS$K_TYPE_PARAM_ERROR           = 0000001C  D     DS$V_DONFLG                     = 0000000D  D
DS$K_TYPE_PROGRAM_END           = 00000010  D     DS$V_ERRFLG                     = 00000004  D
DS$K_TYPE_PROGRAM_INFO          = 00000017  D     DS$V_EXCEPT                     = 00000013  D
DS$K_TYPE_PROGRAM_START         = 0000000F  D     DS$V_EXETST                     = 00000012  D
DS$K_TYPE_QIO_INVADP            = 00000024  D     DS$V_HLTFLG                     = 00000003  D
DS$K_TYPE_QIO_NODRIVER          = 00000022  D     DS$V_LODFLG                     = 00000001  D
DS$K_TYPE_QIO_WRONGVER          = 00000023  D     DS$V_MEMMGT                     = 0000000F  D
DS$K_TYPE_SCRIPT_ECHO           = 00000021  D     DS$V_NI                         = 0000001A  D
DS$K_TYPE_SCRIPT_PNF            = 0000001E  D     DS$V_OUTPUT                     = 00000017  D
DS$K_TYPE_SCRIPT_PROMPT         = 00000020  D     DS$V_RUBFLG                     = 00000005  D
DS$K_TYPE_SCRIPT_SKIP           = 0000001F  D     DS$V_SCRIPT                     = 00000015  D
DS$K_TYPE_SEQUENCE_ERROR        = 00000019  D     DS$V_SETIMR                     = 00000019  D
DS$K_TYPE_START_ERR             = 00000018  D     DS$V_STRFLG                     = 00000002  D
DS$K_TYPE_START_LIST            = 00000025  D     DS$V_SUBT                       = 0000000E  D
DS$K_TYPE_SUMMARY               = 0000000E  D     DS$V_SYSFLG                     = 0000000A  D
DS$K_TYPE_USER_PROMPT           = 00000002  D     DS$V_TIMED                      = 00000019  D
DS$K_WARNING                    = 00000000  D     DS$V_TIMED_OUT                  = 0000001B  D
DS$M_ABRTFLG                    = 00000040  D     DS$V_TIMRON                     = 00000011  D
DS$M_BADTIME                    = 00100000  D     DS$_AP_NORMAL_BREAK             = 00660150  D
DS$M_BATCH                      = 00400000  D     DS$_ARITH                       = 006600D0  D
DS$M_BRKCLR                     = 00001000  D     DS$_ASBE                        = 00660118  D
DS$M_BRKPT                      = 00000800  D     DS$_BADLINK                     = 006600F0  D
DS$M_CHARFLG                    = 00000100  D     DS$_BADTYPE                     = 006600E8  D
DS$M_CMDFLG                     = 00000080  D     DS$_BIIC                        = 00660120  D
DS$M_CTRLC                      = 00000001  D     DS$_CHME                        = 006600A8  D
DS$M_CTRLO                      = 00010000  D     DS$_CHMK                        = 006600E0  D
DS$M_DEVFLG                     = 00000200  D     DS$_DEVNAME                     = 00660108  D
DS$M_DISABLCC                   = 01000000  D     DS$_ERROR                       = 00660002  D
DS$M_DONFLG                     = 00002000  D     DS$_FHWE                        = 00660068  D
DS$M_ERRFLG                     = 00000010  D     DS$_FRAGBUF                     = 00660080  D
DS$M_EXCEPT                     = 00080000  D     DS$_ICBUSY                      = 006600C8  D
DS$M_EXETST                     = 00040000  D     DS$_ICERR                       = 006600C0  D
DS$M_HLTFLG                     = 00000008  D     DS$_IHWE                        = 00660060  D
DS$M_LODFLG                     = 00000002  D     DS$_ILLCHAR                     = 00660018  D
DS$M_MEMMGT                     = 00008000  D     DS$_ILLPAGCNT                   = 00660078  D
DS$M_NI                         = 04000000  D     DS$_ILLUNIT                     = 00660100  D
DS$M_OUTPUT                     = 00800000  D     DS$_INIT_FAIL                   = 00660140  D
DS$M_RUBFLG                     = 00000020  D     DS$_INSFMEM                     = 00660050  D
DS$M_SCRIPT                     = 00200000  D     DS$_INVCPU                      = 00660130  D
DS$M_SETIMR                     = 02000000  D     DS$_IPL2HI                      = 006600B8  D
DS$M_STRFLG                     = 00000004  D     DS$_IVADDR                      = 00660040  D
DS$M_SUBT                       = 00004000  D     DS$_IVVECT                      = 00660038  D
DS$M_SYSFLG                     = 00000400  D     DS$_KRNLSTK                     = 00660090  D
DS$M_TIMED                      = 02000000  D     DS$_LOGIC                       = 00660070  D
DS$M_TIMED_OUT                  = 08000000  D     DS$_MCHK                        = 00660088  D
DS$M_TIMRON                     = 00020000  D     DS$_MEM_ALLOC_ERR               = 00660138  D
DS$V_ABRTFLG                    = 00000006  D     DS$_MMOFF                       = 00660058  D
DS$V_BADTIME                    = 00000014  D     DS$_NEEDUNIT                    = 006600F8  D
DS$V_BATCH                      = 00000016  D     DS$_NODE                        = 00660128  D
DS$V_BRKCLR                     = 0000000C  D     DS$_NOPCS                       = 00660110  D
DS$V_BRKPT                      = 0000000B  D     DS$_NORMAL                      = 00660001  D
```

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DS$_NOSUPPORT                   = 006600B1    D
DS$_NOTALLOWMP                  = 00660148    D
DS$_NOTDON                      = 00660030    D
DS$_NOTIMP                      = 006600B0    D
DS$_NULLSTR                     = 00660010    D
DS$_OVERFLOW                    = 00660008    D
DS$_POWER                       = 00660098    D
DS$_PROGERR                     = 00660020    D
DS$_SEVERE                      = 00660004    D
DS$_TRANSL                      = 006600A0    D
DS$_TRUNCATE                    = 00660028    D
DS$_UNEXPINT                    = 006600D8    D
DS$_UNSUPPDEV                   = 00660158    D
DS$_VASFULL                     = 00660048    D
DS$_WARNING                     = 00660000    D
DSA$AL_APTMAIL                    0000FE00    D
DSA$AT_APTTXT                     0000FA00    D
DSA$GL_APTCOM                     0000FE04    D
DSA$GL_DEVLEN                     0000FE58    D
DSA$GL_ERRNO                      0000FE44    D
DSA$GL_EVENT                      0000FE48    D
DSA$GL_FLAGS                      0000FE00    D
DSA$GL_MSGTYP                     0000FE40    D
DSA$GL_PASSES                     0000FE08    D
DSA$GL_PASSNO                     0000FE54    D
DSA$GL_SECTNO                     0000FE10    D
DSA$GL_SID                        0000FE14    D
DSA$GL_SUBTNO                     0000FE4C    D
DSA$GL_TESTNO                     0000FE50    D
DSA$GL_UNITS                      0000FE0C    D
DSA$GQ_MSGPTR                     0000FE68    D
DSA$GT_DEVNAM                     0000FE5C    D
DSA$V_USER                      = 0000001C    D
DSR$CHECKLOAD                     ********    X   00
DSR$MMENABLE                      0000073D RG D   04
DSR$SETIMR_INI                    ********    X   00
DSX$FREEDBGSYM                    0000090B RG D   04
DSX$MAPDBGBLOCK                   000008BD RG D   04
DSX$MMOFF                         00000717 RG D   04
DSX$MMOFF_X                       0000073C R  D   04
DSX$MMON                          000006FD RG D   04
DSX$MMON_X                        00000716 R  D   04
DSX$PRINT                         ********    X   00
DS_ERRSUP                         ********    X   00
ENV$M_DOMAIN                    = 00000002    D
ENV$M_LEVEL                     = 00000001    D
ENV$M_SUPER                     = 000003FC    D
ENV$S_DOMAIN                    = 00000001    D
ENV$S_LEVEL                     = 00000001    D
ENV$S_SUPER                     = 00000008    D
ENV$V_DOMAIN                    = 00000001    D
ENV$V_LEVEL                     = 00000000    D
ENV$V_SUPER                     = 00000002    D
ENV$_CPU                        = 00000000    D
ENV$_FUNCTIONAL                 = 00000000    D
ENV$_REPAIR                     = 00000001    D
ENV$_SUPER                      = 00000001    D
ENV$_SYSTEM                     = 00000001    D
ESTKPTR                           ********    X   00
EXE$CNTREG                        000005C7 RG D   04
EXE$CNTREG_X                      000006FC R  D   04
EXE$EXPREG                        000004AC RG D   04
EXE$EXPREG_X                      000005C6 R  D   04
EXE$SETPRT                        0000077A RG D   04
EXPREG$_ACMODE                  = 0000000C    D
EXPREG$_NARGS                   = 00000004    D
EXPREG$_PAGCNT                  = 00000004    D
EXPREG$_PTE_OWNER_CODE          = 00000014    D
EXPREG$_REGION                  = 00000010    D
EXPREG$_RETADR                  = 00000008    D
EXPREG_COMMON                     000004BC R  D   04
GETBUF$_NARGS                   = 00000004    D
GETBUF$_PAGCNT                  = 00000004    D
GETBUF$_PHYADR                  = 0000000C    D
GETBUF$_REGION                  = 00000010    D
GETBUF$_RETADR                  = 00000008    D
GETMEM$_NARGS                   = 00000003    D
GETMEM$_PAGCNT                  = 00000004    D
GETMEM$_PHYADR                  = 00000008    D
GETMEM$_VRTADR                  = 0000000C    D
INI$RDONLY                        000009E8 RG D   04
INI$WRITABLE                      000009E8 RG D   04
IO$GQ_PHYSICAL                    ********    X   00
IRP$B_CARCON                      00000038    D
IRP$B_EFN                         00000022    D
IRP$B_PRI                         00000023    D
IRP$B_RMOD                        0000000B    D
IRP$B_TYPE                        0000000A    D
IRP$C_LENGTH                      0000005C    D
IRP$K_LENGTH                      0000005C    D
IRP$L_ARB                         00000050    D
IRP$L_AST                         00000010    D
IRP$L_ASTPRM                      00000014    D
IRP$L_DIAGBUF                     00000044    D
IRP$L_EXTEND                      0000004C    D
IRP$L_IOQBL                       00000004    D
IRP$L_IOQFL                       00000000    D
IRP$L_IOSB                        00000024    D
IRP$L_IOST1                       00000034    D
IRP$L_IOST2                       00000038    D
IRP$L_MEDIA                       00000034    D
IRP$L_PID                         0000000C    D
IRP$L_SEGVBN                      00000040    D
IRP$L_SEQNUM                      00000048    D
IRP$L_SVAPTE                      0000002C    D
IRP$L_TT_TERM                     00000038    D
IRP$L_UCB                         0000001C    D
IRP$L_WIND                        00000018    D
IRP$Q_NT_PRVMSK                   0000003C    D
IRP$W_ABCNT                       0000003C    D
IRP$W_BCNT                        00000032    D
IRP$W_BOFF                        00000030    D
IRP$W_CHAN                        00000028    D
IRP$W_FUNC                        00000020    D
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IRP$W_OBCNT                     0000003E    D
IRP$W_SIZE                      00000008    D
IRP$W_STS                       0000002A    D
IRP$W_TT_PRMPT                  0000003C    D
ISTKPTR                         ********    X   00
KSTKPTR                         ********    X   00
K_P1PAGES                     = 0000007E    D
L$A_CCP                         00000240    D
L$A_DEVP                        0000021C    D
L$A_DREG                        00000224    D
L$A_DTP                         00000218    D
L$A_ICP                         0000023C    D
L$A_LASTADR                     00000214    D
L$A_NAME                        00000208    D
L$A_REPP                        00000244    D
L$A_SECNAM                      00000250    D
L$A_STATAB                      00000248    D
L$A_TSTCNT                      00000254    D
L$L_ENVIRON                     00000204    D
L$L_ERRTYP                      0000024C    D
L$L_HEADLENGTH                  00000200    D
L$L_REV                         0000020C    D
L$L_UNIT                        00000220    D
L$L_UNUSED                      00000228    D
L$L_UPDATE                      00000210    D
L_POLEN                         00000000 R  D   02
MAP$IOSPACE                     ********      X   00
MAPFREE                         000003CF RG D   04
MAPMEM                          00000000 RG D   04
MAPMEM$IOSPACE                  00000297 RG D   04
MAP_BLK                         00000975 R  D   04
MAP_DEBUGGER                    00000935 RG D   04
MEMPOOL$INIT                    ********      X   00
MMG$GL_SPTBASE                  ********      X   00
MMG$IOLOCK                      000008AF RG D   04
MMG$UNLOCK                      000008B9 RG D   04
MP$GR_BOOTED_PROCESSORS         ********      X   00
P0PT_BASE                       ********      X   00
PFN$AB_STATE                  = 00000010 RG D   02
PFN$AB_TYPE                   = 00000000  G D
PFN$AL_BAK                    = 00000008 RG D   02
PFN$AL_PTE                    = 00000004 RG D   02
PFN$AW_BLINK                  = 00000000  G D
PFN$AW_FLINK                  = 00000000  G D
PFN$AW_REFCNT                 = 0000000C RG D   02
PFN$AW_SWPVBN                 = 00000000 RG D   02
PONE                            00000801 R  D   04
PPA_CONSRV4                   = 20040010    D
PR$_IPL                       = 00000012    D
PR$_MAPEN                     = 00000038    D
PR$_P0BR                      = 00000008    D
PR$_P0LR                      = 00000009    D
PR$_P1BR                      = 0000000A    D
PR$_P1LR                      = 0000000B    D
PR$_SBR                       = 0000000C    D
PR$_SID_TYPRTUV2                ********    X   00
PR$_SLR                       = 0000000D    D
PR$_SYS_TYP900                  ********    X   00
PR$_SYS_TYP9CC                  ********W G     00
PR$_TBIA                      = 00000039    D
PR$_TBIS                      = 0000003A    D
PSL$V_IS                      = 0000001A    D
PTE$C_NA                      = 00000000    D
PTE$C_UREW                    = 68000000    D
PTE$C_URKW                    = 70000000    D
PTE$C_URSW                    = 60000000    D
PTE$C_UW                      = 20000000    D
PTE$M_IO                      = 00100000    D
PTE$M_MODIFY                  = 04000000    D
PTE$M_OWN                     = 01800000    D
PTE$M_PFN                     = 001FFFFF    D
PTE$M_PROT                    = 78000000    D
PTE$M_VALID                   = 80000000    D
PTE$S_OWN                     = 00000002    D
PTE$V_IO                      = 00000014    D
PTE$V_OWN                     = 00000017    D
PTE$V_VALID                   = 0000001F    D
PZERO                           000007EB R  D   04
RELBUF$_NARGS                 = 00000003    D
RELBUF$_PAGCNT                = 00000004    D
RELBUF$_REGION                = 0000000C    D
RELBUF$_RETADR                = 00000008    D
RELMEM$_NARGS                 = 00000003    D
RELMEM$_PAGCNT                = 00000004    D
RELMEM$_PHYADR                = 00000008    D
RELMEM$_VRTADR                = 0000000C    D
RESERVD                         0000082D R  D   04
RPTEADR                         00000865 RG D   04
RTVAX                           000002F9 R  D   04
SCB$L_ACCESS                    00000020    D
SCB$L_ARITH                     00000034    D
SCB$L_BREAK                     0000002C    D
SCB$L_CHME                      00000044    D
SCB$L_CHMK                      00000040    D
SCB$L_CHMS                      00000048    D
SCB$L_CHMU                      0000004C    D
SCB$L_COMPAT                    00000030    D
SCB$L_KNLSTK                    00000008    D
SCB$L_MACHCHK                   00000004    D
SCB$L_OPCCUS                    00000014    D
SCB$L_OPCDEC                    00000010    D
SCB$L_POWER                     0000000C    D
SCB$L_RADRMOD                   0000001C    D
SCB$L_ROPRAND                   00000018    D
SCB$L_RXDB                      000000F8    D
SCB$L_SFTLVL1                   00000084    D
SCB$L_SFTLVL10                  000000A8    D
SCB$L_SFTLVL11                  000000AC    D
SCB$L_SFTLVL12                  000000B0    D
SCB$L_SFTLVL13                  000000B4    D
SCB$L_SFTLVL14                  000000B8    D
SCB$L_SFTLVL15                  000000BC    D
SCB$L_SFTLVL2                   00000088    D
SCB$L_SFTLVL3                   0000008C    D
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SCB$L_SFTLVL4                     00000090    D
SCB$L_SFTLVL5                     00000094    D
SCB$L_SFTLVL6                     00000098    D
SCB$L_SFTLVL7                     0000009C    D
SCB$L_SFTLVL8                     000000A0    D
SCB$L_SFTLVL9                     000000A4    D
SCB$L_TBIT                        00000028    D
SCB$L_TIMER                       000000C0    D
SCB$L_TRANSL                      00000024    D
SCB$L_TXDB                        000000FC    D
SCB$L_VM                          00000038    D
SCB$L_ZERO                        00000000    D
SCB_UNKINT                        ********  X   00
SEP_FUNCTIONAL                  = 00000002    D
SEP_REPAIR                      = 00000003    D
SET                               00000831 R  D  04
SETPRT$_ACMODE                  = 0000000C    D
SETPRT$_INADR                   = 00000004    D
SETPRT$_NARGS                   = 00000005    D
SETPRT$_PROT                    = 00000010    D
SETPRT$_PRVPRT                  = 00000014    D
SETPRT$_RETADR                  = 00000008    D
SETPRT_XIT                        000007EA R  D  04
SIZ...                          = 00000001    D
SS$_ACCVIO                      = 0000000C    D
SS$_ILLPAGCNT                   = 000000FC    D
SS$_LENVIO                      = 0000018C    D
SS$_NORMAL                      = 00000001    D
SS$_PAGOWNVIO                   = 000001EC    D
SS$_RESIGNAL                    = 00000918    D
SS$_VASFULL                     = 00000244    D
SSTKPTR                           ********  X   00
STACKPROT                         0000035E R  D  04
STACK_BASE                        ********  X   00
SYMTAB_HI                         ********  X   00
SYS$UNWIND                        ********  X   00
SYSTEM                            00000817 R  D  04
T_INSFMEM                         00000007 R  D  03
UNMAP_BLK                         000009CD R  D  04
UNMAP_DEBUGGER                    0000094E RG D  04
USTKPTR                           ********  X   00
XDS$INIT                        = 00000000  G D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000FE70 (65136.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
WORK	0000001D (29.)	02 (2.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC LONG
DATA	0000003E (62.)	03 (3.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC LONG
CODE	000009E9 (2537.)	04 (4.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$ARGS	=00000005	269 (1)	247 (1) 253 (1) 254 (1) 256 (1) 257 (1) 261 (1) 269 (1)
$$N	=00000002	489 (1)	489 (1)
$$T1	=00000018	269 (1)	247 (1) 253 (1) 254 (1) 256 (1) 257 (1) 261 (1) 269 (1)
$ER	=00000002	1254 (11)	#-1254 (11)
$MODULE	00000000-R	340 (1)	1254 (11)
ACCESSABLE	00000323-R	728 (3)	413 (1) 428 (1)
A_P1BUFPTE	00000004-R	300 (1)	#-1030 (8) #-1200 (10) 318 (1) #-611 (1) #-884 (6)
A_P1BUFVA	00000008-R	301 (1)	#-1032 (8) #-1202 (10) 319 (1) #-602 (1) #-609 (1)
A_SPTEND	0000000C-R	302 (1)	#-1036 (8) #-1205 (10) 320 (1) #-574 (1) #-899 (6)
BIT...	=00000015	268 (1)	244 (1) 245 (1) 251 (1) 252 (1) 259 (1) 268 (1)
BIT0	=00000001	248 (1)	
BIT1	=00000002	248 (1)	
BIT10	=00000400	248 (1)	
BIT11	=00000800	248 (1)	
BIT12	=00001000	248 (1)	
BIT13	=00002000	248 (1)	
BIT14	=00004000	248 (1)	
BIT15	=00008000	248 (1)	
BIT16	=00010000	248 (1)	
BIT17	=00020000	248 (1)	
BIT18	=00040000	248 (1)	
BIT19	=00080000	248 (1)	
BIT2	=00000004	248 (1)	
BIT20	=00100000	248 (1)	
BIT21	=00200000	248 (1)	
BIT22	=00400000	248 (1)	
BIT23	=00800000	248 (1)	
BIT24	=01000000	248 (1)	
BIT25	=02000000	248 (1)	
BIT26	=04000000	248 (1)	
BIT27	=08000000	248 (1)	
BIT28	=10000000	248 (1)	
BIT29	=20000000	248 (1)	
BIT3	=00000008	248 (1)	
BIT30	=40000000	248 (1)	
BIT31	=80000000	248 (1)	
BIT4	=00000010	248 (1)	
BIT5	=00000020	248 (1)	
BIT6	=00000040	248 (1)	
BIT7	=00000080	248 (1)	
BIT8	=00000100	248 (1)	
BIT9	=00000200	248 (1)	
BOOT$A_CCA	00000000-XR		289 (1) #-448 (1) #-856 (6) #-867 (6)
CEP_FUNCTIONAL	=00000000	252 (1)	

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CEP_REPAIR                      =00000001     252    (1)
CMK$MMENABLE                     00000750-R   1432   (14)     1429   (14)
CMK$SETPRT                       0000078F-R   1493   (16)     1490   (16)
CMK$_APBOOT                     =00000004     244    (1)
CMK$_ASTEXIT                    =00000000     244    (1)
CMK$_CANTIM                     =0000000B     244    (1)
CMK$_HIBER                      =00000007     244    (1)
CMK$_INITSCB                    =00000008     244    (1)
CMK$_LAST                       =0000000E     244    (1)
CMK$_MMENABLE                   =00000003     244    (1)     #-1429   (14)
CMK$_RCONSOLE                   =00000001     244    (1)
CMK$_REFRESH                    =00000005     244    (1)
CMK$_SCHDWK                     =00000006     244    (1)
CMK$_SETIMR                     =0000000C     244    (1)
CMK$_SETIPL                     =00000009     244    (1)
CMK$_SETPRT                     =0000000D     244    (1)     #-1490   (16)
CMK$_SGIPR                      =0000000A     244    (1)
CMK$_TCONSOLE                   =00000002     244    (1)
CNTREG$_ACMODE                  =0000000C     247    (1)
CNTREG$_NARGS                   =00000004     247    (1)
CNTREG$_PAGCNT                  =00000004     247    (1)     #-1188   (10)   #-1266   (11)
CNTREG$_REGION                  =00000010     247    (1)     #-1157   (10)   #-1164   (10)   #-1218   (11)
CNTREG$_RETADR                  =00000008     247    (1)     #-1281   (11)   #-1285   (11)
CNTREG$_VA                      =00000014     332    (1)     #-1185   (10)   #-1189   (10)   #-1237   (11)
CRD$EXPREG                       0000048F-R   988    (8)
DEBUG_HI                         00000000-XR                  #-1782   (22)   #-1805   (23)     282    (1)
DEBUG_LO                         00000000-XR                  #-1721   (20)   #-1722   (20)   #-1727   (20)   #-1755   (21)
                                                              #-1758   (21)   #-1781   (22)   #-1803   (23)     282    (1)
DS$AQ_SYSSRV                     00000000-XR                    276    (1)    #-526    (1)
DS$A_PRGBGN                      00000000-XR                    281    (1)     848     (6)
DS$GA_LASTADR                    00000000-XR                    276    (1)    #-613    (1)   #-862    (6)   #-990    (8)
DS$GB_MM_ENB                     0000001C-R   311    (1)     #-1386   (13)
DS$GB_SYSTYPE                    00000000-XR                    287    (1)    #-398    (1)
DS$GL_ACTUAL_MEMSIZE             00000014-R   305    (1)     #-467    (1)
DS$GL_BUFCNT                     00000000-XR                    277    (1)     900     (6)
DS$GL_FLAGS                      00000000-XR                    281    (1)
DS$GL_MEMSIZE                    00000010-R   303    (1)     323    (1)    #-481    (1)   #-536    (1)
DS$GL_SET_MEMSIZE                00000018-R   308    (1)     #-404    (1)   #-468    (1)
DS$GQ_PHYADR                     00000000-XR                  #-1016   (8)    #-1068   (8)   #-1069   (8)   #-1071   (8)
                                                              278    (1)
DS$K_ERROR                      =00000002     251    (1)
DS$K_NORMAL                     =00000001     251    (1)
DS$K_PRGSIZ                      00000000-XR                    281    (1)     848     (6)
DS$K_PRINTB                     =00000002     259    (1)
DS$K_PRINTF                     =00000001     259    (1)     #-489    (1)
DS$K_PRINTI                     =00000000     259    (1)
DS$K_PRINTX                     =00000003     259    (1)
DS$K_SEVERE                     =00000004     251    (1)
DS$K_SUBSYS                     =00000066     251    (1)     251    (1)
DS$K_TYPE_ABORT_PROGRAM         =00000014     259    (1)
DS$K_TYPE_ABORT_TEST            =00000013     259    (1)
DS$K_TYPE_COMMAND_ERR           =00000015     259    (1)
DS$K_TYPE_COMMAND_OUT           =00000016     259    (1)
DS$K_TYPE_CRD_AUTOTEST          =0000001A     259    (1)
DS$K_TYPE_DS_PROMPT             =00000001     259    (1)
DS$K_TYPE_DS_START              =0000001D     259    (1)
DS$K_TYPE_ERRDEV                =00000008     259    (1)
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DS$K_TYPE_ERRHARD              =00000006     259    (1)
DS$K_TYPE_ERROR_BODY           =00000009     259    (1)
DS$K_TYPE_ERROR_END            =0000000A     259    (1)
DS$K_TYPE_ERRPREP              =0000001B     259    (1)
DS$K_TYPE_ERRSOFT              =00000007     259    (1)
DS$K_TYPE_ERRSUP               =00000004     259    (1)
DS$K_TYPE_ERRSYS               =00000005     259    (1)
DS$K_TYPE_ERR_HALT             =0000000D     259    (1)
DS$K_TYPE_EXCEPTION            =0000000C     259    (1)
DS$K_TYPE_EXCEPTION_HEAD       =0000000B     259    (1)
DS$K_TYPE_FIRST_PASS           =00000011     259    (1)
DS$K_TYPE_GENERAL              =00000000     259    (1)
DS$K_TYPE_GENERAL_ERROR        =00000003     259    (1)    #-489    (1)
DS$K_TYPE_NO_TESTS             =00000012     259    (1)
DS$K_TYPE_PARAM_ERROR          =0000001C     259    (1)
DS$K_TYPE_PROGRAM_END          =00000010     259    (1)
DS$K_TYPE_PROGRAM_INFO         =00000017     259    (1)
DS$K_TYPE_PROGRAM_START        =0000000F     259    (1)
DS$K_TYPE_QIO_INVADP           =00000024     259    (1)
DS$K_TYPE_QIO_NODRIVER         =00000022     259    (1)
DS$K_TYPE_QIO_WRONGVER         =00000023     259    (1)
DS$K_TYPE_SCRIPT_ECHO          =00000021     259    (1)
DS$K_TYPE_SCRIPT_PNF           =0000001E     259    (1)
DS$K_TYPE_SCRIPT_PROMPT        =00000020     259    (1)
DS$K_TYPE_SCRIPT_SKIP          =0000001F     259    (1)
DS$K_TYPE_SEQUENCE_ERROR       =00000019     259    (1)
DS$K_TYPE_START_ERR            =00000018     259    (1)
DS$K_TYPE_START_LIST           =00000025     259    (1)
DS$K_TYPE_SUMMARY              =0000000E     259    (1)
DS$K_TYPE_USER_PROMPT          =00000002     259    (1)
DS$K_WARNING                   =00000000     251    (1)
DS$M_ABRTFLG                   =00000040     245    (1)
DS$M_BADTIME                   =00100000     245    (1)
DS$M_BATCH                     =00400000     245    (1)
DS$M_BRKCLR                    =00001000     245    (1)
DS$M_BRKPT                     =00000800     245    (1)
DS$M_CHARFLG                   =00000100     245    (1)
DS$M_CMDFLG                    =00000080     245    (1)
DS$M_CTRLC                     =00000001     245    (1)
DS$M_CTRLO                     =00010000     245    (1)
DS$M_DEVFLG                    =00000200     245    (1)
DS$M_DISABLCC                  =01000000     245    (1)
DS$M_DONFLG                    =00002000     245    (1)
DS$M_ERRFLG                    =00000010     245    (1)
DS$M_EXCEPT                    =00080000     245    (1)
DS$M_EXETST                    =00040000     245    (1)
DS$M_HLTFLG                    =00000008     245    (1)
DS$M_LODFLG                    =00000002     245    (1)
DS$M_MEMMGT                    =00008000     245    (1)
DS$M_NI                        =04000000     245    (1)
DS$M_OUTPUT                    =00800000     245    (1)
DS$M_RUBFLG                    =00000020     245    (1)
DS$M_SCRIPT                    =00200000     245    (1)
DS$M_SETIMR                    =02000000     245    (1)
DS$M_STRFLG                    =00000004     245    (1)
DS$M_SUBT                      =00004000     245    (1)
DS$M_SYSFLG                    =00000400     245    (1)
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DS$M_TIMED                  =02000000     245    (1)
DS$M_TIMED_OUT              =08000000     245    (1)
DS$M_TIMRON                 =00020000     245    (1)
DS$V_ABRTFLG                =00000006     245    (1)
DS$V_BADTIME                =00000014     245    (1)
DS$V_BATCH                  =00000016     245    (1)
DS$V_BRKCLR                 =0000000C     245    (1)
DS$V_BRKPT                  =0000000B     245    (1)
DS$V_CHARFLG                =00000008     245    (1)
DS$V_CMDFLG                 =00000007     245    (1)
DS$V_CTRLC                  =00000000     245    (1)
DS$V_CTRLO                  =00000010     245    (1)
DS$V_DEVFLG                 =00000009     245    (1)
DS$V_DISABLCC               =00000018     245    (1)
DS$V_DONFLG                 =0000000D     245    (1)
DS$V_ERRFLG                 =00000004     245    (1)
DS$V_EXCEPT                 =00000013     245    (1)
DS$V_EXETST                 =00000012     245    (1)
DS$V_HLTFLG                 =00000003     245    (1)
DS$V_LODFLG                 =00000001     245    (1)
DS$V_MEMMGT                 =0000000F     245    (1)
DS$V_NI                     =0000001A     245    (1)
DS$V_OUTPUT                 =00000017     245    (1)
DS$V_RUBFLG                 =00000005     245    (1)
DS$V_SCRIPT                 =00000015     245    (1)
DS$V_SETIMR                 =00000019     245    (1)
DS$V_STRFLG                 =00000002     245    (1)
DS$V_SUBT                   =0000000E     245    (1)
DS$V_SYSFLG                 =0000000A     245    (1)
DS$V_TIMED                  =00000019     245    (1)
DS$V_TIMED_OUT              =0000001B     245    (1)
DS$V_TIMRON                 =00000011     245    (1)
DS$_AP_NORMAL_BREAK         =00660150     251    (1)
DS$_ARITH                   =006600D0     251    (1)
DS$_ASBE                    =00660118     251    (1)
DS$_BADLINK                 =006600F0     251    (1)
DS$_BADTYPE                 =006600E8     251    (1)
DS$_BIIC                    =00660120     251    (1)
DS$_CHME                    =006600A8     251    (1)
DS$_CHMK                    =006600E0     251    (1)
DS$_DEVNAME                 =00660108     251    (1)
DS$_ERROR                   =00660002     251    (1)
DS$_FHWE                    =00660068     251    (1)
DS$_FRAGBUF                 =00660080     251    (1)    #-1271    (11)
DS$_ICBUSY                  =006600C8     251    (1)
DS$_ICERR                   =006600C0     251    (1)
DS$_IHWE                    =00660060     251    (1)
DS$_ILLCHAR                 =00660018     251    (1)
DS$_ILLPAGCNT               =00660078     251    (1)
DS$_ILLUNIT                 =00660100     251    (1)
DS$_INIT_FAIL               =00660140     251    (1)
DS$_INSFMEM                 =00660050     251    (1)
DS$_INVCPU                  =00660130     251    (1)
DS$_IPL2HI                  =006600B8     251    (1)
DS$_IVADDR                  =00660040     251    (1)
DS$_IVVECT                  =00660038     251    (1)
DS$_KRNLSTK                 =00660090     251    (1)
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DS$_LOGIC                       =00660070      251     (1)
DS$_MCHK                        =00660088      251     (1)     #-739    (3)
DS$_MEM_ALLOC_ERR               =00660138      251     (1)
DS$_MMOFF                       =00660058      251     (1)
DS$_NEEDUNIT                    =006600F8      251     (1)
DS$_NODE                        =00660128      251     (1)
DS$_NOPCS                       =00660110      251     (1)
DS$_NORMAL                      =00660001      251     (1)
DS$_NOSUPPORT                   =006600B1      251     (1)
DS$_NOTALLOWMP                  =00660148      251     (1)     #-1336   (12)   #-1391   (13)   #-1440   (14)
DS$_NOTDON                      =00660030      251     (1)
DS$_NOTIMP                      =006600B0      251     (1)       251    (1)
DS$_NULLSTR                     =00660010      251     (1)
DS$_OVERFLOW                    =00660008      251     (1)
DS$_POWER                       =00660098      251     (1)
DS$_PROGERR                     =00660020      251     (1)     #-1504   (16)
DS$_SEVERE                      =00660004      251     (1)
DS$_TRANSL                      =006600A0      251     (1)
DS$_TRUNCATE                    =00660028      251     (1)
DS$_UNEXPINT                    =006600D8      251     (1)
DS$_UNSUPPDEV                   =00660158      251     (1)
DS$_VASFULL                     =00660048      251     (1)
DS$_WARNING                     =00660000      251     (1)     #-1385   (13)     251    (1)
DSA$AT_APTTXT                    0000FA00                      #-860    (6)
DSA$GL_FLAGS                     0000FE00                       1715    (20)    1754    (21)
DSA$GL_SID                       0000FE14                      #-1632   (18)   #-445    (1)    #-584    (1)    #-653    (2)
                                                               #-864    (6)
DSA$V_USER                      =0000001C                      #-1714   (20)   #-1753   (21)
DSR$CHECKLOAD                    00000000-XR                    284    (1)      849    (6)
DSR$MMENABLE                     0000073D-R     1428    (14)   #-1333   (12)   #-1388   (13)
DSR$SETIMR_INI                   00000000-XR                    277    (1)
DSX$FREEDBGSYM                   0000090B-R     1751    (21)
DSX$MAPDBGBLOCK                  000008BD-R     1712    (20)
DSX$MMOFF                        00000717-R     1384    (13)
DSX$MMOFF_X                      0000073C-R     1394    (13)   #-1387   (13)   #-1392   (13)
DSX$MMON                         000006FD-R     1331    (12)
DSX$MMON_X                       00000716-R     1339    (12)   #-1337   (12)
DSX$PRINT                        00000000-XR                    278    (1)      489    (1)
DS_ERRSUP                        00000000-XR                    1254   (11)     278    (1)
ENV$M_DOMAIN                    =00000002      252     (1)
ENV$M_LEVEL                     =00000001      252     (1)
ENV$M_SUPER                     =000003FC      252     (1)
ENV$S_DOMAIN                    =00000001      252     (1)
ENV$S_LEVEL                     =00000001      252     (1)
ENV$S_SUPER                     =00000008      252     (1)
ENV$V_DOMAIN                    =00000001      252     (1)       252    (1)
ENV$V_LEVEL                     =00000000      252     (1)       252    (1)
ENV$V_SUPER                     =00000002      252     (1)
ENV$_CPU                        =00000000      252     (1)       252    (1)
ENV$_FUNCTIONAL                 =00000000      252     (1)       252    (1)
ENV$_REPAIR                     =00000001      252     (1)       252    (1)
ENV$_SUPER                      =00000001      252     (1)
ENV$_SYSTEM                     =00000001      252     (1)       252    (1)
ESTKPTR                          00000000-XR                    280    (1)    #-796    (4)
EXE$CNTREG                       000005C7-R     1154    (10)
EXE$CNTREG_X                     000006FC-R     1287    (11)   #-1282   (11)
EXE$EXPREG                       000004AC-R     995     (8)
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EXE$EXPREG_X                     000005C6-R   1082   (8)     #-1006   (8)     #-1025   (8)     #-1073   (8)
EXE$SETPRT                       0000077A-R   1488   (16)
EXPREG$_ACMODE                  =0000000C     261    (1)
EXPREG$_NARGS                   =00000004     261    (1)
EXPREG$_PAGCNT                  =00000004     261    (1)     #-1003   (8)
EXPREG$_PTE_OWNER_CODE          =00000014     331    (1)     #-1052   (8)
EXPREG$_REGION                  =00000010     261    (1)     #-1018   (8)     #-1048   (8)     #-1075   (8)
EXPREG$_RETADR                  =00000008     261    (1)     #-1072   (8)     #-1081   (8)
EXPREG_COMMON                    000004BC-R   1000   (8)     #-993    (8)
GETBUF$_NARGS                   =00000004     253    (1)
GETBUF$_PAGCNT                  =00000004     253    (1)
GETBUF$_PHYADR                  =0000000C     253    (1)
GETBUF$_REGION                  =00000010     253    (1)
GETBUF$_RETADR                  =00000008     253    (1)
GETMEM$_NARGS                   =00000003     254    (1)
GETMEM$_PAGCNT                  =00000004     254    (1)
GETMEM$_PHYADR                  =00000008     254    (1)
GETMEM$_VRTADR                  =0000000C     254    (1)
INI$RDONLY                       000009E8-R   1879   (24)
INI$WRITABLE                     000009E8-R   1880   (24)
IO$GQ_PHYSICAL                   00000000-XR                  279    (1)      551    (1)     #-566    (1)     #-592    (1)
ISTKPTR                          00000000-XR                  280    (1)    #-793    (4)
KSTKPTR                          00000000-XR                  280    (1)
K_P1PAGES                       =0000007E     273    (1)     1031    (8)      1201   (10)     #-1202   (10)    #-606    (1)
                                                            #-883    (6)
L$A_LASTADR                      00000214                     852    (6)    #-853    (6)
L_POLEN                          00000000-R   299    (1)    #-1194   (10)     317    (1)     #-493    (1)     #-877    (6)
                                                            #-991    (8)    #-998    (8)
MAP$IOSPACE                      00000000-XR                  275    (1)      612    (1)
MAPFREE                          000003CF-R   846    (6)     618    (1)
MAPMEM                           00000000-R   388    (1)
MAPMEM$IOSPACE                   00000297-R   652    (2)    #-608    (1)    #-680    (2)
MAP_BLK                          00000975-R   1824   (24)    1724   (20)     1783   (22)
MAP_DEBUGGER                     00000935-R   1779   (22)
MEMPOOL$INIT                     00000000-XR                  275    (1)      615    (1)
MMG$GL_SPTBASE                   00000000-XR                #-1035   (8)    #-1206   (10)     276    (1)     #-524    (1)
                                                            #-893    (6)
MMG$IOLOCK                       000008AF-R   1682   (19)
MMG$UNLOCK                       000008B9-R   1687   (19)    #-1685   (19)
MP$GR_BOOTED_PROCESSORS          00000000-XR                #-1436   (14)     285    (1)
POPT_BASE                        00000000-XR                  1187   (10)     1196   (10)     1245   (11)     275    (1)
                                                              401   (1)      434    (1)    #-540    (1)     #-591    (1)
                                                              781   (4)    #-872    (6)    #-875    (6)      992    (8)
                                                              997   (8)
PFN$AB_STATE                    =00000010-R   323    (1)
PFN$AB_TYPE                     =00000000     324    (1)
PFN$AL_BAK                      =00000008-R   319    (1)
PFN$AL_PTE                      =00000004-R   318    (1)
PFN$AW_BLINK                    =00000000     322    (1)
PFN$AW_FLINK                    =00000000     321    (1)
PFN$AW_REFCNT                   =0000000C-R   320    (1)
PFN$AW_SWPVBN                   =00000000-R   317    (1)
PONE                             00000801-R   1545   (17)    1513   (16)
PPA_CONSRV4                     =20040010     333    (1)    #-402    (1)
PR$_IPL                         =00000012                   #-780    (4)    #-804    (4)
PR$_MAPEN                       =00000038                  #-1434   (14)    #-1442   (14)
PR$_POBR                        =00000008                  #-1626   (18)    #-541    (1)    #-591    (1)
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PR$_P0LR                =00000009                       #-1532  (17)    #-494   (1)
PR$_P1BR                =0000000A                       #-1628  (18)    #-559   (1)     #-590   (1)     #-656   (2)
                                                        #-684   (2)
PR$_P1LR                =0000000B                       #-1547  (17)    #-554   (1)     #-586   (1)
PR$_SBR                 =0000000C                       #-1644  (18)    #-523   (1)     #-659   (2)
PR$_SID_TYPRTUV2         00000000-XR                    #-1632  (18)      286   (1)     #-584   (1)     #-653   (2)
PR$_SLR                 =0000000D                       #-1562  (17)    #-576   (1)
PR$_SYS_TYP900           00000000-XR                      288   (1)     #-399   (1)
PR$_SYS_TYP9CC           00000000-XR                      289   (1)     #-446   (1)     #-865   (6)
PR$_TBIA                =00000039                       #-1433  (14)
PR$_TBIS                =0000003A                       #-1598  (17)
PSL$V_IS                =0000001A       244     (1)     #-1429  (14)    #-1490  (16)
PTE$C_NA                =00000000                         498   (1)       528   (1)     #-605   (1)       668   (2)
                                                        #-789   (4)
PTE$C_UREW              =68000000                       #-795   (4)
PTE$C_URKW              =70000000                         537   (1)       665   (2)       689   (2)     #-792   (4)
PTE$C_URSW              =60000000                       #-798   (4)
PTE$C_UW                =20000000                       #-1050  (8)     #-1844  (24)      407   (1)       438   (1)
                                                          452   (1)       457   (1)     #-801   (4)
PTE$M_IO                =00100000       268     (1)
PTE$M_MODIFY            =04000000                       #-1249  (11)
PTE$M_OWN               =01800000                       #-1251  (11)    #-1259  (11)    #-1871  (24)      407   (1)
                                                          438   (1)       452   (1)       457   (1)       528   (1)
                                                          537   (1)     #-561   (1)     #-605   (1)       665   (2)
                                                          668   (2)       689   (2)     #-871   (6)     #-874   (6)
PTE$M_PFN               =001FFFFF                       #-1014  (8)     #-1244  (11)
PTE$M_PROT              =78000000                       #-1053  (8)     #-1250  (11)    #-1845  (24)    #-491   (1)
                                                        #-675   (2)     #-691   (2)     #-784   (4)
PTE$M_VALID             =80000000                       #-1259  (11)    #-1871  (24)      407   (1)       438   (1)
                                                          457   (1)       528   (1)       537   (1)       665   (2)
                                                        #-675   (2)       689   (2)     #-691   (2)     #-871   (6)
                                                        #-874   (6)
PTE$S_OWN               =00000002                       #-1049  (8)     #-1217  (11)    #-1843  (24)    #-895   (6)
PTE$V_IO                =00000014       268     (1)
PTE$V_OWN               =00000017                       #-1049  (8)     #-1217  (11)    #-1843  (24)    #-895   (6)
PTE$V_VALID             =0000001F                       #-1047  (8)     #-1833  (24)    #-1842  (24)
PZERO                    000007EB-R     1530    (17)      1513  (16)
RELBUF$_NARGS           =00000003       256     (1)
RELBUF$_PAGCNT          =00000004       256     (1)
RELBUF$_REGION          =0000000C       256     (1)
RELBUF$_RETADR          =00000008       256     (1)
RELMEM$_NARGS           =00000003       257     (1)
RELMEM$_PAGCNT          =00000004       257     (1)
RELMEM$_PHYADR          =00000008       257     (1)
RELMEM$_VRTADR          =0000000C       257     (1)
RESERVD                  0000082D-R     1576    (17)      1513  (16)
RPTEADR                  00000865-R     1623    (18)    #-1587  (17)      1684  (19)      1832  (24)      1841  (24)
                                                          1870  (24)      610   (1)
RTVAX                    000002F9-R     683     (2)     #-654   (2)
SCB_UNKINT               00000000-XR                      280   (1)
SEP_FUNCTIONAL          =00000002       252     (1)
SEP_REPAIR              =00000003       252     (1)
SET                      00000831-R     1585    (17)    #-1537  (17)    #-1552  (17)    #-1567  (17)
SETPRT$_ACMODE          =0000000C       269     (1)
SETPRT$_INADR           =00000004       269     (1)     #-1499  (16)    #-1520  (16)
SETPRT$_NARGS           =00000005       269     (1)
SETPRT$_PROT            =00000010       269     (1)     #-1596  (17)
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SETPRT$_PRVPRT          =00000014     269    (1)    #-1588   (17)   #-1592   (17)
SETPRT$_RETADR          =00000008     269    (1)    #-1494   (16)   #-1507   (16)   #-1518   (16)   #-1521   (16)
                                                    #-1599   (17)
SETPRT_XIT               000007EA-R   1522   (16)   #-1505   (16)   #-1515   (16)   #-1519   (16)
SIZ...                  =00000001     268    (1)      245    (1)      252    (1)      268    (1)
SS$_ACCVIO              =0000000C                   #-1577   (17)
SS$_ILLPAGCNT           =000000FC                   #-1005   (8)
SS$_LENVIO              =0000018C                   #-1535   (17)   #-1550   (17)   #-1565   (17)
SS$_NORMAL              =00000001                   #-1013   (8)    #-1156   (10)   #-1443   (14)   #-1603   (17)
                                                    #-1688   (19)   #-734    (3)
SS$_PAGOWNVIO           =000001EC                   #-1279   (11)
SS$_RESIGNAL            =00000918                   #-746    (3)
SS$_VASFULL             =00000244                   #-1008   (8)    #-1065   (8)
SSTKPTR                  00000000-XR                  280    (1)    #-799    (4)
STACKPROT                0000035E-R   779    (4)      617    (1)      904    (6)
STACK_BASE               00000000-XR                  280    (1)    #-782    (4)    #-787    (4)
SYMTAB_HI                00000000-XR                #-1756   (21)   #-1758   (21)     283    (1)
SYS$UNWIND               00000000-XR                  277    (1)      743    (3)
SYSTEM                   00000817-R   1560   (17)     1513   (16)
T_INSFMEM                00000007-R   342    (1)      489    (1)
UNMAP_BLK                000009CD-R   1867   (24)     1757   (21)     1807   (23)
UNMAP_DEBUGGER           0000094E-R   1801   (23)
USTKPTR                  00000000-XR                  280    (1)    #-785    (4)    #-802    (4)
XDS$INIT                =00000000     325    (1)

                                        +-------------------------+
                                        ! Performance indicators !
                                        +-------------------------+

Phase                   Page faults    CPU Time       Elapsed Time
-----                   -----------    --------       ------------
Initialization                   25    00:00:00.01    00:00:00.20
Command processing              927    00:00:00.30    00:00:01.04
Pass 1                         1025    00:00:04.02    00:00:06.99
Symbol table sort                 0    00:00:00.39    00:00:00.38
Pass 2                          407    00:00:01.34    00:00:02.75
Symbol table output              21    00:00:00.07    00:00:00.19
Psect synopsis output             3    00:00:00.01    00:00:00.01
Cross-reference output            8    00:00:00.31    00:00:00.51
Assembler run totals           2418    00:00:06.45    00:00:12.07

The working set limit was 2900 pages.
244061 bytes (477 pages) of virtual memory were used to buffer the intermediate code.
There were 70 pages of symbol table space allocated to hold 1304 non-local and 103 local symbols.
1883 source lines were read in Pass 1, producing 114 object records in Pass 2.
44 pages of virtual memory were used to define 37 macros.
```

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              15
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                 6
SYS$COMMON:[SYSLIB]LIB.MLB;2                            5
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                 0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1               0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1              0
SYS$COMMON:[SYSLIB]LIB.MLB;2                            0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       14
SYS$COMMON:[SYSLIB]STARLET.MLB;2                        0
TOTALS (all libraries)                                 40

1437 GETS were required to define 40 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element MPDUMMY.B32
;    0002  0      ! *2    12-NOV-1987 10:52:41 GEARIN "FIXED EMPTY EXPRESSION PROBLEM"
;    0003  0      ! *1     6-FEB-1986 15:20:45 DS ""
;    0004  0      ! DEC/CMS REPLACEMENT HISTORY, Element MPDUMMY.B32
;    0005  0      %TITLE '*** - MPDUMMY - ENTRY POINTS FOR DUMMY MULTI-PROC ROUTINES'
;    0006  0      MODULE MPDUMMY(                    !
;    0007  0                     IDENT = '8.0',
;    0008  0                     OPTLEVEL = 3,
;    0009  0                     ADDRESSING_MODE (EXTERNAL = LONG_RELATIVE,
;    0010  0                     NONEXTERNAL = LONG_RELATIVE)
;    0011  0                     ) =
;    0012  0
;    0013  0      !++
;    0014  0      !                          COPYRIGHT (c) 1985 BY
;    0015  0      !       DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS
;    0016  0      !
;    0017  0      ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE AND MAY BE USED AND COPIED
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;    0020  0      ! COPIES THEREOF MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY
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;    0022  0      ! TRANSFERRED.
;    0023  0      !
;    0024  0      ! THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
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;    0028  0      ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
;    0029  0      ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
;    0030  0      !-
;    0031  0
;    0032  0
;    0033  0
;    0034  0      !++
;    0035  0      ! Facility:
;    0036  0      !
;    0037  0      !       Diagnostic Supervisor
;    0038  0      !
;    0039  0      ! Abstract:
;    0040  0      !
;    0041  0      !       This module contains dummy multi-processing routines/entry points
;    0042  0      !       to handle calls from non-multi-processing supervisors.
;    0043  0      !
;    0044  0      ! Environment:
;    0045  0      !
;    0046  0      !
;    0047  0      !
;    0048  0      ! Author:
;    0049  0      !
;    0050  0      !       Domenic Andella,         6-Dec-1984
;    0051  0      !
;    0052  0      ! Creation Date:
;    0053  0      !
;    0054  0      !        6-Dec-1984
;    0055  0      !
;    0056  0      ! Version:
;    0057  0      !
```

```
;    0058  0      !       8.0
;    0059  0      !
;    0060  0      ! Modified By:
;    0061  0      !
;    0062  0      !--
```

```
;    0064  0     %SBTTL ' Declarations'
;    0065  1     BEGIN
;    0066  1
;    0067  1     %SBTTL  'Libraries'
;    0068  1     LIBRARY '$Diag';
;    0069  1
;    0070  1     LIBRARY '$DS';
;    0071  1
;    0072  1     LIBRARY 'Sys$Library:Lib';
```

```
;    0074  1      GLOBAL
;    0075  1        MP$GL_CONDITION_FLAGS : BITVECTOR [32] INITIAL (0);
;    0076  1
;    0077  1
;    0078  1      ! THIS SYMBOL IS TEMPORARILY COMMENTED OUT UNTIL ALL MP
;    0079  1      ! MODULES ARE INCLUDED ARE ADDED TO MP OPTIONS LIST. IN
;    0080  1      ! ADDITION, SYMBOL MUST BE REMOVED FROM KERNEL.
;    0081  1
;    0082  1       ! MP$GR_BOOTED_PROCESSORS : BITVECTOR [32] INITIAL (0);
;    0083  1
;    0084  1      ! Dummy Routines
;    0085  1      GLOBAL ROUTINE DSX$_INTERLOCK_TEST(LOCAL_TEST,GLOBAL_TEST)=
;    0086  2      BEGIN
;    0087  2        RETURN (1);                                                    !G:2
;    0088  1      END;


                                                    .TITLE  MPDUMMY *** - MPDUMMY - ENTRY POINTS FOR DUMMY
;                                                           MULTI-PR
                                                    .IDENT  \8.0\

                                                    .PSECT  $GLOBAL$,NOEXE,2

                                    00000000  00000 MP$GL_CONDITION_FLAGS::
                                                    .LONG   0                       ;


                                                    .PSECT  $CODE$,NOWRT,2

                                              0000 00000    .ENTRY  DSX$_INTERLOCK_TEST, Save nothing       ; 0085
                                        50    01   D0 00002  MOVL   #1, R0                                  ; 0087
                                                   04 00005  RET                                           ;

; Routine Size:  6 bytes,    Routine Base:  $CODE$ + 0000

;    0089  1
;    0090  1      GLOBAL ROUTINE DSX$BOOTATTACHED(UNIT,SCBADDR)=
;    0091  2      BEGIN
;    0092  2        RETURN (1);                                                  !G:2
;    0093  1      END;


                                              0000 00000    .ENTRY  DSX$BOOTATTACHED, Save nothing          ; 0090
                                        50    01   D0 00002  MOVL   #1, R0                                  ; 0092
                                                   04 00005  RET                                           ;

; Routine Size:  6 bytes,    Routine Base:  $CODE$ + 0006

;    0094  1
;    0095  1      GLOBAL ROUTINE DSX$STARTATTACHED(UNIT,START_ADDR)=
;    0096  2      BEGIN
```

```
;   0097  2       RETURN (1);                                                                                    !G:2
;   0098  1     END;



                                                  0000 00000        .ENTRY  DSX$STARTATTACHED, Save nothing                  ; 0095
                                    50          01  D0 00002        MOVL    #1, R0                                           ; 0097
                                                     04 00005        RET                                                      ;

; Routine Size:  6 bytes,    Routine Base:  $CODE$ + 000C


;   0099  1
;   0100  1     GLOBAL ROUTINE DSX$HALTATTACHED (UNIT) =
;   0101  2     BEGIN
;   0102  2       RETURN (1);                                                                                    !G:2
;   0103  1     END;



                                                  0000 00000        .ENTRY  DSX$HALTATTACHED, Save nothing                   ; 0100
                                    50          01  D0 00002        MOVL    #1, R0                                           ; 0102
                                                     04 00005        RET                                                      ;

; Routine Size:  6 bytes,    Routine Base:  $CODE$ + 0012


;   0104  1
;   0105  1     GLOBAL ROUTINE DSX$SHOWIDLE (BITMAP) =
;   0106  2     BEGIN
;   0107  2       RETURN (1);                                                                                    !G:2
;   0108  1     END;



                                                  0000 00000        .ENTRY  DSX$SHOWIDLE, Save nothing                       ; 0105
                                    50          01  D0 00002        MOVL    #1, R0                                           ; 0107
                                                     04 00005        RET                                                      ;

; Routine Size:  6 bytes,    Routine Base:  $CODE$ + 0018


;   0109  1
;   0110  1     GLOBAL ROUTINE MP$_DEALL_MEMORY : NOVALUE =
;   0111  2     BEGIN
;   0112  2       RETURN (1);                                                                                    !G:2
;   0113  1     END;
```

```
                                                0000 00000          .ENTRY  MP$_DEALL_MEMORY, Save nothing                  ; 0110
                                                  04 00002          RET                                                     ; 0112

; Routine Size:  3 bytes,    Routine Base:  $CODE$ + 001E


;   0114  1
;   0115  1     GLOBAL ROUTINE MP$_GET_PROCESSOR_ID (THIS_PROCESSOR_ID) =
;   0116  2     BEGIN
;   0117  2      .THIS_PROCESSOR_ID = 1; ! For non mp systems, 1 will always be returned for id.
;   0118  1     END;
; INFO#212        L1:0118
; Null expression appears in value-required context




                                                0000 00000          .ENTRY  MP$_GET_PROCESSOR_ID, Save nothing              ; 0115
                          04   BC             01  D0 00002          MOVL    #1, @THIS_PROCESSOR_ID                          ; 0117
                                               50  D4 00006          CLRL    R0                                              ; 0118
                                                  04 00008          RET                                                     ;

; Routine Size:  9 bytes,    Routine Base:  $CODE$ + 0021


;   0119  1
;   0120  1     GLOBAL ROUTINE MP$_STOP_EVERYTHING : NOVALUE =
;   0121  2     BEGIN
;   0122  2       RETURN (1);                                                                          !G:2
;   0123  1     END;




                                                0000 00000          .ENTRY  MP$_STOP_EVERYTHING, Save nothing               ; 0120
                                                  04 00002          RET                                                     ; 0122

; Routine Size:  3 bytes,    Routine Base:  $CODE$ + 002A


;   0124  1
;   0125  1     GLOBAL ROUTINE MP$_ATTACHED_CPU_CHECK : NOVALUE =
;   0126  2     BEGIN
;   0127  2       RETURN (1);                                                                          !G:2
;   0128  1     END;




                                                0000 00000          .ENTRY  MP$_ATTACHED_CPU_CHECK, Save nothing            ; 0125
                                                  04 00002          RET                                                     ; 0127

; Routine Size:  3 bytes,    Routine Base:  $CODE$ + 002D
```

```
;   0129  1
;   0130  1     GLOBAL ROUTINE MP$_PRIMARY_CPU_CHECK : NOVALUE =
;   0131  2     BEGIN
;   0132  2       RETURN (1);                                                   !G:2
;   0133  1     END;



                                        0000 00000          .ENTRY  MP$_PRIMARY_CPU_CHECK, Save nothing          ; 0130
                                          04 00002          RET                                                  ; 0132

; Routine Size:  3 bytes,    Routine Base:  $CODE$ + 0030

;   0134  1
;   0135  1     GLOBAL ROUTINE MP$_RESUME_ATTACHED_PROCESSORS : NOVALUE =
;   0136  2     BEGIN
;   0137  2       RETURN (1);                                                   !G:2
;   0138  1     END;



                                        0000 00000          .ENTRY  -                                            ; 0135
                                                                    MP$_RESUME_ATTACHED_PROCESSORS, Save nothin-;
                                                                    g
                                          04 00002          RET                                                  ; 0137

; Routine Size:  3 bytes,    Routine Base:  $CODE$ + 0033

;   0139  1
;   0140  1     GLOBAL ROUTINE DSX$_SET_INTERLOCK: NOVALUE =
;   0141  2     BEGIN
;   0142  2       RETURN (1);                                                   !G:2
;   0143  1     END;



                                        0000 00000          .ENTRY  DSX$_SET_INTERLOCK, Save nothing             ; 0140
                                          04 00002          RET                                                  ; 0142

; Routine Size:  3 bytes,    Routine Base:  $CODE$ + 0036

;   0144  1
;   0145  1     GLOBAL ROUTINE DSX$_CLEAR_INTERLOCK: NOVALUE =
;   0146  2     BEGIN
;   0147  2       RETURN (1);                                                   !G:2
;   0148  1     END;
```

```
                                        0000 00000        .ENTRY  DSX$_CLEAR_INTERLOCK, Save nothing          ; 0145
                                          04 00002        RET                                                 ; 0147

; Routine Size:  3 bytes,    Routine Base:  $CODE$ + 0039


;   0149  1
;   0150  1     END
;   0151  0     ELUDOM




;                                  PSECT SUMMARY
;
;       Name                    Bytes                          Attributes
;
;  $GLOBAL$                          4  NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  $CODE$                           60  NOVEC,NOWRT,  RD ,  EXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)



Symbol                            Type  Defined  Referenced ...
------------------------------ -------- ----- ----------------
BITMAP                         RoutForm   105
DSX$BOOTATTACHED               GlobRout    90
DSX$HALTATTACHED               GlobRout   100
DSX$SHOWIDLE                   GlobRout   105
DSX$STARTATTACHED              GlobRout    95
DSX$_CLEAR_INTERLOCK           GlobRout   145
DSX$_INTERLOCK_TEST            GlobRout    85
DSX$_SET_INTERLOCK             GlobRout   140
GLOBAL_TEST                    RoutForm    85
LOCAL_TEST                     RoutForm    85
MP$GL_CONDITION_FLAGS          Global      75    75=
MP$_ATTACHED_CPU_CHECK         GlobRout   125
MP$_DEALL_MEMORY               GlobRout   110
MP$_GET_PROCESSOR_ID           GlobRout   115
MP$_PRIMARY_CPU_CHECK          GlobRout   130
MP$_RESUME_ATTACHED_PROCESSORS GlobRout   135
MP$_STOP_EVERYTHING            GlobRout   120
SCBADDR                        RoutForm    90
START_ADDR                     RoutForm    95
THIS_PROCESSOR_ID              RoutForm   115   117a=
UNIT                           RoutForm    90
                               RoutForm    95
                               RoutForm   100
```

CROSS REFERENCE MAP

Line #	Event	File ...
1	Source (start)	DISK$DS:[DS.LOCAL.RELEASE.WORK]MPDUMMY.B32;1
6	Module MPDUMMY	
68	Library #1	DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
70	Library #2	DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
72	Library #3	SYS$COMMON:[SYSLIB]LIB.L32;3
151	Eludom MPDUMMY	

KEY TO REFERENCE TYPE FLAGS

```
.   Fetch
=   Store
c   Routine call
a   Address use
a   Indirect use
e   External, external routine, or external literal declaration
f   Forward or forward routine declaration
h   Condition handler enabling
m   Map declaration
u   Undeclare declaration
```

Library Statistics

File	Symbols Total	Symbols Loaded	Symbols Percent	Pages Mapped	Processing Time
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1	942	0	0	96	00:00.0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1	675	0	0	47	00:00.0
SYS$COMMON:[SYSLIB]LIB.L32;3	21522	0	0	1156	00:00.9

```
; Information:  1
; Warnings:     0
; Errors:       0
```

COMMAND QUALIFIERS

```
;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:MPDUMMY.B32

; Size:          60 code + 4 data bytes
; Run Time:         00:01.5
; Elapsed Time:     00:03.4
; Lines/CPU Min:     5883
; Lexemes/CPU-Min: 15974
; Memory Used:  52 pages
; Compilation Complete
```

Table of contents

(2) 97 DECLARATIONS
(3) 246 TU81 load device initialization
(4) 392 TU81 load driver QIO

```
                     1 ; DEC/CMS REPLACEMENT HISTORY, Element MUBTDRIVR.MAR
                     2 ; *6    15-MAY-1986 15:30:24 MUSE "<no reason given>"
                     3 ; *5    15-MAY-1986 15:27:15 MUSE "<no reason given>"
                     4 ; *4    15-MAY-1986 14:10:27 MUSE "<no reason given>"
                     5 ; *3    13-MAY-1986 15:30:03 MUSE "<no reason given>"
                     6 ; *2    13-MAY-1986 15:17:55 MUSE "<no reason given>"
                     7 ; *1     6-FEB-1986 15:20:47 DS ""
                     8 ; DEC/CMS REPLACEMENT HISTORY, Element MUBTDRIVR.MAR
                     9         .TITLE  MUBTDRIVR - TU81 LOAD DRIVER
                    10         .IDENT  '06-12'
                    11         .DISABLE GBL
                    12 ;
                    13 ;*****************************************************************************
                    14 ;*                                                                           *
                    15 ;*  COPYRIGHT (c) 1978, 1980, 1982, 1983, 1984 BY                            *
                    16 ;*  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.                   *
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                    31 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
                    32 ;*                                                                           *
                    33 ;*                                                                           *
                    34 ;*****************************************************************************
                    35 ;
                    36
                    37 ;++
                    38 ; FACILITY:     VDS
                    39 ;
                    40 ; ABSTRACT:
                    41 ;       This module contains the load driver for the
                    42 ;       TU81 magtape.
                    43 ;
                    44 ; ENVIRONMENT: kernel mode
                    45 ;
                    46 ; AUTHOR:  Marion Baggett
                    47 ;
                    48 ; MODIFIED BY:
                    49 ;
                    50 ;
                    51 ;       01      M. Baggett      VDS 6.10
                    52 ;               Change error reporting for command execution failure.
                    53 ;
                    54 ;       02      M. Baggett      VDS 6.10
                    55 ;               Change ID field in message buffer to tape value.
                    56 ;
                    57 ;       03      M. Baggett      VDS 6.11
```

```
0000   ;                Interchanged the offsets names in the skip record and skip file
0000   ;                sections for marks to skip.
0000   ;
0000   ;        04      M. Baggett      VDS 6.11 Jan-29-1983
0000   ;                Change the skip file section to return a normal code on
0000   ;                detection of tape marks.
0000   ;
0000   ;        05      M. Baggett      VDS 6.11 Feb-23-1983
0000   ;                Changed symbol BTD$K_TU to BTD$K_MU for TU81.
0000   ;
0000   ;        06      M. Baggett      VDS 6.11 June-29-1983
0000   ;                Added GET UNIT STATUS to supply values for ONLINE command.
0000   ;
0000   ;        07      BOB BERGAZZI    6.12    July 18, 1983
0000   ;                Changed b^VALID to W^VALID to resolve truncation errors.
0000   ;
0000   ;        08      M. Baggett      VDS 6.13 Oct 24, 1983
0000   ;                Correct displacement error in ONLINE command packet.
0000   ;                Set CLEAR SERIOUS EXCEPTION bit in several commands.
0000   ;
0000   ;        09      M. BAGGETT      VDS 6.14 Jan 5, 1984
0000   ;                Definition of the internal processors registers are temporarily
0000   ;                defined in this module.
0000   ;
0000   ;        10      M. BAGGETT      VDS 7.1 4-OCT-1984
0000   ;                Change skipfile routine to skip records until tape mark.
0000   ;
0000   ;        11      M. BAGGETT      VDS 7.1 25-OCT-1984
0000   ;                MSCP definitions in library are not defined in program.
0000   ;
0000   ;        12      M. BAGGETT      VDS 7.1 2-NOV-1984
0000   ;                Only init device if error or at BOT. Remove
0000   ;                change [10].
0000   ;                                                                        ;G:2
0000   ;        13      R.E.Muse        13-MAY-1986     VERSION 10.1            ;G:2
0000   ;                installed the TIMEDWAIT macro in place of reference's   ;G:2
0000   ;                to TODR.                                                ;G:2
0000   ;--
```

```
                     0000     97          .SBTTL  DECLARATIONS                                                    ;G:2
                     0000     98                                                                                  ;G:2
                     0000     99 ;+                                                                               ;G:2
                     0000    100 ;       external labels                                                         ;G:2
                     0000    101 ;-                                                                              ;G:2
                     0000    102                                                                                 ;G:2
                     0000    103 .extrn  EXE$GL_UBDELAY,EXE$GL_TENUSEC                                           ;G:2
                     0000    104                                                                                 ;G:2
                     0000    105 ;
                     0000    106 ; INCLUDE FILES:
                     0000    107 ;
                     0000    108
                     0000    109         $BTDDEF                             ; Boot device types
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000    110         $IODEF                              ; I/O function codes
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000    111         $MSCPDEF                            ; MSCP definitions
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000    112         $PTEDEF                             ; Page table entries
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000    113         $RPBDEF                             ; RPB offsets
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000    114         $SSDEF                              ; Status codes
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000    115         $UBADEF                             ; UBA definitions
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000    116         $UBIDEF                             ; 11/750 UBA definitions
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000    117         $VADEF                              ; Virtual addresses
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000    118
                     0000    119 ;
                     0000    120 ; EQUATED SYMBOLS:
                     0000    121 ;
000000B1             0000    122         BTD$K_TM        = 177   ; TEMP
000000B2             0000    123         BTD$K_TS        = 178   ; TEMP
000000B3             0000    124         BTD$K_TF        = 179   ; TEMP
000000B4             0000    125         BTD$K_MU        = 180   ; TEMP                                          [05]
                     0000    126
00000000             0000    127         TUIP    = 0
00000002             0000    128         TUSA    = 2
00000001             0000    129         GO      = 1
00008000             0000    130         OWN     = 1@15
0000000B             0000    131         S1      = 11
0000000E             0000    132         S4      = 14
000001EE             0000    133         UMR     = 494               ; Last-1 UNIBUS Mapping Register
                     0000    134         .MACRO  $PRDEF,$GBL
                     0000    135
```

```
0000    136          $DEFINI PR,$GBL
0000    137
0000    138
0000    139  $EQU    PR$_KSP 0
0000    140  $EQU    PR$_ESP 1
0000    141  $EQU    PR$_SSP 2
0000    142  $EQU    PR$_USP 3
0000    143  $EQU    PR$_ISP 4
0000    144  $EQU    PR$_P0BR        8
0000    145  $EQU    PR$_P0LR        9
0000    146  $EQU    PR$_P1BR        10
0000    147  $EQU    PR$_P1LR        11
0000    148  $EQU    PR$_SBR 12
0000    149  $EQU    PR$_SLR 13
0000    150  $EQU    PR$_PCBB        16
0000    151  $EQU    PR$_SCBB        17
0000    152  $EQU    PR$_IPL 18
0000    153  $EQU    PR$_ASTLVL      19
0000    154  $EQU    PR$_SIRR        20
0000    155  $EQU    PR$_SISR        21
0000    156  $EQU    PR$_ICCS        24
0000    157  $EQU    PR$_NICR        25
0000    158  $EQU    PR$_ICR 26
0000    159  $EQU    PR$_TODR        27
0000    160  $EQU    PR$_RXCS        32
0000    161  $EQU    PR$_RXDB        33
0000    162  $EQU    PR$_TXCS        34
0000    163  $EQU    PR$_TXDB        35
0000    164  $EQU    PR$_ACCS        40
0000    165  $EQU    PR$_ACCR        41
0000    166  $EQU    PR$_MAPEN       56
0000    167  $EQU    PR$_TBIA        57
0000    168  $EQU    PR$_TBIS        58
0000    169  $EQU    PR$_PME 61
0000    170  $EQU    PR$_SID 62
0000    171  $EQU    PR$_TBCHK       63
0000    172  $EQU    PR$V_SID_SN     0
0000    173  $EQU    PR$S_SID_SN     12
0000    174  $EQU    PR$V_SID_PL     12
0000    175  $EQU    PR$S_SID_PL     3
0000    176  $EQU    PR$V_SID_ECO    15
0000    177  $EQU    PR$S_SID_ECO    9
0000    178  $EQU    PR$V_SID_TYPE   24
0000    179  $EQU    PR$S_SID_TYPE   8
0000    180  $EQU    PR$_SID_TYP780  1
0000    181  $EQU    PR$_SID_TYP750  2
0000    182  $EQU    PR$_SID_TYP730  3
0000    183  $EQU    PR$_SID_TYP7VV  4
0000    184  $EQU    PR$_SID_TYPMAX  4
0000    185  $EQU    PR$_WCSA        44
0000    186  $EQU    PR$_WCSD        45
0000    187  $EQU    PR$_SBIFS       48
0000    188  $EQU    PR$_SBIS        49
0000    189  $EQU    PR$_SBISC       50
0000    190  $EQU    PR$_SBIMT       51
0000    191  $EQU    PR$_SBIER       52
0000    192  $EQU    PR$_SBITA       53
```

```
                0000   193  $EQU    PR$_SBIQC       54
                0000   194  $EQU    PR$_CMIERR      23
                0000   195  $EQU    PR$_CSRS        28
                0000   196  $EQU    PR$_CSRD        29
                0000   197  $EQU    PR$_CSTS        30
                0000   198  $EQU    PR$_CSTD        31
                0000   199  $EQU    PR$_TBDR        36
                0000   200  $EQU    PR$_CADR        37
                0000   201  $EQU    PR$_MCESR       38
                0000   202  $EQU    PR$_CAER        39
                0000   203  $EQU    PR$_UBRESET     55
                0000   204  $EQU    PR$_PAMACC      64
                0000   205  $EQU    PR$_PAMLOC      65
                0000   206  $EQU    PR$_CSWP        66
                0000   207  $EQU    PR$_CRBT        67
                0000   208  $EQU    PR$_MCTL1       68
                0000   209  $EQU    PR$_MCTL2       69
                0000   210  $EQU    PR$_MGEN        70
                0000   211  $EQU    PR$_MTBER       71
                0000   212  $EQU    PR$_MEAR        72
                0000   213  $EQU    PR$_MDCR1       73
                0000   214  $EQU    PR$_MEDR        74
                0000   215  $EQU    PR$_MECCR       75
                0000   216
                0000   217          $DEFEND PR,$GBL,DEF
                0000   218
                0000   219          .ENDM   $PRDEF
                0000   220          $PRDEF                                  ; Processor registers
                0000                .SAVE   LOCAL_BLOCK
                0000                .RESTORE
                0000   221
                0000   222 ;
                0000   223 ; OWN STORAGE:
                0000   224 ;
0000000A        0000   225 MSCP$K_OP_SETUC=10
                0000   226 ;
                0000   227 ; Boot driver table entry
                0000   228 ;
                0000   229
            00000000   230 .Psect  Bootdrivr_2,    page    ; Define psect allocation
                0000   231
                0000   232          $BOOT_DRIVER    DEVTYPE = BTD$K_MU,-    ; Device type (TU81)          [05]
                0000   233                          SIZE = TU_DRVSIZ,-      ; Driver size
                0000   234                          ADDR = START,-          ; Driver starting address
                0000   235                          ENTRY = TU_DRIVER       ; Driver entry point
            00000000                    .PSECT  BOOTDRIVR_4
        FFFF    0000                    .WORD   -1
        00B4    0002                    .WORD   BTD$K_MU
00000000        0004                    .LONG   0
000003E3'       0008                    .LONG   TU_DRVSIZ
00000000'       000C                    .LONG   START-$TABLE
00000280'       0010                    .LONG   TU_DRIVER-START
00000000'       0014                    .LONG   -START
            00000000                    .PSECT  BOOTDRIVR_2
                0000   236 ;                           UNIT_INIT = TU_INIT,-   ; Driver unit init entry
                0000   237 ;                           DRIVRNAME = TUPDRVNAME,-; Driver tape name
                0000   238 ;                           AUXDRNAME = PRTDRVNAME  ; Driver port name
```

```
                     0000   239
                     0000   240 START:
                     0000   241 ;TUPDRVNAME:
                     0000   242 ;       .ASCIC  /TUDRIVER.EXE/          ; Tape class driver filename
                     0000   243 ;PRTDRVNAME:
                     0000   244 ;       .ASCIC  /PTDRIVER.EXE/          ; Port driver filename
```

```
                                0000   246          .SBTTL  TU81 load device initialization
                                0000   247
                                0000   248 ;++
                                0000   249 ;
                                0000   250 ; Inputs:
                                0000   251 ;
                                0000   252 ;       R9 --> RPB
                                0000   253 ;
                                0000   254 ; Outputs:
                                0000   255 ;
                                0000   256 ;       R0 - status code
                                0000   257 ;
                                0000   258 ;--
                                0000   259
                          01FC  0000   260 .Entry TU_INIT, ^M<R2,R3,R4,R5,R6,R7,R8>
                                0002   261
                                0002   262          .ENABLE LSB
                                0002   263
                     50   38   DB  0002   264          MFPR    #PR$_MAPEN, R0          ; Get the mapping status
                                0005   265 ;
                                0005   266 ; Set up a UNIBUS mapping register(s) to cover the ring and buffers.
                                0005   267 ; To make things easy, we will grab the last two register (494 & 495).
                                0005   268 ; These registers are necessary since the ring area will be accessed by
                                0005   269 ; the controller which is a UNIBUS device that does not do any mapping.
                                0005   270 ;
           56   0003DC00 8F   D0  0005   271          MOVL    #<UMR@9>, R6            ; Set up a constant
                52   0200'CF   9E  000C   272          MOVAB   W^INTTBL, R2            ; Get the address of the ring
      51   52   00000098'EF   CB  0011   273          BICL3   BYTE_OFF, R2, R1        ; Get the byte offset in page          ;G:3
        02 A2   51   56   C9  0019   274          BISL3   R6, R1, 2(R2)           ; Set in the UNIBUS addr
             02 A2   10'  C0  001E   275          ADDL    S^#<RING-INTTBL>,2(R2)  ; Make it the ring address
      52   52   15   09   EF  0022   276          EXTZV   #VA$V_VPN,#VA$S_VPN,R2,R2 ; Get the page frame
                                0027   277          ASSUME  RPB$L_ADPVIR EQ RPB$L_ADPPHY+4
           53   5C A940   D0  0027   278          MOVL    RPB$L_ADPPHY(R9)[R0],R3 ; Get correct pointer to TU81 reg
                                002C   279          ASSUME  RPB$L_CSRVIR EQ RPB$L_CSRPHY+4
           57   54 A940   D0  002C   280          MOVL    RPB$L_CSRPHY(R9)[R0],R7 ; Get correct address of device CSR
                  0C 50   E9  0031   281          BLBC    R0,20$                  ; If clr, then physical
           52   50 B942   D0  0034   282          MOVL    @RPB$L_SVASPT(R9)[R2],R2; Virtual, get physical
      52    FFE00000 8F   CA  0039   283          BICL    #^C<PTE$M_PFN>,R2       ; Now a physical PFN
           54   0FB8 C3   DE  0040   284 20$:     MOVAL   UBA$L_MAP+<UMR*4>(R3),R4; Get the last two UMR's
      84   52   010A'CF   C9  0045   285          BISL3   W^VALID,R2,(R4)+        ; Set as valid w/PFN                   [07]
                     52   D6  004B   286          INCL    R2                      ; Set next page just in case
      64   52   010A'CF   C9  004D   287          BISL3   W^VALID,R2,(R4)         ; Set as valid w/PFN                   [07]
                                0053   288 ;
                                0053   289 ; Now go thru the ridiculously complicated startup sequence.  This is a
                                0053   290 ; fugue in four parts.
                                0053   291 ;
                58   02   D0  0053   292          MOVL    #2,R8                   ; Make two tries at this
           53   0200'CF   9E  0056   293 RETRY:  MOVAB   W^INTTBL, R3
                52   0B   D0  005B   294          MOVL    #S1, R2                 ; Step flag                            ;G:4
                     67   B4  005E   295          CLRW    TUIP(R7)                ; Poke the controller's CSR
                                0060   296 ;
                                0060   297 ; Wait 10 seconds.                                                        ;G:2
                                0060   298 ;
                                0060   299 TIME:                                                                    ;G:2
                                0060   300          TIMEDWAIT TIME=#1000*1000,-             ; wait for 10 seconds   [13]  ;G:2
                                0060   301                    INS1    = <MOVW TUSA(R7),R4>,-  ; check the setup register    ;G:2
                                0060   302                    INS2    = <BLSS 25$>,-          ; bit 15 set ?                ;G:2
```

```
                                0060   303                 INS3    = <BBS  R2,R4,25$>,-    ; done with this step ?        ;G:2
                                0060   304                 DONELBL = 25$                   ; label for exiting wait loop ;G:2
                     50   01    3C   0060                 MOVZWL  #SS$_NORMAL,R0
51   00000000'GF    000F4240 8F   C5   0063                 MULL3   #1000*1000,G^EXE$GL_TENUSEC,R1
                              7E   D4   006F                 CLRL    -(SP)
                                0071       30000$:
                      54   02 A7   B0   0071                 MOVW TUSA(R7),R4
                           13      19   0075                 BLSS    25$
                      0F 54   52   E0   0077                 BBS     R2,R4,25$
                6E    00000000'GF   D0   007B                 MOVL    G^EXE$GL_UBDELAY,(SP)
                         FD 6E    F5   0082       30001$:   SOBGTR  (SP),30001$
                         E9 51    F5   0085                 SOBGTR  R1,30000$
                            50    D4   0088                 CLRL    R0
                                008A       25$:
                            8E    D5   008A                 TSTL    (SP)+
                         0D 50    E8   008C   305           BLBS    R0,26$                  ; br if not timed out          ;G:2
                                008F   306                                                                               ;G:2
                         C4 58    F5   008F   307 ERROR:    SOBGTR  R8,RETRY                ; Try once again
                   50    0054 8F   3C   0092   308           MOVZWL  #SS$_CTRLERR,R0         ; Set failure status
                            04      0097   309           RET
                                0098   310 BYTE_OFF:
                    FFFFFE00        0098   311           .LONG   ^C<^X1FF>               ; Mask for byte offset in page
                                009C   312
                      54    B5      009C   313 26$:      TSTW    R4                      ; check status register for error [13] ;G:2
                      EF    19      009E   314           BLSS    ERROR                   ; br if error                  [13]    ;G:
                                00A0   315                                                                               ;G:2
                   02 A7    83   B0   00A0   316 30$:      MOVW    (R3)+,TUSA(R7)          ; Send the controller the next step
                   B8 52    0E   F3   00A4   317           AOBLEQ  #S4,R2,TIME             ; Set for next step            ;G:5
                                00A8   318 ;
                                00A8   319 ; Initialization complete.  Write the packet address in the ring.
                                00A8   320 ;
         51   0250'CF    9E   00A8   321           MOVAB   W^RSPPKT, R1            ; Get the address of response packet
           51    E8 AF    CA   00AD   322           BICL    BYTE_OFF, R1
0210'CF    51    56       C9   00B1   323           BISL3   R6, R1, W^RD            ; Set byte offset in ring desc
         51   021C'CF    9E   00B7   324           MOVAB   W^CMDPKT, R1            ; Get the address of command packet
         55    51        D0   00BC   325           MOVL    R1,R5                   ; Save pointer
           51    D6 AF    CA   00BF   326           BICL    BYTE_OFF, R1
0214'CF    51    56       C9   00C3   327           BISL3   R6, R1,W^CD             ; Set byte offset in ring desc
                                00C9   328
                                00C9   329
                                00C9   330 ;
                                00C9   331 ; Now bring the device on-line
                                00C9   332 ;
            85    01        D0   00C9   333           MOVL    #1,(R5)+                ; Set command ref number
          85    64 A9       9A   00CC   334           MOVZBL  RPB$W_UNIT(R9),(R5)+    ; Put unit number in cmd packet field
 85    20000009 8F          D0   00D0   335           MOVL    #<MSCP$M_MD_CLSEX@16>!MSCP$K_OP_ONLIN,(R5)+ ; opcode online    [08]
                85          D5   00D7   336           TSTL    (R5)+                   ; Increment register                   [06]
                                00D9   337                                           ; Set characteristics                  [06]
                85          7C   00D9   338           CLRQ    (R5)+                   ; Clear reserved area
                85          D4   00DB   339           CLRL    (R5)+                   ; Set default device dependent parameter[06]
                         0286   30   00DD   340           BSBW    EXECUTE                 ; Send it out
                                00E0   341 ;
                                00E0   342 ; Get unit characteristics
                                00E0   343 ;
         55   021C'CF    9E   00E0   344           MOVAB   W^CMDPKT, R5            ; Get the address of command packet    [12]
            85    01        D0   00E5   345           MOVL    #1,(R5)+                ; Set command ref number               [06]
          85    64 A9       9A   00E8   346           MOVZBL  RPB$W_UNIT(R9),(R5)+    ; Put unit number in cmd packet field  [06]
```

```
                    65   03    9A  00EC    347          MOVZBL  #MSCP$K_OP_GTUNT,(R5)   ; Set opcode to get unit status          [06]
                      0274    30  00EF    348          BSBW    EXECUTE                  ; Send it out                            [06]
                              00F2  349
    0000010F'EF   0000025E'EF   9B  00F2    350          MOVZBW  RSPPKT+MSCP$W_UNT_FLGS, UNIT_FLAGS      ; SAVE UNIT FLAGS       [12]
    00000113'EF   00000270'EF   D0  00FD    351          MOVL    RSPPKT+MSCP$W_FORMAT, FORMAT            ; SAVE FORMAT           [12]
                                04  0108    352          RET
                                    0109    353
                                    0109    354
                                    0109    355          .DISABLE LSB
                         0000010A   0109    356          .=<.+1>&-2
                         80000000   010A    357 VALID:   .LONG   ^X80000000              ; SIgn bit set
                               00   010E    358 INIT:    .byte   0                       ; init flag                              [12]
                                    010F    359 UNIT_FLAGS:
                         00000000   010F    360          .LONG   0                       ; UNIT FLAGS                             [12]
                                    0113    361 FORMAT:
                         00000000   0113    362          .LONG   0                       ; SPEED AND FORMAT                       [12]
                                    0117    363 DEVICE_CSR:
                         0000011B   0117    364          .BLKL   1                       ; Device csr from last initialization    [12]
                                    011B    365 DEVICE_UNIT:
                         0000011D   011B    366          .BLKW   1                       ; Device unit number from last init      [12]
                                    011D    367 ;
                                    011D    368 ; RINGS
                                    011D    369 ;
                                    011D    370 ;
                                    011D    371 .Align  Page
                                    0200    372
                             8000   0200    373 INTTBL: .WORD   OWN                 ; Step 1 pattern
                         00000000   0202    374         .LONG   0                   ; Step 2 & 3 pattern
                             0001   0206    375         .WORD   GO
                                    0208    376
                        0000 0000   0208    377         .WORD   0,0                 ; Reserved
                             0000   020C    378 CMDINT: .WORD   0                   ; Command status word
                             0000   020E    379 RSPINT: .WORD   0                   ; Response status word
                                    0210    380 RING:
                         00000000   0210    381 RD:     .LONG   0                   ; UNIBUS address of response ring
                         00000000   0214    382 CD:     .LONG   0                   ; UNIBUS address of command ring
                                    0218    383 ;
                             0030   0218    384         .WORD   48                  ; Length of message
                             0101   021A    385         .WORD   ^X101               ; Tape ID = 1                                [02]
                             0001   021C    386 CMDPKT: .WORD   1
                         0000024C   021E    387         .BLKW   23                  ; Full envelope
                                    024C    388 ;
                         00000250   024C    389         .BLKW   2
                         00000280   0250    390 RSPPKT: .BLKW   24
```

```
                     0280   392          .SBTTL  TU81 load driver QIO
                     0280   393
                     0280   394 ;++
                     0280   395 ;
                     0280   396 ; Inputs:
                     0280   397 ;
                     0280   398 ;       R3      - base address of adapter's register space
                     0280   399 ;       R5      - lbn for current piece of transfer
                     0280   400 ;       R6      - contains 0
                     0280   401 ;       R7      - address of the device's CSR
                     0280   402 ;       R8      - size of transfer in bytes
                     0280   403 ;       R9      - address of the RPB
                     0280   404 ;       R10     - starting address of transfer (byte offset in first
                     0280   405 ;                 page ORed with starting map register number)
                     0280   406 ;       R11     - LBN at start of transfer
                     0280   407 ;
                     0280   408 ;       FUNC(AP)- I/O operation (IO$_READLBLK or IO$_WRITELBLK only)
                     0280   409 ;       SIZE(AP)- Size of transfer in bytes
                     0280   410 ;       MODE(AP)- Address interpretation mode (0 = physical, 1 = virtual)
                     0280   411 ;       BUF(AP) - Address of buffer
                     0280   412 ;
                     0280   413 ; Implicit inputs:
                     0280   414 ;
                     0280   415 ;       RPB$W_UNIT      - RPB field containing boot device unit number
                     0280   416 ;
                     0280   417 ; Outputs:
                     0280   418 ;
                     0280   419 ;       R0 - status code
                     0280   420 ;
                     0280   421 ;               SS$_NORMAL      - successful transfer
                     0280   422 ;               SS$_CTRLERR     - fatal controller error
                     0280   423 ;               SS$_TAPEPOSLOST - tape position lost
                     0280   424 ;               SS$_DATAOVERUN  - record too long
                     0280   425 ;               SS$_ILLIOFUNC   - illegal I/O function
                     0280   426 ;               SS$_CTRLERR     - controller error
                     0280   427 ;               SS$_ENDOFFILE   - tape mark was read
                     0280   428 ;               SS$_DEVOFFLINE  - device is offline
                     0280   429 ;
                     0280   430 ;       R1 -    Count of bytes transferred for READ operations.
                     0280   431 ;
                     0280   432 ;       R3 - must be preserved
                     0280   433 ;
                     0280   434 ;
                     0280   435 ;--
00000004             0280   436 BUF   = 4
00000008             0280   437 SIZE  = 8
0000000C             0280   438 LBN   = 12
00000010             0280   439 FUNC  = 16
00000014             0280   440 MODE  = 20
                     0280   441
                     0280   442 TU_DRIVER:                                ; TU81 device driver.
                     0280   443
                     0280   444
                     0280   445 ; Translate the I/O function code into a device-dependent function
                     0280   446 ; code for this tape.
                     0280   447 ;
04 AE    D4          0280   448         CLRL    4(SP)                    ; Clear retries count ********      [06]
```

```
                21   10 AC    D1   0283   449          CmpL    Func(AP), #IO$_ReadLBlk ; Read logical block?
                       64    13   0287   450          BEql    E_Read                  ; Execute read function
                24   10 AC    D1   0289   451          CmpL    Func(AP), #IO$_Rewind   ; Rewind?
                       4A    13   028D   452          BEql    E_Rewind                ; Do a rewind
                25   10 AC    D1   028F   453          CmpL    Func(AP), #IO$_SkipFile ; Skip past eof
                       77    13   0293   454          BEql    E_SkipFile              ; Do it
                26   10 AC    D1   0295   455          CmpL    Func(AP), #IO$_SkipRecord; Skip records?
                       03    12   0299   456          BNEQ    10$                     ; Branch to check next function          [08]
                     009F    31   029B   457          BRW     E_SkipRecord            ; Do it                                  [08]
                04   10 AC    D1   029E   458 10$:     CmpL    Func(AP), #IO$_DrvClr   ; Is this drive clear?
                       30    12   02A2   459          Bneq    20$                     ; Yes, all done, exit
              FE6E CF    57    D1   02A4   460          CMPL    R7,DEVICE_CSR           ; IS THIS THE SAME CSR AS LAST TIME ?    [12]
                         0F    12   02A9   461          BNEQ    15$                     ; GO RE-INIT IF NOT                      [12]
              FE6B CF    53    B1   02AB   462          CMPW    R3,DEVICE_UNIT          ; IS THIS THE SAME UNIT AS LAST TIME ?   [12]
                         08    12   02B0   463          BNEQ    15$                     ; GO RE-INIT IF NOT                      [12]
                   50    01    D0   02B2   464          MOVL    #SS$_NORMAL,R0          ; ASSUME NO ERROR                        [12]
                1E FE55 CF    E8   02B5   465          BLBS    W^INIT,RETURN           ; EXIT IF NO NEED TO INIT                [12]
                                   02BA   466 ;
                                   02BA   467 ; Start out by initing the TU81
                                   02BA   468 ;
              FD41 CF    00    FB   02BA   469 15$:     CallS   #0, TU_Init             ; Call init code
                     16 50    E9   02BF   470          BLBC    R0,RETURN               ; EXIT ON ERROR                          [12]
                FE50 CF    57    D0   02C2   471          MOVL    R7,DEVICE_CSR           ; SAVE CSR FOR THIS DEVICE               [12]
             FE4E CF    64 A9    B0   02C7   472          MOVW    RPB$W_UNIT(R9),DEVICE_UNIT ; SAVE UNIT # FOR THIS DEVICE        [12]
                FE3C CF    01    90   02CD   473          MOVB    #1,W^INIT               ; SET FLAG                               [12]
                                   02D2   474 ;
                         04    11   02D2   475          Brb     Return                  ; Exit
                50   F4 8F    9A   02D4   476 20$:     MovZBL  #SS$_IllIOFunc, R0      ; illegal I/O function
                                   02D8   477 Return:
                         05    02D8   478          RSB
                                   02D9   479 ;+
                                   02D9   480 ; Rewind slave drive, wait for completion
                                   02D9   481 ;-
                                   02D9   482 E_REWIND:
                     25    90    02D9   483          MOVB    #MSCP$K_OP_REPOS,-      ; Set function reposition
                FF46 CF            02DB   484                  CMDPKT+MSCP$B_OPCODE
                2002 8F    B0    02DE   485          MOVW    #MSCP$M_MD_CLSEX!MSCP$M_MD_REWND,- ; Set to rewind/clear serious exc
                FF41 CF            02E2   486                  CMDPKT+MSCP$W_MODIFIER  ;
                FF3F CF    7C    02E5   487          CLRQ    CMDPKT+MSCP$L_REC_CNT   ; Clear records/tape marks to avoid errors.
                   007A    30    02E9   488          BSBW    EXECUTE                 ; Execute function.
                         05    02EC   489          RSB                             ; Exit.
                                   02ED   490 ;+
                                   02ED   491 ; Read block of data
                                   02ED   492 ;-
                                   02ED   493 E_READ:
                     21    90    02ED   494          MOVB    #MSCP$K_OP_READ,-       ; Set function to read
                FF32 CF            02EF   495                  CMDPKT+MSCP$B_OPCODE    ;
FF2D CF         2000 8F    B0    02F2   496          MOVW    #MSCP$M_MD_CLSEX,CMDPKT+MSCP$W_MODIFIER ; Clear serious except  [08]
     FF2A CF    58    D0    02F9   497          MOVL    R8,CMDPKT+MSCP$L_BYTE_CNT ; Set byte count.
     FF29 CF    5A    D0    02FE   498          MOVL    R10,CMDPKT+MSCP$B_BUFFER ; Set buffer address.
                   0060    30    0303   499          BSBW    EXECUTE                 ; Execute function.
     51    FF52 CF    D0    0306   500          MOVL    RSPPKT+MSCP$L_BYTE_CNT, R1 ; Get # of bytes transferred         [12]
                         05    030B   501          RSB                             ; EXIT
                                   030C   502 ;
                                   030C   503 ;
                                   030C   504 ;+
                                   030C   505 ; Skip to end of file
```

```
                                030C   506 ; P1 is negative if backwards else forwards
                                030C   507 ;-
                                030C   508 E_SKIPFILE:
                    25    90    030C   509          MOVB    #MSCP$K_OP_REPOS,-      ; Set function to reposition.
                FF13 CF           030E   510                  CMDPKT+MSCP$B_OPCODE
                2080 8F    B0     0311   511          MOVW    #MSCP$M_MD_DLEOT!MSCP$M_MD_CLSEX,-  ; Detect LEOT and          [08]
                FF0E CF           0315   512                              CMDPKT+MSCP$W_MODIFIER  ; Clear serious except  [08]
             50   04    AC    D0  0318   513          MOVL    BUF(AP),R0              ; Count of MARKS to skip.               [12]
                   0A     14    031C   514          BGTR    10$                     ; Branch if positive.
                50   50    CE  031E   515          MNEGL   R0,R0                   ; Make count positive.                  [12]
                2088 8F    B0     0321   516          MOVW    #MSCP$M_MD_DLEOT!MSCP$M_MD_REVRS!MSCP$M_MD_CLSEX,-; Detect LEOT [08]
                FEFE CF           0325   517                  CMDPKT+MSCP$W_MODIFIER  ; Reverse/clear serious except          [08]
                FEFC CF    D4     0328   518 10$:     CLRL    CMDPKT+MSCP$L_REC_CNT   ; CLEAR record FIELD                    [12]
          FEFB CF   50    D0     032C   519          MOVL    R0,CMDPKT+MSCP$L_TMGP_CNT       ; SET field                     [12]
                0032    30     0331   520          BSBW    EXECUTE                 ; Execute function.
                0E   51    D1     0334   521          CMPL    R1, #MSCP$K_ST_TAPEM    ; Was tape mark detected                [04]
                   03     12     0337   522          BNEQ    20$                     ;                                       [12]
                50   01    9A     0339   523          MOVZBL  #SS$_NORMAL, R0         ; Change to normal if EOF               [04]
                          05     033C   524 20$:     RSB                             ; Exit.
                                033D   525 ;
                                033D   526 ;+
                                033D   527 ; Skip to end of record
                                033D   528 ; P1 is negative if backward else forwards
                                033D   529 ;-
                                033D   530 E_SKIPRECORD:
                    25    90    033D   531          MOVB    #MSCP$K_OP_REPOS,-      ; Set function to reposition.
                FEE2 CF           033F   532                  CMDPKT+MSCP$B_OPCODE
                2080 8F    B0     0342   533          MOVW    #MSCP$M_MD_DLEOT!MSCP$M_MD_CLSEX,-  ; Detect LEOT              [08]
                FEDD CF           0346   534                              CMDPKT+MSCP$W_MODIFIER  ; Clear serious except  [08]
             50   04    AC    D0  0349   535          MOVL    BUF(AP),R0              ; Count of RECORDS to skip.
                   0A     14    034D   536          BGTR    10$                     ; Branch if positive.
                50   50    CE  034F   537          MNEGL   R0,R0                   ; Make count positive.
                2088 8F    B0     0352   538          MOVW    #MSCP$M_MD_DLEOT!MSCP$M_MD_REVRS!MSCP$M_MD_CLSEX,-; Detect LEOT [08]
                FECD CF           0356   539                  CMDPKT+MSCP$W_MODIFIER  ;  Reverse/clear serious except         [08]
          FECA CF   50    D0     0359   540 10$:     MOVL    R0,CMDPKT+MSCP$L_REC_CNT ; Set RECORD to skip.                  [03]
                FECA CF    D4     035E   541          CLRL    CMDPKT+MSCP$L_TMGP_CNT  ; Clear to prevent errors               [08]
                   0001    30     0362   542          BSBW    EXECUTE                 ; Execute function.
                          05     0365   543          RSB                             ; Exit.
                                0366   544
                                0366   545
                                0366   546 ;+
                                0366   547 ; Execute all functions.
                                0366   548 ;-
                                0366   549 EXECUTE:
             54   02    A7    B0  0366   550          MOVW    TUSA(R7),R4             ; Controller offline?
                   6B     12     036A   551          BNEQ    50$                     ; Yep, error out
          FEA3 CF   8000    8F    A8  036C   552          BISW    #OWN, CD+2              ; Set controller ownership
          FE98 CF   8000    8F    A8  0373   553          BISW    #OWN, RD+2              ; Ditto
             54   67    B0     037A   554          MOVW    TUIP(R7),R4             ; Tell controller to go.
             54   02    A7    B0  037D   555          MOVW    TUSA(R7),R4             ; Any problems?
                   54     12     0381   556          BNEQ    50$                     ; Yes
             54   02    A7    B0  0383   557 30$:     MovW    TUSa(R7), R4            ; Any problems?
                   4E     12     0387   558          BNeq    50$                     ; Yes
                FE85 CF    B5     0389   559          TSTW    RD+2                    ; Any response back?
                   F4     19     038D   560          BLSS    30$                     ; No, spin until there is
                                038F   561
                                038F   562 ;
```

```
                                  038F   ; Return with  status code.
                                  038F   ;
   51   FEC5 CF   05   00   EF   038F   40$:    EXTZV   #0, #5, RSPPKT+MSCP$W_STATUS,R1 ; Get return status.          [04]
             50   0084 8F   3C   0396           MovZWL  #SS$_DevOffLine, R0      ; Assume offline
                  03   51   D1   039B           CmpL    R1, #MSCP$K_ST_OFFLN     ; Off line
                       42   13   039E           BEql    60$                      ;
             50   0870 8F   3C   03A0           MovZWL  #SS$_EndOfFile, R0       ; Assume end of file
                  0E   51   D1   03A5           CmpL    R1, #MSCP$K_ST_TAPEM     ; Tape mark
                       38   13   03A8           BEql    60$                      ;
                  13   51   D1   03AA           CmpL    R1, #MSCP$K_ST_LED       ; LEOT Detected                      [08]
                       33   13   03AD           BEQL    60$                      ;                                    [08]
                  50   01   D0   03AF           MovL    #SS$_Normal, R0          ; Assume OK
                  00   51   D1   03B2           CmpL    R1, #MSCP$K_ST_SUCC      ; Success
                       2B   13   03B5           BEql    60$                      ;
                  04   51   D1   03B7           Cmpl    R1,#MSCP$K_ST_AVLBL      ; Unit available                     [08]
                       26   13   03BA           Beql    60$                      ;                                    [08]
                  0D   51   D1   03BC           CmpL    R1, #MSCP$K_ST_BOT       ; At BOT
                       21   13   03BF           BEql    60$                      ;
             50   0838 8F   3C   03C1           MOVZWL  #SS$_DataoveRun, R0      ; Assume record too large
                  10   51   D1   03C6           CmpL    R1, #MSCP$K_ST_RDTRN     ; Data truncation
                       17   13   03C9           BEql    60$                      ;
        50   00000224 8F   D0   03CB           MOVL    #SS$_TAPEPOSLOST, R0     ; Assume tape position lost.
                  11   51   D1   03D2           CmpL    R1, #MSCP$K_ST_PLOST     ; Tape position lost                 [08]
                       0B   13   03D5           BEql    60$                      ;                                    [08]
        50   00000054 8F   D0   03D7   50$:    MovL    #SS$_CtrlErr, R0         ; Other codes are failure
                  FD2C CF   94   03DE           CLRB    W^INIT                   ; MUST RE-INIT NEXT TIME             [12]
                            05   03E2   60$:    Rsb                              ; Return
                     000003E3   03E3   TU_DRVSIZ=.-START
                                03E3
                                03E3           .END
```

```
$TABLE                          = 00000000 R  D  03
BTD$K_MU                        = 000000B4    D
BTD$K_TF                        = 000000B3    D
BTD$K_TM                        = 000000B1    D
BTD$K_TS                        = 000000B2    D
BUF                             = 00000004    D
BYTE_OFF                          00000098 R  D  02
CD                                00000214 R  D  02
CMDINT                            0000020C R  D  02
CMDPKT                            0000021C R  D  02
DEVICE_CSR                        00000117 R  D  02
DEVICE_UNIT                       0000011B R  D  02
ERROR                             0000008F R  D  02
EXE$GL_TENUSEC                    ******** X    00
EXE$GL_UBDELAY                    ******** X    00
EXECUTE                           00000366 R  D  02
E_READ                            000002ED R  D  02
E_REWIND                          000002D9 R  D  02
E_SKIPFILE                        0000030C R  D  02
E_SKIPRECORD                      0000033D R  D  02
FORMAT                            00000113 R  D  02
FUNC                            = 00000010    D
GO                              = 00000001    D
INIT                              0000010E R  D  02
INTTBL                            00000200 R  D  02
IO$_DRVCLR                      = 00000004    D
IO$_READLBLK                    = 00000021    D
IO$_REWIND                      = 00000024    D
IO$_SKIPFILE                    = 00000025    D
IO$_SKIPRECORD                  = 00000026    D
LBN                             = 0000000C    D
MODE                            = 00000014    D
MSCP$B_BUFFER                   = 00000010    D
MSCP$B_OPCODE                   = 00000008    D
MSCP$K_OP_GTUNT                 = 00000003    D
MSCP$K_OP_ONLIN                 = 00000009    D
MSCP$K_OP_READ                  = 00000021    D
MSCP$K_OP_REPOS                 = 00000025    D
MSCP$K_OP_SETUC                 = 0000000A    D
MSCP$K_ST_AVLBL                 = 00000004    D
MSCP$K_ST_BOT                   = 0000000D    D
MSCP$K_ST_LED                   = 00000013    D
MSCP$K_ST_OFFLN                 = 00000003    D
MSCP$K_ST_PLOST                 = 00000011    D
MSCP$K_ST_RDTRN                 = 00000010    D
MSCP$K_ST_SUCC                  = 00000000    D
MSCP$K_ST_TAPEM                 = 0000000E    D
MSCP$L_BYTE_CNT                 = 0000000C    D
MSCP$L_REC_CNT                  = 0000000C    D
MSCP$L_TMGP_CNT                 = 00000010    D
MSCP$M_MD_CLSEX                 = 00002000    D
MSCP$M_MD_DLEOT                 = 00000080    D
MSCP$M_MD_REVRS                 = 00000008    D
MSCP$M_MD_REWND                 = 00000002    D
MSCP$W_FORMAT                   = 00000020    D
MSCP$W_MODIFIER                 = 0000000A    D
MSCP$W_STATUS                   = 0000000A    D
MSCP$W_UNT_FLGS                 = 0000000E    D
OWN                             = 00008000    D
PR$_MAPEN                       = 00000038    D
PTE$M_PFN                       = 001FFFFF    D
RD                                00000210 R  D  02
RETRY                             00000056 R  D  02
RETURN                            000002D8 R  D  02
RING                              00000210 R  D  02
RPB$L_ADPPHY                    = 0000005C    D
RPB$L_ADPVIR                    = 00000060    D
RPB$L_CSRPHY                    = 00000054    D
RPB$L_CSRVIR                    = 00000058    D
RPB$L_SVASPT                    = 00000050    D
RPB$W_UNIT                      = 00000064    D
RSPINT                            0000020E R  D  02
RSPPKT                            00000250 R  D  02
S1                              = 0000000B    D
S4                              = 0000000E    D
SIZE                            = 00000008    D
SS$_CTRLERR                     = 00000054    D
SS$_DATAOVERUN                  = 00000838    D
SS$_DEVOFFLINE                  = 00000084    D
SS$_ENDOFFILE                   = 00000870    D
SS$_ILLIOFUNC                   = 000000F4    D
SS$_NORMAL                      = 00000001    D
SS$_TAPEPOSLOST                 = 00000224    D
START                             00000000 R  D  02
TIME                              00000060 R  D  02
TUIP                            = 00000000    D
TUSA                            = 00000002    D
TU_DRIVER                         00000280 R  D  02
TU_DRVSIZ                       = 000003E3    D
TU_INIT                           00000000 RG D  02
UBA$L_MAP                       = 00000800    D
UMR                             = 000001EE    D
UNIT_FLAGS                        0000010F R  D  02
VA$S_VPN                        = 00000015    D
VA$V_VPN                        = 00000009    D
VALID                             0000010A R  D  02
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	00000000 (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
BOOTDRIVR_2	000003E3 (995.)	02 (2.)	NOPIC USR CON REL LCL NOSHR EXE RD WRT NOVEC PAGE
BOOTDRIVR_4	00000018 (24.)	03 (3.)	NOPIC USR CON REL LCL NOSHR EXE RD WRT NOVEC BYTE

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$TABLE	=00000000-R	235 (2)	235 (2)
BTD$K_MU	=000000B4	125 (2)	235 (2)
BTD$K_TF	=000000B3	124 (2)	
BTD$K_TM	=000000B1	122 (2)	
BTD$K_TS	=000000B2	123 (2)	
BUF	=00000004	436 (4)	#-513 (4) #-535 (4)
BYTE_OFF	00000098-R	310 (3)	#-273 (3) #-322 (3) #-326 (3)
CD	00000214-R	382 (3)	#-327 (3) #-552 (4)
CMDINT	0000020C-R	378 (3)	
CMDPKT	0000021C-R	386 (3)	324 (3) 344 (3) #-484 (4) #-486 (4)
			#-487 (4) #-495 (4) #-496 (4) #-497 (4)
			#-498 (4) #-510 (4) #-512 (4) #-517 (4)
			#-518 (4) #-519 (4) #-532 (4) #-534 (4)
			#-539 (4) #-540 (4) #-541 (4)
DEVICE_CSR	00000117-R	363 (3)	#-460 (4) #-471 (4)
DEVICE_UNIT	0000011B-R	365 (3)	#-462 (4) #-472 (4)
ERROR	0000008F-R	307 (3)	#-314 (3)
EXE$GL_TENUSEC	00000000-XR		103 (2) #-304 (3)
EXE$GL_UBDELAY	00000000-XR		103 (2) #-304 (3)
EXECUTE	00000366-R	549 (4)	#-340 (3) #-348 (3) #-488 (4) #-499 (4)
			#-520 (4) #-542 (4)
E_READ	000002ED-R	493 (4)	#-450 (4)
E_REWIND	000002D9-R	482 (4)	#-452 (4)
E_SKIPFILE	0000030C-R	508 (4)	#-454 (4)
E_SKIPRECORD	0000033D-R	530 (4)	#-457 (4)
FORMAT	00000113-R	361 (3)	#-351 (3)
FUNC	=00000010	439 (4)	#-449 (4) #-451 (4) #-453 (4) #-455 (4)
			#-458 (4)
GO	=00000001	129 (2)	375 (3)
INIT	0000010E-R	358 (3)	#-465 (4) #-473 (4) #-588 (4)
INTTBL	00000200-R	373 (3)	272 (3) #-275 (3) 293 (3)
IO$_DRVCLR	=00000004		#-458 (4)
IO$_READLBLK	=00000021		#-449 (4)
IO$_REWIND	=00000024		#-451 (4)
IO$_SKIPFILE	=00000025		#-453 (4)
IO$_SKIPRECORD	=00000026		#-455 (4)
LBN	=0000000C	438 (4)	
MODE	=00000014	440 (4)	
MSCP$B_BUFFER	=00000010		#-498 (4)
MSCP$B_OPCODE	=00000008		#-484 (4) #-495 (4) #-510 (4) #-532 (4)
MSCP$K_OP_GTUNT	=00000003		#-347 (3)
MSCP$K_OP_ONLIN	=00000009		#-335 (3)
MSCP$K_OP_READ	=00000021		#-494 (4)
MSCP$K_OP_REPOS	=00000025		#-483 (4) #-509 (4) #-531 (4)
MSCP$K_OP_SETUC	=0000000A	225 (2)	
MSCP$K_ST_AVLBL	=00000004		#-577 (4)
MSCP$K_ST_BOT	=0000000D		#-579 (4)
MSCP$K_ST_LED	=00000013		#-572 (4)
MSCP$K_ST_OFFLN	=00000003		#-567 (4)
MSCP$K_ST_PLOST	=00000011		#-585 (4)

```
MSCP$K_ST_RDTRN                 =00000010                       #-582   (4)
MSCP$K_ST_SUCC                  =00000000                       #-575   (4)
MSCP$K_ST_TAPEM                 =0000000E                       #-521   (4)    #-570   (4)
MSCP$L_BYTE_CNT                 =0000000C                       #-497   (4)    #-500   (4)
MSCP$L_REC_CNT                  =0000000C                       #-487   (4)    #-518   (4)    #-540   (4)
MSCP$L_TMGP_CNT                 =00000010                       #-519   (4)    #-541   (4)
MSCP$M_MD_CLSEX                 =00002000                       #-335   (3)    #-485   (4)    #-496   (4)    #-511   (4)
                                                                #-516   (4)    #-533   (4)    #-538   (4)
MSCP$M_MD_DLEOT                 =00000080                       #-511   (4)    #-516   (4)    #-533   (4)    #-538   (4)
MSCP$M_MD_REVRS                 =00000008                       #-516   (4)    #-538   (4)
MSCP$M_MD_REWND                 =00000002                       #-485   (4)
MSCP$W_FORMAT                   =00000020                       #-351   (3)
MSCP$W_MODIFIER                 =0000000A                       #-486   (4)    #-496   (4)    #-512   (4)    #-517   (4)
                                                                #-534   (4)    #-539   (4)
MSCP$W_STATUS                   =0000000A                         565   (4)
MSCP$W_UNT_FLGS                 =0000000E                       #-350   (3)
OWN                             =00008000       130     (2)       373   (3)    #-552   (4)    #-553   (4)
PR$_MAPEN                       =00000038                       #-264   (3)
PTE$M_PFN                       =001FFFFF                       #-283   (3)
RD                               00000210-R     381     (3)    #-323   (3)    #-553   (4)    #-559   (4)
RETRY                            00000056-R     293     (3)    #-307   (3)
RETURN                           000002D8-R     477     (4)    #-465   (4)    #-470   (4)    #-475   (4)
RING                             00000210-R     380     (3)    #-275   (3)
RPB$L_ADPPHY                    =0000005C                         277   (3)    #-278   (3)
RPB$L_ADPVIR                    =00000060                         277   (3)
RPB$L_CSRPHY                    =00000054                         279   (3)    #-280   (3)
RPB$L_CSRVIR                    =00000058                         279   (3)
RPB$L_SVASPT                    =00000050                       #-282   (3)
RPB$W_UNIT                      =00000064                       #-334   (3)    #-346   (3)    #-472   (4)
RSPINT                           0000020E-R     379     (3)
RSPPKT                           00000250-R     390     (3)       321   (3)    #-350   (3)    #-351   (3)    #-500   (4)
                                                                  565   (4)
S1                              =0000000B       131     (2)    #-294   (3)
S4                              =0000000E       132     (2)    #-317   (3)
SIZE                            =00000008       437     (4)
SS$_CTRLERR                     =00000054                       #-308   (3)    #-587   (4)
SS$_DATAOVERUN                  =00000838                       #-581   (4)
SS$_DEVOFFLINE                  =00000084                       #-566   (4)
SS$_ENDOFFILE                   =00000870                       #-569   (4)
SS$_ILLIOFUNC                   =000000F4                       #-476   (4)
SS$_NORMAL                      =00000001                       #-304   (3)    #-464   (4)    #-523   (4)    #-574   (4)
SS$_TAPEPOSLOST                 =00000224                       #-584   (4)
START                            00000000-R     240     (2)       235   (2)      590   (4)
TIME                             00000060-R     299     (3)    #-317   (3)
TUIP                            =00000000       127     (2)    #-295   (3)    #-554   (4)
TUSA                            =00000002       128     (2)    #-304   (3)    #-316   (3)    #-550   (4)    #-555   (4)
                                                                #-557   (4)
TU_DRIVER                        00000280-R     442     (4)       235   (2)
TU_DRVSIZ                       =000003E3       590     (4)       235   (2)
TU_INIT                          00000000-R     260     (3)       469   (4)
UBA$L_MAP                       =00000800                         284   (3)
UMR                             =000001EE       133     (2)    #-271   (3)      284   (3)
UNIT_FLAGS                       0000010F-R     359     (3)    #-350   (3)
VA$S_VPN                        =00000015                       #-276   (3)
VA$V_VPN                        =00000009                       #-276   (3)
VALID                            0000010A-R     357     (3)    #-285   (3)    #-287   (3)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	41	00:00:00.01	00:00:00.23
Command processing	955	00:00:00.28	00:00:00.94
Pass 1	662	00:00:02.82	00:00:04.00
Symbol table sort	0	00:00:00.48	00:00:00.48
Pass 2	20	00:00:00.87	00:00:01.50
Symbol table output	2	00:00:00.02	00:00:00.12
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	4	00:00:00.08	00:00:00.12
Assembler run totals	1688	00:00:04.56	00:00:07.39

The working set limit was 2900 pages.
172785 bytes (338 pages) of virtual memory were used to buffer the intermediate code.
There were 90 pages of symbol table space allocated to hold 1690 non-local and 16 local symbols.
592 source lines were read in Pass 1, producing 109 object records in Pass 2.
20 pages of virtual memory were used to define 19 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	8
SYS$COMMON:[SYSLIB]STARLET.MLB;2	6
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	15

1715 GETS were required to define 15 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

```
0     ! DEC/CMS REPLACEMENT HISTORY, Element ODS.B32
0     ! *1     6-FEB-1986 15:20:49 DS ""
0     ! DEC/CMS REPLACEMENT HISTORY, Element ODS.B32
0     %title '*** ODS Disk RMS routines'
0     module ODS (                                  ! RMS$OPEN, RMS$GET, RMS$READ, RMS$CLOSE services
0                     ident = '01-04'
0                     ) =
0     !
0     ! Copyright (c) 1980, 1982
0     ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0     !
0     ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0     ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
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0     !
0     ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0     ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0
0     !++
0     ! FACILITY: Diagnostic Supervisor
0     !
0     ! ABSTRACT:
0     !
0     !       This module supports RMS functions on ODS media.
0     !
0     ! AUTHOR:
0     !       Dave Butenhof,          19-aug-1980
0     !
0     ! MODIFIED BY:
0     !
0     !               Dave Butenhof, 08-oct-1980, version 6.1
0     !       1       Specify "long_relative" access to BOO$QIO routine
0     !               Dave Butenhof, 6-feb-1981, version 6.3
0     !       2       Fix so full record length if returned in RAB$L_STV on
0     !               RMS$_RTB errors.
0     !               - Dave Butenhof, 02-Jun-1981, version 6.4
0     !       03      Alter library spec for flexibility
0     !
0     !       04      - Dave Butenhof, 13-Jan-1982, version 6.6
0     !               Make some minor fixes like variable attributes.  Also,
0     !               support ODS-1 by taking RSIZE field of file header if
0     !               MAXREC is 0 (as it is for ODS-1 fixed length).
0     !--
0
```

```
;    0054  0     %sbttl 'declarations'
;    0055  1     begin
;    0056  1     !
;    0057  1     ! include files:
;    0058  1     !
;    0059  1
;    0060  1     library '$diag';                !                                                   [03]
;    0061  1
;    0062  1     library '$ds';                  !                                                   [03]
;    0063  1
;    0064  1     library 'sys$library:lib.l32';
;    0065  1
;    0066  1     !
;    0067  1     ! local declarations
;    0068  1     !
;    0069  1
;    0070  1     linkage
;    0071  1         jsb_ods = jsb (register = 0) : global (block = 6, vbn = 7, offset = 8, cblock = 9, rab = 10);
;    0072  1
;    0073  1     !
;    0074  1     ! table of contents:
;    0075  1     !
;    0076  1
;    0077  1     forward routine
;    0078  1         ods$advance : jsb_ods novalue,              ! Advance RFA
;    0079  1         ods$access : jsb_ods,                       ! Access a VBN
;    0080  1         ods$open : call_rms,                        ! RMS$OPEN emulator--open file
;    0081  1         ods$get : call_rms,                         ! RMS$GET emulator--deblock record
;    0082  1         ods$read : call_rms;                        ! RMS$READ emulator--read file block(s)
;    0083  1
;    0084  1     !
;    0085  1     ! Local definitions
;    0086  1     !
;    0087  1     !
;    0088  1     ! External references
;    0089  1     !
;    0090  1
;    0091  1     external routine
;    0092  1         rms$alloc_cache : jsb_cblock,       ! Allocate cache blocks
;    0093  1         fil$openfile,                               ! 'Open' a file
;    0094  1         fil$readvbn,                                ! Read a virtual block
;    0095  1         boo$qio : addressing_mode (long_relative),  ! standalone 'level-3' QIO
;    0096  1         exe$alononpaged : jsb_alloc addressing_mode (long_relative);        ! Allocate static buffer space
;    0097  1
;    0098  1     !
;    0099  1     ! psect definitions:
;    0100  1     !
;    0101  1
;    0102  1     psect
;    0103  1         plit = data ( share, addressing_mode (long_relative));
;    0104  1
;    0105  1     psect
;    0106  1         own = work ( read, write);
;    0107  1
;    0108  1     psect
;    0109  1         global = work ( read, write);
;    0110  1
```

```
;   0111  1     psect
;   0112  1         code = code (share);
;   0113  1
```

```
;    0115  1     %sbttl 'Advance RFA'
;    0116  1     routine ods$advance (len) : jsb_ods novalue =
;    0117  1
;    0118  1     !++
;    0119  1     ! Functional description:
;    0120  1     !       Increment the internal 'RFA' (offset and vbn parts) by the
;    0121  1     !       specified number of bytes, considering round-off and block
;    0122  1     !       overlap.
;    0123  1     !
;    0124  1     ! Inputs:
;    0125  1     !       len                     number of bytes to increment by
;    0126  1     !
;    0127  1     ! Implicit inputs:
;    0128  1     !       R7                      vbn
;    0129  1     !       R8                      offset in vbn
;    0130  1     !
;    0131  1     ! Outputs:
;    0132  1     !       none
;    0133  1     !
;    0134  1     ! Implicit outputs:
;    0135  1     !       R7                      new vbn
;    0136  1     !       R8                      new byte offset in vbn
;    0137  1     !
;    0138  1     ! Side effects:
;    0139  1     !       none
;    0140  1     !
;    0141  1     ! Return codes:
;    0142  1     !       none
;    0143  1     !--
;    0144  1
;    0145  2         begin
;    0146  2
;    0147  2         external register
;    0148  2             vbn = 7,                            ! Virtual block number
;    0149  2             offset = 8;                         ! Byte offset in VBN
;    0150  2
;    0151  2         local
;    0152  2             bite;
;    0153  2
;    0154  2         bite = (.offset + .len + 1) and not 1;  ! Add length and round up
;    0155  2         offset = .bite and 511;                 ! Truncate to offset in page
;    0156  3         vbn = .vbn + (.bite/512)                ! Calculate new page
;    0157  1         end;                                    ! of ods$advance

                                                    .TITLE  ODS *** ODS Disk RMS routines
                                                    .IDENT  \01-04\

                                                    .EXTRN  RMS$ALLOC_CACHE
                                                    .EXTRN  FIL$OPENFILE, FIL$READVBN
                                                    .EXTRN  BOO$QIO, EXE$ALONONPAGED

                                                    .PSECT  CODE,NOWRT,  SHR,2

                        50      01 A048  9E 00000 ODS$ADVANCE:
                                                    MOVAB   1(LEN)[OFFSET], R0          ; 0154
                        50           01  8A 00005           BICB2   #1, BITE                    ;
```

```
          58            50            09            00  EF 00008        EXTZV   #0, #9, BITE, OFFSET                   ; 0155
                                      50 00000200   8F  C6 0000D        DIVL2   #512, R0                               ; 0156
                                      57            50  C0 00014        ADDL2   R0, VBN                                ;
                                                        05 00017        RSB                                            ; 0157

; Routine Size:  24 bytes,    Routine Base:  CODE + 0000
```

```
;    0159  1     %sbttl 'Access file block'
;    0160  1     routine ods$access : jsb_ods =
;    0161  1
;    0162  1     !++
;    0163  1     ! Functional description:
;    0164  1     !       If the desired VBN is not currently cached, update cache to
;    0165  1     !       contain it.
;    0166  1     !
;    0167  1     ! Inputs:
;    0168  1     !       none
;    0169  1     !
;    0170  1     ! Implicit inputs:
;    0171  1     !       R7                      VBN to cache/access
;    0172  1     !       R9                      pointer to CBLOCK control structure
;    0173  1     !       R10                     pointer to RAB
;    0174  1     !
;    0175  1     ! Outputs:
;    0176  1     !       none
;    0177  1     !
;    0178  1     ! Implicit outputs:
;    0179  1     !       R6                      pointer to 'memory image' of file block
;    0180  1     !
;    0181  1     ! Side effects:
;    0182  1     !       may alter cache control structure of CBLOCK
;    0183  1     !
;    0184  1     ! Return codes:
;    0185  1     !       RMS$_NORMAL             OK
;    0186  1     !       RMS$_RFA                random RFA is illegal
;    0187  1     !       RMS$_EOF                VBN is past end of file
;    0188  1     !       RMS$_RER                File read error
;    0189  1     !--
;    0190  1
;    0191  2         begin
;    0192  2
;    0193  2         external register
;    0194  2             block = 6,
;    0195  2             vbn = 7,
;    0196  2             cblock = 9 : ref bblock,
;    0197  2             rab = 10 : ref bblock;
;    0198  2
;    0199  2         local
;    0200  2             read_blocks;                                ! Blocks to EOF
;    0201  2
;    0202  2         bind
;    0203  2             cache = cblock [ctl$l_cache1] : vector; ! Map for convenience
;    0204  2
;    0205  2         read_blocks = .cblock [ctl$l_eofvbn] - .vbn;
;    0206  2
;    0207  2         if .read_blocks lss 0                           ! If no more blocks
;    0208  3             or (.read_blocks eql 0                      !  or at EOF block
;    0209  3             and .cblock [ctl$w_offbyte] eql 0)          !  and no bytes there
;    0210  2         then
;    0211  2             return
;    0212  2
;    0213  2                 if .rab [rab$b_rac] eql rab$c_rfa then rms$_rfa else rms$_eof;      ! Check for illegal vbn
;    0214  2
;    0215  2         if .vbn lss .cblock [ctl$l_lvbn]                ! If VBN isn't
```

```
;   0216  2          or .vbn geq .cblock [ctl$l_hvbn]          !  cached now
;   0217  2      then
;   0218  3          begin                                     ! then cache it
;   0219  3
;   0220  3          if .cblock [ctl$w_cache_size] eql 0       ! If no cache allocated
;   0221  3          then
;   0222  4              begin
;   0223  4
;   0224  4              local
;   0225  4                  stat;
;   0226  4
;   0227  4              stat = rms$alloc_cache (1);           ! Allocate cache
;   0228  4
;   0229  4              if not .stat
;   0230  4              then
;   0231  4                  return rms$_dme                   ! Error if can't
;   0232  3              end;
;   0233  3
;   0234  3          cblock [ctl$l_lvbn] = 0;                  ! Clear start vbn
;   0235  3          cblock [ctl$l_hvbn] = 0;                  ! Clear high vbn
;   0236  3          read_blocks = min (2,                     ! 3 blocks or to EOF
;   0237  3              (.read_blocks*512 + .cblock [ctl$w_offbyte] + 511)/512 - 1);
;   0238  3
;   0239  3          incr i from 0 to .read_blocks do          ! read cache buffers
;   0240  4              begin
;   0241  4
;   0242  4              local
;   0243  4                  stat;
;   0244  4
;   0245  5              stat = (if .cblock [ctl$l_startlbn] neq 0   ! If contiguous
;   0246  5              then boo$qio (.cache [.i], 512,     ! do direct QIO
;   0247  5                      .vbn + .cblock [ctl$l_startlbn] + .i - 1, io$_readlblk, 0, .cblock [ctl$l_rpb]) else
;   0248  5                  fil$readvbn (.cblock [ctl$l_rpb], .vbn + .i,    ! Translate VBN to
;   0249  4                      .cache [.i], .cblock [ctl$l_filhdr]));      !  LBN and read
;   0250  4
;   0251  4              if not .stat                          ! If it failed
;   0252  4              then
;   0253  5                  begin
;   0254  5                  rab [rab$l_stv] = .stat;          ! Load QIO return
;   0255  5                  return rms$_rer
;   0256  5                  end
;   0257  5
;   0258  3              end;
;   0259  3
;   0260  3          cblock [ctl$l_lvbn] = .vbn;               ! Set new low vbn
;   0261  3          cblock [ctl$l_hvbn] = .vbn + .read_blocks + 1   ! Set new high vbn
;   0262  2          end;
;   0263  2
;   0264  2      block = .cache [.vbn - .cblock [ctl$l_lvbn]];       ! Get buffer pointer
;   0265  2      1                                             ! Return success
;   0266  1      end;                                          ! of ods$access
```

```
                                                                PUSHR   #^M<R2,R3,R4>                                  ; 0160
                        54        2C   A9  9E 00002            MOVAB   44(CBLOCK), R4                                 ; 0203
                53      44   A9        57  C3 00006            SUBL3   VBN, 68(CBLOCK), READ_BLOCKS                   ; 0205
                                       07  19 0000B            BLSS    1$                                             ; 0207
                                       1D  12 0000D            BNEQ    3$                                             ; 0208
                                  42   A9  B5 0000F            TSTW    66(CBLOCK)                                     ; 0209
                                       18  12 00012            BNEQ    3$                                             ;
                        02        1E   AA  91 00014 1$:        CMPB    30(RAB), #2                                    ; 0213
                                       09  12 00018            BNEQ    2$                                             ;
                        50 0001865C   8F  D0 0001A            MOVL    #99932, R0                                     ;
                                       2D  11 00021            BRB     5$                                             ;
                        50 0001827A   8F  D0 00023 2$:        MOVL    #98938, R0                                     ;
                                       24  11 0002A            BRB     5$                                             ; 0211
                     28   A9           57  D1 0002C 3$:        CMPL    VBN, 40(CBLOCK)                                ; 0215
                                       09  19 00030            BLSS    4$                                             ;
                     24   A9           57  D1 00032            CMPL    VBN, 36(CBLOCK)                                ; 0216
                                       03  18 00036            BGEQ    4$                                             ;
                                     009D  31 00038            BRW     13$                                            ;
                                  0A   A9  B5 0003B 4$:        TSTW    10(CBLOCK)                                     ; 0220
                                       12  12 0003E            BNEQ    6$                                             ;
                        50             01  D0 00040            MOVL    #1, R0                                         ; 0227
                                     0000G 30 00043            BSBW    RMS$ALLOC_CACHE                                ;
                        09             50  E8 00046            BLBS    STAT, 6$                                       ; 0229
                        50 000184D4   8F  D0 00049            MOVL    #99540, R0                                     ; 0231
                                       76  11 00050 5$:        BRB     11$                                            ;
                                  24   A9  7C 00052 6$:        CLRQ    36(CBLOCK)                                     ; 0235
                50      53             09  78 00055            ASHL    #9, READ_BLOCKS, R0                            ; 0237
                        51        42   A9  3C 00059            MOVZWL  66(CBLOCK), R1                                 ;
                        50      01FF C140  9E 0005D            MOVAB   511(R1)[R0], R0                                ;
                        50 00000200   8F  C6 00063            DIVL2   #512, R0                                       ;
                                       50  D7 0006A            DECL    R0                                             ;
                        02             50  D1 0006C            CMPL    R0, #2                                         ; 0236
                                       03  15 0006F            BLEQ    7$                                             ;
                        50             02  D0 00071            MOVL    #2, R0                                         ;
                        53             50  D0 00074 7$:        MOVL    R0, READ_BLOCKS                                ;
                        52             01  CE 00077            MNEGL   #1, I                                          ; 0239
                                       4E  11 0007A            BRB     12$                                            ;
                51      52             02  78 0007C 8$:        ASHL    #2, I, R1                                      ; 0246
                                  50   A9  D5 00080            TSTL    80(CBLOCK)                                     ; 0245
                                       22  13 00083            BEQL    9$                                             ;
                                  38   A9  DD 00085            PUSHL   56(CBLOCK)                                     ; 0246
                        7E             21  7D 00088            MOVQ    #33, -(SP)                                     ; 0247
                50      57        50   A9  C1 0008B            ADDL3   80(CBLOCK), VBN, R0                            ;
                                  FF A240  9F 00090            PUSHAB  -1(I)[R0]                                      ;
                        7E      0200   8F  3C 00094            MOVZWL  #512, -(SP)                                    ; 0246
                                     6144  9F 00099            PUSHAB  (R1)[R4]                                       ;
                                       9E  DD 0009C            PUSHL   @(SP)+                                         ;
                00000000G  EF          06  FB 0009E            CALLS   #6, BOO$QIO                                    ;
                                       13  11 000A5            BRB     10$                                            ;
                                  54   A9  DD 000A7 9$:        PUSHL   84(CBLOCK)                                     ; 0249
                                     6144  9F 000AA            PUSHAB  (R1)[R4]                                       ; 0248
                                       9E  DD 000AD            PUSHL   @(SP)+                                         ;
                                     6247  9F 000AF            PUSHAB  (I)[VBN]                                       ;
                                  38   A9  DD 000B2            PUSHL   56(CBLOCK)                                     ;
                     0000G  CF         04  FB 000B5            CALLS   #4, FIL$READVBN                                ;
                        0D             50  E8 000BA 10$:       BLBS    STAT, 12$                                      ; 0251
                     0C   AA           50  D0 000BD            MOVL    STAT, 12(RAB)                                  ; 0254
```

```
                                50 0001C0F4    8F  D0 000C1          MOVL    #114932, R0                                 ; 0255
                                               1A  11 000C8 11$:     BRB     14$                                         ;
                     AE             52         53  F3 000CA 12$:     AOBLEQ  READ_BLOCKS, I, 8$                          ; 0239
                        28          A9         57  D0 000CE          MOVL    VBN, 40(CBLOCK)                             ; 0260
                        24          A9      01 A347  9E 000D2          MOVAB   1(READ_BLOCKS)[VBN], 36(CBLOCK)             ; 0261
                     50             57      28  A9  C3 000D8 13$:     SUBL3   40(CBLOCK), VBN, R0                         ; 0264
                                    56        6440  D0 000DD          MOVL    (R4)[R0], BLOCK                             ;
                                    50          01  D0 000E1          MOVL    #1, R0                                      ; 0266
                                                1C  BA 000E4 14$:     POPR    #^M<R2,R3,R4>                               ;
                                                    05 000E6          RSB                                                 ;

; Routine Size:  231 bytes,    Routine Base:  CODE + 0018
```

```
;    0268  1      %sbttl 'ODS OPEN service'
;    0269  1
;    0270  1      global routine ods$open : call_rms =
;    0271  1
;    0272  1      !++
;    0273  1      ! Functional description:
;    0274  1      !       Access a file on ODS files-11 disk media.  Return file parameters
;    0275  1      !       in the FAB and internal control block associated with the file
;    0276  1      !
;    0277  1      ! Inputs:
;    0278  1      !       none
;    0279  1      !
;    0280  1      ! Implicit inputs:
;    0281  1      !       R11     points to the FAB
;    0282  1      !       R9      points to the CBLOCK (internal RMS control block)
;    0283  1      !
;    0284  1      ! Outputs:
;    0285  1      !       none
;    0286  1      !
;    0287  1      ! Implicit outputs:
;    0288  1      !       Several fields in the FAB and in the static file control block
;    0289  1      !       are altered to describe the file.  Also, if an XAB (XABFHC is
;    0290  1      !       the only XAB currently supported) exists, it will be filled in.
;    0291  1      !
;    0292  1      ! Return status
;    0293  1      !       RMS$_DME        insufficient memory for buffer allocation
;    0294  1      !       RMS$_FNF        file not found
;    0295  1      !       RMS$_FNM        Bad file name
;    0296  1      !       RMS$_RER        QIO error on file access
;    0297  1      !       RMS$_NORMAL     success
;    0298  1      !--
;    0299  1
;    0300  2          begin
;    0301  2
;    0302  2          local
;    0303  2              ndxhdr : bblock [512],                  ! Buffer for index header
;    0304  2              filhdr : ref bblock,                    ! Convenient pointer
;    0305  2              status : vector [2],                    ! BOO$QIO status return
;    0306  2              stat;
;    0307  2
;    0308  2          external register
;    0309  2              cblock = 9 : ref bblock,                ! Pointer to control block
;    0310  2              rab = 10,
;    0311  2              fab = 11 : ref bblock;                  ! Define the FAB
;    0312  2
;    0313  3          begin                                       ! Allocate file header space
;    0314  3
;    0315  3          global register
;    0316  3              size = 1,
;    0317  3              addr = 2;
;    0318  3
;    0319  3          size = 512;                                 ! Size of file header
;    0320  3
;    0321  3          if not exe$alononpaged () then return rms$_dme;
;    0322  3
;    0323  3          filhdr = cblock [ctl$l_filhdr] = .addr      ! Remember address
;    0324  2          end;
```

```
;    0325  2          stat = fil$openfile (.cblock [ctl$l_rpb], cblock [ctl$q_filename], ndxhdr, .filhdr, status);
;    0326  2                                                  ! Access the file
;    0327  2
;    0328  2          if not .stat                           ! Error
;    0329  2          then
;    0330  3              return (selectone .stat of
;    0331  3                      set
;    0332  3                      [ss$_nosuchfile] : rms$_fnf;
;    0333  3                      [ss$_badfilename] : rms$_fnm;
;    0334  3                      [ss$_filestruct, ss$_badfilehdr, ss$_badchksum] : (fab [fab$l_stv] = .stat; rms$_acc);
;    0335  4                      [otherwise] : (fab [fab$l_stv] = .stat; rms$_rer)
;    0336  2                      tes);
;    0337  2
;    0338  2          if .filhdr [fh2$b_struclev] eql 2      ! If structure level 2                                  [04]
;    0339  2          then
;    0340  2              cblock [ctl$v_ods2] = 1;           ! Then set flag bit
;    0341  2
;    0342  2          cblock [ctl$l_get] = ods$get;          ! Set GET routine address
;    0343  2          cblock [ctl$l_read] = ods$read;        ! Set READ routine address
;    0344  2          cblock [ctl$l_startlbn] = .status [0];  ! First LBN (if contiguous)
;    0345  3          begin                                  ! Load file attributes
;    0346  3
;    0347  3          builtin
;    0348  3              rot;
;    0349  3
;    0350  3          bind
;    0351  3              fileatt = (if .cblock [ctl$v_ods2] then filhdr [fh2$w_recattr] else filhdr [fh1$w_recattr]) : bblock;
;    0352  3
;    0353  3          fab [fab$b_rat] = .fileatt [fat$b_rattrib]; ! Copy record attributes
;    0354  3                                                  ! Get EOF block, which is
;    0355  3          cblock [ctl$l_eofvbn] =                 ! The EOF block VBN is
;    0356  3          rot (.fileatt [fat$l_efblk], 16);       !  stored sideways
;    0357  3          cblock [ctl$w_offbyte] = .fileatt [fat$w_ffbyte];   ! First free byte
;    0358  3          fab [fab$b_org] = .fileatt [fat$v_fileorg]; ! File organization
;    0359  3          fab [fab$b_rfm] = .fileatt [fat$v_rtype];   ! Record format
;    0360  3          fab [fab$w_mrs] = .fileatt [fat$w_maxrec];  ! Max. rec size
;    0361  3
;    0362  3          If .Fab [Fab$W_Mrs] Eql 0              ! If no MAXREC                                          [04]
;    0363  3          Then                                   !                                                       [04]
;    0364  3              Fab [Fab$W_Mrs] = .FileAtt [Fat$W_RSize];       ! Get the record size                       [04]
;    0365  3
;    0366  3          fab [fab$b_fsz] = .fileatt [fat$b_vfcsize]  ! Variable/fixed header size
;    0367  2          end;
;    0368  2          rms$_normal
;    0369  1          end;                                   ! of ODS$OPEN


                                    01FC 00000          .ENTRY  ODS$OPEN, Save R2,R3,R4,R5,R6,R7,R8          ; 0270
                5E      FDF8    CE  9E 00002            MOVAB   -520(SP), SP                                 ;
                51      0200    8F  3C 00007            MOVZWL  #512, SIZE                                   ; 0319
                   00000000G    EF  16 0000C            JSB     EXE$ALONONPAGED                              ; 0321
                08              50  E8 00012            BLBS    R0, 1$                                       ;
                50 000184D4     8F  D0 00015            MOVL    #99540, R0                                   ;
                                    04 0001C            RET                                                  ;
```

```
                    54   A9              52  D0 0001D 1$:    MOVL    ADDR, 84(CBLOCK)                    ; 0323
                                  4004   8F  BB 00021        PUSHR   #^M<R2,SP>                          ; 0325
                                    10   AE  9F 00025        PUSHAB  NDXHDR                              ;
                                    48   A9  9F 00028        PUSHAB  72(CBLOCK)                          ;
                                    38   A9  DD 0002B        PUSHL   56(CBLOCK)                          ;
                  0000G  CF              05  FB 0002E        CALLS   #5, FIL$OPENFILE                    ;
                         55              50  E8 00033        BLBS    STAT, 6$                            ; 0328
              00000910   8F              50  D1 00036        CMPL    STAT, #2320                         ; 0332
                                         08  12 0003D        BNEQ    2$                                  ;
                         50 00018292     8F  D0 0003F        MOVL    #98962, R0                          ;
                                            04 00046        RET                                         ;
              00000818   8F              50  D1 00047 2$:    CMPL    STAT, #2072                         ; 0333
                                         08  12 0004E        BNEQ    3$                                  ;
                         50 0001852C     8F  D0 00050        MOVL    #99628, R0                          ;
                                            04 00057        RET                                         ;
              00000808   8F              50  D1 00058 3$:    CMPL    STAT, #2056                         ; 0334
                                         12  13 0005F        BEQL    4$                                  ;
              00000810   8F              50  D1 00061        CMPL    STAT, #2064                         ;
                                         09  13 00068        BEQL    4$                                  ;
              000008C0   8F              50  D1 0006A        CMPL    STAT, #2240                         ;
                                         0C  12 00071        BNEQ    5$                                  ;
                    0C   AB              50  D0 00073 4$:    MOVL    STAT, 12(FAB)                       ;
                         50 0001C002     8F  D0 00077        MOVL    #114690, R0                         ;
                                            04 0007E        RET                                         ;
                    0C   AB              50  D0 0007F 5$:    MOVL    STAT, 12(FAB)                       ; 0335
                         50 0001C0F4     8F  D0 00083        MOVL    #114932, R0                         ;
                                            04 0008A        RET                                         ; 0330
                         02        07    A2  91 0008B 6$:    CMPB    7(FILHDR), #2                       ; 0338
                                         04  12 0008F        BNEQ    7$                                  ;
                    01   A9              04  88 00091        BISB2   #4, 1(CBLOCK)                       ; 0340
                    0C   A9      0000V   CF  9E 00095 7$:    MOVAB   ODS$GET, 12(CBLOCK)                 ; 0342
                    10   A9      0000V   CF  9E 0009B        MOVAB   ODS$READ, 16(CBLOCK)                ; 0343
                    50   A9              6E  D0 000A1        MOVL    STATUS, 80(CBLOCK)                  ; 0344
              08    01   A9              02  E1 000A5        BBC     #2, 1(CBLOCK), 8$                   ; 0351
                         52              14  C0 000AA        ADDL2   #20, R2                             ;
                         50              52  D0 000AD        MOVL    R2, R0                              ;
                                         04  11 000B0        BRB     9$                                  ;
                         50        0E    A2  9E 000B2 8$:    MOVAB   14(R2), R0                          ;
                    1E   AB        01    A0  90 000B6 9$:    MOVB    1(R0), 30(FAB)                      ; 0353
          44   A9   08   A0              10  9C 000BB        ROTL    #16, 8(R0), 68(CBLOCK)              ; 0356
                    42   A9        0C    A0  B0 000C1        MOVW    12(R0), 66(CBLOCK)                  ; 0357
     51         60        04              04  EF 000C6        EXTZV   #4, #4, (R0), R1                    ; 0358
                    1D   AB              51  90 000CB        MOVB    R1, 29(FAB)                         ;
     51         60        04              00  EF 000CF        EXTZV   #0, #4, (R0), R1                    ; 0359
                    1F   AB              51  90 000D4        MOVB    R1, 31(FAB)                         ;
                    36   AB        10    A0  B0 000D8        MOVW    16(R0), 54(FAB)                     ; 0360
                                         05  12 000DD        BNEQ    10$                                 ; 0362
                    36   AB        02    A0  B0 000DF        MOVW    2(R0), 54(FAB)                      ; 0364
                    3F   AB        0F    A0  90 000E4 10$:   MOVB    15(R0), 63(FAB)                     ; 0366
                         50 00010001     8F  D0 000E9        MOVL    #65537, R0                          ; 0369
                                            04 000F0        RET                                         ;

; Routine Size:  241 bytes,    Routine Base:  CODE + 00FF


;   0370  1
```

```
;    0372  1      %sbttl 'ODS$GET routine'
;    0373  1
;    0374  1      global routine ods$get : call_rms =
;    0375  1
;    0376  1      !++
;    0377  1      ! Functional description:
;    0378  1      !       De-block and return a record from an ODS file.
;    0379  1      !
;    0380  1      ! Inputs:
;    0381  1      !       none
;    0382  1      !
;    0383  1      ! Implicit inputs:
;    0384  1      !       R9                      CBLOCK pointer
;    0385  1      !       R10                     RAB pointer
;    0386  1      !       R11                     FAB pointer
;    0387  1      !       several fields in the above data structures
;    0388  1      !
;    0389  1      ! Outputs:
;    0390  1      !       none
;    0391  1      !
;    0392  1      ! Implicit outputs:
;    0393  1      !       RAB [rab$l_stv]         Set to error status of failing system service
;    0394  1      !       RAB [rab$l_rbf]         Set to user buffer
;    0395  1      !       RAB [rab$w_rsz]         Size of record copied to user buffer
;    0396  1      !
;    0397  1      ! Side effects:
;    0398  1      !       CBLOCK [ctl$w_rfa]      advanced one record if access was not
;    0399  1      !                               random-by-RFA
;    0400  1      !       CBLOCK                  cache control and cache buffers may be
;    0401  1      !                               altered if part or all of the record is
;    0402  1      !                               not within a block currently cached.
;    0403  1      !
;    0404  1      ! Return codes:
;    0405  1      !       RMS$_NORMAL             if OK
;    0406  1      !       RMS$_RER                if system read error (QIO)
;    0407  1      !       RMS$_RFA                if random RFA is beyond EOF
;    0408  1      !       RMS$_EOF                if RFA is beyond end of file
;    0409  1      !       RMS$_IRC                Illegal record
;    0410  1      !       RMS$_RTB                Record is too big for user buffer (truncated)
;    0411  1      !--
;    0412  1
;    0413  2          begin
;    0414  2
;    0415  2          external register
;    0416  2              cblock = 9 : ref bblock,            ! Pointer to CBLOCK
;    0417  2              rab = 10 : ref bblock,              ! Pointer to RAB
;    0418  2              fab = 11 : ref bblock;              ! Pointer to FAB
;    0419  2
;    0420  2          global register
;    0421  2              block = 6 : ref vector [, byte],    ! Pointer to cache buffer
;    0422  2              vbn = 7,                            ! Current VBN in file
;    0423  2              offset = 8;                         ! Current offset in VBN
;    0424  2
;    0425  2          local
;    0426  2              f_size : word,                      ! Full size of record          [04]
;    0427  2              size : word,                        ! Size of record               [04]
;    0428  2              lenlim : word,                      ! Size of user buffer          [04]
```

```
;    0429  2              ptr;                                    ! Address in user buffer
;    0430  2
;    0431  2          vbn = .cblock [ctl$l_vbn];                  ! Extract vbn from next RFA
;    0432  2          offset = .cblock [ctl$w_byte];              ! Extract byte offset
;    0433  2
;    0434  2          do
;    0435  3              begin                                   ! Loop until find real record
;    0436  3
;    0437  3              if .rab [rab$b_rac] neq rab$c_rfa       ! If not random access
;    0438  3              then
;    0439  3                  ods$advance (.cblock [ctl$w_rec_size]);     ! Else advance to next
;    0440  3
;    0441  3              cblock [ctl$l_vbn] = .vbn;              ! Update CBLOCK vbn
;    0442  3              cblock [ctl$w_byte] = .offset;          !  and it's offset
;    0443  3
;    0444  3              if .vbn gtr .cblock [ctl$l_eofvbn] or .vbn eql .cblock [ctl$l_eofvbn] and .offset geq .cblock [
;    0445  3                      ctl$w_offbyte]                  ! If past file EOF
;    0446  3              then
;    0447  3                  return rms$_eof;                    ! can't read past EOF
;    0448  3
;    0449  4              (
;    0450  4
;    0451  4              local
;    0452  4                  stat;
;    0453  4
;    0454  4              stat = ods$access ();                   ! Load the block in cache
;    0455  3              if not .stat then return .stat);
;    0456  3              cblock [ctl$w_rec_size] =               ! Set size of current record
;    0457  4              (if .fab [fab$b_rfm] neq fab$c_fix      ! If not fixed record format
;    0458  4              then
;    0459  5                  begin
;    0460  5                  size = .(block [.offset])<0, 16>;   ! then fetch record size
;    0461  5                  ods$advance (2);                    ! Skip over the size
;    0462  6                  (
;    0463  6
;    0464  6                  local
;    0465  6                      stat;
;    0466  6
;    0467  6                  stat = ods$access ();               ! and be sure (new) VBN is there
;    0468  5                  if not .stat then return .stat);
;    0469  5                  .size + 2
;    0470  5                  end
;    0471  4              else size = .fab [fab$w_mrs])           ! else get fixed size from FAB
;    0472  3              end
;    0473  3          until (if .size eql %x'FFFF'                ! Means non-spanned 'skip to next block'
;    0474  3              then
;    0475  4                  begin
;    0476  4                  vbn = .vbn + 1;
;    0477  4                  cblock [ctl$w_rec_size] = offset = 0;
;    0478  4                  0
;    0479  4                  end
;    0480  2              else 1);
;    0481  2
;    0482  2          if .fab [fab$b_rfm] eql fab$c_vfc           ! If we have header record
;    0483  2          then
;    0484  3              begin
;    0485  3
```

```
;    0486  3              if .size lss .fab [fab$b_fsz]
;    0487  3              then
;    0488  4                  (rab [rab$l_stv] = .vbn;              ! Store VBN of illegal record
;    0489  4                  return rms$_irc                       ! Illegal record
;    0490  3                  );
;    0491  3
;    0492  3              if .rab [rab$l_rhb] neq 0                 ! If there's a place to put it
;    0493  3              then
;    0494  3                  ch$move (.fab [fab$b_fsz], block [.offset], .rab [rab$l_rhb]);      !  copy it over
;    0495  3
;    0496  3              size = .size - .fab [fab$b_fsz];          ! Decrease record size by header length
;    0497  3              ods$advance (.fab [fab$b_fsz])            ! and advance over it anyway
;    0498  2              end;
;    0499  2
;    0500  2          ptr = rab [rab$l_rbf] = .rab [rab$l_ubf];     ! Point to user buffer
;    0501  2          lenlim = .rab [rab$w_usz];                    ! Size limit
;    0502  2          rab [rab$w_rsz] = 0;                          ! Init output size
;    0503  2          f_size = .size;                               ! Store size, since SIZE moves
;    0504  2
;    0505  2          while 1 do                                    ! Copy over the record
;    0506  3              begin
;    0507  3
;    0508  3              local
;    0509  3                  length;
;    0510  3
;    0511  4              (
;    0512  4
;    0513  4              local
;    0514  4                  stat;
;    0515  4
;    0516  4              stat = ods$access ();                     ! Be sure VBN is there
;    0517  3              if not .stat then return .stat);
;    0518  3              length = min (.size, (512 - .offset), .lenlim); ! Size to copy
;    0519  3              ptr = ch$move (.length, block [.offset], .ptr); ! Copy (part of) record
;    0520  3              rab [rab$w_rsz] = .rab [rab$w_rsz] + .length;   ! Update actual length so far
;    0521  3              size = .size - .length;                   ! Rest of record
;    0522  3
;    0523  3              if .size eql 0 then return rms$_normal; ! Return if done
;    0524  3
;    0525  3              lenlim = .lenlim - .length;               ! Buffer size left
;    0526  3
;    0527  3              if .lenlim eql 0                          ! If no space left
;    0528  3              then
;    0529  4                  begin
;    0530  4                  rab [rab$l_stv] = .f_size;            ! Return true size
;    0531  4                  return rms$_rtb
;    0532  3                  end;
;    0533  3
;    0534  3              ods$advance (.length)                     ! Skip on to next block
;    0535  2              end;
;    0536  2
;    0537  2          rms$_normal
;    0538  1          end;
```

```
                                                01FC 00000          .ENTRY  ODS$GET, Save R2,R3,R4,R5,R6,R7,R8          ; 0374
                                  5E          10  C2 00002          SUBL2   #16, SP                                     ;
                                  57      18  A9  D0 00005          MOVL    24(CBLOCK), VBN                             ; 0431
                                  58      1C  A9  3C 00009          MOVZWL  28(CBLOCK), OFFSET                          ; 0432
                                  02      1E  AA  91 0000D 1$:      CMPB    30(RAB), #2                                 ; 0437
                                              07  13 00011          BEQL    2$                                          ;
                                  50      1E  A9  3C 00013          MOVZWL  30(CBLOCK), R0                              ; 0439
                                            FDF6  30 00017          BSBW    ODS$ADVANCE                                 ;
                              18  A9          57  D0 0001A 2$:      MOVL    VBN, 24(CBLOCK)                             ; 0441
                              1C  A9          58  B0 0001E          MOVW    OFFSET, 28(CBLOCK)                          ; 0442
                              44  A9          57  D1 00022          CMPL    VBN, 68(CBLOCK)                             ; 0444
                                              0A  14 00026          BGTR    3$                                          ;
                                              10  12 00028          BNEQ    4$                                          ;
  58      42  A9                  10          00  ED 0002A          CMPZV   #0, #16, 66(CBLOCK), OFFSET                 ; 0445
                                              08  14 00030          BGTR    4$                                          ;
                                  50 0001827A 8F  D0 00032 3$:      MOVL    #98938, R0                                  ; 0447
                                                  04 00039          RET                                                 ;
                                            FDEB  30 0003A 4$:      BSBW    ODS$ACCESS                                  ; 0454
                                  15          50  E9 0003D          BLBC    STAT, 5$                                    ; 0455
                                  01      1F  AB  91 00040          CMPB    31(FAB), #1                                 ; 0457
                                              1A  13 00044          BEQL    6$                                          ;
                                            6846  9F 00046          PUSHAB  (OFFSET)[BLOCK]                             ; 0460
                                  6E          9E  B0 00049          MOVW    @(SP)+, SIZE                                ;
                                  50          02  D0 0004C          MOVL    #2, R0                                      ; 0461
                                            FDBE  30 0004F          BSBW    ODS$ADVANCE                                 ;
                                            FDD3  30 00052          BSBW    ODS$ACCESS                                  ; 0467
                                  75          50  E9 00055 5$:      BLBC    STAT, 13$                                   ; 0468
                                  50          6E  3C 00058          MOVZWL  SIZE, R0                                    ; 0469
                                  50          02  C0 0005B          ADDL2   #2, R0                                      ;
                                              07  11 0005E          BRB     7$                                          ;
                                  50      36  AB  3C 00060 6$:      MOVZWL  54(FAB), R0                                 ; 0471
                                  6E          50  B0 00064          MOVW    R0, SIZE                                    ;
                              1E  A9          50  B0 00067 7$:      MOVW    R0, 30(CBLOCK)                              ; 0456
                            FFFF  8F          6E  B1 0006B          CMPW    SIZE, #65535                                ; 0473
                                              09  12 00070          BNEQ    8$                                          ;
                                              57  D6 00072          INCL    VBN                                         ; 0476
                                              58  D4 00074          CLRL    OFFSET                                      ; 0477
                                          1E  A9  B4 00076          CLRW    30(CBLOCK)                                  ;
                                              92  11 00079          BRB     1$                                          ; 0478
                                  03      1F  AB  91 0007B 8$:      CMPB    31(FAB), #3                                 ; 0482
                                              32  12 0007F          BNEQ    11$                                         ;
                                  50      3F  AB  9A 00081          MOVZBL  63(FAB), R0                                 ; 0486
                                  6E          50  B1 00085          CMPW    R0, SIZE                                    ;
                                              0C  1B 00088          BLEQU   9$                                          ;
                              0C  AA          57  D0 0008A          MOVL    VBN, 12(RAB)                                ; 0488
                                  50 0001857C 8F  D0 0008E          MOVL    #99708, R0                                  ; 0489
                                                  04 00095          RET                                                 ;
                                          2C  AA  D5 00096 9$:      TSTL    44(RAB)                                     ; 0492
                                              0A  13 00099          BEQL    10$                                         ;
                                  50      3F  AB  9A 0009B          MOVZBL  63(FAB), R0                                 ; 0494
          2C  BA                6846          50  28 0009F          MOVC3   R0, (OFFSET)[BLOCK], @44(RAB)               ;
                                  50      3F  AB  9A 000A5 10$:     MOVZBL  63(FAB), R0                                 ; 0496
                                  6E          50  A2 000A9          SUBW2   R0, SIZE                                    ;
                                  50      3F  AB  9A 000AC          MOVZBL  63(FAB), R0                                 ; 0497
                                            FD5D  30 000B0          BSBW    ODS$ADVANCE                                 ;
                                  50      24  AA  D0 000B3 11$:     MOVL    36(RAB), R0                                 ; 0500
```

```
                        28   AA          50  D0 000B7          MOVL    R0, 40(RAB)                                  ;
                             53          50  D0 000BB          MOVL    R0, PTR                                      ;
                        08   AE      20  AA  B0 000BE          MOVW    32(RAB), LENLIM                              ; 0501
                                     22  AA  B4 000C3          CLRW    34(RAB)                                      ; 0502
                        0C   AE          6E  B0 000C6          MOVW    SIZE, F_SIZE                                 ; 0503
                                        FD5B  30 000CA 12$:    BSBW    ODS$ACCESS                                   ; 0516
                             58          50  E9 000CD 13$:    BLBC    STAT, 18$                                    ; 0517
                 51 00000200 8F          58  C3 000D0          SUBL3   OFFSET, #512, R1                             ; 0518
                             50          6E  3C 000D8          MOVZWL  SIZE, R0                                     ;
                             51          50  D1 000DB          CMPL    R0, R1                                       ;
                                         03  15 000DE          BLEQ    14$                                          ;
                             50          51  D0 000E0          MOVL    R1, R0                                       ;
     50       08   AE        10          00  ED 000E3 14$:    CMPZV   #0, #16, LENLIM, R0                          ;
                                         04  18 000E9          BGEQ    15$                                          ;
                             50      08  AE  3C 000EB          MOVZWL  LENLIM, R0                                   ;
                        04   AE          50  D0 000EF 15$:    MOVL    R0, LENGTH                                   ;
                 63        6846      04  AE  28 000F3          MOVC3   LENGTH, (OFFSET)[BLOCK], (PTR)               ; 0519
                        22   AA      04  AE  A0 000F9          ADDW2   LENGTH, 34(RAB)                              ; 0520
                             6E      04  AE  A2 000FE          SUBW2   LENGTH, SIZE                                 ; 0521
                                         1D  13 00102          BEQL    17$                                          ; 0523
                        08   AE      04  AE  A2 00104          SUBW2   LENGTH, LENLIM                               ; 0525
                                         0D  12 00109          BNEQ    16$                                          ; 0527
                        0C   AA      0C  AE  3C 0010B          MOVZWL  F_SIZE, 12(RAB)                              ; 0530
                             50 000181A8 8F  D0 00110          MOVL    #98728, R0                                   ; 0531
                                             04 00117          RET                                                  ;
                             50      04  AE  D0 00118 16$:    MOVL    LENGTH, R0                                   ; 0534
                                        FCF1  30 0011C          BSBW    ODS$ADVANCE                                  ;
                                         A9  11 0011F          BRB     12$                                          ;
                             50 00010001 8F  D0 00121 17$:    MOVL    #65537, R0                                   ; 0538
                                             04 00128 18$:    RET                                                  ;

; Routine Size:  297 bytes,    Routine Base:  CODE + 01F0

;   0539  1
```

```
;    0541  1      %sbttl 'ODS$READ routine'
;    0542  1
;    0543  1      global routine ods$read : call_rms =
;    0544  1
;    0545  1      !++
;    0546  1      ! Functional description:
;    0547  1      !       Read virtual blocks of file
;    0548  1      !
;    0549  1      ! Inputs:
;    0550  1      !       none
;    0551  1      !
;    0552  1      ! Implicit inputs:
;    0553  1      !       R9                      CBLOCK pointer
;    0554  1      !       R10                     RAB pointer
;    0555  1      !       various fields in the above-listed data structures
;    0556  1      !
;    0557  1      ! Outputs:
;    0558  1      !       none
;    0559  1      !
;    0560  1      ! Implicit outputs:
;    0561  1      !       RAB [rab$l_rbf]         points to buffer
;    0562  1      !       RAB [rab$w_rsz]         size of buffer
;    0563  1      !
;    0564  1      ! Side Effects:
;    0565  1      !       CBLOCK [ctl$l_nbp]      points to next VBN for sequential READ.
;    0566  1      !
;    0567  1      ! Return codes:
;    0568  1      !       RMS$_NORMAL             OK
;    0569  1      !       RMS$_RER                Read error
;    0570  1      !--
;    0571  1
;    0572  2          begin
;    0573  2
;    0574  2          external register
;    0575  2              cblock = 9 : ref bblock,                    ! Map the control block
;    0576  2              rab = 10 : ref bblock;                      ! Map the RAB
;    0577  2
;    0578  2          local
;    0579  2              size,
;    0580  2              next;
;    0581  2
;    0582  2          next = .cblock [ctl$l_nbp];                     ! Block to start at
;    0583  2          size = rab [rab$w_rsz] = min (.rab [rab$w_usz],     ! Determine actual size to
;    0584  2              (.cblock [ctl$l_eofvbn] - .next)*512 +      !  read--either given size
;    0585  2              .cblock [ctl$w_offbyte]);                   !  or to end of file if less
;    0586  2          cblock [ctl$l_nbp] = .next + (.size + 511)/512;     ! Point to next full block
;    0587  2
;    0588  2          if .cblock [ctl$l_startlbn] neq 0               ! If file is contiguous
;    0589  2          then
;    0590  3              begin
;    0591  3
;    0592  3              local
;    0593  3                  stat;
;    0594  3
;    0595  3              stat = boo$qio (rab [rab$l_rbf] = .rab [rab$l_ubf], .size, .cblock [ctl$l_startlbn] + .next - 1,
;    0596  3                  io$_readlblk, 0, .cblock [ctl$l_rpb]);      ! Read all at once
;    0597  3
```

```
;   0598  3             if not .stat                          ! If error, scram
;   0599  3             then
;   0600  4                 (rab [rab$l_stv] = .stat; return rms$_rer)
;   0601  4
;   0602  3             end
;   0603  2         else                                      ! Non-contiguous, read it
;   0604  3             begin                                 !  block by block
;   0605  3
;   0606  3             local
;   0607  3                 ptr;
;   0608  3
;   0609  3             ptr = rab [rab$l_rbf] = .rab [rab$l_ubf];       ! Start of user buffer
;   0610  3
;   0611  3             while .size gtr 0 do
;   0612  4                 begin
;   0613  4
;   0614  4                 global register
;   0615  4                     block = 6,                    ! Registers for ACCESS
;   0616  4                     vbn = 7,
;   0617  4                     offset = 8;
;   0618  4
;   0619  4                 local
;   0620  4                     rs,
;   0621  4                     stat;
;   0622  4
;   0623  4                 vbn = .next;                      ! Next block to read
;   0624  4                 rs = min (.size, 512);            ! Read a block or less
;   0625  4                 stat = ods$access ();             ! Access next block
;   0626  4
;   0627  4                 if not .stat                      ! Scram if error
;   0628  4                 then
;   0629  4                     (rab [rab$l_stv] = .stat; return rms$_rer);
;   0630  4
;   0631  4                 ptr = ch$move (.rs, .block, .ptr);  ! Copy to user buffer
;   0632  4                 next = .next + 1;                 ! Advance block number
;   0633  4                 size = .size - .rs                ! Count size of read
;   0634  4                 end
;   0635  4
;   0636  2             end;
;   0637  2
;   0638  2         rms$_normal
;   0639  1         end;                                      ! Of ods$read
```

```
                                    09FC 00000        .ENTRY  ODS$READ, Save R2,R3,R4,R5,R6,R7,R8,R11     ; 0543
                    5E              04  C2 00002       SUBL2   #4, SP                                      ;
                            04      A9  DD 00005       PUSHL   4(CBLOCK)                                   ; 0582
        51      44  A9              6E  C3 00008       SUBL3   NEXT, 68(CBLOCK), R1                        ; 0584
        51          51              09  78 0000D       ASHL    #9, R1, R1                                  ;
                    50      42      A9  3C 00011       MOVZWL  66(CBLOCK), R0                              ; 0585
                    51              50  C0 00015       ADDL2   R0, R1                                      ;
                    50      20      AA  3C 00018       MOVZWL  32(RAB), R0                                 ;
                    51              50  D1 0001C       CMPL    R0, R1                                      ;
                                    03  15 0001F       BLEQ    1$                                          ;
```

```
                                50          51  D0 00021        MOVL    R1, R0                                  ;
                          22    AA          50  B0 00024 1$:    MOVW    R0, 34(RAB)                             ;
                                5B          50  D0 00028        MOVL    R0, SIZE                                ;
                                50     01FF CB  9E 0002B        MOVAB   511(R11), R0                            ; 0586
                                50 00000200 8F  C6 00030        DIVL2   #512, R0                                ;
                04    A9        50          6E  C1 00037        ADDL3   NEXT, R0, 4(CBLOCK)                     ;
                                      50    A9  D5 0003C        TSTL    80(CBLOCK)                              ; 0588
                                            24  13 0003F        BEQL    2$                                      ;
                                      38    A9  DD 00041        PUSHL   56(CBLOCK)                              ; 0596
                                7E          21  7D 00044        MOVQ    #33, -(SP)                              ;
                50        50    A9    0C    AE  C1 00047        ADDL3   NEXT, 80(CBLOCK), R0                    ; 0595
                                      FF    A0  9F 0004D        PUSHAB  -1(R0)                                  ;
                                            5B  DD 00050        PUSHL   SIZE                                    ;
                                      24    AA  DD 00052        PUSHL   36(RAB)                                 ;
                          28    AA          6E  D0 00055        MOVL    (SP), 40(RAB)                           ;
                     00000000G  EF          06  FB 00059        CALLS   #6, BOO$QIO                             ;
                                48          50  E8 00060        BLBS    STAT, 7$                                ; 0598
                                            2D  11 00063        BRB     5$                                      ; 0600
                                50    24    AA  D0 00065 2$:    MOVL    36(RAB), R0                             ; 0609
                          28    AA          50  D0 00069        MOVL    R0, 40(RAB)                             ;
                                53          50  D0 0006D        MOVL    R0, PTR                                 ;
                                            5B  D5 00070 3$:    TSTL    SIZE                                    ; 0611
                                            37  15 00072        BLEQ    7$                                      ;
                                57          6E  D0 00074        MOVL    NEXT, VBN                               ; 0623
                                50          5B  D0 00077        MOVL    SIZE, R0                                ; 0624
                     00000200   8F          50  D1 0007A        CMPL    R0, #512                                ;
                                            05  15 00081        BLEQ    4$                                      ;
                                50     0200 8F  3C 00083        MOVZWL  #512, R0                                ;
                          04    AE          50  D0 00088 4$:    MOVL    R0, RS                                  ;
                                         FC70  30 0008C        BSBW    ODS$ACCESS                              ; 0625
                                0C          50  E8 0008F        BLBS    STAT, 6$                                ; 0627
                          0C    AA          50  D0 00092 5$:    MOVL    STAT, 12(RAB)                           ; 0629
                                50 0001C0F4 8F  D0 00096        MOVL    #114932, R0                             ;
                                            04  0009D           RET                                             ;
                63              66    04    AE  28 0009E 6$:    MOVC3   RS, (BLOCK), (PTR)                      ; 0631
                                            6E  D6 000A3        INCL    NEXT                                    ; 0632
                                5B    04    AE  C2 000A5        SUBL2   RS, SIZE                                ; 0633
                                            C5  11 000A9        BRB     3$                                      ;
                                50 00010001 8F  D0 000AB 7$:    MOVL    #65537, R0                              ; 0639
                                            04  000B2           RET                                             ;

; Routine Size:  179 bytes,    Routine Base:  CODE + 0319


;   0640  1
;   0641  1     end
;   0642  1
;   0643  0     eludom




;                                PSECT SUMMARY
;
;       Name                    Bytes                       Attributes
```

```
;
;  CODE                          972  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
```

Symbol	Type	Defined	Referenced ...
ADDR	GlobReg	317	323.
BBLOCK	Structur	Lib02	196 197 303 304 309 311 351 416 417 418 575 576
BITE	Local	152	154= 155. 156.
BLOCK	ExtReg	194	264=
	GlobReg	421	460a. 494a. 519a.
	GlobReg	615	631a.
BOO$QIO	ExtRout	95	246c 595c
CACHE	Bind	203	246. 249. 264.
CALL_RMS	Linkage	Lib02	80 81 82 270 374 543
CBLOCK	ExtReg	196	203aa 205a. 209a. 215a. 216a. 220a. 234a= 235a= 237a. 245a. 247a. 248a.
			249a. 260a= 261a= 264a.
	ExtReg	309	323a= 325a. 325aa 340a= 342a= 343a= 344a= 351a. 355a= 357a=
	ExtReg	416	431a. 432a. 439a. 441a= 442a= 444a. 456a= 477a=
	ExtReg	575	582a. 584a. 585a. 586a= 588a. 595a. 596a.
CTL$L_CACHE1	Macro	Lib02	203
CTL$L_EOFVBN	Macro	Lib02	205 355 444 584
CTL$L_FILHDR	Macro	Lib02	249 323
CTL$L_GET	Macro	Lib02	342
CTL$L_HVBN	Macro	Lib02	216 235 261
CTL$L_LVBN	Macro	Lib02	215 234 260 264
CTL$L_NBP	Macro	Lib02	582 586
CTL$L_READ	Macro	Lib02	343
CTL$L_RPB	Macro	Lib02	247 248 325 596
CTL$L_STARTLBN	Macro	Lib02	245 247 344 588 595
CTL$L_VBN	Macro	Lib02	431 441
CTL$Q_FILENAME	Macro	Lib02	325
CTL$V_ODS2	Macro	Lib02	340 351
CTL$W_BYTE	Macro	Lib02	432 442
CTL$W_CACHE_SIZE	Macro	Lib02	220
CTL$W_OFFBYTE	Macro	Lib02	209 237 357 445 585
CTL$W_REC_SIZE	Macro	Lib02	439 456 477
EXE$ALONONPAGED	ExtRout	96	321c
FAB	ExtReg	311	334a= 335a= 353a= 358a= 359a= 360a= 362a. 364a= 366a=
	ExtReg	418	457a. 471a. 482a. 486a. 494a. 496a. 497a.
FAB$B_FSZ	Macro	Lib03	366 486 494 496 497
FAB$B_ORG	Macro	Lib03	358
FAB$B_RAT	Macro	Lib03	353
FAB$B_RFM	Macro	Lib03	359 457 482
FAB$C_FIX	Literal	Lib03	457
FAB$C_VFC	Literal	Lib03	482
FAB$L_STV	Macro	Lib03	334 335
FAB$W_MRS	Macro	Lib03	360 362 364 471
FAT$B_RATTRIB	Macro	Lib03	353
FAT$B_VFCSIZE	Macro	Lib03	366
FAT$L_EFBLK	Macro	Lib03	356
FAT$V_FILEORG	Macro	Lib03	358
FAT$V_RTYPE	Macro	Lib03	359
FAT$W_FFBYTE	Macro	Lib03	357

Symbol	Type	Defined	Referenced ...
FAT$W_MAXREC	Macro	Lib03	360
FAT$W_RSIZE	Macro	Lib03	364
FH1$W_RECATTR	Macro	Lib03	351
FH2$B_STRUCLEV	Macro	Lib03	338
FH2$W_RECATTR	Macro	Lib03	351
FIL$OPENFILE	ExtRout	93	325c
FIL$READVBN	ExtRout	94	248c
FILEATT	Bind	351	353. 356. 357. 358. 359. 360. 364. 366.
FILHDR	Local	304	323= 325. 338a. 351aa
F_SIZE	Local	426	503= 530.
I	Local	239	246. 247. 248. 249.
IO$_READLBLK	Literal	Lib03	247 596
JSB_ALLOC	Linkage	Lib02	96
JSB_CBLOCK	Linkage	Lib02	92
JSB_ODS	Linkage	71	78 79 116 160
LEN	RoutForm	116	154.
LENGTH	Local	509	518= 519. 520. 521. 525. 534.
LENLIM	Local	428	501= 518. 525= 525. 527.
NDXHDR	Local	303	325a
NEXT	Local	580	582= 584. 586. 595. 623. 632= 632.
ODS$ACCESS	Routine	160	79f 454c 467c 516c 625c
ODS$ADVANCE	Routine	116	78f 439c 461c 497c 534c
ODS$GET	GlobRout	374	81f 342a
ODS$OPEN	GlobRout	270	80f
ODS$READ	GlobRout	543	82f 343a
OFFSET	ExtReg	149	154. 155=
	GlobReg	423	432= 442. 444. 460. 477= 494. 518. 519.
	GlobReg	617	
PTR	Local	429	500= 519= 519a=
	Local	607	609= 631= 631a=
RAB	ExtReg	197	213a. 254a=
	ExtReg	310	
	ExtReg	417	437a. 488a= 492a. 494a= 500a= 500a. 501a. 502a= 520a= 520a. 530a=
	ExtReg	576	583a= 583a. 595a= 595a. 600a= 609a= 609a. 629a=
RAB$B_RAC	Macro	Lib03	213 437
RAB$C_RFA	Literal	Lib03	213 437
RAB$L_RBF	Macro	Lib03	500 595 609
RAB$L_RHB	Macro	Lib03	492 494
RAB$L_STV	Macro	Lib03	254 488 530 600 629
RAB$L_UBF	Macro	Lib03	500 595 609
RAB$W_RSZ	Macro	Lib03	502 520 583
RAB$W_USZ	Macro	Lib03	501 583
READ_BLOCKS	Local	200	205= 207. 208. 236= 237. 239. 261.
RMS$ALLOC_CACHE	ExtRout	92	227c
RMS$_ACC	Literal	Lib03	334
RMS$_DME	Literal	Lib03	231 321
RMS$_EOF	Literal	Lib03	213 447
RMS$_FNF	Literal	Lib03	332
RMS$_FNM	Literal	Lib03	333
RMS$_IRC	Literal	Lib03	489
RMS$_NORMAL	Literal	Lib03	368 523 537 638
RMS$_RER	Literal	Lib03	255 335 600 629
RMS$_RFA	Literal	Lib03	213
RMS$_RTB	Literal	Lib03	531
ROT	Builtin	348	356

Symbol	Type	Defined	Referenced ...										
RS	Local	620	624=	631.	633.								
SIZE	GlobReg	316	319=										
	Local	427	460=	469.	471=	473.	486.	496=	496.	503.	518.	521=	521.	523.
	Local	579	583=	586.	595.	611.	624.	633=	633.				
SS$_BADCHKSUM	Literal	Lib03	334										
SS$_BADFILEHDR	Literal	Lib03	334										
SS$_BADFILENAME	Literal	Lib03	333										
SS$_FILESTRUCT	Literal	Lib03	334										
SS$_NOSUCHFILE	Literal	Lib03	332										
STAT	Local	225	227=	229.									
	Local	243	245=	251.	254.								
	Local	306	325=	328.	330.	334.	335.						
	Local	452	454=	455.									
	Local	465	467=	468.									
	Local	514	516=	517.									
	Local	593	595=	598.	600.								
	Local	621	625=	627.	629.								
STATUS	Local	305	325a	344.									
VBN	ExtReg	148	156=	156.									
	ExtReg	195	205.	215.	216.	247.	248.	260.	261.	264.			
	GlobReg	422	431=	441.	444.	476=	476.	488.					
	GlobReg	616	623=										

CROSS REFERENCE MAP

Line #	Event	File ...
1	Source (start)	DISK$DS:[DS.LOCAL.RELEASE.WORK]ODS.B32;1
5	Module ODS	
60	Library #1	DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
62	Library #2	DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
64	Library #3	SYS$COMMON:[SYSLIB]LIB.L32;3
643	Eludom ODS	

KEY TO REFERENCE TYPE FLAGS

.	Fetch
=	Store
c	Routine call
a	Address use
a	Indirect use
e	External, external routine, or external literal declaration
f	Forward or forward routine declaration
h	Condition handler enabling
m	Map declaration
u	Undeclare declaration

; Library Statistics
;
; -------- Symbols -------- Pages Processing
; File Total Loaded Percent Mapped Time

```
;
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
;                                          942        0        0       96        00:00.0
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
;                                          675       21        3       47        00:00.0
;  SYS$COMMON:[SYSLIB]LIB.L32;3           21522       43        0     1156        00:00.8




;                                  COMMAND QUALIFIERS

;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:ODS.B32

; Size:          972 code + 0 data bytes
; Run Time:         00:04.2
; Elapsed Time:     00:06.6
; Lines/CPU Min:     9229
; Lexemes/CPU-Min: 71468
; Memory Used:  168 pages
; Compilation Complete
```

Table of contents

(2)   279   SHELL OF STAND ALONE SUPERVISOR MEMORY.
(3)   354   DSP$CONFIG_ADP Build P-table for adapter
(6)   584   MAP$IOSPACE   Validate mapping for adapters
(9)   697   PURGE DATAPATH
(11)   765   UBA$INITIAL   UNIBUS ADAPTER INITIALIZATION
(12)   793   IO$TESTCSR_x   Test CSR for existence
(13)   842   IOGEN$CONN_VEC
(14)   869   QIOCLEAN_CPU
(15)   915   ONLY_SCB   CPU specific SCB setup
(16)   926   HDW_CLOCK_SET   CPU specific clock setup
(17)   937   ONLY_ATTACH   ; [28]
(17)   948   DSR$ONLY_CONSOLE_CONFIG console device configuration for load path
(18)   1004   ONLY_CPU   CPU specific setup   [34] ;G:3

```
                        0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element ONLY750.MAR
                        0000     2 ; *5    17-NOV-1987 12:32:48 GEARIN "MOVE P-TABLE INITIALIZATION CODE FOR CONSOLE DE
                        0000     3 ; *4    11-NOV-1987 08:39:14 GEARIN "ADDED SUPPORT FOR EXTENDED P-TABLE"
                        0000     4 ; *3    10-APR-1986 17:24:48 SHELHAMER "<no reason given>"
                        0000     5 ; *2    12-FEB-1986 16:45:45 BERGAZZI "CI750 FUNCTIONALITY CHANGE"
                        0000     6 ; *1     6-FEB-1986 15:21:00 DS ""
                        0000     7 ; DEC/CMS REPLACEMENT HISTORY, Element ONLY750.MAR
                        0000     8         .TITLE  ONLY750 *** ONLY750 COMET specific routines
                        0000     9         .IDENT  /10.10-4/                                                    ;G:4
                        0000    10         .LIST   MEB
                        0000    11         .NLIST  CND
                        0000    12         .DSABL  GBL
                        0000    13
                        0000    14 ;
                        0000    15 ; Copyright (c) 1979, 1983, 1984, 1985, 1986
                        0000    16 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
                        0000    17 ;
                        0000    18 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
                        0000    19 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
                        0000    20 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
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                        0000    29 ;
                        0000    30 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
                        0000    31 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
                        0000    32
                        0000    33 ;++
                        0000    34 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR.
                        0000    35 ;
                        0000    36 ; ABSTRACT:
                        0000    37 ;
                        0000    38 ; ENVIRONMENT:
                        0000    39 ;
                        0000    40 ; AUTHOR:       Roger Riggs     20-FEB-79       VERSION 01.
                        0000    41 ;
                        0000    42 ;       01      Added MAP$IOSPACE to fix up memory management
                        0000    43 ;               database for I/O adapters present.
                        0000    44 ;               N. Howgate      25-Jun-79
                        0000    45 ;       02      Added UBA750 specific PURGE code
                        0000    46 ;               Roger Riggs, 24-Jan-1980, Version 5.2
                        0000    47 ;       03      Added definition of value DS$GK_USOVR, for
                        0000    48 ;               WAITUS clock overhead.
                        0000    49 ;               Roger Riggs, 15-Feb-1980, Version 5.2
                        0000    50 ;       04      Fixed QIOCLEAN_CPU to correctly restore the SCB
                        0000    51 ;               Roger Riggs, 1-APR-1980
                        0000    52 ;       05      Fixed so gets true adapter type from address in DSP$CONFIG_ADP
                        0000    53 ;               Roger Riggs, 13-SEP-80, Version 6.0
                        0000    54 ;       06      Added code to QIO$CLEAN_CPU to reset UBI and massbus
                        0000    55 ;               adapters.
                        0000    56 ;               Dave Butenhof, 11-dec-1980, version 6.2
                        0000    57 ;       07      Fix DSP$CONFIG_ADP, to use $DS_RH750 PTdesc instead of
```

```
0000  ;                $DS_RH780; also configure correct unit of RH750, not
0000  ;                arbitrarily unit 0.
0000  ;                Dave Butenhof, 05-May-1981, version 6.4
0000  ;        08      Fix edit 07 to function correctly
0000  ;        09      Marion Baggett, 21-Sept-81 version 6.5
0000  ;                Allow access to 11/750 unibus address space
0000  ;
0000  ;                - Dave Butenhof, 1-Dec-1981, version 6.5
0000  ;        10      Insert .LIBRARY statements for libraries
0000  ;
0000  ;        11      M. Baggett      8-Dec-1982      version 6.10
0000  ;                Changed 2 BSBW's to JSB's to fixed trucation errors.
0000  ;
0000  ;        12      Bob Bergazzi    2-Mar-1983      version 6.10 (edit 323)
0000  ;                MAP$IOSPACE messes up the stack somehow when it tries
0000  ;                to map F00000, and when we have a real PCS loaded.
0000  ;                Fix: Don't start mapping at F00000, start at F20000,
0000  ;                where the IO adapters really are.
0000  ;
0000  ;        13      M. Baggett      2-March-1983    version 6.11
0000  ;                Added support for CI750 adapter.
0000  ;
0000  ;        14      Bob Bergazzi    April 26, 1983  Version 6.11
0000  ;                Added ONLY_SCB routine for VENUS. Does nothing for COMET.
0000  ;
0000  ;        15      Bob Bergazzi    May 16,1983     Version 6.11
0000  ;                Changed the order of the .LIB statements.
0000  ;
0000  ;        16      M.Baggett       May 18, 1983    Version 6.11
0000  ;                Change the maintenance field to match 11/780.
0000  ;
0000  ;        17      M. Baggett      May 21, 1983    Version 6.11
0000  ;                Changes to CI750 code.
0000  ;
0000  ;        18      Bob Bergazzi    Jan. 25, 1984   Version 6.14
0000  ;                Added ONLY_CLOCK_INIT routine, which reads the TODR.
0000  ;                We no longer want to MFPR the TODR in CLK$RE_INIT
0000  ;                because not all cpus read the TODR with an MFPR.
0000  ;                Also, TODR is now defined by $PR750DEF as PR750$_TODR,
0000  ;                and for the 750, if the TODR read as 0, we must write
0000  ;                a positive number to it, in order to start it counting.
0000  ;
0000  ;        19      Bob Bergazzi    May 9, 1984     Version 7.0
0000  ;                Added UBINTSZ in order to remove code from QIO.
0000  ;
0000  ;        20      Bob Bergazzi    Aug. 27, 1984   Version 7.1
0000  ;                Removed ONLY_CLOCK_INIT routine.
0000  ;
0000  ;        21      Bob Bergazzi    Aug. 29, 1984   Version 7.1
0000  ;                Added HDW_CLOCK_SET routine. Does nothing for 11/750.
0000  ;
0000  ;        22      Bob Bergazzi    Oct. 25, 1984   Version 7.1
0000  ;                Added EXE$GL_TENUSEC and EXE$GL_UBDELAY values for use by
0000  ;                bootdrivrs that use the TIMEDWAIT macro (PABTDRIVR).
0000  ;
0000  ;        23      Ron Parker      1-NOV-1984
0000  ;                Fixed truncation errors
```

```
                        0000   115 ;
                        0000   116 ;       24      RE Muse         Nov.7,1984      version 7.1
                        0000   117 ;               This psect was originally in the kernel module and now
                        0000   118 ;               becomes machine specific to accomodate the differences
                        0000   119 ;               for scb and unexpected handlers page allocation.
                        0000   120 ;
                        0000   121 ;       25      Bob Bergazzi    Nov. 19, 1984   Version 8.0
                        0000   122 ;               Turn on cache in the ONLY_SCB routine.
                        0000   123 ;
                        0000   124 ;       26      Bob Bergazzi    Dec. 14, 1984   Version 8.0
                        0000   125 ;               Turned on cache in the MAP$IOSPACE routine rather than
                        0000   126 ;               the ONLY_SCB routine (see edit 25).
                        0000   127 ;
                        0000   128 ;       27      Domenic Andella 9-Apr-85        Version 8.2
                        0000   129 ;               Establish global location to store the primary cpu
                        0000   130 ;               identifier number for use by multi-processing in
                        0000   131 ;               routine MAP$IOSPACE.
                        0000   132 ;
                        0000   133 ;       28      R.E. Muse       9 May 85        Version 8.2
                        0000   134 ;
                        0000   135 ;               incorporate the only_attach routine
                        0000   136 ;
                        0000   137 ;       29      Bob Bergazzi    16-May-1985     Version 8.2
                        0000   138 ;               Fixed bug in DSP$CONFIG_ADP for CI750 ptable build.
                        0000   139 ;               Slot # and 3rd char of PAA0 were not right.
                        0000   140 ;
                        0000   141 ;       30      Bob Bergazzi    17-May-1985     Version 8.2
                        0000   142 ;               When auto-configuring CI750 ptable, we were trying to cause an
                        0000   143 ;               interrupt by setting MIN and MIE with one instruction. MIN
                        0000   144 ;               must be set first and MIE with a second instruction. This caused
                        0000   145 ;               the CI750 ptable to take the default values for TR and BR.
                        0000   146 ;
                        0000   147 ;       31      Bob Bergazzi    11-June-1985    Version 8.3
                        0000   148 ;               Change EXE$GL_TENUSEC and EXE$GL_UBDELAY to
                        0000   149 ;               ONLY$GL_TENUSEC and ONLY$GL_UBDELAY because the former
                        0000   150 ;               are set from the latter at boot time, and the former
                        0000   151 ;               symbols are now kept in the BOOTDRIVR module.
                        0000   152 ;               This is so the TIMEDWAIT macro in some bootdrivr modules
                        0000   153 ;               will work.
                        0000   154 ;
                        0000   155 ;       32      Ted Salem       21-November-1985 Version 9.2
                        0000   156 ;               Added DSR$ONLY_CONSOLE_CONFIG to all ONLY modules.
                        0000   157 ;
                        0000   158 ;
                        0000   159 ;       33      Bob Bergazzi    7-Jan-1986      Version 9.1
                        0000   160 ;               Added DEF$Q_DEV, DEF$Q_DIR, SYS$SYSROOT, and SYS$DISK. These
                        0000   161 ;               were removed from the LOAD module so that the default directory
                        0000   162 ;               could be system specific.
                        0000   163 ;                                                                       ;G:2
                        0000   164 ;       34      Bob Bergazzi    12-Feb-1986     Version 10.0            ;G:2
                        0000   165 ;               Changed functionality of CI750 ptable to match version 6        ;G:2
                        0000   166 ;               of the CI780.BIN file.                                  ;G:2
                        0000   167 ;                                                                       ;G:3
                        0000   168 ;       35      Jim Shelhamer   10-Apr-1986     Version 10.0            ;G:3
                        0000   169 ;               Added ONLY_CPU section.                                 ;G:3
                        0000   170 ;                                                                       ;G:4
                        0000   171 ;               David Gearin    27-Oct-1987     Version 10.10           ;G:4
```

```
0000   172 ;              Added support for extended p-table format.                    ;G:4
0000   173 ;                                                                            ;G:5
0000   174 ;              David Gearin    16-Nov-1987     Version 10.10                 ;G:5
0000   175 ;              Moved p-table initialization code for console devices.        ;G:5
0000   176 ;--
```

```
                        0000   178 .library        /sys$library:lib/
                        0000   179 .library        /$ds/                          ;                [15]
                        0000   180 .library        /$diag/                        ;                [15]
                        0000   181
                        0000   182          .NLIST  ME,MEB
                        0000   183         $UCBDEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                        0000                .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
                00000004 0000                       .BLKL   1
                        0004                .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                        0004                .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
                00000008 0004                       .BLKL   1
                        0008                .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
                0000000A 0008                       .BLKW   1
                        000A                .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
                0000000B 000A                       .BLKB   1
                        000B                .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
                0000000C 000B                       .BLKB   1
                        000C                .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                        000C                .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                        000C                .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
                0000000D 000C                       .BLKB   1
                00000010 000D                       .BLKB   3
                        0010                .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                        0010                .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
                00000014 0010                       .BLKL   1
                        0014                .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                        0014                .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                        0014                .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
                00000016 0014                       .BLKW   1
                        0016                .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
                00000018 0016                       .BLKW   1
                        0018                .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                        0018                .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
                0000001A 0018                       .BLKW   1
                        001A                .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                        001A                .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
                0000001C 001A                       .BLKW   1
                        001C                .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
                00000020 001C                       .BLKL   1
                        0020                .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
                00000024 0020                       .BLKL   1
                        0024                .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
                00000028 0024                       .BLKL   1
                        0028                .IIF    NB,UCB$L_PID,   UCB$L_PID:
                0000002C 0028                       .BLKL   1
                        002C                .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
                00000030 002C                       .BLKL   1
                        0030                .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
                00000034 0030                       .BLKL   1
                        0034                .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
                00000038 0034                       .BLKL   1
                        0038                .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
                00000039 0038                       .BLKB   1
                        0039                .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
                0000003A 0039                       .BLKB   1
```

```
                    003A            .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
          0000003C  003A                            .BLKW   1
                    003C            .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
                    003C            .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
                    003C            .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
          0000003D  003C                            .BLKB   1
                    003D            .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
                    003D            .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
          0000003E  003D                            .BLKB   1
                    003E            .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
                    003E            .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
          0000003F  003E                            .BLKB   1
                    003F            .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
          00000040  003F                            .BLKB   1
                    0040            .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
          00000044  0040                            .BLKL   1
                    0044            .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
          00000048  0044                            .BLKL   1
                    0048            .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
          0000004A  0048                            .BLKW   1
                    004A            .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
                    004A            .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
          0000004B  004A                            .BLKB   1
                    004B            .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
          0000004C  004B                            .BLKB   1
                    004C            .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
          00000050  004C                            .BLKL   1
                    0050            .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
          00000052  0050                            .BLKW   1
                    0052            .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
                    0052            .IIF    NB,UCB$B_STATE, UCB$B_STATE:
          00000053  0052                            .BLKB   1
                    0053            .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
          00000054  0053                            .BLKB   1
                    0054            .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
          00000058  0054                            .BLKL   1
                    0058            .IIF    NB,UCB$W_STS,   UCB$W_STS:
          0000005A  0058                            .BLKW   1
                    005A            .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
          0000005C  005A                            .BLKW   1
                    005C            .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
                    005C            .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
          00000060  005C                            .BLKL   1
                    0060            .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
          00000064  0060                            .BLKL   1
                    0064            .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
                    0064            .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
          00000068  0064                            .BLKL   1
                    0068            .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
          0000006C  0068                            .BLKL   1
                    006C            .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
          0000006E  006C                            .BLKW   1
                    006E            .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
          00000070  006E                            .BLKW   1
                    0070            .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
          00000071  0070                            .BLKB   1
                    0071            .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
```

```
00000072  0071                        .BLKB   1
          0072              .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074  0072                        .BLKW   1
          0074              .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
          0074              .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000  0074              . = 0
          0000              .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002  0000                        .BLKW   1
00000074  0002              . = 116
          0074              .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078  0074                        .BLKL   1
          0078              .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C  0078                        .BLKL   1
          007C              .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080  007C                        .BLKL   1
          0080              .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084  0080                        .BLKL   1
          0084              .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088  0084                        .BLKL   1
          0088              .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C  0088                        .BLKL   1
          008C              .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090  008C                        .BLKL   1
          0090              .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
          0090              .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074  0090              . = 116
          0074              .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075  0074                        .BLKB   1
          0075              .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076  0075                        .BLKB   1
          0076              .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077  0076                        .BLKB   1
          0077              .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078  0077                        .BLKB   1
          0078              .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C  0078                        .BLKL   1
0000007E  007C                        .BLKW   1
          007E              .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080  007E                        .BLKW   1
          0080              .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084  0080                        .BLKL   1
00000080  0084              . = 128
00000084  0080                        .BLKL   1
          0084              .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088  0084                        .BLKL   1
          0088              .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A  0088                        .BLKW   1
          008A              .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C  008A                        .BLKW   1
          008C              .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
          008C              .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E  008C                        .BLKW   1
          008E              .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090  008E                        .BLKW   1
          0090              .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092  0090                        .BLKW   1
          0092              .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
```

```
00000094  0092                                  .BLKW   1
          0094                  .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095  0094                                  .BLKB   1
          0095                  .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096  0095                                  .BLKB   1
          0096                  .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098  0096                                  .BLKW   1
00000096  0098                  . = 150
00000098  0096                                  .BLKW   1
          0098                  .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C  0098                                  .BLKL   1
          009C                  .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0  009C                                  .BLKL   1
          00A0                  .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
000000A4  00A0                                  .BLKL   1
          00A4                  .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
000000A6  00A4                                  .BLKW   1
          00A6                  .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
000000A7  00A6                                  .BLKB   1
000000A8  00A7                                  .BLKB   1
00000074  00A8                  . = 116
00000078  0074                                  .BLKL   1
0000007C  0078                                  .BLKL   1
00000080  007C                                  .BLKL   1
00000084  0080                                  .BLKL   1
00000088  0084                                  .BLKL   1
0000008C  0088                                  .BLKL   1
          008C                  .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
00000090  008C                                  .BLKL   1
00000094  0090                                  .BLKL   1
00000098  0094                                  .BLKL   1
0000009C  0098                                  .BLKL   1
          009C                  .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
0000009D  009C                                  .BLKB   1
          009D                  .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
0000009E  009D                                  .BLKB   1
          009E                  .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
0000009F  009E                                  .BLKB   1
000000A0  009F                                  .BLKB   1
          00A0                  .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
000000A1  00A0                                  .BLKB   1
          00A1                  .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
000000A2  00A1                                  .BLKB   1
          00A2                  .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
000000A3  00A2                                  .BLKB   1
000000A4  00A3                                  .BLKB   1
          00A4                  .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
000000A5  00A4                                  .BLKB   1
          00A5                  .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
000000A7  00A5                                  .BLKW   1
000000A8  00A7                                  .BLKB   1
          00A8                  .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
000000AC  00A8                                  .BLKL   1
000000B0  00AC                                  .BLKL   1
000000B4  00B0                                  .BLKL   1
000000B8  00B4                                  .BLKL   1
          00B8                  .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
```

```
                    000000BC  00B8                          .BLKL   1
                              00BC              .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
                              00BC              .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
                    00000074  00BC              . = 116
                              0074              .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
                    00000078  0074                          .BLKL   1
                              0078              .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
                    0000007C  0078                          .BLKL   1
                              007C              .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
                    0000007E  007C                          .BLKW   1
                    00000080  007E                          .BLKW   1
                              0000              .RESTORE
                              0000    184       $JIBDEF
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  00BC              .=0
                              0000              .RESTORE
                              0000    185       $PHDDEF
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  00BC              .=0
                              0000              .RESTORE
                              0000    186       $ARBDEF
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  00BC              .=0
                              0000              .RESTORE
                              0000    187       $CRBDEF
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  00BC              .=0
                              0000              .IIF    NB,CRB$L_WQFL,  CRB$L_WQFL:
                    00000004  0000                          .BLKL   1
                              0004              .IIF    NB,CRB$L_WQBL,  CRB$L_WQBL:
                    00000008  0004                          .BLKL   1
                              0008              .IIF    NB,CRB$W_SIZE,  CRB$W_SIZE:
                    0000000A  0008                          .BLKW   1
                              000A              .IIF    NB,CRB$B_TYPE,  CRB$B_TYPE:
                    0000000B  000A                          .BLKB   1
                    0000000C  000B                          .BLKB   1
                              000C              .IIF    NB,CRB$W_REFC,  CRB$W_REFC:
                    0000000E  000C                          .BLKW   1
                              000E              .IIF    NB,CRB$B_MASK,  CRB$B_MASK:
                    0000000F  000E                          .BLKB   1
                    00000010  000F                          .BLKB   1
                              0010              .IIF    NB,CRB$L_LINK,  CRB$L_LINK:
                    00000014  0010                          .BLKL   1
                              0014              .IIF    NB,CRB$L_INTD,  CRB$L_INTD:
                    00000038  0014                          .BLKL   9
                              0038              .IIF    NB,CRB$C_LENGTH,        CRB$C_LENGTH:
                              0038              .IIF    NB,CRB$K_LENGTH,        CRB$K_LENGTH:
                              0038              .IIF    NB,CRB$L_INTD2, CRB$L_INTD2:
                    0000005C  0038                          .BLKL   9
                              0000              .RESTORE
                              0000    188       $ADPDEF
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
```

```
                    00000000  00BC            .=0
                              0000            .IIF    NB,ADP$L_CSR,   ADP$L_CSR:
                    00000004  0000                    .BLKL   1
                              0004            .IIF    NB,ADP$L_LINK,  ADP$L_LINK:
                    00000008  0004                    .BLKL   1
                              0008            .IIF    NB,ADP$W_SIZE,  ADP$W_SIZE:
                    0000000A  0008                    .BLKW   1
                              000A            .IIF    NB,ADP$B_TYPE,  ADP$B_TYPE:
                    0000000B  000A                    .BLKB   1
                              000B            .IIF    NB,ADP$B_NUMBER,        ADP$B_NUMBER:
                    0000000C  000B                    .BLKB   1
                              000C            .IIF    NB,ADP$W_TR,    ADP$W_TR:
                    0000000E  000C                    .BLKW   1
                              000E            .IIF    NB,ADP$W_ADPTYPE,       ADP$W_ADPTYPE:
                    00000010  000E                    .BLKW   1
                              0010            .IIF    NB,ADP$L_VECTOR,        ADP$L_VECTOR:
                              0010            .IIF    NB,ADP$L_CRB,   ADP$L_CRB:
                    00000014  0010                    .BLKL   1
                              0014            .IIF    NB,ADP$C_MBAADPLEN,     ADP$C_MBAADPLEN:
                              0014            .IIF    NB,ADP$K_MBAADPLEN,     ADP$K_MBAADPLEN:
                              0014            .IIF    NB,ADP$C_DRADPLEN,      ADP$C_DRADPLEN:
                              0014            .IIF    NB,ADP$K_DRADPLEN,      ADP$K_DRADPLEN:
                              0014            .IIF    NB,ADP$L_DPQFL, ADP$L_DPQFL:
                              0014            .IIF    NB,ADP$L_PRQQFL,        ADP$L_PRQQFL:
                    00000018  0014                    .BLKL   1
                              0018            .IIF    NB,ADP$L_DPQBL, ADP$L_DPQBL:
                              0018            .IIF    NB,ADP$L_PRQQBL,        ADP$L_PRQQBL:
                    0000001C  0018                    .BLKL   1
                              001C            .IIF    NB,ADP$L_MRQFL, ADP$L_MRQFL:
                              001C            .IIF    NB,ADP$L_SHB,   ADP$L_SHB:
                    00000020  001C                    .BLKL   1
                              0020            .IIF    NB,ADP$L_MRQBL, ADP$L_MRQBL:
                              0020            .IIF    NB,ADP$B_PORT,  ADP$B_PORT:
                    00000021  0020                    .BLKB   1
                    00000024  0021                    .BLKB   3
                              0024            .IIF    NB,ADP$W_DPBITMAP,      ADP$W_DPBITMAP:
                    00000026  0024                    .BLKW   1
                              0026            .IIF    NB,ADP$W_MRBITMAP,      ADP$W_MRBITMAP:
                    00000064  0026                    .BLKW   31
                              0064            .IIF    NB,ADP$L_INTD,  ADP$L_INTD:
                    00000070  0064                    .BLKL   3
                              0070            .IIF    NB,ADP$C_MPMADPLEN,     ADP$C_MPMADPLEN:
                              0070            .IIF    NB,ADP$K_MPMADPLEN,     ADP$K_MPMADPLEN:
                              0070            .IIF    NB,ADP$C_UBAADPLEN,     ADP$C_UBAADPLEN:
                              0070            .IIF    NB,ADP$K_UBAADPLEN,     ADP$K_UBAADPLEN:
                              0000            .RESTORE
                              0000    189     $VECDEF
                              0000            .SAVE   LOCAL_BLOCK
                              0000            .PSECT  $ABS$,ABS
                    00000000  00BC            .=0
                              0000            .IIF    NB,VEC$Q_DISPATCH,      VEC$Q_DISPATCH:
                    00000008  0000                    .BLKQ   1
                              0008            .IIF    NB,VEC$L_IDB,   VEC$L_IDB:
                    0000000C  0008                    .BLKL   1
                              000C            .IIF    NB,VEC$L_INITIAL,       VEC$L_INITIAL:
                    00000010  000C                    .BLKL   1
                              0010            .IIF    NB,VEC$W_MAPREG,        VEC$W_MAPREG:
```

```
                    00000012  0010                        .BLKW   1
                              0012              .IIF    NB,VEC$B_NUMREG,        VEC$B_NUMREG:
                    00000013  0012                        .BLKB   1
                              0013              .IIF    NB,VEC$B_DATAPATH,      VEC$B_DATAPATH:
                    00000014  0013                        .BLKB   1
                              0014              .IIF    NB,VEC$L_ADP,   VEC$L_ADP:
                    00000018  0014                        .BLKL   1
                              0018              .IIF    NB,VEC$L_UNITINIT,      VEC$L_UNITINIT:
                    0000001C  0018                        .BLKL   1
                              001C              .IIF    NB,VEC$L_START, VEC$L_START:
                    00000020  001C                        .BLKL   1
                              0020              .IIF    NB,VEC$L_UNITDISC,      VEC$L_UNITDISC:
                    00000024  0020                        .BLKL   1
                              0024              .IIF    NB,VEC$C_LENGTH,        VEC$C_LENGTH:
                              0024              .IIF    NB,VEC$K_LENGTH,        VEC$K_LENGTH:
                              0000              .RESTORE
                              0000    190       $DYNDEF
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  00BC              .=0
                              0000              .RESTORE
                              0000    191       $PSLDEF
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  00BC              .=0
                              0000              .RESTORE
                              0000    192       $PTEDEF
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  00BC              .=0
                              0000              .RESTORE
                              0000    193       $VIELD  PTE,<29-9>,<<IO,,M>>
                              0000    194       $PRTDEF                                                         ;G:5
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  00BC              .=0
                              0000              .RESTORE
                              0000    195       $PRDEF
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  00BC              .=0
                              0000              .RESTORE
                              0000    196       $PR750DEF                       ; TODR defined here for VMS v4  [18]
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  00BC              .=0
                              0000              .RESTORE
                              0000    197       $MBADEF
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  00BC              .=0
                              0000              .RESTORE
                    00000014  0000    198 MBA$L_DCR=20            ; Diagnostic control register
                    01000000  0000    199 MBA$M_DCR_ATTN=1a24     ; Set this bit to simulate attention
                              0000    200
                    00000008  0000    201 MBA$M_CR_MAINT=1a3      ; Set this bit to enable maintenance mode
                              0000    202       $UBIDEF
```

```
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
                00000000  00BC            .=0
                        0000              .RESTORE
                        0000   203        $DS_HPODEF
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
                00000000  00BC            .=0
                        0000              .IIF    NB,HP$Q_DEVICE, HP$Q_DEVICE:
                00000008  0000            .IIF    NB,.BLKQ,       .BLKQ   1
                        0008              .IIF    NB,HP$W_SIZE,   HP$W_SIZE:
                0000000A  0008            .IIF    NB,.BLKW,       .BLKW   1
                        000A              .IIF    NB,HP$B_FLAGS,  HP$B_FLAGS:
                0000000B  000A            .IIF    NB,.BLKB,       .BLKB   1
                        000B              .IIF    NB,HP$B_DRIVE,  HP$B_DRIVE:
                0000000C  000B            .IIF    NB,.BLKB,       .BLKB   1
                        000C              .IIF    NB,HP$T_DEVICE, HP$T_DEVICE:
                00000018  000C            .IIF    NB,.BLKB,       .BLKB   12
                        0018              .IIF    NB,HP$A_DEVICE, HP$A_DEVICE:
                0000001C  0018            .IIF    NB,.BLKL,       .BLKL   1
                        001C              .IIF    NB,HP$A_DVA,    HP$A_DVA:
                00000020  001C            .IIF    NB,.BLKL,       .BLKL   1
                        0020              .IIF    NB,HP$A_LINK,   HP$A_LINK:
                00000024  0020            .IIF    NB,.BLKL,       .BLKL   1
                        0024              .IIF    NB,HP$W_VECTOR, HP$W_VECTOR:
                00000026  0024            .IIF    NB,.BLKW,       .BLKW   1
                        0026              .IIF    NB,HP$T_TYPE,   HP$T_TYPE:
                00000032  0026            .IIF    NB,.BLKB,       .BLKB   12
                        0032              .IIF    NB,HP$A_DEPENDENT,      HP$A_DEPENDENT:
                        0000              .RESTORE
                        0000   204        $DS_HPEODEF                                          ;G:4
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
                00000000  00BC            .=0
                        0000              .IIF    NB,HPE$T_DEVICE,        HPE$T_DEVICE:
                00000014  0000            .IIF    NB,.BLKL,       .BLKL   5
                        0014              .IIF    NB,HPE$W_EXT_DRIVE,     HPE$W_EXT_DRIVE:
                00000016  0014            .IIF    NB,.BLKW,       .BLKW   1
                        0016              .IIF    NB,HPE$A_EPB,   HPE$A_EPB:
                0000001A  0016            .IIF    NB,.BLKL,       .BLKL   1
                        0000              .RESTORE
                        0000   205        $DS_RH750_DEF
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
                00000032  00BC            .=HP$A_DEPENDENT
                        0032              .IIF    NB,HP$B_RH750_BR,       HP$B_RH750_BR:
                        0032              .IIF    NB,RH750$B_BR,  RH750$B_BR:
                00000033  0032            .IIF    NB,.BLKB,       .BLKB   1
                        0033              .IIF    NB,HP$K_RH750_LEN,      HP$K_RH750_LEN:
                        0033              .IIF    NB,RH750$K_LEN, RH750$K_LEN:
                        0000              .RESTORE
                        0000   206        $DS_DW750_DEF
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
                00000032  00BC            .=HP$A_DEPENDENT
                        0032              .IIF    NB,DW750$K_LEN, DW750$K_LEN:
                        0000              .RESTORE
```

```
                        0000   207          $DS_DSDEF
                        0000   208          $DS_CI_DEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000032 00BC               .=HP$A_DEPENDENT
                        0032                .IIF    NB,HP$B_CI_TR,  HP$B_CI_TR:
                        0032                .IIF    NB,CI$B_BI_ID,  CI$B_BI_ID:
                        0032                .IIF    NB,CI$B_TR,     CI$B_TR:
                00000033 0032               .IIF    NB,,BLKB,       .BLKB   1
                        0033                .IIF    NB,HP$B_CI_BR,  HP$B_CI_BR:
                        0033                .IIF    NB,CI$B_BR,     CI$B_BR:
                00000034 0033               .IIF    NB,,BLKB,       .BLKB   1
                        0034                .IIF    NB,HP$B_CI_NODE,        HP$B_CI_NODE:
                        0034                .IIF    NB,CI$B_NODE,   CI$B_NODE:
                00000035 0034               .IIF    NB,,BLKB,       .BLKB   1
                        0035                .IIF    NB,HP$L_CI_FUNC,        HP$L_CI_FUNC:
                        0035                .IIF    NB,Ci$L_Func,   Ci$L_Func:
                00000039 0035               .IIF    NB,,BlkL,       .BlkL   1
                        0039                .IIF    NB,HP$L_CI_MAINT_ID,    HP$L_CI_MAINT_ID:
                        0039                .IIF    NB,Ci$L_Maint_Id,       Ci$L_Maint_Id:
                0000003D 0039               .IIF    NB,,BlkL,       .BlkL   1
                        003D                .IIF    NB,HP$L_CI_INDEX,       HP$L_CI_INDEX:
                        003D                .IIF    NB,Ci$L_Index,  Ci$L_Index:
                00000041 003D               .IIF    NB,,BlkL,       .BlkL   1
                        0041                .IIF    NB,HP$K_CI_LEN, HP$K_CI_LEN:
                        0041                .IIF    NB,CI$K_LEN,    CI$K_LEN:
                        0000                .RESTORE
                        0000   209          $NDTDEF         ; Nexus device types
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 00BC               .=0
                        0000                .RESTORE
                00000004 0000   210 PA_PMC  =       ^X4     ; CI REGISTER OFFSET.
                00000924 0000   211 PA_PIC  =       ^X924   ; CI REGISTER OFFSET.
                00000940 0000   212 PA_PPR  =       ^X940   ; CI REGISTER OFFSET.
                00000001 0000   213 PA_PIC_M_PIC    = 1     ;
                00000001 0000   214 PA_PMC_M_MIN    = 1     ;
                00000004 0000   215 PA_PMC_M_IE     = 4     ;
                00000040 0000   216 PA_PMC_M_PSA    =^X40   ;
                        0000   217          CMKDEF
                        0000   218
                00000001 0000   219 SS$_NORMAL=1
                        0000   220
                        0000   221 ;
                        0000   222 ; Clock overhead factor
                        0000   223 ;
                000000C0 0000   224 DS$GK_USOVR     == ^XC0                 ; Overflow factor for 11/750
                        0000   225 ;
                        0000   226 ; I/O SPACE DEFINITION
                        0000   227 ;
                        0000   228
                40000000 0000   229 IOC$K_IOSPACE == ^X40000000
                02000000 0000   230 DS$GK_SID       == 2 @ 24               ; Pseudo SID for 11/750
                        0000   231
                        0000   232          .EXTRN  SCB_IMAGE,      BUG$CHECK
                        0000   233          .EXTRN  EXE$ALONONPAGED, EXE$DEANONPAGED, IOC$GL_ADPLIST
                        0000   234          .EXTRN  DS$WAITUS, DS_ERRSUP, INS$PTABLE
```

```
                                  0000          .EXTRN  SS$_RESIGNAL, SS$_CONTINUE, SS$_CONTROLC, SS$_DATACHECK
                                  0000          .EXTRN  SS$_CTRLERR, UBINT_DISP
                                  0000          .EXTRN  SYS$UNWIND,     SYS$SETPRT,     FETCH_STORE,    MAPMEM$IOSPACE
                                  0000          .EXTRN  CMK$RCONSOLE, CMK$TCONSOLE, QIO$DEALLOCATE
                                  0000          .EXTRN  TST$MCHK
                                  0000          .EXTRN  HPE$C_EPB_SIZE                                                  ;G:4
                                  0000
                              00000000  .PSECT  SEP, SHR, EXE, WRT, LONG
                                  0000  ;
                                  0000  ; CPU specific values for the TIMEDWAIT macro                                  [22]
                                  0000  ;
                                  0000  ONLY$GL_TENUSEC::                          ;                                   [31]
                        00000001  0000          .LONG   1                          ;                                   [22]
                                  0004  ONLY$GL_UBDELAY::                          ;                                   [31]
                        00000001  0004          .LONG   1                          ;                                   [22]
                                  0008
                                  0008  ; Set up location to store the primary cpu identifier number which            [27]
                                  0008  ; is needed for multi-processing;                                              [27]
                                  0008
                              00  0008  DS$GB_PRIMARY_CPU_IDENTIFIER::  .BYTE   0 ;                                   [27]
                                  0009
                                  0009  LOCAL_STORE:
                        00000000  0009          .LONG   0
                                  000D  IO$GQ_PHYSICAL::
                 01000000 00F00000  000D          .LONG   ^XF00000,^X1000000
                                  0015  ADAPTER_TYPE:                              ;                                   [29]
                        00000035  0015          .BLKW   16                         ;                                   [29]
                                  0035
                                  0035  ;                                                                        begin [33]
                                  0035  SYS$SYSROOT::
59 53 24 53 59 53 0000003D'010E0000'  0035          .ASCID  "SYS$SYSROOT"              ; Device name to equate
                     54 4F 4F 52 53  0043
                                  0048  SYS$DISK::
49 44 24 53 59 53 00000050'010E0000'  0048          .ASCID  "SYS$DISK"                 ; default Device name to equate
                              4B 53  0056
                                  0058  DEF$Q_DEV::
                 00000060'00000000  0058          .LONG   0,10$                      ; Null default device
                          0000007E  0060  10$:    .BLKB   30                         ; Storage for default device
                                  007E  DEF$Q_DIR::
41 4D 53 59 53 5B 00000086'010E0000'  007E          .ASCID  "[SYSMAINT]"               ; Default load device
                        5D 54 4E 49  008C
                          000000FF  0090          .BLKB   <39*3>+4-10                ; Extra space for load device spec
                                  00FF
                                  00FF          .ALIGN  LONG                       ; VMS REQUIREMENT
                                  0100  ;                                                                        end [33]
```

```
                    0100   ;                                                                    begin [24]
                    0100   .SBTTL  SHELL OF STAND ALONE SUPERVISOR MEMORY.
                00000000   .PSECT  _LAST, PAGE
                    0000
                    0000   AX_BUFF::
        00000000    0000           $$$ = .
                    0000   ;
                    0000   ; PROCESS CONTROL BLOCK (HARDWARE PCB).
                    0000   ;
                    0000
        00000000    0000   PHD_BASE        == $$$
        00000078    0000   PCB_BASE        == $$$+PHD$L_PCB
        00000200    0000           $$$ = $$$ + 512                  ; 1 Page for PHD
                    0000
                    0000   ;
                    0000   ; Job Information Block and Access Rights Block
                    0000   ;
                    0000
        00000200    0000   DS$AX_JIB       == $$$
        00000274    0000   DS$AX_ARB       == $$$ + JIB$C_LENGTH
                    0000
                    0000   ;
                    0000   ; PROCESS CONTROL BLOCK (SOFTWARE PCB).
                    0000   ;
                    0000
        000002EC    0000   DS$AX_SOFTPCB   == $$$ + JIB$C_LENGTH + ARB$C_LENGTH
                    0000
                    0000   ;
                    0000   ; PROCESS CONTROL BLOCK (SOFTWARE PCB).
                    0000   ;
                    0000
        00000400    0000           $$$ = $$$ + 512                  ; 1 Page for JIB, ARB, and PCB
                    0000
                    0000   ;
                    0000   ; SYSTEM CONTROL BLOCK (SCB).
                    0000   ;
                    0000
        00000400    0000   SCB_BASE        == $$$
        00000A00    0000           $$$ = $$$ + <3*512>              ; MAX 3 pages for SCB
        00000A00    0000   SCB_UNKINT==$$$
        00001000    0000           $$$ = $$$ + <3*512>              ; MAX 3 pages for unexpected handlers
                    0000
                    0000   ;
                    0000   ; STACK AREAS.
                    0000   ;
                    0000   ;       Stacks are ordered so that when a mode overflows it's stack
                    0000   ;       it will get an access violation because the stack below it
                    0000   ;       is protected by memory management. The interrupt stack is
                    0000   ;       above the kernel stack so that kernel stack overflows will not
                    0000   ;       fall into the interrupt stack.  The pages below the kernel stack
                    0000   ;       are NO ACCESS.  See MEMMGT for setup.
                    0000   ;--
                    0000
        00001000    0000   STACK_BASE      == $$$
        00001200    0000           $$$ = $$$ + <1*512>              ; 1 pages for no-access
                    0000
        00002600    0000           $$$ = $$$ + <10*512>             ; 10 pages for KERNEL stack
```

```
                        00002600  0000    335 KSTKPTR == $$$
                                  0000    336
                        00002E00  0000    337         $$$ = $$$ + <4*512>             ; 4 pages for INTERRUPT stack
                        00002E00  0000    338 ISTKPTR == $$$
                                  0000    339
                        00003400  0000    340         $$$ = $$$ + <3*512>             ; 3 pages for EXECUTIVE stack
                        00003400  0000    341 ESTKPTR == $$$
                                  0000    342
                        00003A00  0000    343         $$$ = $$$ + <3*512>             ; 3 pages for SUPERVISOR stack
                        00003A00  0000    344 SSTKPTR == $$$
                                  0000    345
                        00004000  0000    346         $$$ = $$$ + <3*512>             ; 3 pages for USER stack
                        00004000  0000    347 USTKPTR == $$$
                                  0000    348
                        00004000  0000    349 P0PT_BASE       == $$$
                                  0000    350 ;                                                       end [24]
                                  0000    351
                                  0000    352         MODNAM  ONLY750
30 35 37 59 4C 4E 4F 00'          0000        $MODULE:        .ASCIC  \ONLY750\
                        07        0000
```

```
                     0008    354          .SBTTL  DSP$CONFIG_ADP  Build P-table for adapter
                     0008    355 ;++
                     0008    356 ; FUNCTIONAL DESCRIPTION:
                     0008    357 ;
                     0008    358 ;       This routine builds and inserts a P-table for
                     0008    359 ;       the channel/adapter addressed.
                     0008    360 ;
                     0008    361 ; CALLING SEQUENCE:
                     0008    362 ;
                     0008    363 ;       DSP$CONFIG_ADP(Adapter_address,PT_address,type_address)
                     0008    364 ;
                     0008    365 ; INPUT PARAMETERS:
                     0008    366 ;
                     0008    367 ;       4(AP)   Address of configuration status register of adapter
                     0008    368 ;
                     0008    369 ; IMPLICIT INPUTS:      NONE
                     0008    370 ;
                     0008    371 ; OUTPUT PARAMETERS:
                     0008    372 ;
                     0008    373 ;       8(AP)   Address to store address of P-table created
                     0008    374 ;       12(AP)  Address to store type of adapter, 0=MBA, 1=UBA, 32=CIA
                     0008    375 ;
                     0008    376 ; IMPLICIT OUTPUTS:
                     0008    377 ;
                     0008    378 ;       P-table for Adapter
                     0008    379 ;
                     0008    380 ; COMPLETION CODES:
                     0008    381 ;
                     0008    382 ;       SS$_NORMAL
                     0008    383 ;       DS$_MACHCK
                     0008    384 ;
                     0008    385 ; SIDE EFFECTS:
                     0008    386 ;
                     0008    387 ;       The adapter specified is pinged to determine
                     0008    388 ;       interrupt level and interrupt vector.
                     0008    389 ;
                     0008    390 ; REGISTER USAGE:
                     0008    391 ;
                     0008    392 ;       R4      Address of current PT
                     0008    393 ;       R5      Address of channel
                     0008    394 ;--
                     0008    395          .NLIST  ME,MEB
                     0008    396          $OFFSET 0,NEGATIVE, < -
                     0008    397                  <L_VECTOR,4>, -
                     0008    398                  <L_IPL,4>, -
                     0008    399                  <L_CONFIG,4>, -
                     0008    400                  <L_LOCAL,0>>
                     0008             .SAVE   LOCAL_BLOCK
                     0008             .PSECT $ABS$ ABS
00000000             00BC             .=0
FFFFFFFC             0000             .BLKB   -4
                     FFFC        L_VECTOR:
FFFFFFF8             FFFC             .BLKB   -4
                     FFF8        L_IPL:
FFFFFFF4             FFF8             .BLKB   -4
                     FFF4        L_CONFIG:
                     FFF4        L_LOCAL:
```

```
00000008                .RESTORE
                0008    401
                0008    402             .LIST   MEB
```

```
                                00000100   404 .PSECT  SEP, SHR, EXE, WRT, LONG
                                    0100   405
                              019C  0100   406 .ENTRY  DSP$CONFIG_ADP,^M<R2,R3,R4,R7,R8>                                  ;G:4
                                    0102   407
              6D   038D'CF    9E    0102   408         MOVAB   W^HANDLR,(FP)            ; Exception handler
                5E    F4 AD   9E    0107   409         MOVAB   L_LOCAL(FP),SP           ; Allocate space for local storage
              FEF9 CF    5D   D0    010B   410         MOVL    FP,W^LOCAL_STORE         ; And save address for interrupts
                      FC AD   D4    0110   411         CLRL    L_VECTOR(FP)             ; Clear vector
                      F8 AD   D4    0113   412         CLRL    L_IPL(FP)                ; Clear IPL
                                    0116   413
   54   04 AC   40000000 8F   C9    0116   414         BISL3   #IOC$K_IOSPACE,4(AP),R4  ; Base adapter
                F4 AD    54   D0    011F   415         MOVL    R4,L_CONFIG(FP)          ; Store Configuration register addr
                   64    38   B1    0123   416         CMPW    #NDT$_CI, (R4)           ; CHECK FOR CI                        [13]
                         33   13    0126   417         BEQL    5$                       ; Branch if found                     [13]
      50   04 AC   03    0D   EF    0128   418         EXTZV   #13,#3,4(AP),R0          ; Get adapter type
                                    012E   419         CASE    R0,LIMIT=#0,DISPLIST=<40$,42$,10$,10$,20$,20$,20$,20$>
              07'  00    50   AF    012E               CASEW   R0,#0,S^#<<30001$-30000$>/2>-1
                                    0132       30000$:
                              0193' 0132               .SIGNED_WORD    40$-30000$
                              019E' 0134               .SIGNED_WORD    42$-30000$
                              0010' 0136               .SIGNED_WORD    10$-30000$
                              0010' 0138               .SIGNED_WORD    10$-30000$
                              0118' 013A               .SIGNED_WORD    20$-30000$
                              0118' 013C               .SIGNED_WORD    20$-30000$
                              0118' 013E               .SIGNED_WORD    20$-30000$
                              0118' 0140               .SIGNED_WORD    20$-30000$
                                    0142       30001$:
                                    0142   420 10$:
                                    0142   421         ERRSUP_S                         ; Unknown adapter type
              00000000'EF   DF    0142                       PUSHAL  $MODULE
                         00   DD    0148                       PUSHL   #0
                         01   DD    014A                       PUSHL   #$ER
         00000000'EF   03   FB    014C                       CALLS   #3, DS_ERRSUP
      50   00660002 8F   D0    0153   422         MOVL    #DS$_ERROR,R0            ; Error
                         04   015A   423         RET
                                    015B   424 5$:
               0C BC    38   D0    015B   425         MOVL    #NDT$_CI,a12(AP)         ; Set adapter type to CIA             [13]
                                    015F   426
               04 A4    01   D0    015F   427         MOVL    #PA_PMC_M_MIN,PA_PMC(R4); Set MIN                              [30]
               04 A4    04   D0    0163   428         MOVL    #PA_PMC_MIE,PA_PMC(R4)   ; Set MIE                              [30]
   04 A4   00000040 8F   C8    0167   429         BISL    #PA_PMC_M_PSA,PA_PMC(R4); Set program start address            [13]
             0924 C4    01   D0    016F   430         MOVL    #PA_PIC_M_PIC,PA_PIC(R4); Start port                           [13]
                                    0174   431
                                    0174   432         $DS_WAITUS_S #1000               ; Wait 10 Milliseconds                [13]
                         00   DD    0174                       PUSHL   #0
              000003E8 8F   DD    0176                       PUSHL   #1000
         00000000'9F   02   FB    017C                       CALLS   #2, a#DS$WAITUS
                                    0183   433
               04 A4    00   D0    0183   434         MOVL    #0, PA_PMC(R4)           ; Disable interrupts                  [13]
      51   00000041 8F   D0    0187   435         MOVL    #CI$K_LEN, R1            ; Length of P-table for CI750         [13]
      51   00000000'8F   C0    018E   436         ADDL2   #HPE$C_EPB_SIZE,R1       ; Include size of EPB                ;G:4
              00000000'EF   16    0195   437         JSB     EXE$ALONONPAGED          ; Allocate the space for same         [13]
                    03 50   E8    019B   438         BLBS    R0,7$                    ; Branch if no error                  [13]
                     0153   31    019E   439         BRW     50$                      ; Branch on error                     [13]
               08 A2    51   B0    01A1   440 7$:     MOVW    R1,HP$W_SIZE(R2)         ; Set size of PT                      [13]
            58   52    51   C1    01A5   441         ADDL3   R1,R2,R8                 ; Get end of ptable                  ;G:4
            57   58    04   C3    01A9   442         SUBL3   #4,R8,R7                 ; Address to store EPB               ;G:5
```

```
                                                    443          SUBL3   #HPE$C_EPB_SIZE,R8,(R7) ; Compute EPB address and store      ;G:4
                                 58   67    D0      01B5    444          MOVL    (R7),R8                 ; R8 has beginning of EPB      ;G:4
                                           01B8    445
                                 0C A2  4141505F 8F  D0      01B8    446          MOVL    #^A"_PAA",HP$T_DEVICE(R2); Set name in PT              [13]
                                    10 A2  30    90      01C0    447          MOVB    #^A"0",HP$T_DEVICE+4(R2)        ;                      [13]
                                 50   54  04    0D      EF      01C4    448          EXTZV   #13, #4, R4, R0         ; Get slot number      [29]
                                                51      D4      01C9    449          CLRL    R1                      ; Index to slot number [29]
                                                53      01      CE      01CB    450          MNEGL   #1,R3                   ; Count of CI750s found [29]
                                    FE41 CF41   38      B1      01CE    451 8$:      CMPW    #NDT$_CI,ADAPTER_TYPE[R1]       ; CI750 ?      [29]
                                                02      12      01D4    452          BNEQ    9$                      ; Branch if not        [29]
                                                53      D6      01D6    453          INCL    R3                      ; Count another CI750   [29]
                                       F2 51    50      F3      01D8    454 9$:      AOBLEQ  R0,R1,8$                ; Branch if not at boot CI750 slot [29]
                                       FF 8F    53      91      01DC    455          CMPB    R3,#^XFF                ; Will it fit in a byte?       ;G:4
                                                04      14      01E0    456          BGTR    11$                     ; No.                  ;G:4
                                       0B A2    53      90      01E2    457          MOVB    R3,HP$B_DRIVE(R2)       ; Set drive number     [29]
                                       14 A8    53      B0      01E6    458 11$:     MOVW    R3,HPE$W_EXT_DRIVE(R8)  ; Set drive # in EPB   ;G:4
                                       0F A2    53      80      01EA    459          ADDB2   R3,HP$T_DEVICE+3(R2)    ; Add to 2nd "A" of "PAA0" [29]
                                                        01EE    460
                                 1C A2  54    00000400 8F  C9      01EE    461          BISL3   #^X400,R4,HP$A_DVA(R2)  ; Set direct virtural address [13]
                                    26 A2    4305    8F  B0      01F7    462          MOVW    #^X4305,HP$T_TYPE(R2)   ; Set length and "C" of "CI750" [13]
                                 28 A2  30353749 8F  D0      01FD    463          MOVL    #^A"I750",HP$T_TYPE+2(R2) ; Set rest of CI750  [13]
                                           62    05      9A      0205    464          MOVZBL  #5,HP$Q_DEVICE(R2)      ; Set length of device [13]
                                    34 A2  0940    C4      90      0208    465          MOVB    PA_PPR(R4),HP$B_CI_NODE(R2) ; Get port number  [13]
                                 50   FC AD  04    02      EF      020E    466          EXTZV   #2,#4,L_VECTOR(FP),R0   ; Extract SLOT level of interrupt [13]
                                                0E      12      0214    467          BNEQ    13$                     ; Branch if set        [17]
                                       FC AD    28      D0      0216    468          MOVL    #^B101000,L_VECTOR(FP)  ; Set default to 10    [17]
                                       F8 AD    14      D0      021A    469          MOVL    #^X14,L_IPL(FP)         ; Set default to 4     [17]
                              50   FC AD    04    02      EF      021E    470          EXTZV   #2,#4,L_VECTOR(FP),R0   ; Extract Slot level  [17]
                                    32 A2    50      90      0224    471 13$:     MOVB    R0,HP$B_CI_TR(R2)       ; Set SLOT number.     [29]
                                 35 A2  FFFF0F00 8F  D0      0228    472          MOVL    #^XFFFF0F00,HP$L_CI_FUNC(R2) ; Set functionality field  [13][34] ;G:
                                 39 A2  80000002 8F  D0      0230    473          MOVL    #^X80000002,HP$L_CI_MAINT_ID(R2) ; Set maintenance id field  [16]
                                    04 A2    0C A2  9E      0238    474          MOVAB   HP$T_DEVICE(R2), -
                                                            023D    475                  HP$Q_DEVICE+4(R2)       ; Set address of device name   [13]
                                    18 A2    54      D0      023D    476          MOVL    R4,HP$A_DEVICE(R2)      ; Set address of device        [13]
                                 33 A2  F8 AD    10      83      0241    477          SUBB3   #^X10,L_IPL(FP), -
                                                            0247    478                  HP$B_CI_BR(R2)          ; Set BR level                 [13]
                                                0121    31      0247    479          BRW     70$                     ; Join common          [13]
                                                        024A    480 20$:
                                       0C BC    D4      024A    481          CLRL    @12(AP)                 ; Set adapter type to MBA
                                                        024D    482
                                    04 A4    01      D0      024D    483          MOVL    #MBA$M_CR_INIT,MBA$L_CR(R4); Init MBA
                                    04 A4    0C      D0      0251    484          MOVL    #MBA$M_CR_IE!MBA$M_CR_MAINT, -
                                                            0255    485                  MBA$L_CR(R4)            ; Set maintenance mode
                                 14 A4  01000000 8F  C8      0255    486          BISL2   #MBA$M_DCR_ATTN, -
                                                            025D    487                  MBA$L_DCR(R4)           ; Set attention causing interrupt
                                                        025D    488          $DS_WAITUS_S #1000                  ; Wait 10 Milliseconds
                                                00      DD      025D                 PUSHL   #0
                                          000003E8 8F   DD      025F                 PUSHL   #1000
                                    00000000'9F   02    FB      0265                 CALLS   #2, @#DS$WAITUS
                                    04 A4    01      D0      026C    489          MOVL    #MBA$M_CR_INIT,MBA$L_CR(R4); Clear MBA
                                                        0270    490
                                       51    33      D0      0270    491          MOVL    #RH750$K_LEN, R1        ; Length of P-table for RH750
                                 51    00000000'8F   C0      0273    492          ADDL2   #HPE$C_EPB_SIZE,R1      ; Include size of EPB          ;G:4
                                    00000000'EF      16      027A    493          JSB     EXE$ALONONPAGED         ; Allocate the space for same
                                          71 50      E9      0280    494          BLBC    R0,50$                  ; Spaz, no space
                                    08 A2    51      B0      0283    495          MOVW    R1,HP$W_SIZE(R2)        ; Set size of PT
                                 58   52    51      C1      0287    496          ADDL3   R1,R2,R8                ; Get end of ptable            ;G:4
```

```
                57   58   04    C3   028B   497          SUBL3   #4,R8,R7                        ; Address to store EPB                  ;G:5
          67    58    00000000'8F    C3   028F   498          SUBL3   #HPE$C_EPB_SIZE,R8,(R7)   ; Compute EPB address and store        ;G:4
                     58   67    D0   0297   499          MOVL    (R7),R8                         ; R8 has beginning of EPB               ;G:4
                          029A   500
          0C A2    3048525F 8F    D0   029A   501          MOVL    #^A"_RH0",HP$T_DEVICE(R2); Set name in PT
            50   54   02   0D    EF   02A2   502          EXTZV   #13, #2, R4, R0                 ; Get unit number                       [08]
                   0F A2   50    80   02A7   503          ADDB    R0, HP$T_DEVICE+3(R2)           ; Add unit number into name             [08]
      1C A2   54    00000400 8F    C9   02AB   504          BISL3   #^X400,R4,HP$A_DVA(R2)   ; Set direct virtural address
             26 A2    5205 8F    B0   02B4   505          MOVW    #^X5205,HP$T_TYPE(R2)   ; Set length and "R" of "RH780"
          28 A2    30353748 8F    D0   02BA   506          MOVL    #^A"H750",HP$T_TYPE+2(R2) ; Set rest of RH780
                        008D   31    02C2   507          BRW     60$                             ; Join common                           ;G:4
                               02C5   508 40$:
                          7E   D4   02C5   509          CLRL    -(SP)                           ; UBI0 -
             7E   40FC0000 8F    D0   02C7   510          MOVL    #^X40FC0000,-(SP)       ; Set device virtual address
                          0A   11   02CE   511          BRB     45$                             ;
                               02D0   512 42$:
                       7E   01   9A   02D0   513          MOVZBL  #1,-(SP)                        ; UBI1 -
             7E   40F80000 8F    D0   02D3   514          MOVL    #^X40F80000,-(SP)       ; Set device virtual address
                               02DA   515 45$:
                    0C BC   01    D0   02DA   516          MOVL    #1,@12(AP)              ; Set adapter type to UBA
                       51   32    D0   02DE   517          MOVL    #DW750$K_LEN,R1         ; Set length of PT
                51   00000000'8F    C0   02E1   518          ADDL2   #HPE$C_EPB_SIZE,R1      ; Include size of EPB                   ;G:4
                     00000000'EF    16   02E8   519          JSB     EXE$ALONONPAGED         ; Allocate space for PT
                          04 50    E8   02EE   520          BLBS    R0,55$                  ; Branch if successful
                       5E   08    C0   02F1   521          ADDL    #8,SP                   ; Reset stack
                               04   02F4   522 50$:     RET                             ; Return on error
                               02F5   523 55$:
                     1C A2 8ED0    02F5   524          POPL    HP$A_DVA(R2)            ; Set device virtual address
                        50 8ED0    02F9   525          POPL    R0                      ; Get the UBI number
                  08 A2    51    B0   02FC   526          MOVW    R1,HP$W_SIZE(R2)        ; Set length of PT
               58   52    51    C1   0300   527          ADDL3   R1,R2,R8                ; Get end of ptable                     ;G:4
               57   58    04    C3   0304   528          SUBL3   #4,R8,R7                ; Address to store EPB                  ;G:5
     67   58    00000000'8F    C3   0308   529          SUBL3   #HPE$C_EPB_SIZE,R8,(R7) ; Compute EPB address and store        ;G:4
                     58   67    D0   0310   530          MOVL    (R7),R8                 ; R8 has beginning of EPB               ;G:4
                          0313   531                                                                                            ;G:4
      0C A2    3057445F 8F    D0   0313   532          MOVL    #^A"_DW0",HP$T_DEVICE(R2); Set device name
     0F A2    02   00    50    F0   031B   533          INSV    R0,#0,#2,HP$T_DEVICE+3(R2); Correct name by UBA number
             26 A2    4405 8F    B0   0321   534          MOVW    #^X4405,HP$T_TYPE(R2)   ; Set length and "D" of "DW750"
          28 A2    30353757 8F    D0   0327   535          MOVL    #^A"W750",HP$T_TYPE+2(R2); Set rest of "W750"
                     62   04    D0   032F   536          MOVL    #4,HP$Q_DEVICE(R2)      ; Set length of devcie name
                04 A2    0C A2    9E   0332   537          MOVAB   HP$T_DEVICE(R2), -
                                   0337   538                  HP$Q_DEVICE+4(R2)       ; Set address of device name
                  18 A2    54    D0   0337   539          MOVL    R4,HP$A_DEVICE(R2)      ; Set address of device
               24 A2    0200 8F    B0   033B   540          MOVW    #^X200,HP$W_VECTOR(R2)  ; Set SCB base for UBI0
             54   40F30000 8F    D1   0341   541          CMPL    #^X40F30000,R4          ; Is it UBI0
                          21   13   0348   542          BEQL    70$                     ; Yes -
              24 A2    0200 8F    A0   034A   543          ADDW2   #^X200,HP$W_VECTOR(R2)  ; No - correct for UBI1
                          19   11   0350   544          BRB     70$                     ; Insert the p-table
                     62   04    D0   0352   545 60$:     MOVL    #4,HP$Q_DEVICE(R2)      ; Set length of device name
                04 A2    0C A2    9E   0355   546          MOVAB   HP$T_DEVICE(R2), -
                                   035A   547                  HP$Q_DEVICE+4(R2)       ; Set address of device name
                  18 A2    54    D0   035A   548          MOVL    R4,HP$A_DEVICE(R2)      ; Set address of device
               24 A2    FC AD    B0   035E   549          MOVW    L_VECTOR(FP), -
                                   0363   550                  HP$W_VECTOR(R2)         ; Set interrupt vector
                          17   13   0363   551          BEQL    CONFIG_RELEASE          ; Branch if invalid vector
            32 A2    F8 AD    10   83   0365   552          SUBB3   #^X10,L_IPL(FP), -
                                   036B   553                   RH750$B_BR(R2)         ; Set BR level
```

```
                                036B   554 70$:
                  20 A2    D4   036B   555          CLRL    HP$A_LINK(R2)            ; Clear address of link PT
            08 BC    52    D0   036E   556          MOVL    R2,a8(AP)                ; Store address of PT just made
      00000000'EF    62    FA   0372   557          CALLG   (R2),INS$PTABLE          ; Insert this in the table
                  10 50    E8   0379   558          BLBS    R0,CONFIG_EXIT           ; Exit complete
                                037C   559 CONFIG_RELEASE:
                50    52    D0   037C   560          MOVL    R2,R0                    ; Copy address of buffer
           00000000'EF    16   037F   561          JSB     EXE$DEANONPAGED          ; Deallocate buffer
      50   00660002 8F    D0   0385   562          MOVL    #DS$_ERROR,R0            ; Flag error
                                038C   563 CONFIG_EXIT:
                          04   038C   564          RET                                                          ;G:5
```

```
                        0004  038D   566 HANDLR: .WORD   ^M<R2>                    ; Unexpected exception routine
          52   FC76 CF   D0   038F   567         MOVL    W^LOCAL_STORE,R2          ; Base stack
            51    04 BC   DE   0394   568         MOVAL   @4(AP),R1                 ; Point to signal arguments
          50   0000'8F   3C   0398   569         MOVZWL  #SS$_RESIGNAL,R0          ; Assume not ours
                              039D   570
     04 A1   006600D8 8F   D1   039D   571         CMPL    #DS$_UNEXPINT,4(R1)       ; Unexpected interrupt?
                     18   12   03A5   572         BNEQ    10$                       ; Branch if not
        FC A2    08 A1   D0   03A7   573         MOVL    8(R1),L_VECTOR(R2)        ; Store interrupt vector
           F8 A2    12   DB   03AC   574         MFPR    #PR$_IPL,L_IPL(R2)        ; Save current IPL
           50    F4 A2   D0   03B0   575         MOVL    L_CONFIG(R2),R0           ; Get Configuration register address
                 04 A0   D4   03B4   576         CLRL    MBA$L_CR(R0)              ; Clear enables
              60    60   D0   03B7   577         MOVL    MBA$L_CSR(R0), -
                              03BA   578                 MBA$L_CSR(R0)             ; Clear status bits
          50   0000'8F   3C   03BA   579         MOVZWL  #SS$_CONTINUE,R0          ; Continue from exception
                              03BF   580
                          04  03BF   581 10$:    RET
                              03C0   582
```

```
03C0   584          .SBTTL  MAP$IOSPACE     Validate mapping for adapters
03C0   585 ;++
03C0   586 ; FUNCTIONAL DESCRIPTION:
03C0   587 ;
03C0   588 ;       This is routine is called from MAPMEM (MEMMGT) to
03C0   589 ;       validate those P1 space address that map thru to physical
03C0   590 ;       I/O space... bit 29=1
03C0   591 ;       For each TR pages are mapped according to adapter type.
03C0   592 ;       All 16 pages are mapped for all adapter types.
03C0   593 ;
03C0   594 ; CALLING SEQUENCE:
03C0   595 ;
03C0   596 ;       BSBW    MAP$IOSPACE
03C0   597 ;
03C0   598 ; INPUT PARAMETERS:     NONE
03C0   599 ;
03C0   600 ;       R5      Address of P1 page tables
03C0   601 ;
03C0   602 ; IMPLICIT INPUTS:      NONE
03C0   603 ;
03C0   604 ; OUTPUT PARAMETERS:    NONE
03C0   605 ;
03C0   606 ; IMPLICIT OUTPUTS:
03C0   607 ;
03C0   608 ;       Updates P1 page tables
03C0   609 ;
03C0   610 ; SIDE EFFECTS:         Turns on cache.                          [26]
03C0   611 ;--
```

```
                                03C0   613 MAP$IOSPACE::
                     0058 8F    BB  03C0   614          PUSHR   #^M<R3,R4,R6>                ; Save
                     FC40 CF    94  03C4   615          CLRB    DS$GB_PRIMARY_CPU_IDENTIFIER    ; =s zero for non-mp systems     [27]
               54    00F20000 8F    D0  03C8   616          MOVL    #^XF20000,R4               ; Lowest slot address            [12]
              56   54    04    0D    EF  03CF   617 10$:     EXTZV   #13,#4,R4,R6               ; Get slot number                [29]
                     FC3C CF46    B4  03D4   618          CLRW    W^ADAPTER_TYPE[R6]         ; Assume no adapter at this node [29]
                                    03D9   619
                           7E    DF  03D9   620          PUSHAL  -(SP)                      ; Address to store longword
                           54    DD  03DB   621          PUSHL   R4                         ; Address to fetch
                00000455'EF      02  03DD   622          CALLS   #2,FETCH_LONG              ; Check it out
                           08    BA  03E4   623          POPR    #^M<R3>                    ; Get data fetched
                        1B 50    E9  03E6   624          BLBC    R0,50$                     ; Failed... get next slot
                                    03E9   625
                  FC26 CF46      53  B0   03E9   626          MOVW    R3,W^ADAPTER_TYPE[R6]      ; Save adapter type (for CI750)  [29]
                                    03EF   627
                  51    54    F7 8F    78  03EF   628          ASHL    #-9,R4,R1                  ; PFN of Adapter
                  52    A0000000 8F    D0  03F4   629          MOVL    #PTE$M_VALID!PTE$C_UW,R2   ; Protection
                           50    10    D0  03FB   630          MOVL    #16,R0                     ; Do 16 PTE's
                     00000000'EF      16  03FE   631          JSB     MAPMEM$IOSPACE             ; setup the map                  [11]
                                    0404   632
54    00002000 8F    00F3E000 8F    F1  0404   633 50$:     ACBL    #^XF3E000,#^X2000,R4,10$   ; Loop to next slot
                                 FFBD   0410
                           7E    DF  0412   634          PUSHAL  -(SP)                      ; Address to store longword
                     00F32000 8F    DD  0414   635          PUSHL   #^XF32000                  ; Address to test                [09]
                00000455'EF      02  FB  041A   636          CALLS   #2,FETCH_LONG              ; Check if valid address         [09]
                           08    BA  0421   637          POPR    #^M<R3>                    ; Get data                       [09]
                        0E 50    E9  0423   638          BLBC    R0,60$                     ; Failed to respond  Not present [09]
50    00000400 8F    D0  0426   639          MOVL    #1024,R0                   ; # of PTE's to set up           [09]
     51    7C00 8F    3C  042D   640          MOVZWL  #^XF80000a-9,R1            ; Start of Unibus address space  [09]
                        0C  11  0432   641          BRB     70$                        ; Go set PTE's                   [09]
     51    7E00 8F    3C  0434   642 60$:     MOVZWL  #^XFC0000a-9,R1            ; Start of Unibus address space  [09]
50    00000200 8F    D0  0439   643          MOVL    #512,R0                    ; # of PTE's to set up           [09]
                                    0440   644 70$:                             ;                                [09]
52    A0000000 8F    D0  0440   645          MOVL    #PTE$M_VALID!PTE$C_UW,R2   ; Protection
      00000000'EF      16  0447   646          JSB     MAPMEM$IOSPACE             ; setup the map                  [11]
                                    044D   647
                     25    00    DA  044D   648          MTPR    #0,#PR$_CADR               ; Turn on cache (VMB turned it off) [26]
                                    0450   649
                     0058 8F    BA  0450   650          POPR    #^M<R3,R4,R6>              ; Restore                        [29]
                                 05  0454   651          RSB
```

```
                                0455   653 ;++
                                0455   654 ; FUNCTIONAL DESCRIPTION:
                                0455   655 ;
                                0455   656 ;       This routine is used to fetch a longword from the designated location
                                0455   657 ;       It handles machine checks if they occur and return the indicated status
                                0455   658 ;
                                0455   659 ; CALLING SEQUENCE:
                                0455   660 ;
                                0455   661 ;       FETCH_LONG(ADDRESS,RESULT)
                                0455   662 ;
                                0455   663 ; INPUT PARAMETERS:
                                0455   664 ;
                                0455   665 ;       ADDRESS Address of Longword to fetch
                                0455   666 ;
                                0455   667 ; IMPLICIT INPUTS:      NONE
                                0455   668 ;
                                0455   669 ; OUTPUT PARAMETERS:
                                0455   670 ;
                                0455   671 ;       RESULT  Address to store the fetched longword
                                0455   672 ;
                                0455   673 ; IMPLICIT OUTPUTS:     NONE
                                0455   674 ;
                                0455   675 ;--
                                0455   676
                          0000  0455   677 .ENTRY  FETCH_LONG,^M<>
                                0457   678
          6D    64'AF     9E  0457   679         MOVAB   B^20$,(FP)              ; Set exception handler
       08 BC     04 BC     D0  045B   680         MOVL    a4(AP),a8(AP)           ; Fetch
             50     01     D0  0460   681         MOVL    S^#SS$_NORMAL,R0        ; Success
                           04  0463   682         RET
                               0464   683
                          0000 0464   684 20$:    .WORD   ^M<>                    ; Save no registers
          50     04 AC     7D  0466   685         MOVQ    4(AP),R0                ; Get signal and mechanism pointers
    04 A0    00660088 8F     D1  046A   686         CMPL    #DS$_MCHK,4(R0)         ; Machine check?
                        0F   12  0472   687         BNEQ    30$                     ; Branch if not
       0C A1     04 A0     D0  0474   688         MOVL    4(R0),12(R1)            ; Change return code
                        7E   7C  0479   689         CLRQ    -(SP)                   ; Null args to unwind
    00000000'EF     02     FB  047B   690         CALLS   #2,SYS$UNWIND           ; Unwind the stack
                           04  0482   691         RET                             ; And return
                               0483   692
          50    0000'8F     3C  0483   693 30$:    MOVZWL  #SS$_RESIGNAL,R0        ; Let someone else have it
                           04  0488   694         RET                             ; Return
                               0489   695
```

```
                                  0489          .SBTTL  PURGE DATAPATH
                                  0489  ;+
                                  0489  ; IOC$PURGDATAP - PURGE DATAPATH
                                  0489  ;
                                  0489  ; THIS ROUTINE PURGES THE CALLER'S BUFFERED DATAPATH, AND CLEARS ANY
                                  0489  ; DATAPATH ERRORS.  IF THERE WAS A DATAPATH ERROR, THIS FACT IS
                                  0489  ; RETURNED TO THE CALLER.
                                  0489  ;
                                  0489  ; INPUTS:
                                  0489  ;
                                  0489  ;       R5 = UCB ADDRESS
                                  0489  ;
                                  0489  ; OUTPUTS:
                                  0489  ;
                                  0489  ;       R0-R3 ALTERED
                                  0489  ;       OTHER REGISTERS PRESERVED
                                  0489  ;       R0 LOW BIT CLEAR/SET IF TRANSMISSION ERROR/SUCCESS
                                  0489  ;       R1 = DPR CONTENTS AFTER PURGE (FOR REGISTER DUMP BY CALLER)
                                  0489  ;       R2 = ADDRESS OF START OF ADAPTER MAP REGISTERS (FOR REG DUMP BY CALLER)
                                  0489  ;       R3 = CRB ADDRESS
                                  0489  ;-
                                  0489
                                  0489
                                  0489          .ENABL  LSB
                                  0489
                                  0489  IOC$PURGDATAP::                                  ;
                       10   BB    0489          PUSHR   #^M<R4>                          ;SAVE REGISTER
                 53  20 A5   D0   048B          MOVL    UCB$L_CRB(R5),R3                 ;GET CRB ADDR
                 52  28 B3   D0   048F          MOVL    @CRB$L_INTD+VEC$L_ADP(R3),R2 ;GET START OF ADAPTER
                                  0493                                                   ; REGISTER SPACE
                       00   EF    0493          EXTZV   #VEC$V_DATAPATH,-                ;EXTRACT DATAPATH #
                       05         0495                  #VEC$S_DATAPATH,-                ; FROM CRB
                 51  27 A3        0496                  CRB$L_INTD+VEC$B_DATAPATH(R3),R1
                 54   6241   DE    0499          MOVAL   UBI$L_DPR(R2)[R1],R4             ;GET ADDR OF DPR
              64   01   00   78   049D          ASHL    #UBI$V_DPR_PUR,#1,(R4)           ;PURGE DATAPATH
                   50   0A   D0   04A1          MOVL    #UBI$C_PURCNT,R0                 ;GET MAX # OF TRIES FOR
                                  04A4                                                   ; PURGE DONE TEST
                   51   64   D0   04A4  10$:    MOVL    (R4),R1                          ;GET DPR CONTENTS
                 1A 51   1F   E1   04A7          BBC     #UBI$V_DPR_ERROR,R1,15$          ;BRANCH IF PURGE DONE
                     F6 50   F5   04AB          SOBGTR  R0,10$                           ;BRANCH IF MORE TRIES ALLOWED
                                  04AE          BUG_CHECK BDPPURGERR,FATAL               ;ELSE, FATAL ERROR (PURGE STATE
              00000000'9F   16    04AE          JSB     @#BUG$CHECK
2C 52 52 45 47 52 55 50 50 44 42 00'  04B4          .ASCIC  "BDPPURGERR,FATAL"
                 4C 41 54 41   46   04C0
                               10   04B4
                                  04C5                                                   ; STUCK ON)
                 07 51   1F   E1   04C5  15$:    BBC     #UBI$V_DPR_ERROR,R1,20$          ;BRANCH IF NO ERROR
                   64   00   D2   04C9          MCOML   #0,(R4)                          ;CLEAR DPR ERROR(S)
                       50   D4   04CC          CLRL    R0                               ;SET TO RETURN XFER ERROR
                       03   11   04CE          BRB     30$                              ;JOIN COMMON CODE
                   50   01   9A   04D0  20$:    MOVZBL  #1,R0                            ;SET TO RETURN XFER SUCCESS
              52   0800 C2   DE   04D3  30$:    MOVAL   UBI$L_MAP(R2),R2                 ;RETURN ADDR OF 1ST MAP REG
                       10   BA   04D8          POPR    #^M<R4>                          ;RESTORE REGISTER
                               05   04DA          RSB                                      ;RETURN
                                  04DB
                                  04DB          .DSABL  LSB
```

```
                                04DB   750 ;++
                                04DB   751 ; 11/750 SPECIFIC UBI INITIALIZATION
                                04DB   752 ; AND ADAPTER BLOCK BUILD
                                04DB   753 ;--
                                04DB   754 UBADP_CPU::
                  0600'CF   DE  04DB   755          MOVAL   W^SCB_BASE+^X200,-      ; ASSUME UB0
                     10 A2      04DF   756                  ADP$L_VECTOR(R2)        ;  VECTOR SPACE
               08    0C A2   B1  04E1   757          CMPW    ADP$W_TR(R2),#8         ; IS DEVICE TYPE = UB0?
                        08   13  04E5   758          BEQL    10$                     ; BRANCH IF SO
         10 A2   00000200 8F   C0  04E7   759          ADDL    #^X200,ADP$L_VECTOR(R2) ; ELSE STEP TO UB1 VECTOR SPACE
                  24 A2   0E   B0  04EF   760 10$:     MOVW    #^XE,ADP$W_DPBITMAP(R2) ; MARK DATAPATHS 1-3 AVAILABLE
                           05   04F3   761          RSB                             ; RETURN TO COMMON CODE
                                04F4   762
                       000000B4 04F4   763 UBINTSZ==^XB4                           ; Defined for QIO                       [19]
```

```
                        04F4    765          .SBTTL  UBA$INITIAL     UNIBUS ADAPTER INITIALIZATION
                        04F4    766 ;+
                        04F4    767 ; UBA$INITIAL - UNIBUS ADAPTER INITIALIZATION
                        04F4    768 ;
                        04F4    769 ; THIS ROUTINE IS CALLED VIA A JSB INSTRUCTION AT SYSTEM STARTUP AND AFTER
                        04F4    770 ; A POWER RECOVERY RESTART TO ALLOW INITIALIZATION OF UNIBUS ADAPTERS.
                        04F4    771 ;
                        04F4    772 ; INPUTS:
                        04F4    773 ;
                        04F4    774 ;       R4 = ADDRESS OF UNIBUS ADAPTER CONFIGURATION STATUS REGISTER.
                        04F4    775 ;
                        04F4    776 ;       ALL INTERRUPTS ARE LOCKED OUT.
                        04F4    777 ;
                        04F4    778 ; OUTPUTS:
                        04F4    779 ;
                        04F4    780 ;       THE UNIBUS ADAPTER IS INITIALIZED AND INTERRUPTS ARE ENABLED.
                        04F4    781 ;-
                        04F4    782
                        04F4    783 UBA$INITIAL::                           ;UNIBUS ADAPTER INITIALIZATION
                  05    04F4    784          RSB                            ;
                        04F5    785 ;
                        04F5    786 ; IGNORE UNEXPECTED UNIBUS INTERRUPTS
                        04F5    787 ;
                        04F5    788
                        04F5    789          .ALIGN  LONG
                        04F8    790 UBA$UNEXINT::                           ; UNEXPECTED INTERRUPT CODE
                  02    04F8    791          REI                            ; AND RETURN
```

```
                        04F9    793          .SBTTL  IO$TESTCSR_x    Test CSR for existence
                        04F9    794 ;++
                        04F9    795 ;
                        04F9    796 ; IO$TESTCSR_L - TEST A LONGWORD FOR EXISTENCE
                        04F9    797 ; IO$TESTCSR_W - TEST A WORD FOR EXISTENCE IN I/O SPACE
                        04F9    798 ;
                        04F9    799 ; THIS TEST IS CPU DEPENDENT. THE FOLLOWING CPU'S ARE SUPPORTED:
                        04F9    800 ;
                        04F9    801 ;       11/780 - TEST CSR AND CHECK RESULT IN THE UBA STATUS REGISTER.
                        04F9    802 ;       11/750 - NOM-EXISTENT CSR IS REPORTED VIA MACHINE CHECK AS A
                        04F9    803 ;    & 11/730    NON-EXISTENT MEMORY REFERENCE. CONNECT A TEMPORARY
                        04F9    804 ;                MACHINE CHECK HANDLER, TEST THE CSR, AND RESTORE THE
                        04F9    805 ;                ORIGINAL MACHINE CHECK HANDLER.
                        04F9    806 ;
                        04F9    807 ; INPUTS:
                        04F9    808 ;
                        04F9    809 ;       R0 = CSR ADDRESS
                        04F9    810 ;       R6 = ADAPTER CONFIGURATION REGISTER
                        04F9    811 ;
                        04F9    812 ; OUTPUTS:
                        04F9    813 ;
                        04F9    814 ;       R0 = LOW BIT SET/CLEAR FOR EXISTENT/NONEX CSR
                        04F9    815 ;            OTHER REGISTERS ARE PRESERVED.
                        04F9    816 ;
                        04F9    817 ;--
                        04F9    818 IO$TESTCSR_L::
                02   BB 04F9    819          PUSHR   #^M<R1>                 ; Save a register
      00000404'EF       DE 04FB    820          MOVAL   SCB_BASE+4,R1           ; Base SCB
                61      DD 0502    821          PUSHL   (R1)                    ; Save previous machine check handler
      00000000'EF       DE 0504    822          MOVAL   TST$MCHK,(R1)           ; Set machine check handler
                60      D5 050B    823          TSTL    (R0)                    ; Test for existence
                61 8ED0   050D    824          POPL    (R1)                    ; Restore previous MCHK handler
                50      DC 0510    825          MOVPSL  R0                      ; C-bit set indicates MCHK
             50 50      D2 0512    826          MCOML   R0,R0                   ; C-bit clear indicates ok
                02      BA 0515    827          POPR    #^M<R1>                 ; Restore
                05      05 0517    828          RSB                             ; Return
                           0518    829
                           0518    830 IO$TESTCSR_W::
                02      BB 0518    831          PUSHR   #^M<R1>                 ; Save a register
      00000404'EF       DE 051A    832          MOVAL   SCB_BASE+4,R1           ; Base SCB
                61      DD 0521    833          PUSHL   (R1)                    ; Save previous machine check handler
      00000000'EF       DE 0523    834          MOVAL   TST$MCHK,(R1)           ; Set machine check handler
                60      B5 052A    835          TSTW    (R0)                    ; Test for existence
                61 8ED0   052C    836          POPL    (R1)                    ; Restore previous MCHK handler
                50      DC 052F    837          MOVPSL  R0                      ; C-bit set indicates MCHK
             50 50      D2 0531    838          MCOML   R0,R0                   ; C-bit clear indicates ok
                02      BA 0534    839          POPR    #^M<R1>                 ; Restore
                05      05 0536    840          RSB                             ; Return
```

```
                        0537   842          .SBTTL  IOGEN$CONN_VEC
                        0537   843 ;++
                        0537   844 ;
                        0537   845 ; IOGEN$CONN_VEC - CONNECT A UNIBUS INTERRUPT DISPATCHER TO A VECTOR
                        0537   846 ;
                        0537   847 ; THIS SUBROUTINE IS CPU-DEPENDENT. THE FOLLOWING CPU'S ARE SUPPORTED:
                        0537   848 ;
                        0537   849 ;       11/780 - CONNECT VEC$Q_DISPATCH+2 (JSB @#) TO VECTOR
                        0537   850 ;       11/750 - CONNECT VEC$Q_DISPATCH (PUSHR) TO VECTOR
                        0537   851 ;
                        0537   852 ; FOR ALL CPU'S, PUSHR #^M<R2,R3,R4,R5> IN THE INTERRUPT DISPATCH BLOCK
                        0537   853 ; IS CHANGED TO PUSHR #^M<R0,R1,R2,R3,R4,R5>.
                        0537   854 ;
                        0537   855 ; INPUTS:
                        0537   856 ;
                        0537   857 ;       R0 = ADDRESS OF VECTOR TO CONNECT
                        0537   858 ;       R4 = ADDRESS OF INTERRUPT DISPATCH BLOCK IN CRB
                        0537   859 ;
                        0537   860 ; OUTPUTS:
                        0537   861 ;
                        0537   862 ;       ALL REGISTERS PRESERVED
                        0537   863 ;--
                        0537   864 IOGEN$CONN_VEC::
64  00000000'EF   B0    0537   865          MOVW    UBINT_DISP,VEC$Q_DISPATCH(R4)   ; CHANGE PUSHR TO PUSH R0-R5
      60   64     9E    053E   866          MOVAB   VEC$Q_DISPATCH(R4),(R0)         ; CONNECT PUSHR TO VECTOR
                  05    0541   867          RSB                                     ; RETURN
```

```
                        0542   869          .SBTTL  QIOCLEAN_CPU
                        0542   870 ;
                        0542   871 ; CPU SPECIFIC QIO CLEANUP
                        0542   872 ;       R4 = SCB_IMAGE
                        0542   873 ;       R5 = SCB_BASE
                        0542   874 ; Uses R0,R1,R2,R3
                        0542   875 ;
                        0542   876 QIOCLEAN_CPU::
                  3F    BB    0542   877          PUSHR   #^M<R0,R1,R2,R3,R4,R5>  ; SAVE R0,R1,R2,R3,R4,R5
            50    0080 8F     3C    0544   878          MOVZWL  #<512/4>,R0             ; Start with SCB page 2, offset ^X200
      6540    00000A00'EF40     DE    0549   879 10$:     MOVAL   SCB_UNKINT[R0],(R5)[R0] ; Re-fill SCB with pointer to UNK_INT
       EF 50    00000180 8F     F2    0552   880          AOBLSS  #3*<512/4>,R0,10$       ; Fill 2 SCB vector pages
                        055A   881
                        055A   882 ;+
                        055A   883 ; Re-init the adapter and release the ADP
                        055A   884 ;-
            53    0000'CF     DE    055A   885          MOVAL   W^IOC$GL_ADPLIST,R3     ; POINT TO THE ADAPTER HEADER
                        055F   886 20$:
                50    63     D0    055F   887          MOVL    (R3),R0                 ; POINT TO THE FIRST ADAPTER BLOCK
                      20     13    0562   888          BEQL    50$                     ; FINISH IF EMPTY
                51    60     D0    0564   889          MOVL    ADP$L_CSR(R0),R1        ; Get Base of Adapter
              63    04 A0     D0    0567   890          MOVL    ADP$L_LINK(R0),(R3)     ; LINK TO THE NEXT
            0000057C'EF     9F    056B   891          PUSHAB  40$                     ; Pseudo return address   (JSB)
                        0571   892          CASE    ADP$W_ADPTYPE(R0),TYPE=W,LIMIT=#0,DISPLIST=-
                        0571   893                  <60$,70$>
         01'  00    0E A0     AF    0571           CASEW   ADP$W_ADPTYPE(R0),#0,S^#<<30003$-30002$>/2>-1
                        0576   30002$:
                0011'   0576           .SIGNED_WORD    60$-30002$
                0016'   0578           .SIGNED_WORD    70$-30002$
                        057A   30003$:
                  8E    D5    057A   894          TSTL    (SP)+                   ; Remove address
                        057C   895 40$:
      00000000'EF     16    057C   896          JSB     QIO$DEALLOCATE          ; RELEASE THE ADAPTER CONTROL BLOCK ; 23
                  DB    11    0582   897          BRB     20$                     ; RELEASE THEM ALL
                        0584   898 50$:
                  3F    BA    0584   899          POPR    #^M<R0,R1,R2,R3,R4,R5>  ; RESTORE R0,R1,R2,R3,R4,R5
                        05    0586   900          RSB                             ; RETURN
                        0587   901
                        0587   902 ;
                        0587   903 ; MASSBUS adapter
                        0587   904 ;
      04 A1     01    C8    0587   905 60$:     BISL    #1,MBA$L_CR(R1)         ; Re-init adapter
                        05    058B   906          RSB                             ; Return
                        058C   907
                        058C   908 ;
                        058C   909 ; UNIBUS adapter
                        058C   910 ;
         37     01    DA    058C   911 70$:     MTPR    #1,#^X37                ; I/O CLEAR FOR NOW
                        05    058F   912          RSB                             ; Return
                        0590   913
```

```
                     0590   915          .SBTTL  ONLY_SCB        CPU specific SCB setup
                     0590   916 ;++                                                          [14]
                     0590   917 ; FUNCTIONAL DESCRIPTION:
                     0590   918 ;
                     0590   919 ;       Turns on cache. Doesn't touch SCB for COMET.
                     0590   920 ;
                     0590   921 ;--                                                          [14]
                     0590   922
                     0590   923 ONLY_SCB::                              ;                   [14]
                  05 0590   924          RSB                           ;                   [14]
```

```
                     0591   926          .SBTTL  HDW_CLOCK_SET   CPU specific clock setup
                     0591   927 ;++                                                          [15]
                     0591   928 ; FUNCTIONAL DESCRIPTION:
                     0591   929 ;
                     0591   930 ;       Does nothing for the case of COMET
                     0591   931 ;
                     0591   932 ;--                                                          [15]
                     0591   933
                     0591   934 HDW_CLOCK_SET::                          ;                 [15]
                  05 0591   935          RSB                             ;                 [15]
```

```
                                  0592          .SBTTL  ONLY_ATTACH                    ; [28]
                                  0592  ;++                                                                          [15]
                                  0592  ; FUNCTIONAL DESCRIPTION:
                                  0592  ;
                                  0592  ;       Does nothing for the case of COMET
                                  0592  ;
                                  0592  ;--                                                                          [15]
                                  0592
                                  0592  ONLY_ATTACH::                          ;
                              05  0592          RSB                            ;
                                  0593
                                  0593          .SBTTL  DSR$ONLY_CONSOLE_CONFIG  console device configuration for load path
                                  0593  ;++
                                  0593  ; FUNCTIONAL DESCRIPTION:
                                  0593  ;
                                  0593  ;       This subroutine sets up the P-tables for the console load device(s).
                                  0593  ;
                                  0593  ; CALLING SEQUENCE:
                                  0593  ;
                                  0593  ;       JSB     DSR$ONLY_CONSOLE_CONFIG
                                  0593  ;
                                  0593  ; INPUT PARAMETERS:     NONE
                                  0593  ;
                                  0593  ; IMPLICIT INPUTS:      NONE
                                  0593  ;
                                  0593  ; OUTPUT PARAMETERS:    NONE
                                  0593  ;
                                  0593  ; IMPLICIT OUTPUTS:
                                  0593  ;
                                  0593  ;       P-talbles for each device in the console load path.
                                  0593  ;
                                  0593  ; SIDE EFFECTS:
                                  0593  ;
                                  0593  ;       R0, R1, and R2 are destroyed.
                                  0593  ;
                                  0593  ;--
                                  0593  DSR$ONLY_CONSOLE_CONFIG::                      ; Build console P-table for [32]
                                  0593                                                 ; this particular processor [32]
                 0180 8F     BB   0593          PUSHR   #^M<R7,R8>                                                  ;G:4
                 51   32     3C   0597          MovZWL  #Hp$A_Dependent, R1                ; Length of Ptable to make
        51   00000000'8F     C0   059A          ADDL2   #HPE$C_EPB_SIZE,R1       ; Include size of EPB                ;G:4
             00000000'EF     16   05A1          Jsb     L^Exe$AloNonPaged                  ; Allocate it
                   5B 50     E9   05A7          BlbC    R0, 10$                            ; Skip setup if couldn't do it
                      3E     BB   05AA          PushR   #^M<R1,R2,R3,R4,R5>                ; Save volatile registers     ;G:5
  62   51   00   6E   00     2C   05AC          MovC5   #0, (Sp), #0, R1, (R2)             ; Clear the Ptable            ;G:5
                      3E     BA   05B2          PopR    #^M<R1,R2,R3,R4,R5>                ; Restore registers           ;G:5
             58   52   51     C1   05B4          ADDL3   R1,R2,R8                 ; Get end of ptable                  ;G:4
             57   58   04     C3   05B8          SUBL3   #4,R8,R7                 ; Address to store EPB               ;G:5
  67   58   00000000'8F     C3   05BC          SUBL3   #HPE$C_EPB_SIZE,R8,(R7) ; Compute EPB address and store       ;G:4
                 58   67     D0   05C4          MOVL    (R7),R8                  ; R8 has beginning of EPB            ;G:4
              08 A2   51     B0   05C7          MovW    R1, Hp$W_Size(R2)                  ; Set size field
                 62   05     D0   05CB          MovL    #5, Hp$Q_Device(R2)                ; Set length of descriptor
              50   0C A2     9E   05CE          MovAB   Hp$T_Device(R2), R0                ; Set address of "_CSA0"
              04 A2   60     9E   05D2          MovAB   (R0), Hp$Q_Device+4(R2)            ; Set address of string
        80   4153435F 8F     D0   05D6          MovL    #^A"_CSA", (R0)+                   ; Set first 4 chars of name
                 60   30     90   05DD          MovB    #^A"0", (R0)                       ; Set last character
              50   26 A2     9E   05E0          MovAB   Hp$T_Type(R2), R0                  ; Set address of type string
```

```
                80   6E6F6307 8F    D0  05E4   994          MovL    #7!<<^A"con">&8>, (R0)+          ; Set length/"con"
                60   656C6F73 8F    D0  05EB   995          MovL    #^A"sole", (R0)                  ; Set rest of name
                00000000'EF   62    FA  05F2   996          CallG   (R2), L^Ins$Ptable               ; Insert the Ptable in list
                           09 50    E8  05F9   997          BlbS    R0, 10$                          ; Continue if it worked
                        50   52    D0  05FC   998          MovL    R2, R0                           ; Else, copy length to R0
                    00000000'EF    16  05FF   999          Jsb     L^Exe$DeaNonPaged                ; .. and deallocate the buffer
                                       0605  1000 10$:
                          0180 8F    BA  0605  1001          POPR    #^M<R7,R8>                                                ;G:4
                                       05  0609  1002          RSB                                  ; RETURN
```

```
                    060A  1004          .SBTTL  ONLY_CPU        CPU specific setup                      [34]  ;G:3
                    060A  1005 ;++                                                                              ;G:4
                    060A  1006 ; FUNCTIONAL DESCRIPTION:                                                        ;G:3
                    060A  1007 ;                                                                                ;G:3
                    060A  1008 ;       Does nothing for the case of COMET.                                      ;G:3
                    060A  1009 ;                                                                                ;G:3
                    060A  1010 ;--                                                                              ;G:4
                    060A  1011                                                                                  ;G:3
                    060A  1012 ONLY_CPU::                               ;                                       [34]  ;G:3
                 05 060A  1013          RSB                             ;                                       [34]  ;G:3
                    060B  1014          .END
```

```
$$$                     = 00004000 R  D  03
$ER                     = 00000002    D
$MODULE                   00000000 R  D  03
ADAPTER_TYPE              00000015 R  D  02
ADP$B_NUMBER              0000000B    D
ADP$B_PORT                00000020    D
ADP$B_TYPE                0000000A    D
ADP$C_DRADPLEN            00000014    D
ADP$C_MBAADPLEN           00000014    D
ADP$C_MPMADPLEN           00000070    D
ADP$C_UBAADPLEN           00000070    D
ADP$K_DRADPLEN            00000014    D
ADP$K_MBAADPLEN           00000014    D
ADP$K_MPMADPLEN           00000070    D
ADP$K_UBAADPLEN           00000070    D
ADP$L_CRB                 00000010    D
ADP$L_CSR                 00000000    D
ADP$L_DPQBL               00000018    D
ADP$L_DPQFL               00000014    D
ADP$L_INTD                00000064    D
ADP$L_LINK                00000004    D
ADP$L_MRQBL               00000020    D
ADP$L_MRQFL               0000001C    D
ADP$L_PRQQBL              00000018    D
ADP$L_PRQQFL              00000014    D
ADP$L_SHB                 0000001C    D
ADP$L_VECTOR              00000010    D
ADP$W_ADPTYPE             0000000E    D
ADP$W_DPBITMAP            00000024    D
ADP$W_MRBITMAP            00000026    D
ADP$W_SIZE                00000008    D
ADP$W_TR                  0000000C    D
ARB$C_LENGTH            = 00000078    D
AX_BUFF                   00000000 RG D  03
BIT...                  = 0000000F    D
BUG$CHECK                 ********  X   00
CI$B_BI_ID                00000032    D
CI$B_BR                   00000033    D
CI$B_NODE                 00000034    D
CI$B_TR                   00000032    D
CI$K_LEN                  00000041    D
CI$L_FUNC                 00000035    D
CI$L_INDEX                0000003D    D
CI$L_MAINT_ID             00000039    D
CMK$RCONSOLE              ********  X   00
CMK$TCONSOLE              ********  X   00
CMK$_APBOOT             = 00000004    D
CMK$_ASTEXIT            = 00000000    D
CMK$_CANTIM             = 0000000B    D
CMK$_HIBER              = 00000007    D
CMK$_INITSCB            = 00000008    D
CMK$_LAST               = 0000000E    D
CMK$_MMENABLE           = 00000003    D
CMK$_RCONSOLE           = 00000001    D
CMK$_REFRESH            = 00000005    D
CMK$_SCHDWK             = 00000006    D
CMK$_SETIMR             = 0000000C    D
CMK$_SETIPL             = 00000009    D
CMK$_SETPRT             = 0000000D    D
CMK$_SGIPR              = 0000000A    D
CMK$_TCONSOLE           = 00000002    D
CONFIG_EXIT               0000038C R  D  02
CONFIG_RELEASE            0000037C R  D  02
CRB$B_MASK                0000000E    D
CRB$B_TYPE                0000000A    D
CRB$C_LENGTH              00000038    D
CRB$K_LENGTH              00000038    D
CRB$L_INTD                00000014    D
CRB$L_INTD2               00000038    D
CRB$L_LINK                00000010    D
CRB$L_WQBL                00000004    D
CRB$L_WQFL                00000000    D
CRB$W_REFC                0000000C    D
CRB$W_SIZE                00000008    D
DEF$Q_DEV                 00000058 RG D  02
DEF$Q_DIR                 0000007E RG D  02
DIR...                  = FFFFFFFF    D
DS$AX_ARB               = 00000274 RG D  03
DS$AX_JIB               = 00000200 RG D  03
DS$AX_SOFTPCB           = 000002EC RG D  03
DS$GB_PRIMARY_CPU_IDENTIFIER  00000008 RG D  02
DS$GK_SID               = 02000000  G D
DS$GK_USOVR             = 000000C0  G D
DS$K_ERROR              = 00000002    D
DS$K_NORMAL             = 00000001    D
DS$K_SEVERE             = 00000004    D
DS$K_SUBSYS             = 00000066    D
DS$K_WARNING            = 00000000    D
DS$WAITUS                 ********  X   00
DS$_AP_NORMAL_BREAK     = 00660150    D
DS$_ARITH               = 006600D0    D
DS$_ASBE                = 00660118    D
DS$_BADLINK             = 006600F0    D
DS$_BADTYPE             = 006600E8    D
DS$_BIIC                = 00660120    D
DS$_CHME                = 006600A8    D
DS$_CHMK                = 006600E0    D
DS$_DEVNAME             = 00660108    D
DS$_ERROR               = 00660002    D
DS$_FHWE                = 00660068    D
DS$_FRAGBUF             = 00660080    D
DS$_ICBUSY              = 006600C8    D
DS$_ICERR               = 006600C0    D
DS$_IHWE                = 00660060    D
DS$_ILLCHAR             = 00660018    D
DS$_ILLPAGCNT           = 00660078    D
DS$_ILLUNIT             = 00660100    D
DS$_INIT_FAIL           = 00660140    D
DS$_INSFMEM             = 00660050    D
DS$_INVCPU              = 00660130    D
DS$_IPL2HI              = 006600B8    D
DS$_IVADDR              = 00660040    D
DS$_IVVECT              = 00660038    D
DS$_KRNLSTK             = 00660090    D
```

```
DS$_LOGIC                       = 00660070     D
DS$_MCHK                        = 00660088     D
DS$_MEM_ALLOC_ERR               = 00660138     D
DS$_MMOFF                       = 00660058     D
DS$_NEEDUNIT                    = 006600F8     D
DS$_NODE                        = 00660128     D
DS$_NOPCS                       = 00660110     D
DS$_NORMAL                      = 00660001     D
DS$_NOSUPPORT                   = 006600B1     D
DS$_NOTALLOWMP                  = 00660148     D
DS$_NOTDON                      = 00660030     D
DS$_NOTIMP                      = 006600B0     D
DS$_NULLSTR                     = 00660010     D
DS$_OVERFLOW                    = 00660008     D
DS$_POWER                       = 00660098     D
DS$_PROGERR                     = 00660020     D
DS$_SEVERE                      = 00660004     D
DS$_TRANSL                      = 006600A0     D
DS$_TRUNCATE                    = 00660028     D
DS$_UNEXPINT                    = 006600D8     D
DS$_UNSUPPDEV                   = 00660158     D
DS$_VASFULL                     = 00660048     D
DS$_WARNING                     = 00660000     D
DSP$CONFIG_ADP                    00000100 RG  D   02
DSR$ONLY_CONSOLE_CONFIG           00000593 RG  D   02
DS_ERRSUP                         ********     X   00
DW750$K_LEN                       00000032       D
ESTKPTR                         = 00003400 RG  D   03
EXE$ALONONPAGED                   ********     X   00
EXE$DEANONPAGED                   ********     X   00
FETCH_LONG                        00000455 RG  D   02
FETCH_STORE                       ********     X   00
HANDLR                            0000038D R   D   02
HDW_CLOCK_SET                     00000591 RG  D   02
HP$A_DEPENDENT                    00000032       D
HP$A_DEVICE                       00000018       D
HP$A_DVA                          0000001C       D
HP$A_LINK                         00000020       D
HP$B_CI_BR                        00000033       D
HP$B_CI_NODE                      00000034       D
HP$B_CI_TR                        00000032       D
HP$B_DRIVE                        0000000B       D
HP$B_FLAGS                        0000000A       D
HP$B_RH750_BR                     00000032       D
HP$K_CI_LEN                       00000041       D
HP$K_RH750_LEN                    00000033       D
HP$L_CI_FUNC                      00000035       D
HP$L_CI_INDEX                     0000003D       D
HP$L_CI_MAINT_ID                  00000039       D
HP$Q_DEVICE                       00000000       D
HP$T_DEVICE                       0000000C       D
HP$T_TYPE                         00000026       D
HP$W_SIZE                         00000008       D
HP$W_VECTOR                       00000024       D
HPE$A_EPB                         00000016       D
HPE$C_EPB_SIZE                    ********     X   00
HPE$T_DEVICE                      00000000       D
HPE$W_EXT_DRIVE                   00000014       D
INS$PTABLE                        ********     X   00
IO$GQ_PHYSICAL                    0000000D RG  D   02
IO$TESTCSR_L                      000004F9 RG  D   02
IO$TESTCSR_W                      00000518 RG  D   02
IOC$GL_ADPLIST                    ********     X   00
IOC$K_IOSPACE                   = 40000000   G D
IOC$PURGDATAP                     00000489 RG  D   02
IOGEN$CONN_VEC                    00000537 RG  D   02
ISTKPTR                         = 00002E00 RG  D   03
JIB$C_LENGTH                    = 00000074     D
KSTKPTR                         = 00002600 RG  D   03
LOCAL_STORE                       00000009 R   D   02
L_CONFIG                          FFFFFFF4       D
L_IPL                             FFFFFFF8       D
L_LOCAL                           FFFFFFF4       D
L_VECTOR                          FFFFFFFC       D
MAP$IOSPACE                       000003C0 RG  D   02
MAPMEM$IOSPACE                    ********     X   00
MBA$L_CR                        = 00000004     D
MBA$L_CSR                       = 00000000     D
MBA$L_DCR                       = 00000014     D
MBA$M_CR_IE                     = 00000004     D
MBA$M_CR_INIT                   = 00000001     D
MBA$M_CR_MAINT                  = 00000008     D
MBA$M_DCR_ATTN                  = 01000000     D
NDT$_CI                         = 00000038     D
ONLY$GL_TENUSEC                   00000000 RG  D   02
ONLY$GL_UBDELAY                   00000004 RG  D   02
ONLY_ATTACH                       00000592 RG  D   02
ONLY_CPU                          0000060A RG  D   02
ONLY_SCB                          00000590 RG  D   02
P0PT_BASE                       = 00004000 RG  D   03
PA_PIC                          = 00000924     D
PA_PIC_M_PIC                    = 00000001     D
PA_PMC                          = 00000004     D
PA_PMC_MIE                      = 00000004     D
PA_PMC_M_MIN                    = 00000001     D
PA_PMC_M_PSA                    = 00000040     D
PA_PPR                          = 00000940     D
PCB_BASE                        = 00000078 RG  D   03
PHD$L_PCB                       = 000000[redacted]     D
PHD_BASE                        = 00000000 RG  D   03
PR$_CADR                        = 00000025     D
PR$_IPL                         = 00000012     D
PTE$C_UW                        = 20000000     D
PTE$M_IO                        = 00100000     D
PTE$M_VALID                     = 80000000     D
PTE$V_IO                        = 00000014     D
QIO$DEALLOCATE                    ********     X   00
QIOCLEAN_CPU                      00000542 RG  D   02
RH750$B_BR                        00000032       D
RH750$K_LEN                       00000033       D
SAVABS...                       = FFFFFFF4     D
SCB_BASE                        = 00000400 RG  D   03
SCB_IMAGE                         ********     X   00
SCB_UNKINT                      = 00000A00 RG  D   03
```

SIZ...	=	00000001		D	UCB$K_LENGTH		00000074		D
SS$_CONTINUE		********		X 00	UCB$K_MB_LENGTH		00000090		D
SS$_CONTROLC		********		X 00	UCB$K_TT_LENGTH		000000BC		D
SS$_CTRLERR		********		X 00	UCB$L_AMB		00000054		D
SS$_DATACHECK		********		X 00	UCB$L_ASTQBL		00000010		D
SS$_NORMAL	=	00000001		D	UCB$L_ASTQFL		0000000C		D
SS$_RESIGNAL		********		X 00	UCB$L_CPID		0000005C		D
SSTKPTR	=	00003A00	RG	D 03	UCB$L_CRB		00000020		D
STACK_BASE	=	00001000	RG	D 03	UCB$L_DDB		00000024		D
SYS$DISK		00000048	RG	D 02	UCB$L_DEVCHAR		00000034		D
SYS$SETPRT		********		X 00	UCB$L_DEVDEPEND		0000003C		D
SYS$SYSROOT		00000035	RG	D 02	UCB$L_DPC		00000080		D
SYS$UNWIND		********		X 00	UCB$L_DUETIM		0000005C		D
TST$MCHK		********		X 00	UCB$L_DX_BFPNT		0000009C		D
UBA$INITIAL		000004F4	RG	D 02	UCB$L_DX_BUF		00000098		D
UBA$UNEXINT		000004F8	RG	D 02	UCB$L_DX_RXDB		000000A0		D
UBADP_CPU		000004DB	RG	D 02	UCB$L_EMB		00000078		D
UBI$C_PURCNT	=	0000000A		D	UCB$L_FIRST		00000014		D
UBI$L_DPR	=	00000000		D	UCB$L_FPC		0000000C		D
UBI$L_MAP	=	00000800		D	UCB$L_FQBL		00000004		D
UBI$V_DPR_ERROR	=	0000001F		D	UCB$L_FQFL		00000000		D
UBI$V_DPR_PUR	=	00000000		D	UCB$L_FR3		00000010		D
UBINTSZ	=	000000B4	G	D	UCB$L_FR4		00000014		D
UBINT_DISP		********		X 00	UCB$L_IOQBL		00000044		D
UCB$B_AMOD		00000053		D	UCB$L_IOQFL		00000040		D
UCB$B_CEX		00000077		D	UCB$L_IRP		0000004C		D
UCB$B_CM1		0000004A		D	UCB$L_LINK		0000002C		D
UCB$B_CM2		0000004B		D	UCB$L_LOGADR		00000064		D
UCB$B_DEVCLASS		00000038		D	UCB$L_MAXBLOCK		00000084		D
UCB$B_DEVTYPE		00000039		D	UCB$L_MB_MBX		0000007C		D
UCB$B_DIPL		00000052		D	UCB$L_MB_PORT		0000008C		D
UCB$B_DX_SCTCNT		000000A6		D	UCB$L_MB_RAST		00000078		D
UCB$B_ERTCNT		00000070		D	UCB$L_MB_SHB		00000080		D
UCB$B_ERTMAX		00000071		D	UCB$L_MB_WAST		00000074		D
UCB$B_FEX		00000076		D	UCB$L_MB_WIOQBL		00000088		D
UCB$B_FIPL		0000000B		D	UCB$L_MB_WIOQFL		00000084		D
UCB$B_LOCSRV		0000003C		D	UCB$L_MEDIA		0000008C		D
UCB$B_OFFNDX		00000094		D	UCB$L_NT_DATSSB		00000074		D
UCB$B_OFFRTC		00000095		D	UCB$L_NT_INTSSB		00000078		D
UCB$B_REMSRV		0000003D		D	UCB$L_OPCNT		00000060		D
UCB$B_SECTORS		0000003C		D	UCB$L_OWNUIC		0000001C		D
UCB$B_SLAVE		00000074		D	UCB$L_PID		00000028		D
UCB$B_SPR		00000075		D	UCB$L_RQBL		00000004		D
UCB$B_STATE		00000052		D	UCB$L_RQFL		00000000		D
UCB$B_TRACKS		0000003D		D	UCB$L_SVAPTE		00000068		D
UCB$B_TT_CRFILL		0000009D		D	UCB$L_SVPN		00000064		D
UCB$B_TT_DECRF		000000A1		D	UCB$L_TT_DECHAR		000000A8		D
UCB$B_TT_DELFF		000000A2		D	UCB$L_TT_RDUE		0000008C		D
UCB$B_TT_DESPEE		000000A0		D	UCB$L_TT_RTIMOU		000000B8		D
UCB$B_TT_DETYPE		000000A4		D	UCB$L_VCB		00000030		D
UCB$B_TT_LFFILL		0000009E		D	UCB$T_PARTNER		0000000C		D
UCB$B_TT_SPEED		0000009C		D	UCB$W_BCNT		0000006E		D
UCB$B_TYPE		0000000A		D	UCB$W_BCR		00000096		D
UCB$B_VERTSZ		0000003F		D	UCB$W_BOFF		0000006C		D
UCB$C_LENGTH		00000074		D	UCB$W_BUFQUO		00000018		D
UCB$C_MB_LENGTH		00000090		D	UCB$W_BYTESTOGO		0000003E		D
UCB$C_TT_LENGTH		000000BC		D	UCB$W_CHARGE		0000004A		D

```
UCB$W_CYLINDERS                   0000003E    D
UCB$W_DA                          0000008C    D
UCB$W_DC                          0000008E    D
UCB$W_DEVBUFSIZ                   0000003A    D
UCB$W_DEVSTS                      0000005A    D
UCB$W_DIRSEQ                      00000088    D
UCB$W_DSTADDR                     00000018    D
UCB$W_DX_BCR                      000000A4    D
UCB$W_EC1                         00000090    D
UCB$W_EC2                         00000092    D
UCB$W_ERRCNT                      00000072    D
UCB$W_FUNC                        0000007E    D
UCB$W_MB_SEED                     00000000    D
UCB$W_MSGCNT                      00000016    D
UCB$W_MSGMAX                      00000014    D
UCB$W_NT_CHAN                     0000007C    D
UCB$W_OFFSET                      0000008A    D
UCB$W_REFC                        00000050    D
UCB$W_SIZE                        00000008    D
UCB$W_SRCADDR                     0000001A    D
UCB$W_STS                         00000058    D
UCB$W_TT_DESIZE                   000000A5    D
UCB$W_UNIT                        00000048    D
UCB$W_VPROT                       0000001A    D
USTKPTR                         = 00004000 RG D  03
VEC$B_DATAPATH                    00000013    D
VEC$B_NUMREG                      00000012    D
VEC$C_LENGTH                      00000024    D
VEC$K_LENGTH                      00000024    D
VEC$L_ADP                         00000014    D
VEC$L_IDB                         00000008    D
VEC$L_INITIAL                     0000000C    D
VEC$L_START                       0000001C    D
VEC$L_UNITDISC                    00000020    D
VEC$L_UNITINIT                    00000018    D
VEC$Q_DISPATCH                    00000000    D
VEC$S_DATAPATH                  = 00000005    D
VEC$V_DATAPATH                  = 00000000    D
VEC$W_MAPREG                      00000010    D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	FFFFFFFC (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
SEP	0000060B (1547.)	02 (2.)	NOPIC USR CON REL LCL SHR EXE RD WRT NOVEC LONG
_LAST	00000008 (8.)	03 (3.)	NOPIC USR CON REL LCL NOSHR EXE RD WRT NOVEC PAGE

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$$	=00004000-R	346 (2)	288 (2) 289 (2) 290 (2) 296 (2) 297 (2) 303 (2) 309 (2) 315 (2) 316 (2) 317 (2) 318 (2) 331 (2) 332 (2) 334 (2) 335 (2) 337 (2) 338 (2) 340 (2) 341 (2) 343 (2) 344 (2) 346 (2) 347 (2) 349 (2)
$ER	=00000002	421 (4)	#-421 (4)
$MODULE	00000000-R	352 (2)	421 (4)
ADAPTER_TYPE	00000015-R	260 (2)	#-451 (4) #-618 (7) #-626 (7)
ADP$L_CSR	00000000		#-889 (14)
ADP$L_LINK	00000004		#-890 (14)
ADP$L_VECTOR	00000010		#-756 (10) #-759 (10)
ADP$W_ADPTYPE	0000000E		#-893 (14)
ADP$W_DPBITMAP	00000024		#-760 (10)
ADP$W_TR	0000000C		#-757 (10)
ARB$C_LENGTH	=00000078		303 (2)
AX_BUFF	00000000-R	282 (2)	
BIT...	=0000000F	217 (2)	193 (2) 207 (2) 217 (2)
BUG$CHECK	00000000-XR		232 (2) 737 (9)
CI$K_LEN	00000041		#-435 (4)
CMK$RCONSOLE	00000000-XR		238 (2)
CMK$TCONSOLE	00000000-XR		238 (2)
CMK$_APBOOT	=00000004	217 (2)	
CMK$_ASTEXIT	=00000000	217 (2)	
CMK$_CANTIM	=0000000B	217 (2)	
CMK$_HIBER	=00000007	217 (2)	
CMK$_INITSCB	=00000008	217 (2)	
CMK$_LAST	=0000000E	217 (2)	
CMK$_MMENABLE	=00000003	217 (2)	
CMK$_RCONSOLE	=00000001	217 (2)	
CMK$_REFRESH	=00000005	217 (2)	
CMK$_SCHDWK	=00000006	217 (2)	
CMK$_SETIMR	=0000000C	217 (2)	
CMK$_SETIPL	=00000009	217 (2)	
CMK$_SETPRT	=0000000D	217 (2)	
CMK$_SGIPR	=0000000A	217 (2)	
CMK$_TCONSOLE	=00000002	217 (2)	
CONFIG_EXIT	0000038C-R	563 (4)	#-558 (4)
CONFIG_RELEASE	0000037C-R	559 (4)	#-551 (4)
CRB$L_INTD	00000014		#-725 (9) 729 (9)
DEF$Q_DEV	00000058-R	268 (2)	
DEF$Q_DIR	0000007E-R	271 (2)	
DIR...	=FFFFFFFF	400 (3)	400 (3)
DS$AX_ARB	=00000274-R	297 (2)	
DS$AX_JIB	=00000200-R	296 (2)	
DS$AX_SOFTPCB	=000002EC-R	303 (2)	
DS$GB_PRIMARY_CPU_IDENTIFIER	00000008-R	254 (2)	#-615 (7)
DS$GK_SID	=02000000	230 (2)	
DS$GK_USOVR	=000000C0	224 (2)	
DS$K_ERROR	=00000002	207 (2)	

```
DS$K_NORMAL                     =00000001      207     (2)
DS$K_SEVERE                     =00000004      207     (2)
DS$K_SUBSYS                     =00000066      207     (2)      207     (2)
DS$K_WARNING                    =00000000      207     (2)
DS$WAITUS                        00000000-XR                     234     (2)      432     (4)      488     (4)
DS$_AP_NORMAL_BREAK             =00660150      207     (2)
DS$_ARITH                       =006600D0      207     (2)
DS$_ASBE                        =00660118      207     (2)
DS$_BADLINK                     =006600F0      207     (2)
DS$_BADTYPE                     =006600E8      207     (2)
DS$_BIIC                        =00660120      207     (2)
DS$_CHME                        =006600A8      207     (2)
DS$_CHMK                        =006600E0      207     (2)
DS$_DEVNAME                     =00660108      207     (2)
DS$_ERROR                       =00660002      207     (2)    #-422    (4)    #-562    (4)
DS$_FHWE                        =00660068      207     (2)
DS$_FRAGBUF                     =00660080      207     (2)
DS$_ICBUSY                      =006600C8      207     (2)
DS$_ICERR                       =006600C0      207     (2)
DS$_IHWE                        =00660060      207     (2)
DS$_ILLCHAR                     =00660018      207     (2)
DS$_ILLPAGCNT                   =00660078      207     (2)
DS$_ILLUNIT                     =00660100      207     (2)
DS$_INIT_FAIL                   =00660140      207     (2)
DS$_INSFMEM                     =00660050      207     (2)
DS$_INVCPU                      =00660130      207     (2)
DS$_IPL2HI                      =006600B8      207     (2)
DS$_IVADDR                      =00660040      207     (2)
DS$_IVVECT                      =00660038      207     (2)
DS$_KRNLSTK                     =00660090      207     (2)
DS$_LOGIC                       =00660070      207     (2)
DS$_MCHK                        =00660088      207     (2)    #-686    (8)
DS$_MEM_ALLOC_ERR               =00660138      207     (2)
DS$_MMOFF                       =00660058      207     (2)
DS$_NEEDUNIT                    =006600F8      207     (2)
DS$_NODE                        =00660128      207     (2)
DS$_NOPCS                       =00660110      207     (2)
DS$_NORMAL                      =00660001      207     (2)
DS$_NOSUPPORT                   =006600B1      207     (2)
DS$_NOTALLOWMP                  =00660148      207     (2)
DS$_NOTDON                      =00660030      207     (2)
DS$_NOTIMP                      =006600B0      207     (2)      207     (2)
DS$_NULLSTR                     =00660010      207     (2)
DS$_OVERFLOW                    =00660008      207     (2)
DS$_POWER                       =00660098      207     (2)
DS$_PROGERR                     =00660020      207     (2)
DS$_SEVERE                      =00660004      207     (2)
DS$_TRANSL                      =006600A0      207     (2)
DS$_TRUNCATE                    =00660028      207     (2)
DS$_UNEXPINT                    =006600D8      207     (2)    #-571    (5)
DS$_UNSUPPDEV                   =00660158      207     (2)
DS$_VASFULL                     =00660048      207     (2)
DS$_WARNING                     =00660000      207     (2)      207     (2)
DSP$CONFIG_ADP                   00000100-R    406     (4)
DSR$ONLY_CONSOLE_CONFIG          00000593-R    973     (17)
DS_ERRSUP                        00000000-XR                     234     (2)      421     (4)
DW750$K_LEN                      00000032                       #-517    (4)
```

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ESTKPTR                         =00003400-R   341     (2)
EXE$ALONONPAGED                  00000000-XR                    233     (2)       437     (4)       493     (4)       519     (4)
                                                                978     (17)
EXE$DEANONPAGED                  00000000-XR                    233     (2)       561     (4)       999     (17)
FETCH_LONG                       00000455-R   677     (8)       622     (7)       636     (7)
FETCH_STORE                      00000000-XR                    237     (2)
HANDLR                           0000038D-R   566     (5)       408     (4)
HDW_CLOCK_SET                    00000591-R   934     (16)
HP$A_DEPENDENT                   00000032                     #-976     (17)
HP$A_DEVICE                      00000018                     #-476     (4)     #-539     (4)     #-548     (4)
HP$A_DVA                         0000001C                     #-461     (4)     #-504     (4)     #-524     (4)
HP$A_LINK                        00000020                     #-555     (4)
HP$B_CI_BR                       00000033                     #-478     (4)
HP$B_CI_NODE                     00000034                     #-465     (4)
HP$B_CI_TR                       00000032                     #-471     (4)
HP$B_DRIVE                       0000000B                     #-457     (4)
HP$L_CI_FUNC                     00000035                     #-472     (4)
HP$L_CI_MAINT_ID                 00000039                     #-473     (4)
HP$Q_DEVICE                      00000000                     #-464     (4)     #-475     (4)     #-536     (4)     #-538     (4)
                                                              #-545     (4)     #-547     (4)     #-988     (17)    #-990     (17)
HP$T_DEVICE                      0000000C                     #-446     (4)     #-447     (4)     #-459     (4)       474     (4)
                                                              #-501     (4)     #-503     (4)     #-532     (4)       533     (4)
                                                                537     (4)       546     (4)       989     (17)
HP$T_TYPE                        00000026                     #-462     (4)     #-463     (4)     #-505     (4)     #-506     (4)
                                                              #-534     (4)     #-535     (4)       993     (17)
HP$W_SIZE                        00000008                     #-440     (4)     #-495     (4)     #-526     (4)     #-987     (17)
HP$W_VECTOR                      00000024                     #-540     (4)     #-543     (4)     #-550     (4)
HPE$C_EPB_SIZE                   00000000-XR                    240     (2)     #-436     (4)     #-443     (4)     #-492     (4)
                                                              #-498     (4)     #-518     (4)     #-529     (4)     #-977     (17)
                                                              #-985     (17)
HPE$W_EXT_DRIVE                  00000014                     #-458     (4)
INS$PTABLE                       00000000-XR                    234     (2)       557     (4)       996     (17)
IO$GQ_PHYSICAL                   0000000D-R   258     (2)
IO$TESTCSR_L                     000004F9-R   818     (12)
IO$TESTCSR_W                     00000518-R   830     (12)
IOC$GL_ADPLIST                   00000000-XR                    233     (2)       885     (14)
IOC$K_IOSPACE                   =40000000     229     (2)     #-414     (4)
IOC$PURGDATAP                    00000489-R   722     (9)
IOGEN$CONN_VEC                   00000537-R   864     (13)
ISTKPTR                         =00002E00-R   338     (2)
JIB$C_LENGTH                    =00000074                      297     (2)       303     (2)
KSTKPTR                         =00002600-R   335     (2)
LOCAL_STORE                      00000009-R   256     (2)     #-410     (4)     #-567     (5)
L_CONFIG                         FFFFFFF4     400     (3)     #-415     (4)     #-575     (5)
L_IPL                            FFFFFFF8     400     (3)     #-412     (4)     #-469     (4)     #-477     (4)     #-552     (4)
                                                              #-574     (5)
L_LOCAL                          FFFFFFF4     400     (3)       409     (4)
L_VECTOR                         FFFFFFFC     400     (3)     #-411     (4)       466     (4)     #-468     (4)       470     (4)
                                                              #-549     (4)     #-573     (5)
MAP$IOSPACE                      000003C0-R   613     (7)
MAPMEM$IOSPACE                   00000000-XR                    237     (2)       631     (7)       646     (7)
MBA$L_CR                        =00000004                     #-483     (4)     #-485     (4)     #-489     (4)     #-576     (5)
                                                              #-905     (14)
MBA$L_CSR                       =00000000                     #-577     (5)     #-578     (5)
MBA$L_DCR                       =00000014     198     (2)     #-487     (4)
MBA$M_CR_IE                     =00000004                     #-484     (4)
MBA$M_CR_INIT                   =00000001                     #-483     (4)     #-489     (4)
```

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MBA$M_CR_MAINT                  =00000008     201     (2)     #-484     (4)
MBA$M_DCR_ATTN                  =01000000     199     (2)     #-486     (4)
NDT$_CI                         =00000038                     #-416     (4)     #-425     (4)     #-451     (4)
ONLY$GL_TENUSEC                  00000000-R   246     (2)
ONLY$GL_UBDELAY                  00000004-R   248     (2)
ONLY_ATTACH                      00000592-R   945     (17)
ONLY_CPU                         0000060A-R   1012    (18)
ONLY_SCB                         00000590-R   923     (15)
P0PT_BASE                       =00004000-R   349     (2)
PA_PIC                          =00000924     211     (2)     #-430     (4)
PA_PIC_M_PIC                    =00000001     213     (2)     #-430     (4)
PA_PMC                          =00000004     210     (2)     #-427     (4)     #-428     (4)     #-429     (4)     #-434     (4)
PA_PMC_MIE                      =00000004     215     (2)     #-428     (4)
PA_PMC_M_MIN                    =00000001     214     (2)     #-427     (4)
PA_PMC_M_PSA                    =00000040     216     (2)     #-429     (4)
PA_PPR                          =00000940     212     (2)     #-465     (4)
PCB_BASE                        =00000078-R   289     (2)
PHD$L_PCB                       =00000078                     289     (2)
PHD_BASE                        =00000000-R   288     (2)
PR$_CADR                        =00000025                     #-648     (7)
PR$_IPL                         =00000012                     #-574     (5)
PSL$V_IS                        =0000001A     217     (2)
PTE$C_UW                        =20000000                     #-629     (7)     #-645     (7)
PTE$M_IO                        =00100000     193     (2)
PTE$M_VALID                     =80000000                     #-629     (7)     #-645     (7)
PTE$V_IO                        =00000014     193     (2)
QIO$DEALLOCATE                   00000000-XR                  238     (2)     896     (14)
QIOCLEAN_CPU                     00000542-R   876     (14)
RH750$B_BR                       00000032                   #-553     (4)
RH750$K_LEN                      00000033                   #-491     (4)
SAVABS...                       =FFFFFFF4     400     (3)
SCB_BASE                        =00000400-R   315     (2)     755     (10)     820     (12)     832     (12)
SCB_IMAGE                        00000000-XR                  232     (2)
SCB_UNKINT                      =00000A00-R   317     (2)     879     (14)
SIZ...                          =00000001     193     (2)     193     (2)
SS$_CONTINUE                     00000000-XR                  235     (2)     #-579     (5)
SS$_CONTROLC                     00000000-XR                  235     (2)
SS$_CTRLERR                      00000000-XR                  236     (2)
SS$_DATACHECK                    00000000-XR                  235     (2)
SS$_NORMAL                      =00000001     219     (2)     #-681     (8)
SS$_RESIGNAL                     00000000-XR                  235     (2)     #-569     (5)     #-693     (8)
SSTKPTR                         =00003A00-R   344     (2)
STACK_BASE                      =00001000-R   331     (2)
SYS$DISK                         00000048-R   266     (2)
SYS$SETPRT                       00000000-XR                  237     (2)
SYS$SYSROOT                      00000035-R   264     (2)
SYS$UNWIND                       00000000-XR                  237     (2)     690     (8)
TST$MCHK                         00000000-XR                  239     (2)     822     (12)     834     (12)
UBA$INITIAL                      000004F4-R   783     (11)
UBA$UNEXINT                      000004F8-R   790     (11)
UBADP_CPU                        000004DB-R   754     (10)
UBI$C_PURCNT                    =0000000A                   #-732     (9)
UBI$L_DPR                       =00000000                     730     (9)
UBI$L_MAP                       =00000800                     744     (9)
UBI$V_DPR_ERROR                 =0000001F                   #-735     (9)     #-739     (9)
UBI$V_DPR_PUR                   =00000000                   #-731     (9)
UBINTSZ                         =000000B4     763     (10)
```

```
UBINT_DISP                      00000000-XR                     236     (2)     #-865     (13)
UCB$L_CRB                       00000020                      #-724     (9)
USTKPTR                        =00004000-R   347     (2)
VEC$B_DATAPATH                  00000013                      729     (9)
VEC$L_ADP                       00000014                      #-725     (9)
VEC$Q_DISPATCH                  00000000                      #-865     (13)      866     (13)
VEC$S_DATAPATH                 =00000005                      #-728     (9)
VEC$V_DATAPATH                 =00000000                      #-727     (9)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.02	00:00:00.19
Command processing	923	00:00:00.26	00:00:01.95
Pass 1	850	00:00:03.34	00:00:05.79
Symbol table sort	0	00:00:00.27	00:00:00.27
Pass 2	71	00:00:00.98	00:00:01.82
Symbol table output	2	00:00:00.05	00:00:00.21
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	5	00:00:00.12	00:00:00.18
Assembler run totals	1879	00:00:05.05	00:00:10.41

```
The working set limit was 2900 pages.
216329 bytes (423 pages) of virtual memory were used to buffer the intermediate code.
There were 60 pages of symbol table space allocated to hold 1078 non-local and 39 local symbols.
1014 source lines were read in Pass 1, producing 80 object records in Pass 2.
47 pages of virtual memory were used to define 43 macros.
```

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	13
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	4
SYS$COMMON:[SYSLIB]LIB.MLB;2	7
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	12
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	36

```
1409 GETS were required to define 36 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 274 DECLARATIONS
(2) 582 Boot driver interface routines ;G:16
(2) 583 - PA_ACTION - driver selection action routine ;G:16
(3) 634 - PA_INIT - port bootstrap device initialization ;G:16
(4) 677 - PA_DRIVER - port bootstrap driver QIO ;G:16
(6) 867 - TAPE_BOOT - Tape port bootstrap driver QIO ;G:27
(7) 1129 - ERROR common error return path ;G:16
(8) 1172 MSCP layer ;G:16
(8) 1173 - INIT_MSCP - initialize the MSCP layer ;G:16
(9) 1213 - REC_MSCP - dispatch an MSCP response ;G:16
(10) 1342 SCS layer ;G:16
(10) 1343 - INIT_CONNECT - Begin SCS Connection Handshake ;G:16
(11) 1375 - REC_SCS_MSG - Process a received SCS message ;G:16
(12) 1483 - Q_PKT - Queue an SCS message ;G:16
(13) 1508 Virtual Circuit layer ;G:16
(13) 1509 - BVP_START Format BVP start data ;G:16
(14) 1560 - START_VC Initialize the Routing layer ;G:16
(15) 1624 - VC Handshake state/action tables ;G:16
(16) 1734 - VC Handshake action routines ;G:16
(17) 1833 - VC Handshake action routine dispatcher ;G:16
(17) 1834 - TIMOUT - timeout handler ;G:16
(17) 1835 - DISPATCH_DG - dispatch received datagram ;G:16
(18) 1897 Port queue block layer ;G:16
(18) 1898 - RE_INIT initialize the port and its data structures ;G:16
(19) 2030 - INIT_FREEQ - populate the free queues ;G:16
(20) 2070 - ALLOC_DG obtain a datagram from the free queue ;G:16
(21) 2098 - SEND insert a packet on the command queue ;G:16
(22) 2155 - DISCARD insert a packet on a free queue ;G:16
(23) 2185 - INVALIDATE - invalidate translation cache ;G:16
(24) 2231 - REM_NEXT_RSP dispatch a response queue entry ;G:16
(25) 2339 Port hardware layer ;G:16
(26) 2447 - SELECT_HARDWARE, configure for supported devices ;G:16
(27) 2551 - INIT_HARDWARE, start the port hardware ;G:16
(28) 2578 - START_CI780 - Start the CI750 and CI780 ;G:16
(28) 2579 - START_BCI750 - Start the BCI750 ;G:16
(29) 2647 - START_BCA - Start the BCA ;G:16
(30) 2716 - START_BVP - Start the AIE, AIO, and BSA ;G:16
(30) 2792 - WAIT_BVP - Wait for a BVP state transition ;G:16
(31) 2836 - NEW_CMD, tell the hardware a command is present ;G:16
(32) 2870 - NEW_FRQ, tell the hardware a free queue entry is present ;G:16
(33) 2927 - INTERRUPT, process adapter interrupts ;G:16
(33) 2928 - INTERRUPT_CI780, CI750 and CI780 ;G:27
(34) 2978 - INTERRUPT_BCI750, BCI750 interrupt service ;G:16
(35) 3038 - INTERRUPT_BCA, BCA interrupt service ;G:16
(36) 3082 - INTERRUPT_BVP, AIE, AIO, and BSA interrupt ;G:16
(37) 3140 - RESET - reset the port ;G:16
(37) 3141 - RESET_CI780 - reset the CI750 and CI780 ;G:16
(38) 3168 - RESET_BCI750 - reset the BCI750 ;G:16
(38) 3169 - RESET_BCA - reset the BCA ;G:16
(39) 3207 - RESET_BVP - reset the AIE, AIO, or BSA ;G:16
(40) 3227 - SET_SST - begin a self test on a BI adapter. ;G:16
(41) 3306 - CI_MCHECK - reset the SST machine check ;G:16
(41) 3362 SPT_RESET ;G:16

```
0000      1 ; DEC/CMS REPLACEMENT HISTORY, Element PABTDRIVR.MAR
0000      2 ; *29   11-NOV-1987 13:00:39 MI "MERGED GEN 28 AND 27A1 FOR REL. 31"
0000      3 ; *28   11-NOV-1987 08:49:25 GEARIN "ADDED SUPPORT FOR LARGE DEVICE #"
0000      4 ;  27A1 10-NOV-1987 15:54:16 BAGGETT "FINISHED DIRECTORY COMMAND CHANGES"
0000      5 ; *27    2-NOV-1987 14:59:00 BAGGETT "FINISHED"
0000      6 ; *26   12-MAY-1987 08:17:17 FORTUNA "FIX IDENT FIELD TO CORRECT GENERATION NUMBER"
0000      7 ; *25   11-MAY-1987 13:17:39 FORTUNA "COMPLETE DELETING REPEATED CALLS TO TURNING ME
0000      8 ;TRANSLATION BUFFER"
0000      9 ; *24    8-MAY-1987 10:28:20 BAGGETT "PLACE .OBJ IN LIBRARIES"
0000     10 ; *23    8-MAY-1987 10:19:17 BAGGETT "TK50 CODE ADDED"
0000     11 ; *22    7-MAY-1987 13:55:11 FORTUNA "M"
0000     12 ;  20A1  7-MAY-1987 13:53:24 FORTUNA "INVALIDATE TB BEFORE TURNING ON MEM MGT."
0000     13 ; *21    6-MAY-1987 15:57:01 BAGGETT "TK50 SUPPORTED. HSC50 ACCESSIBLE WITHOUT BOOTI
0000     14 ; *20   23-DEC-1986 16:15:44 BERGAZZI "FIX UP EDIT NUMBER 23"
0000     15 ; *19   23-DEC-1986 14:24:19 MUSE "FIX FOR HSC NODE NUMBER"
0000     16 ; *18   12-DEC-1986 10:58:23 BERGAZZI "FIXED ERROR AND ERROR1 ROUTINES"
0000     17 ; *17    4-DEC-1986 13:55:36 MUSE "RECOMPILE FOR NEW .OBJ"
0000     18 ; *16    4-DEC-1986 13:43:04 MUSE "REPLACE WITH NEW PABTDRIVR"
0000     19 ; *15   22-SEP-1986 15:28:56 MUSE "<no reason given>"
0000     20 ; *14   18-SEP-1986 14:47:44 MUSE "UPDATE"
0000     21 ; *13   18-SEP-1986 14:35:49 MUSE "UPDATES"
0000     22 ; *12   18-SEP-1986 14:12:12 MUSE "ENHANCEMENTS AND UPDATES"
0000     23 ; *11   23-MAY-1986 12:19:58 BERGAZZI "SST FIX"
0000     24 ; *10   18-APR-1986 09:41:06 BERGAZZI "DISABLE INTERRUPTS AROUND SELF-TEST"
0000     25 ; *9    17-APR-1986 09:42:55 BERGAZZI "CHACHE"
0000     26 ; *8    15-APR-1986 12:42:28 BERGAZZI "ACBW"
0000     27 ; *7    15-APR-1986 09:55:34 BERGAZZI "ACBB 100>48"
0000     28 ; *6    10-APR-1986 10:20:39 BERGAZZI "SELFTEST FIX"
0000     29 ; *5     8-APR-1986 16:45:27 BERGAZZI "SST BUG FIX"
0000     30 ; *4     3-APR-1986 13:11:44 BERGAZZI "SST FIX"
0000     31 ; *3     1-APR-1986 14:57:29 BERGAZZI "PASS 5 BIIC SST BUG"
0000     32 ; *2    21-MAR-1986 11:25:01 BERGAZZI "CLEAR NPE AFTER SEFLTEST"
0000     33 ; *1     6-FEB-1986 15:21:25 DS ""
0000     34 ; DEC/CMS REPLACEMENT HISTORY, Element PABTDRIVR.MAR
0000     35         .TITLE  PABTDRIVR - CI PORT BOOT DRIVER
0000     36         .IDENT  '10.10-29'                                          ;G:29
0000     37 ;
0000     38 ;*************************************************************************
0000     39 ;*                                                                       *
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0000     58 ;*                                                                              *
0000     59 ;************************************************************************************
0000     60 ;
0000     61
0000     62 ;++
0000     63 ; FACILITY:     BOOTS
0000     64 ;
0000     65 ; ABSTRACT:
0000     66 ;       This module contains the bootstrap device driver for the
0000     67 ;       CI port and disks accessed over it.
0000     68 ;                                                                              ;G:27
0000     69 ; ENVIRONMENT:  IPL 31, kernel mode, code must be PIC
0000     70 ;
0000     71 ; AUTHOR:  Kerbey T. Altmann,   CREATION DATE:  20-Nov-1981
0000     72 ;
0000     73 ; MODIFIED BY:                                                                 ;G:23
0000     74 ;       [28]    David Gearin    11-Nov-1987     Version 10.10                ;G:28
0000     75 ;               Add support for large device #'s.                            ;G:28
0000     76 ;                                                                            ;G:28
0000     77 ;       28      M. Baggett      5-Nov-1987      Version 10.10                ;G:29
0000     78 ;               Allow TK50 DIRECTORY to find all files after                 ;G:29
0000     79 ;               booting from it the first time.                              ;G:29
0000     80 ;       [27]    M. Baggett      26-Oct-1987     Version 10.9                 ;G:27
0000     81 ;               Allow regaining control of TK50 when other software gets control ;G:
0000     82 ;               of data structures used to access it.                        ;G:27
0000     83 ;                                                                            ;G:27
0000     84 ;               Steven Fortuna  8-May-1987      Version 10.8                 ;G:26
0000     85 ;               Removed all references to turning Memory Management          ;G:25
0000     86 ;               ON in the main program and moved it SPT_RESET procedure      ;G:25
0000     87 ;               thus consoldating the code.                                  ;G:25
0000     88 ;                                                                            ;G:25
0000     89 ;       [24]    M. Baggett      5-Mar-1987      Version 10.8                 ;G:25
0000     90 ;               Upgrade to support TK50. Fix bug to allow                    ;G:21
0000     91 ;               operations on HSC50 if VDS loaded from other                 ;G:21
0000     92 ;               device.                                                      ;G:21
0000     93 ;                                                                            ;G:21
0000     94 ;       [23]    Bob Bergazzi    23-dec-1986     Version 10.4                 ;G:20
0000     95 ;               Return CI node used in R1 from PA_INIT.                      ;G:20
0000     96 ;                                                                            ;G:20
0000     97 ;       [22]    Bob Bergazzi    11-Dec-1986     Version 10.4                 ;G:18
0000     98 ;               Change ERROR, ERROR1, and success return routines.           ;G:18
0000     99 ;                                                                            ;G:18
0000    100 ;       [21]    R.E.Muse        4-Dec-1986      version 10.4                 ;G:16
0000    101 ;               added support for bca                                        ;G:16
0000    102 ;                                                                            ;G:27
0000    103 ;       [20]    Bob Bergazzi    21-May-1986     Version 10.1                 ;G:14
0000    104 ;               Disable arbitration before starting self-test.               ;G:14
0000    105 ;                                                                            ;G:14
0000    106 ;       [19]    Bob Bergazzi    18-Apr-1986     Version 10.0                 ;G:14
0000    107 ;               Change addressing mode from relative deferred to relative    ;G:14
0000    108 ;               for edit 18. Disable interrupts while starting selftest.     ;G:14
0000    109 ;                                                                            ;G:14
0000    110 ;       [18]    Bob Bergazzi    17-Apr-1986     Version 10.0                 ;G:14
0000    111 ;               Force more code into cache.                                  ;G:14
0000    112 ;                                                                            ;G:14
0000    113 ;       [17]    Bob Bergazzi    15-Apr-1986     Version 10.0                 ;G:14
0000    114 ;               Adjust edit #16 (100>48). Short literal limitation.          ;G:14
```

```
0000    115 ;                                                                   ;G:14
0000    116 ;       [16]    Bob Bergazzi    10-Apr-1986     Version 10.0        ;G:14
0000    117 ;               Increase the delay after starting self-test, so that cpu    ;G:14
0000    118 ;               won't execute MOVL SAVE_MCHK,...., which was causing a BTO  ;G:14
0000    119 ;               because SAVE_MCHK wasn't in cache.                  ;G:14
0000    120 ;                                                                   ;G:14
0000    121 ;       [15]    Bob Bergazzi    8-Apr-1986      Version 10.0        ;G:14
0000    122 ;               Force more code into cache after starting selftest. Symptom ;G:14
0000    123 ;               was seen on KDB50, BTO was set because cpu was prefetching  ;G:14
0000    124 ;               more than was originally thought.                   ;G:14
0000    125 ;                                                                   ;G:14
0000    126 ;       [14]    Bob Bergazzi    3-Apr-1986      Version 10.0        ;G:14
0000    127 ;               Changed instruction for starting self-test from a BISL to   ;G:14
0000    128 ;               a MOVL because the BISL is a read-modify-write type which   ;G:14
0000    129 ;               may have caused problems.                           ;G:14
0000    130 ;                                                                   ;G:14
0000    131 ;       [13]    Bob Bergazzi    31-Mar-1986     Version 9.3         ;G:14
0000    132 ;               After starting self-test, wait for 1ms before addressing    ;G:14
0000    133 ;               the node in order to avoid a machine check.         ;G:14
0000    134 ;                                                                   ;G:14
0000    135 ;       [12]    Bob Bergazzi    21-Mar-1986     Version 10.0        ;G:14
0000    136 ;               Addition to clear the NPE bit in BER after selftest, which  ;G:14
0000    137 ;               may get set due to a pass 5 BIIC bug.               ;G:14
0000    138 ;                                                                   ;G:14
0000    139 ;       [11]    Ted Salem       20-Aug-1985     Version 8.3         ;G:14
0000    140 ;               Added code in order to save the HSC port number     ;G:14
0000    141 ;               that is being used.                                 ;G:14
0000    142 ;                                                                   ;G:14
0000    143 ;       [10]    Bob Bergazzi    2-Aug-1985      Version 8.3         ;G:14
0000    144 ;               Added code to handle a machine check when           ;G:14
0000    145 ;               setting SST, in case cache is broken or turned      ;G:14
0000    146 ;               off.                                                ;G:14
0000    147 ;                                                                   ;G:14
0000    148 ;       [09]    Bob Bergazzi    20-June-1985    Version 8.3         ;G:14
0000    149 ;               Changed method of set start self-test bit,          ;G:14
0000    150 ;               so that machine check does not occur.               ;G:14
0000    151 ;                                                                   ;G:14
0000    152 ;       [08]    Bob Bergazzi    11-June-1985    Version 8.3         ;G:14
0000    153 ;               Changed BCI750 to CIBCI.                            ;G:14
0000    154 ;                                                                   ;G:14
0000    155 ;       [07]    Bob Bergazzi    May 31, 1985    Version 8.3         ;G:14
0000    156 ;               Change setting of SST from ASHL to BISL, also       ;G:14
0000    157 ;               setting STS with it.                                ;G:14
0000    158 ;                                                                   ;G:14
0000    159 ;       [06]    Bob Bergazzi    May 13, 1985    Version 8.2         ;G:14
0000    160 ;               Add support for BCI750.                             ;G:14
0000    161 ;                                                                   ;G:14
0000    162 ;       [05]    Bob Bergazzi    Apr. 2, 1985    Version 8.1         ;G:14
0000    163 ;               Restore SPT on errors.                              ;G:14
0000    164 ;                                                                   ;G:14
0000    165 ;       [04]    Jim Shelhamer   Mar 25, 1985    Version 8.1         ;G:14
0000    166 ;               Changed location of PALIB.MLB to WRKD$3:[DS.LIBRARIES]      ;G:14
0000    167 ;                                                                   ;G:14
0000    168 ;       [03]    Bob Bergazzi    Nov. 7, 1984    Version 7.1         ;G:14
0000    169 ;               Use supervisor's SPT instead of a fake SPT          ;G:14
0000    170 ;               This results in all of physical memory now          ;G:14
0000    171 ;               being mapped.                                       ;G:14
```

```
0000   172 ;                                                                    ;G:14
0000   173 ;       [02]    Domenic Andella 6-Nov-84        Version 7.1          ;G:14
0000   174 ;               Increased size of pseudo SPT for Venus               ;G:14
0000   175 ;                                                                    ;G:14
0000   176 ;       [01]    Bob Bergazzi    Oct. 5,1984     Version 7.1          ;G:14
0000   177 ;               Converted VMS VENUS PABTDRIVR to run on DS.           ;G:14
0000   178 ;
0000   179 ;       X-6     EJL0056         Edward J. Los           22-Apr-1986  ;G:16
0000   180 ;               Remove ACT9 from the state table and replace it with ;G:16
0000   181 ;               ACT1.  ACT9 did not issue a SETCKT to open the VC.   ;G:16
0000   182 ;               Use the BCA microcode header block to locate the     ;G:16
0000   183 ;               microcode image.                                     ;G:16
0000   184 ;               Guarantee queue and BDT alignment                    ;G:16
0000   185 ;               Correct BCA initialization errors                    ;G:16
0000   186 ;               Make all jumps to ERROR a subroutine call to obtain  ;G:16
0000   187 ;               the address of the error                             ;G:16
0000   188 ;               Enhance the debugging trace.                         ;G:16
0000   189 ;               Add fixes for BVP register corruption                ;G:16
0000   190 ;               Add the BVP system ID                                ;G:16
0000   191 ;                                                                    ;G:16
0000   192 ;       X-5     EJL0051         Edward J. Los           16-Dec-1985  ;G:16
0000   193 ;               Correct BCI750 self test machine check recovery when ;G:16
0000   194 ;               writing a crash dump file.                           ;G:27
0000   195 ;                                                                    ;G:16
0000   196 ;       X-4     EJL0039         Edward J. Los           05-Dec-1985  ;G:16
0000   197 ;               Add BCA support                                      ;G:16
0000   198 ;               Add BVPSSP (AIE,AIO,BSA) support                     ;G:16
0000   199 ;               Correct message and datagram lengths in START handshake ;G:16
0000   200 ;               Correct QRETRY error return                          ;G:16
0000   201 ;               Add more cluster nodes                               ;G:16
0000   202 ;               Correct TIMEOUT action for an open virtual circuit   ;G:16
0000   203 ;               Prevent re-initialization retries after the first QIO ;G:16
0000   204 ;               Correct for holes in memory and for non-contiguous reading ;G:16
0000   205 ;                of SYS.EXE and associated files.                    ;G:16
0000   206 ;               Do not attempt to boot from a physical unit until all ;G:16
0000   207 ;                retries at a shadow unit are exhausted.            ;G:16
0000   208 ;               Correct the local system ID                          ;G:16
0000   209 ;               Correct recovery from a start handshake error.       ;G:16
0000   210 ;               Recover from virtual circuit failures which occur once QIO's ;G:27
0000   211 ;                have begun.                                         ;G:16
0000   212 ;               Increment the key of the buffer handle for each QIO. ;G:16
0000   213 ;                                                                    ;G:16
0000   214 ;       V04-004 EJL0023         Edward J. Los           05-Aug-1985  ;G:16
0000   215 ;               Correct the timeout mechanism for the start handshake -- ;G:16
0000   216 ;               when there are two HSC's, a timeout on one will now force ;G:16
0000   217 ;               a switch to the other.  This timeout is possible when one ;G:16
0000   218 ;               of the HSC's is running, but off line.               ;G:16
0000   219 ;               Set the RTOEVEN bit in the BCICR.                    ;G:16
0000   220 ;               Add a timedwait after setting start self test to wait for ;G:16
0000   221 ;               the resumption of bus arbitration.                   ;G:16
0000   222 ;               Prevent a state change to 'open' on receipt of a connect ;G:16
0000   223 ;               message.                                             ;G:16
0000   224 ;                                                                    ;G:16
0000   225 ;       V04-003 EJL0014         Edward J. Los           29-May-1985  ;G:16
0000   226 ;               Enable BICA registers before attempting to clear     ;G:16
0000   227 ;               them.                                                ;G:27
0000   228 ;               Do not attempt to clear the NOCI bit in the BCI750   ;G:16
```

```
0000    229 ;                   since it is a maintenance function on writes.                   ;G:16
0000    230 ;                   Don't release the port status during a timeout                  ;G:16
0000    231 ;                                                                                   ;G:16
0000    232 ;       V04-002 EJL0013         Edward J. Los           20-Mar-1985             ;G:16
0000    233 ;                   Add BCI750 support                                              ;G:16
0000    234 ;                                                                                   ;G:16
0000    235 ;       V04-001 WMC0001         Wayne Cardoza           05-Sep-1984
0000    236 ;                   Built in page table must allow for bad pages.
0000    237 ;
0000    238 ;       V03-013 KTA3200         Kerbey T. Altmann       26-Jun-1984
0000    239 ;                   Fix some bugs found during new processor testing.
0000    240 ;
0000    241 ;       V03-012 KTA3111         Kerbey T. Altmann       12-Mar-1984
0000    242 ;                   Add support for booting off dual-pathed disks.
0000    243 ;                   MAINT-INIT the port after doing dump.
0000    244 ;
0000    245 ;       V03-011 KTA3082         Kerbey T. Altmann       03-Oct-1983
0000    246 ;                   Redo startup for better VC OPEN conditions.
0000    247 ;
0000    248 ;       V03-010 ROW0230         Ralph O. Weber          28-SEP-1983
0000    249 ;                   Change a B^PQB_PTR offset to a W^PQB_PTR offset near label
0000    250 ;                   350$ to correct a link truncation error.
0000    251 ;
0000    252 ;       V03-009 KTA3075         Kerbey T. Altmann       29-Aug-1983
0000    253 ;                   Make status check look at major code only - this
0000    254 ;                   will allow booting off disk already ONLINE.
0000    255 ;
0000    256 ;       V03-008 KDM0059         Kathleen D. Morse       13-Jul-1983
0000    257 ;                   Replace use of IPR TODR with new TIMEDWAIT macro.
0000    258 ;
0000    259 ;       V03-006 KTA3067         Kerbey T. Altmann       02-Jul-1983
0000    260 ;                   Enhance UNIT_DISC.
0000    261 ;
0000    262 ;       V03-005 KTA3057         Kerbey T. Altmann       17-Jun-1983
0000    263 ;                   Redo for new SCS definitions.  Add SET CNTRL CHAR
0000    264 ;                   command, support for boot device name, UNIT_DISC.
0000    265 ;
0000    266 ;       V03-004 KTA3034         Kerbey T. Altmann       02-Feb-1983
0000    267 ;                   Recover the boot node name.
0000    268 ;
0000    269 ;       V03-003 KTA3011         Kerbey T. Altmann       23-Sep-1982
0000    270 ;                   Fix misc bugs, add CREDIT_RSP, loop forever if no path.
0000    271 ;
0000    272 ;
0000    273 ;--
0000    274                     .SBTTL  DECLARATIONS
0000    275 ;
0000    276 ;       WEAK SYMBOLS                                                            ;G:16
0000    277 ;                                                                               ;G:13
0000    278                                                                                 ;G:16
0000    279                     .WEAK           MCHECK,MC_RETURN,SAVE_MCHK                  ;G:16
0000    280                     .WEAK           BOOT$L_R2               ; saved CI port numbers ;G:16
0000    281                                                                                 ;G:27
0000    282 ;                                                                               ;G:13
0000    283 ; INCLUDE FILES:
0000    284 ;
0000    285                     .library/wrkd$3:[ds.libraries]pamac.mlb/                    ;G:16
```

```
                     0000   286
                     0000   287          $BIICDEF                        ; BI Interface Chip offsets          ;G:16
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   288          $BQODEF                         ; Boot qio offsets
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   289          $BTDDEF                         ; Boot device types
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   290          $CIBDDEF                        ; CI BDT entry def
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   291          $CIBHANDEF                      ; CI Buffer handle
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   292          $IODEF                          ; I/O function codes
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   293          $MSCPDEF                        ; MSCP definitions
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   294          $NDTDEF                         ; Adapter codes
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   295          $PAREGDEF                       ; CI port registers
                     0000   296          $PPDDEF                         ; PPD layer definitions
                     0000   297          $PRDEF                          ; Processor registers
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
            00000000 1040                .=0
                     0000                .RESTORE
                     0000   298          $PR8SSDEF                       ; 8ss - specific processor registers  ;G:16
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
            00000000 1040                .=0
                     0000                .RESTORE
                     0000   299          $PR8NNDEF                       ; 8nn - specific processor registers  ;G:16
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
            00000000 1040                .=0
                     0000                .RESTORE
                     0000   300          $PTEDEF                         ; Page table entries
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
            00000000 1040                .=0
                     0000                .RESTORE
                     0000   301          $RPBDEF                         ; RPB offsets
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
            00000000 1040                .=0
                     0000                .RESTORE
                     0000   302          $SCSDEF                         ; SCS layer definitions
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
            00000000 1040                .=0
                     0000                .RESTORE
```

```
                    0000   303          $SSDEF                          ; Status codes
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
          00000000  1040                .=0
                    0000                .RESTORE
                    0000   304          $VADEF                          ; Virtual addresses
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
          00000000  1040                .=0
                    0000                .RESTORE
                    0000   305 ;        $VMBARGDEF                      ; VMB argument list offsets             ;G:13
                    0000   306          $DS_SCBDEF                      ; Supervisor SCB offset definitions     ;G:13
                    0000   307
                    0000   308 ;
                    0000   309 ; EQUATED SYMBOLS:
                    0000   310 ;
                    0000   311
                    0000   312                                          ; in a 4 second time-wait loop          ;G:16
          00061A80  0000   313          WAIT_TIME=      4*1000*100      ; Number of 10 micro-sec intervals      ;G:16
                    0000   314                                          ;  in a 4 second time-wait loop
          00000008  0000   315          MAX_TIMEOUT =   8               ; Number of trials for the start        ;G:16
                    0000   316                                          ;  handshake before switching to the    ;G:16
                    0000   317                                          ;  other port.                          ;G:16
          00000060  0000   318          DG_SIZ  =       96              ; Full datagram size                    ;G:16
          00000060  0000   319          MS_SIZ  =       96              ; Full message size                     ;G:16
          00000020  0000   320          MS_OHD  =       32              ; Message overhead: 18 bytes PPD        ;G:16
                    0000   321                                          ;                   14 bytes SCS        ;G:16
                    0000   322 ;                                                                               ;G:16
                    0000   323 ;        Port queue block                                                       ;G:16
                    0000   324 ;                                                                               ;G:16
                    0000   325          $DEFINI PQB
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
          00000000  1040                .=0
                    0000   326
                    0000   327 $DEF     PQB_Q_CMDQ0     .BLKQ           ; Low priority command queue            ;G:16
                    0000                .IIF    NB,PQB_Q_CMDQ0, PQB_Q_CMDQ0:
          00000008  0000                .IIF    NB,.BLKQ,       .BLKQ
                    0008   328 $DEF     PQB_Q_CMDQ1     .BLKQ           ; High priority command queue           ;G:16
                    0008                .IIF    NB,PQB_Q_CMDQ1, PQB_Q_CMDQ1:
          00000010  0008                .IIF    NB,.BLKQ,       .BLKQ
                    0010   329 $DEF     PQB_Q_CMDQ2     .BLKQ           ; Command queue 2 (unused)              ;G:16
                    0010                .IIF    NB,PQB_Q_CMDQ2, PQB_Q_CMDQ2:
          00000018  0010                .IIF    NB,.BLKQ,       .BLKQ
                    0018   330 $DEF     PQB_Q_CMDQ3     .BLKQ           ; Command queue 3 (unused)              ;G:16
                    0018                .IIF    NB,PQB_Q_CMDQ3, PQB_Q_CMDQ3:
          00000020  0018                .IIF    NB,.BLKQ,       .BLKQ
                    0020   331 $DEF     PQB_Q_RESPQ     .BLKQ           ; Response queue                        ;G:16
                    0020                .IIF    NB,PQB_Q_RESPQ, PQB_Q_RESPQ:
          00000028  0020                .IIF    NB,.BLKQ,       .BLKQ
                    0028   332 $DEF     PQB_L_DFRQ_HDR  .BLKL           ; Address of the datagram free queue    ;G:16
                    0028                .IIF    NB,PQB_L_DFRQ_HDR,      PQB_L_DFRQ_HDR:
          0000002C  0028                .IIF    NB,.BLKL,       .BLKL
                    002C   333 $DEF     PQB_L_MFRQ_HDR  .BLKL           ; Address of the message free queue     ;G:16
                    002C                .IIF    NB,PQB_L_MFRQ_HDR,      PQB_L_MFRQ_HDR:
          00000030  002C                .IIF    NB,.BLKL,       .BLKL
                    0030   334 $DEF     PQB_L_DQE_LEN   .BLKL           ; Length of datagram free queue entries ;G:1
```

```
                     0030                .IIF    NB,PQB_L_DQE_LEN,       PQB_L_DQE_LEN:
00000034             0030                .IIF    NB,,BLKL,               .BLKL
                     0034    335 $DEF    PQB_L_MQE_LEN   .BLKL           ; Length of message free queue entries ;G:16
                     0034                .IIF    NB,PQB_L_MQE_LEN,       PQB_L_MQE_LEN:
00000038             0034                .IIF    NB,,BLKL,               .BLKL
                     0038    336 $DEF    PQB_L_VPQB_BASE .BLKL           ; Virtual address of the PQB base       ;G:16
                     0038                .IIF    NB,PQB_L_VPQB_BASE,     PQB_L_VPQB_BASE:
0000003C             0038                .IIF    NB,,BLKL,               .BLKL
                     003C    337 $DEF    PQB_L_BDT_BASE  .BLKL           ; Virtual address of the BDT base       ;G:16
                     003C                .IIF    NB,PQB_L_BDT_BASE,      PQB_L_BDT_BASE:
00000040             003C                .IIF    NB,,BLKL,               .BLKL
                     0040    338 $DEF    PQB_L_BDT_LEN   .BLKL           ; Length (# entries) in the BDT         ;G:16
                     0040                .IIF    NB,PQB_L_BDT_LEN,       PQB_L_BDT_LEN:
00000044             0040                .IIF    NB,,BLKL,               .BLKL
                     0044    339 $DEF    PQB_L_SPT_BASE  .BLKL           ; Physical address of the SPT           ;G:16
                     0044                .IIF    NB,PQB_L_SPT_BASE,      PQB_L_SPT_BASE:
00000048             0044                .IIF    NB,,BLKL,               .BLKL
                     0048    340 $DEF    PQB_L_SPT_LEN   .BLKL           ; Length (longwords) of the SPT         ;G:16
                     0048                .IIF    NB,PQB_L_SPT_LEN,       PQB_L_SPT_LEN:
0000004C             0048                .IIF    NB,,BLKL,               .BLKL
                     004C    341 $DEF    PQB_L_GPT_BASE  .BLKL           ; Virtual address of the GPT            ;G:16
                     004C                .IIF    NB,PQB_L_GPT_BASE,      PQB_L_GPT_BASE:
00000050             004C                .IIF    NB,,BLKL,               .BLKL
                     0050    342 $DEF    PQB_L_GPT_LEN   .BLKL           ; Length (longwords) of the GPT         ;G:16
                     0050                .IIF    NB,PQB_L_GPT_LEN,       PQB_L_GPT_LEN:
00000054             0050                .IIF    NB,,BLKL,               .BLKL
                     0054    343 $DEF    PQB_L_KEEPALIVE .BLKL           ; Port keepalive interval               ;G:16
                     0054                .IIF    NB,PQB_L_KEEPALIVE,     PQB_L_KEEPALIVE:
00000058             0054                .IIF    NB,,BLKL,               .BLKL
                     0058    344 $DEF    PQB_L_FUNC_MASK .BLKL           ; Function Mask                         ;G:16
                     0058                .IIF    NB,PQB_L_FUNC_MASK,     PQB_L_FUNC_MASK:
0000005C             0058                .IIF    NB,,BLKL,               .BLKL
                     005C    345 $EQU    PQB_M_MMD       1               ; Memory management disable             ;G:16
                     005C    346 $EQU    PQB_V_MMD       0               ;                                       ;G:16
                     005C    347 ;                                                                               ;G:16
                     005C    348 ;       BI Storage Systems Port (BVP) section of the PDT.                       ;G:16
                     005C    349 ;                                                                               ;G:16
                     005C    350 $DEF    PQB_L_PIV       .BLKL           ; Port interrupt vector                 ;G:16
                     005C                .IIF    NB,PQB_L_PIV,   PQB_L_PIV:
00000060             005C                .IIF    NB,,BLKL,               .BLKL
                     0060    351 $DEF    PQB_L_BVP_LEVEL .BLKL           ; BVP functionality level               ;G:16
                     0060                .IIF    NB,PQB_L_BVP_LEVEL,     PQB_L_BVP_LEVEL:
00000064             0060                .IIF    NB,,BLKL,               .BLKL
                     0064    352 ;                                                                               ;G:16
                     0064    353 ;       BI Storage Systems Port (BVP) port handshake data.  This                ;G:16
                     0064    354 ;       information allows bypassing of the SCA virtual circuit handshake.      ;G:16
                     0064    355 ;       All data in the following fields is supplied by the port driver         ;G:16
                     0064    356 ;       to the adapter                                                          ;G:16
                     0064    357 ;                                                                               ;G:16
00000084             0064    358 .=PQB_Q_CMDQ0+132                                                               ;G:16
                     0084    359 $DEF    PQB_B_PD_PRTVRS .BLKB           ;PPD protocol rev level                 ;G:16
                     0084                .IIF    NB,PQB_B_PD_PRTVRS,     PQB_B_PD_PRTVRS:
00000085             0084                .IIF    NB,,BLKB,               .BLKB
00000088             0085    360                         .BLKB   3       ;Three unused bytes                     ;G:16
                     0088    361 $DEF    PQB_W_PD_MAXDG  .BLKW           ;Maximum Datagram size                  ;G:16
                     0088                .IIF    NB,PQB_W_PD_MAXDG,      PQB_W_PD_MAXDG:
0000008A             0088                .IIF    NB,,BLKW,               .BLKW
```

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                    008A   362 $DEF    PQB_W_PD_MAXMSG .BLKW           ;Maximum Message size                   ;G:16
                    008A                .IIF    NB,PQB_W_PD_MAXMSG,     PQB_W_PD_MAXMSG:
                    008A                .IIF    NB,.BLKW,       .BLKW
                    008C   363 $DEF    PQB_T_PD_SWTYPE .BLKB   4       ;Software type                          ;G:16
                    008C                .IIF    NB,PQB_T_PD_SWTYPE,     PQB_T_PD_SWTYPE:
                    008C                .IIF    NB,.BLKB,       .BLKB   4
                    0090   364 $DEF    PQB_T_PD_SWVERS .BLKB   4       ;Software version                       ;G:16
                    0090                .IIF    NB,PQB_T_PD_SWVERS,     PQB_T_PD_SWVERS:
                    0090                .IIF    NB,.BLKB,       .BLKB   4
                    0094   365 $DEF    PQB_T_PD_HWTYPE .BLKB   4       ;Processor hardware type                ;G:16
                    0094                .IIF    NB,PQB_T_PD_HWTYPE,     PQB_T_PD_HWTYPE:
                    0094                .IIF    NB,.BLKB,       .BLKB   4
                    0098   366 $DEF    PQB_B_PD_HWVERS .BLKB   12      ;Processor hardware version             ;G:16
                    0098                .IIF    NB,PQB_B_PD_HWVERS,     PQB_B_PD_HWVERS:
                    0098                .IIF    NB,.BLKB,       .BLKB   12
                    00A4   367 $DEF    PQB_Q_PD_CURTIME .BLKQ          ;Current system time measured in        ;G:16
                    00A4                .IIF    NB,PQB_Q_PD_CURTIME,    PQB_Q_PD_CURTIME:
                    00A4                .IIF    NB,.BLKQ,       .BLKQ
                    00AC   368                                          ;  100 nsec units                       ;G:16
                    00AC   369 ;                                                                                ;G:16
                    00AC   370 ;       BI Storage Systems Port (BVP) port handshake data.  This                 ;G:16
                    00AC   371 ;       information allows bypassing of theSCA virtual circuit handshake.        ;G:16
                    00AC   372 ;       All data in the following fields is supplied by the adapter to           ;G:16
                    00AC   373 ;       the port                                                                 ;G:16
                    00AC   374 ;                                                                                ;G:16
                    00AC   375 .=PQB_Q_CMDQ0+196                                                                ;G:16
                    00C4   376 $DEF    PQB_B_AD_PRTVRS .BLKB           ;PPD protocol rev level                 ;G:16
                    00C4                .IIF    NB,PQB_B_AD_PRTVRS,     PQB_B_AD_PRTVRS:
                    00C4                .IIF    NB,.BLKB,       .BLKB
                    00C5   377 $DEF    PQB_B_AD_RP_TYP .BLKB           ;Remote port type                       ;G:16
                    00C5                .IIF    NB,PQB_B_AD_RP_TYP,     PQB_B_AD_RP_TYP:
                    00C5                .IIF    NB,.BLKB,       .BLKB
                    00C6   378                          .BLKB   2       ;Two unused bytes                       ;G:16
                    00C8   379                          .BLKL           ;Reserved                               ;G:16
                    00CC   380 $DEF    PQB_W_AD_MAXDG  .BLKW           ;Maximum Datagram size                  ;G:16
                    00CC                .IIF    NB,PQB_W_AD_MAXDG,      PQB_W_AD_MAXDG:
                    00CC                .IIF    NB,.BLKW,       .BLKW
                    00CE   381 $DEF    PQB_W_AD_MAXMSG .BLKW           ;Maximum Message size                   ;G:16
                    00CE                .IIF    NB,PQB_W_AD_MAXMSG,     PQB_W_AD_MAXMSG:
                    00CE                .IIF    NB,.BLKW,       .BLKW
                    00D0   382 $DEF    PQB_T_AD_SWTYPE .BLKB   4       ;Software type                          ;G:16
                    00D0                .IIF    NB,PQB_T_AD_SWTYPE,     PQB_T_AD_SWTYPE:
                    00D0                .IIF    NB,.BLKB,       .BLKB   4
                    00D4   383 $DEF    PQB_T_AD_SWVERS .BLKB   4       ;Software version                       ;G:16
                    00D4                .IIF    NB,PQB_T_AD_SWVERS,     PQB_T_AD_SWVERS:
                    00D4                .IIF    NB,.BLKB,       .BLKB   4
                    00D8   384 $DEF    PQB_T_AD_HWTYPE .BLKB   4       ;Processor hardware type                ;G:16
                    00D8                .IIF    NB,PQB_T_AD_HWTYPE,     PQB_T_AD_HWTYPE:
                    00D8                .IIF    NB,.BLKB,       .BLKB   4
                    00DC   385 $DEF    PQB_B_AD_HWVERS .BLKB   12      ;Processor hardware version             ;G:16
                    00DC                .IIF    NB,PQB_B_AD_HWVERS,     PQB_B_AD_HWVERS:
                    00DC                .IIF    NB,.BLKB,       .BLKB   12
                    00E8   386 ;                                                                                ;G:16
                    00E8   387 ;       Port data structures - this area overwrites the logout area of           ;G:16
                    00E8   388 ;       the PQB.  The driver, however, does not support power failure recovery. ;G:1
                    00E8   389 ;                                                                                ;G:27
                    00E8   390 $DEF    TAB_L_HOLE      .BLKL           ; Dummy counter and temporary storage   ;G:16
```

```
                    00E8                .IIF    NB,TAB_L_HOLE,  TAB_L_HOLE:
000000EC            00E8                .IIF    NB,.BLKL,       .BLKL
                    00EC    391                                         ; for the function code                 ;G:16
                    00EC    392 $DEF    TAB_L_STATE     .BLKL           ; Virtual circuit handshake state       ;G:16
                    00EC                .IIF    NB,TAB_L_STATE, TAB_L_STATE:
000000F0            00EC                .IIF    NB,.BLKL,       .BLKL
                    00F0    393 $DEF    TAB_Q_DFRQ      .BLKQ           ; Datagram Free queue header            ;G:16
                    00F0                .IIF    NB,TAB_Q_DFRQ,  TAB_Q_DFRQ:
000000F8            00F0                .IIF    NB,.BLKQ,       .BLKQ
                    00F8    394         ASSUME  <TAB_Q_DFRQ&^X7> EQ 0   ; Quadword align                        ;G:16
                    00F8    395 $DEF    TAB_Q_MFRQ      .BLKQ           ; Message Free queue header             ;G:16
                    00F8                .IIF    NB,TAB_Q_MFRQ,  TAB_Q_MFRQ:
00000100            00F8                .IIF    NB,.BLKQ,       .BLKQ
                    0100    396         ASSUME  <TAB_Q_MFRQ&^X7> EQ 0   ; Quadword align                        ;G:16
                    0100    397 $DEF    TAB_L_TIMER     .BLKL           ; Wait period (10 usec counts)          ;G:16
                    0100                .IIF    NB,TAB_L_TIMER, TAB_L_TIMER:
00000104            0100                .IIF    NB,.BLKL,       .BLKL
                    0104    398 $DEF    TAB_L_RSTAID    .BLKL           ; Remote Port (HSC) number              ;G:16
                    0104                .IIF    NB,TAB_L_RSTAID,        TAB_L_RSTAID:
00000108            0104                .IIF    NB,.BLKL,       .BLKL
                    0108    399 $DEF    TAB_L_PAGETBL   .BLKL           ; Address of the pseudo-page table      ;G:16
                    0108                .IIF    NB,TAB_L_PAGETBL,       TAB_L_PAGETBL:
0000010C            0108                .IIF    NB,.BLKL,       .BLKL
                    010C    400 ;                                                                               ;G:16
                    010C    401 ;       Current number of timeout trials for the start handshake.  This         ;G:16
                    010C    402 ;       number is initalized to MAX_TIMEOUT.  On expiration, the driver         ;G:16
                    010C    403 ;       will re-initialize the port and try the other HSC if the other HSC      ;G:16
                    010C    404 ;       is requested                                                            ;G:16
                    010C    405 ;                                                                               ;G:16
                    010C    406 $DEF    TAB_L_TMO_CNT   .BLKL           ; Current timeout count                 ;G:16
                    010C                .IIF    NB,TAB_L_TMO_CNT,       TAB_L_TMO_CNT:
00000110            010C                .IIF    NB,.BLKL,       .BLKL
                    0110    407 $DEF    TAB_B_BDT       .BLKB   16      ; Single entry buffer descriptor table ;G:16
                    0110                .IIF    NB,TAB_B_BDT,   TAB_B_BDT:
00000120            0110                .IIF    NB,.BLKB,       .BLKB   16
                    0120    408         ASSUME  <TAB_B_BDT&^XF> EQ 0    ; Octaword align                        ;G:16
                    0120    409 $DEF    TAB_L_RCONID    .BLKL           ; Remote connection ID                  ;G:16
                    0120                .IIF    NB,TAB_L_RCONID,        TAB_L_RCONID:
00000124            0120                .IIF    NB,.BLKL,       .BLKL
                    0124    410 $DEF    TAB_L_LCONID    .BLKL           ; Local connection ID                   ;G:16
                    0124                .IIF    NB,TAB_L_LCONID,        TAB_L_LCONID:
00000128            0124                .IIF    NB,.BLKL,       .BLKL
                    0128    411 ;                                                                               ;G:16
                    0128    412 ;       Pre-allocated packets                                                   ;G:16
                    0128    413 ;                                                                               ;G:16
00000128            0128    414         .=<.+7>&-8                              ; .ALIGN QUAD                   ;G:16
                    0128    415 $DEF    TAB_PKT0        .BLKB   MS_SIZ
                    0128                .IIF    NB,TAB_PKT0,    TAB_PKT0:
00000188            0128                .IIF    NB,.BLKB,       .BLKB   MS_SIZ
                    0188    416 $DEF    TAB_PKT1        .BLKB   MS_SIZ
                    0188                .IIF    NB,TAB_PKT1,    TAB_PKT1:
000001E8            0188                .IIF    NB,.BLKB,       .BLKB   MS_SIZ
                    01E8    417 $DEF    TAB_PKT2        .BLKB   MS_SIZ
                    01E8                .IIF    NB,TAB_PKT2,    TAB_PKT2:
00000248            01E8                .IIF    NB,.BLKB,       .BLKB   MS_SIZ
                    0248    418 $DEF    TAB_PKT3        .BLKB   MS_SIZ
                    0248                .IIF    NB,TAB_PKT3,    TAB_PKT3:
```

```
                 000002A8  0248
                           02A8    419 $DEF     .IIF    NB,.BLKB,       .BLKB   MS_SIZ
                                               TAB_PKT4        .BLKB   MS_SIZ
                           02A8                .IIF    NB,TAB_PKT4,    TAB_PKT4:
                 00000308  02A8                .IIF    NB,.BLKB,       .BLKB   MS_SIZ
                           0308    420 $DEF     TAB_PKT5        .BLKB   MS_SIZ
                           0308                .IIF    NB,TAB_PKT5,    TAB_PKT5:
                 00000368  0308                .IIF    NB,.BLKB,       .BLKB   MS_SIZ
                           0368    421 $DEF     TAB_PKT6        .BLKB   MS_SIZ
                           0368                .IIF    NB,TAB_PKT6,    TAB_PKT6:
                 000003C8  0368                .IIF    NB,.BLKB,       .BLKB   MS_SIZ
                           03C8    422 $DEF     TAB_PKT7        .BLKB   MS_SIZ
                           03C8                .IIF    NB,TAB_PKT7,    TAB_PKT7:
                 00000428  03C8                .IIF    NB,.BLKB,       .BLKB   MS_SIZ
                           0428    423 $DEF     TAB_PKT8        .BLKB   MS_SIZ
                           0428                .IIF    NB,TAB_PKT8,    TAB_PKT8:
                 00000488  0428                .IIF    NB,.BLKB,       .BLKB   MS_SIZ
                           0488    424 $DEF     TAB_PKT9        .BLKB   MS_SIZ
                           0488                .IIF    NB,TAB_PKT9,    TAB_PKT9:
                 000004E8  0488                .IIF    NB,.BLKB,       .BLKB   MS_SIZ
                           04E8    425 ;
                           04E8    426 ;       New fields for CIBCI support.  The following three CIPA             ;G:13
                           04E8    427 ;       registers have the same functionality for the CI750, CI780,
                           04E8    428 ;       and BCI750, but they are located at different offsets.              ;G:16
                           04E8    429 ;
                           04E8    430 $DEF     TAB_L_INI_FLAGS .BLKL          ; Initialization flags               ;G:16
                           04E8                .IIF    NB,TAB_L_INI_FLAGS,     TAB_L_INI_FLAGS:
                 000004EC  04E8                .IIF    NB,.BLKL,       .BLKL
                           04EC    431                                                                             ;G:16
                           04EC    432 $EQU     FLAG_M_MMD      1              ; Device supports memory management  ;G:16
                           04EC    433 $EQU     FLAG_V_MMD      0              ; disable                            ;G:16
                           04EC    434                                                                             ;G:16
                           04EC    435 $EQU     FLAG_M_TMSCP    2              ; Device supports TMSCP              ;G:16
                           04EC    436 $EQU     FLAG_V_TMSCP    1                                                   ;G:16
                           04EC    437                                                                             ;G:16
                           04EC    438 $EQU     FLAG_M_INVTC    4              ; Device supports INVTC              ;G:16
                           04EC    439 $EQU     FLAG_V_INVTC    2                                                   ;G:16
                           04EC    440                                                                             ;G:16
                           04EC    441 $DEF     TAB_L_PMC       .BLKL          ; Address of the port maintenance
                           04EC                .IIF    NB,TAB_L_PMC,   TAB_L_PMC:
                 000004F0  04EC                .IIF    NB,.BLKL,       .BLKL
                           04F0    442                                    ; and control register
                           04F0    443 $DEF     TAB_L_MADR      .BLKL          ; Address of the maintenance address
                           04F0                .IIF    NB,TAB_L_MADR,  TAB_L_MADR:
                 000004F4  04F0                .IIF    NB,.BLKL,       .BLKL
                           04F4    444                                    ; register
                           04F4    445 $DEF     TAB_L_MDATR     .BLKL          ; Address of the maintenance data
                           04F4                .IIF    NB,TAB_L_MDATR, TAB_L_MDATR:
                 000004F8  04F4                .IIF    NB,.BLKL,       .BLKL
                           04F8    446                                    ; register
                           04F8    447                                                                             ;G:16
                           04F8    448 ;                                                                           ;G:14
                           04F8    449 ;       Adapter specific routine pointers -- these are set up by            ;G:27
                           04F8    450 ;       SELECT_HARDWARE to take into account differences between individual  ;G:16
                           04F8    451 ;       hardware implementations                                            ;G:16
                           04F8    452 ;                                                                           ;G:14
                           04F8    453 $DEF     TAB_L_INTERRUPT .BLKL          ; Interrupt service routine          ;G:16
                           04F8                .IIF    NB,TAB_L_INTERRUPT,     TAB_L_INTERRUPT:
```

```
000004FC  04F8                .IIF    NB,.BLKL,       .BLKL
          04FC    $DEF        TAB_L_RESET     .BLKL           ; Adapter reset routine                ;G:16
          04FC                .IIF    NB,TAB_L_RESET, TAB_L_RESET:
00000500  04FC                .IIF    NB,.BLKL,       .BLKL
          0500    $DEF        TAB_L_NEW_CMD   .BLKL           ; Adapter cmd queue notification routine ;G:
          0500                .IIF    NB,TAB_L_NEW_CMD,       TAB_L_NEW_CMD:
00000504  0500                .IIF    NB,.BLKL,       .BLKL
          0504    $DEF        TAB_L_NEW_FRQ   .BLKL           ; Adapter free queue notification      ;G:16
          0504                .IIF    NB,TAB_L_NEW_FRQ,       TAB_L_NEW_FRQ:
00000508  0504                .IIF    NB,.BLKL,       .BLKL
          0508    $DEF        TAB_L_START     .BLKL           ; Start the adapter microcode          ;G:16
          0508                .IIF    NB,TAB_L_START, TAB_L_START:
0000050C  0508                .IIF    NB,.BLKL,       .BLKL
          050C    ;           DEBUG   =       0               ; Enable vc state table debug          ;G:16
          050C    .IF DEFINED DEBUG                                                                  ;G:16
          050C                MAX_EVENT  =  100               ; Maximum events to trace              ;G:16
          050C    $DEF        TAB_L_EVENT     .BLKL           ; Event being traced                   ;G:16
          050C    $DEF        TAB_AL_DEBUG    .BLKL MAX_EVENT ; Bit n set means that STATE*4+EVENT   ;G:16
          050C                                                ; has been dispatched.                 ;G:16
          050C    .ENDC                                                                              ;G:16
          050C
0000050C  050C    TAB_LEN = .-PQB_Q_CMDQ0
          050C
          050C                $DEFEND
          0000                .RESTORE
          0000
          0000    ;
          0000    ; LOCAL MACROS
          0000    ;
          0000                .MACRO  $QRETRY OPCODE,OPER1,OPER2,ERR,?LOOP,?OK                       ;G:16
          0000                .show binary                                                           ;G:16
          0000                 CLRL   R0
          0000    LOOP:        OPCODE OPER1,OPER2
          0000                 BCC    OK
          0000                 AOBLSS #63,R0,LOOP
          0000                .if idn ERR ERROR                                                      ;G:27
          0000                 BSBW   ERR                                                            ;G:16
          0000                .if_false                                                              ;G:16
          0000                .if idn ERR ERROR1                                                     ;G:16
          0000                 BSBW   ERR                                                            ;G:16
          0000                .if_false                                                              ;G:16
          0000                 BRB    ERR                                                            ;G:16
          0000                .endc                                                                  ;G:16
          0000                .endc                                                                  ;G:16
          0000    OK:
          0000                .noshow binary                                                         ;G:16
          0000                .ENDM   $QRETRY
          0000
          0000    ;
          0000    ; OWN STORAGE:
          0000    ;
          0000                                                                                       ;G:16
          0000    ;
          0000    ; Boot driver table entry
          0000    ;
          0000                $BOOT_DRIVER    DEVTYPE = BTD$K_HSCCI,- ; Device type (MSCP/CI)        ;G:16
          0000                                SIZE = PA_DRVSIZ,-      ; Driver size                  ;G:14
```

```
                                  0000   501                          ADDR = START_DRV,-      ; Driver starting address
                                  0000   502                          ENTRY = PA_DRIVER       ; Driver entry point          ;G:16
                            00000000                .PSECT  BOOTDRIVR_4
                           FFFF  0000                .WORD   -1
                           0020  0002                .WORD   BTD$K_HSCCI
                       00000000  0004                .LONG   0
                       000019B0' 0008                .LONG   PA_DRVSIZ
                       00000000' 000C                .LONG   START_DRV-$TABLE
                       00000138' 0010                .LONG   PA_DRIVER-START_DRV
                       00000000' 0014                .LONG   -START_DRV
                            00000000                .PSECT  BOOTDRIVR_2
                                  0000   503
                                  0000   504 START_DRV:
                                  0000   505 ;                                                                          ;G:16
                                  0000   506 ;       Driver data structures                                             ;G:16
                                  0000   507 ;                                                                          ;G:16
                       00000000  0000   508 MAPEN:: .LONG   0                      ; storage for pr$_mapen register      ;G:16
                             00  0004   509 DS$GB_CI_INIT:: .BYTE 0                ; init flag                          ;G:16
                           55 44  0005   510 DEVNAME:.ASCII  /DU/                   ; Boot device name
                       00000008  0007   511          .=<.+3>&-4                     ; .ALIGN LONG                        ;G:16
                                  0008   512                                                                            ;G:16
                                  0008   513 TEMPL_MSG:
                           0042  0008   514          .WORD   SCS$C_CON_REQL         ; SCS$W_LENGTH
                           0004  000A   515          .WORD   PPD$C_SCS_MSG          ; PPD$W_MTYPE
                           0000  000C   516          .WORD   SCS$C_CON_REQ          ; SCS$W_MTYPE
                           0003  000E   517          .WORD   3                      ; Credit
                       00000000  0010   518          .LONG   0
                       00010001  0014   519          .LONG   ^X10001                ; Conid
                       00000001  0018   520          .LONG   1                      ; Min send/Status
20 20 20 4B 53 49 44 24 50 43 53 4D  001C   521 SERVER: .ASCII  /MSCP$DISK       /                                      ;G:21
                     20 20 20 20  0028
5F 4C 43 5F 4B 53 49 44 24 53 4D 56  002C   522 CLASS:  .ASCII  /VMS$DISK_CL_DRVR/                                      ;G:21
                     52 56 52 44  0038
                       00000034  003C   523 TEMPL_MSG_LEN=.-TEMPL_MSG
                                  003C   524 ;                                                                          ;G:16
                                  003C   525 ;                                                                          ;G:21
                                  003C   526 ; Data area for tape booting                                               ;G:21
                                  003C   527 ;                                                                          ;G:21
20 20 4B 53 49 44 24 50 43 53 4D 00' 003C   528 SERVER_DISK:    .ASCIC  /MSCP$DISK       /                                  ;G:21
                  20 20 20 20 20  0048
                             10  003C
4C 43 5F 4B 53 49 44 24 53 4D 56 00' 004D   529 CLASS_DISK:     .ASCIC  /VMS$DISK_CL_DRVR/                                  ;G:21
                  52 56 52 44 5F  0059
                             10  004D
                                  005E   530                                                                            ;G:21
                                  005E   531 SERVER_TAPE:                                                               ;G:21
20 20 45 50 41 54 24 50 43 53 4D 00' 005E   532          .ASCIC  /MSCP$TAPE       /      ; TMSCP server name                 ;G:21
                  20 20 20 20 20  006A
                             10  005E
                                  006F   533                                                                            ;G:21
                                  006F   534 CLASS_TAPE:                                                                ;G:21
4C 43 5F 45 50 41 54 24 53 4D 56 00' 006F   535          .ASCIC  /VMS$TAPE_CL_DRVR/      ; Tape class driver name            ;G:21
                  52 56 52 44 5F  007B
                             10  006F
                                  0080   536                                                                            ;G:21
                                  0080   537 CUR_POS:                                                                   ;G:27
                       00000084  0080   538          .BLKL   1                      ; Current position on tape           ;G:21
```

```
                 0084
00000002         0084  MAX_READ = 2                          ; Maximum number of I/O outstanding   ;G:21
                 0084
00000200         0084  BLKSIZE = 512                         ; Data transfer block size            ;G:21
                 0084
                 0084  TAPE_RETRY:
00000088         0084          .BLKL   1                     ; Tape boot retry counter             ;G:21
                 0088  SAVE_RETRY_ADR:
0000008C         0088          .BLKL   1                     ; Address of retry count from bootdrivr ;G:2
                 008C
0000401B         008C  NDT$_AIE_TK =   ^X401B          ;;;;; TEMPORARY [24]                      ;G:21
8000410E         008C  NDT$_AIE_TKNI = ^X8000410E      ;;;;; TEMPRARY  [24]                      ;G:21
                 008C  ; Dual path data
                 008C  ;
                 008C  REM_NODE:
   00 00         008C          .BYTE   0,0                   ; Dual path nodes                     ;G:16
                 008E  REM_NODE_INDEX:
      01         008E          .BYTE   1                     ; Starting index to select REM_NODE   ;G:16
      00         008F          .BYTE   0                     ; Extra                               ;G:16
      00         0090  HSC$B_PORT_NUMBER:      .BYTE   0     ;                                     ;G:16
                 0091  ;
                 0091  ; Data area
                 0091  ;
00000000         0091  PQB_PTR:        .LONG   0             ; Port queue block pointer            ;G:16
00000000         0095  NXT_MSG1:       .LONG   0             ; Address of the first message to use ;G:21
00000000         0099  SCB_ADDR:       .LONG   0             ; Saved SCB address (for the MCHECK   ;G:16
                 009D                                        ;  handler)                           ;G:16
00000000         009D  SAVE_FUNC:      .LONG   0             ; Saved QIO function                  ;G:16
                 00A1  ;
                 00A1  ; List of port states
                 00A1  ;
00000000         00A1          STATE_CLOSED    = 0     ; CLOSED                                    ;G:16
00000001         00A1          STATE_ST_SENT   = 1     ; Start Sent                                ;G:16
00000002         00A1          STATE_ST_RECV   = 2     ; Start Received                            ;G:16
00000003         00A1          STATE_OPEN      = 3     ; OPEN                                      ;G:16
00000004         00A1          STATE_MESSAGE   = 4     ; OPEN state with different error recovery  ;G:16
00000005         00A1          STATE_INIT      = 5     ; CLOSED state before port initialization   ;G:16
00000006         00A1          STATE_FATAL     = 6     ; CLOSED because of a fatal error           ;G:16
00000007         00A1          STATE_VCBROKEN  = 7     ; CLOSED because of a broken VC             ;G:16
                 00A1                                                                              ;G:16
00000003         00A1          CIPA_PPR_S_CSZ  = 3                                                 ;G:16
0000001D         00A1          CIPA_PPR_V_CSZ  =^X1D                                               ;G:16
```

```
                        00A1    582          .SBTTL  Boot driver interface routines                                  ;G:16
                        00A1    583          .SBTTL  -       PA_ACTION - driver selection action routine             ;G:16
                        00A1    584 ;+                                                                               ;G:16
                        00A1    585 ;       PA_ACTION                                                                ;G:16
                        00A1    586 ;                                                                                ;G:16
                        00A1    587 ;       This routine checks for two device types:                                ;G:27
                        00A1    588 ;               BTD$K_HSCCI - boot from an HSC/CI                                ;G:16
                        00A1    589 ;               BTD$K_BVPSSP - boot from a BI-Vax Port Storage Systems Port      ;G:16
                        00A1    590 ;                                                                                ;G:16
                        00A1    591 ;       Inputs:                                                                  ;G:16
                        00A1    592 ;       R3      - Boot device type                                               ;G:16
                        00A1    593 ;                                                                                ;G:16
                        00A1    594 ;       Outputs:                                                                 ;G:16
                        00A1    595 ;       R0      - 0/1 for failure/success                                        ;G:16
                        00A1    596 ;                                                                                ;G:16
                        00A1    597 ;-                                                                               ;G:16
                        00A1    598          .enable lsb                                                             ;G:16
                        00A1    599 PA_ACTION:                                                                       ;G:16
            50   D4     00A1    600          CLRL    R0                      ; Assume failure                        ;G:16
       53   20   D1     00A3    601          CMPL    #BTD$K_HSCCI,R3         ; MSCP/CI boot?                         ;G:16
            29   13     00A6    602          BEQL    5$                      ; Branch if so                          ;G:21
       53   22   D1     00A8    603          CMPL    #BTD$K_BVPSSP,R3        ; BVP SSP boot?                         ;G:16
            24   13     00AB    604          BEQL    5$                      ; Branch if YES                         ;G:21
       53   23   D1     00AD    605          CMPL    #BTD$K_AIE_TK50,R3      ; BVP tape boot?                        ;G:21
            40   12     00B0    606          BNEQ    20$                     ; BR if not                             ;G:27
            3F   BB     00B2    607          PUSHR   #^M<R0,R1,R2,R3,R4,R5>  ; Save registers                        ;G:21
  50    A7   AF   9A     00B4    608          MOVZBL  SERVER_TAPE,R0          ; Get the size of the string            ;G:21
  A3 AF     50   28     00B8    609          MOVC3   R0,SERVER_TAPE+1,-      ; Change "MSCP$DISK" to                 ;G:21
       FF5D CF          00BC    610                  SERVER                 ; "MSCP$TAPE".                          ;G:21
  50    AD   AF   9A     00BF    611          MOVZBL  CLASS_TAPE,R0           ; Get the size of string                ;G:21
  A9 AF     50   28     00C3    612          MOVC3   R0,CLASS_TAPE+1,-       ; Change "VMS$DISK_CL_DRVR" to          ;G:21
       FF62 CF          00C7    613                  CLASS                  ; "VMS$TAPE_CL_DRVR".                   ;G:21
                        00CA    614                                                                                  ;G:21
       B3   AF   D4     00CA    615          CLRL    CUR_POS                 ; Clear storage area for tape booting   ;G:27
                        00CD    616                                                                                  ;G:21
            3F   BA     00CD    617          POPR    #^M<R0,R1,R2,R3,R4,R5>  ; Restore registers                    ;G:21
            1E   11     00CF    618          BRB     10$                                                             ;G:27
                        00D1    619                                                                                  ;G:21
                        00D1    620 5$:                                     ; Disk initialization parameters        [24]
            3F   BB     00D1    621          PUSHR   #^M<R0,R1,R2,R3,R4,R5>  ; Save registers                        ;G:21
50      FF65 CF   9A     00D3    622          MOVZBL  SERVER_DISK,R0          ; Get the size of the string            ;G:21
FF60 CF     50   28     00D8    623          MOVC3   R0,SERVER_DISK+1,-      ; Change "MSCP$TAPE" to                 ;G:21
       FF3C CF          00DD    624                  SERVER                 ; "MSCP$DISK".                          ;G:21
50      FF69 CF   9A     00E0    625          MOVZBL  CLASS_DISK,R0           ; Get the size of string                ;G:21
FF64 CF     50   28     00E5    626          MOVC3   R0,CLASS_DISK+1,-       ; Change "VMS$TAPE_CL_DRVR" to          ;G:21
       FF3F CF          00EA    627                  CLASS                  ; "VMS$DISK_CL_DRVR".                   ;G:21
            3F   BA     00ED    628          POPR    #^M<R0,R1,R2,R3,R4,R5>  ; Restore registers                    ;G:21
       50   01   9A     00EF    629 10$:     MOVZBL  #1,R0                   ; Declare success                       ;G:16
                05     00F2    630 20$:     RSB                                                                     ;G:16
                        00F3    631                                                                                  ;G:21
                        00F3    632          .disable lsb                                                            ;G:16
```

```
                                  00F3          .SBTTL  -       PA_INIT - port bootstrap device initialization          ;G:16
                                  00F3  ;++                                                                             ;G:16
                                  00F3  ;                                                                               ;G:16
                                  00F3  ; Inputs:                                                                       ;G:16
                                  00F3  ;                                                                               ;G:16
                                  00F3  ;       R7      - SCB                                                           ;G:16
                                  00F3  ;       R9      - RPB                                                           ;G:16
                                  00F3  ;       AP      - VMB argument list                                             ;G:16
                                  00F3  ;                                                                               ;G:16
                                  00F3  ; Outputs:                                                                      ;G:16
                                  00F3  ;                                                                               ;G:16
                                  00F3  ;       R0      - status code                                                   ;G:16
                                  00F3  ;       R1      - CI port number actually used                                  ;G:20
                                  00F3  ;       R2      - Pointer to MSCP packet with media ID for call from CONFIG module ;
                                  00F3  ;                                                                               ;G:16
                                  00F3  ;--                                                                             ;G:16
                                  00F3          .enable lsb                                                             ;G:16
                                  00F3  PA_INIT::                                                                       ;G:16
                            05FC  00F3          .WORD   ^M<R2,R3,R4,R5,R6,R7,R8,R10>                                    ;G:16
                                  00F5                                                                                  ;G:16
                95 AF   01    90  00F5          MOVB    #1,REM_NODE_INDEX                ; Initialize node index        ;G:16
          8B AF   00000000'EF  90  00F9          MOVB    BOOT$L_R2,REM_NODE       ; Pick up path1 node                   ;G:23
          84 AF   00000001'EF  90  0101          MOVB    BOOT$L_R2+1,REM_NODE+1   ; Pick up path2 node                   ;G:23
                          09    12  0109          BNEQ    10$                              ; Something there              ;G:23
        FF79 CF   0000C000'EF  90  010B          MOVB    BOOT$L_R2,REM_NODE+1     ; Duplicate path1 node                 ;G:23
             0C 00000000'EF    E8  0114  10$:    BLBS    HSC50_BOOT,20$                   ; Branch if BOOTING/SET MEMORY  [24]
           FF6B CF   24 A9    90  011B          MOVB    RPB$L_BOOTR2(R9),REM_NODE        ; Pick up path1 node            [24]
           FF66 CF   24 A9    90  0121          MOVB    RPB$L_BOOTR2(R9),REM_NODE+1      ; Shadow unit # not accessible ;G:23
                                  0127                                                   ;   from p-table. Reuse node.   [24]
                                  0127  ;                                                                               ;G:16
                                  0127  ; When booting from a shadow set, make every effort to access the shadow        ;G:16
                                  0127  ; set disk from either HSC before going to the physical unit.                   ;G:16
                                  0127  ;                                                                               ;G:16
                          04    DD  0127  20$:    PUSHL   #4                       ; Try this four times (2 HSC's x       ;G:23
                                  0129                                             ;  choice of shadow/physical)          ;G:16
                        05C0    30  0129  30$:    BSBW    RE_INIT                  ; Do the complete initialization       ;G:16
                       03 50    E8  012C          BLBS    R0,40$                   ; Return with success                  ;G:16
                       F7 6E    F5  012F          SOBGTR  (SP),30$                 ; Failed, try again                    ;G:16
                                  0132  40$:                                                                            ;G:19
              51   FF5A CF    9A  0132          MOVZBL  HSC$B_PORT_NUMBER,R1     ; pick up port number          [23]    ;G:20
                              04  0137          RET                                                                     ;G:19
                                  0138          .disable lsb                                                            ;G:16
```

```
                        0138          .SBTTL  -       PA_DRIVER - port bootstrap driver QIO                   ;G:16
                        0138  ;++                                                                             ;G:16
                        0138  ;                                                                               ;G:16
                        0138  ; Inputs:                                                                       ;G:16
                        0138  ;                                                                               ;G:16
                        0138  ;       R3      - base address of adapter's register space                      ;G:16
                        0138  ;       R5      - lbn for current piece of transfer                             ;G:16
                        0138  ;       R6      - contains 0                                                    ;G:16
                        0138  ;       R8      - size of transfer in bytes                                     ;G:16
                        0138  ;       R9      - address of the RPB                                            ;G:16
                        0138  ;       R10     - starting address of transfer (byte offset in first            ;G:16
                        0138  ;                 page ORed with starting map register number)                   ;G:16
                        0138  ;       (SP)    - Address of return to BOO$QIO                                  ;G:16
                        0138  ;                                                                               ;G:16
                        0138  ;       FUNC(AP)- I/O operation (IO$_READLBLK or IO$_WRITELBLK only)            ;G:16
                        0138  ;       MODE(AP)- Address interpretation mode (0 = physical, 1 = virtual)       ;G:23
                        0138  ;                                                                               ;G:16
                        0138  ; Outputs:                                                                      ;G:16
                        0138  ;                                                                               ;G:16
                        0138  ;       R0      - status code                                                   ;G:16
                        0138  ;                 SS$_NORMAL    - successful transfer                           ;G:16
                        0138  ;                 SS$_CTRLERR   - fatal controller error                        ;G:16
                        0138  ;                                                                               ;G:16
                        0138  ;       R3       - must be preserved                                            ;G:16
                        0138  ;                                                                               ;G:16
                        0138  ; NOTE:                                                                         ;G:16
                        0138  ;       This routine can be called with four combinations of mapping:           ;G:16
                        0138  ;                                                                               ;G:16
                        0138  ;       1) MODE(AP) = physical and PR$_MAPEN = physical.  This is the case      ;G:16
                        0138  ;               when being called from BOOTDRIVR.  We use the made up page      ;G:16
                        0138  ;               table that maps VA = PA for both the port and BDT page tables. ;G:16
                        0138  ;                                                                               ;G:16
                        0138  ;       2) MODE(AP) = virtual and PR$_MAPEN = physical.  This is the case       ;G:16
                        0138  ;               when being called from SYSBOOT to read in SYS.EXE using         ;G:16
                        0138  ;               the real system page table.  We continue to use the made up     ;G:16
                        0138  ;               page table for the port, but use the real system page table     ;G:16
                        0138  ;               for the BDT.                                                    ;G:16
                        0138  ;                                                                               ;G:16
                        0138  ;       3) MODE(AP) = virtual and PR$_MAPEN = virtual.  This is the case        ;G:16
                        0138  ;               when being called from BUGCHECK to read in the non-resident     ;G:16
                        0138  ;               portion of the bugcheck code.  We use the real system page      ;G:16
                        0138  ;               table for both the port and the BDT.                            ;G:16
                        0138  ;                                                                               ;G:16
                        0138  ;       4) MODE(AP) = physical and PR$_MAPEN = virtual.  This is the case       ;G:16
                        0138  ;               when being called from BUGCHECK to write out all of physical    ;G:16
                        0138  ;               memory from the descriptors in the RPB.  We use the real        ;G:16
                        0138  ;               system page table for the port, but make up a new pagetable     ;G:16
                        0138  ;               for the BDT.  This table is only a page long since the max      ;G:16
                        0138  ;               IOSIZE is 127 pages.  This table is created on the fly with     ;G:16
                        0138  ;               the first entry being the first PFN to be written out.          ;G:16
                        0138  ;--                                                                             ;G:16
                00000004 0138  BUF = 4                                                                        ;G:21
                00000010 0138  FUNC = 16                                                                      ;G:16
                00000014 0138  MODE = 20                                                                      ;G:16
                        0138                                                                                  ;G:16
                        0138  PA_DRIVER:                                ; CI/HSC device driver.               ;G:16
FF4A CF   04 AE   9E    0138          MOVAB   4(SP),SAVE_RETRY_ADR    ;
```

```
                FEBD CF    38    DB  013E   734          MFPR    #PR$_MAPEN,MAPEN          ; SAVE STATE OF MEMORY MANAGEMENT
                     38    00    DA  0143   735          MTPR    #0,#PR$_MAPEN             ; TURN OFF MEMORY MANAGEMENT
                           3F    BB  0146   736          PUSHR   #^M<R0,R1,R2,R3,R4,R5>    ; Save for MOVC3
             50    00000000'EF    D0  0148   737          MOVL    MMG$GL_SPTBASE,R0         ; Source to move
   00000EA4'EF    60    0200 8F    28  014F   738          MOVC3   #512,(R0),SPT_PTR         ; Save 1 page of SPTEs
                           3F    BA  0159   739          POPR    #^M<R0,R1,R2,R3,R4,R5>    ; Restore registers
                                 015B   740                                                                          ;G:29
             50    00000000'EF    D0  015B   741          MOVL    MMG$GL_SPTBASE, R0        ; START OF SPT
                   54    0080 8F    3C  0162   742          MOVZWL  #128,R4                   ; Do 1 page of SPTEs
                   52    09   1C    9C  0167   743          ROTL    #28,S^#<<PTE$C_KW!PTE$M_VALID>@-28>&^XF,R2     ; SET UP FAKE SPT
                                 016B   744 10$:                                                                     ;G:29
                         80    52    D0  016B   745          MOVL    R2,(R0)+                  ; PUT IT IN
                               52    D6  016E   746          INCL    R2                        ; STEP TO NEXT PAGE
                                  F8 54    F5  0170   747          SOBGTR  R4,10$                    ; LOOP UNTIL DONE
                            04    10 AC    D1  0173   748          CmpL    Func(AP), #IO$_DrvClr     ; Is this drive clear?
                                 18    12  0177   749          Bneq    20$                       ; Yes, all done, exit
 11 00000000'EF    00000000'8F    E1  0179   750          BBC     #DIR_V_CMM,DIR_FLAGS,23$ ; BRANCH IF NOT DIRECTORY COMMAND
 05 00000000'EF    00000000'8F    E4  0185   751          BBSC    #DIR_V_DRVCLR,DIR_FLAGS,23$ ; BRANCH AND CLEAR IF FIRST TIME
                    0F FE6F CF    E8  0191   752 20$:      BLBS    DS$GB_CI_INIT,25$         ; BRANCH IF ALREADY SET
                                 0196   753                                                                         ;G:16
                                 0196   754 ;                                                                       ;G:16
                                 0196   755 ; START BY SETTING UP A PORT QUEUE BLOCK (PQB) FOR QUEUE HEADS , POINTERS,SPT
                                 0196   756 ; AND COMMUNICATION WITH THE CI-HSC50 DEVICE.
                                 0196   757 ;                                                                       ;G:16
                FF58 CF    00    FB  0196   758 23$:      CALLS   #0,PA_INIT                ; CALLS ROUTINE TO INITIALIZE DEVICE
                         07 50    E8  019B   759          BLBS    R0,25$                    ; CONTINUE IF SUCCESS
                    00000E86'EF    16  019E   760          JSB     SPT_RESET                 ; Restore the SPT
                                 05    01A4   761          RSB                                                      ;G:16
                                 01A5   762                                                                       ;G:16
                                 01A5   763 ;                                                                     ;G:16
                                 01A5   764 ; Translate the I/O function code into a device-dependent function    ;G:16
                                 01A5   765 ; code for this disk/tape.                                            ;G:21
                                 01A5   766 ;                                                                     ;G:16
                                 01A5   767 25$:                                                                  ;G:29
                                 01A5   768          .ENABLE LSB                                                  ;G:14
                      38    00    DA  01A5   769          MTPR    #0,#PR$_MAPEN             ; TURN OFF MEMORY MANAGEMENT ;G:21
                 FE57 CF    01    90  01A8   770          MOVB    #1,DS$GB_CI_INIT          ; SET INIT BYTE FLAG         ;G:21
                   57    FEE0 CF    D0  01AD   771          MOVL    PQB_PTR,R7                ; Cover the PQB etc          ;G:16
             00E8 C7      10 AC    D0  01B2   772          MOVL    FUNC(AP),TAB_L_HOLE(R7)   ; Temp store function       ;G:16
             FEDF CF      10 AC    D0  01B8   773          MOVL    FUNC(AP),SAVE_FUNC        ; Store function
                00EC C7    04    9A  01BE   774          MOVZBL  #STATE_MESSAGE,TAB_L_STATE(R7) ; Show we are in message mode ;G:16
                   52    FEC5 CF    D0  01C3   775          MOVL    NXT_MSG1,R2               ; Pick up message buffer     ;G:21
                                 01C8   776          ASSUME  MSCP$L_BYTE_CNT EQ MSCP$B_OPCODE+4                   ;G:16
                               01    E0  01C8   777          BBS     #FLAG_V_TMSCP,-           ; Is it tape booting (AIE/TK50) ?
                      2A 04E8 C7          01CA   778                  TAB_L_INI_FLAGS(R7),40$   ; BR if yes
                                 01CE   779                                                                       ;G:21
                   56    0110 C7    DE  01CE   780          MOVAL   TAB_B_BDT(R7),R6          ; Otherwise, a disk booting and ;G:2
                                 01D3   781                                                   ; use the first entry in BDT. ;G:21
                         0025    30  01D3   782          BSBW    INIT_BDT_ENTRY            ; Fill in the BDT entry      ;G:21
                                 01D6   783 ;                                                                     ;G:16
                                 01D6   784 ;                                                                     ;G:16
                                 01D6   785 ; All mapping done. Format the write packet and send it out           ;G:16
                                 01D6   786 ;                                                                     ;G:16
                      56    28 A2    DE  01D6   787          MOVAL   MSCP$B_OPCODE-SCS$B_PPD(R2),R6 ; Point into message ;G:16
                         86    21    9A  01DA   788          MOVZBL  #MSCP$K_OP_READ,(R6)+     ; Assume read              ;G:16
                                 01DD   789 ;        CMPW    TAB_L_HOLE(R7),#IO$_WRITELBLK ; Check for write function ;G:21
                                 01DD   790 ;        BNEQ    30$                       ; No, do read                ;G:21
```

```
                          01DD   791 ;        MOVB    #MSCP$K_OP_WRITE,-4(R6)          ; Set write function code     ;G:21
          86    58   D0   01DD   792 30$:     MOVL    R8,(R6)+                         ; Set the byte count          ;G:16
                86   D4   01E0   793          CLRL    (R6)+                            ; Set no offset in buffer     ;G:16
                86   B4   01E2   794          CLRW    (R6)+                            ; Buffer name index           ;G:16
    86    0112 C7   B0   01E4   795          MOVW    TAB_B_BDT+CIBD$W_KEY(R7),(R6)+   ; Buffer name key             ;G:16
    86    0120 C7   D0   01E9   796          MOVL    TAB_L_RCONID(R7),(R6)+           ; RCONID                      ;G:16
          66    55   D0   01EE   797          MOVL    R5,(R6)                          ; Set the logical block number ;G:16
                2E   B0   01F1   798          MOVW    #<-SCS$B_PPD-PPD$C_LENGTH>+MSCP$L_LBN+4,-                     ;G:16
             10 A2        01F3   799                   SCS$W_LENGTH-SCS$B_PPD(R2)      ; Set the message length      ;G:16
              0363   31   01F5   800          BRW     Q_PKT                            ; Send and wait               ;G:16
              0060   31   01F8   801 40$:     BRW     TAPE_BOOT                        ; BR to tape boot code          [24]
                          01FB   802          .disable lsb                                                           ;G:21
```

```
                                01FB
                                01FB  ; INIT_BDT_ENTRY -
                                01FB  ;
                                01FB  ; Fill in the BDT entry for READ/WRITE QIO functions
                                01FB  ;
                                01FB  ;Inputs:
                                01FB  ;
                                01FB  ;       R3      - base address of adapter's register space
                                01FB  ;       R5      - lbn for current piece of transfer
                                01FB  ;       R6      - Address of the BDT entry
                                01FB  ;       R7      - Address of PQB
                                01FB  ;       R8      - size of transfer in bytes
                                01FB  ;       R9      - address of the RPB
                                01FB  ;       R10     - starting address of transfer (byte offset in first
                                01FB  ;                 page ORed with starting map register number)
                                01FB  ;
                                01FB  ;
                                01FB  ;
                                01FB  INIT_BDT_ENTRY:
                                01FB
                     30    BB   01FB          PUSHR   #^M<R4,R5>                      ; Save registers
      54   5A   FE00 8F    AB   01FD          BICW3   #^C<VA$M_BYTE>,R10,R4           ; Get the byte offset
      66   54   8000 8F    A9   0203          BISW3   #^X8000,R4,CIBD$W_FLAGS(R6)     ; Set the boff and valid
                  02 A6    B6   0209  7$:     INCW    CIBD$W_KEY(R6)                  ; Bump the buffer key
                     FB    13   020C          BEQL    7$                              ;  zero isn't legal
                                020E                                                  ; the buffer key by one more.
            04 A6    58    D0   020E  9$:     MOVL    R8,CIBD$L_BLEN(R6)              ; Set the byte count
                                0212          ;
                                0212          ; Construct the page table address in the BDT -- assume first
                                0212          ; case #2 or 3 PR$_MAPEN = virtual; MODE = virtual
                                0212          ;       Use R1 = address of the base of the page table
                                0212          ;           R4 = offset into the page table
                                0212          ;
      54   5A   15    09    EF   0212          EXTZV   #VA$V_VPN,#VA$S_VPN,R10,R4      ; Pick up page table offset
51   50 A9   80000000 8F    C9   0217          BISL3   #VA$M_SYSTEM,RPB$L_SVASPT(R9),R1; Virtual
                2F 14 AC    E8   0220          BLBS    MODE(AP),20$                    ; Pick correct page table
                                0224          ;
                                0224          ; CASE 1 or 4: MODE = physical
                                0224          ; Assume case 1,
                                0224          ;
            51   0108 C7    D0   0224          MOVL    TAB_L_PAGETBL(R7),R1            ; Physical
                  50    38    DB   0229          MFPR    #PR$_MAPEN,R0                   ; Check the current addr mode
                  24 50    E9   022C          BLBC    R0,20$                          ; Normal, skip out
                                022F          ;
                                022F          ; CASE 4: MODE = physical, PR$_MAPEN = virtual
                                022F          ;
                  05D5    30   022F          BSBW    INVALIDATE                      ; Invalidate translation cache
            51   17B0'CF    DE   0232          MOVAL   W^PPAGTBL,R1                    ; New page table
                     5A    DD   0237          PUSHL   R10                             ; Save R10 for retry
         5A   58   F7 8F    78   0239          ASHL    #-9,R8,R10                      ; Number of pages
                  50    51    D0   023E          MOVL    R1,R0                           ; Copy start of table
   80   54   90000000 8F    C9   0241  10$:    BISL3   #<PTE$C_KW!PTE$M_VALID>,R4,(R0)+; Fake up a page table entry
                     54    D6   0249          INCL    R4                              ; Next PFN
                  F3 5A    F5   024B          SOBGTR  R10,10$                         ; Loop until done
                     5A 8ED0   024E          POPL    R10                             ; Restore R10 for retry
                     54    D4   0251          CLRL    R4                              ; Use start of fake table
            08 A6   6144    DE   0253  20$:    MOVAL   (R1)[R4],CIBD$L_SVAPTE(R6)      ; Set it in *** TEMP ***
```

```
                     30   BA  0258   861          POPR    #^M<R4,R5>                      ; Restore registers          ;G:27
                          05  025A   862          RSB                                     ; Return                     ;G:21
                              025B   863                                                                               ;G:21
                              025B   864          .disable lsb                                                         ;G:21
                              025B   865                                                                               ;G:21
```

```
                        025B   867          .SBTTL  -       TAPE_BOOT - Tape port bootstrap driver QIO                ;G:27
                        025B   868 ;                                                                                    ;G:21
                        025B   869 ;++                                                                                   ;G:21
                        025B   870 ;                                                                                    ;G:21
                        025B   871 ; Inputs:                                                                            ;G:21
                        025B   872 ;                                                                                    ;G:21
                        025B   873 ;       R3      - base address of adapter's register space                           ;G:21
                        025B   874 ;       R4      - address to return current tape position in                         ;G:21
                        025B   875 ;       R5      - repetition count for current request (signed word value)           ;G:21
                        025B   876 ;       R6      - contains 0                                                         ;G:21
                        025B   877 ;       R7      - address of the PQB                                                 ;G:21
                        025B   878 ;       R8      - size of transfer in bytes                                          ;G:21
                        025B   879 ;       R9      - address of the RPB                                                 ;G:21
                        025B   880 ;       R10     - starting address of transfer (byte offset in first                ;G:21
                        025B   881 ;                 page ORed with starting map register number)                      ;G:21
                        025B   882 ;                                                                                    ;G:27
                        025B   883 ;       FUNC(AP)- I/O operation                                                      ;G:21
                        025B   884 ;                       IO$_READLBLK - read next block from tape.                    ;G:21
                        025B   885 ;                       IO$_SKIPFILE - skip N files from current position        ;G:21
                        025B   886 ;                                      on tape (really skipping tapemarks)       ;G:21
                        025B   887 ;                       IO$_SKIPRECORD - skip N records from current position    ;G:21
                        025B   888 ;                                      on tape.                                  ;G:21
                        025B   889 ;                       IO$_REWIND   - rewind tape.                              ;G:21
                        025B   890 ;       SIZE(AP)- Size of transfer in bytes                                          ;G:21
                        025B   891 ;       MODE(AP)- Address interpretation mode (0 = physical, 1 = virtual)            ;G:21
                        025B   892 ;       POS(AP) - Address of longword to return current tape position                ;G:21
                        025B   893 ;                                                                                    ;G:21
                        025B   894 ;                                                                                    ;G:27
                        025B   895 ; Outputs:                                                                           ;G:21
                        025B   896 ;                                                                                    ;G:21
                        025B   897 ;       R0 - status code (high byte = size of last block read on READLBLK)           ;G:21
                        025B   898 ;                                                                                    ;G:21
                        025B   899 ;               SS$_NORMAL      - successful transfer                            ;G:21
                        025B   900 ;               SS$_NOSUCHDEV   - unsupported device                             ;G:21
                        025B   901 ;               SS$_CTRLERR     - fatal controller error                         ;G:21
                        025B   902 ;               SS$_ENDOFFILE   - end of file on tape                            ;G:21
                        025B   903 ;               SS$_TAPEPOSLOST - tape position lost                             ;G:21
                        025B   904 ;               SS$_DATAOVERUN  - record too long                                ;G:21
                        025B   905 ;               SS$_ILLIOFUNC   - illegal I/O function                           ;G:21
                        025B   906 ;               SS$_DEVOFFLINE  - device is offline                              ;G:21
                        025B   907 ;                                                                                    ;G:21
                        025B   908 ;       R3,R10 - must be preserved                                                   ;G:21
                        025B   909 ;                                                                                    ;G:21
                        025B   910 ;                                                                                    ;G:21
                        025B   911 ;--                                                                                  ;G:21
                        025B   912                                                                                      ;G:21
           00000000     025B   913 ARGCNT  = 0                                                                        ;G:21
           00000008     025B   914 SIZE    = 8                                                                        ;G:21
           00000010     025B   915 FUNC    = 16                                                                       ;G:21
           00000014     025B   916 MODE    = 20                                                                       ;G:21
           0000001C     025B   917 POS     = 28                                                                       ;G:21
                        025B   918                                                                                      ;G:21
                        025B   919 TAPE_BOOT:                                                                           ;G:21
        FE29 DF   D4    025B   920          CLRL    aSAVE_RETRY_ADR         ; Clear retries count  ********          [24]
          0129    30    025F   921          BSBW    GET_MSG_BUFFER            ; Get message buffer (R2=address)     ;G:21
21      FE37 CF   B1    0262   922          CMPW    SAVE_FUNC,#IO$_READLBLK   ; Is this a READ function?           ;G:21
             03   13    0267   923          BEQL    5$                        ; BR if yes                           ;G:21
```

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                0042   31  0269   924          BRW     POSITION_FUNCTION         ; Else, must be a position function ;G:27
                       026C   925                                                                                      ;G:21
                       026C   926 5$:                                                                                  ;G:27
                       026C   927 ;                                                                                    ;G:21
                       026C   928 ; IO$_READ function                                                                  ;G:21
                       026C   929 ;                                                                                    ;G:21
            0500 8F    BB  026C   930          PUSHR   #^M<R8,R10>               ; Save registers                    ;G:21
                       0270   931                                                                                      ;G:21
                       0270   932 20$:    ;                                                                            ;G:21
                0118   30  0270   933          BSBW    GET_MSG_BUFFER            ; Get message buffer (R2=the address). ;G:21
                       0273   934                                                                                      ;G:21
                       0273   935          ASSUME  MSCP$B_FLAGS EQ MSCP$B_OPCODE+1                                  ;G:21
                       0273   936                                                                                      ;G:21
          28 A2   21   9B  0273   937          MOVZBW  #MSCP$K_OP_READ,-         ; Read function                     ;G:21
                       0277   938                   MSCP$B_OPCODE-SCS$B_PPD(R2)                                    ;G:21
          2C A2   58   D0  0277   939          MOVL    R8,MSCP$L_BYTE_CNT-SCS$B_PPD(R2)  ; Set the byte count        ;G:27
                       027B   940                                                                                      ;G:21
       56   0110 C7   DE  027B   941          MOVAL   TAB_B_BDT(R7),R6          ; Set BDT address (the first entry) in R6 ;G
              FF78   30  0280   942          BSBW    INIT_BDT_ENTRY            ; Go fill the BDT entry             ;G:21
                       0283   943                                                                                      ;G:21
                       0283   944 ;                                                                                    ;G:21
                       0283   945 ; Now fill the MSCP packet                                                           ;G:21
                       0283   946 ;                                                                                    ;G:21
          58   30 A2   DE  0283   947          MOVAL   MSCP$B_BUFFER-SCS$B_PPD(R2),R8  ; Point into the buffer area ;G:21
                 88   D4  0287   948          CLRL    (R8)+                     ; Set no offset in buffer           ;G:27
                 88   B4  0289   949          CLRW    (R8)+                     ; Assume the first BDT entry        ;G:21
          88   02 A6   B0  028B   950          MOVW    CIBD$W_KEY(R6), (R8)+     ; Fill the buffer name key          ;G:21
                       028F   951                                               ;                                   ;G:21
       68   0120 C7   D0  028F   952          MOVL    TAB_L_RCONID(R7),(R8)     ; RCONID                            ;G:21
                 2E   B0  0294   953          MOVW    #<-SCS$B_PPD-PPD$C_LENGTH>+MSCP$L_LBN+4,-                    ;G:21
            10 A2       0296   954                   SCS$W_LENGTH-SCS$B_PPD(R2)  ; Set the message length          ;G:21
                       0298   955                                                                                      ;G:21
              00DB   30  0298   956          BSBW    SEND_NOWAIT               ; Give read request to port         ;G:21
                       029B   957                                                                                      ;G:27
            06 50   E9  029B   958          BLBC    R0,85$                    ; Br if error                       ;G:21
                       029E   959                                                                                      ;G:21
                       029E   960          ;                                                                        ;G:21
                       029E   961          ;   All done reading what user requested, make sure commands             ;G:21
                       029E   962          ;   are all completed.                                                   ;G:21
                       029E   963                                                                                      ;G:21
              057E   30  029E   964          BSBW    REM_NEXT_RSP              ; Else, wait for 'em                ;G:21
              0077   30  02A1   965          BSBW    COMMON                    ; To common response packet processing ;G:21
        0500 8F   BA  02A4   966 85$:    POPR    #^M<R8,R10>               ; Restore registers                 ;G:21
     51   2C A2   D0  02A8   967          MOVL    MSCP$L_BYTE_CNT-SCS$B_PPD(R2), R1 ; GET # OF BYTES TRANSFERRED  [24]
            1E   11  02AC   968          BRB     RETURN                    ; Return to bootdrivr.                  [24]
                       02AE   969 ;                                                                                    ;G:21
                       02AE   970 ; Tape positioning operation function requests                                       ;G:21
                       02AE   971 ;                                                                                    ;G:21
                       02AE   972                                                                                      ;G:21
                       02AE   973 POSITION_FUNCTION:                                                                   ;G:21
                       02AE   974                                                                                      ;G:21
                       02AE   975          ASSUME  MSCP$B_FLAGS EQ MSCP$B_OPCODE+1                                  ;G:21
            25   9B  02AE   976          MOVZBW  #MSCP$K_OP_REPOS,-        ; Set MSCP function code            ;G:21
          28 A2       02B0   977                   MSCP$B_OPCODE-SCS$B_PPD(R2)                                    ;G:21
     24   FDE7 CF   D1  02B2   978          CMPL    SAVE_FUNC,#IO$_REWIND     ; Check for REWIND function         ;G:21
            09   12  02B7   979          BNEQ    60$                       ; Br if not. Other function.        ;G:21
                       02B9   980                                                                                      ;G:21
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                        02B9          ;                                                                    ;G:21
                        02B9          ; IO$_REWIND function                                                ;G:21
                        02B9          ;                                                                    ;G:21
          02    A8      02B9          BISW    #MSCP$M_MD_REWND,-      ; Rewind tape                        [24]
       2A A2            02BB                   MSCP$W_MODIFIER-SCS$B_PPD(R2)                               ;G:21
        0055    30      02BD          BSBW    SEND_WAIT                                                    ;G:21
          0A    11      02C0          BRB     RETURN                                                       ;G:21
                        02C2                                                                               ;G:21
04   FDD7 CF    D1      02C2  60$:    CMPL    SAVE_FUNC,#IO$_DrvClr   ; Check for drive clear function    [24]
          07    12      02C7          BNEQ    CONTINUE                ; Br if no, other function           ;G:21
                        02C9                                                                               ;G:21
                        02C9  ;                                                                            ;G:21
                        02C9  ; IO$_DrvClr function                                                        ;G:21
                        02C9  ; The drive has been inited already so exit with normal status               ;G:21
                        02C9  ;                                                                            ;G:21
     50   01    9A      02C9          MovZBL  #SS$_NORMAL, R0         ;                                   [24]
                        02CC  Return:                                                                      ;G:21
        0BB7    30      02CC          BSBW    SPT_RESET               ; RESTORE PAGE TABLES                [24]
                05      02CF          RSB                                                                  ;G:21
                        02D0                                                                               ;G:21
                        02D0  CONTINUE:                                                                    ;G:27
                        02D0                                                                               ;G:21
                        02D0          ;                                                                    ;G:21
                        02D0          ; IO$_SKIPFILE or IO$_SKIPRECORD function                            ;G:27
                        02D0          ;                                                                    ;G:21
                        02D0                                                                               ;G:21
  51   30 A2    9E      02D0          MOVAB   MSCP$L_TMGP_CNT-SCS$B_PPD(R2),R1  ; Assume skip file operation ;G:21
25   FDC5 CF    D1      02D4          CMPL    SAVE_FUNC,#IO$_SKIPFILE ; Is this a SKIPFILE operation?     ;G:21
          11    13      02D9          BEQL    80$                     ; Br if yes,                         [24]
                        02DB                                          ; Else, must be SKIPRECORD           ;G:21
  51   2C A2    9E      02DB          MOVAB   MSCP$L_REC_CNT-SCS$B_PPD(R2),R1  ; Address of record count field ;G:
                        02DF                                                                               ;G:21
26   FDBA CF    D1      02DF          CMPL    SAVE_FUNC,#IO$_SKIPRECORD ; Is this a SKIPRECORD operation?  [24]
          06    13      02E4          BEQL    80$                     ;                                    [24]
  50   F4 8F    9A      02E6          MOVZBL  #SS$_ILLIOFUNC,R0       ; ILLEGAL I/O FUNCTION               [24]
          E0    11      02EA          BRB     RETURN                  ; EXIT                               [24]
                        02EC                                                                               ;G:21
     0080 8F    A8      02EC  80$:    BISW    #MSCP$M_MD_DLEOT,-      ; DETECT LEOT                        [24]
       2A A2            02F0                   MSCP$W_MODIFIER-SCS$B_PPD(R2)                               ;G:21
  55   04 AC    D0      02F2          MOVL    BUF(AP),R5              ; Get skip number                    [24]
          07    18      02F6          BGEQ    90$                     ; Br if positive value               ;G:21
     55   55    CE      02F8          MNEGL   R5,R5                   ; Else, make it positive             ;G:21
          08    A8      02FB          BISW    #MSCP$M_MD_REVRS,-      ; Make tape go in reverse            ;G:21
       2A A2            02FD                   MSCP$W_MODIFIER-SCS$B_PPD(R2)                               ;G:21
     61   55    D0      02FF  90$:    MOVL    R5,(R1)                 ; Store number of objects to skip    ;G:21
                        0302                                                                               ;G:21
          11    10      0302          BSBB    SEND_WAIT               ; Sent to get status                 [24]
25   FD95 CF    D1      0304          CMPL    SAVE_FUNC,#IO$_SKIPFILE ; Is this a SKIPFILE operation?      [24]
          08    12      0309          BNEQ    100$                    ; Br if NOT,                         [24]
                        030B                                                                               ;G:21
     0E   51    D1      030B          CMPL    R1,#MSCP$K_ST_TAPEM     ; Was tape mark detected             [24]
          03    12      030E          BNEQ    100$                    ;                                    [24]
     50   01    9A      0310          MOVZBL  #SS$_NORMAL,R0          ; CHANGE TO NORMAL IF EOF            [24]
          B7    11      0313  100$:   BRB     RETURN                  ; EXIT                               [24]
                        0315  ;                                                                            ;G:21
                        0315  ;SEND_WAIT                                                                   ;G:21
                        0315  ;                                                                            ;G:27
```

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                        0315  1038 ; Queue the packet to the port and wait for and process the response, and     ;G:21
                        0315  1039 ; then return here.                                                          ;G:21
                        0315  1040 ;                                                                            ;G:21
                        0315  1041 SEND_WAIT:                                                                   ;G:21
                        0315  1042                                                                              ;G:21
          0000055B'EF   16  0315  1043         JSB     Q_PKT                      ; Send and wait             ;G:21
                        031B  1044                                                                              ;G:27
                        031B  1045                                                                              ;G:21
                        031B  1046 COMMON:                                                                      ;G:21
                        031B  1047                                                                              ;G:21
                01 50   E8  031B  1048         BLBS    R0,10$                     ; Br on success             ;G:27
                        05  031E  1049         RSB                                ;                           ;G:21
                        031F  1050 10$:                                                                         ;G:27
        FD5B CF   3C A2   D0  031F  1051         MOVL    MSCP$L_POSITION-SCS$B_PPD(R2),CUR_POS   ; Save current position ;G:2
             05   00   EF  0325  1052         EXTZV   #MSCP$V_ST_MASK,#MSCP$S_ST_MASK,-   ; Any drive errors?  ;G:21
           51   2A A2      0328  1053                 MSCP$W_STATUS-SCS$B_PPD(R2),R1                           ;G:21
                        032B  1054                                                                              ;G:21
                        032B  1055 STATUS_CODE:                                                                 ;G:27
              50   01   D0  032B  1056         MOVL    #SS$_NORMAL,R0             ;                           [24]
                        032E  1057         ASSUME  MSCP$K_ST_SUCC  EQ  0                                       ;G:21
                   51   D5  032E  1058         TSTL    R1                         ; Check status              [24]
                   43   13  0330  1059         BEQL    60$                        ; Br if no                  ;G:21
                51 01   D1  0332  1060         CMPL    S^#MSCP$K_ST_ICMD,R1       ; Invalid command?          ;G:21
                   3E   13  0335  1061         BEQL    60$                        ; Br if yes, ignore invalid command ;G:21
                        0337  1062                                                ;  which is caused by multiple onlines ;G:21
                51 04   D1  0337  1063         CMPL    S^#MSCP$K_ST_AVLBL,R1      ; Unit available?           [24]
                   39   13  033A  1064         BEQL    60$                        ; Br if yes,                [24]
                51 0D   D1  033C  1065         CMPL    S^#MSCP$K_ST_BOT,R1        ; At BOT                    [24]
                   34   13  033F  1066         BEQL    60$                        ; BR IF YES,                [24]
           50   0838 8F   3C  0341  1067         Movzwl  #SS$_DATAOVERUN, R0        ; Assume record too large   [24]
                51   10   D1  0346  1068         CMPL    S^#MSCP$K_ST_RDTRN,R1      ; Read truncated?           ;G:21
                   2A   13  0349  1069         BEQL    60$                        ; Br if yes                 ;G:21
        50   00000224 8F   D0  034B  1070         MOVL    #SS$_TAPEPOSLOST,R0        ; ASSUME TAPE POSITON LOST. [24]
                51   11   D1  0352  1071         CMPL    S^#MSCP$K_ST_PLOST,R1      ; TAPE POSITION LOST    [24] ;G:21
                   1E   13  0355  1072         BEQL    60$                        ;                           [24]
        50   00000870 8F   D0  0357  1073         MOVL    #SS$_ENDOFFILE,R0          ; ASSUME EOF                [24]
                51   13   D1  035E  1074         CMPL    S^#MSCP$K_ST_LED,R1        ; LEOT DETECTED             [24]
                   12   13  0361  1075         BEQL    60$                        ;                           [24]
                51   0E   D1  0363  1076         CMPL    #MSCP$K_ST_TAPEM,R1        ; Is this a tapemark?       ;G:21
                   0D   13  0366  1077         BEQL    60$                        ;                           ;G:27
           50   0084 8F   3C  0368  1078         MOVZWL  #SS$_DEVOFFLINE,R0         ; ASSUME DEVICE OFFLINE.    [24]
                51   03   D1  036D  1079         CMPL    S^#MSCP$K_ST_OFFLN,R1      ;                           ;G:21
                   03   13  0370  1080         BEQL    60$                        ; BR IF YES                 [24]
                     0033 30  0372  1081         BSBW    ERROR                      ; Error out                 ;G:21
                        0375  1082 ;                                                                           ;G:21
                        0375  1083 ; Transfer is complete. Return with status code.                            ;G:21
                        0375  1084 ;                                                                           ;G:21
                   05   0375  1085 60$:    RSB                                    ; RETURN EXACT STATUS CODE  [24]
                        0376  1086                                                                             ;G:27
                        0376  1087                                                                             ;G:21
                        0376  1088 ;                                                                           ;G:27
                        0376  1089 ; SEND_NOWAIT                                                               ;G:21
                        0376  1090 ;                                                                           ;G:27
                        0376  1091 ; Queue the packet to the port and return here without waiting for          ;G:21
                        0376  1092 ; the response packet.                                                      ;G:21
                        0376  1093 ;                                                                           ;G:27
                        0376  1094 SEND_NOWAIT:                                                                ;G:21
```

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                16 A2    01    B0  0376  1095          MOVW    #1,SCS$W_CREDIT-SCS$B_PPD(R2); Always give back one credit    ;G:21
                   0120 C7    7D  037A  1096          MOVQ    TAB_L_RCONID(R7),-                                            ;G:21
                     18 A2        037E  1097                   SCS$L_DST_CONID-SCS$B_PPD(R2)  ; Set correct xct_id          ;G:21
                0E A2    02    90  0380  1098          MOVB    #PPD$C_SNDMSG,PPD$B_OPC(R2)  ; Set opcode to send message    ;G:21
            000007D3'EF          16  0384  1099          JSB     SEND_PKT                     ; Send it out                  ;G:21
                                 05  038A  1100          RSB                                                                ;G:27
                                     038B  1101                                                                             ;G:21
                                     038B  1102                                                                             ;G:21
                                     038B  1103 ;                                                                           ;G:21
                                     038B  1104 ; GET_MSG_BUFFER                                                            ;G:21
                                     038B  1105 ;                                                                           ;G:27
                                     038B  1106 ; This routine finds the next available message buffer.                     ;G:21
                                     038B  1107 ;                                                                           ;G:21
                                     038B  1108 ; Inputs:                                                                   ;G:21
                                     038B  1109 ;       None.                                                               ;G:21
                                     038B  1110 ;                                                                           ;G:21
                                     038B  1111 ; Outputs:                                                                  ;G:21
                                     038B  1112 ;       R2       - The address  of the available message buffer             ;G:21
                                     038B  1113 ;                                                                           ;G:21
                                     038B  1114 GET_MSG_BUFFER:                                                             ;G:21
            52    FD06 CF    D0  038B  1115          MOVL    NXT_MSG1,R2                  ; Pick up message buffer (address)    ;G:21
                       52    DD  0390  1116          PUSHL   R2                           ; Save address of packet              ;G:21
              52    28 A2    DE  0392  1117          MOVAL   MSCP$B_OPCODE-SCS$B_PPD(R2),R2 ; Get the start address             ;G:21
                 50    04    9A  0396  1118          MOVZBL  #4,R0                        ; Get number of quads to zero         ;G:21
                       82    7C  0399  1119 40$:     CLRQ    (R2)+                        ; Zero out quad  words                ;G:21
                    FB 50    F5  039B  1120          SOBGTR  R0,40$                       ; Loop if more                        ;G:21
                       52 8ED0  039E  1121          POPL    R2                           ; Restore R2                          ;G:21
                       20    90  03A1  1122          MOVB    #<MSCP$M_MD_CLSEX@-8>,-  ; Clear any serious exception          [24]
            2B A2                03A3  1123          MSCP$W_MODIFIER+1-SCS$B_PPD(R2)  ;                                      [24]
                          05     03A5  1124          RSB                                                                    ;G:21
                                 03A6  1125                                                                                 ;G:21
                                 03A6  1126          .disable lsb                                                           ;G:21
                                 03A6  1127                                                                                 ;G:21
```

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                        03A6  1129          .SBTTL  -       ERROR common error return path                          ;G:16
                        03A6  1130 ;++                                                                              ;G:16
                        03A6  1131 ;                                                                                ;G:16
                        03A6  1132 ;       These routines set the failure status for return to the caller.       ;G:16
                        03A6  1133 ;                                                                                ;G:27
                        03A6  1134 ; Inputs:                                                                        ;G:16
                        03A6  1135 ;                                                                                ;G:16
                        03A6  1136 ;       R7      - Address of the PQB                                             ;G:16
                        03A6  1137 ;       R9      - RPB                                                            ;G:16
                        03A6  1138 ;       AP      - VMB argument list                                              ;G:16
                        03A6  1139 ;                                                                                ;G:16
                        03A6  1140 ; For ERROR:                                                                     ;G:16
                        03A6  1141 ;      4(SP)    - Return to PA_DISC, BOO$QIO, or PA_INIT                         ;G:16
                        03A6  1142 ;       (SP)    - Address of failure                                             ;G:16
                        03A6  1143 ;                                                                                ;G:16
                        03A6  1144 ; For ERROR1:                                                                    ;G:16
                        03A6  1145 ;       8(SP)   - Return to PA_DISC, BOO$QIO, or PA_INIT                        ;G:16
                        03A6  1146 ;       4(SP)   - Return to first level subroutine                              ;G:16
                        03A6  1147 ;        (SP)   - Address of failure                                             ;G:16
                        03A6  1148 ;                                                                                ;G:16
                        03A6  1149 ; Outputs:                                                                       ;G:16
                        03A6  1150 ;                                                                                ;G:16
                        03A6  1151 ;       R0 - status code                                                         ;G:16
                        03A6  1152 ;                                                                                ;G:16
                        03A6  1153 ;--                                                                              ;G:16
                        03A6  1154 ;                                                                                ;G:16
                        03A6  1155 ;       .enable lsb                                                              ;G:16
              8E   D5   03A6  1156 ERROR1: TSTL    (SP)+                    ; Clear stack                         ;G:18
              8E   D5   03A8  1157 ERROR:  TSTL    (SP)+                    ; Clear stack                         ;G:18
        50    0054 8F   3C    03AA  1158          MOVZWL  #SS$_CTRLERR,R0     ; Set failure status                  ;G:18
              07   D1   03AF  1159          CMPL    #STATE_VCBROKEN,-       ; Is the state VCBROKEN?              ;G:18
                   00EC C7    03B1  1160                  TAB_L_STATE(R7)                                       ;G:18
              05   13   03B4  1161          BEQL    10$                     ; Yes, don't change it                ;G:18
              06   9A   03B6  1162          MOVZBL  #STATE_FATAL,-          ; Set the state to closed             ;G:18
                   00EC C7    03B8  1163                  TAB_L_STATE(R7)                                       ;G:27
              FC45 CF   94    03BB  1164 10$:     CLRB    DS$GB_CI_INIT       ; Initialize next time      [22]  ;G:23
 00000E86'EF       16   03BF  1165          JSB     SPT_RESET               ; Reset the SPT the way it was [22]  ;G:23
                        03C5  1166 ;        TSTL    SAVE_QIO_AP             ; Got a QIO AP?                       ;G:18
                        03C5  1167 ;        BEQL    20$                     ; No, continue                        ;G:16
                        03C5  1168 ;        MOVL    SAVE_QIO_AP,AP          ; Yes, restore it                     ;G:16
                   05   03C5  1169 20$:     RSB                             ; Return                              ;G:18
                        03C6  1170          .disable lsb                                                          ;G:18
```

```
                        03C6  1172          .SBTTL  MSCP layer                                                      ;G:16
                        03C6  1173          .SBTTL  -       INIT_MSCP - initialize the MSCP layer                   ;G:16
                        03C6  1174 ;+                                                                               ;G:16
                        03C6  1175 ; The MSCP layer constitutes this initialization code plus the  operations       ;G:27
                        03C6  1176 ; performed in the PA_DRIVER QIO routine and the PA_DISC routine.                ;G:16
                        03C6  1177 ;                                                                                ;G:16
                        03C6  1178 ; MSCP initialization begins at the completion of the SCS connection handshake  ;G:16
                        03C6  1179 ; Start by setting the controller characteristics.                               ;G:16
                        03C6  1180 ;                                                                                ;G:16
                        03C6  1181 ;                                                                                ;G:16
                        03C6  1182 ; Inputs:                                                                        ;G:16
                        03C6  1183 ;                                                                                ;G:16
                        03C6  1184 ;       R2      - CI packet address                                              ;G:16
                        03C6  1185 ;       R3      - CSR                                                            ;G:16
                        03C6  1186 ;       R7      - PQB                                                            ;G:16
                        03C6  1187 ;       R9      - RPB                                                            ;G:16
                        03C6  1188 ;       AP      - VMB argument list                                              ;G:16
                        03C6  1189 ;                                                                                ;G:16
                        03C6  1190 ;       (SP)    - Return to PA_INIT                                              ;G:16
                        03C6  1191 ;                                                                                ;G:16
                        03C6  1192 ;-                                                                               ;G:16
                        03C6  1193          .enable lsb                                                             ;G:16
                        03C6  1194 INIT_MSCP:                                                                       ;G:16
      0E A2     B4      03C6  1195          CLRW    PPD$B_OPC(R2)           ; Clear response flags                  ;G:27
55    20 A2     DE      03C9  1196          MOVAL   -SCS$B_PPD(R2),R5       ; Set R5 to cover packet                ;G:16
   85    01     D0      03CD  1197          MOVL    #1,(R5)+                ; Set command ref number                ;G:16
         85     D4      03D0  1198          CLRL    (R5)+                   ; Reserved field                        ;G:16
   85    04     9A      03D2  1199          MOVZBL  #MSCP$K_OP_STCON,(R5)+  ; Set opcode to SET CTRL CHAR           ;G:16
         85     D4      03D5  1200          CLRL    (R5)+                   ; Version & flags                       ;G:16
85     FF 8F     9A      03D7  1201          MOVZBL  #255,(R5)+              ; Set time out to 255 seconds           ;G:16
         85     7C      03DB  1202          CLRQ    (R5)+                   ; Clear time and date                   ;G:16
         65     D4      03DD  1203          CLRL    (R5)                    ; Clear controller depend params        ;G:16
         04     B0      03DF  1204          MOVW    #PPD$C_SCS_MSG,-        ; Set PPD type to application           ;G:16
      12 A2             03E1  1205                   PPD$W_MTYPE(R2)        ;  message                              ;G:16
         0A     B0      03E3  1206          MOVW    #SCS$C_APPL_MSG,-       ; Set SCS type to application           ;G:16
      14 A2             03E5  1207                   SCS$W_MTYPE-SCS$B_PPD(R2) ;  message                            ;G:16
         2E     B0      03E7  1208          MOVW    #<-SCS$B_PPD-PPD$C_LENGTH>+MSCP$Q_TIME+12,-                     ;G:16
      10 A2             03E9  1209                   SCS$W_LENGTH-SCS$B_PPD(R2) ; Set the message length            ;G:16
       016D     31      03EB  1210          BRW     Q_PKT                                                           ;G:16
                        03EE  1211          .disable lsb                                                            ;G:16
```

```
                        03EE  1213          .SBTTL  -       REC_MSCP - dispatch an MSCP response                    ;G:16
                        03EE  1214 ;+                                                                               ;G:16
                        03EE  1215 ; This routine is called on receipt of application messages.                     ;G:16
                        03EE  1216 ;                                                                                ;G:16
                        03EE  1217 ; Inputs:                                                                        ;G:16
                        03EE  1218 ;                                                                                ;G:16
                        03EE  1219 ;       R2      - CI packet address                                              ;G:16
                        03EE  1220 ;       R3      - CSR                                                            ;G:16
                        03EE  1221 ;       R7      - PQB                                                            ;G:16
                        03EE  1222 ;       R9      - RPB                                                            ;G:16
                        03EE  1223 ;       AP      - VMB argument list                                              ;G:16
                        03EE  1224 ;                                                                                ;G:16
                        03EE  1225 ;       (SP)    - Return to PA_DISC, BOO$QIO, or PA_INIT                         ;G:16
                        03EE  1226 ;                                                                                ;G:16
                        03EE  1227 ; Outputs:                                                                       ;G:16
                        03EE  1228 ;                                                                                ;G:16
                        03EE  1229 ;-                                                                               ;G:16
                        03EE  1230          .enable lsb                                                             ;G:16
                        03EE  1231 REC_MSCP:                                                                        ;G:16
FCA2 CF   52    D0      03EE  1232          MOVL    R2,W^NXT_MSG1           ; Hold for later                    ;G:21
FC99 CF   57    D0      03F3  1233          MOVL    R7,W^PQB_PTR                                                ;G:16
                        03F8  1234                                                                              ;G:21
                        03F8  1235          ASSUME  MSCP$V_ST_MASK EQ 0                                         ;G:16
    FFE0 8F     AB      03F8  1236          BICW3   #^C<<1@MSCP$S_ST_MASK>-1>,-      ; Store status in R1       ;G:21
  51   2A A2             03FC  1237                  MSCP$W_STATUS-SCS$B_PPD(R2),R1  ; for testings of drive errors ;G:21
                        03FF  1238                                                                              ;G:16
      28 A2     91      03FF  1239 10$:     CMPB    MSCP$B_OPCODE-SCS$B_PPD(R2),-                               ;G:16
      84 8F             0402  1240                   #MSCP$K_OP_STCON!-                                         ;G:16
                        0404  1241                    MSCP$K_OP_END          ; Is it SET CTRL CHAR?             ;G:16
         28     12      0404  1242          BNEQ    13$                     ; No                               ;G:27
         51     D5      0406  1243          TSTL    R1                      ; Any drive errors?                ;G:21
         03     13      0408  1244          BEQL    12$                     ; NO, continue                     ;G:21
       FF9B     30      040A  1245          BSBW    ERROR                   ; Yes, error out                   ;G:21
                        040D  1246 12$:                                                                         ;G:21
                        040D  1247 ;                                                                            ;G:16
                        040D  1248 ; After receipt of the end packet from the SET CTRL CHAR, it is time to      ;G:16
                        040D  1249 ; attempt to put the unit online.                                            ;G:27
                        040D  1250                                                                              ;G:21
                        040D  1251 ;                                                                            ;G:21
                        040D  1252 ; Test for booting from disk or tape device                                  ;G:21
                        040D  1253 ;                                                                            ;G:21
         01     E0      040D  1254          BBS     #FLAG_V_TMSCP,-         ; Is it tape booting (AIE/TK50)?   ;G:21
1D 04E8 C7              040F  1255                  TAB_L_INI_FLAGS(R7),15$ ; BR if yes                        ;G:21
                        0413  1256 ;                                                                            ;G:27
                        0413  1257 ; For disk booting                                                           ;G:21
                        0413  1258 ;                                                                            ;G:16
55   20 A2      DE      0413  1259          MOVAL   -SCS$B_PPD(R2),R5       ; Set R5 to cover packet           ;G:16
   85   01     D0      0417  1260          MOVL    #1,(R5)+                ; Set command ref number           ;G:16
85    64 A9     3C      041A  1261          MOVZWL  RPB$W_UNIT(R9),(R5)+    ; Put unit number in cmd packet field ;G:16
   85   09     9A      041E  1262          MOVZBL  #MSCP$K_OP_ONLIN,(R5)+  ; Set opcode to bring drive online ;G:16
        85     7C      0421  1263          CLRQ    (R5)+                   ; Clear byte count, buff desc      ;G:16
        85     7C      0423  1264          CLRQ    (R5)+                   ;  buff desc and LBN               ;G:16
        65     7C      0425  1265          CLRQ    (R5)                    ;  resvd and copy speed            ;G:16
        32     B0      0427  1266          MOVW    #<-SCS$B_PPD-PPD$C_LENGTH>+MSCP$W_SHDW_UNT+4,-              ;G:16
     10 A2              0429  1267                   SCS$W_LENGTH-SCS$B_PPD(R2) ; Set the message length       ;G:16
      012D      31      042B  1268          BRW     Q_PKT                   ; Send it out                      ;G:23
                        042E  1269                                                                              ;G:14
```

```
                        52   11  042E  1270 13$:    BRB     30$                                                          ;G:21
                                 0430  1271                                                                                ;G:21
                                 0430  1272 ;                                                                              ;G:21
                                 0430  1273 ;                                                                              ;G:21
                                 0430  1274 ; For tape booting                                                             ;G:21
                                 0430  1275 ;                                                                              ;G:21
                                 0430  1276                                                                                ;G:21
                                 0430  1277 15$:                                                                           ;G:27
                                 0430  1278          TIMEDWAIT TIME=#100*1000        ; WAit for 1 second for TK50          ;G:21
                    50   01   3C  0430                MOVZWL  #SS$_NORMAL,R0
51   00000000'GF   000186A0 8F  C5  0433                MULL3   #100*1000,G^EXE$GL_TENUSEC,R1
                        7E   D4  043F                CLRL    -(SP)
                                 0441        30000$:
            6E   00000000'GF   D0  0441                MOVL    G^EXE$GL_UBDELAY,(SP)
                     FD 6E     F5  0448        30001$: SOBGTR  (SP),30001$
                     F3 51     F5  044B                SOBGTR  R1,30000$
                        50   D4  044E                CLRL    R0
                        8E   D5  0450                TSTL    (SP)+
                                 0452  1279                                          ; drive to come on-line before        ;G:27
                                 0452  1280                                          ; giving the ONLINE command           ;G:21
                     0E A2   B4  0452  1281          CLRW    PPD$B_OPC(R2)           ; Clear response flag                 ;G:21
                 55  20 A2   DE  0455  1282          MOVAL   -SCS$B_PPD(R2),R5       ; Set R5 to cover packet              ;G:21
                    85   01   D0  0459  1283          MOVL    #1,(R5)+                ; Set command ref number              ;G:21
                 85  64 A9   3C  045C  1284          MOVZWL  RPB$W_UNIT(R9),(R5)+    ; Put unit number in cmd packet field ;G:21
                    85   09   B0  0460  1285          MOVW    #MSCP$K_OP_ONLIN,(R5)+  ; Set opcode to bring drive online    ;G:21
                                 0463  1286                                                                                ;G:21
              85   2000 8F   A8  0463  1287          BISW    #MSCP$M_MD_CLSEX, (R5)+ ; Do clear serious                    ;G:27
                                 0468  1288                                          ; exception (modifier)                ;G:27
                        85   7C  0468  1289          CLRQ    (R5)+                   ; Clear byte count, buff desc         ;G:21
                        85   7C  046A  1290          CLRQ    (R5)+                   ;  buff desc and LBN                  ;G:21
                        65   7C  046C  1291          CLRQ    (R5)                    ;  resvd and copy speed               ;G:21
                        32   B0  046E  1292          MOVW    #<-SCS$B_PPD-PPD$C_LENGTH>+MSCP$W_SHDW_UNT+4,-                ;G:21
                     10 A2       0470  1293                   SCS$W_LENGTH-SCS$B_PPD(R2) ; Set the message length          ;G:21
                      00E6   31  0472  1294          BRW     Q_PKT                   ; Send it out                         ;G:21
                                 0475  1295                                                                                ;G:21
                                 0475  1296 25$:                                                                           ;G:27
                        01   E0  0475  1297          BBS     #FLAG_V_TMSCP,-         ; Is it tape booting (AIE/TK50)?      ;G:21
                 03 04E8 C7      0477  1298                  TAB_L_INI_FLAGS(R7),26$ ; BR if yes                           ;G:27
                      FF2A   30  047B  1299          BSBW    ERROR                   ; Otherwise, error out                ;G:21
                                 047E  1300                                                                                ;G:21
                    50   01   3C  047E  1301 26$:    MOVZWL  #SS$_NORMAL,R0          ; Set completion code to indicate     ;G:21
                        05       0481  1302          RSB                             ; Return                              ;G:21
                                 0482  1303                                                                                ;G:21
                     28 A2   91  0482  1304 30$:    CMPB    MSCP$B_OPCODE-SCS$B_PPD(R2),-                                 ;G:21
                     89 8F       0485  1305                   #MSCP$K_OP_ONLIN!-                                           ;G:16
                                 0487  1306                    MSCP$K_OP_END          ; Is it ONLINE?                       ;G:16
                        28   12  0487  1307          BNEQ    35$                     ; No                                  ;G:21
                                 0489  1308                                                                                ;G:21
                        51   D5  0489  1309          TSTL    R1                       ; Any drive errors?                  ;G:21
                        03   13  048B  1310          BEQL    32$                      ; NO, continue                       ;G:21
                      FF18   30  048D  1311          BSBW    ERROR                    ; Yes, error out                      [24]
                                 0490  1312 32$:                                                                           ;G:21
                                 0490  1313 ;                                                                              ;G:16
                                 0490  1314 ; Received packet was a successful ONLINE end packet.  Pick up the device     ;G:16
                                 0490  1315 ; name from the MEDIA_ID field.                                                ;G:16
                                 0490  1316 ;                                                                              ;G:16
                        16   EF  0490  1317          EXTZV   #MSCP$V_MTYP_D1,-                                             ;G:16
```

```
                05        0492  1318                  #MSCP$S_MTYP_D1,-                                        ;G:16
        51   3C A2        0493  1319                  MSCP$L_MEDIA_ID- -                                       ;G:16
                          0496  1320                  SCS$B_PPD(R2),R1        ; Pull out 2nd device character  ;G:16
     51   51   08   78    0496  1321          ASHL    #8,R1,R1                ; Stick it in high byte          ;G:16
                1B   EF    049A  1322          EXTZV   #MSCP$V_MTYP_D0,-                                        ;G:16
                05        049C  1323                  #MSCP$S_MTYP_D0,-                                        ;G:16
        50   3C A2        049D  1324                  MSCP$L_MEDIA_ID- -                                       ;G:16
                          04A0  1325                  SCS$B_PPD(R2),R0        ; Pull out 1st device character   [24]
     51   4040 8F   A8    04A0  1326          BISW    #^X4040,R1              ; Make ASCII characters          ;G:16
FB5A CF   50   51   A9    04A5  1327          BISW3   R1,R0,DEVNAME           ; Set into driver name            [24]
        52   20 A2   9E    04AB  1328          MOVAB   -SCS$B_PPD(R2),R2       ; Get address of MSCP packet for CONFIG [24]
                04   11    04AF  1329          BRB     40$                     ;                                 [24]
                          04B1  1330 ;                                        ;                                ;G:21
                51   D5    04B1  1331 35$:     TSTL    R1                      ; Drive error?                   ;G:21
                C0   12    04B3  1332          BNEQ    25$                     ; Yes, error out                 ;G:21
                          04B5  1333 ;                                                                         ;G:16
                          04B5  1334 ; Transfer is complete. Return with success status code.                  ;G:16
                          04B5  1335 ;                                                                         ;G:16
           50   01   3C    04B5  1336 40$:     MOVZWL  #SS$_NORMAL,R0          ; Set completion code            ;G:21
     00000E86'EF   16    04B8  1337 50$:     JSB     SPT_RESET                                                ;G:25
                05        04BE  1338          RSB                             ; And return                     ;G:25
                          04BF  1339                                                                           ;G:21
                          04BF  1340          .disable lsb                                                     ;G:16
```

```
                        04BF  1342          .SBTTL  SCS layer                                                    ;G:16
                        04BF  1343          .SBTTL  -       INIT_CONNECT - Begin SCS Connection Handshake        ;G:16
                        04BF  1344 ;+                                                                            ;G:16
                        04BF  1345 ; The SCS layer is responsible for opening a connection to the MSCP$DISK      ;G:16
                        04BF  1346 ; server in the remote node.                                                  ;G:16
                        04BF  1347 ;
                        04BF  1348 ; Now the virtual circuit is establised.  Send out the CONNECT_REQ
                        04BF  1349 ;
                        04BF  1350 ;                                                                             ;G:16
                        04BF  1351 ; Inputs:                                                                     ;G:16
                        04BF  1352 ;                                                                             ;G:16
                        04BF  1353 ;       R2      - CI packet address                                           ;G:16
                        04BF  1354 ;       R3      - CSR                                                         ;G:16
                        04BF  1355 ;       R7      - PQB                                                         ;G:16
                        04BF  1356 ;       R9      - RPB                                                         ;G:16
                        04BF  1357 ;       AP      - VMB argument list                                           ;G:16
                        04BF  1358 ;                                                                             ;G:16
                        04BF  1359 ;       (SP)    - Return to PA_INIT                                           ;G:16
                        04BF  1360 ;                                                                             ;G:16
                        04BF  1361 ;-                                                                            ;G:16
                        04BF  1362          .enable lsb                                                          ;G:16
                        04BF  1363 INIT_CONNECT:                                                                 ;G:16
08 A2    01    D0       04BF  1364          MOVL    #1,PPD$W_SIZE(R2)       ; Set software flag
     0325      30       04C3  1365          BSBW    DISCARD                 ; Turn the DG into a free message
     02E9      30       04C6  1366          BSBW    ALLOC_DG                ; Grab another datagram
   7E    52    7D       04C9  1367          MOVQ    R2,-(SP)                ; Save some registers
FB37 CF    34    28       04CC  1368          MOVC3   #TEMPL_MSG_LEN,TEMPL_MSG,-
     10 A2                04D1  1369           SCS$W_LENGTH-SCS$B_PPD(R2) ; Set up the CONNECT message
   52    8E    7D       04D3  1370          MOVQ    (SP)+,R2                ; Restore some registers
08 A2    01    D0       04D6  1371          MOVL    #1,PPD$W_SIZE(R2)       ; Set software flag
     02EA      31       04DA  1372          BRW     SEND_MSG                ; Send out a message                 ;G:16
                        04DD  1373          .disable lsb                                                         ;G:16
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                        04DD  1375          .SBTTL  -       REC_SCS_MSG - Process a received SCS message          ;G:16
                        04DD  1376 ;+                                                                            ;G:16
                        04DD  1377 ;                                                                             ;G:16
                        04DD  1378 ; Received a SCS message -- process it depending on type.  Normally, the      ;G:16
                        04DD  1379 ; receipt of an SCS CON_REQ message completes the virtual circuit transition  ;G:16
                        04DD  1380 ; to OPEN with the assumption that the ACK datagram was lost.  However, we    ;G:16
                        04DD  1381 ; never expect the HSC to make any connection request, so leave the circuit   ;G:16
                        04DD  1382 ; closed and let it time out naturally.                                       ;G:27
                        04DD  1383 ;                                                                             ;G:16
                        04DD  1384 ; Inputs:                                                                     ;G:16
                        04DD  1385 ;                                                                             ;G:16
                        04DD  1386 ;       R2      - CI packet address                                           ;G:16
                        04DD  1387 ;       R3      - CSR                                                         ;G:16
                        04DD  1388 ;       R7      - PQB                                                         ;G:16
                        04DD  1389 ;       R9      - RPB                                                         ;G:16
                        04DD  1390 ;       AP      - VMB argument list                                           ;G:16
                        04DD  1391 ;                                                                             ;G:16
                        04DD  1392 ;       (SP)    - Return to PA_DISC, BOO$QIO, or PA_INIT                      ;G:16
                        04DD  1393 ;                                                                             ;G:16
                        04DD  1394 ; Outputs:                                                                    ;G:16
                        04DD  1395 ;                                                                             ;G:16
                        04DD  1396 ;-                                                                            ;G:16
                        04DD  1397          .enable lsb                                                          ;G:16
                        04DD  1398 REC_SCS_MSG:                                                                  ;G:16
              14 A2  B1 04DD  1399          CMPW    SCS$W_MTYPE-SCS$B_PPD(R2),-
                 00     04E0  1400                   #SCS$C_CON_REQ          ; Is it a CONNECT request?
                 13  13 04E1  1401          BEQL    20$                     ; Yes
              14 A2  B1 04E3  1402          CMPW    SCS$W_MTYPE-SCS$B_PPD(R2),-
                 01     04E6  1403                   #SCS$C_CON_RSP          ; Is it a CONNECT response?
                 20  12 04E7  1404          BNEQ    30$                     ; No
           03 22 A2  E8 04E9  1405          BLBS    SCS$W_STATUS-SCS$B_PPD(R2),10$
               FEB8  30 04ED  1406          BSBW    ERROR                   ; Error out if bad status received    ;G:16
                     04F0  1407
               02F8  30 04F0  1408 10$:     BSBW    DISCARD                 ; Get rid of it to free queue
               0329  31 04F3  1409          BRW     REM_NEXT_RSP            ; Go wait for ACCEPT request          ;G:16
                     04F6  1410 ;
                     04F6  1411 ; Received a CONNECT_REQUEST - Send back a NOLISTEN status: we do not
                     04F6  1412 ; support any connections other than our own MSCP initiated ones.  It
                     04F6  1413 ; is probably the SCS directory poller.
                     04F6  1414 ;
                  0A B0 04F6  1415 20$:     MOVW    #SCS$C_STNOMAT,-        ; No matching listener
              22 A2     04F8  1416                   SCS$W_STATUS-SCS$B_PPD(R2)
           50 18 A2  D0 04FA  1417          MOVL    SCS$L_DST_CONID- -
                     04FE  1418                   SCS$B_PPD(R2),R0        ; Reverse the SRC/DST connection ids
                     D0 04FE  1419          MOVL    SCS$L_SRC_CONID- -
                     04FF  1420                   SCS$B_PPD(R2),-
        18 A2  1C A2      04FF  1421                   SCS$L_DST_CONID- -
                     0503  1422                   SCS$B_PPD(R2)
           1C A2  50 D0 0503  1423          MOVL    R0,SCS$L_SRC_CONID-SCS$B_PPD(R2)
                  27 11 0507  1424          BRB     50$                     ; Send it out
                     0509  1425
                  14 A2  B1 0509  1426 30$:     CMPW    SCS$W_MTYPE-SCS$B_PPD(R2),-
                     02     050C  1427                   #SCS$C_ACCP_REQ         ; Is it an ACCEPT request?
                     27  12 050D  1428          BNEQ    60$                     ; No
                     050F  1429 ;
                     050F  1430 ; Received a valid ACCEPT_REQUEST - turn it around to be a ACCEPT_RESPONSE.
                     050F  1431 ;
```

```
                     12   B0  050F  1432          MOVW    #SCS$C_ACCP_RSPL,-
                 10 A2        0511  1433                   SCS$W_LENGTH-SCS$B_PPD(R2) ; Set new length
                          B0  0513  1434          MOVW    #<PPD$M_RSP@8-
                              0514  1435                   !PPD$C_SNDMSG>,-
              0E A2  0102 8F      0514  1436                   PPD$B_OPC(R2)          ; Set to get it back
                             01   B0  0519  1437 40$:     MOVW    #SCS$C_STNORMAL,-
                          22 A2        051B  1438                   SCS$W_STATUS-SCS$B_PPD(R2) ; Set a success status
                       50 18 A2   D0  051D  1439          MOVL    SCS$L_DST_CONID- -
                              0521  1440                   SCS$B_PPD(R2),R0       ; Reverse the SRC/DST connection ids
                          D0  0521  1441          MOVL    SCS$L_SRC_CONID- -
                              0522  1442                   SCS$B_PPD(R2),-
                    18 A2 1C A2       0522  1443                   SCS$L_DST_CONID- -
                              0526  1444                   SCS$B_PPD(R2)
                    1C A2 50   D0  0526  1445          MOVL    R0,SCS$L_SRC_CONID-SCS$B_PPD(R2)
                       18 A2   7D  052A  1446          MOVQ    SCS$L_DST_CONID-SCS$B_PPD(R2),-
                    0120 C7        052D  1447                   TAB_L_RCONID(R7)       ; Store them both for later use
                       14 A2   B6  0530  1448 50$:     INCW    SCS$W_MTYPE-SCS$B_PPD(R2) ; Change to ACP_RSP
                        0291   31  0533  1449          BRW     SEND_MSG               ; Send it out and wait
                              0536  1450
                       14 A2   B1  0536  1451 60$:     CMPW    SCS$W_MTYPE-SCS$B_PPD(R2),-
                          08   0539  1452                   #SCS$C_CR_REQ          ; Is it an CREDIT request?
                          06   12  053A  1453          BNEQ    65$                    ; No                                    ;G:16
                              053C  1454 ;
                              053C  1455 ; Received a CREDIT_REQUEST - send out a CREDIT_RESPONSE and ignore
                              053C  1456 ;
                          0E   B0  053C  1457          MOVW    #SCS$C_CR_RSPL,-
                       10 A2        053E  1458                   SCS$W_LENGTH-SCS$B_PPD(R2) ; Set new length
                          D7   11  0540  1459          BRB     40$                    ; Send it out
                              0542  1460
                       14 A2   B1  0542  1461 65$:     CMPW    SCS$W_MTYPE-SCS$B_PPD(R2),-                             ;G:16
                          06   0545  1462                   #SCS$C_DISC_REQ        ; Is it an DISCONNECT request?          ;G:16
                          07   12  0546  1463          BNEQ    70$                    ; No                                    ;G:16
                              0548  1464 ;                                                                               ;G:16
                              0548  1465 ; Received a DISCONNECT REQUEST                                                 ;G:16
                              0548  1466 ; The other side may be disconnecting because the MSCP timer has expired.       ;G:16
                              0548  1467 ; move the state to VCBROKEN and exit with an error                            ;G:16
                              0548  1468 ;                                                                               ;G:16
                          07   9A  0548  1469          MOVZBL  #STATE_VCBROKEN,-      ; Set the state to VC broken            ;G:16
                    00EC C7        054A  1470                   TAB_L_STATE(R7)                                         ;G:27
                          09   11  054D  1471          BRB     80$                                                     ;G:16
                              054F  1472                                                                               ;G:16
                       14 A2   B1  054F  1473 70$:     CMPW    SCS$W_MTYPE-SCS$B_PPD(R2),-
                          0A   0552  1474                   #SCS$C_APPL_MSG        ; Is it an application message?
                          03   12  0553  1475          BNEQ    80$                                                     ;G:16
                              0555  1476 ;                                                                               ;G:16
                              0555  1477 ; Received an application message - call the MSCP layer                       ;G:16
                              0555  1478 ;                                                                               ;G:16
                        FE96   31  0555  1479          BRW     REC_MSCP               ; Yes, call the MSCP layer              ;G:16
                        FE4D   30  0558  1480 80$:     BSBW    ERROR                  ; No, error                             ;G:16
                              055B  1481          .disable lsb                                                            ;G:16
```

```
                     055B  1483          .SBTTL  -       Q_PKT - Queue an SCS message                                    ;G:16
                     055B  1484 ;+                                                                                       ;G:16
                     055B  1485 ;       Queue an SCS packet - set in the correct credit count and the                    ;G:16
                     055B  1486 ;       connection ID's and forward to the PPT layer                                    ;G:27
                     055B  1487 ;                                                                                       ;G:16
                     055B  1488 ;                                                                                       ;G:16
                     055B  1489 ; Inputs:                                                                               ;G:16
                     055B  1490 ;                                                                                       ;G:16
                     055B  1491 ;       R2      - Packet address                                                        ;G:16
                     055B  1492 ;       R3      - CSR                                                                   ;G:16
                     055B  1493 ;       R7      - PQB                                                                   ;G:16
                     055B  1494 ;       R9      - RPB                                                                   ;G:16
                     055B  1495 ;       (SP)    - Return to  PA_INIT                                                    ;G:21
                     055B  1496 ;                                                                                       ;G:16
                     055B  1497 ; Outputs:                                                                              ;G:16
                     055B  1498 ;                                                                                       ;G:16
                     055B  1499 ;               R0,R1 destroyed                                                         ;G:16
                     055B  1500 ;               R2 - No longer valid                                                    ;G:16
                     055B  1501 ;                                                                                       ;G:16
                     055B  1502 ;-                                                                                      ;G:16
           16 A2  01 B0  055B  1503 Q_PKT:  MOVW    #1,SCS$W_CREDIT-SCS$B_PPD(R2); Always give back one credit          ;G:16
              0120 C7 7D  055F  1504        MOVQ    TAB_L_RCONID(R7),-
                18 A2      0563  1505                 SCS$L_DST_CONID-SCS$B_PPD(R2)  ; Set correct xct_id
                  025F 31  0565  1506        BRW     SEND_MSG                      ; Send it out and wait
```

```
                                0568  1508          .SBTTL  Virtual Circuit layer                                          ;G:16
                                0568  1509          .SBTTL  -       BVP_START Format BVP start data                         ;G:16
                                0568  1510 ;+                                                                             ;G:16
                                0568  1511 ; The Virtual Circuit layer is responsible for opening a virtual circuit      ;G:16
                                0568  1512 ; to a remote node by exchanging the required start handshake data.           ;G:16
                                0568  1513 ;                                                                             ;G:16
                                0568  1514 ; BVP_START -- write the BVP start handshake data into the PQB               ;G:16
                                0568  1515 ;                                                                             ;G:16
                                0568  1516 ; NOTE:  We are defaulting to the PPD protocol version #0 which does        ;G:16
                                0568  1517 ; not allow the sending of out-of-band error log messages or host shutdown   ;G:16
                                0568  1518 ; messages.                                                                   ;G:16
                                0568  1519 ;                                                                             ;G:16
                                0568  1520 ; Inputs:                                                                     ;G:16
                                0568  1521 ;                                                                             ;G:16
                                0568  1522 ;       R2      - Packet address                                              ;G:16
                                0568  1523 ;       R3      - CSR                                                         ;G:16
                                0568  1524 ;       R7      - PQB                                                         ;G:16
                                0568  1525 ;       R9      - RPB                                                         ;G:16
                                0568  1526 ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)    ;G:16
                                0568  1527 ;       4(SP)   - Return to PA_INIT                                           ;G:16
                                0568  1528 ;        (SP)   - Return to RE_INIT                                           ;G:16
                                0568  1529 ;                                                                             ;G:16
                                0568  1530 ;  Output:                                                                    ;G:16
                                0568  1531 ;                                                                             ;G:16
                                0568  1532 ;       R2 - destroyed                                                        ;G:16
                                0568  1533 ;                                                                             ;G:16
                                0568  1534 ;-                                                                            ;G:16
                                0568  1535          .enable lsb                                                        ;G:16
                                0568  1536 BVP_START:                                                                   ;G:16
                          01    9A    0568  1537          MOVZBL  #BVP_C_PRT_BASE,-       ; Set the base BVP protocol level  ;G:16
                        60 A7         056A  1538                  PQB_L_BVP_LEVEL(R7)                                    ;G:16
                    52  0088 C7   DE  056C  1539          MOVAL   PQB_W_PD_MAXDG(R7),R2   ; Get the addr of the              ;G:27
                                0571  1540                                          ;  Maximum Datagram size               ;G:16
                                0571  1541                                                                             ;G:16
                                0571  1542          ASSUME  PQB_W_PD_MAXMSG EQ PQB_W_PD_MAXDG+2                        ;G:16
                82  00400040 8F   D0  0571  1543          MOVL    #<<MS_SIZ-MS_OHD>a16!<DG_SIZ-MS_OHD>>,(R2)+            ;G:16
                                0578  1544                                          ; Store user dg and msg lengths        ;G:16
                                0578  1545                                                                             ;G:16
                                0578  1546          ASSUME  PQB_T_PD_SWTYPE EQ PQB_W_PD_MAXDG+4                        ;G:16
                82  42534D56 8F   D0  0578  1547          MOVL    #^A/VMSB/,(R2)+         ; Software type = VMS/VMB          ;G:16
                                057F  1548                                                                             ;G:16
                                057F  1549          ASSUME  PQB_T_PD_SWVERS EQ PQB_T_PD_SWTYPE+4                       ;G:16
                82  544F4F42 8F   D0  057F  1550          MOVL    #^A/BOOT/,(R2)+         ; Software Version                 ;G:16
                                0586  1551                                                                             ;G:16
                                0586  1552          ASSUME  PQB_T_PD_HWTYPE EQ PQB_T_PD_SWVERS+4                       ;G:16
                          82    D4    0586  1553          CLRL    (R2)+                   ; Hardware type -- unknown         ;G:16
                                0588  1554                                                                             ;G:16
                                0588  1555          ASSUME  PQB_B_PD_HWVERS EQ PQB_T_PD_HWTYPE+4                       ;G:27
                          62    3E    DB  0588  1556          MFPR    #PR$_SID,(R2)           ; Processor id             ;G:16
                                05    058B  1557          RSB                                                            ;G:16
                                      058C  1558          .disable lsb                                                   ;G:16
```

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                        058C  1560          .SBTTL  -       START_VC Initialize the Routing layer                    ;G:16
                        058C  1561 ;+                                                                                 ;G:16
                        058C  1562 ; Only CI ports invoke this layer to establish a virtual circuit to the           ;G:16
                        058C  1563 ; node of the boot device.                                                         ;G:16
                        058C  1564 ;                                                                                  ;G:16
                        058C  1565 ; Begin by inhibiting datagram receipt from all remote ports except the           ;G:16
                        058C  1566 ; one which we are booting from.                                                   ;G:16
                        058C  1567 ;                                                                                  ;G:16
                        058C  1568 ; Next, send a REQID to initiate the virtual circuit handshake.                    ;G:16
                        058C  1569 ;                                                                                  ;G:16
                        058C  1570 ;                                                                                  ;G:16
                        058C  1571 ; Inputs:                                                                          ;G:16
                        058C  1572 ;                                                                                  ;G:16
                        058C  1573 ;       R3      - CSR                                                              ;G:16
                        058C  1574 ;       R4      - Contents of the Port Paramter Register                           ;G:16
                        058C  1575 ;       R7      - PQB                                                              ;G:16
                        058C  1576 ;       R9      - RPB                                                              ;G:16
                        058C  1577 ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)         ;G:16
                        058C  1578 ;       (SP)    - Return to PA_INIT                                                ;G:16
                        058C  1579 ;       R1,R2,R4,R6,R8 - scratch                                                   ;G:16
                        058C  1580 ;-                                                                                 ;G:16
                        058C  1581          .enable lsb                                                               ;G:16
                        058C  1582 START_VC:                                                                          ;G:16
52   0128 C7    DE      058C  1583          MOVAL   TAB_PKT0(R7),R2         ; Set to cover DG                     ;G:16
  55   DF 8F    90      0591  1584          MOVB    #223,R5                 ; Assume large capacity cluster       ;G:16
       54       D5      0595  1585          TSTL    R4                      ; Is it 224 ports?                    ;G:16
       0D       19      0597  1586          BLSS    10$                     ; Yes if high bit set                 ;G:16
                        0599  1587                                                                                  ;G:16
                        0599  1588 ASSUME  BCA_PPR_V_CSZ  EQ CIPA_PPR_V_CSZ                                        ;G:16
                        0599  1589 ASSUME  BCA_PPR_S_CSZ  EQ CIPA_PPR_S_CSZ                                        ;G:16
                        0599  1590                                                                                  ;G:16
           1D    EF      0599  1591          EXTZV   #CIPA_PPR_V_CSZ,-       ; Extract cluster size                ;G:16
54   54    03            059B  1592                  #CIPA_PPR_S_CSZ,R4,R4   ; 0 = 16; 1 = 32 ; 2 = 64 ; 3 = 128  ;G:16
54   10    54    78      059E  1593          ASHL    R4,#16,R4               ; Convert to number of nodes          ;G:16
55   54    01    C3      05A2  1594          SUBL3   #1,R4,R5                ; Store maximum node number           ;G:16
0104 C7    55    91      05A6  1595 10$:     CMPB    R5,TAB_L_RSTAID(R7)     ; Our remote port?                    ;G:16
           1B    13      05AB  1596          BEQL    20$                     ; Yes, skip this                      ;G:16
  0C A2    55    B0      05AD  1597          MOVW    R5,PPD$B_PORT(R2)       ; Set port number                     ;G:16
           B0      05B1  1598          MOVW    #<PPD$M_RSPa8-                                                    ;G:16
                   05B2  1599                   !PPD$C_SETCKT>,-                                                 ;G:16
0E A2      0119 8F      05B2  1600                   PPD$B_OPC(R2)          ; Set to get it back                  ;G:16
           1000 8F 3C   05B7  1601          MOVZWL  #PPD$M_DQI,-                                                ;G:16
             10 A2      05BB  1602                   PPD$W_MASK(R2)         ; Inhibit receipt of datagram         ;G:16
             10 A2 D0   05BD  1603          MOVL    PPD$W_MASK(R2),-                                            ;G:16
             14 A2      05C0  1604                   PPD$W_M_VAL(R2)        ; Copy mask to value                  ;G:16
              0214 30   05C2  1605          BSBW    SENDX                   ; Set the circuit                     ;G:16
              0257 31   05C5  1606          BRW     REM_NEXT_RSP            ;  and wait for response              ;G:16
                        05C8  1607                                                                                  ;G:16
                        05C8  1608 SETCKT:                                                                          ;G:16
           DB 55    F4   05C8  1609 20$:     SOBGEQ  R5,10$                  ; Loop thru them all                  ;G:16
              01C9  30   05CB  1610          BSBW    INIT_FREEQ              ; Init the free queues                ;G:16
                        05CE  1611                                                                                  ;G:16
                        05CE  1612 ;                                                                                ;G:16
                        05CE  1613 ; Now send out a REQID to the remote node to get the handshake started.          ;G:16
                        05CE  1614 ; This will also confirm that the other side is there                            ;G:16
                        05CE  1615 ;                                                                                ;G:16
           05    B0      05CE  1616          MOVW    #PPD$C_REQID,-                                              ;G:16
```

```
      0E A2        05D0  1617                PPD$B_OPC(R2)          ; Request ID from target          ;G:16
      10 A2    7C  05D2  1618        CLRQ    PPD$Q_XCT_ID(R2)                                         ;G:16
       01FB    30  05D5  1619        BSBW    SEND_PKT               ; Send it out and wait            ;G:16
    00EC C7    D4  05D8  1620        CLRL    TAB_L_STATE(R7)        ; Set state to closed             ;G:16
       0240    31  05DC  1621        BRW     REM_NEXT_RSP                                             ;G:16
                   05DF  1622        .disable lsb                                                     ;G:16
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                        05DF  1624          .SBTTL  -       VC Handshake state/action tables                                ;G:16
                        05DF  1625 ;+                                                                                       ;G:16
                        05DF  1626 ;                                                                                        ;G:16
                        05DF  1627 ;  Virtual Circuit handshake state table.  This state table governs the                  ;G:16
                        05DF  1628 ;  START/STACK/ACK datagram handshake which is necessary to open a virtual               ;G:16
                        05DF  1629 ;  circuit between the local and remote nodes.  This handshake is initiated              ;G:16
                        05DF  1630 ;  by the REQID which was sent at the end of the START_VC routine.                       ;G:16
                        05DF  1631 ;                                                                                        ;G:16
                        05DF  1632 ; Event Table                                                                            ;G:16
                        05DF  1633 ;                                                                                        ;G:16
                        05DF  1634                                                                                          ;G:16
                00000000 05DF  1635          EVENT_CLOSED    = 0                                                        ;G:16
                00000001 05DF  1636          EVENT_ST_SENT   = 1                                                        ;G:16
                00000002 05DF  1637          EVENT_ST_RECV   = 2                                                        ;G:16
                        05DF  1638          ASSUME  EVENT_CLOSED EQ PPD$C_START                                        ;G:16
                        05DF  1639          ASSUME  EVENT_ST_SENT EQ PPD$C_STACK                                       ;G:16
                        05DF  1640          ASSUME  EVENT_ST_RECV EQ PPD$C_ACK                                         ;G:16
                        05DF  1641                                                                                      ;G:16
                00000003 05DF  1642          EVENT_TIMEOUT   = 3                                                        ;G:16
                        05DF  1643                                                                                      ;G:16
                        05DF  1644          .MACRO  ACTION,ROUT                                                        ;G:16
                        05DF  1645          .BYTE   ROUT-ROUT_TABLE                                                    ;G:16
                        05DF  1646          .ENDM                                                                      ;G:16
                        05DF  1647                                                                                      ;G:16
                        05DF  1648          .MACRO  SET_ST,NEW_STATE,FINISH                                            ;G:16
                        05DF  1649          .IF B FINISH                                                               ;G:16
                        05DF  1650          .BYTE   128!NEW_STATE                                                      ;G:16
                        05DF  1651          .IFF                                                                       ;G:16
                        05DF  1652          .BYTE   128!64!NEW_STATE                                                   ;G:16
                        05DF  1653          .ENDC                                                                      ;G:16
                        05DF  1654          .ENDM                                                                      ;G:16
                        05DF  1655                                                                                      ;G:16
                        05DF  1656 ;                                                                                        ;G:16
                        05DF  1657 ; State table                                                                            ;G:16
                        05DF  1658 ;                                                                                        ;G:16
                        05DF  1659 STATE_TABLE:                                                                             ;G:16
                        05DF  1660 ;                    CLOSED  ST_SENT ST_RECV OPEN                                        ;G:16
                        05DF  1661 ;                    ------  ------- ------- ----                                        ;G:16
17'00'00'00'            05DF  1662          .BYTE   ACT1-X, ACT1-X, ACT1-X, ACT8-X  ; START received                    ;G:16
13'07'07'17'            05E3  1663          .BYTE   ACT8-X, ACT2-X, ACT2-X, ACT6-X  ; STACK received                    ;G:16
15'11'17'17'            05E7  1664          .BYTE   ACT8-X, ACT8-X, ACT4-X, ACT7-X  ; ACK received                      ;G:16
17'03'0D'0E'            05EB  1665          .BYTE   ACT3-X, ACT3A-X,ACT1A-X,ACT8-X  ; Timeout                           ;G:16
                        05EF  1666 ;                                                                                        ;G:16
                        05EF  1667 ; Action table                                                                           ;G:16
                        05EF  1668 ;                                                                                        ;G:16
                        05EF  1669 ACTION_TABLE:                                                                            ;G:16
                        05EF  1670 X:                                                                                       ;G:16
                        05EF  1671 ;                                                                                        ;G:16
                        05EF  1672 ; START received in CLOSED, ST_SENT, or ST_RECV state                                    ;G:27
                        05EF  1673 ;                                                                                        ;G:16
                        05EF  1674 ACT1:    ACTION  COPY_SYSID                                                              ;G:16
                     00' 05EF               .BYTE   COPY_SYSID-ROUT_TABLE
                        05F0  1675          ACTION  OPEN_VC                                                                 ;G:16
                     1A' 05F0               .BYTE   OPEN_VC-ROUT_TABLE
                        05F1  1676          ACTION  SPIN                                                                    ;G:16
                     1C' 05F1               .BYTE   SPIN-ROUT_TABLE                                                         ;G:16
                        05F2  1677 ;                                                                                        ;G:16
```

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        05F2  1678 ; Timeout in ST_RECV state                                          ;G:16
        05F2  1679 ;                                                                   ;G:16
        05F2  1680 ACT1A:  ACTION  CHK_TIMEOUT                                         ;G:16
     1E' 05F2              .BYTE   CHK_TIMEOUT-ROUT_TABLE
        05F3  1681         ACTION  GET_NEW_PKT                                         ;G:16
     01' 05F3              .BYTE   GET_NEW_PKT-ROUT_TABLE
        05F4  1682         ACTION  SEND_STACK                                          ;G:16
     32' 05F4              .BYTE   SEND_STACK-ROUT_TABLE
        05F5  1683         SET_ST  STATE_ST_RECV                                       ;G:16
     82  05F5              .BYTE   128!STATE_ST_RECV
        05F6  1684 ;                                                                   ;G:16
        05F6  1685 ;       STACK received in the ST_SENT and ST_RECV state             ;G:16
        05F6  1686 ;                                                                   ;G:16
        05F6  1687 ACT2:   ACTION  COPY_SYSID                                          ;G:16
     00' 05F6              .BYTE   COPY_SYSID-ROUT_TABLE
        05F7  1688         ACTION  OPEN_VC                                             ;G:16
     1A' 05F7              .BYTE   OPEN_VC-ROUT_TABLE
        05F8  1689         ACTION  SPIN                                                ;G:16
     1C' 05F8              .BYTE   SPIN-ROUT_TABLE                                     ;G:16
        05F9  1690         ACTION  GET_NEW_PKT                                         ;G:16
     01' 05F9              .BYTE   GET_NEW_PKT-ROUT_TABLE
        05FA  1691         ACTION  SEND_ACK                                            ;G:16
     07' 05FA              .BYTE   SEND_ACK-ROUT_TABLE
        05FB  1692         SET_ST  STATE_OPEN,FINISH                                   ;G:16
     C3  05FB              .BYTE   128!64!STATE_OPEN                                   ;G:16
        05FC  1693 ;                                                                   ;G:16
        05FC  1694 ;  TIMEOUT in the ST_SENT state                                     ;G:16
        05FC  1695 ;                                                                   ;G:16
        05FC  1696 ACT3A:  ACTION  GET_NEW_PKT                                         ;G:16
     01' 05FC              .BYTE   GET_NEW_PKT-ROUT_TABLE
        05FD  1697 ;                                                                   ;G:16
        05FD  1698 ;  TIMEOUT in the CLOSED state                                      ;G:16
        05FD  1699 ;                                                                   ;G:16
        05FD  1700 ACT3:   ACTION  CHK_TIMEOUT                                         ;G:16
     1E' 05FD              .BYTE   CHK_TIMEOUT-ROUT_TABLE
        05FE  1701         ACTION  SEND_START                                          ;G:16
     11' 05FE              .BYTE   SEND_START-ROUT_TABLE
        05FF  1702         SET_ST  STATE_ST_SENT                                       ;G:16
     81  05FF              .BYTE   128!STATE_ST_SENT
        0600  1703 ;                                                                   ;G:16
        0600  1704 ;  ACK received in ST_RECV state                                    ;G:16
        0600  1705 ;                                                                   ;G:16
        0600  1706 ACT4:   SET_ST  STATE_OPEN,FINISH                                   ;G:16
     C3  0600              .BYTE   128!64!STATE_OPEN                                   ;G:16
        0601  1707 ;                                                                   ;G:16
        0601  1708 ;  TIMEOUT in OPEN state                                            ;G:16
        0601  1709 ;                                                                   ;G:16
        0601  1710 ACT5:   SET_ST  STATE_OPEN                                          ;G:16
     83  0601              .BYTE   128!STATE_OPEN                                      ;G:16
        0602  1711 ;                                                                   ;G:16
        0602  1712 ;  STACK received in OPEN state                                     ;G:16
        0602  1713 ;                                                                   ;G:16
        0602  1714 ACT6:   ACTION  SEND_ACK                                            ;G:16
     07' 0602              .BYTE   SEND_ACK-ROUT_TABLE
        0603  1715         SET_ST  STATE_OPEN                                          ;G:16
     83  0603              .BYTE   128!STATE_OPEN                                      ;G:16
        0604  1716 ;                                                                   ;G:16
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                     0604  1717 ;  ACK received in OPEN state.                                          ;G:16
                     0604  1718 ;                                                                       ;G:16
                     0604  1719 ACT7:   ACTION  DISCARD_PKT                                            ;G:16
                04'  0604               .BYTE   DISCARD_PKT-ROUT_TABLE
                     0605  1720         SET_ST  STATE_OPEN                                            ;G:16
                83   0605               .BYTE   128!STATE_OPEN                                        ;G:16
                     0606  1721 ;                                                                       ;G:16
                     0606  1722 ;  Unexpected datagram for the current state:                          ;G:16
                     0606  1723 ;                                                                       ;G:16
                     0606  1724 ;  START received or TIMEOUT in OPEN state                            ;G:16
                     0606  1725 ;  STACK or ACK received in CLOSED state                              ;G:16
                     0606  1726 ;  ACK received in ST_SENT state                                      ;G:16
                     0606  1727 ;                                                                       ;G:27
                     0606  1728 ;                                                                       ;G:27
                     0606  1729 ;  Assume that the HSC lost the virtual circuit and begin again from  ;G:16
                     0606  1730 ;  scratch.                                                           ;G:16
                     0606  1731 ;                                                                       ;G:16
                     0606  1732 ACT8:   ACTION  START_OVER                                            ;G:16
                2C'  0606               .BYTE   START_OVER-ROUT_TABLE
```

```
                     0607  1734          .SBTTL  -       VC Handshake action routines                                    ;G:16
                     0607  1735 ;+                                                                                       ;G:16
                     0607  1736 ;                                                                                        ;G:16
                     0607  1737 ; Start handshake action routines                                                        ;G:16
                     0607  1738 ;                                                                                        ;G:16
                     0607  1739 ; Inputs:                                                                                ;G:16
                     0607  1740 ;                                                                                        ;G:16
                     0607  1741 ;       R2      - Packet address                                                        ;G:16
                     0607  1742 ;       R3      - CSR                                                                   ;G:16
                     0607  1743 ;       R5      - Next Action                                                           ;G:16
                     0607  1744 ;       R7      - PQB                                                                   ;G:16
                     0607  1745 ;       R9      - RPB                                                                   ;G:16
                     0607  1746 ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)              ;G:16
                     0607  1747 ;       4(SP)   - Return to PA_INIT                                                     ;G:16
                     0607  1748 ;        (SP)   - Return to DISPATCH_DG                                                 ;G:16
                     0607  1749 ;                                                                                       ;G:16
                     0607  1750 ;-                                                                                       ;G:16
                     0607  1751          .enable lsb                                                                    ;G:16
                     0607  1752 ROUT_TABLE:                              ; Start of the routines                        ;G:16
                     0607  1753 COPY_SYSID:                                                                            ;G:16
                  05 0607  1754 10$:     RSB                             ; Leave                                        ;G:16
                     0608  1755 GET_NEW_PKT:                                                                           ;G:16
                01A7 31 0608  1756          BRW     ALLOC_DG                                                           ;G:16
                     060B  1757                                                                                        ;G:16
                     060B  1758 DISCARD_PKT:                                                                           ;G:16
                01DD 31 060B  1759          BRW     DISCARD                                                            ;G:16
                     060E  1760                                                                                        ;G:16
                     060E  1761 SEND_ACK:                                                                              ;G:16
            00020004 8F  D0  060E  1762          MOVL    #<PPD$C_ACK@16+PPD$C_ACK_LEN>,-                               ;G:16
                  10 A2      0614  1763           PPD$W_LENGTH(R2)                                                    ;G:16
                     53  11  0616  1764          BRB     40$                             ; Send it out                  ;G:27
                     0618  1765                                                                                        ;G:16
                     0618  1766 SEND_START:                                                                            ;G:16
           50    10 A2  9E  0618  1767          MOVAB   PPD$W_LENGTH(R2),R0             ; Set pointer                  ;G:16
              80    3E  D0  061C  1768          MOVL    #<PPD$C_START@16+PPD$C_START_LEN>,(R0)+                        ;G:16
                     26  11  061F  1769          BRB     30$                                                            ;G:16
                     0621  1770                                                                                        ;G:16
                     0621  1771 OPEN_VC:                                                                               ;G:16
                     4B  11  0621  1772          BRB     OPEN_VC_CONT                    ; Spacing                      ;G:16
                     0623  1773                                                                                        ;G:16
                     0623  1774 SPIN:                                                                                  ;G:16
                     5C  11  0623  1775          BRB     SPIN_CONT                                                      ;G:16
                     0625  1776 ; CHK_TIMEOUT:                                                                         ;G:16
                     0625  1777 ;                                                                                       ;G:16
                     0625  1778 ;       A timeout occurred during the start handshake.                                  ;G:16
                     0625  1779 ;       If we have exceeded our timeout limit and have a second HSC to                 ;G:16
                     0625  1780 ;       try, then abort here and re-init the port using the second HSC.                ;G:16
                     0625  1781 ;       If there is only one HSC, then keep waiting on that HSC since                  ;G:16
                     0625  1782 ;       it may be rebooting                                                            ;G:16
                     0625  1783 ;                                                                                      ;G:27
                     0625  1784 ; START_OVER:                                                                          ;G:16
                     0625  1785 ;                                                                                       ;G:16
                     0625  1786 ;       An illegal datagram arrived indicating that the HSC and the VAX                ;G:16
                     0625  1787 ;       are not in synchronization -- the safest recovery is to re-init the            ;G:16
                     0625  1788 ;       port and start from the beginning.                                             ;G:16
                     0625  1789 ;                                                                                       ;G:16
                     0625  1790 CHK_TIMEOUT:                                                                           ;G:16
```

```
                FA61 CF    FA63 CF    91   0625  1791          CMPB    REM_NODE,REM_NODE+1     ; Alternate HSC to try?                ;G:16
                                0A    13   062C  1792          BEQL    20$                     ; No alternate, keep retrying          ;G:16
                      05 010C C7    F4   062E  1793          SOBGEQ  TAB_L_TMO_CNT(R7),20$   ; Retries not exhausted, continue     ;G:16
                                      0633  1794 START_OVER:                                                                          ;G:16
                                   8E   D5   0633  1795          TSTL    (SP)+                   ; Get rid of first level return        ;G:16
                                00B4    31   0635  1796          BRW     RE_INIT                 ; Restart using the other HSC          ;G:16
                                        05   0638  1797 20$:      RSB                                                                    ;G:16
                                             0639  1798                                                                               ;G:16
                                             0639  1799          ASSUME  <.-ROUT_TABLE> LT 128                                          ;G:16
                                             0639  1800 SEND_STACK:                                                                   ;G:16
                                      40 A2  7C   0639  1801          CLRQ    PPD$Q_NODENAME(R2)      ; Clear out the node name field        ;G:16
                                50    10 A2  9E   063C  1802          MOVAB   PPD$W_LENGTH(R2),R0     ; Set pointer                          ;G:16
                           80   0001003E 8F  D0   0640  1803          MOVL    #<PPD$C_STACK@16+PPD$C_STACK_LEN>,(R0)+                ;G:16
                                   80    3E  DB   0647  1804 30$:      MFPR    #PR$_SID,(R0)+          ; Set fake system id           ;G:16
                                80   8000 8F  3C   064A  1805          MOVZWL  #^X8000,(R0)+           ; Set high bit in high order   ;G:16
                           80   00400040 8F  D0   064F  1806          MOVL    #<<MS_SIZ-MS_OHD>@16!<DG_SIZ-MS_OHD>>,(R0)+            ;G:16
                           80   42534D56 8F  D0   0656  1807          MOVL    #^A/VMSB/,(R0)+         ; Opsys = VMS/VMB              ;G:16
                           80   544F4F42 8F  D0   065D  1808          MOVL    #^A/BOOT/,(R0)+         ; Version                      ;G:16
                                      80    7C   0664  1809          CLRQ    (R0)+                   ; Boot time                    ;G:16
                                      80    D4   0666  1810          CLRL    (R0)+                                                  ;G:16
                                60    3E    DB   0668  1811          MFPR    #PR$_SID,(R0)           ; Processor id                 ;G:16
                                  0161    31   066B  1812 40$:      BRW     SEND_DG                                                ;G:16
                                          066E  1813                                                                               ;G:16
                                          066E  1814 OPEN_VC_CONT:                                                                 ;G:16
                                      19  B0   066E  1815          MOVW    #PPD$C_SETCKT,-         ; Set to SETCKT but don't ask for      ;G:16
                                   0E A2          0670  1816           PPD$B_OPC(R2)          ; a response                           ;G:16
                                          3C   0672  1817          MOVZWL  #<PPD$M_CST!PPD$M_NR-                                  ;G:16
                                          0673  1818                   !PPD$M_NS>,-                                            ;G:16
                            10 A2  E000 8F       0673  1819            PPD$W_MASK(R2)          ; Open the virtual circuit             ;G:16
                                   8000 8F   3C   0678  1820          MOVZWL  #PPD$M_CST,-                                           ;G:16
                                     14 A2       067C  1821           PPD$W_M_VAL(R2)         ; Clear all but the circuit status     ;G:16
                                      0152   31   067E  1822          BRW     SEND_PKT                                               ;G:16
                                             0681  1823                                                                               ;G:16
                                             0681  1824 SPIN_CONT:                                                                   ;G:16
                                             0681  1825          .show binary                                                           ;G:16
                                             0681  1826          TIMEDWAIT TIME=#33*1000,-       ; 1/3 second wait                      ;G:16
                                             0681  1827                    INS1=<MOVL TAB_L_RSTAID(R7),TAB_L_HOLE(R7)>,-          ;G:16
                                             0681  1828                    DONELBL=1$              ; Waste time                   ;G:16
                                50    01   3C   0681                MOVZWL  #SS$_NORMAL,R0
51   00000000'GF    000080E8 8F  C5   0684                MULL3   #33*1000,G^EXE$GL_TENUSEC,R1
                                   7E   D4   0690                CLRL    -(SP)
                                        0692          30002$:
                      00E8 C7    0104 C7   D0   0692                MOVL TAB_L_RSTAID(R7),TAB_L_HOLE(R7)
                       6E   00000000'GF   D0   0699                MOVL    G^EXE$GL_UBDELAY,(SP)
                                 FD 6E    F5   06A0          30003$: SOBGTR  (SP),30003$
                                 EC 51    F5   06A3                  SOBGTR  R1,30002$
                                    50    D4   06A6                  CLRL    R0
                                          06A8          1$:
                                    8E    D5   06A8                  TSTL    (SP)+
                                          06AA  1829                  .noshow binary                                                 ;G:16
                                          05   06AA  1830                  RSB                                                    ;G:16
                                          06AB  1831                  .disable lsb                                                   ;G:16
```

```
                        06AB  1833          .SBTTL  -       VC Handshake action routine dispatcher                  ;G:16
                        06AB  1834          .SBTTL  -               TIMOUT - timeout handler                        ;G:16
                        06AB  1835          .SBTTL  -               DISPATCH_DG - dispatch received datagram        ;G:16
                        06AB  1836 ;+                                                                               ;G:16
                        06AB  1837 ; TIMOUT -       Timeout handler                                                 ;G:16
                        06AB  1838 ; DISPATCH_DG - Datagram dispatcher                                              ;G:16
                        06AB  1839 ;                                                                                ;G:16
                        06AB  1840 ; Use the incoming DG type (or timeout) and the current state to index           ;G:16
                        06AB  1841 ; into the state table and determine next action to take.                        ;G:16
                        06AB  1842 ;                                                                                ;G:16
                        06AB  1843 ; Inputs:                                                                        ;G:16
                        06AB  1844 ;                                                                                ;G:16
                        06AB  1845 ;       R0       - Event code                                                    ;G:16
                        06AB  1846 ;       R2       - Packet address                                                ;G:16
                        06AB  1847 ;       R3       - CSR                                                           ;G:16
                        06AB  1848 ;       R5       - Next Action                                                   ;G:16
                        06AB  1849 ;       R7       - PQB                                                           ;G:16
                        06AB  1850 ;       R9       - RPB                                                           ;G:16
                        06AB  1851 ;       R10      - Mapping Enabled Flag  (Zero for virtual mapping enabled)      ;G:16
                        06AB  1852 ;       (SP)     - Return to PA_INIT                                             ;G:16
                        06AB  1853 ;                                                                                ;G:16
                        06AB  1854 ;       R1,R4, scratch                                                          ;G:16
                        06AB  1855 ;                                                                                ;G:16
                        06AB  1856 ;-                                                                               ;G:16
                        06AB  1857          .enable lsb                                                             ;G:16
                        06AB  1858                                                                                  ;G:16
          50   03   D0   06AB  1859 TIMOUT: MOVL    #EVENT_TIMEOUT,R0       ; Timed out, set code                 ;G:16
                        06AE  1860                                                                                  ;G:16
                        06AE  1861 DISPATCH_DG:                                                                     ;G:16
       03   00EC C7   91   06AE  1877 10$:    CMPB    TAB_L_STATE(R7),#STATE_OPEN     ; Is it in a legal state?  ;G:16
                 08   15   06B3  1878          BLEQ    20$                             ; Yes, continue             ;G:16
                 07   9A   06B5  1879          MOVZBL  #STATE_VCBROKEN,-               ; Set the state to VC broken ;G:16
             00EC C7        06B7  1880                  TAB_L_STATE(R7)                                             ;G:27
                FCEB   30   06BA  1881          BSBW    ERROR                           ; No, leave                  [24]
    50   00EC D740   DE   06BD  1882 20$:    MOVAL   @TAB_L_STATE(R7)[R0],R0 ; Set up to index into              ;G:16
    50   FF17 CF40   9A   06C3  1883          MOVZBL  STATE_TABLE[R0],R0      ;  the state table to get action offset ;G:1
    55   FF21 CF40   9E   06C9  1884          MOVAB   ACTION_TABLE[R0],R5     ; Point to start in action table    ;G:16
       50   85   98   06CF  1885 30$:    CVTBL   (R5)+,R0                        ; Pick up offset to routine         ;G:16
                 07   19   06D2  1886          BLSS    40$                             ; State change              ;G:16
             FF2E CF40   16   06D4  1887          JSB     ROUT_TABLE[R0]                  ; Do the routine            ;G:16
                F4   11   06D9  1888          BRB     30$                             ; Try for more              ;G:16
                        06DB  1889                                                                                  ;G:16
00EC C7   50   C0 8F   8B   06DB  1890 40$:    BICB3   #192,R0,TAB_L_STATE(R7) ; Set new state                     ;G:16
          03 50   06   E1   06E2  1891          BBC     #6,R0,50$               ; Branch if not yet done            ;G:16
                FDD6   31   06E6  1892          BRW     INIT_CONNECT            ; We are finished, begin the SCS    ;G:16
                        06E9  1893                                              ; connection handshake              ;G:16
                0133   31   06E9  1894 50$:    BRW     REM_NEXT_RSP            ; Else go wait for new arrival      ;G:16
                        06EC  1895          .disable lsb                                                            ;G:16
```

```
                        06EC  1897          .SBTTL  Port queue block layer                                          ;G:16
                        06EC  1898          .SBTTL  -       RE_INIT initialize the port and its data structures     ;G:16
                        06EC  1899 ;+                                                                               ;G:16
                        06EC  1900 ; The Port Queue block layer is responsible for management of the port queues    ;G:16
                        06EC  1901 ; and the dispatching of port commands.                                          ;G:16
                        06EC  1902 ;                                                                                ;G:16
                        06EC  1903 ; Begin by allocating and initializing the port queue block.                     ;G:16
                        06EC  1904 ;                                                                                ;G:16
                        06EC  1905 ; Inputs:                                                                        ;G:16
                        06EC  1906 ;                                                                                ;G:16
                        06EC  1907 ;        R9      - RPB                                                           ;G:16
                        06EC  1908 ;        AP      - VMB argument list                                             ;G:16
                        06EC  1909 ;        (SP)    - Return to PA_INIT                                             ;G:16
                        06EC  1910 ;                                                                                ;G:16
                        06EC  1911 ; Outputs:                                                                       ;G:16
                        06EC  1912 ;                                                                                ;G:16
                        06EC  1913 ;        R0-R5   - destroyed                                                     ;G:16
                        06EC  1914 ;        R3      - port register base                                            ;G:16
                        06EC  1915 ;        R7      - PQB base                                                      ;G:16
                        06EC  1916 ;                                                                                ;G:16
                        06EC  1917 ;-                                                                               ;G:16
                        06EC  1918          .enable lsb                                                             ;G:16
                        06EC  1919 RE_INIT:                                                                         ;G:16
                        06EC  1920 ;                                                                                ;G:16
                        06EC  1921 ; Allocate the PQB on a page-aligned boundary                                    ;G:16
                        06EC  1922 ;                                                                                ;G:16
            57  10A4'CF  9E  06EC  1923          MOVAB   W^TABLE,R7              ; Cover the area                ;G:16
            57  01FF C7  9E  06F1  1924          MOVAB   511(R7),R7              ; Set to round up               ;G:16
            57  01FF 8F  AA  06F6  1925          BICW    #511,R7                 ;  to next page                 ;G:16
67  050C 8F  00  6E  00  2C  06FB  1926          MOVC5   #0,(SP),#0,#TAB_LEN,(R7); Zero it all out               ;G:16
                        0703  1927 ;+                                                                               ;G:16
                        0703  1928 ; Obtain the address of the port hardware registers and set up the               ;G:16
                        0703  1929 ; correct page tables for the mapping mode.                                      ;G:16
                        0703  1930 ;                                                                                ;G:16
                        0703  1931 ; Outputs:                                                                       ;G:16
                        0703  1932 ;        R2,R4,R6- Destroyed                                                     ;G:16
                        0703  1933 ;                                                                                ;G:16
                        0703  1934 ;        R3      - Address of port hardware registers                            ;G:16
                        0703  1935 ;                                                                                ;G:16
                        0703  1936 ;        R1      - Number of system page table entries                           ;G:16
                        0703  1937 ;        R5      - Physical address of the system page table                     ;G:16
                        0703  1938 ;        R8      - Physical address of the Port Queue Block base                 ;G:16
                        0703  1939 ;        R10     - System virtual address bit                                    ;G:16
                        0703  1940 ;                                                                                ;G:16
                        0703  1941 ;-                                                                               ;G:16
            50  38  DB  0703  1942          MFPR    #PR$_MAPEN,R0           ; Get the mapping status            ;G:16
                        0706  1943          ASSUME  RPB$L_ADPVIR EQ RPB$L_ADPPHY+4                              ;G:16
            53  5C A940  D0  0706  1944          MOVL    RPB$L_ADPPHY(R9)[R0],R3 ; Get correct pointer to port registers ;G:1
            5A  01  1F  9C  070B  1945          ROTL    #VA$V_SYSTEM,#1,R10     ; Set the system VA bit         ;G:16
              05 50  E8  070F  1946          BLBS    R0,20$                  ; If virtual, skip some set up      ;G:16
                        0712  1947          ;                                                                   ;G:16
                        0712  1948          ; Mapping is physical -- assume that VMB has allocated space for a  ;G:16
                        0712  1949          ; system page table in a region just beyond the microcode.  Initialize ;G:16
                        0712  1950          ; this page table and use it for further port operations.           ;G:16
                        0712  1951          ;                                                                   ;G:16
            58  57  D0  0712  1952          MOVL    R7,R8                   ; PQB PA=VA                         ;G:16
                10  11  0715  1953          BRB     30$                     ; Join common                       ;G:16
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                                0717  1954          ;                                                                       ;G:16
                                0717  1955          ; Mapping is virtual                                                    ;G:16
                                0717  1956          ;                                                                       ;G:16
        58   57   15   09   EF  0717  1957 20$:     EXTZV   #VA$V_VPN,#VA$S_VPN,R7,R8 ; Get virtual page number          ;G:16
             58   50 B948   DE  071C  1958          MOVAL   @RPB$L_SVASPT(R9)[R8],R8  ; Find page table entry            ;G:16
             58   68   09   78  0721  1959          ASHL    #9,(R8),R8                ; Turn into physical address          ;G:16
                       5A   D4  0725  1960          CLRL    R10                       ; Initialize                          ;G:16
                                0727  1961 ;                                                                               ;G:16
                                0727  1962 ; Set up the PQB                                                               ;G:27
                                0727  1963 ;       Use R2 as a pointer into the current PQB cell                         ;G:16
                                0727  1964 ;       Use R6 as a pointer into the rest of the driver data base             ;G:16
                                0727  1965 ;                                                                               ;G:16
                                0727  1966 30$:                                                                           ;G:16
             51   0D   DB  0727  1967          MFPR    #PR$_SLR,R1               ; Size of page table                  ;G:16
        55   00000000'EF   D0  072A  1968          MOVL    @MMG$GL_SPTBASE,R5        ; Address                             ;G:16
                  020D   30  0731  1969          BSBW    SELECT_HARDWARE           ; Configure the current hardware      ;G:16
             56   00EC C7   DE  0734  1970          MOVAL   TAB_L_STATE(R7),R6        ; Point to start                      ;G:16
               52   28 A7   DE  0739  1971          MOVAL   PQB_L_DFRQ_HDR(R7),R2     ; Ditto                               ;G:16
                  86   05   D0  073D  1972          MOVL    #STATE_INIT,(R6)+         ; Set STATE to initial                ;G:16
                                0740  1973                                                                                  ;G:16
                                0740  1974          ASSUME  TAB_Q_DFRQ      EQ TAB_L_STATE+4                              ;G:16
                                0740  1975          ASSUME  TAB_Q_DFRQ&7 EQ 0         ; Quadword aligned?                   ;G:16
                  62   86   7E  0740  1976          MOVAQ   (R6)+,(R2)                ; Datagram free que header            ;G:16
                  82   5A   C8  0743  1977          BISL    R10,(R2)+                 ; Set sys VA bit                      ;G:16
                                0746  1978                                                                                  ;G:16
                                0746  1979          ASSUME  TAB_Q_MFRQ&7 EQ 0         ; Quadword aligned?                   ;G:16
                                0746  1980          ASSUME  TAB_Q_MFRQ EQ TAB_Q_DFRQ+8                                    ;G:16
                                0746  1981          ASSUME  PQB_L_MFRQ_HDR EQ PQB_L_DFRQ_HDR+4                            ;G:16
                  62   86   7E  0746  1982          MOVAQ   (R6)+,(R2)                ; Message free que header             ;G:16
                  82   5A   C8  0749  1983          BISL    R10,(R2)+                 ; Set sys VA bit                      ;G:16
                                074C  1984                                                                                  ;G:16
                                074C  1985          ASSUME  PQB_L_DQE_LEN EQ PQB_L_MFRQ_HDR+4                             ;G:16
             82   0060 8F   3C  074C  1986          MOVZWL  #DG_SIZ,(R2)+             ; Datagram size                       ;G:16
                                0751  1987                                                                                  ;G:16
                                0751  1988          ASSUME  PQB_L_MQE_LEN EQ PQB_L_DQE_LEN+4                              ;G:16
             82   0060 8F   3C  0751  1989          MOVZWL  #MS_SIZ,(R2)+             ; Message size                        ;G:16
                                0756  1990                                                                                  ;G:16
                                0756  1991          ASSUME  TAB_L_TIMER     EQ TAB_Q_MFRQ+8                               ;G:16
          86   00061A80 8F   D0  0756  1992          MOVL    #WAIT_TIME,(R6)+          ; Set timer                           ;G:16
                                075D  1993                                                                                  ;G:16
                                075D  1994          ASSUME  TAB_L_RSTAID    EQ TAB_L_TIMER+4                              ;G:16
             50   F92D CF   90  075D  1995          MOVB    REM_NODE_INDEX,R0                 ; Pick up remote port/node index ;G:
        F926 CF   50   01   8D  0762  1996          XORB3   #1,R0,REM_NODE_INDEX              ; Set other path for next time ;G:16
             86   F91F CF40   9A  0768  1997          MOVZBL  REM_NODE[R0],(R6)+                ; Transfer remote port          ;G:16
   F91A CF   F919 CF40   90  076E  1998          MOVB    REM_NODE[R0],HSC$B_PORT_NUMBER                                    ;G:16
                                0776  1999          ASSUME  TAB_L_PAGETBL   EQ TAB_L_RSTAID+4                             ;G:16
             86   55   5A   C9  0776  2000          BISL3   R10,R5,(R6)+              ; Store the psuedo page table        ;G:16
                                077A  2001                                                                                  ;G:16
                                077A  2002          ASSUME  TAB_L_TMO_CNT   EQ TAB_L_PAGETBL+4                            ;G:16
                  86   08   9A  077A  2003          MOVZBL  #MAX_TIMEOUT,(R6)+        ; Set number of start handshake       ;G:16
                                077D  2004                                            ;  trials                             ;G:16
                                077D  2005                                                                                  ;G:16
                                077D  2006          ASSUME  PQB_L_VPQB_BASE EQ PQB_L_MQE_LEN+4                            ;G:16
             82   57   5A   C9  077D  2007          BISL3   R10,R7,(R2)+               ; Set virtual address of self        ;G:16
                                0781  2008                                                                                  ;G:16
                                0781  2009          ASSUME  TAB_B_BDT       EQ TAB_L_TMO_CNT+4                            ;G:16
                                0781  2010          ASSUME  PQB_L_BDT_BASE EQ PQB_L_VPQB_BASE+4                           ;G:16
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                82   56   5A   C9  0781  2011          BISL3   R10,R6,(R2)+            ; Address of BDT                        ;G:16
                66   01   10   9C  0785  2012          ROTL    #16,#1,(R6)             ; Set the valid bit                     ;G:16
                                  0789  2013                                                                                  ;G:16
                                  0789  2014          ASSUME  PQB_L_BDT_LEN EQ PQB_L_BDT_BASE+4                           ;G:16
                     82   D6      0789  2015          INCL    (R2)+                   ; Num of entries in BDT                 ;G:16
                                  078B  2016                                                                                  ;G:16
                                  078B  2017          ASSUME  PQB_L_SPT_BASE EQ PQB_L_BDT_LEN+4                           ;G:16
                82   55   D0      078B  2018          MOVL    R5,(R2)+                ; Set phys addr of page table           ;G:16
                                  078E  2019                                                                                  ;G:16
                                  078E  2020          ASSUME  PQB_L_SPT_LEN EQ PQB_L_SPT_BASE+4                           ;G:16
                82   51   D0      078E  2021          MOVL    R1,(R2)+                ; And length                            ;G:16
                                  0791  2022                                                                                  ;G:16
                   FDD4   30      0791  2023          BSBW    BVP_START               ; Call the virtual circuit layer        ;G:16
                                  0794  2024                                          ; to fill in the BVP start handshake    ;G:16
                                  0794  2025                                          ; data.                                 ;G:16
                   0265   31      0794  2026          BRW     INIT_HARDWARE           ; Done with PQB, initialize the         ;G:16
                                  0797  2027                                          ; hardware layer                        ;G:16
                                  0797  2028          .disable lsb                                                        ;G:16
```

```
                     0797  2030          .SBTTL  -       INIT_FREEQ - populate the free queues                   ;G:16
                     0797  2031 ;+                                                                                ;G:16
                     0797  2032 ; INIT_FREEQ -- populate the free queues                                          ;G:16
                     0797  2033 ;                                                                                 ;G:16
                     0797  2034 ; Give 5 of the 6 datagrams to the port to put on the free queue.                 ;G:16
                     0797  2035 ; By giving it 6 we can be assured that 3 should always be on the actual          ;G:16
                     0797  2036 ; queue and not hidden away in internal caches.                                   ;G:16
                     0797  2037 ;                                                                                 ;G:16
                     0797  2038 ; Input:                                                                          ;G:16
                     0797  2039 ;                                                                                 ;G:16
                     0797  2040 ;       R2 - address of the first packet for the free queue                      ;G:16
                     0797  2041 ;       R3      - CSR                                                            ;G:16
                     0797  2042 ;       R7      - PQB                                                            ;G:16
                     0797  2043 ;       R9      - RPB                                                            ;G:16
                     0797  2044 ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)       ;G:16
                     0797  2045 ;       4(SP)   - Return to PA_INIT                                              ;G:16
                     0797  2046 ;        (SP)   - Return to START_VC or START_BVP                                ;G:16
                     0797  2047 ;                                                                                 ;G:16
                     0797  2048 ;       Output:                                                                  ;G:27
                     0797  2049 ;                                                                                 ;G:16
                     0797  2050 ;       R2      - address of the last free packet                                ;G:16
                     0797  2051 ;-                                                                                ;G:16
                     0797  2052          .enable lsb                                                             ;G:16
                     0797  2053 INIT_FREEQ:                                                                       ;G:16
          55   09   D0  0797  2054          MOVL    #9,R5                   ; Keep one in reserve                ;G:16
               56 8ED0  079A  2055          POPL    R6                      ; Save the return address.  We must  ;G:16
                     079D  2056                                           ;  do this because DISCARD is a second ;G:16
                     079D  2057                                           ;  level subroutine that invokes error ;G:16
                     079D  2058                                           ;  recovery.                          ;G:16
     04    55   91  079D  2059 10$:     CMPB    R5,#4                   ; First four are messages            ;G:16
               04   15  07A0  2060          BLEQ    20$                                                      ;G:16
 08  A2    01   D0  07A2  2061          MOVL    #1,PPD$W_SIZE(R2)       ; Show as message                    ;G:16
               43   10  07A6  2062 20$:     BSBB    DISCARD                 ; Put it on free queue               ;G:16
 52    60  A2   9E  07A8  2063          MOVAB   DG_SIZ(R2),R2           ; Step to next one                   ;G:16
       EE  55   F5  07AC  2064          SOBGTR  R5,10$                                                       ;G:16
           56   DD  07AF  2065          PUSHL   R6                      ; Restore the caller's address       ;G:16
               05   07B1  2066          RSB                                                                  ;G:16
                     07B2  2067                                                                               ;G:16
                     07B2  2068          .disable lsb                                                         ;G:16
```

```
                                07B2  2070          .SBTTL  -       ALLOG_DG obtain a datagram from the free queue        ;G:16
                                07B2  2071 ;+                                                                          ;G:16
                                07B2  2072 ; ALLOC_DG looks for a datagram on the free queue.  There should always       ;G:16
                                07B2  2073 ; be enough datagrams there to be in excess of those which the port has       ;G:16
                                07B2  2074 ; cached internally.                                                          ;G:16
                                07B2  2075 ;                                                                             ;G:16
                                07B2  2076 ; Input:                                                                      ;G:16
                                07B2  2077 ;                                                                             ;G:16
                                07B2  2078 ;        R3      - CSR                                                        ;G:16
                                07B2  2079 ;        R7      - PQB                                                        ;G:16
                                07B2  2080 ;        R9      - RPB                                                        ;G:16
                                07B2  2081 ;        R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)   ;G:16
                                07B2  2082 ;        4(SP)   - Return to PA_DISC, BOO$QIO, or PA_INIT                     ;G:16
                                07B2  2083 ;         (SP)   - Return to SEND_MSG, SEND_ANY, DISPATCH_DG, START_VC or     ;G:16
                                07B2  2084 ;                  INIT_FREEQ                                                 ;G:16
                                07B2  2085 ;                                                                             ;G:27
                                07B2  2086 ; Output:                                                                     ;G:16
                                07B2  2087 ;                                                                             ;G:16
                                07B2  2088 ;        R2      - Allocated packet                                           ;G:16
                                07B2  2089 ;        R0,R1   - Destroyed                                                  ;G:16
                                07B2  2090 ;                                                                             ;G:16
                                07B2  2091 ;-                                                                            ;G:16
                                07B2  2092 ALLOC_DG:                                                                     ;G:16
                                07B2  2093          $QRETRY REMQHI,TAB_Q_DFRQ(R7),R2,400$ ; Yank an entry from free queue ;G:16
                   50    D4     07B2                CLRL    R0
        52    00F0 C7    5E     07B4       30004$:  REMQHI  TAB_Q_DFRQ(R7),R2
                   06    1E     07B9                BCC     30005$
          F5 50    3F    F2     07BB                AOBLSS  #63,R0,30004$
                   02    11     07BF                BRB     400$                                                         ;G:16
                                07C1       30005$:
                   03    1C     07C1  2094          BVC     500$                    ; Branch if we got one               ;G:16
                 FBE0    30     07C3  2095 400$:    BSBW    ERROR1                                                       ;G:16
                         05     07C6  2096 500$:    RSB                             ; Success                            ;G:16
```

```
                     07C7  2098          .SBTTL  -       SEND    insert a packet on the command queue          ;G:16
                     07C7  2099 ;+                                                                           ;G:16
                     07C7  2100 ; SEND/WAIT -- Send a datagram or a message and wait for a response.         ;G:16
                     07C7  2101 ;                                                                            ;G:16
                     07C7  2102 ; Input:                                                                     ;G:16
                     07C7  2103 ;                                                                            ;G:16
                     07C7  2104 ;       R2 - address of the first packet for the free queue                  ;G:16
                     07C7  2105 ;       R3      - CSR                                                       ;G:16
                     07C7  2106 ;       R7      - PQB                                                       ;G:16
                     07C7  2107 ;       R9      - RPB                                                       ;G:16
                     07C7  2108 ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)  ;G:16
                     07C7  2109 ;       (SP)    - Return to PA_DISC, BOO$QIO, or PA_INIT                    ;G:16
                     07C7  2110 ;                                                                            ;G:16
                     07C7  2111 ;       R4,R5,R6,R8,R10 - must be preserved                                 ;G:16
                     07C7  2112 ;                                                                            ;G:16
                     07C7  2113 ; Outputs:                                                                   ;G:16
                     07C7  2114 ;                                                                            ;G:16
                     07C7  2115 ;       R0,R1   - destroyed                                                 ;G:16
                     07C7  2116 ;       R2      - no longer valid                                           ;G:16
                     07C7  2117 ;-                                                                           ;G:16
                     07C7  2118          .enable lsb                                                         ;G:16
                     07C7  2119 SEND_MSG:                                                                    ;G:16
          02   90    07C7  2120          MOVB    #PPD$C_SNDMSG,-                                             ;G:16
      0E  A2         07C9  2121                   PPD$B_OPC(R2)          ; Set opcode to send message        ;G:16
                     07CB  2122                                                                              ;G:16
                     07CB  2123 SEND_ANY:                                                                    ;G:16
          06   10    07CB  2124          BSBB    SEND_PKT               ; Send the CONNECT and wait         ;G:16
          50   11    07CD  2125          BRB     REM_NEXT_RSP                                                ;G:16
                     07CF  2126 ;+                                                                           ;G:16
                     07CF  2127 ; SEND/NOWAIT -- Send a datagram or a message and return without waiting     ;G:16
                     07CF  2128 ;                                                                            ;G:16
                     07CF  2129 ;       Input:                                                               ;G:16
                     07CF  2130 ;                                                                            ;G:16
                     07CF  2131 ;       R2 - address of the first packet for the free queue                  ;G:16
                     07CF  2132 ;       R3      - CSR                                                       ;G:16
                     07CF  2133 ;       R7      - PQB                                                       ;G:16
                     07CF  2134 ;       R9      - RPB                                                       ;G:16
                     07CF  2135 ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)  ;G:16
                     07CF  2136 ;       4(SP)   - Return to PA_DISC, BOO$QIO, or PA_INIT                    ;G:16
                     07CF  2137 ;        (SP)   - Return to SEND_MSG, SEND_ANY, DISPATCH_DG or START_VC      ;G:16
                     07CF  2138 ;                                                                            ;G:16
                     07CF  2139 ;       R4,R5,R6,R8,R10 - must be preserved                                 ;G:16
                     07CF  2140 ;                                                                            ;G:16
                     07CF  2141 ;       Outputs:                                                             ;G:16
                     07CF  2142 ;                                                                            ;G:16
                     07CF  2143 ;       R0,R1   - destroyed                                                 ;G:16
                     07CF  2144 ;       R2      - no longer valid                                           ;G:16
                     07CF  2145 ;-                                                                           ;G:16
          01   B0    07CF  2146 SEND_DG:MOVW    #PPD$C_SNDDG,-                                              ;G:16
      0E  A2         07D1  2147                  PPD$B_OPC(R2)           ; Set opcode to send datagram       ;G:16
                     07D3  2148 SEND_PKT:                                                                    ;G:16
    0104  C7   B0    07D3  2149          MOVW    TAB_L_RSTAID(R7),-                                          ;G:16
      0C  A2         07D7  2150                   PPD$B_PORT(R2)         ; Set in remote port/station id     ;G:16
                     07D9  2151 SENDX:  $QRETRY INSQTI,(R2),PQB_Q_CMDQ0(R7),ERROR1                           ;G:16
          50   D4    07D9                CLRL    R0
    67    62   5D    07DB       30006$:  INSQTI (R2),PQB_Q_CMDQ0(R7)
          07   1E    07DE                BCC     30007$
```

```
F7 50   3F   F2  07E0                AOBLSS #63,R0,30006$
      FBBF   30  07E4                BSBW   ERROR1                                                    ;G:16
                 07E7        30007$:
   0500 D7   17  07E7  2152          JMP     @TAB_L_NEW_CMD(R7)      ; Tell the port it is there      ;G:16
                 07EB  2153          .disable lsb                                                     ;G:16
```

```
                        07EB  2155          .SBTTL  -       DISCARD insert a packet on a free queue                 ;G:16
                        07EB  2156 ;+                                                                               ;G:16
                        07EB  2157 ; Put a datagram or a message on the port queue block and notify the             ;G:16
                        07EB  2158 ; port of its presence.                                                          ;G:16
                        07EB  2159 ;                                                                                ;G:16
                        07EB  2160 ; Input:                                                                         ;G:16
                        07EB  2161 ;                                                                                ;G:16
                        07EB  2162 ;       R2       - Allocated packet                                              ;G:16
                        07EB  2163 ;       R3       - CSR                                                           ;G:16
                        07EB  2164 ;       R7       - PQB                                                           ;G:16
                        07EB  2165 ;       R9       - RPB                                                           ;G:16
                        07EB  2166 ;       R10      - Mapping Enabled Flag  (Zero for virtual mapping enabled)      ;G:16
                        07EB  2167 ;       4(SP)    - Return to PA_DISC, BOO$QIO, or PA_INIT                        ;G:16
                        07EB  2168 ;        (SP)    - Return to SEND_MSG, SEND_ANY, DISPATCH_DG, START_VC or        ;G:16
                        07EB  2169 ;                  INIT_FREEQ                                                    ;G:16
                        07EB  2170 ;                                                                                ;G:27
                        07EB  2171 ; Output:                                                                        ;G:16
                        07EB  2172 ;                                                                                ;G:16
                        07EB  2173 ;       R4       - Destroyed                                                     ;G:16
                        07EB  2174 ;       R6       - Must be preserved                                             ;G:16
                        07EB  2175 ;                                                                                ;G:16
                        07EB  2176 ;-                                                                               ;G:16
                        07EB  2177          .enable lsb                                                             ;G:16
                        07EB  2178 DISCARD:                                                                         ;G:16
      54    08 A2   9A  07EB  2179          MOVZBL  PPD$W_SIZE(R2),R4       ; Get software flag (0=dg,1=msg)      ;G:16
51    00F0 C744   7E  07EF  2180          MOVAQ   TAB_Q_DFRQ(R7)[R4],R1   ; Get que head                        ;G:16
                      07F5  2181          $QRETRY INSQTI,(R2),(R1),ERROR1 ; Put it back                         ;G:16
            50    D4  07F5                 CLRL    R0
         61   62    5D  07F7        30008$:  INSQTI (R2),(R1)
              07    1E  07FA                 BCC     30009$
      F7 50   3F    F2  07FC                 AOBLSS  #63,R0,30008$
          FBA3      30  0800                 BSBW    ERROR1                                                      ;G:16
                    0803        30009$:
    0504 D7   17  0803  2182          JMP     @TAB_L_NEW_FRQ(R7)      ; Notify the port                     ;G:16
                  0807  2183          .disable lsb                                                              ;G:16
```

```
                     0807  2185          .SBTTL  -       INVALIDATE - invalidate translation cache               ;G:16
                     0807  2186 ;+                                                                               ;G:16
                     0807  2187 ;                                                                                 ;G:16
                     0807  2188 ; Send an INVALIDATE TRANSLATE CACHE to port and wait for the response           ;G:16
                     0807  2189 ;                                                                                 ;G:14
                     0807  2190 ; Inputs:                                                                        ;G:14
                     0807  2191 ;                                                                                 ;G:14
                     0807  2192 ;       R3      - base address of adapter's register space                    ;G:14
                     0807  2193 ;       R5      - lbn for current piece of transfer                           ;G:14
                     0807  2194 ;       R6      - contains 0                                                  ;G:14
                     0807  2195 ;       R7      - Address of the PQB                                          ;G:16
                     0807  2196 ;       R8      - size of transfer in bytes                                   ;G:14
                     0807  2197 ;       R9      - address of the RPB                                          ;G:14
                     0807  2198 ;       R10     - starting address of transfer (byte offset in first          ;G:14
                     0807  2199 ;                 page ORed with starting map register number)               ;G:14
                     0807  2200 ;       (AP)    - pointer to VMB                                              ;G:27
                     0807  2201 ;                                                                                 ;G:14
                     0807  2202 ;       4(SP)   - Address of return to BOO$QIO                                ;G:16
                     0807  2203 ;       (SP)    - Address of return to PA_DRIVER                              ;G:16
                     0807  2204 ;                                                                                 ;G:14
                     0807  2205 ; Outputs:                                                                       ;G:14
                     0807  2206 ;                                                                                 ;G:14
                     0807  2207 ;       R6      - Destroyed                                                   ;G:16
                     0807  2208 ;       R4,R5,R6,R7,R8,R9,R10 - Preserved                                     ;G:16
                     0807  2209 ;                                                                                 ;G:16
                     0807  2210 ;-                                                                                ;G:16
                     0807  2211          .enable lsb                                                           ;G:16
                     0807  2212 INVALIDATE:                                                                     ;G:16
          02   E1    0807  2213          BBC     #FLAG_V_INVTC,-                 ; Skip all this if the device ;G:16
                     0809  2214                  TAB_L_INI_FLAGS(R7),10$         ;  doesn't support INVTC      ;G:16
        56 8ED0      080D  2215          POPL    R6                              ; Save the return address.    ;G:16
                     0810  2216                                                  ;  we must do this because    ;G:16
                     0810  2217                                                  ;  SEND_ANY is a first level  ;G:16
                     0810  2218                                                  ;  subroutine that invokes error ;G:
                     0810  2219                                                  ;  recovery                    ;G:16
          B0         0810  2220          MOVW    #<PPD$M_RSPa8-                  ; Send a INVALIDAT and
                     0811  2221                   !PPD$C_INVTC>,-                ;  set to get it back
    0E A2   0118 8F  0811  2222                    PPD$B_OPC(R2)                 ;  but leave port alone
        FFB2   31    0816  2223          BRW     SEND_ANY                        ; Do it
                     0819  2224
                     0819  2225 REC_INVTC:                                       ; Return from dispatcher      ;G:16
        0E A2   B4   0819  2226          CLRW    PPD$B_OPC(R2)                   ; Clean up packet
           56   DD   081C  2227          PUSHL   R6                              ; Restore return address      ;G:16
                05   081E  2228 10$:     RSB                                                                   ;G:16
                     081F  2229          .disable lsb                                                          ;G:16
```

```
                        081F  2231          .SBTTL  -       REM_NEXT_RSP    dispatch a response queue entry         ;G:16
                        081F  2232 ;+                                                                               ;G:16
                        081F  2233 ;  Check to see if a packet is available.  If so, remove it and process it.      ;G:16
                        081F  2234 ;  Otherwise, wait for an interrupt flag.                                        ;G:16
                        081F  2235 ;                                                                                ;G:16
                        081F  2236 ;                                                                                ;G:16
                        081F  2237 ; Input:                                                                         ;G:16
                        081F  2238 ;                                                                                ;G:16
                        081F  2239 ;       R3      - CSR                                                            ;G:16
                        081F  2240 ;       R4      - Must be preserved                                              ;G:16
                        081F  2241 ;       R7      - PQB                                                            ;G:16
                        081F  2242 ;       R9      - RPB                                                            ;G:16
                        081F  2243 ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)       ;G:16
                        081F  2244 ;       (SP)    - Return to PA_DISC, BOO$QIO, or PA_INIT                         ;G:16
                        081F  2245 ;                                                                                ;G:16
                        081F  2246 ;       R4,R5,R6,R8,R10 - must be preserved                                      ;G:16
                        081F  2247 ;                                                                                ;G:16
                        081F  2248 ;       Outputs:                                                                 ;G:16
                        081F  2249 ;                                                                                ;G:16
                        081F  2250 ;       R0,R1   - destroyed                                                      ;G:16
                        081F  2251 ;       R2      - new packet address                                             ;G:16
                        081F  2252 ;                                                                                ;G:16
                        081F  2253 ;-                                                                               ;G:16
                        081F  2254          .enable lsb                                                             ;G:16
                        081F  2255 REM_NEXT_RSP:                                                                    ;G:27
          24 A7   D5    081F  2256          TSTL    PQB_Q_RESPQ+4(R7)       ; Anything already there?               ;G:16
             07   12    0822  2257          BNEQ    20$                     ; Yes, take it off                      ;G:16
    04F8 D7   17    0824  2258          JMP     @TAB_L_INTERRUPT(R7)    ; No, wait for an interrupt             ;G:16
       FB7D   30    0828  2259 10$:     BSBW    ERROR                                                           ;G:16
                        082B  2260 ;                                                                                ;G:16
                        082B  2261 ; Remove the entry from the response queue.                                      ;G:16
                        082B  2262 ;                                                                                ;G:16
                        082B  2263 REM_RSP:                                                                         ;G:16
                        082B  2264 20$:     $QRETRY REMQHI,PQB_Q_RESPQ(R7),-                                        ;G:16
                        082B  2265                   R2,ERROR                   ; Get next response, addr in R2     ;G:16
          50    D4    082B                 CLRL    R0
    52    20 A7   5E    082D       30010$:  REMQHI  PQB_Q_RESPQ(R7),R2
             07   1E    0831                BCC     30011$
    F6 50    3F   F2    0833                AOBLSS  #63,R0,30010$
          FB6E   30    0837                BSBW    ERROR                                                           ;G:16
                        083A       30011$:
             02   1C    083A  2266          BVC     30$                     ; Br if one                             ;G:16
             E1   11    083C  2267          BRB     REM_NEXT_RSP            ; Br if none                            ;G:16
                        083E  2268                                                                                  ;G:16
             05   EF    083E  2269 30$:     EXTZV   #PPD$V_STSTYP,-                                                 ;G:16
             03         0840  2270                  #PPD$S_STSTYP,-                                                ;G:16
    51    0D A2         0841  2271                   PPD$B_STATUS(R2),R1     ; Check the status                      ;G:16
             3F   13    0844  2272          BEQL    50$                     ; Okay                                  ;G:16
       05    51   91    0846  2273          CMPB    R1,#PPD$C_TYPNP         ; Bad, No path?                         ;G:16
             DD   12    0849  2274          BNEQ    10$                     ; No, something else                    ;G:16
 03    00EC C7   91    084B  2275          CMPB    TAB_L_STATE(R7),#STATE_OPEN ; Is it in a legal state?           ;G:16
             07   15    0850  2276          BLEQ    40$                     ; Yes, we can reset                     ;G:16
             07   9A    0852  2277 35$:     MOVZBL  #STATE_VCBROKEN,-       ; Set the state to VC broken            ;G:16
       00EC C7         0854  2278                  TAB_L_STATE(R7)                                                 ;G:27
             CF   11    0857  2279          BRB     10$                     ; No, leave                             ;G:16
                        0859  2280          .show binary                                                            ;G:16
                        0859  2281 40$:     TIMEDWAIT TIME=#100*1000,-      ; One second wait                       ;G:16
```

```
                                  0859  2282                 INS1=<MOVL TAB_L_RSTAID(R7),TAB_L_HOLE(R7)>,-                ;G:16
                                  0859  2283                 DONELBL=1$                ; Waste time                        ;G:16
                    50   01   3C  0859                MOVZWL  #SS$_NORMAL,R0
51   00000000'GF   000186A0 8F  C5  085C                MULL3   #100*1000,G^EXE$GL_TENUSEC,R1
                         7E   D4  0868                CLRL    -(SP)
                                  086A        30012$:
          00E8 C7   0104 C7   D0  086A                MOVL TAB_L_RSTAID(R7),TAB_L_HOLE(R7)
           6E   00000000'GF   D0  0871                MOVL    G^EXE$GL_UBDELAY,(SP)
                      FD 6E   F5  0878        30013$: SOBGTR  (SP),30013$
                      EC 51   F5  087B                SOBGTR  R1,30012$
                         50   D4  087E                CLRL    R0
                                  0880        1$:
                         8E   D5  0880                TSTL    (SP)+
                                  0882  2284          .noshow binary                                                        ;G:16
                       FE67   31  0882  2285          BRW     RE_INIT                   ; Retry the whole thing             ;G:16
                                  0885  2286 ;                                                                                ;G:16
                                  0885  2287 ; Dispatch on opcode type.  The skip chain used here is very ugly but it       ;G:16
                                  0885  2288 ; is shorter than any other way to pick 5 items out of a list of 40.           ;G:16
                                  0885  2289 ;                                                                                ;G:16
                      0E A2   91  0885  2290 50$:    CMPB    PPD$B_OPC(R2),-                                                ;G:16
                         19       0888  2291                  #PPD$C_SETCKT             ; Is it a sent SETCKT?              ;G:16
                         03   12  0889  2292          BNEQ    55$                       ; No, skip on                       ;G:16
                       FD3A   31  088B  2293          BRW     SETCKT                    ; Yes, only the START_VC routine    ;G:16
                                  088E  2294                                            ;  requests a response on SETCKT    ;G:16
                                  088E  2295                                                                                ;G:16
                      0E A2   91  088E  2296 55$:    CMPB    PPD$B_OPC(R2),-                                                ;G:16
                         18       0891  2297                  #PPD$C_INVTC              ; Is it a sent INVTC?               ;G:16
                         03   12  0892  2298          BNEQ    60$                       ; No, skip on                       ;G:16
                       FF82   31  0894  2299          BRW     REC_INVTC                 ; Yes, return to Invalidation routine ;G:16
                                  0897  2300                                                                                ;G:16
                      0C A2   91  0897  2301 60$:    CMPB    PPD$B_PORT(R2),-          ; From the remote node?             ;G:16
                    0104 C7       089A  2302                   TAB_L_RSTAID(R7)                                             ;G:16
                         06   13  089D  2303          BEQL    80$                       ; Yes accept it                     ;G:16
                                  089F  2304                                                                                ;G:16
                       FF49   30  089F  2305 70$:    BSBW    DISCARD                   ; No, get rid of it                 ;G:16
                       FF7A   31  08A2  2306          BRW     REM_NEXT_RSP                                                  ;G:16
                                  08A5  2307                                                                                ;G:16
                      0E A2   91  08A5  2308 80$:    CMPB    PPD$B_OPC(R2),-                                                ;G:16
                         02       08A8  2309                  #PPD$C_SNDMSG             ; Is it a sent message?             ;G:16
                         03   12  08A9  2310          BNEQ    90$                                                           ;G:16
                       FB18   31  08AB  2311          BRW     INIT_MSCP                 ; Yes, go to the MSCP layer         ;G:16
                                  08AE  2312                                            ; because the successful accept response ;G:
                                  08AE  2313                                            ; completes the connection handshake. ;G:16
                                  08AE  2314                                                                                ;G:16
                      0E A2   91  08AE  2315 90$:    CMPB    PPD$B_OPC(R2),-                                                ;G:16
                         21       08B1  2316                  #PPD$C_DGREC              ; Is it a received datagram?        ;G:16
                         14   13  08B2  2317          BEQL    110$                      ; Yes                               ;G:16
                         E9   1F  08B4  2318          BLSSU   70$                       ; Continue for DGREC, MSGREC, and IDREC ;G:1
                                  08B6  2319                                            ; ignore everything else.           ;G:16
                                  08B6  2320                                                                                ;G:16
                      0E A2   91  08B6  2321          CMPB    PPD$B_OPC(R2),-                                                ;G:16
                         2B       08B9  2322                  #PPD$C_IDREC              ; Is it a received ID               ;G:16
                         03   12  08BA  2323          BNEQ    100$                      ; Yes, fake a time out to start up  ;G:16
                       FDEC   31  08BC  2324          BRW     TIMOUT                    ; Timed out                         ;G:16
                                  08BF  2325                                                                                ;G:16
                      0E A2   91  08BF  2326 100$:   CMPB    PPD$B_OPC(R2),-                                                ;G:16
                         22       08C2  2327                  #PPD$C_MSGREC             ; Is it a received msg?             ;G:16
```

```
                DA   1A  08C3  2328          BGTRU   70$                      ; No, ignore it                        ;G:16
              FC15   31  08C5  2329          BRW     REC_SCS_MSG              ; Yes, go process it                   ;G:16
                         08C8  2330                                                                                  ;G:16
        50   12 A2   9A  08C8  2331 110$:    MOVZBL  PPD$W_MTYPE(R2),R0       ; Pick up type                         ;G:16
           02   50   91  08CC  2332          CMPB    R0,#EVENT_ST_RECV        ; Is it a handshake DG?                ;G:16
                CE   14  08CF  2333          BGTR    70$                      ; No, ignore it (probably an errlog    ;G:16
                         08D1  2334                                           ; or host shutdown datagram)           ;G:16
              FDDA   31  08D1  2335 120$:    BRW     DISPATCH_DG              ; Call the VC layer with the handshake ;G:16
                         08D4  2336                                           ; datagram                             ;G:16
                         08D4  2337          .disable lsb                                                            ;G:16
```

```
08D4          .SBTTL  Port hardware layer                                                ;G:16
08D4  ;+                                                                                 ;G:16
08D4  ; The Port hardware layer is responsible for access to the physical port           ;G:16
08D4  ; hardware registers.                                                              ;G:16
08D4  ;                                                                                  ;G:16
08D4  ; PORT_TAB - Generate Adapter-specific dispatch table.  This macro                 ;G:16
08D4  ;             creates pointers to all adapter-specific code located                ;G:16
08D4  ;             in this driver.                                                      ;G:16
08D4  ;                                                                                  ;G:16
08D4  ;       Parameters:                                                                ;G:16
08D4  ;                                                                                  ;G:16
08D4  ;                       DEVICE,-                                                   ;G:16
08D4  ;                       NDT,-                                                      ;G:16
08D4  ;                       INI_FLAGS=0,-                                              ;G:16
08D4  ;                       PMC=0,-                                                    ;G:16
08D4  ;                       MADR=0,-                                                   ;G:16
08D4  ;                       MDATR=0                                                    ;G:16
08D4  ;       DEVICE        - Adapter device type                                        ;G:16
08D4  ;       NDT           - Adapter Hardware Type                                      ;G:16
08D4  ;       INI_FLAGS     - Initialization Flags                                       ;G:16
08D4  ;                                                                                  ;G:16
08D4  ;       PMC           - Port Maintenance/Control Register Offset                   ;G:16
08D4  ;       MADR          - Port maintenance address register                          ;G:16
08D4  ;       MDATR         - Port maintenance data register                             ;G:16
08D4  ;                                                                                  ;G:16
08D4  ;       Adapter specific routines                                                  ;G:16
08D4  ;       INTERRUPT_XXXX  - wait for an interrupt                                    ;G:16
08D4  ;       RESET_XXXX      - reset the adapter                                        ;G:16
08D4  ;       NEW_CMD_XXXX    - notify the adapter of a new command queue entry          ;G:16
08D4  ;       NEW_FRQ_XXXX    - notify the adapter of a new free queue entry             ;G:16
08D4  ;       START_XXXX      - initiate a virtual circuit                               ;G:16
08D4  ;-                                                                                 ;G:16
08D4          .MACRO  PORT_TAB -                                                         ;G:16
08D4                          DEVICE,-                                                   ;G:16
08D4                          NDT,-                                                      ;G:16
08D4                          INI_FLAGS=0,-                                              ;G:16
08D4                          PMC=0,-                                                    ;G:16
08D4                          MADR=0,-                                                   ;G:16
08D4                          MDATR=0                                                    ;G:16
08D4          .show   expansions                                                         ;G:16
08D4          .IF     BLANK NDT                                                          ;G:16
08D4          .LONG   0                                                                  ;G:27
08D4          .IF_FALSE                                                                  ;G:16
08D4                                                                                     ;G:16
08D4          .LONG   NDT                                                                ;G:16
08D4          .BYTE   INI_FLAGS                                                          ;G:16
08D4          .WORD   PMC                                                                ;G:16
08D4          .WORD   MADR                                                               ;G:16
08D4          .WORD   MDATR                                                              ;G:16
08D4          .WORD   INTERRUPT_'DEVICE'-PA_DRIVER                                       ;G:16
08D4          .WORD   RESET_'DEVICE'    -PA_DRIVER                                       ;G:16
08D4          .WORD   NEW_CMD_'DEVICE'  -PA_DRIVER                                       ;G:16
08D4          .WORD   NEW_FRQ_'DEVICE'  -PA_DRIVER                                       ;G:16
08D4          .WORD   START_'DEVICE'    -PA_DRIVER                                       ;G:16
08D4          .ENDC                                                                      ;G:16
08D4          .noshow expansions                                                         ;G:16
08D4          .ENDM   PORT_TAB                                                           ;G:16
```

```
                08D4  2396 ;                                                                    ;G:16
                08D4  2397 ;       Devices supported by this driver                             ;G:16
                08D4  2398 ;                                                                    ;G:16
                08D4  2399 DEVICE_TAB:                                                          ;G:16
                08D4  2400         ;                                                            ;G:16
                08D4  2401         ;       CI780 and CI750                                      ;G:16
                08D4  2402         ;                                                            ;G:16
                08D4  2403         PORT_TAB -                                                   ;G:16
                08D4  2404                 DEVICE = CI780,-                                     ;G:16
                08D4  2405                 NDT = NDT$_CI,-                                      ;G:16
                08D4  2406                 INI_FLAGS=FLAG_M_INVTC,-                             ;G:16
                08D4  2407                 PMC=CCI_PMC,-                                        ;G:16
                08D4  2408                 MADR=CCI_MADR,-                                      ;G:16
                08D4  2409                 MDATR=CCI_MDATR                                      ;G:16
                08D4               .show   expansions                                           ;G:16
                08D4                                                                            ;G:16
        00000038 08D4              .LONG   NDT$_CI                                              ;G:16
              04 08D8              .BYTE   FLAG_M_INVTC                                         ;G:16
            0004 08D9              .WORD   CCI_PMC                                              ;G:16
            0014 08DB              .WORD   CCI_MADR
            0018 08DD              .WORD   CCI_MDATR
            0AE2' 08DF             .WORD   INTERRUPT_CI780-PA_DRIVER                            ;G:16
            0C48' 08E1             .WORD   RESET_CI780       -PA_DRIVER                         ;G:16
            0A73' 08E3             .WORD   NEW_CMD_CI780  -PA_DRIVER                            ;G:16
            0A8A' 08E5             .WORD   NEW_FRQ_CI780  -PA_DRIVER                            ;G:16
            08E5' 08E7             .WORD   START_CI780    -PA_DRIVER                            ;G:16
        00000015 08E9  2410 DEVICE_TAB_LEN=.-DEVICE_TAB                                         ;G:16
                08E9  2411         ;                                                            ;G:16
                08E9  2412         ;       BCI750                                               ;G:16
                08E9  2413         ;                                                            ;G:16
                08E9  2414         PORT_TAB -                                                   ;G:16
                08E9  2415                 DEVICE = BCI750,-                                    ;G:16
                08E9  2416                 NDT = NDT$_BCI750,-                                  ;G:16
                08E9  2417                 INI_FLAGS=FLAG_M_INVTC,-                             ;G:16
                08E9  2418                 PMC=BICA_PMC,-                                       ;G:16
                08E9  2419                 MADR=BICA_MADR,-                                     ;G:16
                08E9  2420                 MDATR=BICA_MDATR                                     ;G:16
                08E9               .show   expansions                                           ;G:16
                08E9                                                                            ;G:16
        8000010B 08E9              .LONG   NDT$_BCI750
              04 08ED              .BYTE   FLAG_M_INVTC                                         ;G:16
            0110 08EE              .WORD   BICA_PMC
            0114 08F0              .WORD   BICA_MADR
            0118 08F2              .WORD   BICA_MDATR
            0B25' 08F4             .WORD   INTERRUPT_BCI750-PA_DRIVER                           ;G:16
            0C50' 08F6             .WORD   RESET_BCI750      -PA_DRIVER                         ;G:16
            0A73' 08F8             .WORD   NEW_CMD_BCI750  -PA_DRIVER                           ;G:16
            0A8A' 08FA             .WORD   NEW_FRQ_BCI750  -PA_DRIVER                           ;G:16
            08D2' 08FC             .WORD   START_BCI750    -PA_DRIVER                           ;G:16
                08FE  2421         ;                                                            ;G:16
                08FE  2422         ;       BCA                                                  ;G:16
                08FE  2423         ;                                                            ;G:16
                08FE  2424         PORT_TAB -                                                   ;G:16
                08FE  2425                 DEVICE = BCA,-                                       ;G:16
                08FE  2426                 NDT = NDT$_BCA,-                                     ;G:16
                08FE  2427                 INI_FLAGS=FLAG_M_INVTC                               ;G:16
                08FE               .show   expansions                                           ;G:16
```

```
                 08FE                                                                                  ;G:16
      80000108   08FE          .LONG   NDT$_BCA
            04   0902          .BYTE   FLAG_M_INVTC                                                   ;G:16
          0000   0903          .WORD   0                                                              ;G:16
          0000   0905          .WORD   0                                                              ;G:16
          0000   0907          .WORD   0                                                              ;G:16
          0B7E'  0909          .WORD   INTERRUPT_BCA-PA_DRIVER                                ;G:16
          0C50'  090B          .WORD   RESET_BCA         -PA_DRIVER                                   ;G:16
          0A79'  090D          .WORD   NEW_CMD_BCA  -PA_DRIVER                                ;G:16
          0A94'  090F          .WORD   NEW_FRQ_BCA  -PA_DRIVER                                ;G:16
          094F'  0911          .WORD   START_BCA    -PA_DRIVER                                ;G:16
                 0913  2428    ;                                                                      ;G:16
                 0913  2429    ;       BVP - the AIE, AIO, and BSA                                    ;G:16
                 0913  2430    ;                                                                      ;G:16
                 0913  2431    PORT_TAB -                                                             ;G:16
                 0913  2432            DEVICE = BVP,-                                                 ;G:16
                 0913  2433            NDT = NDT$_BSA,-                                               ;G:16
                 0913  2434            INI_FLAGS=0                                                    ;G:16
                 0913          .show   expansions                                                     ;G:16
                 0913                                                                                 ;G:16
      80004104   0913          .LONG   NDT$_BSA
            00   0917          .BYTE   0                                                      ;G:16
          0000   0918          .WORD   0                                                              ;G:16
          0000   091A          .WORD   0                                                              ;G:16
          0000   091C          .WORD   0                                                              ;G:16
          0BCE'  091E          .WORD   INTERRUPT_BVP-PA_DRIVER                                ;G:16
          0C6C'  0920          .WORD   RESET_BVP         -PA_DRIVER                                   ;G:16
          0A7F'  0922          .WORD   NEW_CMD_BVP  -PA_DRIVER                                ;G:16
          0A9E'  0924          .WORD   NEW_FRQ_BVP  -PA_DRIVER                                ;G:16
          09C2'  0926          .WORD   START_BVP    -PA_DRIVER                                ;G:16
                 0928  2435    ;                                                                      ;G:16
                 0928  2436    ;       For AIE -                                                      ;G:27
                 0928  2437    ;                                                                      ;G:21
                 0928  2438    PORT_TAB -                                                             ;G:21
                 0928  2439            DEVICE = BVP,-                                                 ;G:21
                 0928  2440            NDT = NDT$_AIE_TKNI,-      ; Set AIE with NI and TK ports code  [24]
                 0928  2441            INI_FLAGS=FLAG_M_TMSCP     ; Indicates tape booting             [24]
                 0928          .show   expansions                                                     ;G:16
                 0928                                                                                 ;G:16
      8000410E   0928          .LONG   NDT$_AIE_TKNI
            02   092C          .BYTE   FLAG_M_TMSCP                                                   ;G:16
          0000   092D          .WORD   0                                                              ;G:16
          0000   092F          .WORD   0                                                              ;G:16
          0000   0931          .WORD   0                                                              ;G:16
          0BCE'  0933          .WORD   INTERRUPT_BVP-PA_DRIVER                                ;G:16
          0C6C'  0935          .WORD   RESET_BVP         -PA_DRIVER                                   ;G:16
          0A7F'  0937          .WORD   NEW_CMD_BVP  -PA_DRIVER                                ;G:16
          0A9E'  0939          .WORD   NEW_FRQ_BVP  -PA_DRIVER                                ;G:16
          09C2'  093B          .WORD   START_BVP    -PA_DRIVER                                ;G:16
                 093D  2442    ;                                                                      ;G:21
                 093D  2443    ;       End of the port table                                          ;G:16
                 093D  2444    ;                                                                      ;G:16
                 093D  2445    PORT_TAB                                                               ;G:16
                 093D          .show   expansions                                                     ;G:16
      00000000   093D          .LONG   0                                                              ;G:27
```

```
                        0941  2447          .SBTTL  -       SELECT_HARDWARE, configure for supported devices      ;G:16
                        0941  2448 ;+                                                                             ;G:16
                        0941  2449 ; SELECT_HARDWARE - check the device NDT against a table of supported        ;G:16
                        0941  2450 ; devices and fill in the device-specific information in the PDT extension    ;G:16
                        0941  2451 ; of the PQB                                                                   ;G:16
                        0941  2452 ;                                                                             ;G:16
                        0941  2453 ; Input:                                                                       ;G:16
                        0941  2454 ;                                                                             ;G:16
                        0941  2455 ;       R3      - CSR                                                        ;G:16
                        0941  2456 ;       R7      - PQB                                                        ;G:16
                        0941  2457 ;       R9      - RPB                                                        ;G:16
                        0941  2458 ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)   ;G:16
                        0941  2459 ;       4(SP)   - Return to PA_INIT                                          ;G:16
                        0941  2460 ;        (SP)   - Return to RE_INIT                                          ;G:16
                        0941  2461 ;                                                                             ;G:16
                        0941  2462 ;       R0,R2,R4,R6 scratch                                                  ;G:16
                        0941  2463 ;       All other registers must be preserved                                ;G:16
                        0941  2464 ;                                                                             ;G:16
                        0941  2465 ;-                                                                            ;G:16
                        0941  2466          .enable lsb                                                          ;G:16
                        0941  2467 SELECT_HARDWARE:                                                             ;G:16
                        0941  2468 ;                                                                             ;G:16
                        0941  2469 ;       Read the physical device type.  For the case of BVP devices,         ;G:16
                        0941  2470 ;       convert this device type to that of the BSA.                         ;G:16
                        0941  2471 ;                                                                             ;G:16
                  51 DD 0941  2472          PUSHL   R1                          ; Save R1                      ;G:16
                        0943  2473          .show binary                                                         ;G:16
                        0943  2474          TIMEDWAIT TIME=#1000*1000,-         ; Ten second wait              ;G:16
                        0943  2475                    INS1=<MOVL (R3),R4>,-     ; Read the configuration register ;G:16
                        0943  2476                    INS2=<CMPW #^XFFFF,R4>,-  ; Has the adapter written it yet? ;G:16
                        0943  2477                    INS3=<BNEQ      1$>,-     ; Br if it has                 ;G:16
                        0943  2478                    DONELBL=1$                ; Label if all done            ;G:16
                     50 01 3C 0943                  MOVZWL  #SS$_NORMAL,R0
51 00000000'GF    000F4240 8F C5 0946                MULL3   #1000*1000,G^EXE$GL_TENUSEC,R1
                        7E D4 0952                  CLRL    -(SP)
                        0954  30014$:
                     54 63 D0 0954                  MOVL (R3),R4
                  54 FFFF 8F B1 0957                CMPW #^XFFFF,R4
                        0F 12 095C                  BNEQ    1$
               6E 00000000'GF D0 095E               MOVL    G^EXE$GL_UBDELAY,(SP)
                     FD 6E F5 0965  30015$:         SOBGTR  (SP),30015$
                     E9 51 F5 0968                  SOBGTR  R1,30014$
                        50 D4 096B                  CLRL    R0
                        096D  1$:
                        8E D5 096D                  TSTL    (SP)+
                        096F  2479          .noshow binary                                                       ;G:16
                     51 8ED0 096F  2480             POPL    R1                  ; Restore R1                   ;G:16
                  03 50 E8 0972  2481               BLBS    R0,5$               ; Branch if good                 [24]
                   0081 31 0975  2482               BRW     80$                 ; Br if nothing there            [24]
                  50 20 D0 0978  2483 5$:           MOVL    #BTD$K_HSCCI,R0     ; Assume it is CI7x0             [24]
                  54 38 B1 097B  2484               CMPW    #NDT$_CI,R4         ; Is it CI7x0                    [24]
                        2D 13 097E  2485            BEQL    20$                 ;                                [24]
               54 410D 8F B1 0980  2486             CMPW    #<^XFFFF&NDT$_AIO>,R4   ; An AIO?                  ;G:16
                        10 13 0985  2487            BEQL    10$                 ; Yes if EQ                    ;G:21
               54 410E 8F B1 0987  2488             CMPW    #<^XFFFF&NDT$_AIE_TKNI>,R4 ; An AIE with TK50 port only?  [24]
                        15 13 098C  2489            BEQL    15$                 ; Branch if yes                  [24]
               54 401B 8F B1 098E  2490             CMPW    #<^XFFFF&NDT$_AIE_TK>,R4        ; An AIE with TK50 port only?  [24]
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                     0E   13   0993   2491          BEQL    15$                             ; Branch if yes                                  [24]
                     16   11   0995   2492          BRB     20$                             ; No if NEQ                                    ;G:21
          54  00004104 8F   D0   0997   2493 10$:     MOVL    #<^XFFFF&NDT$_BSA>,R4           ; Convert  AIO to BSA                          ;G:21
               50   22   D0   099E   2494          MOVL    #BTD$K_BVPSSP,R0                ; It is BVP                                      [24]
                     0A   11   09A1   2495          BRB     20$                             ; Continue                                       [24]
          54  0000410E 8F   D0   09A3   2496 15$:     MOVL    #<^XFFFF&NDT$_AIE_TKNI>,R4      ; Convert AIE with TK50 port only                [24]
                                09AA   2497                                                  ; to AIE with both NI and TK ports.            ;G:21
               50   23   D0   09AA   2498          MOVL    #BTD$K_AIE_TK50,R0              ; It is TK50                                     [24]
                                09AD   2499                                                                                                 ;G:27
                                09AD   2500 ;                                                                                               ;G:16
                                09AD   2501 ;       Now see if the device type is on the list of our supported adapters                     ;G:16
                                09AD   2502 ;                                                                                               ;G:16
          52  FF0E CF   DE   09AD   2503 20$:     MOVAL   DEVICE_TAB-DEVICE_TAB_LEN,R2 ; Get base of the device table                     ;G:16
            52   15 A2   DE   09B2   2504 30$:     MOVAL   DEVICE_TAB_LEN(R2),R2           ; Step to first/next device                      ;G:16
                     62   D5   09B6   2505          TSTL    (R2)                            ; Anything there?                                ;G:16
                     3F   13   09B8   2506          BEQL    80$                             ; Wrong device, can't init                       ;G:16
                     06   19   09BA   2507          BLSS    40$                             ; A BI device                                    ;G:16
               54    62   91   09BC   2508          CMPB    (R2),R4                         ; A CI780 or CI750?                              ;G:16
                  0003   31   09BF   2509          BRW     50$                                                                              ;G:16
               54    62   B1   09C2   2510 40$:     CMPW    (R2),R4                         ; A supported BI device?                         ;G:16
                     EB   12   09C5   2511 50$:     BNEQ    30$                             ; No match, try again                            ;G:16
                                09C7   2512 ;                                                                                               ;G:16
                     08   BB   09C7   2513          PUSHR   #^M<R3>                         ; Save register                                  [24]
               53    50   D0   09C9   2514          MOVL    R0,R3                           ; Move device type to reg                        [24]
                  F6D2   30   09CC   2515          BSBW    PA_ACTION                       ; Set up initialization packet                   [24]
                     08   BA   09CF   2516          POPR    #^M<R3>                         ; Restore register                               [24]
                                09D1   2517 ;       Here we have a good device type, start with the flags byte                              ;G:16
                                09D1   2518 ;                                                                                               ;G:27
                     82   D5   09D1   2519          TSTL    (R2)+                           ; Advance to the flags byte                      ;G:16
          54  04E8 C7   DE   09D3   2520          MOVAL   TAB_L_INI_FLAGS(R7),R4          ; Set base                                       ;G:27
               84   82   9A   09D8   2521          MOVZBL  (R2)+,(R4)+                     ; Save the flags                                 ;G:16
                                09DB   2522 ;                                                                                               ;G:16
                                09DB   2523 ;       Now fill in the registers                                                               ;G:16
                                09DB   2524 ;                                                                                               ;G:16
                                09DB   2525          ASSUME  TAB_L_PMC       EQ TAB_L_INI_FLAGS+4                                           ;G:16
                                09DB   2526          ASSUME  TAB_L_MADR      EQ TAB_L_PMC+4                                                 ;G:16
                                09DB   2527          ASSUME  TAB_L_MDATR     EQ TAB_L_MADR+4                                                ;G:16
                00000003        09DB   2528          TAB_K_REGS = <TAB_L_MDATR-TAB_L_INI_FLAGS>/4                                           ;G:16
               50   03   9A   09DB   2529          MOVZBL  #TAB_K_REGS,R0                  ; Set the count                                  ;G:16
               64   82   3C   09DE   2530 60$:     MOVZWL  (R2)+,(R4)                      ; Get the register offset                        ;G:16
               84   53   C0   09E1   2531          ADDL    R3,(R4)+                        ; Add the register base                          ;G:16
                 F7 50   F5   09E4   2532          SOBGTR  R0,60$                                                                           ;G:16
                                09E7   2533 ;                                                                                               ;G:16
                                09E7   2534 ;       Now fill in the routine addresses                                                       ;G:16
                                09E7   2535 ;                                                                                               ;G:27
                                09E7   2536          ASSUME  TAB_L_INTERRUPT EQ TAB_L_MDATR+4                                               ;G:16
                                09E7   2537          ASSUME  TAB_L_RESET     EQ TAB_L_INTERRUPT+4                                           ;G:16
                                09E7   2538          ASSUME  TAB_L_NEW_CMD   EQ TAB_L_RESET+4                                               ;G:16
                                09E7   2539          ASSUME  TAB_L_NEW_FRQ   EQ TAB_L_NEW_CMD+4                                             ;G:16
                                09E7   2540          ASSUME  TAB_L_START     EQ TAB_L_NEW_FRQ+4                                             ;G:16
                00000005        09E7   2541          TAB_K_SUBS = <TAB_L_START-TAB_L_MDATR>/4                                               ;G:27
               50   05   9A   09E7   2542          MOVZBL  #TAB_K_SUBS,R0                  ; Set the count                                  ;G:16
          56  F74A CF   DE   09EA   2543          MOVAL   PA_DRIVER,R6                    ; Set the base address                           ;G:16
               64   82   3C   09EF   2544 70$:     MOVZWL  (R2)+,(R4)                      ; Get the register offset                        ;G:16
               84   56   C0   09F2   2545          ADDL    R6,(R4)+                        ; Add the register base                          ;G:16
                 F7 50   F5   09F5   2546          SOBGTR  R0,70$                                                                           ;G:16
                     05   09F8   2547          RSB                                     ; Return successfully                            ;G:16
```

```
                F9AA   30  09F9  2548 80$:    BSBW    ERROR1                  ; Declare failure                       ;G:16
                           09FC  2549         .disable lsb                                                           ;G:16
```

```
                        09FC  2551          .SBTTL  -       INIT_HARDWARE, start the port hardware                ;G:16
                        09FC  2552 ;+                                                                             ;G:16
                        09FC  2553 ; INIT_HARDWARE -- load                                                        ;G:27
                        09FC  2554 ; Now go thru the hardware startup sequence.  This sequence involves           ;G:16
                        09FC  2555 ; loading and starting the port microcode.                                     ;G:16
                        09FC  2556 ;                                                                              ;G:16
                        09FC  2557 ; Inputs:                                                                      ;G:16
                        09FC  2558 ;                                                                              ;G:16
                        09FC  2559 ;        R3      - CSR                                                         ;G:16
                        09FC  2560 ;        R7      - PQB                                                         ;G:16
                        09FC  2561 ;        R8      - Physical address of the PQB                                 ;G:16
                        09FC  2562 ;        R9      - RPB                                                         ;G:16
                        09FC  2563 ;        R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)    ;G:16
                        09FC  2564 ;        (SP)    - Return to PA_INIT                                           ;G:16
                        09FC  2565 ;                                                                              ;G:16
                        09FC  2566 ;        R1,R2,R4,R5,R6 scratch                                                ;G:16
                        09FC  2567 ;        All other registers must be preserved                                 ;G:16
                        09FC  2568 ;                                                                              ;G:16
                        09FC  2569 ;-                                                                             ;G:16
                        09FC  2570          .enable lsb                                                           ;G:16
                        09FC  2571 INIT_HARDWARE:                                                                 ;G:16
04FC D7   16            09FC  2572 10$:     JSB     @TAB_L_RESET(R7)        ; Reset the port hardware         ;G:16
  03 50   E8            0A00  2573          BLBS    R0,20$                  ; Continue if success             ;G:16
    F9A2  30            0A03  2574          BSBW    ERROR                                                     ;G:16
0508 D7   17            0A06  2575 20$:     JMP     @TAB_L_START(R7)        ; Go to port-specific code        ;G:21
                        0A0A  2576          .disable lsb                                                      ;G:16
```

```
                                0A0A  2578          .SBTTL  -               START_CI780 - Start the CI750 and CI780      ;G:16
                                0A0A  2579          .SBTTL  -               START_BCI750 - Start the BCI750              ;G:16
                                0A0A  2580 ;+                                                                           ;G:16
                                0A0A  2581 ; CI780, CI750, and BCI750 microcode startup                                 ;G:16
                                0A0A  2582 ;                                                                            ;G:16
                                0A0A  2583 ;       Load the microcode image into the adapter and start the              ;G:16
                                0A0A  2584 ;       microengine                                                          ;G:16
                                0A0A  2585 ;                                                                            ;G:16
                                0A0A  2586 ; Inputs:                                                                    ;G:16
                                0A0A  2587 ;                                                                            ;G:16
                                0A0A  2588 ;       R3      - CSR                                                        ;G:21
                                0A0A  2589 ;       R7      - PQB                                                        ;G:16
                                0A0A  2590 ;       R8      - Physical address of the PQB                                ;G:16
                                0A0A  2591 ;       R9      - RPB                                                        ;G:16
                                0A0A  2592 ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)   ;G:16
                                0A0A  2593 ;       (SP)    - Return to PA_INIT                                          ;G:16
                                0A0A  2594 ;                                                                            ;G:16
                                0A0A  2595 ;       R1,R2,R5,R6 scratch                                                  ;G:16
                                0A0A  2596 ;       All other registers must be preserved                                ;G:16
                                0A0A  2597 ;                                                                            ;G:16
                                0A0A  2598 ; Outputs:                                                                   ;G:16
                                0A0A  2599 ;                                                                            ;G:16
                                0A0A  2600 ;       R4 - contents of the Port Parameter Register                         ;G:16
                                0A0A  2601 ;-                                                                           ;G:16
                                0A0A  2602          .enable lsb                                                         ;G:16
                                0A0A  2603 START_BCI750:                                                                ;G:16
                                0A0A  2604          ;                                                                   ;G:16
                                0A0A  2605          ; The BCI750 configuration register doesn't clear on a self     ;G:16
                                0A0A  2606          ; test.  Perform the operation here to ensure that all power-up ;G:16
                                0A0A  2607          ; errors are gone.                                                  ;G:16
                                0A0A  2608          ;                                                                   ;G:27
            55   0100 C3   D0   0A0A  2609          MOVL    BICA_CNF(R3),R5         ; Get the configuration register
        55   00800000 8F   CA   0A0F  2610          BICL    #BICA_CNF_M_NOCI,R5     ; Don't clear NOCI, it is really
                                0A16  2611                                          ; MAINT_GO on a write               ;G:27
            0100 C3   55   D0   0A16  2612          MOVL    R5,BICA_CNF(R3)         ; Clear any power failure errors
                      03   11   0A1B  2613          BRB     10$                     ; Join common code                  ;G:16
                                0A1D  2614 START_CI780:                                                                 ;G:16
                 63   63   D0   0A1D  2615          MOVL    CCI_CNF(R3),CCI_CNF(R3) ; clear any SBI errors              ;G:16
                                0A20  2616          ;                                                                   ;G:16
                                0A20  2617          ; Start the port microengine                                        ;G:16
                                0A20  2618          ;                                                                   ;G:16
    04EC D7   00000040 8F   C8   0A20  2619 10$:    BISL    #CIPA_PMC_M_PSA,aTAB_L_PMC(R7); Set program start addr      ;G:16
    04F0 D7   00000400 8F   D0   0A29  2620          MOVL    #CIPA_C_UCODEST,aTAB_L_MADR(R7) ; Set it                    ;G:16
            0924 C3   01   D0   0A32  2621          MOVL    #CIPA_PIC_M_PIC,CIPA_PIC(R3); Start port                    ;G:16
                                0A37  2622          ;                                                                   ;G:16
                                0A37  2623          ; Wait for the port to enter the initialized state                  ;G:16
                                0A37  2624          ;                                                                   ;G:16
                                0A37  2625          .show binary                                                        ;G:16
                                0A37  2626          TIMEDWAIT TIME=TAB_L_TIMER(R7),- ; Time to wait                     ;G:16
                                0A37  2627                    INS1=<BITL      #CIPA_PMC_M_MIF,aTAB_L_PMC(R7)>,- ; Check status reg
                                0A37  2628                    INS2=<BNEQ      1$>,-   ; Br if all done                 ;G:16
                                0A37  2629                    DONELBL=1$              ; Label if all done             ;G:16
                 50   01   3C   0A37                MOVZWL  #SS$_NORMAL,R0
51  00000000'GF   0100 C7   C5   0A3A                MULL3   TAB_L_TIMER(R7),G^EXE$GL_TENUSEC,R1
                      7E   D4   0A44                CLRL    -(SP)
                                0A46          30016$:
            04EC D7   08   D3   0A46                BITL    #CIPA_PMC_M_MIF,aTAB_L_PMC(R7)
```

```
                 0F   12  0A4B                BNEQ    1$
     6E   00000000'GF  D0  0A4D                MOVL    G^EXE$GL_UBDELAY,(SP)
               FD 6E   F5  0A54        30017$: SOBGTR  (SP),30017$
               EC 51   F5  0A57                SOBGTR  R1,30016$
                  50   D4  0A5A                CLRL    R0
                          0A5C        1$:
                  8E   D5  0A5C                TSTL    (SP)+
                          0A5E  2630           .noshow binary                                                  ;G:16
               03 50   E8  0A5E  2631           BLBS    R0,30$                  ; Br if wait time not exceeded  ;G:16
                F944   30  0A61  2632 20$:      BSBW    ERROR                   ; *** Br on yes, ERROR ***      ;G:16
                          0A64  2633                                                                           ;G:16
        0900 C3   08   D1  0A64  2634 30$:      CMPL    #CIPA_PS_M_PIC,CIPA_PS(R3) ; Check we are done          ;G:16
                  F6   12  0A69  2635           BNEQ    20$                     ; error during startup          ;G:16
                          0A6B  2636           ;                                                               ;G:16
                          0A6B  2637           ; Now set the port queue block base in the port and enable the port ;G:16
                          0A6B  2638           ;                                                               ;G:16
        0904 C3   58   D0  0A6B  2639           MOVL    R8,CIPA_PQBBR(R3)       ; Set the physical addr of PQB  ;G:16
        04EC D7   02   C8  0A70  2640           BISL    #CIPA_PMC_M_MTD,@TAB_L_PMC(R7); Disable the sanity timer ;G:16
        091C C3   01   D0  0A75  2641           MOVL    #CIPA_PEC_M_PEC,CIPA_PEC(R3); Enable the port           ;G:16
        0918 C3   01   D0  0A7A  2642           MOVL    #CIPA_PSR_M_PSC,CIPA_PSR(R3); Release the status register ;G:27
        54   0940 C3   D0  0A7F  2643           MOVL    CIPA_PPR(R3),R4         ; Get the port parameter register ;G:16
                FB05   31  0A84  2644           BRW     START_VC                ; Done -- go start the next layer ;G:16
                          0A87  2645           .disable lsb                                                    ;G:16
```

```
                                0A87  2647          .SBTTL  -               START_BCA - Start the BCA                       ;G:16
                                0A87  2648 ;+                                                                                 ;G:16
                                0A87  2649 ;       BCA microcode startup                                                      ;G:16
                                0A87  2650 ;                                                                                  ;G:16
                                0A87  2651 ;       Load the microcode image into the adapter and start the                ;G:16
                                0A87  2652 ;       microengine                                                            ;G:16
                                0A87  2653 ;                                                                                  ;G:16
                                0A87  2654 ; Inputs:                                                                          ;G:16
                                0A87  2655 ;                                                                                  ;G:16
                                0A87  2656 ;       R3      - CSR                                                          ;G:21
                                0A87  2657 ;       R7      - PQB                                                          ;G:16
                                0A87  2658 ;       R8      - Physical address of the PQB                                  ;G:16
                                0A87  2659 ;       R9      - RPB                                                          ;G:16
                                0A87  2660 ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)     ;G:16
                                0A87  2661 ;       (SP)    - Return to PA_INIT                                            ;G:16
                                0A87  2662 ;                                                                                  ;G:16
                                0A87  2663 ;       R1,R2,R5,R6 scratch                                                    ;G:16
                                0A87  2664 ;       All other registers must be preserved                                  ;G:16
                                0A87  2665 ;                                                                                  ;G:16
                                0A87  2666 ; Outputs:                                                                         ;G:16
                                0A87  2667 ;                                                                                  ;G:16
                                0A87  2668 ;       R4 - contents of the Port Parameter Register                           ;G:16
                                0A87  2669 ;-                                                                                 ;G:16
                                0A87  2670          .enable lsb                                                               ;G:16
                                0A87  2671 START_BCA:                                                                         ;G:16
                                0A87  2672          ;                                                                         ;G:16
                                0A87  2673          ;  Halt the adapter microcode engine                                      ;G:16
                                0A87  2674          ;                                                                         ;G:16
                          00    78    0A87  2675          ASHL    #BCA_PMC_V_START,-      ; Put the device in the UNINIT state  ;G:16
                1004 C3   01          0A89  2676                  #1,BCA_PMC(R3)          ;                                     ;G:16
                          07    78    0A8D  2677          ASHL    #BCA_PMC_V_HLT,-        ; Halt the microcode                  ;G:16
                1004 C3   01          0A8F  2678                  #1,BCA_PMC(R3)          ;                                     ;G:16
                                      0A93  2679          ;                                                                     ;G:16
                                      0A93  2680          ;  Now restart the microcode and initialize the port                  ;G:16
                                      0A93  2681          ;                                                                     ;G:16
                          00    78    0A93  2682 5$:      ASHL    #BCA_PMC_V_START,-       ; Restart the microcode              ;G:16
                1004 C3   01          0A95  2683                  #1,BCA_PMC(R3)  ;                                             ;G:16
                          01    D0    0A99  2684          MOVL    #CIPA_PIC_M_PIC,-        ; Set port initialize -- move        ;G:16
                     102C C3          0A9B  2685                  BCA_PIC(R3)              ;  port state from uninit to disabled ;G:16
                                      0A9E  2686          ;                                                                     ;G:16
                                      0A9E  2687          ; Wait for the port to enter the initialized state                    ;G:16
                                      0A9E  2688          ;                                                                     ;G:16
                                      0A9E  2689          .show binary                                                          ;G:16
                                      0A9E  2690          TIMEDWAIT TIME=TAB_L_TIMER(R7),- ; Time to wait                       ;G:16
                                      0A9E  2691                  INS1=<BITL      #BCA_PS_M_MIF,BCA_PS(R3)>,- ; Check status reg ;G:16
                                      0A9E  2692                  INS2=<BNEQ      1$>,-    ; Br if all done                    ;G:16
                                      0A9E  2693                  DONELBL=1$               ; Label if all done                 ;G:16
                     50   01    3C    0A9E                MOVZWL  #SS$_NORMAL,R0
51   00000000'GF     0100 C7    C5    0AA1                MULL3   TAB_L_TIMER(R7),G^EXE$GL_TENUSEC,R1
                          7E    D4    0AAB                CLRL    -(SP)
                                0AAD          30018$:
     1000 C3         00000200 8F    D3    0AAD                BITL    #BCA_PS_M_MIF,BCA_PS(R3)
                                0F    12    0AB6                BNEQ    1$
          6E         00000000'GF    D0    0AB8                MOVL    G^EXE$GL_UBDELAY,(SP)
                           FD 6E    F5    0ABF          30019$: SOBGTR  (SP),30019$
                           E8 51    F5    0AC2                SOBGTR  R1,30018$
                              50    D4    0AC5                CLRL    R0
```

```
                                0AC7        1$:
                    8E    D5    0AC7                TSTL    (SP)+
                                0AC9  2694          .noshow binary                                                  ;G:16
                 03 50    E8    0AC9  2695          BLBS    R0,30$                  ; Br if wait time not exceeded  ;G:16
                  F8D9    30    0ACC  2696 20$:     BSBW    ERROR                   ; *** Br on yes, ERROR ***      ;G:16
                                0ACF  2697                                                                          ;G:16
        50   1000 C3    D0    0ACF  2698 30$:     MOVL    BCA_PS(R3),R0           ; Get the port status           ;G:16
        50   8200 8F    AA    0AD4  2699          BICW    #BCA_PS_M_NRSPE!BCA_PS_M_MIF,R0                         ;G:16
                                0AD9  2700                                          ; Clear nonsense bits           ;G:27
             50   08    B1    0AD9  2701          CMPW    #BCA_PS_M_PIC,R0        ; Only PIC set?                 ;G:16
                  EE    12    0ADC  2702          BNEQ    20$                     ; error during startup          ;G:16
                                0ADE  2703                                                                          ;G:16
                                0ADE  2704                                                                          ;G:16
                                0ADE  2705          ;                                                               ;G:16
                                0ADE  2706          ; Now set the port queue block base in the port and enable the port ;G:16
                                0ADE  2707          ;                                                               ;G:16
        00F0 C3   58    D0    0ADE  2708          MOVL    R8,BCA_PQBBR(R3)        ; Set the physical addr of PQB  ;G:16
        1004 C3   02    C8    0AE3  2709          BISL    #BCA_PMC_M_MTD,BCA_PMC(R3); Disable the sanity timer    ;G:16
        1024 C3   01    D0    0AE8  2710          MOVL    #BCA_PEC_M_PEC,BCA_PEC(R3); Enable the port             ;G:16
        1020 C3   01    D0    0AED  2711          MOVL    #BCA_PSR_M_PSC,BCA_PSR(R3); Release the status register ;G:27
        54   00F8 C3    D0    0AF2  2712          MOVL    BCA_PPR(R3),R4          ; Get the port parameter register ;G:16
                  FA92    31    0AF7  2713          BRW     START_VC                ; Done -- go start the next layer ;G:16
                                0AFA  2714          .disable lsb                                                    ;G:16
```

```
                                0AFA  2716          .SBTTL  -               START_BVP - Start the AIE, AIO, and BSA      ;G:16
                                0AFA  2717 ;+                                                                           ;G:16
                                0AFA  2718 ; BVP port startup                                                           ;G:16
                                0AFA  2719 ;                                                                            ;G:16
                                0AFA  2720 ;       There is no microcode to be loaded for BVP adapters.                 ;G:27
                                0AFA  2721 ;                                                                            ;G:27
                                0AFA  2722 ;       First confirm the completion of self test.  Then bring the           ;G:16
                                0AFA  2723 ;       port from the UNDEFINED to the INITIALIZED to the ENABLED state.     ;G:16
                                0AFA  2724 ;                                                                            ;G:16
                                0AFA  2725 ;                                                                            ;G:27
                                0AFA  2726 ; Inputs:                                                                    ;G:16
                                0AFA  2727 ;                                                                            ;G:16
                                0AFA  2728 ;       R3      - CSR                                                        ;G:16
                                0AFA  2729 ;       R7      - PQB                                                        ;G:16
                                0AFA  2730 ;       R8      - Physical address of the PQB                                ;G:16
                                0AFA  2731 ;       R9      - RPB                                                        ;G:16
                                0AFA  2732 ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)   ;G:16
                                0AFA  2733 ;       (SP)    - Return to PA_INIT                                          ;G:16
                                0AFA  2734 ;                                                                            ;G:16
                                0AFA  2735 ;       R1,R2,R5,R6 scratch                                                  ;G:16
                                0AFA  2736 ;       All other registers must be preserved                                ;G:16
                                0AFA  2737 ;                                                                            ;G:16
                                0AFA  2738 ; Outputs:                                                                   ;G:16
                                0AFA  2739 ;                                                                            ;G:16
                                0AFA  2740 ;       R4 - contents of the Port Parameter Register                         ;G:16
                                0AFA  2741 ;                                                                            ;G:16
                                0AFA  2742 ;-                                                                           ;G:16
                                0AFA  2743          .enable lsb                                                         ;G:16
                                0AFA  2744 START_BVP:                                                                   ;G:16
                                0AFA  2745          ;                                                                   ;G:16
                                0AFA  2746          ; Self test part I -- wait for ACC to appear in 10 seconds          ;G:16
                                0AFA  2747          ;                                                                   ;G:27
                     55   1C   D0  0AFA  2748          MOVL    #BVP_STAT_V_ACC,R5      ; Wait for ACC                ;G:16
                          6B   10  0AFD  2749          BSBB    WAIT_BVP                                                  ;G:16
                                0AFF  2750          ;                                                                   ;G:16
                                0AFF  2751          ; Self test part II -- look for STD to appear.  If not, check       ;G:16
                                0AFF  2752          ; the progress count for port activity                              ;G:16
                                0AFF  2753          ;                                                                   ;G:16
                     55   1D   D0  0AFF  2754          MOVL    #BVP_STAT_V_STD,R5      ; Wait for STD                ;G:16
                          66   10  0B02  2755          BSBB    WAIT_BVP                                                  ;G:16
                                0B04  2756          ;                                                                   ;G:16
                                0B04  2757          ;       Port is UNDEFINED, go to the INITIALIZED state              ;G:16
                                0B04  2758          ;                                                                   ;G:16
              80000000 8F   CA  0B04  2759          BICL    #BVP_STAT_M_OWNER,-     ; Acknowledge the UNDEFINED status  ;G:16
                  00F4 C3       0B0A  2760                  BVP_STAT(R3)                                              ;G:16
00F0 C3   58  00000081 8F   C9  0B0D  2761          BISL3   #BVP_CTRL_M_OWNER!-     ; Now INIT the port                 ;G:16
                                0B17  2762                  BVPCTR_C_INIT,R8,-                                        ;G:16
                                0B17  2763                  BVP_CTRL(R3)                                              ;G:16
                     55   1F   D0  0B17  2764          MOVL    #BVP_STAT_V_OWNER,R5    ; Wait for ownership          ;G:16
                          4E   10  0B1A  2765          BSBB    WAIT_BVP                                                  ;G:16
              52  FFF8FFFF 8F   CA  0B1C  2766          BICL    #^C<BVP_STAT_M_PST>,R2  ; Clear all but the state    ;G:16
              52  00020000 8F   D1  0B23  2767          CMPL    #<BVPSTA_C_INIT-        ; Are we undefined?          ;G:16
                                0B2A  2768                  @BVP_STAT_V_PST>,R2                                       ;G:27
                          3B   12  0B2A  2769          BNEQ    10$                     ; No, take error exit         ;G:16
                                0B2C  2770          ;                                                                   ;G:16
                                0B2C  2771          ;       In the INITIALIZED state, go to ENABLED                     ;G:16
                                0B2C  2772          ;                                                                   ;G:16
```

```
                80000000 8F    CA   0B2C  2773          BICL    #BVP_STAT_M_OWNER,-     ; Acknowledge the INITIALIZED status  ;G:16
                    00F4 C3          0B32  2774                  BVP_STAT(R3)                                                  ;G:16
                         D0    0B35  2775          MOVL    #BVP_CTRL_M_OWNER!-     ; Now ENABLE the port                 ;G:16
                               0B36  2776                  BVPCTR_C_ENABLE,-                                             ;G:16
        00F0 C3   00000082 8F        0B36  2777                  BVP_CTRL(R3)                                          ;G:16
                       55  1F    D0   0B3E  2778          MOVL    #BVP_STAT_V_OWNER,R5    ; Wait for ownership          ;G:16
                           27  10    0B41  2779          BSBB    WAIT_BVP                                              ;G:16
             52    FFF8FFFF 8F    CA   0B43  2780          BICL    #^C<BVP_STAT_M_PST>,R2  ; Clear all but the state    ;G:16
             52    00040000 8F    D1   0B4A  2781          CMPL    #<BVPSTA_C_ENAB-        ; Are we enabled?             ;G:16
                               0B51  2782                  @BVP_STAT_V_PST>,R2                                           ;G:27
                           14  12    0B51  2783          BNEQ    10$                     ; No, take error exit         ;G:16
                80000000 8F    CA   0B53  2784          BICL    #BVP_STAT_M_OWNER,-     ; Acknowledge the ENABLED status      ;G:16
                    00F4 C3          0B59  2785                  BVP_STAT(R3)                                                  ;G:16
                52    0128 C7    DE   0B5C  2786          MOVAL   TAB_PKT0(R7),R2         ; Get the first packet        ;G:16
                       FC33  30    0B61  2787          BSBW    INIT_FREEQ              ; Init the free queues        ;G:16
                       F958  31    0B64  2788          BRW     INIT_CONNECT            ; Skip VC layer and form a connection ;G:16
                       F83E  30    0B67  2789 10$:     BSBW    ERROR                                                 ;G:16
                             0B6A  2790          .disable lsb                                                          ;G:16
                             0B6A  2791                                                                                ;G:16
                             0B6A  2792          .SBTTL  -               WAIT_BVP - Wait for a BVP state transition    ;G:16
                             0B6A  2793 ;+                                                                             ;G:16
                             0B6A  2794 ; This routine waits for the completion of a BVP state transition.             ;G:16
                             0B6A  2795 ; This routine assumes that the port data register contains a progress count   ;G:16
                             0B6A  2796 ; which must be incremented every second.  Certain transitions do not use      ;G:16
                             0B6A  2797 ; this progress count.  If the adapter is truly dead, it should not be changing ;G:1
                             0B6A  2798 ; the contents of the port data register.                                      ;G:16
                             0B6A  2799 ;                                                                              ;G:16
                             0B6A  2800 ; Wait a generous 10 seconds here to allow ACC to appear.  All other waits     ;G:16
                             0B6A  2801 ; will be accomodated                                                          ;G:16
                             0B6A  2802 ;                                                                              ;G:16
                             0B6A  2803 ; Inputs:                                                                      ;G:16
                             0B6A  2804 ;                                                                              ;G:16
                             0B6A  2805 ;       R3      - CSR                                                          ;G:16
                             0B6A  2806 ;       R5      - Bit in the port status register to wait for                  ;G:16
                             0B6A  2807 ;       R7      - PQB                                                          ;G:16
                             0B6A  2808 ;       R8      - Physical address of the PQB                                  ;G:16
                             0B6A  2809 ;       R9      - RPB                                                          ;G:16
                             0B6A  2810 ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)     ;G:16
                             0B6A  2811 ;       4(SP)   - Return to PA_INIT                                            ;G:16
                             0B6A  2812 ;        (SP)   - Return to START_BVP                                          ;G:16
                             0B6A  2813 ;                                                                              ;G:16
                             0B6A  2814 ; Outputs:                                                                     ;G:16
                             0B6A  2815 ;                                                                              ;G:16
                             0B6A  2816 ;       R0,R1,R6- destroyed                                                    ;G:16
                             0B6A  2817 ;       R2      - contents of the BVP Status register                          ;G:16
                             0B6A  2818 ;-                                                                             ;G:16
                             0B6A  2819          .enable lsb                                                           ;G:16
                             0B6A  2820 WAIT_BVP:                                                                      ;G:16
                             0B6A  2821          .show binary                                                          ;G:16
                56    00FC C3    D0   0B6A  2822 10$:    MOVL    BVP_DATA(R3),R6         ; Get the self test count     ;G:27
                             0B6F  2823          TIMEDWAIT TIME=#10*1000*10,-    ; Time to wait                        ;G:16
                             0B6F  2824                    INS1=<MOVL BVP_STAT(R3),R2>,- ; Get the current state       ;G:16
                             0B6F  2825                    INS2=<BBS R5,R2,1$>,- ; State reported, continue            ;G:16
                             0B6F  2826                    DONELBL=1$            ; Label if all done                   ;G:16
                         50  01    3C   0B6F              MOVZWL  #SS$_NORMAL,R0
51    00000000'GF    000186A0 8F    C5   0B72              MULL3   #10*1000*10,G^EXE$GL_TENUSEC,R1
                               7E    D4   0B7E              CLRL    -(SP)
```

```
                                0B80        30020$:
        52   00F4 C3    D0     0B80                MOVL BVP_STAT(R3),R2
          0F 52   55    E0     0B85                BBS R5,R2,1$
    6E   00000000'GF    D0     0B89                MOVL    G^EXE$GL_UBDELAY,(SP)
              FD 6E     F5     0B90        30021$: SOBGTR  (SP),30021$
              EA 51     F5     0B93                SOBGTR  R1,30020$
                 50     D4     0B96                CLRL    R0
                                0B98        1$:
                 8E     D5     0B98                TSTL    (SP)+
                                0B9A   2827         .noshow binary                                                  ;G:16
              01 50     E9     0B9A   2828         BLBC    R0,20$                  ; Br if wait time exceeded      ;G:16
                        05     0B9D   2829         RSB                             ; Return to START_BVP           ;G:16
        52   00FC C3    D0     0B9E   2830 20$:    MOVL    BVP_DATA(R3),R2         ; Get the progress count        ;G:16
             56   52    D1     0BA3   2831         CMPL    R2,R6                   ; Same count?                   ;G:16
                  C2    12     0BA6   2832         BNEQ    10$                     ; No, go back for more          ;G:16
                F7FD    30     0BA8   2833 30$:    BSBW    ERROR                   ; Yes, we timed out.            ;G:16
                                0BAB   2834         .disable lsb                                                    ;G:16
```

```
                        0BAB  2836          .SBTTL  -       NEW_CMD, tell the hardware a command is present        ;G:16
                        0BAB  2837 ;+                                                                              ;G:16
                        0BAB  2838 ; NEW_CMD -- tell the port about a new command                                  ;G:16
                        0BAB  2839 ;                                                                               ;G:16
                        0BAB  2840 ; Input:                                                                        ;G:16
                        0BAB  2841 ;                                                                               ;G:16
                        0BAB  2842 ;       R2      - Packet address                                                ;G:16
                        0BAB  2843 ;       R3      - CSR                                                           ;G:16
                        0BAB  2844 ;       R7      - PQB                                                           ;G:16
                        0BAB  2845 ;       R9      - RPB                                                           ;G:16
                        0BAB  2846 ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)      ;G:16
                        0BAB  2847 ;       4(SP)   - Return to PA_DISC, BOO$QIO, or PA_INIT                        ;G:16
                        0BAB  2848 ;        (SP)   - Return to SEND_MSG, SEND_ANY, DISPATCH_DG or START_VC         ;G:16
                        0BAB  2849 ;                                                                               ;G:16
                        0BAB  2850 ; Outputs:                                                                      ;G:16
                        0BAB  2851 ;                                                                               ;G:16
                        0BAB  2852 ;       R0,R1,R2- destroyed                                                     ;G:16
                        0BAB  2853 ;                                                                               ;G:16
                        0BAB  2854 ;-                                                                              ;G:16
                        0BAB  2855          .enable lsb                                                            ;G:16
                        0BAB  2856 NEW_CMD_CI780:                                                                  ;G:16
                        0BAB  2857 NEW_CMD_BCI750:                                                                 ;G:16
0908 C3   01    D0      0BAB  2858          MOVL    #CIPA_CQ0_M_CQC,CIPA_CQ0(R3); Tell port its there              ;G:16
                  05    0BB0  2859          RSB                                                                    ;G:16
                        0BB1  2860 NEW_CMD_BCA:                                                                    ;G:16
1010 C3   01    D0      0BB1  2861          MOVL    #BCA_CQ0_M_CQC,BCA_CQ0(R3); Tell port its there                ;G:16
                  05    0BB6  2862          RSB                                                                    ;G:16
                        0BB7  2863 NEW_CMD_BVP:                                                                    ;G:16
                  D0    0BB7  2864          MOVL    #<BVP_CTRL_M_OWNER!-    ; Notify port of an entry          ;G:16
                        0BB8  2865                      BVPCTR_C_CMDQ>,-    ; on command queue zero                ;G:16
00F0 C3   00000086 8F       0BB8  2866                      BVP_CTRL(R3)                                           ;G:16
                     22 11  0BC0  2867          BRB     CHECK_BVP_INSTR     ; Be sure the port accepts it      ;G:16
                        0BC2  2868          .disable lsb                                                           ;G:16
```

```
                        0BC2  2870          .SBTTL  -       NEW_FRQ, tell the hardware a free queue entry is present ;G:
                        0BC2  2871 ;+
                        0BC2  2872 ; NEW_FRQ -- tell the port about a new free queue entry
                        0BC2  2873 ;
                        0BC2  2874 ;
                        0BC2  2875 ; Input:
                        0BC2  2876 ;
                        0BC2  2877 ;       R2      - Packet address
                        0BC2  2878 ;       R3      - CSR
                        0BC2  2879 ;       R4      - Command Index  0 = datagram
                        0BC2  2880 ;                                1 = message
                        0BC2  2881 ;       R6      - Must be preserved
                        0BC2  2882 ;       R7      - PQB
                        0BC2  2883 ;       R9      - RPB
                        0BC2  2884 ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)
                        0BC2  2885 ;       4(SP)   - Return to PA_DISC, BOO$QIO, or PA_INIT
                        0BC2  2886 ;        (SP)   - Return to SEND_MSG, SEND_ANY, DISPATCH_DG or START_VC
                        0BC2  2887 ;
                        0BC2  2888 ; Outputs:
                        0BC2  2889 ;
                        0BC2  2890 ;       R0,R1,R4- destroyed
                        0BC2  2891 ;
                        0BC2  2892 ;-
                        0BC2  2893          .enable lsb
                        0BC2  2894 NEW_FRQ_CI780:
                        0BC2  2895 NEW_FRQ_BCI750:
                        0BC2  2896          ASSUME  CIPA_MFQ EQ CIPA_DFQ+4
      51    0928 C344   DE    0BC2  2897          MOVAL   CIPA_DFQ(R3)[R4],R1      ; Get correct register
        61    01    D0    0BC8  2898          MOVL    #CIPA_DFQ_M_DFQC,(R1)   ; Tell the port its there
              05    0BCB  2899          RSB
                        0BCC  2900 NEW_FRQ_BCA:
                        0BCC  2901          ASSUME  BCA_MFQ EQ BCA_DFQ+4
            51    1030 C344   DE    0BCC  2902          MOVAL   BCA_DFQ(R3)[R4],R1      ; Get correct register
              61    01    D0    0BD2  2903          MOVL    #BCA_DFQ_M_DFQC,(R1)    ; Tell the port its there
              05    0BD5  2904          RSB
                        0BD6  2905 NEW_FRQ_BVP:
          54    54    08    78    0BD6  2906          ASHL    #BVP_CTRL_V_DATA,R4,R4  ; Shift bit into data position
00F0 C3   54    00000087 8F   C9    0BDA  2907          BISL3   #<BVP_CTRL_M_OWNER!-     ; Notify port of an entry
                        0BE4  2908                  BVPCTR_C_FREQ>,R4,-     ; on command queue zero
                        0BE4  2909                  BVP_CTRL(R3)
                        0BE4  2910 ;
                        0BE4  2911 ;       R4 must be preserved beyond this point.
                        0BE4  2912 ;
                        0BE4  2913 CHECK_BVP_INSTR:
                        0BE4  2914          .show binary
              04    BB    0BE4  2915          PUSHR   #^M<R2>
                        0BE6  2916          TIMEDWAIT TIME=#2*100*1000,-    ; Two second wait
                        0BE6  2917                  INS1=<MOVL BVP_CTRL(R3),R2>,- ; Get the control register
                        0BE6  2918                  INS2=<BBC #BVP_CTRL_V_OWNER,R2,1$>,- ; Command accepted
                        0BE6  2919                  DONELBL=1$                  ; Label if all done
        50    01    3C    0BE6          MOVZWL  #SS$_NORMAL,R0
51  00000000'GF   00030D40 8F   C5    0BE9          MULL3   #2*100*1000,G^EXE$GL_TENUSEC,R1
              7E    D4    0BF5          CLRL    -(SP)
                        0BF7      30022$:
          52    00F0 C3   D0    0BF7          MOVL BVP_CTRL(R3),R2
            0F 52   07    E1    0BFC          BBC #BVP_CTRL_V_OWNER,R2,1$
        6E    00000000'GF   D0    0C00          MOVL    G^EXE$GL_UBDELAY,(SP)
```

```
                FD 6E   F5  0C07       30023$: SOBGTR  (SP),30023$
                EA 51   F5  0C0A               SOBGTR  R1,30022$
                   50   D4  0C0D               CLRL    R0
                                0C0F       1$:
                   8E   D5  0C0F               TSTL    (SP)+
                                0C11  2920     .noshow binary                                          ;G:16
                   04   BA  0C11  2921         POPR    #^M<R2>                                         ;G:16
                03 50   E8  0C13  2922         BLBS    R0,10$          ; Branch if success             ;G:16
                 F78D   30  0C16  2923         BSBW    ERROR1          ; Return an error status        ;G:16
                        05  0C19  2924 10$:     RSB                                                     ;G:16
                            0C1A  2925         .disable lsb                                            ;G:16
```

```
                                0C1A  2927          .SBTTL  -       INTERRUPT, process adapter interrupts                ;G:16
                                0C1A  2928          .SBTTL  -               INTERRUPT_CI780, CI750 and CI780             ;G:27
                                0C1A  2929 ;+                                                                            ;G:16
                                0C1A  2930 ; INTERRUPT_CI780 -- this routine waits for the adapter's MIF flag and then   ;G:16
                                0C1A  2931 ; verifies that a 'response queue available' interrupt has occurred.          ;G:16
                                0C1A  2932 ;                                                                             ;G:16
                                0C1A  2933 ; Input:                                                                      ;G:16
                                0C1A  2934 ;                                                                             ;G:16
                                0C1A  2935 ;       R3      - CSR                                                         ;G:16
                                0C1A  2936 ;       R7      - PQB                                                         ;G:16
                                0C1A  2937 ;       R9      - RPB                                                         ;G:16
                                0C1A  2938 ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)    ;G:16
                                0C1A  2939 ;       (SP)    - Return to PA_DISC, BOO$QIO, or PA_INIT                      ;G:16
                                0C1A  2940 ;                                                                             ;G:16
                                0C1A  2941 ;       R4,R5,R6,R8,R10 - must be preserved                                   ;G:16
                                0C1A  2942 ;                                                                             ;G:16
                                0C1A  2943 ;       Outputs:                                                              ;G:16
                                0C1A  2944 ;                                                                             ;G:16
                                0C1A  2945 ;       R0,R1,R2- destroyed                                                   ;G:16
                                0C1A  2946 ;-                                                                            ;G:16
                                0C1A  2947          .enable lsb                                                          ;G:16
                                0C1A  2948 INTERRUPT_CI780:                                                              ;G:16
                                0C1A  2949          ;                                                                    ;G:16
                                0C1A  2950          ;       Wait for an interrupt                                        ;G:16
                                0C1A  2951          ;                                                                    ;G:16
                                0C1A  2952          .show binary                                                         ;G:16
                                0C1A  2953          TIMEDWAIT TIME=TAB_L_TIMER(R7),-; Time to wait                       ;G:16
                                0C1A  2954                    INS1=<BITL #CIPA_PMC_M_MIF,@TAB_L_PMC(R7)>,- ; Check status reg ;G:1
                                0C1A  2955                    INS2=<BNEQ 1$>,-          ; Br if all done                   ;G:16
                                0C1A  2956                    DONELBL=1$                ; Label if all done                ;G:16
                      50   01   3C  0C1A                    MOVZWL  #SS$_NORMAL,R0
51    00000000'GF       0100 C7   C5  0C1D                    MULL3   TAB_L_TIMER(R7),G^EXE$GL_TENUSEC,R1
                             7E   D4  0C27                    CLRL    -(SP)
                                  0C29          30024$:
                04EC D7      08   D3  0C29                    BITL #CIPA_PMC_M_MIF,@TAB_L_PMC(R7)
                             0F   12  0C2E                    BNEQ 1$
            6E   00000000'GF      D0  0C30                    MOVL    G^EXE$GL_UBDELAY,(SP)
                       FD 6E      F5  0C37          30025$:   SOBGTR  (SP),30025$
                       EC 51      F5  0C3A                    SOBGTR  R1,30024$
                          50      D4  0C3D                    CLRL    R0
                                  0C3F          1$:
                          8E      D5  0C3F                    TSTL    (SP)+
                       03 50      E8  0C41  2957              BLBS    R0,10$                    ; Br if wait time not exceeded ;G:16
                                  0C44  2958                  .noshow binary                                               ;G:16
                        FA64      31  0C44  2959              BRW     TIMOUT                    ; Br on yes                  ;G:16
                                  0C47  2960                  ;                                                            ;G:16
                                  0C47  2961                  ;  Now ignore any nonsense bits                              ;G:16
                                  0C47  2962                  ;                                                            ;G:16
                    38    63      D1  0C47  2963 10$:         CMPL    CCI_CNF(R3),#NDT$_CI      ; Any config reg bits set except type? ;G:16
                          0C      13  0C4A  2964              BEQL    20$                       ; No, okay                   ;G:16
                                  D0  0C4C  2965              MOVL    #<CCI_CNF_M_CRD-                                     ;G:16
                                  0C4D  2966                       !CCI_CNF_M_MXTFLT-                                      ;G:16
                                  0C4D  2967                       !CCI_CNF_M_PARFLT-                                      ;G:16
                                  0C4D  2968                       !CCI_CNF_M_URDFLT-                                      ;G:16
                                  0C4D  2969                       !CCI_CNF_M_WSQFLT-                                      ;G:16
                                  0C4D  2970                       !CCI_CNF_M_XMTFLT>,-                                    ;G:16
            63   EC010000 8F      0C4D  2971                       CCI_CNF(R3)               ; Clear 'don't care' bits    ;G:16
```

```
                38   63   D1  0C53  2972          CMPL    CCI_CNF(R3),#NDT$_CI    ; Try again                    ;G:16
                     02   12  0C56  2973          BNEQ    30$                     ; Error                        ;G:16
                     43   11  0C58  2974 20$:      BRB     CHECK_PS                ; Branch to common code        ;G:16
                   F74B   30  0C5A  2975 30$:      BSBW    ERROR                   ; Error                        ;G:16
                              0C5D  2976          .disable lsb                                                   ;G:16
```

```
                                0C5D          .SBTTL  -                INTERRUPT_BCI750, BCI750 interrupt service    ;G:16
                                0C5D  ;+                                                                            ;G:16
                                0C5D  ; INTERRUPT_BCI750 -- this routine waits for the adapter's MIF flag and then  ;G:16
                                0C5D  ; verifies that a 'response queue available' interrupt has occurred.          ;G:16
                                0C5D  ;                                                                             ;G:16
                                0C5D  ; Input:                                                                      ;G:16
                                0C5D  ;                                                                             ;G:16
                                0C5D  ;       R3      - CSR                                                         ;G:16
                                0C5D  ;       R7      - PQB                                                         ;G:16
                                0C5D  ;       R9      - RPB                                                         ;G:16
                                0C5D  ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)    ;G:16
                                0C5D  ;       (SP)    - Return to PA_DISC, BOO$QIO, or PA_INIT                      ;G:16
                                0C5D  ;                                                                             ;G:16
                                0C5D  ;       R4,R5,R6,R8,R10 - must be preserved                                   ;G:16
                                0C5D  ;                                                                             ;G:16
                                0C5D  ;       Outputs:                                                              ;G:16
                                0C5D  ;                                                                             ;G:16
                                0C5D  ;       R0,R1,R2- destroyed                                                   ;G:16
                                0C5D  ;-                                                                            ;G:16
                                0C5D          .enable lsb                                                           ;G:16
                                0C5D  INTERRUPT_BCI750:                                                             ;G:16
                                0C5D          .show binary                                                          ;G:16
                                0C5D          TIMEDWAIT TIME=TAB_L_TIMER(R7),-; Time to wait                        ;G:16
                                0C5D                  INS1=<BITL #CIPA_PMC_M_MIF,BICA_PMC(R3)>,- ; Check status reg ;G:16
                                0C5D                  INS2=<BNEQ 1$>,-          ; Br if all done                    ;G:16
                                0C5D                  DONELBL=1$                ; Label if all done                 ;G:16
                    50    01    3C  0C5D              MOVZWL  #SS$_NORMAL,R0
  51   00000000'GF   0100 C7    C5  0C60              MULL3   TAB_L_TIMER(R7),G^EXE$GL_TENUSEC,R1
                          7E    D4  0C6A              CLRL    -(SP)
                                0C6C        30026$:
              0110 C3     08    D3  0C6C              BITL #CIPA_PMC_M_MIF,BICA_PMC(R3)
                          0F    12  0C71              BNEQ 1$
          6E   00000000'GF      D0  0C73              MOVL    G^EXE$GL_UBDELAY,(SP)
                       FD 6E    F5  0C7A        30027$: SOBGTR  (SP),30027$
                       EC 51    F5  0C7D              SOBGTR  R1,30026$
                          50    D4  0C80              CLRL    R0
                                0C82        1$:
                          8E    D5  0C82              TSTL    (SP)+
                       03 50    E8  0C84              BLBS    R0,10$                  ; Br if wait time not exceeded      ;G:16
                                0C87                  .noshow binary                                                      ;G:16
                        FA21    31  0C87              BRW     TIMOUT                  ; Br on yes                         ;G:16
                                0C8A  ;                                                                             ;G:16
                                0C8A  ;  BICA configuration register error bits (Rest are the BMCR read data       ;G:16
                                0C8A  ;  mask or undefined)                                                         ;G:16
                                0C8A  ;                                                                             ;G:16
                                0C8A  FATAL_BICA_CNF= BICA_CNF_M_NOCI!-       ; CIPA uncabled or without power     ;G:16
                                0C8A                  BICA_CNF_M_DCLO!-       ; No CIPA dc power                   ;G:16
                                0C8A                  BICA_CNF_M_DIAG!-       ; Diagnostic mode                    ;G:16
                                0C8A                  BICA_CNF_M_PUP!-        ; Power Up                           ;G:16
                                0C8A                  BICA_CNF_M_PDN!-        ; Power Down                         ;G:16
                                0C8A                  BICA_CNF_M_BBE!-        ; BI bus busy                        ;G:16
                                0C8A                  BICA_CNF_M_BIPE!-       ; BI parity error                    ;G:16
                                0C8A                  BICA_CNF_M_BAPE!-       ; BI adapter parity error            ;G:16
                     FF800000   0C8A                  BICA_CNF_M_CPPE         ; CIPA parity error                  ;G:16
                                0C8A                                                                                ;G:16
     0100 C3   FF800000 8F      D3  0C8A  10$:        BITL    #FATAL_BICA_CNF,BICA_CNF(R3) ; Any fatal configuration      ;G:16
                                0C93                                          ; register bits?                     ;G:27
```

```
                1B   12  0C93  3023          BNEQ    30$                         ; Yes if NEQ --> Error                  ;G:16
          51    04 A3   D0  0C95  3024          MOVL    BIIC$L_BICSR(R3),R1         ; Get the BICSR                         ;G:16
          13 51    0F   E0  0C99  3025          BBS     #BIIC$V_HES,R1,30$          ; Branch if hard error, abort           ;G:16
                        0C9D  3026 ;                                                                                        ;G:16
                        0C9D  3027 ;        Common code for CI780, CI750, and BCI750                                        ;G:16
                        0C9D  3028 ;                                                                                        ;G:16
                        0C9D  3029 CHECK_PS:                                                                                ;G:16
       51    0900 C3   D0  0C9D  3030 20$:    MOVL    CIPA_PS(R3),R1              ; Obtain the port status                ;G:16
       0918 C3    01   D0  0CA2  3031          MOVL    #CIPA_PSR_M_PSC,CIPA_PSR(R3); Release status register to port      ;G:16
    51   FFFFFFF6 8F   D3  0CA7  3032          BITL    #^C<CIPA_PS_M_PIC!CIPA_PS_M_RQA>,R1 ; Any bits but RQA?             ;G:16
                03   13  0CAE  3033          BEQL    40$                         ; No, okay                              ;G:16
              F6F5   30  0CB0  3034 30$:     BSBW    ERROR                       ; *** ERROR ***                         ;G:16
              FB75   31  0CB3  3035 40$:     BRW     REM_RSP                     ; O.K., continue                        ;G:16
                        0CB6  3036          .disable lsb                                                                ;G:16
```

```
                        0CB6  3038          .SBTTL  -               INTERRUPT_BCA, BCA interrupt service          ;G:16
                        0CB6  3039 ;+                                                                             ;G:16
                        0CB6  3040 ; INTERRUPT_BCA -- this routine waits for the adapter's MIF flag and then      ;G:16
                        0CB6  3041 ; verifies that a 'response queue available' interrupt has occurred.           ;G:16
                        0CB6  3042 ;                                                                              ;G:16
                        0CB6  3043 ; Input:                                                                       ;G:16
                        0CB6  3044 ;                                                                              ;G:16
                        0CB6  3045 ;        R3      - CSR                                                         ;G:16
                        0CB6  3046 ;        R7      - PQB                                                         ;G:16
                        0CB6  3047 ;        R9      - RPB                                                         ;G:16
                        0CB6  3048 ;        R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)    ;G:16
                        0CB6  3049 ;        (SP)    - Return to PA_DISC, BOO$QIO, or PA_INIT                      ;G:16
                        0CB6  3050 ;                                                                              ;G:16
                        0CB6  3051 ;        R4,R5,R6,R8,R10 - must be preserved                                   ;G:16
                        0CB6  3052 ;                                                                              ;G:16
                        0CB6  3053 ;        Outputs:                                                              ;G:16
                        0CB6  3054 ;                                                                              ;G:16
                        0CB6  3055 ;        R0,R1,R2- destroyed                                                   ;G:16
                        0CB6  3056 ;-                                                                             ;G:16
                        0CB6  3057          .enable lsb                                                           ;G:16
                        0CB6  3058 INTERRUPT_BCA:                                                                 ;G:16
                        0CB6  3059          .show binary                                                          ;G:16
                        0CB6  3060          TIMEDWAIT TIME=TAB_L_TIMER(R7),-; Time to wait                        ;G:16
                        0CB6  3061                    INS1=<BITL #BCA_PS_M_MIF,BCA_PS(R3)>,- ; Check status reg   ;G:16
                        0CB6  3062                    INS2=<BNEQ 1$>,-        ; Br if all done                    ;G:16
                        0CB6  3063                    DONELBL=1$              ; Label if all done                 ;G:16
          50    01   3C  0CB6                MOVZWL  #SS$_NORMAL,R0
51  00000000'GF   0100 C7  C5  0CB9                MULL3   TAB_L_TIMER(R7),G^EXE$GL_TENUSEC,R1
                      7E  D4  0CC3                CLRL    -(SP)
                          0CC5      30028$:
    1000 C3   00000200 8F  D3  0CC5                BITL #BCA_PS_M_MIF,BCA_PS(R3)
                      0F  12  0CCE                BNEQ 1$
         6E   00000000'GF  D0  0CD0                MOVL    G^EXE$GL_UBDELAY,(SP)
                   FD 6E  F5  0CD7      30029$:   SOBGTR  (SP),30029$
                   E8 51  F5  0CDA                SOBGTR  R1,30028$
                      50  D4  0CDD                CLRL    R0
                          0CDF      1$:
                      8E  D5  0CDF                TSTL    (SP)+
                   03 50  E8  0CE1  3064          BLBS    R0,10$                  ; Br if wait time not exceeded    ;G:16
                          0CE4  3065          .noshow binary                                                    ;G:16
                    F9C4  31  0CE4  3066          BRW     TIMOUT                  ; Br on yes                       ;G:16
                          0CE7  3067                                                                            ;G:16
                          0CE7  3068                                                                            ;G:16
              51   1000 C3  D0  0CE7  3069 10$:    MOVL    BCA_PS(R3),R1           ; Get the port status register    ;G:16
              1020 C3   01  D0  0CEC  3070          MOVL    #BCA_PSR_M_PSC,BCA_PSR(R3); Release the status register  ;G:27
              51   7DF6 8F  B3  0CF1  3071          BITW    #^C<BCA_PS_M_NRSPE!-    ; Ignore NRSPE                    ;G:16
                          0CF6  3072                        BCA_PS_M_MIF!-          ;        MIF                      ;G:16
                          0CF6  3073                        BCA_PS_M_PIC!-          ;        PIC                      ;G:16
                          0CF6  3074                        BCA_PS_M_RQA>,R1        ; Expect RQA                      ;G:16
                       0B 12  0CF6  3075          BNEQ    20$                     ; Got some other bit              ;G:16
                 51    04 A3  D0  0CF8  3076          MOVL    BIIC$L_BICSR(R3),R1     ; Get the BICSR                   ;G:16
                 03 51    0F  E0  0CFC  3077          BBS     #BIIC$V_HES,R1,20$      ; Branch if hard error, abort     ;G:16
                       FB28  31  0D00  3078          BRW     REM_RSP                 ; O.K., continue                  ;G:16
                       F6A2  30  0D03  3079 20$:     BSBW    ERROR                   ; *** ERROR ***                   ;G:16
                             0D06  3080          .disable lsb                                                      ;G:16
```

```
                                0D06  3082          .SBTTL  -               INTERRUPT_BVP, AIE, AIO, and BSA interrupt     ;G:16
                                0D06  3083 ;+                                                                               ;G:16
                                0D06  3084 ; INTERRUPT_BVP -- this routine waits for the adapter status register to         ;G:16
                                0D06  3085 ; change and then verifies that a 'response queue available' interrupt has       ;G:27
                                0D06  3086 ; occurred.                                                                      ;G:16
                                0D06  3087 ;                                                                                ;G:16
                                0D06  3088 ; Input:                                                                         ;G:16
                                0D06  3089 ;                                                                                ;G:16
                                0D06  3090 ;       R3      - CSR                                                            ;G:16
                                0D06  3091 ;       R7      - PQB                                                            ;G:16
                                0D06  3092 ;       R9      - RPB                                                            ;G:16
                                0D06  3093 ;       R10     - Mapping Enabled Flag  (Zero for virtual mapping enabled)       ;G:16
                                0D06  3094 ;       (SP)    - Return to PA_DISC, BOO$QIO, or PA_INIT                         ;G:16
                                0D06  3095 ;                                                                                ;G:16
                                0D06  3096 ;       R4,R5,R6,R8,R10 - must be preserved                                      ;G:16
                                0D06  3097 ;                                                                                ;G:16
                                0D06  3098 ;       Outputs:                                                                 ;G:16
                                0D06  3099 ;                                                                                ;G:16
                                0D06  3100 ;       R0,R1,R2- destroyed                                                      ;G:16
                                0D06  3101 ;-                                                                               ;G:16
                                0D06  3102          .enable lsb                                                             ;G:16
                                0D06  3103 INTERRUPT_BVP:                                                                   ;G:16
        F379 CF    0A    D0     0D06  3104          MOVL    #10,TAPE_RETRY          ; Init tape retry counter               ;G:21
                                0D0B  3105          .show binary                                                            ;G:16
                                0D0B  3106 10$:     TIMEDWAIT TIME=TAB_L_TIMER(R7),-; Time to wait                          ;G:16
                                0D0B  3107                    INS1=<MOVL BVP_STAT(R3),R2>,- ; Get the current state        ;G:16
                                0D0B  3108                    INS2=<BBS #BVP_STAT_V_OWNER,R2,1$>,- ; State reported, continue ;G:1
                                0D0B  3109                    DONELBL=1$              ; Label if all done                   ;G:16
          50   01    3C       0D0B              MOVZWL  #SS$_NORMAL,R0
51  00000000'GF    0100 C7    C5  0D0E              MULL3   TAB_L_TIMER(R7),G^EXE$GL_TENUSEC,R1
                        7E     D4  0D18              CLRL    -(SP)
                               0D1A        30030$:
        52   00F4 C3           D0  0D1A              MOVL BVP_STAT(R3),R2
          0F 52    1F          E0  0D1F              BBS #BVP_STAT_V_OWNER,R2,1$
      6E   00000000'GF          D0  0D23              MOVL    G^EXE$GL_UBDELAY,(SP)
                FD 6E           F5  0D2A        30031$: SOBGTR  (SP),30031$
                EA 51           F5  0D2D              SOBGTR  R1,30030$
                   50           D4  0D30              CLRL    R0
                               0D32        1$:
                   8E           D5  0D32              TSTL    (SP)+
                               0D34  3110          .noshow binary                                                          ;G:16
                0E 50           E8  0D34  3111        BLBS    R0,20$                  ; Br if wait time not exceeded        ;G:16
                   01           E1  0D37  3112        BBC     #FLAG_V_TMSCP,-         ; BR if not tape booting              ;G:21
             05 04E8 C7            0D39  3113                TAB_L_INI_FLAGS(R7),15$ ;                                     ;G:21
             C9 F343 CF     F5     0D3D  3114        SOBGTR  TAPE_RETRY,10$          ; Else, wait up to retry count        ;G:21
                               0D42  3115 15$:                                                                             ;G:21
                F966    31     0D42  3116          BRW     TIMOUT                  ; Br on yes                           ;G:16
             22 52      06     E1  0D45  3117 20$:   BBC     #BVP_STAT_V_SUME,R2,-   ; Branch if no error occurred         ;G:16
                               0D49  3118                    30$                                                           ;G:27
                               0D49  3119          ;                                                                       ;G:16
                               0D49  3120          ; Error checking -- if the port is still ENABLED and there is no        ;G:16
                               0D49  3121          ; adapter exception, then we can ignore the error.                      ;G:16
                               0D49  3122          ;                                                                       ;G:16
    51  52  FFF8FFFF 8F     CB  0D49  3123          BICL3   #^C<BVP_STAT_M_PST>,R2,R1 ; Clear all but the state           ;G:16
        51  00040000 8F     D1  0D51  3124          CMPL    #<BVPSTA_C_ENAB-        ; Are we enabled?                     ;G:16
                               0D58  3125                    @BVP_STAT_V_PST>,R1                                           ;G:27
                   23       12  0D58  3126          BNEQ    50$                     ; No, must have been fatal            ;G:16
```

```
        51   52   FFFF00FF 8F    CB   0D5A  3127          BICL3   #^C<BVP_STAT_M_E_TYPE>,R2,R1 ; Clear all but the error type    ;G:16
             51   00000200 8F    D1   0D62  3128          CMPL    #<BVPTYP_C_ADAPT-            ; An adapter exception?            ;G:16
                                        0D69  3129                  &BVP_STAT_V_E_TYPE>,R1                                      ;G:27
                           12   13   0D69  3130          BEQL    50$                          ; Yes, message free queue depletion ;G:16
                   80000000 8F    CA   0D6B  3131 30$:   BICL    #BVP_STAT_M_OWNER,-          ; Release the status to the port    ;G:16
                       00F4 C3         0D71  3132                  BVP_STAT(R3)                                                ;G:16
                    02 52   07    E0   0D74  3133          BBS     #BVP_STAT_V_RSQ,R2,-         ; Branch if an entry is ready      ;G:16
                                        0D78  3134                  40$                                                         ;G:27
                           91   11   0D78  3135          BRB     10$                          ; Wait for another                 ;G:16
                         FAAE   31   0D7A  3136 40$:     BRW     REM_RSP                      ; O.K., continue                   ;G:16
                         F628   30   0D7D  3137 50$:     BSBW    ERROR                        ; Problem                          ;G:16
                                        0D80  3138          .disable lsb                                                        ;G:16
```

```
                     0D80  3140          .SBTTL  -       RESET - reset the port                                   ;G:16
                     0D80  3141          .SBTTL  -               RESET_CI780 - reset the CI750 and CI780          ;G:16
                     0D80  3142 ;+                                                                                ;G:16
                     0D80  3143 ;       RESET_CI780 -- restart the CI750 or CI780 by setting the MIN bit          ;G:16
                     0D80  3144 ;                                                                                 ;G:16
                     0D80  3145 ;       This routine stops the port microcode to put the device in a quiescent ;G:16
                     0D80  3146 ;       state.                                                                    ;G:16
                     0D80  3147 ;                                                                                 ;G:16
                     0D80  3148 ;                                                                                 ;G:16
                     0D80  3149 ; Inputs:                                                                         ;G:16
                     0D80  3150 ;                                                                                 ;G:16
                     0D80  3151 ;       R3      - Address of the configuration register                           ;G:16
                     0D80  3152 ;       (SP)    - return to PA_DISC or INIT_HARDWARE                              ;G:16
                     0D80  3153 ;                                                                                 ;G:16
                     0D80  3154 ;       Outputs:                                                                  ;G:16
                     0D80  3155 ;       R0      - status code                                                     ;G:16
                     0D80  3156 ;-                                                                                ;G:16
                     0D80  3157          .enable lsb                                                              ;G:16
                     0D80  3158 RESET_CI780:                                                                      ;G:16
                     0D80  3159 ;                                                                                 ;G:16
                     0D80  3160 ;       CI750 and CI780-specific code -- stop the microcode with MIN              ;G:16
                     0D80  3161 ;                                                                                 ;G:27
                     0D80  3162 ;                                                                                 ;G:16
04 A3   01   D0      0D80  3163          MOVL    #CIPA_PMC_M_MIN,CCI_PMC(R3); Do maint init                       ;G:16
   50   01   9A      0D84  3164          MOVZBL  #SS$_NORMAL,R0          ; Declare success                        ;G:16
             05      0D87  3165          RSB                                                                      ;G:16
                     0D88  3166          .disable lsb                                                             ;G:16
```

```
                        0D88  3168          .SBTTL  -               RESET_BCI750 - reset the BCI750                 ;G:16
                        0D88  3169          .SBTTL  -               RESET_BCA - reset the BCA                       ;G:16
                        0D88  3170 ;+                                                                               ;G:16
                        0D88  3171 ; RESET_BCI750                                                                   ;G:16
                        0D88  3172 ; RESET_BCA                                                                      ;G:27
                        0D88  3173 ; Initialize the BIIC chip.                                                      ;G:27
                        0D88  3174 ;                                                                                ;G:16
                        0D88  3175 ; Afterwards, we must wait 750 msec for the initialization to complete and       ;G:16
                        0D88  3176 ; then enable user CSR space for the BCI750.  The BCA enables user CSR space     ;G:16
                        0D88  3177 ; itself, so the write to the BCICR is a no-op.                                  ;G:16
                        0D88  3178 ;                                                                                ;G:16
                        0D88  3179 ;                                                                                ;G:16
                        0D88  3180 ; Inputs:                                                                        ;G:16
                        0D88  3181 ;       R3      - Address of the configuration register                          ;G:16
                        0D88  3182 ;       R9      - Address of the RPB                                             ;G:16
                        0D88  3183 ;       (SP)    - return to PA_DISC or INIT_HARDWARE                             ;G:16
                        0D88  3184 ;                                                                                ;G:16
                        0D88  3185 ; Outputs:                                                                       ;G:16
                        0D88  3186 ;       R0      - status code                                                    ;G:16
                        0D88  3187 ;       R1,R5,R6- destroyed                                                      ;G:16
                        0D88  3188 ;-                                                                               ;G:16
                        0D88  3189          .enable lsb                                                             ;G:16
                        0D88  3190 RESET_BCI750:                                                                    ;G:16
                        0D88  3191 RESET_BCA:                                                                       ;G:16
        54    63   B0    0D88  3192          MOVW    (R3),R4                 ; get configuration register            ;G:16
  54    0108 8F   B1    0D8B  3193          CMPW    #<^XFFFF&NDT$_BCA>,R4   ; if bca                                ;G:16
        06   13    0D90  3194          BEQL    10$                     ; then  - skip self test                    ;G:16
     0012   30    0D92  3195          BSBW    SET_SST                 ; do self test                              ;G:16
     000B   31    0D95  3196          BRW     20$                     ; return to sender                          ;G:16
                        0D98  3197 10$:                                                                             ;G:16
            C8    0D98  3198          BISL    #<BIIC$M_RTOEVEN!-      ; Retry timeout enable                      ;G:16
                        0D99  3199            BIIC$M_STOPEN!-       ; Stop Enable.                              ;G:16
                        0D99  3200            BIIC$M_UCSREN>,-      ; User CSR Enable.                          ;G:16
28 A3   00002108 8F         0D99  3201                  BIIC$L_BCICR(R3)                                            ;G:16
        50   01   9A    0DA0  3202          MOVZBL  #SS$_NORMAL,R0          ; Set success                       ;G:27
                        0DA3  3203 20$:                                                                             ;G:16
            05    0DA3  3204          RSB                                                                         ;G:16
                        0DA4  3205          .disable lsb                                                            ;G:16
```

```
                        0DA4  3207          .SBTTL  -               RESET_BVP - reset the AIE, AIO, or BSA        ;G:16
                        0DA4  3208 ;+                                                                            ;G:16
                        0DA4  3209 ; RESET_BVP                                                                   ;G:16
                        0DA4  3210 ; Initialize the BIIC chip and return.  The self test completion sequence     ;G:16
                        0DA4  3211 ; will be handled in START_BVP.                                               ;G:16
                        0DA4  3212 ;                                                                             ;G:16
                        0DA4  3213 ;                                                                             ;G:16
                        0DA4  3214 ; Inputs:                                                                     ;G:16
                        0DA4  3215 ;       R3      - Address of the configuration register                       ;G:16
                        0DA4  3216 ;       R9      - Address of the RPB                                          ;G:16
                        0DA4  3217 ;       (SP)    - return to PA_DISC or INIT_HARDWARE                          ;G:16
                        0DA4  3218 ;                                                                             ;G:16
                        0DA4  3219 ; Outputs:                                                                    ;G:16
                        0DA4  3220 ;       R0      - status code                                                 ;G:16
                        0DA4  3221 ;       R1,R5,R6- destroyed                                                   ;G:16
                        0DA4  3222 ;-                                                                            ;G:16
                        0DA4  3223 RESET_BVP:                                                                    ;G:16
01   10                 0DA4  3224          BSBB    SET_SST                 ; Set self test                     ;G:16
     05                 0DA6  3225          RSB                                                                 ;G:16
```

```
                                0DA7  3227          .SBTTL  -       SET_SST - begin a self test on a BI adapter.          ;G:16
                                0DA7  3228 ;+                                                                          ;G:16
                                0DA7  3229 ; SET_SST                                                                   ;G:16
                                0DA7  3230 ;                                                                           ;G:16
                                0DA7  3231 ; This routine resets the adapter by setting the SST bit to bring the       ;G:16
                                0DA7  3232 ; adapter to a known initial state.                                         ;G:16
                                0DA7  3233 ;                                                                           ;G:16
                                0DA7  3234 ; Setting 'SST' forces a machine check on the 8SS processor, so we must     ;G:16
                                0DA7  3235 ; provide the appropriate protection. Because the self test prevents        ;G:16
                                0DA7  3236 ; arbitration on the BI bus, wait one millisecond before freeing up the     ;G:16
                                0DA7  3237 ; machine check protection.                                                 ;G:27
                                0DA7  3238 ;                                                                           ;G:16
                                0DA7  3239 ;                                                                           ;G:16
                                0DA7  3240 ; Inputs:                                                                   ;G:16
                                0DA7  3241 ;       R3      - Address of the configuration register                     ;G:16
                                0DA7  3242 ;       R9      - Address of the RPB                                        ;G:16
                                0DA7  3243 ;       4(SP)   - return to PA_DISC or INIT_HARDWARE                        ;G:16
                                0DA7  3244 ;        (SP)   - return to RESET_XXX                                       ;G:16
                                0DA7  3245 ;                                                                           ;G:16
                                0DA7  3246 ;       SCB_ADDR - Address of the SCB                                       ;G:16
                                0DA7  3247 ;                                                                           ;G:16
                                0DA7  3248 ; Outputs:                                                                  ;G:16
                                0DA7  3249 ;       R0      - status code                                               ;G:16
                                0DA7  3250 ;       R1,R5,R6- destroyed                                                 ;G:16
                                0DA7  3251 ;-                                                                          ;G:16
                                0DA7  3252          .enable lsb                                                        ;G:16
                                0DA7  3253 SET_SST:                                                                    ;G:16
                                0DA7  3254 10$:                                                                        ;G:27
00000000'EF   00000004'9F   D0  0DA7  3255          MOVL    a#<SCB_BASE+SCB$L_MACHCHK>,SAVE_MCHK ; Save old mchk vector[10] ;G:1
00000000'EF   00000E19'EF   DE  0DB2  3256          MOVAL   20$,MC_RETURN                 ; Go to 20$ after mchk  [10]   ;G:16
00000004'9F   00000001'EF   DE  0DBD  3257          MOVAL   MCHECK+1,a#<SCB_BASE+SCB$L_MACHCHK>    ; Change SCB    [10]   ;G:16
         50   00000E0A'EF   D0  0DC8  3258          MOVL    13$,R0                ; Force code into cache [15][19]         ;G:16
         50   00000E1A'EF   D0  0DCF  3259          MOVL    13$+16,R0             ; Force code into cache [15][18][19]     ;G:16
         50   00000E2A'EF   D0  0DD6  3260          MOVL    13$+32,R0             ; Force code into cache [15][18][19]     ;G:16
                        50   D4  0DDD  3261          CLRL    R0                    ;                               [09]     ;G:16
                             DB  0DDF  3262          DSBINT  #31                   ; Disable clock interrupts      [19]     ;G:16
                  7E   12        0DDF                        MFPR    S^#PR$_IPL,-(SP)
                  12   1F   DA  0DE2                        MTPR    #31,S^#PR$_IPL
      04 A3   00000830 8F   D0  0DE5  3263          MOVL    #BIIC$M_STS!<3a@BIIC$V_ARBCNTL>, - ;                    [20]     ;G:16
                             D0  0DED  3264                  BIIC$L_BICSR(R3)      ; Disable arbitration           [20]     ;G:16
                        00   11  0DED  3265          BRB     11$                   ;                               [09]     ;G:16
      04 A3   00000C00 8F   D0  0DEF  3266 11$:     MOVL    #<BIIC$M_STS!BIIC$M_SST>, -     ;                       [07][14] ;G:
                             D0  0DF7  3267                  BIIC$L_BICSR(R3)                ; Poke the SST bit in the CSR ;G:16
                             D0  0DF7  3268                                                  ; to invoke hard init.        ;G:16
   FFF8 50   01   03E8 8F   3D  0DF7  3269 12$:     ACBW    #1000,#1,R0,12$               ;                       [09][16][17]   ;G:16
00000004'9F   00000000'EF   D0  0DFF  3270          MOVL    SAVE_MCHK,a#<SCB_BASE+SCB$L_MACHCHK>    ; Restore vector if no mchk[
                             0E0A  3271 13$:     $DS_WAITUS_S #100                       ; Wait for BIIC self-test to    [13][15] ;G:
                        00   DD  0E0A                        PUSHL   #0
                  00000064 8F   DD  0E0C                        PUSHL   #100
            00000000'9F   02   FB  0E12                        CALLS   #2, a#DS$WAITUS
                             0E19  3272                                              ; finish before checking status [13]   ;G:16
                             0E19  3273 ;                                                                           ;G:16
                             0E19  3274 ; Wait up to 4 sec for the self test to complete on tape                    ;G:21
                             0E19  3275 ;                                                                           ;G:16
                             0E19  3276          .show expansions                                                   ;G:16
                             0E19  3277 20$:     ENBINT                                  ; Allow interrupts again        [19]   ;G:16
                  12   8E   DA  0E19                        MTPR    (SP)+,S^#PR$_IPL
```

```
                                        0E1C
                                        0E1C  3278          TIMEDWAIT TIME=#4000*100,-      ; Wait for 4000 msec                    [24]
                                        0E1C  3279          INS1=<MOVL BIIC$L_BICSR(R3),R5>,- ; Read status register             ;G:16
                                        0E1C  3280          INS2=<BBS #BIIC$V_STS,R5,30$>,- ; Test Self Test Status              ;G:16
                                        0E1C  3281          DONELBL=30$                     ; Label to exit wait loop            ;G:16
                                        0E1C                .nlist cnd
                     50    01    3C   0E1C                MOVZWL  #SS$_NORMAL,R0
51   00000000'GF   00061A80 8F    C5   0E1F                MULL3   #4000*100,G^EXE$GL_TENUSEC,R1
                           7E    D4   0E2B                CLRL    -(SP)
                                        0E2D          30032$:
                  55    04 A3   D0   0E2D                MOVL BIIC$L_BICSR(R3),R5
                  0F 55   0B    E0   0E31                BBS #BIIC$V_STS,R5,30$
                                        0E35
                                        0E35
                                        0E35
                                        0E35
            6E    00000000'GF   D0   0E35                MOVL    G^EXE$GL_UBDELAY,(SP)
                        FD 6E   F5   0E3C          30033$: SOBGTR  (SP),30033$
                        EB 51   F5   0E3F                SOBGTR  R1,30032$
                           50   D4   0E42                CLRL    R0
                                        0E44          30$:
                              8E    D5   0E44                TSTL    (SP)+
                                        0E46
                        3C 50   E9   0E46  3282          BLBC    R0,50$                  ; BIIC is not accessible             ;G:16
                                        0E49  3283          TIMEDWAIT TIME=#4000*100,-      ; Wait for 4000 msec                    [24]
                                        0E49  3284          INS1=<MOVL BIIC$L_BICSR(R3),R5>,- ; Read status register             ;G:16
                                        0E49  3285          INS2=<BBC #BIIC$V_BROKE,R5,35$>,- ; OK if broke bit clear            ;G:16
                                        0E49  3286          DONELBL=35$                     ; Label to exit wait loop            ;G:16
                                        0E49                .nlist cnd
                     50    01    3C   0E49                MOVZWL  #SS$_NORMAL,R0
51   00000000'GF   00061A80 8F    C5   0E4C                MULL3   #4000*100,G^EXE$GL_TENUSEC,R1
                           7E    D4   0E58                CLRL    -(SP)
                                        0E5A          30034$:
                  55    04 A3   D0   0E5A                MOVL BIIC$L_BICSR(R3),R5
                  0F 55   0C    E1   0E5E                BBC #BIIC$V_BROKE,R5,35$
                                        0E62
                                        0E62
                                        0E62
                                        0E62
            6E    00000000'GF   D0   0E62                MOVL    G^EXE$GL_UBDELAY,(SP)
                        FD 6E   F5   0E69          30035$: SOBGTR  (SP),30035$
                        EB 51   F5   0E6C                SOBGTR  R1,30034$
                           50   D4   0E6F                CLRL    R0
                                        0E71          35$:
                              8E    D5   0E71                TSTL    (SP)+
                                        0E73
                                        0E73  3287          .noshow expansions                                                   ;G:16
                        0F 50   E9   0E73  3288          BLBC    R0,50$                  ; BICA is not accessible             ;G:16
                                        0E76  3289          ;                                                                    ;G:16
                                        0E76  3290          ;       Set the required bits in the BCI control register            ;G:16
                                        0E76  3291          ;                                                                    ;G:16
                  08 A3   01    D0   0E76  3292          MOVL    #BIIC$M_NPE,BIIC$L_BER(R3)      ; Clear Null Bus Parity [12] ;G:16
                                        0E7A  3293                                          ; Error due to BIIC pass[12] ;G:16
                                        0E7A  3294                                          ; 5 bug                 [12] ;G:16
                                        0E7A  3295                                                                           ;G:16
                              C8    0E7A  3296          BISL    #<BIIC$M_RTOEVEN!-      ; retry timeout Enable.              ;G:16
                                        0E7B  3297                    BIIC$M_STOPEN!-       ; stop enable                        ;G:16
```

```
                                0E7B  3298                    BIIC$M_UCSREN>,-      ; User CSR Enable.                    ;G:16
          28 A3   00002108 8F   0E7B  3299                  BIIC$L_BCICR(R3)                                              ;G:16
                       50   01   9A  0E82  3300 40$:    MOVZBL  #SS$_NORMAL,R0      ; Set success                         ;G:27
                                05  0E85  3301 50$:    RSB                                                               ;G:16
                                    0E86  3302                                                                            ;G:16
                                    0E86  3303                                                                            ;G:16
                                    0E86  3304          .DISABLE LSB                                                      ;G:16
```

```
                        .SBTTL  -       CI_MCHECK - reset the SST machine check                 ;G:16
                        ;+                                                                      ;G:16
                        ;       CI_MCHECK                                                       ;G:16
                        ;                                                                       ;G:16
                        ; This routine handles the machine check exception caused               ;G:16
                        ; by setting the SST bit on a BIIC.  This routine is in a separate      ;G:16
                        ; PSECT because moving this code with the driver could cause problems   ;G:16
                        ; with alignment.                                                       ;G:16
                        ;                                                                       ;G:16
                        ;                                                                       ;G:16
                        ; Inputs:                                                               ;G:16
                        ;       R5      - Saved interrupt stack pointer, used to reset SP to to the ;G:27
                        ;                 inputs listed below                                   ;G:16
                        ;       R6      - Address of the SCB                                    ;G:16
                        ;       R9      - Address of the RPB                                    ;G:16
                        ;        8(SP)  - return to PA_DISC or INIT_HARDWARE                    ;G:16
                        ;        4(SP)  - return to RESET_XXX                                   ;G:16
                        ;          (SP) - Saved MCHECK vector                                   ;G:16
                        ;                                                                       ;G:16
                        ; Outputs:                                                              ;G:27
                        ;       R0      - Status                                                ;G:16
                        ;                                                                       ;G:16
                        ; This routine must be longword aligned.  This requirement is          ;G:16
                        ; satisfied after the driver is moved because the BOO$DRIVER label     ;G:16
                        ; is longword aligned.                                                  ;G:16
                        ;-                                                                      ;G:16
                        ;                                                                       ;G:16
                        ;       .enable lsb                                                     ;G:16
                        ;       .=<.+3>&-4                              ; .ALIGN LONG           ;G:16
                        ;CI_MCHECK:                                                            ;G:16
                        ;       SUBL    #4,R5                           ; Adjust the saved stack pointer ;G:16
                        ;                                               ; to the PSL of the aborted ;G:16
                        ;                                                                       ;G:16
                        ;       Dispatch on processor type -- can't use CPUDISP here            ;G:16
                        ;       because of the reference to ERROUT                              ;G:16
                        ;                                                                       ;G:16
                        ;       MOVL    RPB$L_IOVEC(R9),R0              ; Pick up address of IOVECTOR ;G:16
                        ;       CMPB    #PR$_SID_TYP8SS,BQO$B_CPUTYPE(R0) ; On an 8ss?         ;G:16
                        ;       BNEQ    10$                             ; No if NEQ             ;G:16
                        ;                                                                       ;G:16
                        ;       8SS processor                                                   ;G:16
                        ;                                                                       ;G:27
                        ;       MTPR    #0,#PR8SS$_MCESR                ; Reset machine check   ;G:25
                        ;       BRB     20$                             ; Rejoin common code    ;G:16
                        ;                                                                       ;G:16
                        ;       Unknown processor -- we should have never gotten here.          ;G:16
                        ;                                                                       ;G:16
                        ;10$:   CLRL    R0                              ; Signal error          ;G:16
                        ;       BRB     30$                                                     ;G:16
                        ;20$:   MOVZBL  #SS$_NORMAL,R0                  ; Assume successful dispatch ;G:16
                        ;30$:           MOVL    R5,SP                           ; Clear off mcheck frame from stack
                                                                        ; except for the PSL    ;G:16
                        ;       PUSHAB  MCHECK_RET                      ; Form a interrupt PC/PSL ;G:16
                        ;       REI                                     ; and return            ;G:16
                        ;       .disable lsb                                                    ;G:16
```

```
                                0E86  3362          .SBTTL  SPT_RESET                                                       ;G:16
                                0E86  3363                                                                                ;G:16
                                0E86  3364 ;++                                                                            ;G:16
                                0E86  3365 ; This routine copies the saved 1st page of the SPT back to the SPT            ;G:16
                                0E86  3366 ;--                                                                            ;G:16
                                0E86  3367 SPT_RESET:                                                                     ;G:16
                          3F    BB  0E86  3368          PUSHR   #^M<R0,R1,R2,R3,R4,R5>  ; Save for MOVC3
          50  00000000'EF     D0  0E88  3369          MOVL    MMG$GL_SPTBASE,R0       ; Source to move
    60  00000EA4'EF  0200 8F   28  0E8F  3370          MOVC3   #512,SPT_PTR,(R0)       ; Restore 1 page of SPTEs
                          3F    BA  0E99  3371          POPR    #^M<R0,R1,R2,R3,R4,R5>  ; Restore registers
                       39   00   DA  0E9B  3372          MTPR    #0,#PR$_TBIA            ; INVALIDATE THE TB BEFORE ENABLING MM.
                    38   F15E CF   DA  0E9E  3373          MTPR    MAPEN,#PR$_MAPEN        ; RESTORE STATE OF MEMORY MANAGEMENT    [24]
                                05  0EA3  3374          RSB                             ;
                                0EA4  3375                                                                                ;G:16
                                0EA4  3376 ;                                                                              ;G:16
                                0EA4  3377 ; Data area                                                                    ;G:16
                                0EA4  3378 ;                                                                              ;G:16
                                0EA4  3379 SPT_PTR:                                     ; Space to save 1st page of SPTEs       [03]
                   000010A4     0EA4  3380          .BLKL   128                         ; 128 SYSTEM page table entries         [03]
                                10A4  3381                                                                                ;G:16
                   000017B0     10A4  3382 TABLE:   .BLKB   TAB_LEN+512                                                   ;G:16
                                17B0  3383                                                                                ;G:16
                   000017B0     17B0  3384          .=<.+3>&-4                          ; .ALIGN LONG                     ;G:16
                   000019B0     17B0  3385 PPAGTBL:.BLKB    512                                                           ;G:16
                   000019B0     19B0  3386 PA_DRVSIZ=.-START_DRV
                                19B0  3387
                                19B0  3388          .END
```

```
$TABLE                          = 00000000 R  D  02
ACT1                              000005EF R  D  03
ACT1A                             000005F2 R  D  03
ACT2                              000005F6 R  D  03
ACT3                              000005FD R  D  03
ACT3A                             000005FC R  D  03
ACT4                              00000600 R  D  03
ACT5                              00000601 R  D  03
ACT6                              00000602 R  D  03
ACT7                              00000604 R  D  03
ACT8                              00000606 R  D  03
ACTION_TABLE                      000005EF R  D  03
ALLOC_DG                          000007B2 R  D  03
ARGCNT                          = 00000000    D
BCA_CQ0                           00001010    D
BCA_CQ0_M_CQC                   = 00000001    D
BCA_CQ1                           00001014    D
BCA_CQ2                           00001018    D
BCA_CQ3                           0000101C    D
BCA_DFQ                           00001030    D
BCA_DFQ_M_DFQC                  = 00000001    D
BCA_MADR                          00001008    D
BCA_MDATR                         0000100C    D
BCA_MFQ                           00001034    D
BCA_MTC                           00001038    D
BCA_MTEC                          0000103C    D
BCA_PDC                           00001028    D
BCA_PEC                           00001024    D
BCA_PEC_M_PEC                   = 00000001    D
BCA_PESR                          000000FC    D
BCA_PFAR                          000000F4    D
BCA_PIC                           0000102C    D
BCA_PMC                           00001004    D
BCA_PMC_M_MTD                   = 00000002    D
BCA_PMC_V_HLT                   = 00000007    D
BCA_PMC_V_START                 = 00000000    D
BCA_PPR                           000000F8    D
BCA_PPR_S_CSZ                   = 00000003    D
BCA_PPR_V_CSZ                   = 0000001D    D
BCA_PQBBR                         000000F0    D
BCA_PS                            00001000    D
BCA_PSR                           00001020    D
BCA_PSR_M_PSC                   = 00000001    D
BCA_PS_M_MIF                    = 00000200    D
BCA_PS_M_NRSPE                  = 00008000    D
BCA_PS_M_PIC                    = 00000008    D
BCA_PS_M_RQA                    = 00000001    D
BICA_CNF                          00000100    D
BICA_CNF_M_BAPE                 = 40000000    D
BICA_CNF_M_BBE                  = 10000000    D
BICA_CNF_M_BIPE                 = 20000000    D
BICA_CNF_M_CPPE                 = 80000000    D
BICA_CNF_M_DCLO                 = 01000000    D
BICA_CNF_M_DIAG                 = 02000000    D
BICA_CNF_M_NOCI                 = 00800000    D
BICA_CNF_M_PDN                  = 08000000    D
BICA_CNF_M_PUP                  = 04000000    D
BICA_MADR                         00000114    D
BICA_MDATR                        00000118    D
BICA_PMC                          00000110    D
BIIC$L_BCICR                    = 00000028    D
BIIC$L_BER                      = 00000008    D
BIIC$L_BICSR                    = 00000004    D
BIIC$L_GPR0                     = 000000F0    D
BIIC$M_NPE                      = 00000001    D
BIIC$M_RTOEVEN                  = 00000008    D
BIIC$M_SST                      = 00000400    D
BIIC$M_STOPEN                   = 00002000    D
BIIC$M_STS                      = 00000800    D
BIIC$M_UCSREN                   = 00000100    D
BIIC$V_ARBCNTL                  = 00000004    D
BIIC$V_BROKE                    = 0000000C    D
BIIC$V_HES                      = 0000000F    D
BIIC$V_STS                      = 0000000B    D
BLKSIZE                         = 00000200    D
BOOT$L_R2                         ********W GX   00
BTD$K_AIE_TK50                  = 00000023    D
BTD$K_BVPSSP                    = 00000022    D
BTD$K_HSCCI                     = 00000020    D
BUF                             = 00000004    D
BVPCTR_C_CMDQ                   = 00000006    D
BVPCTR_C_ENABLE                 = 00000002    D
BVPCTR_C_FREQ                   = 00000007    D
BVPCTR_C_INIT                   = 00000001    D
BVPSTA_C_ENAB                   = 00000004    D
BVPSTA_C_INIT                   = 00000002    D
BVPTYP_C_ADAPT                  = 00000002    D
BVP_CTRL                          000000F0    D
BVP_CTRL_M_OWNER                = 00000080    D
BVP_CTRL_V_DATA                 = 00000008    D
BVP_CTRL_V_OWNER                = 00000007    D
BVP_C_PRT_BASE                  = 00000001    D
BVP_DATA                          000000FC    D
BVP_ERROR                         000000F8    D
BVP_START                         00000568 R  D  03
BVP_STAT                          000000F4    D
BVP_STAT_M_E_TYPE               = 0000FF00    D
BVP_STAT_M_OWNER                = 80000000    D
BVP_STAT_M_PST                  = 00070000    D
BVP_STAT_V_ACC                  = 0000001C    D
BVP_STAT_V_E_TYPE               = 00000008    D
BVP_STAT_V_OWNER                = 0000001F    D
BVP_STAT_V_PST                  = 00000010    D
BVP_STAT_V_RSQ                  = 00000007    D
BVP_STAT_V_STD                  = 0000001D    D
BVP_STAT_V_SUME                 = 00000006    D
CCI_CNF                           00000000    D
CCI_CNF_M_CRD                   = 00010000    D
CCI_CNF_M_MXTFLT                = 08000000    D
CCI_CNF_M_PARFLT                = 80000000    D
CCI_CNF_M_URDFLT                = 20000000    D
CCI_CNF_M_WSQFLT                = 40000000    D
CCI_CNF_M_XMTFLT                = 04000000    D
CCI_MADR                          00000014    D
```

```
CCI_MDATR                       00000018    D
CCI_PMC                         00000004    D
CHECK_BVP_INSTR                 00000BE4 R  D  03
CHECK_PS                        00000C9D R  D  03
CHK_TIMEOUT                     00000625 R  D  03
CIBD$L_BLEN                   = 00000004    D
CIBD$L_SVAPTE                 = 00000008    D
CIBD$W_FLAGS                  = 00000000    D
CIBD$W_KEY                    = 00000002    D
CIPA_CQ0                        00000908    D
CIPA_CQ0_M_CQC                = 00000001    D
CIPA_CQ1                        0000090C    D
CIPA_CQ2                        00000910    D
CIPA_CQ3                        00000914    D
CIPA_C_UCODEST                = 00000400    D
CIPA_DFQ                        00000928    D
CIPA_DFQ_M_DFQC               = 00000001    D
CIPA_MFQ                        0000092C    D
CIPA_MTC                        00000930    D
CIPA_MTEC                       00000934    D
CIPA_PDC                        00000920    D
CIPA_PEC                        0000091C    D
CIPA_PEC_M_PEC                = 00000001    D
CIPA_PESR                       0000093C    D
CIPA_PFAR                       00000938    D
CIPA_PIC                        00000924    D
CIPA_PIC_M_PIC                = 00000001    D
CIPA_PMC_M_MIF                = 00000008    D
CIPA_PMC_M_MIN                = 00000001    D
CIPA_PMC_M_MTD                = 00000002    D
CIPA_PMC_M_PSA                = 00000040    D
CIPA_PPR                        00000940    D
CIPA_PPR_S_CSZ                = 00000003    D
CIPA_PPR_V_CSZ                = 0000001D    D
CIPA_PQBBR                      00000904    D
CIPA_PS                         00000900    D
CIPA_PSR                        00000918    D
CIPA_PSR_M_PSC                = 00000001    D
CIPA_PS_M_PIC                 = 00000008    D
CIPA_PS_M_RQA                 = 00000001    D
CLASS                           0000002C R  D  03
CLASS_DISK                      0000004D R  D  03
CLASS_TAPE                      0000006F R  D  03
COMMON                          0000031B R  D  03
CONTINUE                        000002D0 R  D  03
COPY_SYSID                      00000607 R  D  03
CUR_POS                         00000080 R  D  03
DEVICE_TAB                      000008D4 R  D  03
DEVICE_TAB_LEN                = 00000015    D
DEVNAME                         00000005 R  D  03
DG_SIZ                        = 00000060    D
DIR_FLAGS                       ********  X  03
DIR_V_CMM                       ********  X  03
DIR_V_DRVCLR                    ********  X  03
DISCARD                         000007EB R  D  03
DISCARD_PKT                     0000060B R  D  03
DISPATCH_DG                     000006AE R  D  03

DS$GB_CI_INIT                   00000004 RG D  03
DS$WAITUS                       ********  X  03
ERROR                           000003A8 R  D  03
ERROR1                          000003A6 R  D  03
EVENT_CLOSED                  = 00000000    D
EVENT_ST_RECV                 = 00000002    D
EVENT_ST_SENT                 = 00000001    D
EVENT_TIMEOUT                 = 00000003    D
EXE$GL_TENUSEC                  ********  X  03
EXE$GL_UBDELAY                  ********  X  03
FATAL_BICA_CNF                = FF800000    D
FLAG_M_INVTC                  = 00000004    D
FLAG_M_TMSCP                  = 00000002    D
FLAG_V_INVTC                  = 00000002    D
FLAG_V_TMSCP                  = 00000001    D
FUNC                          = 00000010    D
GET_MSG_BUFFER                  0000038B R  D  03
GET_NEW_PKT                     00000608 R  D  03
HSC$B_PORT_NUMBER               00000090 R  D  03
HSC50_BOOT                      ********  X  03
INIT_BDT_ENTRY                  000001FB R  D  03
INIT_CONNECT                    000004BF R  D  03
INIT_FREEQ                      00000797 R  D  03
INIT_HARDWARE                   000009FC R  D  03
INIT_MSCP                       000003C6 R  D  03
INTERRUPT_BCA                   00000CB6 R  D  03
INTERRUPT_BCI750                00000C5D R  D  03
INTERRUPT_BVP                   00000D06 R  D  03
INTERRUPT_CI780                 00000C1A R  D  03
INVALIDATE                      00000807 R  D  03
IO$_DRVCLR                    = 00000004    D
IO$_READLBLK                  = 00000021    D
IO$_REWIND                    = 00000024    D
IO$_SKIPFILE                  = 00000025    D
IO$_SKIPRECORD                = 00000026    D
MAPEN                           00000000 RG D  03
MAX_READ                      = 00000002    D
MAX_TIMEOUT                   = 00000008    D
MCHECK                          ********W GX   00
MC_RETURN                       ********W GX   00
MMG$GL_SPTBASE                  ********  X  03
MODE                          = 00000014    D
MSCP$B_BUFFER                 = 00000010    D
MSCP$B_FLAGS                  = 00000009    D
MSCP$B_OPCODE                 = 00000008    D
MSCP$K_OP_END                 = 00000080    D
MSCP$K_OP_ONLIN               = 00000009    D
MSCP$K_OP_READ                = 00000021    D
MSCP$K_OP_REPOS               = 00000025    D
MSCP$K_OP_STCON               = 00000004    D
MSCP$K_ST_AVLBL               = 00000004    D
MSCP$K_ST_BOT                 = 0000000D    D
MSCP$K_ST_ICMD                = 00000001    D
MSCP$K_ST_LED                 = 00000013    D
MSCP$K_ST_OFFLN               = 00000003    D
MSCP$K_ST_PLOST               = 00000011    D
MSCP$K_ST_RDTRN               = 00000010    D
```

```
MSCP$K_ST_SUCC                  = 00000000     D
MSCP$K_ST_TAPEM                 = 0000000E     D
MSCP$L_BYTE_CNT                 = 0000000C     D
MSCP$L_LBN                      = 0000001C     D
MSCP$L_MEDIA_ID                 = 0000001C     D
MSCP$L_POSITION                 = 0000001C     D
MSCP$L_REC_CNT                  = 0000000C     D
MSCP$L_TMGP_CNT                 = 00000010     D
MSCP$M_MD_CLSEX                 = 00002000     D
MSCP$M_MD_DLEOT                 = 00000080     D
MSCP$M_MD_REVRS                 = 00000008     D
MSCP$M_MD_REWND                 = 00000002     D
MSCP$Q_TIME                     = 00000014     D
MSCP$S_MTYP_D0                  = 00000005     D
MSCP$S_MTYP_D1                  = 00000005     D
MSCP$S_ST_MASK                  = 00000005     D
MSCP$V_MTYP_D0                  = 0000001B     D
MSCP$V_MTYP_D1                  = 00000016     D
MSCP$V_ST_MASK                  = 00000000     D
MSCP$W_MODIFIER                 = 0000000A     D
MSCP$W_SHDW_UNT                 = 00000020     D
MSCP$W_STATUS                   = 0000000A     D
MS_OHD                          = 00000020     D
MS_SIZ                          = 00000060     D
NDT$_AIE_TK                     = 0000401B     D
NDT$_AIE_TKNI                   = 8000410E     D
NDT$_AIO                        = 8000410D     D
NDT$_BCA                        = 80000108     D
NDT$_BCI750                     = 8000010B     D
NDT$_BSA                        = 80004104     D
NDT$_CI                         = 00000038     D
NEW_CMD_BCA                       00000BB1 R   D   03
NEW_CMD_BCI750                    00000BAB R   D   03
NEW_CMD_BVP                       00000BB7 R   D   03
NEW_CMD_CI780                     00000BAB R   D   03
NEW_FRQ_BCA                       00000BCC R   D   03
NEW_FRQ_BCI750                    00000BC2 R   D   03
NEW_FRQ_BVP                       00000BD6 R   D   03
NEW_FRQ_CI780                     00000BC2 R   D   03
NXT_MSGI                          00000095 R   D   03
OPEN_VC                           00000621 R   D   03
OPEN_VC_CONT                      0000066E R   D   03
PA_ACTION                         000000A1 R   D   03
PA_DRIVER                         00000138 R   D   03
PA_DRVSIZ                       = 000019B0     D
PA_INIT                           000000F3 RG  D   03
POS                             = 0000001C     D
POSITION_FUNCTION                 000002AE R   D   03
PPAGTBL                           000017B0 R   D   03
PPD$B_DEF_ST                      0000001C     D
PPD$B_FLAGS                       0000000F     D
PPD$B_HWVERS                      00000034     D
PPD$B_LBDATA                      00000012     D
PPD$B_LCB_0                       00000012     D
PPD$B_LCB_LPORT                   00000010     D
PPD$B_LCB_NPORT                   0000000F     D
PPD$B_LCB_OPC                     00000011     D
PPD$B_LCB_PORT                    0000000E     D
PPD$B_OPC                         0000000E     D
PPD$B_PORT                        0000000C     D
PPD$B_PROTOCOL                    0000001A     D
PPD$B_RSTATE                      00000025     D
PPD$B_RST_PORT                    00000024     D
PPD$B_STATUS                      0000000D     D
PPD$B_SWFLAG                      0000000B     D
PPD$B_SYSTEMID                    00000014     D
PPD$B_TYPE                        0000000A     D
PPD$C_ACK                       = 00000002     D
PPD$C_ACK_LEN                   = 00000004     D
PPD$C_DGREC                     = 00000021     D
PPD$C_IDREC                     = 0000002B     D
PPD$C_INVTC                     = 00000018     D
PPD$C_LB_LENGTH                   00000046     D
PPD$C_LCB_DATA                    00000013     D
PPD$C_LENGTH                      00000012     D
PPD$C_MIN_DGSIZ                   00000050     D
PPD$C_MSGREC                    = 00000022     D
PPD$C_REQID                     = 00000005     D
PPD$C_SCS_MSG                   = 00000004     D
PPD$C_SETCKT                    = 00000019     D
PPD$C_SNDDG                     = 00000001     D
PPD$C_SNDMSG                    = 00000002     D
PPD$C_STACK                     = 00000001     D
PPD$C_STACK_LEN                 = 0000003E     D
PPD$C_START                     = 00000000     D
PPD$C_START_LEN                 = 0000003E     D
PPD$C_TYPNP                     = 00000005     D
PPD$K_LB_LENGTH                   00000046     D
PPD$K_LENGTH                      00000012     D
PPD$L_BLINK                       00000004     D
PPD$L_DG_DISC                     00000028     D
PPD$L_FLINK                       00000000     D
PPD$L_IN_VCD                      00000018     D
PPD$L_LBCRC                       00000042     D
PPD$L_P0_ACK                      00000010     D
PPD$L_P0_NAK                      00000014     D
PPD$L_P0_NRSP                     00000018     D
PPD$L_P1_ACK                      0000001C     D
PPD$L_P1_NAK                      00000020     D
PPD$L_P1_NRSP                     00000024     D
PPD$L_REC_BOFF                    00000028     D
PPD$L_REC_NAME                    00000024     D
PPD$L_RPORT_FCN                   00000020     D
PPD$L_RPORT_REV                   0000001C     D
PPD$L_RPORT_TYP                   00000018     D
PPD$L_SND_BOFF                    00000020     D
PPD$L_SND_NAME                    0000001C     D
PPD$L_ST_ADDR                     00000018     D
PPD$L_XCT_LEN                     00000018     D
PPD$M_CST                       = 00008000     D
PPD$M_DQI                       = 00001000     D
PPD$M_NR                        = 00004000     D
PPD$M_NS                        = 00002000     D
PPD$M_RSP                       = 00000001     D
```

```
PPD$Q_CURTIME                     00000048    D
PPD$Q_NODENAME                    00000040    D
PPD$Q_SWINCARN                    00000028    D
PPD$Q_XCT_ID                      00000010    D
PPD$S_STSTYP                    = 00000003    D
PPD$T_HWTYPE                      00000030    D
PPD$T_SWTYPE                      00000020    D
PPD$T_SWVERS                      00000024    D
PPD$V_STSTYP                    = 00000005    D
PPD$W_LCB_LEN7                    0000000C    D
PPD$W_LENGTH                      00000010    D
PPD$W_MASK                        00000010    D
PPD$W_MAXDG                       0000001C    D
PPD$W_MAXMSG                      0000001E    D
PPD$W_MTYPE                       00000012    D
PPD$W_M_VAL                       00000014    D
PPD$W_SIZE                        00000008    D
PQB_B_AD_HWVERS                   000000DC    D
PQB_B_AD_PRTVRS                   000000C4    D
PQB_B_AD_RP_TYP                   000000C5    D
PQB_B_PD_HWVERS                   00000098    D
PQB_B_PD_PRTVRS                   00000084    D
PQB_L_BDT_BASE                    0000003C    D
PQB_L_BDT_LEN                     00000040    D
PQB_L_BVP_LEVEL                   00000060    D
PQB_L_DFRQ_HDR                    00000028    D
PQB_L_DQE_LEN                     00000030    D
PQB_L_FUNC_MASK                   00000058    D
PQB_L_GPT_BASE                    0000004C    D
PQB_L_GPT_LEN                     00000050    D
PQB_L_KEEPALIVE                   00000054    D
PQB_L_MFRQ_HDR                    0000002C    D
PQB_L_MQE_LEN                     00000034    D
PQB_L_PIV                         0000005C    D
PQB_L_SPT_BASE                    00000044    D
PQB_L_SPT_LEN                     00000048    D
PQB_L_VPQB_BASE                   00000038    D
PQB_PTR                           00000091 R  D  03
PQB_Q_CMDQ0                       00000000    D
PQB_Q_CMDQ1                       00000008    D
PQB_Q_CMDQ2                       00000010    D
PQB_Q_CMDQ3                       00000018    D
PQB_Q_PD_CURTIME                  000000A4    D
PQB_Q_RESPQ                       00000020    D
PQB_T_AD_HWTYPE                   000000D8    D
PQB_T_AD_SWTYPE                   000000D0    D
PQB_T_AD_SWVERS                   000000D4    D
PQB_T_PD_HWTYPE                   00000094    D
PQB_T_PD_SWTYPE                   0000008C    D
PQB_T_PD_SWVERS                   00000090    D
PQB_W_AD_MAXDG                    000000CC    D
PQB_W_AD_MAXMSG                   000000CE    D
PQB_W_PD_MAXDG                    00000088    D
PQB_W_PD_MAXMSG                   0000008A    D
PR$_IPL                         = 00000012    D
PR$_MAPEN                       = 00000038    D
PR$_SID                         = 0000003E    D
PR$_SLR                         = 0000000D    D
PR$_TBIA                        = 00000039    D
PTE$C_KW                        = 10000000    D
PTE$M_VALID                     = 80000000    D
Q_PKT                             0000055B R  D  03
REC_INVTC                         00000819 R  D  03
REC_MSCP                          000003EE R  D  03
REC_SCS_MSG                       000004DD R  D  03
REM_NEXT_RSP                      0000081F R  D  03
REM_NODE                          0000008C R  D  03
REM_NODE_INDEX                    0000008E R  D  03
REM_RSP                           0000082B R  D  03
RESET_BCA                         00000D88 R  D  03
RESET_BCI750                      00000D88 R  D  03
RESET_BVP                         00000DA4 R  D  03
RESET_CI780                       00000D80 R  D  03
RETURN                            000002CC R  D  03
RE_INIT                           000006EC R  D  03
ROUT_TABLE                        00000607 R  D  03
RPB$L_ADPPHY                    = 0000005C    D
RPB$L_ADPVIR                    = 00000060    D
RPB$L_BOOTR2                    = 00000024    D
RPB$L_SVASPT                    = 00000050    D
RPB$W_UNIT                      = 00000064    D
SAVE_FUNC                         0000009D R  D  03
SAVE_MCHK                         ********W GX   00
SAVE_RETRY_ADR                    00000088 R  D  03
SCB$L_ACCESS                      00000020    D
SCB$L_ARITH                       00000034    D
SCB$L_BREAK                       0000002C    D
SCB$L_CHME                        00000044    D
SCB$L_CHMK                        00000040    D
SCB$L_CHMS                        00000048    D
SCB$L_CHMU                        0000004C    D
SCB$L_COMPAT                      00000030    D
SCB$L_KNLSTK                      00000008    D
SCB$L_MACHCHK                     00000004    D
SCB$L_OPCCUS                      00000014    D
SCB$L_OPCDEC                      00000010    D
SCB$L_POWER                       0000000C    D
SCB$L_RADRMOD                     0000001C    D
SCB$L_ROPRAND                     00000018    D
SCB$L_RXDB                        000000F8    D
SCB$L_SFTLVL1                     00000084    D
SCB$L_SFTLVL10                    000000A8    D
SCB$L_SFTLVL11                    000000AC    D
SCB$L_SFTLVL12                    000000B0    D
SCB$L_SFTLVL13                    000000B4    D
SCB$L_SFTLVL14                    000000B8    D
SCB$L_SFTLVL15                    000000BC    D
SCB$L_SFTLVL2                     00000088    D
SCB$L_SFTLVL3                     0000008C    D
SCB$L_SFTLVL4                     00000090    D
SCB$L_SFTLVL5                     00000094    D
SCB$L_SFTLVL6                     00000098    D
SCB$L_SFTLVL7                     0000009C    D
SCB$L_SFTLVL8                     000000A0    D
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SCB$L_SFTLVL9                   000000A4     D
SCB$L_TBIT                      00000028     D
SCB$L_TIMER                     000000C0     D
SCB$L_TRANSL                    00000024     D
SCB$L_TXDB                      000000FC     D
SCB$L_VM                        00000038     D
SCB$L_ZERO                      00000000     D
SCB_ADDR                        00000099 R   D   03
SCB_BASE                        ********   X   03
SCS$B_PPD                     = FFFFFFE0     D
SCS$C_ACCP_REQ                = 00000002     D
SCS$C_ACCP_RSPL               = 00000012     D
SCS$C_APPL_MSG                = 0000000A     D
SCS$C_CON_REQ                 = 00000000     D
SCS$C_CON_REQL                = 00000042     D
SCS$C_CON_RSP                 = 00000001     D
SCS$C_CR_REQ                  = 00000008     D
SCS$C_CR_RSPL                 = 0000000E     D
SCS$C_DISC_REQ                = 00000006     D
SCS$C_STNOMAT                 = 0000000A     D
SCS$C_STNORMAL                = 00000001     D
SCS$L_DST_CONID               = FFFFFFF8     D
SCS$L_SRC_CONID               = FFFFFFFC     D
SCS$W_CREDIT                  = FFFFFFF6     D
SCS$W_LENGTH                  = FFFFFFF0     D
SCS$W_MTYPE                   = FFFFFFF4     D
SCS$W_STATUS                  = 00000002     D
SELECT_HARDWARE                 00000941 R   D   03
SENDX                           000007D9 R   D   03
SEND_ACK                        0000060E R   D   03
SEND_ANY                        000007CB R   D   03
SEND_DG                         000007CF R   D   03
SEND_MSG                        000007C7 R   D   03
SEND_NOWAIT                     00000376 R   D   03
SEND_PKT                        000007D3 R   D   03
SEND_STACK                      00000639 R   D   03
SEND_START                      00000618 R   D   03
SEND_WAIT                       00000315 R   D   03
SERVER                          0000001C R   D   03
SERVER_DISK                     0000003C R   D   03
SERVER_TAPE                     0000005E R   D   03
SETCKT                          000005C8 R   D   03
SET_SST                         00000DA7 R   D   03
SIZ...                        = 00000008     D
SIZE                          = 00000008     D
SPIN                            00000623 R   D   03
SPIN_CONT                       00000681 R   D   03
SPT_PTR                         00000EA4 R   D   03
SPT_RESET                       00000E86 R   D   03
SS$_CTRLERR                   = 00000054     D
SS$_DATAOVERUN                = 00000838     D
SS$_DEVOFFLINE                = 00000084     D
SS$_ENDOFFILE                 = 00000870     D
SS$_ILLIOFUNC                 = 000000F4     D
SS$_NORMAL                    = 00000001     D
SS$_TAPEPOSLOST               = 00000224     D
START_BCA                       00000A87 R   D   03
START_BCI750                    00000A0A R   D   03
START_BVP                       00000AFA R   D   03
START_CI780                     00000A1D R   D   03
START_DRV                       00000000 R   D   03
START_OVER                      00000633 R   D   03
START_VC                        0000058C R   D   03
STATE_CLOSED                  = 00000000     D
STATE_FATAL                   = 00000006     D
STATE_INIT                    = 00000005     D
STATE_MESSAGE                 = 00000004     D
STATE_OPEN                    = 00000003     D
STATE_ST_RECV                 = 00000002     D
STATE_ST_SENT                 = 00000001     D
STATE_TABLE                     000005DF R   D   03
STATE_VCBROKEN                = 00000007     D
STATUS_CODE                     0000032B R   D   03
TABLE                           000010A4 R   D   03
TAB_B_BDT                       00000110     D
TAB_K_REGS                    = 00000003     D
TAB_K_SUBS                    = 00000005     D
TAB_LEN                       = 0000050C     D
TAB_L_HOLE                      000000E8     D
TAB_L_INI_FLAGS                 000004E8     D
TAB_L_INTERRUPT                 000004F8     D
TAB_L_LCONID                    00000124     D
TAB_L_MADR                      000004F0     D
TAB_L_MDATR                     000004F4     D
TAB_L_NEW_CMD                   00000500     D
TAB_L_NEW_FRQ                   00000504     D
TAB_L_PAGETBL                   00000108     D
TAB_L_PMC                       000004EC     D
TAB_L_RCONID                    00000120     D
TAB_L_RESET                     000004FC     D
TAB_L_RSTAID                    00000104     D
TAB_L_START                     00000508     D
TAB_L_STATE                     000000EC     D
TAB_L_TIMER                     00000100     D
TAB_L_TMO_CNT                   0000010C     D
TAB_PKT0                        00000128     D
TAB_PKT1                        00000188     D
TAB_PKT2                        000001E8     D
TAB_PKT3                        00000248     D
TAB_PKT4                        000002A8     D
TAB_PKT5                        00000308     D
TAB_PKT6                        00000368     D
TAB_PKT7                        000003C8     D
TAB_PKT8                        00000428     D
TAB_PKT9                        00000488     D
TAB_Q_DFRQ                      000000F0     D
TAB_Q_MFRQ                      000000F8     D
TAPE_BOOT                       0000025B R   D   03
TAPE_RETRY                      00000084 R   D   03
TEMPL_MSG                       00000008 R   D   03
TEMPL_MSG_LEN                 = 00000034     D
TIMOUT                          000006AB R   D   03
VA$M_BYTE                     = 000001FF     D
VA$M_SYSTEM                   = 80000000     D
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VA$S_VPN                    = 00000015    D
VA$V_SYSTEM                 = 0000001F    D
VA$V_VPN                    = 00000009    D
WAIT_BVP                      00000B6A R  D  03
WAIT_TIME                   = 00061A80    D
X                             000005EF R  D  03

                                        +----------------+
                                        ! Psect synopsis !
                                        +----------------+

PSECT name                  Allocation          PSECT No.  Attributes
----------                  ----------          ---------  ----------
.  ABS  .                   00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                       00001040  ( 4160.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
BOOTDRIVR_4                 00000018  (   24.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
BOOTDRIVR_2                 000019B0  ( 6576.)  03 (  3.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$TABLE	=00000000-R	502 (1)	502 (1)
ACT1	000005EF-R	1674 (15)	1662 (15)
ACT1A	000005F2-R	1680 (15)	1665 (15)
ACT2	000005F6-R	1687 (15)	1663 (15)
ACT3	000005FD-R	1700 (15)	1665 (15)
ACT3A	000005FC-R	1696 (15)	1665 (15)
ACT4	00000600-R	1706 (15)	1664 (15)
ACT5	00000601-R	1710 (15)	
ACT6	00000602-R	1714 (15)	1663 (15)
ACT7	00000604-R	1719 (15)	1664 (15)
ACT8	00000606-R	1732 (15)	1662 (15) 1663 (15) 1664 (15) 1665 (15)
ACTION_TABLE	000005EF-R	1669 (15)	1884 (17)
ALLOC_DG	000007B2-R	2092 (20)	#-1366 (10) #-1756 (16)
ARGCNT	=00000000	913 (6)	
BCA_CQ0	00001010		#-2861 (31)
BCA_CQ0_M_CQC	=00000001		#-2861 (31)
BCA_DFQ	00001030		2901 (32) 2902 (32)
BCA_DFQ_M_DFQC	=00000001		#-2903 (32)
BCA_MFQ	00001034		2901 (32)
BCA_PEC	00001024		#-2710 (29)
BCA_PEC_M_PEC	=00000001		#-2710 (29)
BCA_PIC	0000102C		#-2685 (29)
BCA_PMC	00001004		#-2676 (29) #-2678 (29) #-2683 (29) #-2709 (29)
BCA_PMC_M_MTD	=00000002		#-2709 (29)
BCA_PMC_V_HLT	=00000007		#-2677 (29)
BCA_PMC_V_START	=00000000		#-2675 (29) #-2682 (29)
BCA_PPR	000000F8		#-2712 (29)
BCA_PPR_S_CSZ	=00000003		1589 (14)
BCA_PPR_V_CSZ	=0000001D		1588 (14)
BCA_PQBBR	000000F0		#-2708 (29)
BCA_PS	00001000		#-2693 (29) #-2698 (29) #-3063 (35) #-3069 (35)
BCA_PSR	00001020		#-2711 (29) #-3070 (35)
BCA_PSR_M_PSC	=00000001		#-2711 (29) #-3070 (35)
BCA_PS_M_MIF	=00000200		#-2693 (29) #-2699 (29) #-3063 (35) #-3072 (35)
BCA_PS_M_NRSPE	=00008000		#-2699 (29) #-3071 (35)
BCA_PS_M_PIC	=00000008		#-2701 (29) #-3073 (35)
BCA_PS_M_RQA	=00000001		#-3074 (35)
BICA_CNF	00000100		#-2609 (28) #-2612 (28) #-3021 (34)
BICA_CNF_M_BAPE	=40000000		3018 (34)
BICA_CNF_M_BBE	=10000000		3016 (34)
BICA_CNF_M_BIPE	=20000000		3017 (34)
BICA_CNF_M_CPPE	=80000000		3019 (34)
BICA_CNF_M_DCLO	=01000000		3012 (34)
BICA_CNF_M_DIAG	=02000000		3013 (34)
BICA_CNF_M_NOCI	=00800000		#-2610 (28) 3011 (34)
BICA_CNF_M_PDN	=08000000		3015 (34)
BICA_CNF_M_PUP	=04000000		3014 (34)
BICA_MADR	00000114		2420 (25)
BICA_MDATR	00000118		2420 (25)
BICA_PMC	00000110		2420 (25) #-3003 (34)

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BIIC$L_BCICR                    =00000028                       #-3201  (38)   #-3299  (40)
BIIC$L_BER                      =00000008                       #-3292  (40)
BIIC$L_BICSR                    =00000004                       #-3024  (34)   #-3076  (35)   #-3264  (40)   #-3267  (40)
                                                                #-3281  (40)   #-3286  (40)
BIIC$M_NPE                      =00000001                       #-3292  (40)
BIIC$M_RTOEVEN                  =00000008                       #-3198  (38)   #-3296  (40)
BIIC$M_SST                      =00000400                       #-3266  (40)
BIIC$M_STOPEN                   =00002000                       #-3199  (38)   #-3297  (40)
BIIC$M_STS                      =00000800                       #-3263  (40)   #-3266  (40)
BIIC$M_UCSREN                   =00000100                       #-3200  (38)   #-3298  (40)
BIIC$V_ARBCNTL                  =00000004                       #-3263  (40)
BIIC$V_BROKE                    =0000000C                       #-3286  (40)
BIIC$V_HES                      =0000000F                       #-3025  (34)   #-3077  (35)
BIIC$V_STS                      =0000000B                       #-3281  (40)
BLKSIZE                         =00000200       542     (1)
BOOT$L_R2                        00000000-XR                      280   (1)    #-655   (3)    #-656   (3)    #-658   (3)
BTD$K_AIE_TK50                  =00000023                       #-2498  (26)   #-605   (2)
BTD$K_BVPSSP                    =00000022                       #-2494  (26)   #-603   (2)
BTD$K_HSCCI                     =00000020                       #-2483  (26)     502   (1)   #-601   (2)
BUF                             =00000004       728     (4)     #-1020  (6)
BVPCTR_C_CMDQ                   =00000006                       #-2865  (31)
BVPCTR_C_ENABLE                 =00000002                       #-2776  (30)
BVPCTR_C_FREQ                   =00000007                       #-2908  (32)
BVPCTR_C_INIT                   =00000001                       #-2762  (30)
BVPSTA_C_ENAB                   =00000004                       #-2782  (30)   #-3125  (36)
BVPSTA_C_INIT                   =00000002                       #-2768  (30)
BVPTYP_C_ADAPT                  =00000002                       #-3129  (36)
BVP_CTRL                         000000F0                       #-2763  (30)   #-2777  (30)   #-2866  (31)   #-2909  (32)
                                                                #-2919  (32)
BVP_CTRL_M_OWNER                =00000080                       #-2761  (30)   #-2775  (30)   #-2864  (31)   #-2907  (32)
BVP_CTRL_V_DATA                 =00000008                       #-2906  (32)
BVP_CTRL_V_OWNER                =00000007                       #-2919  (32)
BVP_C_PRT_BASE                  =00000001                       #-1537  (13)
BVP_DATA                         000000FC                       #-2822  (30)   #-2830  (30)
BVP_START                        00000568-R     1536     (13)   #-2023  (18)
BVP_STAT                         000000F4                       #-2760  (30)   #-2774  (30)   #-2785  (30)   #-2826  (30)
                                                                #-3109  (36)   #-3132  (36)
BVP_STAT_M_E_TYPE               =0000FF00                       #-3127  (36)
BVP_STAT_M_OWNER                =80000000                       #-2759  (30)   #-2773  (30)   #-2784  (30)   #-3131  (36)
BVP_STAT_M_PST                  =00070000                       #-2766  (30)   #-2780  (30)   #-3123  (36)
BVP_STAT_V_ACC                  =0000001C                       #-2748  (30)
BVP_STAT_V_E_TYPE               =00000008                       #-3129  (36)
BVP_STAT_V_OWNER                =0000001F                       #-2764  (30)   #-2778  (30)   #-3109  (36)
BVP_STAT_V_PST                  =00000010                       #-2768  (30)   #-2782  (30)   #-3125  (36)
BVP_STAT_V_RSQ                  =00000007                       #-3133  (36)
BVP_STAT_V_STD                  =0000001D                       #-2754  (30)
BVP_STAT_V_SUME                 =00000006                       #-3117  (36)
CCI_CNF                          00000000                       #-2615  (28)   #-2963  (33)   #-2971  (33)   #-2972  (33)
CCI_CNF_M_CRD                   =00010000                       #-2966  (33)
CCI_CNF_M_MXTFLT                =08000000                       #-2967  (33)
CCI_CNF_M_PARFLT                =80000000                       #-2968  (33)
CCI_CNF_M_URDFLT                =20000000                       #-2969  (33)
CCI_CNF_M_WSQFLT                =40000000                       #-2970  (33)
CCI_CNF_M_XMTFLT                =04000000                       #-2970  (33)
CCI_MADR                         00000014                         2409  (25)
CCI_MDATR                        00000018                         2409  (25)
CCI_PMC                          00000004                         2409  (25)   #-3163  (37)
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CHECK_BVP_INSTR                 00000BE4-R  2913  (32)    #-2867  (31)
CHECK_PS                        00000C9D-R  3029  (34)    #-2974  (33)
CHK_TIMEOUT                     00000625-R  1790  (16)      1680  (15)      1700  (15)
CIBD$L_BLEN                     =00000004                  #-830  (5)
CIBD$L_SVAPTE                   =00000008                  #-860  (5)
CIBD$W_FLAGS                    =00000000                  #-826  (5)
CIBD$W_KEY                      =00000002                  #-795  (4)    #-827  (5)    #-950  (6)
CIPA_CQO                         00000908                  #-2858  (31)
CIPA_CQO_M_CQC                  =00000001                  #-2858  (31)
CIPA_C_UCODEST                  =00000400                  #-2620  (28)
CIPA_DFQ                         00000928                   2896  (32)      2897  (32)
CIPA_DFQ_M_DFQC                 =00000001                  #-2898  (32)
CIPA_MFQ                         0000092C                   2896  (32)
CIPA_PEC                         0000091C                  #-2641  (28)
CIPA_PEC_M_PEC                  =00000001                  #-2641  (28)
CIPA_PIC                         00000924                  #-2621  (28)
CIPA_PIC_M_PIC                  =00000001                  #-2621  (28)   #-2684  (29)
CIPA_PMC_M_MIF                  =00000008                  #-2629  (28)   #-2956  (33)   #-3003  (34)
CIPA_PMC_M_MIN                  =00000001                  #-3163  (37)
CIPA_PMC_M_MTD                  =00000002                  #-2640  (28)
CIPA_PMC_M_PSA                  =00000040                  #-2619  (28)
CIPA_PPR                         00000940                  #-2643  (28)
CIPA_PPR_S_CSZ                  =00000003      579  (1)      1589  (14)   #-1592  (14)
CIPA_PPR_V_CSZ                  =0000001D      580  (1)      1588  (14)   #-1591  (14)
CIPA_PQBBR                       00000904                  #-2639  (28)
CIPA_PS                          00000900                  #-2634  (28)   #-3030  (34)
CIPA_PSR                         00000918                  #-2642  (28)   #-3031  (34)
CIPA_PSR_M_PSC                  =00000001                  #-2642  (28)   #-3031  (34)
CIPA_PS_M_PIC                   =00000008                  #-2634  (28)   #-3032  (34)
CIPA_PS_M_RQA                   =00000001                  #-3032  (34)
CLASS                            0000002C-R    522  (1)      613  (2)      627  (2)
CLASS_DISK                       0000004D-R    529  (1)    #-625  (2)      626  (2)
CLASS_TAPE                       0000006F-R    534  (1)    #-611  (2)      612  (2)
COMMON                           0000031B-R   1046  (6)    #-965  (6)
CONTINUE                         000002D0-R   1001  (6)    #-990  (6)
COPY_SYSID                       00000607-R   1753  (16)     1674  (15)     1687  (15)
CUR_POS                          00000080-R    537  (1)    #-1051  (6)    #-615  (2)
DEVICE_TAB                       000008D4-R   2399  (25)     2410  (25)     2503  (26)
DEVICE_TAB_LEN                  =00000015     2410  (25)     2503  (26)     2504  (26)
DEVNAME                          00000005-R    510  (1)    #-1327  (9)
DG_SIZ                          =00000060      318  (1)    #-1543  (13)   #-1806  (16)   #-1986  (18)     2063  (19)
DIR_FLAGS                        00000000-XR               750  (4)      751  (4)
DIR_V_CMM                        00000000-XR              #-750  (4)
DIR_V_DRVCLR                     00000000-XR              #-751  (4)
DISCARD                          000007EB-R   2178  (22)  #-1365  (10)   #-1408  (11)   #-1759  (16)   #-2062  (19)
                                                         #-2305  (24)
DISCARD_PKT                      0000060B-R   1758  (16)     1719  (15)
DISPATCH_DG                      000006AE-R   1861  (17)  #-2335  (24)
DS$GB_CI_INIT                    00000004-R    509  (1)    #-1164  (7)    #-752  (4)    #-770  (4)
DS$WAITUS                        00000000-XR               3271  (40)
ERROR                            000003A8-R   1157  (7)    #-1081  (6)    #-1245  (9)    #-1299  (9)    #-1311  (9)
                                                         #-1406  (11)   #-1480  (11)   #-1881  (17)   #-2259  (24)
                                                         #-2265  (24)   #-2574  (27)   #-2632  (28)   #-2696  (29)
                                                         #-2789  (30)   #-2833  (30)   #-2975  (33)   #-3034  (34)
                                                         #-3079  (35)   #-3137  (36)
ERROR1                           000003A6-R   1156  (7)    #-2095  (20)   #-2151  (21)   #-2181  (22)   #-2548  (26)
                                                         #-2923  (32)
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EVENT_CLOSED                    =00000000     1635    (15)     1638    (15)
EVENT_ST_RECV                   =00000002     1637    (15)     1640    (15)    #-2332    (24)
EVENT_ST_SENT                   =00000001     1636    (15)     1639    (15)
EVENT_TIMEOUT                   =00000003     1642    (15)  #-1859    (17)
EXE$GL_TENUSEC                   00000000-XR                  #-1278    (9)     #-1828    (16)    #-2283    (24)    #-2478    (26)
                                                              #-2629    (28)    #-2693    (29)    #-2826    (30)    #-2919    (32)
                                                              #-2956    (33)    #-3003    (34)    #-3063    (35)    #-3109    (36)
                                                              #-3281    (40)    #-3286    (40)
EXE$GL_UBDELAY                   00000000-XR                  #-1278    (9)     #-1828    (16)    #-2283    (24)    #-2478    (26)
                                                              #-2629    (28)    #-2693    (29)    #-2826    (30)    #-2919    (32)
                                                              #-2956    (33)    #-3003    (34)    #-3063    (35)    #-3109    (36)
                                                              #-3281    (40)    #-3286    (40)
FATAL_BICA_CNF                  =FF800000     3019    (34)  #-3021    (34)
FLAG_M_INVTC                    =00000004                     2409    (25)      2420    (25)      2427    (25)
FLAG_M_TMSCP                    =00000002                     2441    (25)
FLAG_V_INVTC                    =00000002                  #-2213    (23)
FLAG_V_TMSCP                    =00000001                  #-1254    (9)     #-1297    (9)     #-3112    (36)    #-777     (4)
FUNC                            =00000010      915    (6)  #-748     (4)     #-772     (4)     #-773     (4)
GET_MSG_BUFFER                   0000038B-R    1114    (6)  #-921     (6)     #-933     (6)
GET_NEW_PKT                      00000608-R    1755    (16)    1681    (15)      1690    (15)      1696    (15)
HSC$B_PORT_NUMBER                00000090-R     558    (1)  #-1998    (18)    #-673     (3)
HSC50_BOOT                       00000000-XR                #-659     (3)
INIT_BDT_ENTRY                   000001FB-R     822    (5)  #-782     (4)     #-942     (6)
INIT_CONNECT                     000004BF-R    1363    (10) #-1892    (17)    #-2788    (30)
INIT_FREEQ                       00000797-R    2053    (19) #-1610    (14)    #-2787    (30)
INIT_HARDWARE                    000009FC-R    2571    (27) #-2026    (18)
INIT_MSCP                        000003C6-R    1194    (8)  #-2311    (24)
INTERRUPT_BCA                    00000CB6-R    3058    (35)    2427    (25)
INTERRUPT_BCI750                 00000C5D-R    2998    (34)    2420    (25)
INTERRUPT_BVP                    00000D06-R    3103    (36)    2434    (25)      2441    (25)
INTERRUPT_CI780                  00000C1A-R    2948    (33)    2409    (25)
INVALIDATE                       00000807-R    2212    (23) #-850     (5)
IO$_DRVCLR                      =00000004                  #-748     (4)     #-989     (6)
IO$_READLBLK                    =00000021                  #-922     (6)
IO$_REWIND                      =00000024                  #-978     (6)
IO$_SKIPFILE                    =00000025                  #-1008    (6)     #-1028    (6)
IO$_SKIPRECORD                  =00000026                  #-1013    (6)
MAPEN                            00000000-R     508    (1)  #-3373    (41)    #-734     (4)
MAX_READ                        =00000002      540    (1)
MAX_TIMEOUT                     =00000008      315    (1)  #-2003    (18)
MCHECK                           00000000-XR                  279    (1)      3257    (40)
MC_RETURN                        00000000-XR                  279    (1)   #-3256    (40)
MMG$GL_SPTBASE                   00000000-XR                #-1968    (18)  #-3369    (41)    #-737     (4)     #-741     (4)
MODE                            =00000014      916    (6)  #-839     (5)
MSCP$B_BUFFER                   =00000010                    947    (6)
MSCP$B_FLAGS                    =00000009                    935    (6)      975    (6)
MSCP$B_OPCODE                   =00000008                   1117    (6)   #-1239    (9)    #-1304    (9)       776    (4)
                                                             787    (4)      935    (6)    #-938     (6)       975    (6)
                                                          #-977     (6)
MSCP$K_OP_END                   =00000080                  #-1241    (9)     #-1306    (9)
MSCP$K_OP_ONLIN                 =00000009                  #-1262    (9)     #-1285    (9)    #-1305    (9)
MSCP$K_OP_READ                  =00000021                  #-788     (4)     #-937     (6)
MSCP$K_OP_REPOS                 =00000025                  #-976     (6)
MSCP$K_OP_STCON                 =00000004                  #-1199    (8)     #-1240    (9)
MSCP$K_ST_AVLBL                 =00000004                  #-1063    (6)
MSCP$K_ST_BOT                   =0000000D                  #-1065    (6)
MSCP$K_ST_ICMD                  =00000001                  #-1060    (6)
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MSCP$K_ST_LED                   =00000013                       #-1074   (6)
MSCP$K_ST_OFFLN                 =00000003                       #-1079   (6)
MSCP$K_ST_PLOST                 =00000011                       #-1071   (6)
MSCP$K_ST_RDTRN                 =00000010                       #-1068   (6)
MSCP$K_ST_SUCC                  =00000000                        1057    (6)
MSCP$K_ST_TAPEM                 =0000000E                       #-1031   (6)    #-1076   (6)
MSCP$L_BYTE_CNT                 =0000000C                        776     (4)    #-939    (6)    #-967    (6)
MSCP$L_LBN                      =0000001C                       #-798    (4)    #-953    (6)
MSCP$L_MEDIA_ID                 =0000001C                        1319    (9)     1324    (9)
MSCP$L_POSITION                 =0000001C                       #-1051   (6)
MSCP$L_REC_CNT                  =0000000C                        1011    (6)
MSCP$L_TMGP_CNT                 =00000010                        1007    (6)
MSCP$M_MD_CLSEX                 =00002000                       #-1122   (6)    #-1287   (9)
MSCP$M_MD_DLEOT                 =00000080                       #-1018   (6)
MSCP$M_MD_REVRS                 =00000008                       #-1023   (6)
MSCP$M_MD_REWND                 =00000002                       #-984    (6)
MSCP$Q_TIME                     =00000014                       #-1208   (8)
MSCP$S_MTYP_D0                  =00000005                       #-1323   (9)
MSCP$S_MTYP_D1                  =00000005                       #-1318   (9)
MSCP$S_ST_MASK                  =00000005                       #-1052   (6)    #-1236   (9)
MSCP$V_MTYP_D0                  =0000001B                       #-1322   (9)
MSCP$V_MTYP_D1                  =00000016                       #-1317   (9)
MSCP$V_ST_MASK                  =00000000                       #-1052   (6)     1235    (9)
MSCP$W_MODIFIER                 =0000000A                       #-1019   (6)    #-1024   (6)    #-1123   (6)    #-985    (6)
MSCP$W_SHDW_UNT                 =00000020                       #-1266   (9)    #-1292   (9)
MSCP$W_STATUS                   =0000000A                        1053    (6)    #-1237   (9)
MS_OHD                          =00000020       320     (1)     #-1543   (13)   #-1806   (16)
MS_SIZ                          =00000060       319     (1)     #-1543   (13)   #-1806   (16)   #-1989   (18)
NDT$_AIE_TK                     =0000401B       549     (1)     #-2490   (26)
NDT$_AIE_TKNI                   =8000410E       550     (1)      2441    (25)   #-2488   (26)   #-2496   (26)
NDT$_AIO                        =8000410D                       #-2486   (26)
NDT$_BCA                        =80000108                        2427    (25)   #-3193   (38)
NDT$_BCI750                     =8000010B                        2420    (25)
NDT$_BSA                        =80004104                        2434    (25)   #-2493   (26)
NDT$_CI                         =00000038                        2409    (25)   #-2484   (26)   #-2963   (33)   #-2972   (33)
NEW_CMD_BCA                      00000BB1-R     2860    (31)     2427    (25)
NEW_CMD_BCI750                   00000BAB-R     2857    (31)     2420    (25)
NEW_CMD_BVP                      00000BB7-R     2863    (31)     2434    (25)    2441    (25)
NEW_CMD_CI780                    00000BAB-R     2856    (31)     2409    (25)
NEW_FRQ_BCA                      00000BCC-R     2900    (32)     2427    (25)
NEW_FRQ_BCI750                   00000BC2-R     2895    (32)     2420    (25)
NEW_FRQ_BVP                      00000BD6-R     2905    (32)     2434    (25)    2441    (25)
NEW_FRQ_CI780                    00000BC2-R     2894    (32)     2409    (25)
NXT_MSGI                         00000095-R     563     (1)     #-1115   (6)    #-1232   (9)    #-775    (4)
OPEN_VC                          00000621-R     1771    (16)     1675    (15)    1688    (15)
OPEN_VC_CONT                     0000066E-R     1814    (16)    #-1772   (16)
PA_ACTION                        000000A1-R     599     (2)     #-2515   (26)
PA_DRIVER                        00000138-R     732     (4)      2409    (25)    2420    (25)    2427    (25)    2434    (25)
                                                                 2441    (25)    2543    (26)     502    (1)
PA_DRVSIZ                       =000019B0       3386    (41)     502     (1)
PA_INIT                          000000F3-R     651     (3)      758     (4)
POS                             =0000001C       917     (6)
POSITION_FUNCTION                000002AE-R     973     (6)     #-924    (6)
PPAGTBL                          000017B0-R     3385    (41)     851     (5)
PPD$B_OPC                        0000000E                        #-1098   (6)    #-1195   (8)    #-1281   (9)    #-1436   (11)
                                                                 #-1600   (14)   #-1617   (14)   #-1816   (16)   #-2121   (21)
                                                                 #-2147   (21)   #-2222   (23)   #-2226   (23)   #-2290   (24)
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                                                  #-2296   (24)   #-2308   (24)   #-2315   (24)   #-2321   (24)
                                                  #-2326   (24)
PPD$B_PORT                  0000000C              #-1597   (14)   #-2150   (21)   #-2301   (24)
PPD$B_STATUS                0000000D                2271   (24)
PPD$C_ACK                  =00000002                1640   (15)   #-1762   (16)
PPD$C_ACK_LEN              =00000004              #-1762   (16)
PPD$C_DGREC                =00000021              #-2316   (24)
PPD$C_IDREC                =0000002B              #-2322   (24)
PPD$C_INVTC                =00000018              #-2221   (23)   #-2297   (24)
PPD$C_LENGTH                00000012              #-1208   (8)    #-1266   (9)    #-1292   (9)    #-798    (4)
                                                  #-953    (6)
PPD$C_MSGREC               =00000022              #-2327   (24)
PPD$C_REQID                =00000005              #-1616   (14)
PPD$C_SCS_MSG              =00000004              #-1204   (8)      515    (1)
PPD$C_SETCKT               =00000019              #-1599   (14)   #-1815   (16)   #-2291   (24)
PPD$C_SNDDG                =00000001              #-2146   (21)
PPD$C_SNDMSG               =00000002              #-1098   (6)    #-1435   (11)   #-2120   (21)   #-2309   (24)
PPD$C_STACK                =00000001                1639   (15)   #-1803   (16)
PPD$C_STACK_LEN            =0000003E              #-1803   (16)
PPD$C_START                =00000000                1638   (15)   #-1768   (16)
PPD$C_START_LEN            =0000003E              #-1768   (16)
PPD$C_TYPNP                =00000005              #-2273   (24)
PPD$M_CST                  =00008000              #-1817   (16)   #-1820   (16)
PPD$M_DQI                  =00001000              #-1601   (14)
PPD$M_NR                   =00004000              #-1818   (16)
PPD$M_NS                   =00002000              #-1818   (16)
PPD$M_RSP                  =00000001              #-1434   (11)   #-1598   (14)   #-2220   (23)
PPD$Q_NODENAME              00000040              #-1801   (16)
PPD$Q_XCT_ID                00000010              #-1618   (14)
PPD$S_STSTYP               =00000003              #-2270   (24)
PPD$V_STSTYP               =00000005              #-2269   (24)
PPD$W_LENGTH                00000010              #-1763   (16)     1767   (16)     1802   (16)
PPD$W_MASK                  00000010              #-1602   (14)   #-1603   (14)   #-1819   (16)
PPD$W_MTYPE                 00000012              #-1205   (8)    #-2331   (24)
PPD$W_M_VAL                 00000014              #-1604   (14)   #-1821   (16)
PPD$W_SIZE                  00000008              #-1364   (10)   #-1371   (10)   #-2061   (19)   #-2179   (22)
PQB_B_PD_HWVERS             00000098                1555   (13)
PQB_L_BDT_BASE              0000003C                2010   (18)     2014   (18)
PQB_L_BDT_LEN               00000040                2014   (18)     2017   (18)
PQB_L_BVP_LEVEL             00000060              #-1538   (13)
PQB_L_DFRQ_HDR              00000028                1971   (18)     1981   (18)
PQB_L_DQE_LEN               00000030                1985   (18)     1988   (18)
PQB_L_MFRQ_HDR              0000002C                1981   (18)     1985   (18)
PQB_L_MQE_LEN               00000034                1988   (18)     2006   (18)
PQB_L_SPT_BASE              00000044                2017   (18)     2020   (18)
PQB_L_SPT_LEN               00000048                2020   (18)
PQB_L_VPQB_BASE             00000038                2006   (18)     2010   (18)
PQB_PTR                     00000091-R   562   (1)  #-1233   (9)    #-771    (4)
PQB_Q_CMDQ0                 00000000                2151   (21)
PQB_Q_RESPQ                 00000020              #-2256   (24)     2265   (24)
PQB_T_PD_HWTYPE             00000094                1552   (13)     1555   (13)
PQB_T_PD_SWTYPE             0000008C                1546   (13)     1549   (13)
PQB_T_PD_SWVERS             00000090                1549   (13)     1552   (13)
PQB_W_PD_MAXDG              00000088                1539   (13)     1542   (13)     1546   (13)
PQB_W_PD_MAXMSG             0000008A                1542   (13)
PR$_IPL                    =00000012              #-3262   (40)   #-3277   (40)
PR$_MAPEN                  =00000038              #-1942   (18)   #-3373   (41)   #-734    (4)    #-735    (4)
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                                                  #-769    (4)    #-845    (5)
PR$_SID                  =0000003E                #-1556   (13)   #-1804   (16)   #-1811   (16)
PR$_SLR                  =0000000D                #-1967   (18)
PR$_TBIA                 =00000039                #-3372   (41)
PTE$C_KW                 =10000000                #-743    (4)    #-855    (5)
PTE$M_VALID              =80000000                #-743    (4)    #-855    (5)
Q_PKT                     0000055B-R   1503   (12)   1043    (6)    #-1210   (8)    #-1268   (9)    #-1294   (9)
                                                  #-800    (4)
REC_INVTC                 00000819-R   2225   (23)  #-2299   (24)
REC_MSCP                  000003EE-R   1231   (9)   #-1479   (11)
REC_SCS_MSG               000004DD-R   1398   (11)  #-2329   (24)
REM_NEXT_RSP              0000081F-R   2255   (24)  #-1409   (11)   #-1606   (14)   #-1621   (14)   #-1894   (17)
                                                  #-2125   (21)   #-2267   (24)   #-2306   (24)   #-964    (6)
REM_NODE                  0000008C-R   553    (1)   #-1791   (16)   #-1997   (18)   #-1998   (18)   #-655    (3)
                                                  #-656    (3)    #-658    (3)    #-660    (3)    #-661    (3)
REM_NODE_INDEX            0000008E-R   555    (1)   #-1995   (18)   #-1996   (18)   #-654    (3)
REM_RSP                   0000082B-R   2263   (24)  #-3035   (34)   #-3078   (35)   #-3136   (36)
RESET_BCA                 00000D88-R   3191   (38)   2427   (25)
RESET_BCI750              00000D88-R   3190   (38)   2420   (25)
RESET_BVP                 00000DA4-R   3223   (39)   2434   (25)    2441   (25)
RESET_CI780               00000D80-R   3158   (37)   2409   (25)
RETURN                    000002CC-R   997    (6)   #-1016   (6)    #-1034   (6)    #-968    (6)    #-987    (6)
RE_INIT                   000006EC-R   1919   (18)  #-1796   (16)   #-2285   (24)   #-669    (3)
ROUT_TABLE                00000607-R   1752   (16)   1674   (15)    1675   (15)    1676   (15)    1680   (15)
                                                    1681   (15)    1682   (15)    1687   (15)    1688   (15)
                                                    1689   (15)    1690   (15)    1691   (15)    1696   (15)
                                                    1700   (15)    1701   (15)    1714   (15)    1719   (15)
                                                    1732   (15)    1799   (16)    1887   (17)
RPB$L_ADPPHY             =0000005C                  1943   (18)   #-1944   (18)
RPB$L_ADPVIR             =00000060                  1943   (18)
RPB$L_BOOTR2             =00000024                #-660    (3)    #-661    (3)
RPB$L_SVASPT             =00000050                  1958   (18)   #-838    (5)
RPB$W_UNIT               =00000064                #-1261   (9)    #-1284   (9)
SAVE_FUNC                 0000009D-R   566    (1)   #-1008   (6)    #-1013   (6)    #-1028   (6)    #-773    (4)
                                                  #-922    (6)    #-978    (6)    #-989    (6)
SAVE_MCHK                 00000000-XR                279    (1)    #-3255   (40)   #-3270   (40)
SAVE_RETRY_ADR            00000088-R   546    (1)   #-733    (4)    #-920    (6)
SCB$L_MACHCHK             00000004                #-3255   (40)   #-3257   (40)   #-3270   (40)
SCB_ADDR                  00000099-R   564    (1)
SCB_BASE                  00000000-XR             #-3255   (40)   #-3257   (40)   #-3270   (40)
SCS$B_PPD                =FFFFFFE0                  1007   (6)     1011   (6)    #-1019   (6)    #-1024   (6)
                                                  #-1051   (6)     1053   (6)    #-1095   (6)    #-1097   (6)
                                                    1117   (6)    #-1123   (6)     1196   (8)    #-1207   (8)
                                                  #-1208   (8)    #-1209   (8)    #-1237   (9)    #-1239   (9)
                                                    1259   (9)    #-1266   (9)    #-1267   (9)     1282   (9)
                                                  #-1292   (9)    #-1293   (9)    #-1304   (9)     1320   (9)
                                                    1325   (9)     1328   (9)     1369   (10)   #-1399   (11)
                                                  #-1402   (11)   #-1405   (11)   #-1416   (11)   #-1418   (11)
                                                  #-1420   (11)   #-1422   (11)   #-1423   (11)   #-1426   (11)
                                                  #-1433   (11)   #-1438   (11)   #-1440   (11)   #-1442   (11)
                                                  #-1444   (11)   #-1445   (11)   #-1446   (11)   #-1448   (11)
                                                  #-1451   (11)   #-1458   (11)   #-1461   (11)   #-1473   (11)
                                                  #-1503   (12)   #-1505   (12)    787    (4)    #-798    (4)
                                                  #-799    (4)    #-938    (6)    #-939    (6)     947    (6)
                                                  #-953    (6)    #-954    (6)    #-967    (6)    #-977    (6)
                                                  #-985    (6)
SCS$C_ACCP_REQ           =00000002                #-1427   (11)
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SCS$C_ACCP_RSPL                 =00000012                       #-1432  (11)
SCS$C_APPL_MSG                  =0000000A                       #-1206  (8)     #-1474  (11)
SCS$C_CON_REQ                   =00000000                       #-1400  (11)      516   (1)
SCS$C_CON_REQL                  =00000042                         514   (1)
SCS$C_CON_RSP                   =00000001                       #-1403  (11)
SCS$C_CR_REQ                    =00000008                       #-1452  (11)
SCS$C_CR_RSPL                   =0000000E                       #-1457  (11)
SCS$C_DISC_REQ                  =00000006                       #-1462  (11)
SCS$C_STNOMAT                   =0000000A                       #-1415  (11)
SCS$C_STNORMAL                  =00000001                       #-1437  (11)
SCS$L_DST_CONID                 =FFFFFFF8                       #-1097  (6)     #-1417  (11)    #-1421  (11)    #-1439  (11)
                                                                #-1443  (11)    #-1446  (11)    #-1505  (12)
SCS$L_SRC_CONID                 =FFFFFFFC                       #-1419  (11)    #-1423  (11)    #-1441  (11)    #-1445  (11)
SCS$W_CREDIT                    =FFFFFFF6                       #-1095  (6)     #-1503  (12)
SCS$W_LENGTH                    =FFFFFFF0                       #-1209  (8)     #-1267  (9)     #-1293  (9)       1369  (10)
                                                                #-1433  (11)    #-1458  (11)    #-799   (4)     #-954   (6)
SCS$W_MTYPE                     =FFFFFFF4                       #-1207  (8)     #-1399  (11)    #-1402  (11)    #-1426  (11)
                                                                #-1448  (11)    #-1451  (11)    #-1461  (11)    #-1473  (11)
SCS$W_STATUS                    =00000002                       #-1405  (11)    #-1416  (11)    #-1438  (11)
SELECT_HARDWARE                  00000941-R   2467   (26)      #-1969  (18)
SENDX                            000007D9-R   2151   (21)      #-1605  (14)
SEND_ACK                         0000060E-R   1761   (16)        1691  (15)      1714  (15)
SEND_ANY                         000007CB-R   2123   (21)      #-2223  (23)
SEND_DG                          000007CF-R   2146   (21)      #-1812  (16)
SEND_MSG                         000007C7-R   2119   (21)      #-1372  (10)    #-1449  (11)    #-1506  (12)
SEND_NOWAIT                      00000376-R   1094   (6)       #-956   (6)
SEND_PKT                         000007D3-R   2148   (21)        1099  (6)     #-1619  (14)    #-1822  (16)    #-2124  (21)
SEND_STACK                       00000639-R   1800   (16)        1682  (15)
SEND_START                       00000618-R   1766   (16)        1701  (15)
SEND_WAIT                        00000315-R   1041   (6)       #-1027  (6)     #-986   (6)
SERVER                           0000001C-R   521    (1)         610   (2)       624   (2)
SERVER_DISK                      0000003C-R   528    (1)       #-622   (2)       623   (2)
SERVER_TAPE                      0000005E-R   531    (1)       #-608   (2)       609   (2)
SETCKT                           000005C8-R   1608   (14)      #-2293  (24)
SET_SST                          00000DA7-R   3253   (40)      #-3195  (38)    #-3224  (39)
SIZE                            =00000008     914    (6)
SPIN                             00000623-R   1774   (16)        1676  (15)      1689  (15)
SPIN_CONT                        00000681-R   1824   (16)      #-1775  (16)
SPT_PTR                          00000EA4-R   3379   (41)        3370  (41)      738   (4)
SPT_RESET                        00000E86-R   3367   (41)        1165  (7)       1337  (9)       760   (4)     #-998   (6)
SS$_CTRLERR                     =00000054                       #-1158  (7)
SS$_DATAOVERUN                  =00000838                       #-1067  (6)
SS$_DEVOFFLINE                  =00000084                       #-1078  (6)
SS$_ENDOFFILE                   =00000870                       #-1073  (6)
SS$_ILLIOFUNC                   =000000F4                       #-1015  (6)
SS$_NORMAL                      =00000001                       #-1033  (6)     #-1056  (6)     #-1278  (9)     #-1301  (9)
                                                                #-1336  (9)     #-1828  (16)    #-2283  (24)    #-2478  (26)
                                                                #-2629  (28)    #-2693  (29)    #-2826  (30)    #-2919  (32)
                                                                #-2956  (33)    #-3003  (34)    #-3063  (35)    #-3109  (36)
                                                                #-3164  (37)    #-3202  (38)    #-3281  (40)    #-3286  (40)
                                                                #-3300  (40)    #-996   (6)
SS$_TAPEPOSLOST                 =00000224                       #-1070  (6)
START_BCA                        00000A87-R   2671   (29)        2427  (25)
START_BCI750                     00000A0A-R   2603   (28)        2420  (25)
START_BVP                        00000AFA-R   2744   (30)        2434  (25)      2441  (25)
START_CI780                      00000A1D-R   2614   (28)        2409  (25)
START_DRV                        00000000-R   504    (1)         3386  (41)      502   (1)
```

```
START_OVER                      00000633-R   1794  (16)    1732  (15)
START_VC                        0000058C-R   1582  (14)  #-2644  (28)  #-2713  (29)
STATE_CLOSED                    =00000000    570   (1)
STATE_FATAL                     =00000006    576   (1)  #-1162  (7)
STATE_INIT                      =00000005    575   (1)  #-1972  (18)
STATE_MESSAGE                   =00000004    574   (1)  #-774   (4)
STATE_OPEN                      =00000003    573   (1)    1692  (15)    1706  (15)    1710  (15)    1715  (15)
                                                          1720  (15)  #-1877  (17)  #-2275  (24)
STATE_ST_RECV                   =00000002    572   (1)    1683  (15)
STATE_ST_SENT                   =00000001    571   (1)    1702  (15)
STATE_TABLE                     000005DF-R   1659  (15)  #-1883  (17)
STATE_VCBROKEN                  =00000007    577   (1)  #-1159  (7)   #-1469  (11)  #-1879  (17)  #-2277  (24)
STATUS_CODE                     0000032B-R   1055  (6)
TABLE                           000010A4-R   3382  (41)   1923  (18)
TAB_B_BDT                       00000110                   2009  (18)    780  (4)   #-795  (4)    941  (6)
TAB_K_REGS                      =00000003    2528  (26)  #-2529  (26)
TAB_K_SUBS                      =00000005    2541  (26)  #-2542  (26)
TAB_LEN                         =0000050C                #-1926  (18)    3382  (41)
TAB_L_HOLE                      000000E8                 #-1828  (16)  #-2283  (24)  #-772  (4)
TAB_L_INI_FLAGS                 000004E8                   1255  (9)     1298  (9)     2214  (23)    2520  (26)
                                                           2525  (26)    2528  (26)    3113  (36)    778  (4)
TAB_L_INTERRUPT                 000004F8                   2258  (24)    2536  (26)    2537  (26)
TAB_L_MADR                      000004F0                   2526  (26)    2527  (26)  #-2620  (28)
TAB_L_MDATR                     000004F4                   2527  (26)    2528  (26)    2536  (26)    2541  (26)
TAB_L_NEW_CMD                   00000500                   2152  (21)    2538  (26)    2539  (26)
TAB_L_NEW_FRQ                   00000504                   2182  (22)    2539  (26)    2540  (26)
TAB_L_PAGETBL                   00000108                   1999  (18)    2002  (18)  #-844   (5)
TAB_L_PMC                       000004EC                   2525  (26)    2526  (26)  #-2619  (28)  #-2629  (28)
                                                         #-2640  (28)  #-2956  (33)
TAB_L_RCONID                    00000120                 #-1096  (6)   #-1447  (11)  #-1504  (12)  #-796   (4)
                                                         #-952   (6)
TAB_L_RESET                     000004FC                   2537  (26)    2538  (26)    2572  (27)
TAB_L_RSTAID                    00000104                 #-1595  (14)  #-1828  (16)    1994  (18)    1999  (18)
                                                         #-2149  (21)  #-2283  (24)  #-2302  (24)
TAB_L_START                     00000508                   2540  (26)    2541  (26)    2575  (27)
TAB_L_STATE                     000000EC                 #-1160  (7)   #-1163  (7)   #-1470  (11)  #-1620  (14)
                                                         #-1877  (17)  #-1880  (17)    1882  (17)  #-1890  (17)
                                                           1970  (18)    1974  (18)  #-2275  (24)  #-2278  (24)
                                                         #-774   (4)
TAB_L_TIMER                     00000100                   1991  (18)    1994  (18)  #-2629  (28)  #-2693  (29)
                                                         #-2956  (33)  #-3003  (34)  #-3063  (35)  #-3109  (36)
TAB_L_TMO_CNT                   0000010C                 #-1793  (16)    2002  (18)    2009  (18)
TAB_PKT0                        00000128                   1583  (14)    2786  (30)
TAB_Q_DFRQ                      000000F0                   1974  (18)    1975  (18)    1980  (18)    2093  (20)
                                                           2180  (22)
TAB_Q_MFRQ                      000000F8                   1979  (18)    1980  (18)    1991  (18)
TAPE_BOOT                       0000025B-R   919   (6)  #-801   (4)
TAPE_RETRY                      00000084-R   544   (1)  #-3104  (36)  #-3114  (36)
TEMPL_MSG                       00000008-R   513   (1)    1368  (10)    523   (1)
TEMPL_MSG_LEN                   =00000034    523   (1)  #-1368  (10)
TIMOUT                          000006AB-R   1859  (17)  #-2324  (24)  #-2959  (33)  #-3006  (34)  #-3066  (35)
                                                         #-3116  (36)
VA$M_BYTE                       =000001FF                #-825   (5)
VA$M_SYSTEM                     =80000000                #-838   (5)
VA$S_VPN                        =00000015                #-1957  (18)  #-837   (5)
VA$V_SYSTEM                     =0000001F                #-1945  (18)
VA$V_VPN                        =00000009                #-1957  (18)  #-837   (5)
```

```
WAIT_BVP                    00000B6A-R   2820   (30)   #-2749   (30)   #-2755   (30)   #-2765   (30)   #-2779   (30)
WAIT_TIME                  =00061A80     313    (1)    #-1992   (18)
X                           000005EF-R   1670   (15)     1662   (15)     1663   (15)     1664   (15)     1665   (15)
```

```
                                        +-------------------------+
                                        ! Performance indicators !
                                        +-------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    42    00:00:00.03    00:00:00.21
Command processing               956    00:00:00.29    00:00:01.18
Pass 1                          1305    00:00:08.38    00:00:10.79
Symbol table sort                  0    00:00:00.84    00:00:00.85
Pass 2                           377    00:00:02.60    00:00:05.26
Symbol table output                2    00:00:00.08    00:00:00.31
Psect synopsis output              2    00:00:00.01    00:00:00.01
Cross-reference output             6    00:00:00.38    00:00:00.62
Assembler run totals            2693    00:00:12.61    00:00:19.23

The working set limit was 4000 pages.
408464 bytes (798 pages) of virtual memory were used to buffer the intermediate code.
There were 170 pages of symbol table space allocated to hold 2934 non-local and 177 local symbols.
3388 source lines were read in Pass 1, producing 182 object records in Pass 2.
40 pages of virtual memory were used to define 37 macros.

                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DIAGPACK03:[DS.LIBRARIES]PAMAC.MLB;3              2
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              2
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                          14
SYS$COMMON:[SYSLIB]STARLET.MLB;2                      11
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                30

3057 GETS were required to define 30 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

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(3)	188	DSX$GETDATA	NUMERIC DATA INPUT ROUTINE
(5)	281	DSX$GETVIELD	BIT FIELD INPUT ROUTINE
(7)	366	DSX$GETADDRESS	ADDRESS INPUT ROUTINE
(9)	444	DSX$GETLOGICAL	LOGICAL RESPONSE ROUTINE
(11)	565	DSX$GETSTRING	ASCII STRING INPUT ROUTINE
(13)	751	RESPONSE	PARAMETER RETRIEVAL SUBROUTINE

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element PARAM.MAR
0000     2 ; *4    19-OCT-1987 08:53:13 MEIER "RECOMPILE"
0000     3 ; *3    25-JUN-1987 15:40:05 MEIER "CHANGES TO DS"
0000     4 ; *2    25-JUN-1987 12:00:25 MEIER "FIXED BR_IF_MP, A BEQL WAS MISSING."
0000     5 ; *1     6-FEB-1986 15:21:28 DS ""
0000     6 ; DEC/CMS REPLACEMENT HISTORY, Element PARAM.MAR
0000     7         .TITLE  PARAM   *** PARAM Parameter input routines
0000     8         .IDENT  /9.1-17/
0000     9         .NoShow Conditionals
0000    10
0000    11         .DSABL  GBL
0000    12
0000    13 ;
0000    14 ; COPYRIGHT  1977, 1980, 1981, 1982, 1985, 1986, 1987                    ;G:3
0000    15 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    16 ;
0000    17 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0000    18 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
0000    19 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
0000    20 ; MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
0000    21 ; EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
0000    22 ; TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
0000    23 ; REMAIN IN DEC.
0000    24 ;
0000    25 ; THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
0000    26 ; AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
0000    27 ; CORPORATION.
0000    28 ;
0000    29 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0000    30 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    31
0000    32 ;++
0000    33 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR
0000    34 ;
0000    35 ; ABSTRACT: This version of PARAM was created solely for
0000    36 ;           use in Scorpio and Nautilus to support multiprocessing.
0000    37 ;
0000    38 ; ENVIRONMENT:
0000    39 ;
0000    40 ; AUTHOR:       TOM SOUTTER     10-NOV-77       VERSION 01
0000    41 ;
0000    42 ; MODIFIED BY:
0000    43 ;                KEN CHAPMAN     03-FEB-78       VERSION 02 (ESSAA-3.07).
0000    44 ;       01       CHANGED UNIT NUMBER CHECK IN $GPHARD FROM SIGNED TO MAGNITUDE.
0000    45 ;                Roger Riggs     15-JUL-78
0000    46 ;       02       Rewrite to shorten and let GETLINE do the prompting
0000    47 ;                so that in script mode the prompts come out correctly.
0000    48 ;                Fix entry points to conform to naming conventions.
0000    49 ;                Also use .ENTRY ... ENTRY fixed to use .VECTOR
0000    50 ;                Also removed MOVC5 in GETSTRING
0000    51 ;                Roger Riggs     13-March-1978
0000    52 ;       03       Removed DS_GETPARAM, unnecessary since P-code was removed
0000    53 ;                Roger Riggs, 28-May-1980, Version 5.4
0000    54 ;       04       Fixed to correctly return 0 in R1 if default answer was
0000    55 ;                given to DS$ASKSTR. Also fixed size of field in ASKDATA
0000    56 ;                Roger RIggs, 19-Jun-1980, Version 5.5
0000    57 ;       05       Fixed default value when prompt was disabled
```

```
0000     58 ;          Roger Riggs, 16-Oct-1980
0000     59 ;     06   Fixed bug that failed to give default values on prompt
0000     60 ;          in ASKDATA, ASKVLD, ASKADR.
0000     61 ;
0000     62 ;     07   - Jack Stansbury, 22-Oct-1981, Version 6.-
0000     63 ;          Changed the .PSECT CODE statement on line 117 that was
0000     64 ;          commented out (for some strange reason) to .PSECT CODE.
0000     65 ;          Also took out the $DS_HDRDEF statement since none of the
0000     66 ;          diagnostic program header symbols are used here!
0000     67 ;          Also fixed some truncation errors.
0000     68 ;          Also changed some messages to mixed case.
0000     69 ;          Also added calls to the QA_MAIN macro and DSQA for QA.
0000     70 ;          Also added .LIBRARY statements for $DS and $DIAG.
0000     71 ;
0000     72 ;     08   - Jack Stansbury, 30-Nov-1981, Version 6.5
0000     73 ;          Added some more code for the QA routines.
0000     74 ;
0000     75 ;     09   - Jack Stansbury, 5-Dec-1981, Version 6.6
0000     76 ;          Changed the entry masks on each of the .ENTRY lines so
0000     77 ;          that ALL the registers are saved (rather than only those
0000     78 ;          used). This is so that the QA dump routine can find all
0000     79 ;          the registers in the call frame set up for these
0000     80 ;          ASK routines.
0000     81 ;
0000     82 ;     10   Marion Baggett, 31-Mar-1982, Version 6.7
0000     83 ;          Changed all $DS_PRINT type statements to $PRINT form.
0000     84 ;
0000     85 ;     11   Marion Baggett, 7-Apr-1982, Version 6.7
0000     86 ;          Added macro $DS_TYPEDEF definition.
0000     87 ;
0000     88 ;     12   Amy Iorio, 25-June-1985, Version 9.0
0000     89 ;          Added $DS> to ASK macro prompts.
0000     90 ;
0000     91 ;     13   Domenic Andella 26-June-1985    9.0
0000     92 ;          "Yes" transfer address in routine
0000     93 ;          DSX$GETLOGICAL must be altered to
0000     94 ;          load the saved FP's pc instead of
0000     95 ;          the currect FP's to compensate
0000     96 ;          for additional call frame generated
0000     97 ;          as a result of interlocking code.
0000     98 ;
0000     99 ;     14   Amy Iorio,      22-July-1985    9.0
0000    100 ;          Took $DS> change out.
0000    101 ;
0000    102 ;     15   Domenic Andella 7-August-1985   9.0
0000    103 ;          Comment out modification 13 until
0000    104 ;          interlocking code is reinstated.
0000    105 ;
0000    106 ;     16   Domenic Andella 30-August-1985  9.1
0000    107 ;          Reinstate edit 13.
0000    108 ;
0000    109 ;     17   Domenic Andella 17-Dec-1985     9.1
0000    110 ;          Modify routine DSX$GETLOGICAL such that if cpu
0000    111 ;          is a Scorpio or Nautilus, frame pointer will be
0000    112 ;          altered to accomodate interlocking.
0000    113 ;
0000    114 ;     18   Domenic Andella 31-Dec-1985     9.1
```

```
                                0000    115 ;                   Add extrn symbol ref for DS$GK_SID
                                0000    116 ;--
```

```
                        0000   118          .SBTTL  DECLARATIONS
                        0000   119 ;
                        0000   120 ; INCLUDE FILES:
                        0000   121 ;
                        0000   122          .LIBRARY        /SYS$LIBRARY:LIB/                       ;               [10]
                        0000   123          .LIBRARY        /$DS/                                   ;               [07]
                        0000   124          .LIBRARY        /$DIAG/                                 ;               [07]
                        0000   125
                        0000   126 ;
                        0000   127 ;       ENTERNAL SYMBOLS
                        0000   128 ;
                        0000   129          .EXTRN  DS$ABORT,       DSX$PRINT                       ;               [10]
                        0000   130          .EXTRN  QA$AOB_Flags,   QA$Main                         ;               [08]
                        0000   131          .EXTRN  DS$K_STRBUF,    DS$GL_BUFLEN,   DS$GT_STRBUF
                        0000   132          .EXTRN  DS_GETLINE,     SYS$FAO,        SCAN$NUMERIC,   SCAN$SPACES
                        0000   133          .EXTRN  DS$GK_SID                                               ;[18]
                        0000   134 ;
                        0000   135 ; MACROS:
                        0000   136 ;
                        0000   137 ;
                        0000   138 ; EQUATED SYMBOLS:
                        0000   139 ;
                00000001  0000   140 SS$_NORMAL=1
                        0000   141          $DS_DSDEF                       ; DIAGNOSTIC SUPERVISOR ERROR CODES
                        0000   142          $DS_DSADEF                      ; CONTROL FLAG DEFINITIONS
                        0000   143          $DS_PARDEF                      ; PARAMETER ARG DEFINITIONS
                        0000   144          DSQA                            ; QA definitions                [07]
                        0000   145          DS_QADEFS                       ; More QA defs....              [08]
                        0000   146          $DS_TYPEDEF                     ; DEFINE TYPE CODES             [11]
                0000003F  0000   147          QUESTN = 63                     ; ASCII QUESTION MARK
                        0000   148
                00000000  0000   149          .PSECT  WORK, NoSHR, NoEXE, WRT, BYTE
                        0000   150
                        0000   151 ;
                        0000   152 ; OWN STORAGE:
                        0000   153 ;
                        0000   154
                        0000   155 PRNT_PRMT::
                00000000  0000   156          .LONG   0
                        0004   157
                00000000  0000   158          .PSECT  DATA, SHR, NOEXE, NOWRT, BYTE
                        0000   159
                        0000   160 INDEX_RADIX:
0000004B'0000003A'00000029'00000018'    0000   161          .LONG   10$,20$,30$,40$,50$,60$
                00000077'00000061'      0010
4C 53 21 2D 4C 53 21 2B 21 5B 20 00'    0018   162 10$:     .ASCIC  " [!+!SL-!SL(D)] "
                   20 5D 29 44 28       0024
                                10      0018
4C 4F 21 2D 4C 4F 21 2B 21 5B 20 00'    0029   163 20$:     .ASCIC  " [!+!OL-!OL(O)] "
                   20 5D 29 4F 28       0035
                                10      0029
4C 58 21 2D 4C 58 21 2B 21 5B 20 00'    003A   164 30$:     .ASCIC  " [!+!XL-!XL(X)] "
                   20 5D 29 58 28       0046
                                10      003A
53 21 20 2C 29 4C 53 21 28 5B 20 00'    004B   165 40$:     .ASCIC  " [(!SL), !SL-!SL(D)] "
      20 5D 29 44 28 4C 53 21 2D 4C     0057
                                15      004B
```

```
4F 21 20 2C 29 4C 4F 21 28 5B 20 00'  0061    166 50$:    .ASCIC  " [(!OL), !OL-!OL(0)] "
      20 5D 29 4F 28 4C 4F 21 2D 4C   006D
                                 15   0061
58 21 20 2C 29 4C 58 21 28 5B 20 00'  0077    167 60$:    .ASCIC  " [(!XL), !XL-!XL(X)] "
      20 5D 29 58 28 4C 58 21 2D 4C   0083
                                 15   0077
                                      008D    168
                                      008D    169
                                      008D    170 FMT_NODEFAULT:
73 69 20 65 72 65 68 54 20 3F 3F 00'  008D    171         .ASCIC  .?? There is no default for this parameter!/.   ;  [07]
20 74 6C 75 61 66 65 64 20 6F 6E 20   0099
72 61 70 20 73 69 68 74 20 72 6F 66   00A5
            2F 21 72 65 74 65 6D 61   00B1
                                 2B   008D
                                      00B9    172 FMT_INVALID:
20 64 69 6C 61 76 6E 49 20 3F 3F 00'  00B9    173         .ASCIC  .?? Invalid response!/.                 ;  [07]
      2F 21 65 73 6E 6F 70 73 65 72   00C5
                                 15   00B9
                                      00CF    174 FMT_PROGERR:
20 72 74 67 20 77 6F 4C 20 3F 3F 00'  00CF    175         .ASCIC  .?? Low gtr high at PC=!XL!/.           ;  [07]
21 3D 43 50 20 74 61 20 68 67 69 68   00DB
                  2F 21 4C 58 1B      00E7
                                      00CF
                                      00EB    176 FMT_RANGE:
                                      00EB    177 FMT_OVERFLOW:
72 20 66 6F 20 74 75 4F 20 3F 3F 00'  00EB    178         .ASCIC  .?? Out of range or overflow!/.         ;  [07]
72 65 76 6F 20 72 6F 20 65 67 6E 61   00F7
               2F 21 77 6F 6C 66 1D   0103
                                      00EB
                                      0109    179 FMT_ILLCHAR:
20 6C 61 67 65 6C 6C 49 20 3F 3F 00'  0109    180         .ASCIC  "?? Illegal character!/"                ;  [07]
   2F 21 72 65 74 63 61 72 61 68 63   0115
                                 16   0109
                                      0120    181 FMT_DEFYES:
6F 4E 20 2C 29 73 65 59 28 5B 20 00'  0120    182         .ASCIC  " [(Yes), No] "                         ;  [07]
                              20 5D   012C
                                 0D   0120
                                      012E    183 FMT_DEFNO:
73 65 59 20 2C 29 6F 4E 28 5B 20 00'  012E    184         .ASCIC  " [(No), Yes] "                         ;  [07]
                              20 5D   013A
                                 0D   012E
                                      013C    185 FMT_NULL:
                                 00'  013C    186         .ASCIC  ""
                                 00   013C
```

```
                     013D   188          .SBTTL  DSX$GETDATA     NUMERIC DATA INPUT ROUTINE
                  00000000  189          .PSECT  Code, Exe, Shr, NoWrt, Long              ;  [07]
                     0000   190 ;++
                     0000   191 ; FUNCTIONAL DESCRIPTION:
                     0000   192 ;
                     0000   193 ;       DISPLAYS A PROMPT MESSAGE AND ACCEPTS AN ASCII NUMERIC
                     0000   194 ;       STRING WHICH IS CONVERTED, TRUNCATED AND STORED INTO
                     0000   195 ;       A CALLER SPECIFIED VARIABLE FIELD (MASK)
                     0000   196 ;
                     0000   197 ; CALLING SEQUENCE:
                     0000   198 ;
                     0000   199 ;       CALLG   ARGLST, @#DS$GETDATA
                     0000   200 ;         OR
                     0000   201 ;       CALLS   #9, @#DS$GETDATA
                     0000   202 ;
                     0000   203 ; INPUT PARAMETERS:
                     0000   204 ;
                     0000   205 ;        4(AP) ADDRESS OF COUNTED ASCII PROMPT MESSAGE
                     0000   206 ;        8(AP) OFFSET OR ADDRESS FOR DATA STORAGE
                     0000   207 ;       12(AP) RADIX FOR ASCII TO BINARY CONVERSION
                     0000   208 ;       16(AP) BIT POSITION MASK FOR FIELD INSERTION
                     0000   209 ;       20(AP) LOW LIMIT (MAY BE OFFSET OR ADDRESS)
                     0000   210 ;       24(AP) HIGH LIMIT (MAY BE OFFSET OR ADDRESS)
                     0000   211 ;       28(AP) DEFAULT VALUE (MAY BE OFFSET OR ADDRESS)
                     0000   212 ;       32(AP) DEVICE TYPE MASK
                     0000   213 ;       36(AP) EXCEPTION MASK
                     0000   214 ;
                     0000   215 ; IMPLICIT INPUTS:      NONE
                     0000   216 ;
                     0000   217 ; OUTPUT PARAMETERS:
                     0000   218 ;
                     0000   219 ;       NONE
                     0000   220 ;
                     0000   221 ; IMPLICIT OUTPUTS:
                     0000   222 ;
                     0000   223 ;       NONE
                     0000   224 ;
                     0000   225 ; COMPLETION CODES:
                     0000   226 ;
                     0000   227 ;       SS$_NORMAL
                     0000   228 ;       DS$_TRUNCATE
                     0000   229 ;       DS$_PROGERR
                     0000   230 ;
                     0000   231 ; SIDE EFFECTS:
                     0000   232 ;
                     0000   233 ;       R1 = CONVERTED BINARY VALUE (NOT TRUNCATED)
                     0000   234 ;
                     0000   235 ;--
```

```
                                0FFC  0000    237 .ENTRY  DSX$GETDATA,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ;                [09]
                                      0002    238
                          13    E1    0002    239         BBC     #DSA$V_ASK_PROMPT,-     ; Flag to print ASK> prompt
                07 0000FE00'EF        0004    240                 L^DSA$GL_FLAGS,5$
               00000000'EF    01    D0  000A    241         MOVL    #1,PRNT_PRMT            ; Flag to getline to print prompt for $DSASK
                                      0011    242
        50   24 AC    01    01    EE  0011    243 5$:     EXTV    #PAR$V_NODEF, #1, -     ; Extract the NoDef flag                [08]
                                      0017    244           36(AP), R0                    ;                                       [08]
   00000000'EF   01    00    50    F0  0017    245         INSV    R0, S^#QA$K_NoDef, -    ; Store the NoDef flag in the           [08]
                                      0020    246           #1, L^QA$AOB_Flags            ; QA$AOB_Flags bit vector for QA        [08]
                                      0020    247         QA_MAIN Param_DSX$GetData       ; Call QA$MAIN                          [07]
                          0C    DD    0020                PUSHL   #DSQA$K_Param_DSX$GetData
               00000000'9F    01    FB  0022                CALLS   #1, a#QA$MAIN
                                      0029    248
               50   00660020 8F    D0  0029    249         MOVL    #DS$_PROGERR,R0         ; ASSUME PROGRAMMER ERROR
                        6C    09    D1  0030    250         CMPL    #9,(AP)                 ; CHECK ARG LIST VALIDITY
                              4F    12  0033    251         BNEQ    GETDATA_X               ; INCORRECT NUMBER OF ARGS
                           10 AC    D5  0035    252         TSTL    16(AP)                  ; ANY BITS IN FIELD?
                              4A    13  0038    253         BEQL    GETDATA_X               ; ERROR, NULL FIELD
                                      003A    254
                              01    DD  003A    255         PUSHL   #1                      ; Flag signed comparisons
                           24 AC    DD  003C    256         PUSHL   36(AP)                  ; Flags
                           1C AC    DD  003F    257         PUSHL   28(AP)                  ; Default value
                        7E 14 AC    7D  0042    258         MOVQ    20(AP),-(SP)            ; Low and High
                           0C AC    DD  0046    259         PUSHL   12(AP)                  ; Conversion radix
                           04 AC    DD  0049    260         PUSHL   4(AP)                   ; Prompt string
               000003FB'EF    07    FB  004C    261         CALLS   #7,RESPONSE             ; GET RESPONSE FROM OPERATOR
                           2E 50    E9  0053    262         BLBC    R0,GETDATA_X            ; EXIT IF ERROR
                                      0056    263
   53   10 AC    20    00    EA  0056    264         FFS     #0,#32,16(AP),R3        ; GET POSITION OF FIELD
        54   20    53    C3  005C    265         SUBL3   R3,#32,R4               ; DETERMINE REMAINING # OF BITS
   54   10 AC    54    53    EB  0060    266         FFC     R3,R4,16(AP),R4         ; GET SIZE OF FIELD
             54    53    C2  0066    267         SUBL    R3,R4                   ; Make field size
                                0069    268
08 BC    54    53    51    F0  0069    269         INSV    R1,R3,R4,a8(AP)         ; STORE THE PARAMETER
   53   08 BC    54    53    EF  006F    270         EXTZV   R3,R4,a8(AP),R3         ; GET STORED FIELD
                                0075    271
             50    01    D0  0075    272         MOVL    #SS$_NORMAL,R0          ; ASSUME IT'S OK
             53    51    D1  0078    273         CMPL    R1,R3                   ; INSERTED SAME AS EXTRACTED?
                   07    13  007B    274         BEQL    GETDATA_X               ; BRANCH IF NOT TRUNCATED
                                007D    275
        50   00660028 8F    D0  007D    276         MOVL    #DS$_TRUNCATE,R0        ; YES, INDICATE TRUNCATED
                                0084    277
                                0084    278 GETDATA_X:
                          04    0084    279         RET                             ; RETURN
```

```
0085    281          .SBTTL  DSX$GETVIELD    BIT FIELD INPUT ROUTINE
0085    282 ;++
0085    283 ; FUNCTIONAL DESCRIPTION:
0085    284 ;
0085    285 ;       DISPLAYS A PROMPT MESSAGE AND ACCEPTS AN ASCII NUMERIC
0085    286 ;       STRING WHICH IS CONVERTED, TRUNCATED AND STORED INTO
0085    287 ;       A CALLER SPECIFIED VARIABLE FIELD (POSITION & SIZE)
0085    288 ;
0085    289 ; CALLING SEQUENCE:
0085    290 ;
0085    291 ;       CALLG   ARGLST, a#DS$GETVIELD
0085    292 ;         OR
0085    293 ;       CALLS   #10, a#DS$GETVIELD
0085    294 ;
0085    295 ; INPUT PARAMETERS:
0085    296 ;
0085    297 ;        4(AP) ADDRESS OF COUNTED ASCII PROMPT MESSAGE
0085    298 ;        8(AP) OFFSET OR ADDRESS FOR DATA STORAGE
0085    299 ;       12(AP) RADIX FOR ASCII TO BINARY CONVERSION
0085    300 ;       16(AP) BIT POSITION FOR FIELD INSERTION
0085    301 ;       20(AP) FIELD SIZE FOR FIELD INSERTION
0085    302 ;       24(AP) LOW LIMIT (MAY BE OFFSET OR ADDRESS)
0085    303 ;       28(AP) HIGH LIMIT (MAY BE OFFSET OR ADDRESS)
0085    304 ;       32(AP) DEFAULT VALUE (MAY BE OFFSET OR ADDRESS)
0085    305 ;       36(AP) DEVICE TYPE MASK
0085    306 ;       40(AP) EXCEPTION MASK
0085    307 ;
0085    308 ; IMPLICIT INPUTS:      NONE
0085    309 ;
0085    310 ; OUTPUT PARAMETERS:
0085    311 ;
0085    312 ;       NONE
0085    313 ;
0085    314 ; IMPLICIT OUTPUTS:
0085    315 ;
0085    316 ;       NONE
0085    317 ;
0085    318 ; COMPLETION CODES:
0085    319 ;
0085    320 ;       SS$_NORMAL
0085    321 ;       DS$_TRUNCATE
0085    322 ;       DS$_PROGERR
0085    323 ;
0085    324 ; SIDE EFFECTS:
0085    325 ;
0085    326 ;       R1 = CONVERTED BINARY VALUE (NOT TRUNCATED)
0085    327 ;
0085    328 ;--
```

```
                                  0FFC  0085   330 .ENTRY  DSX$GETVIELD,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>        ;                [09]
                                        0087   331
                             13    E1  0087   332          BBC     #DSA$V_ASK_PROMPT,-      ; Flag to print ASK> prompt
                07 0000FE00'EF         0089   333                  L^DSA$GL_FLAGS,5$
            00000000'EF      01    D0  008F   334          MOVL    #1,PRNT_PRMT             ; Flag to getline to print prompt for $DSASK
                                        0096   335
        50   28 AC   01      01    EE  0096   336 5$:      EXTV    #PAR$V_NODEF, #1, -      ; Extract the NoDef flag                [08]
                                        009C   337                    40(AP), R0             ;                                       [08]
   00000000'EF   01   00      50    F0  009C   338          INSV    R0, S^#QA$K_NoDef, -     ; Store the NoDef flag in the           [08]
                                        00A5   339                      #1, L^QA$AOB_Flags   ; QA$AOB_Flags bit vector for QA        [08]
                                        00A5   340          QA_MAIN Param_DSX$GetVield       ; Call QA$Main                          [07]
                             0D    DD  00A5                PUSHL   #DSQA$K_Param_DSX$GetVield
            00000000'9F      01    FB  00A7                CALLS   #1, a#QA$MAIN
                                        00AE   341
            50   00660020 8F      D0  00AE   342          MOVL    #DS$_PROGERR,R0          ; ASSUME ERROR
                      6C      0A    D1  00B5   343          CMPL    #10,(AP)                 ; CHECK ARG LIST VALIDITY
                             3B    12  00B8   344          BNEQ    GETVIELD_X               ; INCORRECT NUMBER OF ARGS
                                        00BA   345
                             01    DD  00BA   346          PUSHL   #1                       ; Do signed comparisons
                          28 AC    DD  00BC   347          PUSHL   40(AP)                   ; Flags
                          20 AC    DD  00BF   348          PUSHL   32(AP)                   ; Default
                   7E     18 AC    7D  00C2   349          MOVQ    24(AP),-(SP)             ; Low and high
                          0C AC    DD  00C6   350          PUSHL   12(AP)                   ; Conversion radix
                          04 AC    DD  00C9   351          PUSHL   4(AP)                    ; Prompt string
            000003FB'EF      07    FB  00CC   352          CALLS   #7,RESPONSE              ; GET RESPONSE FROM OPERATOR
                          1F 50    E9  00D3   353          BLBC    R0,GETVIELD_X            ; EXIT IF ERROR
                                        00D6   354
   08 BC   14 AC   10 AC      51    F0  00D6   355          INSV    R1,16(AP),20(AP),a8(AP) ; STORE THE PARAMETER
   53   08 BC   14 AC   10 AC      EF  00DE   356          EXTZV   16(AP),20(AP),a8(AP),R3 ; GET FIELD JUST STORED
                                        00E6   357
                      50      01    D0  00E6   358          MOVL    #SS$_NORMAL,R0           ; ASSUME IT WORKED
                      53      51    D1  00E9   359          CMPL    R1,R3                    ; SAME?
                             07    13  00EC   360          BEQL    GETVIELD_X               ; NO, NONE FOUND
            50   00660028 8F      D0  00EE   361          MOVL    #DS$_TRUNCATE,R0         ; NO, INDICATE TRUNCATED
                                        00F5   362
                                        00F5   363 GETVIELD_X:
                             04        00F5   364          RET                              ; RETURN
```

```
                        00F6   366          .SBTTL  DSX$GETADDRESS  ADDRESS INPUT ROUTINE
                        00F6   367 ;++
                        00F6   368 ; FUNCTIONAL DESCRIPTION:
                        00F6   369 ;
                        00F6   370 ;       DISPLAYS A PROMPT MESSAGE AND ACCEPTS AN ASCII NUMERIC
                        00F6   371 ;       ADDRESS STRING WHICH IS CONVERTED AND STORED INTO A
                        00F6   372 ;       CALLER SPECIFIED LONGWORD
                        00F6   373 ;
                        00F6   374 ; CALLING SEQUENCE:
                        00F6   375 ;
                        00F6   376 ;       CALLG   ARGLST, a#DS$GETADDRESS
                        00F6   377 ;         OR
                        00F6   378 ;       CALLS   #8, a#DS$GETADDRESS
                        00F6   379 ;
                        00F6   380 ; INPUT PARAMETERS:
                        00F6   381 ;
                        00F6   382 ;        4(AP) ADDRESS OF COUNTED ASCII PROMPT MESSAGE
                        00F6   383 ;        8(AP) OFFSET OR ADDRESS FOR DATA STORAGE
                        00F6   384 ;       12(AP) RADIX FOR ASCII TO BINARY CONVERSION
                        00F6   385 ;       16(AP) LOW LIMIT (MAY BE OFFSET OR ADDRESS)
                        00F6   386 ;       20(AP) HIGH LIMIT (MAY BE OFFSET OR ADDRESS)
                        00F6   387 ;       24(AP) DEFAULT VALUE (MAY BE OFFSET OR ADDRESS)
                        00F6   388 ;       28(AP) DEVICE TYPE MASK
                        00F6   389 ;       32(AP) EXCEPTION MASK
                        00F6   390 ;
                        00F6   391 ; IMPLICIT INPUTS:      NONE
                        00F6   392 ;
                        00F6   393 ; OUTPUT PARAMETERS:
                        00F6   394 ;
                        00F6   395 ;       NONE
                        00F6   396 ;
                        00F6   397 ; IMPLICIT OUTPUTS:
                        00F6   398 ;
                        00F6   399 ;       NONE
                        00F6   400 ;
                        00F6   401 ; COMPLETION CODES:
                        00F6   402 ;
                        00F6   403 ;       SS$_NORMAL
                        00F6   404 ;       DS$_TRUNCATE
                        00F6   405 ;       DS$_PROGERR
                        00F6   406 ;
                        00F6   407 ; SIDE EFFECTS:
                        00F6   408 ;
                        00F6   409 ;       R1 = CONVERTED BINARY ADDRESS
                        00F6   410 ;
                        00F6   411 ;--
```

```
                          0FFC  00F6   413 .ENTRY  DSX$GETADDRESS,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>      ;                [09]
                                00F8   414
                      13   E1   00F8   415         BBC     #DSA$V_ASK_PROMPT,-      ; Flag to print ASK> prompt
          07 0000FE00'EF        00FA   416                 L^DSA$GL_FLAGS,5$
        00000000'EF   01   D0   0100   417         MOVL    #1,PRNT_PRMT             ; Flag to getline to print prompt for $DSASK
                                0107   418
     50   20 AC   01   01   EE   0107   419 5$:    EXTV    #PAR$V_NODEF, #1, -      ; Extract the NoDef flag                [08]
                                010D   420                   32(AP), R0             ;                                       [08]
  00000000'EF   01   00   50   F0   010D   421         INSV    R0, S^#QA$K_NoDef, -     ; Store the NoDef flag in the           [08]
                                0116   422                     #1, L^QA$AOB_Flags   ; QA$AOB_Flags bit vector for QA        [08]
                                0116   423         QA_MAIN Param_DSX$GetAddress     ; Call QA$Main                          [07]
                      0E   DD   0116               PUSHL   #DSQA$K_Param_DSX$GetAddress
        00000000'9F   01   FB   0118               CALLS   #1, @#QA$MAIN
                                011F   424
        50   00660020 8F   D0   011F   425         MOVL    #DS$_PROGERR,R0          ; ASSUME BAD CALL
                  6C   08   D1   0126   426         CMPL    #8,(AP)                  ; CHECK ARG LIST VALIDITY
                       CA   12   0129   427         BNEQ    GETVIELD_X               ; INCORRECT NUMBER OF ARGS
                                012B   428
                       00   DD   012B   429         PUSHL   #0                       ; Use unsigned comparisons
                    20 AC   DD   012D   430         PUSHL   32(AP)                   ; Flags
                    18 AC   DD   0130   431         PUSHL   24(AP)                   ; Default
              7E    10 AC   7D   0133   432         MOVQ    16(AP),-(SP)             ; Low and high
                    0C AC   DD   0137   433         PUSHL   12(AP)                   ; Radix
                    04 AC   DD   013A   434         PUSHL   4(AP)                    ; prompt string
        000003FB'EF   07   FB   013D   435         CALLS   #7,RESPONSE              ; GET RESPONSE FROM OPERATOR
                    07 50   E9   0144   436         BLBC    R0,GETADDRESS_X          ; EXIT IF ERROR
                                0147   437
              08 BC   51   D0   0147   438         MOVL    R1,@8(AP)                ; STORE THE ADDRESS
                 50   01   D0   014B   439         MOVL    #SS$_NORMAL,R0           ; INDICATE SUCCESS
                                014E   440
                                014E   441 GETADDRESS_X:                            ;
                          04   014E   442         RET                              ; RETURN
```

```
                        .SBTTL  DSX$GETLOGICAL  LOGICAL RESPONSE ROUTINE
                ;++
                ; FUNCTIONAL DESCRIPTION:
                ;
                ;       DISPLAYS A PROMPT MESSAGE AND ACCEPTS AN ASCII "YES" OR
                ;       "NO" STRING WHICH IS CONVERTED TO A SINGLE BIT (FLAG) AND
                ;       STORED INTO A CALLER SPECIFIED BIT WITHIN A BYTE
                ;
                ; CALLING SEQUENCE:
                ;
                ;       CALLG   ARGLST, a#DS$GETLOGICAL
                ;         OR
                ;       CALLS   #7, a#DS$GETLOGICAL
                ;
                ; INPUT PARAMETERS:
                ;
                ;        4(AP) ADDRESS OF COUNTED ASCII PROMPT MESSAGE
                ;        8(AP) OFFSET OR ADDRESS FOR DATA STORAGE
                ;       12(AP) BIT POSITION WITHIN BYTE
                ;       16(AP) TRANSFER ADDRESS IF YES
                ;       20(AP) TRANSFER ADDRESS IF NO
                ;       24(AP) DEFAULT VALUE (0=NO, 1=YES)
                ;       28(AP) DEVICE TYPE MASK
                ;
                ; IMPLICIT INPUTS:      NONE
                ;
                ; OUTPUT PARAMETERS:
                ;
                ;       R1 = TRANSFER ADDRESS
                ;
                ; IMPLICIT OUTPUTS:
                ;
                ;       PC = TRANSFER ADDRESS   ; IF CALLED FROM PROGRAM AND TRANSFER
                ;                               ; ADDRESS IS NOT EQUAL TO ZERO
                ;
                ; COMPLETION CODES:
                ;
                ;       SS$_NORMAL
                ;       DS$_PROGERR
                ;
                ; SIDE EFFECTS:         NONE
                ;--
```

```
                          0FFC  014F   487 .ENTRY  DSX$GETLOGICAL,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>      ;                [09]
                                0151   488
                       13   E1  0151   489         BBC     #DSA$V_ASK_PROMPT,-      ; Flag to print ASK> prompt
            07 0000FE00'EF      0153   490                 L^DSA$GL_FLAGS,3$
      00000000'EF   01   D0  0159   491         MOVL    #1,PRNT_PRMT             ; Flag to getline to print prompt for $DSASK
                                0160   492
      00000000'EF   00   E5  0160   493 3$:     BBCC    S^#QA$K_NoDef, -         ; Clear the no-default flag since the    [08]
                       00       0167   494                   L^QA$AOB_Flags, 5$   ; default is automatically given        [08]
                                0168   495 5$:                                  ;
                                0168   496         QA_MAIN Param_DSX$GetLogical  ; Call QA$Main                          [07]
                       0F   DD  0168              PUSHL   #DSQA$K_Param_DSX$GetLogical
      00000000'9F      01   FB  016A              CALLS   #1, a#QA$MAIN
                                0171   497
0000FE00'EF   01   0D   EF  0171   498         EXTZV   #DSA$V_PROMPT, #1, -
                       7E       0179   499                   L^DSA$GL_FLAGS, -(SP) ; SAVE STATE OF PROMPT FLAG            [07]
      50   00660020   8F  D0  017A   500         MOVL    #DS$_PROGERR,R0          ; ASSUME POSITION  GTR 7...ERROR
                 6C   07  D1  0181   501         CMPL    #7,(AP)                  ; CHECK ARG LIST VALIDITY
                       06  12  0184   502         BNEQ    10$                      ; INCORRECT NUMBER OF ARGS
                 07   0C  AC  D1  0186   503         CMPL    12(AP),#7                ; LOOK AT POSITION VARIABLE
                       08  1B  018A   504         BLEQU   RETRY_LOGICAL            ; BRANCH IF IN A BYTE
                           018C   505 10$:
      50   00660020   8F  D0  018C   506         MOVL    #DS$_PROGERR,R0          ; PROGRAMMER ERROR
                       04  0193   507         RET
                           0194   508
                           0194   509 RETRY_LOGICAL:
      0000013C'EF      9F  0194   510         PUSHAB  L^FMT_NULL               ; Address of empty prompt string         [07]
0000FE00'EF   0D   E3  019A   511         BBCS    #DSA$V_PROMPT, L^DSA$GL_FLAGS -          ;                        [07]
                       12  01A1   512                 , 10$                    ; NO PROMPT                              [07]
      6E   00000120'EF   9E  01A2   513         MOVAB   L^FMT_DEFYES,(SP)        ; ASSUME DEFAULT IS YES                  [07]
                 07 18   AC  E8  01A9   514         BLBS    24(AP), 10$              ; BRANCH IF DEFAULT IS YES               [07]
      6E   0000012E'EF   9E  01AD   515         MOVAB   L^FMT_DEFNO,(SP)         ; DEFAULT IS NO                          [07]
                           01B4   516 10$:
                 04   AC  DD  01B4   517         PUSHL   4(AP)                    ; Address of user prompt
                       04  DD  01B7   518         PUSHL   #4                       ; Up to 4 characters
           00000000'EF   DF  01B9   519         PUSHAL  L^DS$GL_BUFLEN           ; Address of longword to get length      [07]
           00000000'EF   9F  01BF   520         PUSHAB  L^DS$GT_STRBUF           ; Address of buffer                      [07]
      00000000'EF   05   FB  01C5   521         CALLS   #5,L^DS_GETLINE          ; Get a line with dual prompt            [07]
                           01CC   522                                            ;                                        [07]
            50   18   AC  D0  01CC   523         MOVL    24(AP),R0                ; GET DEFAULT RESPONSE                   [07]
           00000000'EF   D5  01D0   524         TSTL    L^DS$GL_BUFLEN           ; DEFAULT RESPONSE?                      [07]
                       30  13  01D6   525         BEQL    80$                      ; YES, USE IT
                           01D8   526
                 50   00   D0  01D8   527         MOVL    #PAR$_NO,R0              ; ASSUME NEGATIVE RESPONSE
00000000'EF   4E   8F  91  01DB   528         CMPB    #^A"N",L^DS$GT_STRBUF    ; DID HE TYPE 'N.....                    [07]
                       23  13  01E3   529         BEQL    80$                      ; YES, USE IT
                 50   01   D0  01E5   530         MOVL    #PAR$_YES,R0             ; ASSUME POSITIVE
00000000'EF   59   8F  91  01E8   531         CMPB    #^A"Y",L^DS$GT_STRBUF    ; DID HE TYPE 'Y.....                    [07]
                       16  13  01F0   532         BEQL    80$                      ; YES, USE IT
                           01F2   533
                           01F2   534         $PRINT  #DS$K_TYPE_PARAM_ERROR,- ; PROVIDE A HELP MESSAGE                 [10]
                           01F2   535                 #DS$K_PRINTF,-
                           01F2   536                 L^FMT_INVALID
           000000B9'EF   9F  01F2                     PUSHAB  L^FMT_INVALID
                 7E   01   9A  01F8                     movzbl  #DS$K_PRINTF, -(sp)
                 7E   1C   98  01FB                     cvtbl   #DS$K_TYPE_PARAM_ERROR, -(sp)
      00000000'GF   03   FB  01FE                     CALLS   #$$N+2, G^DSX$PRINT
                     FF8C  31  0205   537         BRW     RETRY_LOGICAL            ; AND TRY AGAIN
```

```
                                0208    538
      08 BC    01    0C AC    50   F0  0208    539 80$:    INSV    R0,12(AP),#1,@8(AP)     ; STORE THE PARAMETER
                                0020F   540
                     51    10 AC    D0  020F    541         MOVL    16(AP),R1               ; USE YES TRANSFER
                        04 50    E8  0213    542         BLBS    R0,120$                 ; IF SET USE YES TRANSFER
                     51    14 AC    D0  0216    543         MOVL    20(AP),R1               ; GET NO TRANSFER
                           51    D5  021A    544 120$:   TSTL    R1                      ; LOOK AT TRANSFER POINT
                           43    13  021C    545         BEQL    130$                    ; FORGET IT IF ZERO
                                021E    546
                                021E    547         BR_IF_MP 125$                       ; Alter fp for interlocking code [17]
      05000000 8F    00000000'8F   D1  021E            CMPL    #DS$GK_SID,#^X05000000          ; Branch if Scorpio [61]
                           2E    13  0229            BEQL    125$                            ; Yes, branch
      06000000 8F    00000000'8F   D1  022B            CMPL    #DS$GK_SID,#^X06000000          ; Branch if Nautilus [61]
                           21    13  0236            BEQL    125$                            ; Yes, branch
      11000000 8F    00000000'8F   D1  0238            CMPL    #DS$GK_SID,#^X11000000          ; Branch if RRR [69]        ;G:20
                           14    13  0243            BEQL    125$                                                        ;G:18
      0A000000 8F    00000000'8F   D1  0245            CMPL    #DS$GK_SID,#^X0A000000          ; Branch if LLL [69]        ;G:20
                           07    13  0250            BEQL    125$                                                        ;G:22
                                0252    548
                     10 AD    51   D0  0252    549         MOVL    R1,16(FP)               ; Alter return                  [17]
                           0008   31  0256    550         BRW     130$                    ; NON-MP SYSTEM                 [17]
                                0259    551
                                0259    552 ; The tranfer address must be loaded into the saved frame pointers old pc. [17]
                                0259    553 ; This is necessary since the current stack frame was built as a result    [17]
                                0259    554 ; of interlocking routines.                                                [17]
                                0259    555
                     50    0C AD    D0  0259    556 125$:   MOVL    12(FP),R0               ; GET SAVED FRAME POINTER       [17]
                     10 A0    51   D0  025D    557         MOVL    R1,16(R0)               ; ALTER RET ADR OF SAVED FP'S pc [17]
                        50    01   D0  0261    558 130$:   MOVL    #SS$_NORMAL,R0          ; INDICATE SUCCESS
                                0264    559
                                0264    560 GETLOGICAL_X:
0000FE00'EF    01    0D    FC AD    F0  0264    561         INSV    -4(FP), #DSA$V_PROMPT, -
                                026E    562                 #1, L^DSA$GL_FLAGS      ; RESTORE PROMPT FLAG           [07]
                           04   026E    563         RET                             ; RETURN
```

```
                        565          .SBTTL  DSX$GETSTRING   ASCII STRING INPUT ROUTINE
                        566 ;++
                        567 ; FUNCTIONAL DESCRIPTION:
                        568 ;
                        569 ;       DISPLAYS A PROMPT MESSAGE AND ACCEPTS AN ASCII STRING RESPONSE
                        570 ;       WHICH IS VALIDATED AGAINST A LIST OF STRINGS BEFORE BEING
                        571 ;       RETURNED TO THE CALLER SPECIFIED BUFFER
                        572 ;
                        573 ; CALLING SEQUENCE:
                        574 ;
                        575 ;       CALLG   ARGLST, a#DS$GETSTRING
                        576 ;         OR
                        577 ;       CALLS   #6, a#DS$GETSTRING
                        578 ;
                        579 ; INPUT PARAMETERS:
                        580 ;
                        581 ;        4(AP) ADDRESS OF COUNTED ASCII PROMPT MESSAGE
                        582 ;        8(AP) OFFSET OR ADDRESS FOR STRING STORAGE
                        583 ;       12(AP) SIZE OF RETURN STRING BUFFER
                        584 ;       16(AP) ADDRESS OF COUNTED LIST OF COUNTED ASCII STRING POINTERS
                        585 ;       20(AP) ADDRESS OF DEFAULT COUNTED ASCII STRING
                        586 ;       24(AP) DEVICE TYPE MASK
                        587 ;
                        588 ; IMPLICIT INPUTS:      NONE
                        589 ;
                        590 ; OUTPUT PARAMETERS:
                        591 ;
                        592 ;       R1 = INDEX OF MATCHED STRING IN VALIDATION TABLE IF SUCCESSFUL
                        593 ;          = 0 IF DEFAULT STRING WAS SELECTED
                        594 ;
                        595 ;       R1 = UNPREDICTABLE ON ERROR STATUS
                        596 ;
                        597 ; IMPLICIT OUTPUTS:
                        598 ;
                        599 ;       NONE
                        600 ;
                        601 ; COMPLETION CODES:
                        602 ;
                        603 ;       SS$_NORMAL
                        604 ;       DS$_TRUNCATE
                        605 ;       DS$_PROGERR
                        606 ;
                        607 ; SIDE EFFECTS:
                        608 ;
                        609 ;       NONE
                        610 ;
                        611 ;--
```

```
                          0FFC  026F   613 .ENTRY  DSX$GETSTRING,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>      ;                [09]
                                0271   614
                       13   E1  0271   615         BBC     #DSA$V_ASK_PROMPT,-      ; Flag to print ASK> prompt
                 07 0000FE00'EF    0273   616                 L^DSA$GL_FLAGS,5$
           00000000'EF   01   D0  0279   617         MOVL    #1,PRNT_PRMT             ; Flag to getline to print prompt for $DSASK
                                0280   618
                    14 AC   D5  0280   619 5$:      TSTL    20(AP)                   ; Check to see if a default string       [08]
                       0A   12  0283   620         BNEQ    10$                      ; If default was given, branch           [08]
           00000000'EF   00   E3  0285   621         BBCS    S^#QA$K_NoDef, -         ; Set NoDef flag: no default was given   [08]
                       0A       028C   622                   L^QA$AOB_Flags, 20$    ;                                        [08]
                       08   11  028D   623         BRB     20$                      ;                                        [08]
                                028F   624
           00000000'EF   00   E5  028F   625 10$:    BBCC    S^#QA$K_NoDef, -         ; Clear NoDef flag: default was given    [08]
                       00       0296   626                   L^QA$AOB_Flags, 20$    ;                                        [08]
                                0297   627
                                0297   628 20$:                                    ;                                        [08]
                                0297   629         QA_MAIN Param_DSX$GetString      ; Call QA$Main                           [07]
                       10   DD  0297             PUSHL   #DSQA$K_Param_DSX$GetString
           00000000'9F   01   FB  0299             CALLS   #1, a#QA$MAIN
                                02A0   630
      0000FE00'EF   01   0D   EF  02A0   631         EXTZV   #DSA$V_PROMPT,#1, -
                       7E       02A8   632                   L^DSA$GL_FLAGS ,-(SP)  ; SAVE CURRENT PROMPT FLAG               [07]
                    6C   06   D1  02A9   633         CMPL    #6,(AP)                  ; CHECK ARG LIST VALIDITY
                       0A   13  02AC   634         BEQL    RETRY_STRING             ; OK, PROCEED
           50   00660020 8F   D0  02AE   635         MOVL    #DS$_PROGERR,R0          ; INSUFFICIENT ARGS
                      0138   31  02B5   636         BRW     GETSTRING_X
                                02B8   637
                                02B8   638 RETRY_STRING:
                 5E   FC AD   DE  02B8   639         MOVAL   -4(FP),SP                ; SPACE FOR LOCAL STORAGE
                                02BC   640 ;+
                                02BC   641 ;       BUILD A PROMPT MESSAGE ON THE STACK FROM THE VALIDATION
                                02BC   642 ;       LIST, DEFAULT, AND PROMPT TEXT
                                02BC   643 ;-
           56   0000013C'EF   9E  02BC   644         MOVAB   L^FMT_NULL,R6            ; Address of information prompt          [07]
                    57   5E   D0  02C3   645         MOVL    SP,R7                    ; SAVE HIGHEST ADDR OF STRING            [07]
      0000FE00'EF   0D   E3  02C6   646         BBCS    #DSA$V_PROMPT,L^DSA$GL_FLAGS -           ;                        [07]
                       5F       02CD   647                   , 70$                  ; IF NOT PROMPTING SKIP
                 53   10 AC   D0  02CE   648         MOVL    16(AP),R3                ; GET ADDRESS OF COUNTED LIST
                       59   13  02D2   649         BEQL    70$                      ; NONE, SKIP
                    52   63   D0  02D4   650         MOVL    (R3),R2                  ; GET COUNT
              7E   205D 8F   B0  02D7   651         MOVW    #^A"] ",-(SP)            ; TRAILING ]
                       05   11  02DC   652         BRB     20$                      ; SKIP INITIAL ", "
                                02DE   653 10$:
              7E   202C 8F   B0  02DE   654         MOVW    #^A", ",-(SP)            ; IF NOT FIRST PRECEED WITH ", "
                                02E3   655 20$:
                 50   6342   D0  02E3   656         MOVL    (R3)[R2],R0              ; GET ADDRESS OF COUNTED STRING
                       14   13  02E7   657         BEQL    35$                      ; IGNORE NULL ENTRIES
                 14 AC   50   D1  02E9   658         CMPL    R0,20(AP)                ; IS THIS THE DEFAULT?
                       0E   13  02ED   659         BEQL    35$                      ; YES, SKIP IT
                    51   60   9A  02EF   660         MOVZBL  (R0),R1                  ; GET LENGTH
                       09   13  02F2   661         BEQL    35$                      ; NULL SKIP COPY
                 7E   6041   90  02F4   662 30$:      MOVB    (R0)[R1],-(SP)           ; COPY BYTE
                    F9 51   F5  02F8   663         SOBGTR  R1,30$                   ; COPY STRING
                       02   11  02FB   664         BRB     40$                      ; NEXT!
                       8E   B5  02FD   665 35$:      TSTW    (SP)+                    ; REMOVE EXTRA ", "
                    DC 52   F5  02FF   666 40$:      SOBGTR  R2,10$                   ; COPY REST OF VALID STRINGS
                                0302   667
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                50    14 AC    D0  0302   668          MOVL    20(AP),R0                       ; GET ADDRESS OF DEFAULT
                         17    13  0306   669          BEQL    60$                             ; NONE, FINISH IT
                      51 60    9A  0308   670          MOVZBL  (R0),R1                         ; GET LENGTH
                         12    13  030B   671          BEQL    60$                             ; NULL, SKIP COPY
              7E    202C 8F    B0  030D   672          MOVW    #^A", ",-(SP)                   ; SEPARATE FROM REST OF OPTIONS
                   7E   29    90  0312   673          MOVB    #^A")",-(SP)
                7E   6041    90  0315   674 50$:      MOVB    (R0)[R1],-(SP)                  ; COPY BYTE
                   F9 51     F5  0319   675          SOBGTR  R1,50$                          ; COPY STRING
                   7E   28    90  031C   676          MOVB    #^A"(",-(SP)
                               031F   677 60$:
              7E   5B20 8F    B0  031F   678          MOVW    #^A" [",-(SP)                   ; FINISH DEFAULT AND OPTION LIST
                   57   5E    C2  0324   679          SUBL2   SP,R7                           ; LENGTH OF PROMPT STRING
                   7E   57    90  0327   680          MOVB    R7,-(SP)                        ; Make ASCIC prompt string
                   56   5E    D0  032A   681          MOVL    SP,R6                           ; Supercede prompt address
                               032D   682 70$:
                         56    DD  032D   683          PUSHL   R6                              ; Put Address of infor prompt on stack
                      04 AC    DD  032F   684          PUSHL   4(AP)                           ; Address of user prompt
            7E    0C AC    01    C3  0332   685          SUBL3   #1,12(AP),-(SP)                 ; GET LENGTH AVAILABLE FOR STRING
                00000000'EF    DF  0337   686          PUSHAL  L^DS$GL_BUFLEN                  ; Longword for returned length          [07]
                52    08 AC    D0  033D   687          MOVL    8(AP),R2                        ; GET ADDRESS OF BUFFER
                      01 A2    9F  0341   688          PUSHAB  1(R2)                           ; Push address of buffer
          00000000'EF    05    FB  0344   689          CALLS   #5,L^DS_GETLINE                 ; Get a line of input                   [07]
                               034B   690
          62    00000000'EF    90  034B   691          MOVB    L^DS$GL_BUFLEN,(R2)             ; MAKE IT ASCIC                         [07]
                         31    12  0352   692          BNEQ    99$                             ; NOT DEFAULTED
                               0354   693
                50    14 AC    D0  0354   694          MOVL    20(AP),R0                               ; GET ADDRESS OF DEFAULT
                         1E    12  0358   695          BNEQ    94$                                     ; GOT ONE, USE IT
                               035A   696
                               035A   697          $PRINT  #DS$K_TYPE_PARAM_ERROR,-                ;  TELL OPERATOR                [10]
                               035A   698                  #DS$K_PRINTF,-
                               035A   699                  L^FMT_NODEFAULT
                0000008D'EF    9F  035A                    PUSHAB  L^FMT_NODEFAULT
                   7E    01    9A  0360                    movzbl  #DS$K_PRINTF, -(sp)
                   7E    1C    98  0363                    cvtbl   #DS$K_TYPE_PARAM_ERROR, -(sp)
          00000000'GF    03    FB  0366                    CALLS   #$$N+2, G^DSX$PRINT
          0000FE00'EF    0C    E1  036D   700          BBC     #DSA$V_OPER,L^DSA$GL_FLAGS -    ;                               [07]
                         74        0374   701                  , GETSTRING_E                   ; IF OPERATOR ABSENT, TAKE ERROR EXI
                      FF40    31  0375   702          BRW     RETRY_STRING                    ; TRY AGAIN
                               0378   703
                   53    60    9A  0378   704 94$:      MOVZBL  (R0),R3                 ; GET LENGTH
                   82    80    90  037B   705 95$:      MOVB    (R0)+,(R2)+             ; COPY DEFAULT TO INPUT BUFFER
                      FA 53    F4  037E   706          SOBGEQ  R3,95$                  ; COPY STRING
                         54    D4  0381   707          CLRL    R4                      ; Clear index to indicate default
                         39    11  0383   708          BRB     140$                    ; Set returns and exit
                               0385   709
                53    10 AC    D0  0385   710 99$:      MOVL    16(AP),R3               ; GET STRING LIST ADDRESS
                         33    13  0389   711          BEQL    140$                    ; IF NONE, JUST FINISH
                   54    63    D0  038B   712          MOVL    (R3),R4                 ; GET COUNT OF VALID STRINGS
                         2E    13  038E   713          BEQL    140$                    ; IF NONE, JUST FINISH
                 51    6344    D0  0390   714 100$:     MOVL    (R3)[R4],R1             ; GET STRING ADDRESS
                50    08 AC    D0  0394   715          MOVL    8(AP),R0                ; GET ADDRESS OF STRING
                   52    60    9A  0398   716          MOVZBL  (R0),R2                 ; GET LENGTH OF STRING INPUT
                   81    80    91  039B   717 110$:     CMPB    (R0)+,(R1)+             ; MATCH?
                         05    12  039E   718          BNEQ    120$                    ; NO, GO SET UP NEXT STRING
                      F8 52    F4  03A0   719          SOBGEQ  R2,110$                 ; COMPARE WHOLE STRING
                         19    11  03A3   720          BRB     140$                    ; COMPLETE MATCH USE IT
```

```
                E8 54    F5  03A5    721 120$:   SOBGTR  R4,100$                    ; COUNT AND CONTINUE
                            03A8    722
                            03A8    723         $PRINT  #DS$K_TYPE_PARAM_ERROR,-    ; FAILURE, NO MATCH FOUND          [10]
                            03A8    724                 #DS$K_PRINTF,-
                            03A8    725                 L^FMT_INVALID               ;
        000000B9'EF    9F   03A8                        PUSHAB  L^FMT_INVALID
              7E    01    9A  03AE                        movzbl  #DS$K_PRINTF, -(sp)
              7E    1C    98  03B1                        cvtbl   #DS$K_TYPE_PARAM_ERROR, -(sp)
  00000000'GF    03    FB  03B4                        CALLS   #$$N+2, G^DSX$PRINT
                FEFA    31  03BB    726         BRW     RETRY_STRING                ; GO TRY AGAIN
                            03BE    727 140$:
              51    54    D0  03BE    728         MOVL    R4,R1                       ; SAVE "INDEX" FOR 'R1' RETURN
           53    08 AC    D0  03C1    729         MOVL    8(AP),R3                    ; GET DESTINATION ADDRESS
      50    00660028 8F    D0  03C5    730         MOVL    #DS$_TRUNCATE,R0            ; ASSUME TRUNCATION ERROR
              52    63    9A  03CC    731         MOVZBL  (R3),R2                     ; GET LENGTH OF STRING
       54    0C AC    01    C3  03CF    732         SUBL3   #1,12(AP),R4                ; LENGTH OF SPACE AVAILABLE FOR TEXT
              54    52    D1  03D4    733         CMPL    R2,R4                       ; DATA VS. SPACE AVAIL
                    17    14  03D7    734         BGTR    GETSTRING_X                 ; TOO MUCH DATA, EXIT
                    09    13  03D9    735         BEQL    160$                        ; FIT EXACTLY NO NEED TO CLEAR, EXIT
                    52    D6  03DB    736         INCL    R2                          ; Plus 1 to skip length byte
                  6342    94  03DD    737 150$:   CLRB    (R3)[R2]                    ; Clear byte
             F9 52    54    F3  03E0    738         AOBLEQ  R4,R2,150$                  ; CLEAR UNTIL END OF BUFFER
                            03E4    739
              50    01    D0  03E4    740 160$:   MOVL    #SS$_NORMAL,R0              ; INDICATE SUCCESS
                    07    11  03E7    741         BRB     GETSTRING_X
                            03E9    742
                            03E9    743 GETSTRING_E:
                            03E9    744         $DS_ABORT                           ; No operator abort the program
  00000000'9F    6C    FA  03E9                        CALLG   (AP), a#DS$ABORT
                            03F0    745
                            03F0    746 GETSTRING_X:                                ;
0000FE00'EF    01    0D    FC AD    F0  03F0    747         INSV    -4(FP),#DSA$V_PROMPT, -
                            03FA    748                 #1, L^DSA$GL_FLAGS          ; RESTORE PROMPT FLAG              [07]
                      04    03FA    749         RET                                 ; RETURN
```

```
                     03FB    751          .SBTTL  RESPONSE        PARAMETER RETRIEVAL SUBROUTINE
                     03FB    752 ;++
                     03FB    753 ; FUNCTIONAL DESCRIPTION:
                     03FB    754 ;
                     03FB    755 ;       DISPLAYS A CALLER SPECIFIED PROMPT MESSAGE, DEFAULT AND
                     03FB    756 ;       RANGE VALUES IF REQUESTED BY THE OPERATOR, THEN ACCEPTS
                     03FB    757 ;       AN ASCII RESPONSE AND CONVERTS IT TO BINARY
                     03FB    758 ;
                     03FB    759 ; CALLING SEQUENCE:
                     03FB    760 ;
                     03FB    761 ;       RESPONSE(prompt,radix,low,high,default,flags)
                     03FB    762 ;
                     03FB    763 ; INPUT PARAMETERS:
                     03FB    764 ;
                     03FB    765 ;       4(AP)   Address of prompt string
                     03FB    766 ;       8(AP)   conversion radix
                     03FB    767 ;       12(AP)  low limit argument
                     03FB    768 ;       16(AP)  high limit argument
                     03FB    769 ;       20(AP)  default argument
                     03FB    770 ;       24(AP)  flags argument
                     03FB    771 ;       28(AP)  1 if signed comparisons, 0 if unsigned
                     03FB    772 ;
                     03FB    773 ; IMPLICIT INPUTS:      NONE
                     03FB    774 ;
                     03FB    775 ; OUTPUT PARAMETERS:
                     03FB    776 ;
                     03FB    777 ;       R1 = BINARY PARAMETER   IF SUCCESSFUL
                     03FB    778 ;
                     03FB    779 ; IMPLICIT OUTPUTS:     NONE
                     03FB    780 ;
                     03FB    781 ; COMPLETION CODES:
                     03FB    782 ;
                     03FB    783 ;       SS$_NORMAL
                     03FB    784 ;       DS$_PROGERR
                     03FB    785 ;
                     03FB    786 ; SIDE EFFECTS:         NONE
                     03FB    787 ;--
                     03FB    788 $OFFSET 0,NEGATIVE,<-
                     03FB    789         <OLDPROMPT,4>, -        ; Saved prompt flag
                     03FB    790         <BUFFER,80>, -          ; Buffer for prompt string
                     03FB    791         <DESC,8>, -             ; Descriptor of string
                     03FB    792         <LOCAL,0>>              ; Length of local storage
                     03FB                .SAVE   LOCAL_BLOCK
                     03FB                .PSECT $ABS$ ABS
00000000             FE70                .=0
FFFFFFFC             0000                .BLKB   -4
                     FFFC        OLDPROMPT:
FFFFFFAC             FFFC                .BLKB   -80
                     FFAC        BUFFER:
FFFFFFA4             FFAC                .BLKB   -8
                     FFA4        DESC:
                     FFA4        LOCAL:
                     000003FB            .RESTORE
                     03FB    793 $OFFSET 0,POSITIVE,<-   ; Argument list
                     03FB    794         <CNT,4>,-               ; Argument
                     03FB    795         <PROMPT,4>, -           ; Address of ASCIC prompt string
                     03FB    796         <RADIX,4>, -            ; Radix for conversion
```

```
                    03FB   797          <LOW,4>, -                  ; Low limit on response
                    03FB   798          <HIGH,4>, -                 ; High limit on response
                    03FB   799          <DEF,4>, -                  ; Default value
                    03FB   800          <FLAGS,4>, -                ; Flags, refer to PAR$_DEF
                    03FB   801          <SIGNED,4>>                 ; 0 if unsigned, 1 if signed
                    03FB                .SAVE   LOCAL_BLOCK
                    03FB                .PSECT $ABS$ ABS
00000000            FFFC                .=0
                    0000        CNT:
00000004            0000                .BLKB   4
                    0004        PROMPT:
00000008            0004                .BLKB   4
                    0008        RADIX:
0000000C            0008                .BLKB   4
                    000C        LOW:
00000010            000C                .BLKB   4
                    0010        HIGH:
00000014            0010                .BLKB   4
                    0014        DEF:
00000018            0014                .BLKB   4
                    0018        FLAGS:
0000001C            0018                .BLKB   4
                    001C        SIGNED:
00000020            001C                .BLKB   4
                000003FB                .RESTORE
```

```
                                03FB    803 RESPONSE:
                              01FC  03FB    804         .WORD   ^M<R2,R3,R4,R5,R6,R7,R8>
                                    03FD    805
                   5E   A4 AD   9E  03FD    806         MOVAB   LOCAL(FP),SP            ; allocate space for local storage
                                    0401    807
 FC AD   0000FE00'EF   01   0D   EF  0401    808         EXTZV   #DSA$V_PROMPT,#1,L^DSA$GL_FLAGS, -      ;                [07]
                                    040B    809                 OLDPROMPT(FP)           ; SAVE STATE OF PROMPT FLAG
                                    040B    810 RETRY_RESP:
                   5E   A4 AD   9E  040B    811         MOVAB   LOCAL(FP),SP            ; Restore stack pointer
                                    040F    812
                   53   0C AC   D0  040F    813         MOVL    LOW(AP),R3              ; GET LOW LIMIT
                03 18 AC    02   E1  0413    814         BBC     #PAR$V_ATLO,FLAGS(AP),10$; BRANCH IF DIRECT ADDRESS
                      53    63   D0  0418    815         MOVL    (R3),R3                 ; GET LOW LIMIT
                                    041B    816 10$:
                   54   10 AC   D0  041B    817         MOVL    HIGH(AP),R4             ; GET HIGH LIMIT
                03 18 AC    03   E1  041F    818         BBC     #PAR$V_ATHI,FLAGS(AP),20$; BRANCH IF DIRECT ADDRESS
                      54    64   D0  0424    819         MOVL    (R4),R4                 ; GET HIGH LIMIT
                                    0427    820 20$:
             50   00660020 8F   D0  0427    821         MOVL    #DS$_PROGERR,R0         ; Prepare for programmer error
                      54    53   D1  042E    822         CMPL    R3,R4                   ; Compare low and high
                   05 1C AC    E9  0431    823         BLBC    SIGNED(AP),25$          ; Branch if unsigned comparison
                         08    15  0435    824         BLEQ    29$                     ; Branch if valid range
                       012F    31  0437    825         BRW     RESPONSE_X              ; Branch since invalid
                         03    1B  043A    826 25$:    BLEQU   29$                     ; Branch if valid range
                       012A    31  043C    827         BRW     RESPONSE_X              ; Branch since invalid
                                    043F    828
                0C 18 AC    01   E0  043F    829 29$:    BBS     #PAR$V_NODEF,FLAGS(AP),30$; IF NO DEFAULT SKIP
                   55   14 AC   D0  0444    830         MOVL    DEF(AP),R5              ; Get Value of default
                03 18 AC    04   E1  0448    831         BBC     #PAR$V_ATDEF,FLAGS(AP),30$; BRANCH IF DIRECT ADDRESS
                      55    65   D0  044D    832         MOVL    (R5),R5                 ; Get default value
                                    0450    833 30$:
                   AC AD    94   0450    834         CLRB    BUFFER(FP)              ; Set prompt to null
       0000FE00'EF   0D    E3   0453    835         BBCS    #DSA$V_PROMPT, L^DSA$GL_FLAGS -         ;                [07]
                         4C         045A    836                 , 80$                   ; IF SHOULD NOT PROMPT, SKIP IT
                                    045B    837                                         ; SETS BIT SO ERRORS WILL PRINT RANGE
                                    045B    838 ;+
                                    045B    839 ;       R3=LOW LIMIT, R4=HIGH LIMIT, R5=ADDR DEFAULT
                                    045B    840 ;-
                         50   D4   045B    841         CLRL    R0                      ; CLEAR
                   08 AC    0A   D1  045D    842         CMPL    #10,RADIX(AP)           ; DECIMAL RADIX CONVERSION?
                         06    13  0461    843         BEQL    50$                     ; YES, USE IT
                         02    14  0463    844         BGTR    40$                     ; MUST BE OCTAL 8 IS LESS THAN 10
                         50    D6  0465    845         INCL    R0
                         50    D6  0467    846 40$:    INCL    R0
                                    0469    847 50$:                                    ; R0=0 DECIMAL, 1=OCTAL, 2=HEX
                03 18 AC    01   E0  0469    848         BBS     #PAR$V_NODEF,FLAGS(AP),60$; Branch if no default value present
                      50    03   C0  046E    849         ADDL2   #3,R0                   ; R0=3 DECIMAL, 4=OCTAL, 5=HEX
                                    0471    850 60$:
                   AD AD    9F   0471    851         PUSHAB  BUFFER+1(FP)            ; MAKE DESCRIPTOR OF OUTPUT BUFFER
                7E   4F 8F   9A  0474    852         MOVZBL  #79,-(SP)               ; LENGTH
                         7E   D4  0478    853         CLRL    -(SP)                   ; SPACE FOR RETURNED LENGTH
          51    00000000'EF40   D0  047A    854         MOVL    INDEX_RADIX[R0],R1      ; GET ADDRESS OF PROPER DIRECTIVE
                      50    81   9A  0482    855         MOVZBL  (R1)+,R0                ; GET LENGTH
                         03   BB  0485    856         PUSHR   #^M<R0,R1>              ; MAKE CONTROL STRING DESCRIPTOR
                                    0487    857
                         18   BB  0487    858         PUSHR   #^M<R4,R3>              ; LOW VALUE AND HIGH VALUE
                         20   BB  0489    859         PUSHR   #^MR5                   ; DEFAULT
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                    18 AE   7F   048B    860          PUSHAQ  24(SP)                         ; ADDRESS OF OUTPUT BUFFER DESCRIPTOR
                    18 AE   DF   048E    861          PUSHAL  24(SP)                         ; ADDRESS OF LENGTH LONGWORD
                    14 AE   7F   0491    862          PUSHAQ  20(SP)                         ; ADDRESS OF CONTROL STRING DESCRIPTOR
          00000000'9F   08   FB   0494    863          CALLS   #8,@#SYS$FAO                   ; EDIT AND CLEAN STACK TO RETURNED LEN
                              049B    864
                       04   BA   049B    865          POPR    #^M<R2>                        ; GET LENGTH OF EDITED STRING
                    5E 08   C0   049D    866          ADDL2   #8,SP                          ; REMOVE OUTPUT BUFFER DESCRIPTOR
                    5E 08   C0   04A0    867          ADDL2   #8,SP                          ; REMOVE OUTPUT BUFFER DESCRIPTOR
                 AC AD   52   90   04A3    868          MOVB    R2,BUFFER(FP)                  ; Make ascic info prompt
                              04A7    869 80$:
                    AC AD   9F   04A7    870          PUSHAB  BUFFER(FP)                     ; Stash info prompt address in param list
                              04AA    871
                    04 AC   DD   04AA    872          PUSHL   PROMPT(AP)                     ; User prompt
                              04AD    873
                00000000'8F   DD   04AD    874          PUSHL   #DS$K_STRBUF                   ; Length of buffer for input
                00000000'EF   DF   04B3    875          PUSHAL  L^DS$GL_BUFLEN                 ; Longword to get length of input       [07]
                00000000'EF   9F   04B9    876          PUSHAB  L^DS$GT_STRBUF                 ; Buffer for input line                 [07]
          00000000'EF   05   FB   04BF    877          CALLS   #5,L^DS_GETLINE                ; Get a line of input                   [07]
                       51   D5   04C6    878          TSTL    R1                             ; ANYTHING THERE?
                       44   13   04C8    879          BEQL    DEFAULT                        ; NO, USE DEFAULT
                       38   BB   04CA    880          PUSHR   #^M<R3,R4,R5>                  ; SAVE LOW,HIGH,DEFAULT ADDR
          55   00000000'EF   9E   04CC    881          MOVAB   L^DS$GT_STRBUF,R5              ; ADDRESS OF INPUT                      [07]
          54   00000000'EF   D0   04D3    882          MOVL    L^DS$GL_BUFLEN,R4              ; GET LENGTH OF INPUT STRING            [07]
                    FB23'   30   04DA    883          BSBW    SCAN$SPACES                    ; Remove leading spaces
                53   08 AC   D0   04DD    884          MOVL    RADIX(AP),R3                   ; SET RADIX FOR CONVERSION
                     FB1C'   30   04E1    885          BSBW    SCAN$NUMERIC                   ; CONVERT A NUMBER
                       38   BA   04E4    886          POPR    #^M<R3,R4,R5>                  ; RESTORE ARGS
                       53   13   04E6    887          BEQL    CVTERR                         ; CONVERSION ERROR
                              04E8    888
                    51   50   D0   04E8    889          MOVL    R0,R1                          ; COPY VALUE
          52   000000EB'EF   9E   04EB    890          MOVAB   L^FMT_RANGE,R2                 ; PREPARE FOR RANGE ERROR               [07]
                    53   51   D1   04F2    891          CMPL    R1,R3                          ; CHECK W/ LOW LIMIT
                 04 1C AC   E9   04F5    892          BLBC    SIGNED(AP),90$                 ; Branch if unsigned comparison
                       59   19   04F9    893          BLSS    ERR_TEXT                       ; TYPE TEXT AND RETRY
                       02   11   04FB    894          BRB     100$                           ; Branch to upper limit check
                       55   1F   04FD    895 90$:     BLSSU   ERR_TEXT                       ; TYPE TEXT AND RETRY
                    54   51   D1   04FF    896 100$:    CMPL    R1,R4                          ; CHECK W/ LOW LIMIT
                 04 1C AC   E9   0502    897          BLBC    SIGNED(AP),110$                ; Branch if unsigned comparison
                       4C   14   0506    898          BGTR    ERR_TEXT                       ; TYPE TEXT AND RETRY
                       5C   11   0508    899          BRB     RESPONSE_OK                    ; EXIT
                       48   1A   050A    900 110$:    BGTRU   ERR_TEXT                       ; Type text and retry
                       58   11   050C    901          BRB     RESPONSE_OK                    ; Exit
                              050E    902
                              050E    903 DEFAULT:
                    51   55   D0   050E    904          MOVL    R5,R1                          ; ASSUME DEFAULT
                 18 AC   01   E1   0511    905          BBC     #PAR$V_NODEF, FLAGS(AP) -
                       50        0515    906                  , RESPONSE_OK                  ; IF DEFAULT ALLOWED, EXIT
                              0516    907
                              0516    908          $PRINT  #DS$K_TYPE_PARAM_ERROR,-       ; TEXT OF MESSAGE                       [10]
                              0516    909                  #DS$K_PRINTF,-
                              0516    910                  FMT_NODEFAULT                  ;
                0000008D'EF   9F   0516                    PUSHAB  FMT_NODEFAULT
                    7E   01   9A   051C                    movzbl  #DS$K_PRINTF, -(sp)
                    7E   1C   98   051F                    cvtbl   #DS$K_TYPE_PARAM_ERROR, -(sp)
          00000000'GF   03   FB   0522                    CALLS   #$$N+2, G^DSX$PRINT
          0000FE00'EF   0C   E1   0529    911          BBC     #DSA$V_OPER,L^DSA$GL_FLAGS -   ;                               [07]
                       03        0530    912                  , 10$                          ; IF NO OPERATOR PRESENT...ABORT
```

```
                FED7   31  0531   913          BRW     RETRY_RESP                      ; TRY AGAIN
                       0534   914 10$:     $DS_ABORT
00000000'9F     6C     FA  0534                        CALLG   (AP), a#DS$ABORT
                       053B   915
                       053B   916 CVTERR:
52  00000109'EF 9E     D1  053B   917          MOVAB   FMT_ILLCHAR,R2                  ; ASSUME ERROR WAS ILLEGAL CHARACTER
00660018 8F     50     13  0542   918          CMPL    R0,#DS$_ILLCHAR                 ; WAS IT?
                09     9E  0549   919          BEQL    ERR_TEXT                        ; TYPE ERROR AND TRY AGAIN
52  000000EB'EF 9E     11  054B   920          MOVAB   FMT_OVERFLOW,R2                 ; ASSUME WAS OVERFLOW
                00     FB  0552   921          BRB     ERR_TEXT                        ; TYPE ERROR AND TRY AGAIN
                       0554   922 ERR_TEXT:
                       0554   923          $PRINT  #DS$K_TYPE_PARAM_ERROR,-        ; TYPE ERROR TEXT                [10]
                       0554   924                  #DS$K_PRINTF,-
                       0554   925                  (R2)            ;
                62     9F  0554                    PUSHAB  (R2)
          7E    01     9A  0556                    movzbl  #DS$K_PRINTF, -(sp)
          7E    1C     98  0559                    cvtbl   #DS$K_TYPE_PARAM_ERROR, -(sp)
00000000'GF     03     FB  055C                    CALLS   #$$N+2, G^DSX$PRINT
                FEA5   31  0563   926          BRW     RETRY_RESP                      ; AND TRY AGAIN
                       0566   927
                       0566   928 RESPONSE_OK:
          50    01     D0  0566   929          MOVL    S^#SS$_NORMAL,R0                ; It worked.
                       0569   930 RESPONSE_X:
       0D   FC AD     F0  0569   931          INSV    OLDPROMPT(FP), #DSA$V_PROMPT -
0000FE00'EF     01         056D   932                  ,#1, L^DSA$GL_FLAGS             ; RESTORE PROMPT FLAG            [07]
                04     FB  0573   933          RET                                     ; RETURN
                       0574   934
                       0574   935          .END
```

```
$$N                             = 00000001     D
BIT...                          = 00000004     D
BUFFER                            FFFFFFAC     D
CNT                               00000000     D
CVTERR                            0000053B R   D   04
DEF                               00000014     D
DEFAULT                           0000050E R   D   04
DESC                              FFFFFFA4     D
DIR...                          = 00000001     D
DS$ABORT                          ********     X   00
DS$GK_SID                         ********     X   00
DS$GL_BUFLEN                      ********     X   00
DS$GT_STRBUF                      ********     X   00
DS$K_BBC                        = 0000001D   G D
DS$K_BBCC                       = 00000021   G D
DS$K_BBCCI                      = 00000023   G D
DS$K_BBCS                       = 0000001F   G D
DS$K_BBS                        = 0000001C   G D
DS$K_BBSC                       = 00000020   G D
DS$K_BBSS                       = 0000001E   G D
DS$K_BBSSI                      = 00000022   G D
DS$K_BCC_M                      = 0000001B   G D
DS$K_BCS_M                      = 0000001A   G D
DS$K_BEQLU_B                    = 00000005   G D
DS$K_BEQLU_M                    = 00000011   G D
DS$K_BEQL_B                     = 00000004   G D
DS$K_BEQL_M                     = 00000010   G D
DS$K_BERROR                     = 00000026   G D
DS$K_BGEQU_B                    = 00000007   G D
DS$K_BGEQU_M                    = 00000013   G D
DS$K_BGEQ_B                     = 00000006   G D
DS$K_BGEQ_M                     = 00000012   G D
DS$K_BGTRU_B                    = 00000009   G D
DS$K_BGTRU_M                    = 00000015   G D
DS$K_BGTR_B                     = 00000008   G D
DS$K_BGTR_M                     = 00000014   G D
DS$K_BLBC                       = 00000025   G D
DS$K_BLBS                       = 00000024   G D
DS$K_BLEQU_B                    = 00000003   G D
DS$K_BLEQU_M                    = 0000000F   G D
DS$K_BLEQ_B                     = 00000002   G D
DS$K_BLEQ_M                     = 0000000E   G D
DS$K_BLSSU_B                    = 00000001   G D
DS$K_BLSSU_M                    = 0000000D   G D
DS$K_BLSS_B                     = 00000000   G D
DS$K_BLSS_M                     = 0000000C   G D
DS$K_BNEQU_B                    = 0000000B   G D
DS$K_BNEQU_M                    = 00000017   G D
DS$K_BNEQ_B                     = 0000000A   G D
DS$K_BNEQ_M                     = 00000016   G D
DS$K_BNERROR                    = 00000027   G D
DS$K_BVC_M                      = 00000019   G D
DS$K_BVS_M                      = 00000018   G D
DS$K_DS_STARTING_LOCATION       = 00010000     D
DS$K_ERROR                      = 00000002     D
DS$K_NORMAL                     = 00000001     D
DS$K_PRINTB                     = 00000002     D
DS$K_PRINTF                     = 00000001     D
DS$K_PRINTI                     = 00000000     D
DS$K_PRINTX                     = 00000003     D
DS$K_SEVERE                     = 00000004     D
DS$K_STRBUF                       ********     X   00
DS$K_SUBSYS                     = 00000066     D
DS$K_TYPE_ABORT_PROGRAM         = 00000014     D
DS$K_TYPE_ABORT_TEST            = 00000013     D
DS$K_TYPE_COMMAND_ERR           = 00000015     D
DS$K_TYPE_COMMAND_OUT           = 00000016     D
DS$K_TYPE_CRD_AUTOTEST          = 0000001A     D
DS$K_TYPE_DS_PROMPT             = 00000001     D
DS$K_TYPE_DS_START              = 0000001D     D
DS$K_TYPE_ERRDEV                = 00000008     D
DS$K_TYPE_ERRHARD               = 00000006     D
DS$K_TYPE_ERROR_BODY            = 00000009     D
DS$K_TYPE_ERROR_END             = 0000000A     D
DS$K_TYPE_ERRPREP               = 0000001B     D
DS$K_TYPE_ERRSOFT               = 00000007     D
DS$K_TYPE_ERRSUP                = 00000004     D
DS$K_TYPE_ERRSYS                = 00000005     D
DS$K_TYPE_ERR_HALT              = 0000000D     D
DS$K_TYPE_EXCEPTION             = 0000000C     D
DS$K_TYPE_EXCEPTION_HEAD        = 0000000B     D
DS$K_TYPE_FIRST_PASS            = 00000011     D
DS$K_TYPE_GENERAL               = 00000000     D
DS$K_TYPE_GENERAL_ERROR         = 00000003     D
DS$K_TYPE_NO_TESTS              = 00000012     D
DS$K_TYPE_PARAM_ERROR           = 0000001C     D
DS$K_TYPE_PROGRAM_END           = 00000010     D
DS$K_TYPE_PROGRAM_INFO          = 00000017     D
DS$K_TYPE_PROGRAM_START         = 0000000F     D
DS$K_TYPE_QIO_INVADP            = 00000024     D
DS$K_TYPE_QIO_NODRIVER          = 00000022     D
DS$K_TYPE_QIO_WRONGVER          = 00000023     D
DS$K_TYPE_SCRIPT_ECHO           = 00000021     D
DS$K_TYPE_SCRIPT_PNF            = 0000001E     D
DS$K_TYPE_SCRIPT_PROMPT         = 00000020     D
DS$K_TYPE_SCRIPT_SKIP           = 0000001F     D
DS$K_TYPE_SEQUENCE_ERROR        = 00000019     D
DS$K_TYPE_START_ERR             = 00000018     D
DS$K_TYPE_START_LIST            = 00000025     D
DS$K_TYPE_SUMMARY               = 0000000E     D
DS$K_TYPE_USER_PROMPT           = 00000002     D
DS$K_WARNING                    = 00000000     D
DS$_AP_NORMAL_BREAK             = 00660150     D
DS$_ARITH                       = 006600D0     D
DS$_ASBE                        = 00660118     D
DS$_BADLINK                     = 006600F0     D
DS$_BADTYPE                     = 006600E8     D
DS$_BIIC                        = 00660120     D
DS$_CHME                        = 006600A8     D
DS$_CHMK                        = 006600E0     D
DS$_DEVNAME                     = 00660108     D
DS$_ERROR                       = 00660002     D
DS$_FHWE                        = 00660068     D
DS$_FRAGBUF                     = 00660080     D
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DS$_ICBUSY                      = 006600C8    D
DS$_ICERR                       = 006600C0    D
DS$_IHWE                        = 00660060    D
DS$_ILLCHAR                     = 00660018    D
DS$_ILLPAGCNT                   = 00660078    D
DS$_ILLUNIT                     = 00660100    D
DS$_INIT_FAIL                   = 00660140    D
DS$_INSFMEM                     = 00660050    D
DS$_INVCPU                      = 00660130    D
DS$_IPL2HI                      = 006600B8    D
DS$_IVADDR                      = 00660040    D
DS$_IVVECT                      = 00660038    D
DS$_KRNLSTK                     = 00660090    D
DS$_LOGIC                       = 00660070    D
DS$_MCHK                        = 00660088    D
DS$_MEM_ALLOC_ERR               = 00660138    D
DS$_MMOFF                       = 00660058    D
DS$_NEEDUNIT                    = 006600F8    D
DS$_NODE                        = 00660128    D
DS$_NOPCS                       = 00660110    D
DS$_NORMAL                      = 00660001    D
DS$_NOSUPPORT                   = 006600B1    D
DS$_NOTALLOWMP                  = 00660148    D
DS$_NOTDON                      = 00660030    D
DS$_NOTIMP                      = 006600B0    D
DS$_NULLSTR                     = 00660010    D
DS$_OVERFLOW                    = 00660008    D
DS$_POWER                       = 00660098    D
DS$_PROGERR                     = 00660020    D
DS$_SEVERE                      = 00660004    D
DS$_TRANSL                      = 006600A0    D
DS$_TRUNCATE                    = 00660028    D
DS$_UNEXPINT                    = 006600D8    D
DS$_UNSUPPDEV                   = 00660158    D
DS$_VASFULL                     = 00660048    D
DS$_WARNING                     = 00660000    D
DSA$AL_APTMAIL                    0000FE00    D
DSA$AT_APTTXT                     0000FA00    D
DSA$GL_APTCOM                     0000FE04    D
DSA$GL_DEVLEN                     0000FE58    D
DSA$GL_ERRNO                      0000FE44    D
DSA$GL_EVENT                      0000FE48    D
DSA$GL_FLAGS                      0000FE00    D
DSA$GL_MSGTYP                     0000FE40    D
DSA$GL_PASSES                     0000FE08    D
DSA$GL_PASSNO                     0000FE54    D
DSA$GL_SECTNO                     0000FE10    D
DSA$GL_SID                        0000FE14    D
DSA$GL_SUBTNO                     0000FE4C    D
DSA$GL_TESTNO                     0000FE50    D
DSA$GL_UNITS                      0000FE0C    D
DSA$GQ_MSGPTR                     0000FE68    D
DSA$GT_DEVNAM                     0000FE5C    D
DSA$V_ASK_PROMPT                = 00000013    D
DSA$V_OPER                      = 0000000C    D
DSA$V_PROMPT                    = 0000000D    D
DSQA$K_DISPAT_AFTER_INIT        = 00000014    D
DSQA$K_DISPAT_BEFORE_INIT       = 00000013    D
DSQA$K_DISPAT_CALLTEST          = 00000015    D
DSQA$K_DISPAT_DONE_TESTS        = 00000018    D
DSQA$K_DISPAT_DSX$ENDPASS_BGN   = 00000001    D
DSQA$K_DISPAT_DSX$ENDPASS_END   = 00000002    D
DSQA$K_DISPAT_DSX$ENDPASS_MID   = 00000000    D
DSQA$K_DISPAT_DS_CLEANUP_BGN    = 00000003    D
DSQA$K_DISPAT_DS_CLEANUP_END    = 00000004    D
DSQA$K_DUMMY_1                  = 00000007    D
DSQA$K_ERROR_ERROR_BGN          = 00000006    D
DSQA$K_ERROR_ERROR_END          = 00000005    D
DSQA$K_KERNEL_INIT_CONTEXT      = 00000008    D
DSQA$K_LOOP_DSX$BGNSUB          = 00000009    D
DSQA$K_LOOP_DSX$CKLOOP          = 0000000B    D
DSQA$K_LOOP_DSX$ENDSUB          = 0000000A    D
DSQA$K_PARAM_DSX$GETADDRESS     = 0000000E    D
DSQA$K_PARAM_DSX$GETDATA        = 0000000C    D
DSQA$K_PARAM_DSX$GETLOGICAL     = 0000000F    D
DSQA$K_PARAM_DSX$GETSTRING      = 00000010    D
DSQA$K_PARAM_DSX$GETVIELD       = 0000000D    D
DSQA$K_QA_DSX$BRANCH            = 00000011    D
DSQA$K_START_BEFORE_HEADER      = 00000017    D
DSQA$K_START_VRRESTART          = 00000012    D
DSQA$K_START_VRSTART            = 00000016    D
DSX$GETADDRESS                    000000F6 RG D  04
DSX$GETDATA                       00000000 RG D  04
DSX$GETLOGICAL                    0000014F RG D  04
DSX$GETSTRING                     0000026F RG D  04
DSX$GETVIELD                      00000085 RG D  04
DSX$PRINT                         ******** *  X  00
DS_GETLINE                        ******** *  X  00
ERR_TEXT                          00000554 R  D  04
FALSE                           = 00000000    D
FLAGS                             00000018    D
FMT_DEFNO                         0000012E R  D  03
FMT_DEFYES                        00000120 R  D  03
FMT_ILLCHAR                       00000109 R  D  03
FMT_INVALID                       000000B9 R  D  03
FMT_NODEFAULT                     0000008D R  D  03
FMT_NULL                          0000013C R  D  03
FMT_OVERFLOW                      000000EB R  D  03
FMT_PROGERR                       000000CF R  D  03
FMT_RANGE                         000000EB R  D  03
GETADDRESS_X                      0000014E R  D  04
GETDATA_X                         00000084 R  D  04
GETLOGICAL_X                      00000264 R  D  04
GETSTRING_E                       000003E9 R  D  04
GETSTRING_X                       000003F0 R  D  04
GETVIELD_X                        000000F5 R  D  04
HIGH                              00000010    D
INDEX_RADIX                       00000000 R  D  03
LOCAL                             FFFFFFA4    D
LOW                               0000000C    D
OFF                             = 00000000    D
OLDPROMPT                         FFFFFFFC    D
ON                              = 00000001    D
PAR$M_ATDEF                     = 00000010    D
```

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PAR$M_ATHI                      = 00000008    D
PAR$M_ATLO                      = 00000004    D
PAR$M_NODEF                     = 00000002    D
PAR$V_ATDEF                     = 00000004    D
PAR$V_ATHI                      = 00000003    D
PAR$V_ATLO                      = 00000002    D
PAR$V_NODEF                     = 00000001    D
PAR$_BIN                        = 00000002    D
PAR$_DEC                        = 0000000A    D
PAR$_HEX                        = 00000010    D
PAR$_NO                         = 00000000    D
PAR$_OCT                        = 00000008    D
PAR$_YES                        = 00000001    D
PRNT_PRMT                         00000000 RG D  02
PROMPT                            00000004    D
QA$AOB_FLAGS                      ********   X   00
QA$K_ABORT_NOW                  = 00000007    D
QA$K_APT_PHASE_ONE              = 0000000B    D
QA$K_APT_PHASE_TWO              = 0000000C    D
QA$K_BAD_ADDRESS                = 00000009    D
QA$K_CONTROL_C_CONT             = 0000000A    D
QA$K_DEALLOCATION               = 0000000E    D
QA$K_ERROR_PHASE_ONE            = 00000005    D
QA$K_ERROR_PHASE_THREE          = 00000007    D
QA$K_ERROR_PHASE_TWO            = 00000006    D
QA$K_FAILURE                    = 00000000    D
QA$K_FIRST_BRANCH_CODE          = 00000000    D
QA$K_FIRST_TIME                 = 00000005    D
QA$K_INIT_CONTEXT_DONE          = 00000003    D
QA$K_LAST_BRANCH_CODE           = 00000025    D
QA$K_LOOP_ON_SUBTEST            = 00000003    D
QA$K_LOOP_ON_TEST               = 00000002    D
QA$K_LOOP_TEST_DONE             = 00000004    D
QA$K_MEMORY_MANAGE              = 0000000D    D
QA$K_MULTIPLE_PASS              = 00000001    D
QA$K_NODEF                      = 00000000    D
QA$K_NORMAL_START               = 00000000    D
QA$K_NO_HEADER                  = 00000006    D
QA$K_NUMBER_OF_CHECKS           = 0000000F    D
QA$K_NUMBER_QA_FLAGS            = 00000008    D
QA$K_NUMB_ROUTINE_STATES        = 00000004    D
QA$K_QA_DEBUG                   = 00000001    D
QA$K_QA_DONE                    = 00000002    D
QA$K_RUN_BACKWARDS              = 00000004    D
QA$K_SECTION                    = 00000008    D
QA$K_SUCCESS                    = 00000001    D
QA$MAIN                           ********   X   00
QA$V_CHECK_DONE                 = 00000003    D
QA$V_DOING_CLEANUP              = 00000002    D
QA$V_ERROR_FOUND                = 00000001    D
QA$V_INIT_DONE                  = 00000000    D
QUESTN                          = 0000003F    D
RADIX                             00000008    D
RESPONSE                          000003FB R  D  04
RESPONSE_OK                       00000566 R  D  04
RESPONSE_X                        00000569 R  D  04
RETRY_LOGICAL                     00000194 R  D  04
RETRY_RESP                        0000040B R  D  04
RETRY_STRING                      000002B8 R  D  04
SAVABS...                       = 00000020    D
SCAN$NUMERIC                      ********   X   00
SCAN$SPACES                       ********   X   00
SIGNED                            0000001C    D
SIZ...                          = 00000001    D
SS$_NORMAL                      = 00000001    D
SYS$FAO                           ********   X   00
TRUE                            = 00000001    D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	FFFFFFFC (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
WORK	00000004 (4.)	02 (2.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC BYTE
DATA	0000013D (317.)	03 (3.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC BYTE
CODE	00000574 (1396.)	04 (4.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$N	=00000001	925 (14)	#-536 (10) #-699 (12) #-725 (12) #-910 (14) #-925 (14)
BIT...	=00000004	146 (2)	141 (2) 143 (2) 144 (2) 145 (2) 146 (2)
BUFFER	FFFFFFAC	792 (13)	#-834 (14) 851 (14) #-868 (14) 870 (14)
CNT	00000000	801 (13)	
CVTERR	0000053B-R	916 (14)	#-887 (14)
DEF	00000014	801 (13)	#-830 (14)
DEFAULT	0000050E-R	903 (14)	#-879 (14)
DESC	FFFFFFA4	792 (13)	
DIR...	=00000001	801 (13)	792 (13) 801 (13)
DS$ABORT	00000000-XR		129 (2) 744 (12) 914 (14)
DS$GK_SID	00000000-XR		133 (2) #-547 (10)
DS$GL_BUFLEN	00000000-XR		131 (2) 519 (10) #-524 (10) 686 (12) #-691 (12) 875 (14) #-882 (14)
DS$GT_STRBUF	00000000-XR		131 (2) 520 (10) #-528 (10) #-531 (10) 876 (14) 881 (14)
DS$K_BBC	=0000001D	145 (2)	
DS$K_BBCC	=00000021	145 (2)	
DS$K_BBCCI	=00000023	145 (2)	
DS$K_BBCS	=0000001F	145 (2)	
DS$K_BBS	=0000001C	145 (2)	
DS$K_BBSC	=00000020	145 (2)	
DS$K_BBSS	=0000001E	145 (2)	
DS$K_BBSSI	=00000022	145 (2)	
DS$K_BCC_M	=0000001B	145 (2)	
DS$K_BCS_M	=0000001A	145 (2)	
DS$K_BEQLU_B	=00000005	145 (2)	
DS$K_BEQLU_M	=00000011	145 (2)	
DS$K_BEQL_B	=00000004	145 (2)	
DS$K_BEQL_M	=00000010	145 (2)	
DS$K_BERROR	=00000026	145 (2)	
DS$K_BGEQU_B	=00000007	145 (2)	
DS$K_BGEQU_M	=00000013	145 (2)	
DS$K_BGEQ_B	=00000006	145 (2)	
DS$K_BGEQ_M	=00000012	145 (2)	
DS$K_BGTRU_B	=00000009	145 (2)	
DS$K_BGTRU_M	=00000015	145 (2)	
DS$K_BGTR_B	=00000008	145 (2)	
DS$K_BGTR_M	=00000014	145 (2)	
DS$K_BLBC	=00000025	145 (2)	145 (2)
DS$K_BLBS	=00000024	145 (2)	
DS$K_BLEQU_B	=00000003	145 (2)	
DS$K_BLEQU_M	=0000000F	145 (2)	
DS$K_BLEQ_B	=00000002	145 (2)	
DS$K_BLEQ_M	=0000000E	145 (2)	
DS$K_BLSSU_B	=00000001	145 (2)	
DS$K_BLSSU_M	=0000000D	145 (2)	
DS$K_BLSS_B	=00000000	145 (2)	145 (2)
DS$K_BLSS_M	=0000000C	145 (2)	

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DS$K_BNEQU_B                    =0000000B     145     (2)
DS$K_BNEQU_M                    =00000017     145     (2)
DS$K_BNEQ_B                     =0000000A     145     (2)
DS$K_BNEQ_M                     =00000016     145     (2)
DS$K_BNERROR                    =00000027     145     (2)
DS$K_BVC_M                      =00000019     145     (2)
DS$K_BVS_M                      =00000018     145     (2)
DS$K_DS_STARTING_LOCATION       =00010000     145     (2)
DS$K_ERROR                      =00000002     141     (2)
DS$K_NORMAL                     =00000001     141     (2)
DS$K_PRINTB                     =00000002     146     (2)
DS$K_PRINTF                     =00000001     146     (2)   #-536    (10)   #-699    (12)   #-725    (12)   #-910    (14)
                                                            #-925    (14)
DS$K_PRINTI                     =00000000     146     (2)
DS$K_PRINTX                     =00000003     146     (2)
DS$K_SEVERE                     =00000004     141     (2)
DS$K_STRBUF                      00000000-XR                  131     (2)    #-874    (14)
DS$K_SUBSYS                     =00000066     141     (2)   141     (2)
DS$K_TYPE_ABORT_PROGRAM         =00000014     146     (2)
DS$K_TYPE_ABORT_TEST            =00000013     146     (2)
DS$K_TYPE_COMMAND_ERR           =00000015     146     (2)
DS$K_TYPE_COMMAND_OUT           =00000016     146     (2)
DS$K_TYPE_CRD_AUTOTEST          =0000001A     146     (2)
DS$K_TYPE_DS_PROMPT             =00000001     146     (2)
DS$K_TYPE_DS_START              =0000001D     146     (2)
DS$K_TYPE_ERRDEV                =00000008     146     (2)
DS$K_TYPE_ERRHARD               =00000006     146     (2)
DS$K_TYPE_ERROR_BODY            =00000009     146     (2)
DS$K_TYPE_ERROR_END             =0000000A     146     (2)
DS$K_TYPE_ERRPREP               =0000001B     146     (2)
DS$K_TYPE_ERRSOFT               =00000007     146     (2)
DS$K_TYPE_ERRSUP                =00000004     146     (2)
DS$K_TYPE_ERRSYS                =00000005     146     (2)
DS$K_TYPE_ERR_HALT              =0000000D     146     (2)
DS$K_TYPE_EXCEPTION             =0000000C     146     (2)
DS$K_TYPE_EXCEPTION_HEAD        =0000000B     146     (2)
DS$K_TYPE_FIRST_PASS            =00000011     146     (2)
DS$K_TYPE_GENERAL               =00000000     146     (2)
DS$K_TYPE_GENERAL_ERROR         =00000003     146     (2)
DS$K_TYPE_NO_TESTS              =00000012     146     (2)
DS$K_TYPE_PARAM_ERROR           =0000001C     146     (2)   #-536    (10)   #-699    (12)   #-725    (12)   #-910    (14)
                                                            #-925    (14)
DS$K_TYPE_PROGRAM_END           =00000010     146     (2)
DS$K_TYPE_PROGRAM_INFO          =00000017     146     (2)
DS$K_TYPE_PROGRAM_START         =0000000F     146     (2)
DS$K_TYPE_QIO_INVADP            =00000024     146     (2)
DS$K_TYPE_QIO_NODRIVER          =00000022     146     (2)
DS$K_TYPE_QIO_WRONGVER          =00000023     146     (2)
DS$K_TYPE_SCRIPT_ECHO           =00000021     146     (2)
DS$K_TYPE_SCRIPT_PNF            =0000001E     146     (2)
DS$K_TYPE_SCRIPT_PROMPT         =00000020     146     (2)
DS$K_TYPE_SCRIPT_SKIP           =0000001F     146     (2)
DS$K_TYPE_SEQUENCE_ERROR        =00000019     146     (2)
DS$K_TYPE_START_ERR             =00000018     146     (2)
DS$K_TYPE_START_LIST            =00000025     146     (2)
DS$K_TYPE_SUMMARY               =0000000E     146     (2)
DS$K_TYPE_USER_PROMPT           =00000002     146     (2)
```

```
DS$K_WARNING                    =00000000     141     (2)
DS$_AP_NORMAL_BREAK             =00660150     141     (2)
DS$_ARITH                       =006600D0     141     (2)
DS$_ASBE                        =00660118     141     (2)
DS$_BADLINK                     =006600F0     141     (2)
DS$_BADTYPE                     =006600E8     141     (2)
DS$_BIIC                        =00660120     141     (2)
DS$_CHME                        =006600A8     141     (2)
DS$_CHMK                        =006600E0     141     (2)
DS$_DEVNAME                     =00660108     141     (2)
DS$_ERROR                       =00660002     141     (2)
DS$_FHWE                        =00660068     141     (2)
DS$_FRAGBUF                     =00660080     141     (2)
DS$_ICBUSY                      =006600C8     141     (2)
DS$_ICERR                       =006600C0     141     (2)
DS$_IHWE                        =00660060     141     (2)
DS$_ILLCHAR                     =00660018     141     (2)     #-918     (14)
DS$_ILLPAGCNT                   =00660078     141     (2)
DS$_ILLUNIT                     =00660100     141     (2)
DS$_INIT_FAIL                   =00660140     141     (2)
DS$_INSFMEM                     =00660050     141     (2)
DS$_INVCPU                      =00660130     141     (2)
DS$_IPL2HI                      =006600B8     141     (2)
DS$_IVADDR                      =00660040     141     (2)
DS$_IVVECT                      =00660038     141     (2)
DS$_KRNLSTK                     =00660090     141     (2)
DS$_LOGIC                       =00660070     141     (2)
DS$_MCHK                        =00660088     141     (2)
DS$_MEM_ALLOC_ERR               =00660138     141     (2)
DS$_MMOFF                       =00660058     141     (2)
DS$_NEEDUNIT                    =006600F8     141     (2)
DS$_NODE                        =00660128     141     (2)
DS$_NOPCS                       =00660110     141     (2)
DS$_NORMAL                      =00660001     141     (2)
DS$_NOSUPPORT                   =006600B1     141     (2)
DS$_NOTALLOWMP                  =00660148     141     (2)
DS$_NOTDON                      =00660030     141     (2)
DS$_NOTIMP                      =006600B0     141     (2)       141     (2)
DS$_NULLSTR                     =00660010     141     (2)
DS$_OVERFLOW                    =00660008     141     (2)
DS$_POWER                       =00660098     141     (2)
DS$_PROGERR                     =00660020     141     (2)     #-249     (4)     #-342     (6)     #-425     (8)     #-500     (10)
                                                              #-506     (10)    #-635     (12)    #-821     (14)
DS$_SEVERE                      =00660004     141     (2)
DS$_TRANSL                      =006600A0     141     (2)
DS$_TRUNCATE                    =00660028     141     (2)     #-276     (4)     #-361     (6)     #-730     (12)
DS$_UNEXPINT                    =006600D8     141     (2)
DS$_UNSUPPDEV                   =00660158     141     (2)
DS$_VASFULL                     =00660048     141     (2)
DS$_WARNING                     =00660000     141     (2)       141     (2)
DSA$GL_FLAGS                     0000FE00                       240     (4)       333     (6)       416     (8)       490     (10)
                                                                499     (10)      511     (10)      562     (10)      616     (12)
                                                                632     (12)      646     (12)      700     (12)      748     (12)
                                                                808     (14)      835     (14)      911     (14)      932     (14)
DSA$V_ASK_PROMPT                =00000013                     #-239     (4)     #-332     (6)     #-415     (8)     #-489     (10)
                                                              #-615     (12)
DSA$V_OPER                      =0000000C                     #-700     (12)    #-911     (14)
```

```
DSA$V_PROMPT                    =0000000D                       #-498    (10)   #-511    (10)   #-561    (10)   #-631    (12)
                                                                #-646    (12)   #-747    (12)   #-808    (14)   #-835    (14)
                                                                #-931    (14)
DSQA$K_DISPAT_AFTER_INIT        =00000014     144    (2)
DSQA$K_DISPAT_BEFORE_INIT       =00000013     144    (2)
DSQA$K_DISPAT_CALLTEST          =00000015     144    (2)
DSQA$K_DISPAT_DONE_TESTS        =00000018     144    (2)
DSQA$K_DISPAT_DSX$ENDPASS_BGN   =00000001     144    (2)
DSQA$K_DISPAT_DSX$ENDPASS_END   =00000002     144    (2)
DSQA$K_DISPAT_DSX$ENDPASS_MID   =00000000     144    (2)
DSQA$K_DISPAT_DS_CLEANUP_BGN    =00000003     144    (2)
DSQA$K_DISPAT_DS_CLEANUP_END    =00000004     144    (2)
DSQA$K_DUMMY_1                  =00000007     144    (2)
DSQA$K_ERROR_ERROR_BGN          =00000006     144    (2)
DSQA$K_ERROR_ERROR_END          =00000005     144    (2)
DSQA$K_KERNEL_INIT_CONTEXT      =00000008     144    (2)
DSQA$K_LOOP_DSX$BGNSUB          =00000009     144    (2)
DSQA$K_LOOP_DSX$CKLOOP          =0000000B     144    (2)
DSQA$K_LOOP_DSX$ENDSUB          =0000000A     144    (2)
DSQA$K_PARAM_DSX$GETADDRESS     =0000000E     144    (2)    #-423    (8)
DSQA$K_PARAM_DSX$GETDATA        =0000000C     144    (2)    #-247    (4)
DSQA$K_PARAM_DSX$GETLOGICAL     =0000000F     144    (2)    #-496    (10)
DSQA$K_PARAM_DSX$GETSTRING      =00000010     144    (2)    #-629    (12)
DSQA$K_PARAM_DSX$GETVIELD       =0000000D     144    (2)    #-340    (6)
DSQA$K_QA_DSX$BRANCH            =00000011     144    (2)
DSQA$K_START_BEFORE_HEADER      =00000017     144    (2)
DSQA$K_START_VRRESTART          =00000012     144    (2)
DSQA$K_START_VRSTART            =00000016     144    (2)
DSX$GETADDRESS                   000000F6-R   413    (8)
DSX$GETDATA                      00000000-R   237    (4)
DSX$GETLOGICAL                   0000014F-R   487    (10)
DSX$GETSTRING                    0000026F-R   613    (12)
DSX$GETVIELD                     00000085-R   330    (6)
DSX$PRINT                        00000000-XR                     129    (2)    536    (10)   699    (12)   725    (12)
                                                                910    (14)   925    (14)
DS_GETLINE                       00000000-XR                     132    (2)    521    (10)   689    (12)   877    (14)
ERR_TEXT                         00000554-R   922    (14)    #-893    (14)   #-895    (14)   #-898    (14)   #-900    (14)
                                                                #-919    (14)   #-921    (14)
FALSE                           =00000000     145    (2)
FLAGS                            00000018     801    (13)    814    (14)   818    (14)   829    (14)   831    (14)
                                                                848    (14)   905    (14)
FMT_DEFNO                        0000012E-R   183    (2)     515    (10)
FMT_DEFYES                       00000120-R   181    (2)     513    (10)
FMT_ILLCHAR                      00000109-R   179    (2)     917    (14)
FMT_INVALID                      000000B9-R   172    (2)     536    (10)   725    (12)
FMT_NODEFAULT                    0000008D-R   170    (2)     699    (12)   910    (14)
FMT_NULL                         0000013C-R   185    (2)     510    (10)   644    (12)
FMT_OVERFLOW                     000000EB-R   177    (2)     920    (14)
FMT_PROGERR                      000000CF-R   174    (2)
FMT_RANGE                        000000EB-R   176    (2)     890    (14)
GETADDRESS_X                     0000014E-R   441    (8)    #-436    (8)
GETDATA_X                        00000084-R   278    (4)    #-251    (4)    #-253    (4)    #-262    (4)    #-274    (4)
GETLOGICAL_X                     00000264-R   560    (10)
GETSTRING_E                      000003E9-R   743    (12)   #-701    (12)
GETSTRING_X                      000003F0-R   746    (12)   #-636    (12)   #-734    (12)   #-741    (12)
GETVIELD_X                       000000F5-R   363    (6)    #-344    (6)    #-353    (6)    #-360    (6)    #-427    (8)
HIGH                             00000010     801    (13)   #-817    (14)
```

```
INDEX_RADIX                     00000000-R    160     (2)     #-854     (14)
LOCAL                           FFFFFFA4      792     (13)      806     (14)      811     (14)
LOW                             0000000C      801     (13)    #-813     (14)
OFF                            =00000000      145     (2)
OLDPROMPT                       FFFFFFFC      792     (13)    #-809     (14)    #-931     (14)
ON                             =00000001      145     (2)
PAR$M_ATDEF                    =00000010      143     (2)
PAR$M_ATHI                     =00000008      143     (2)
PAR$M_ATLO                     =00000004      143     (2)
PAR$M_NODEF                    =00000002      143     (2)
PAR$V_ATDEF                    =00000004      143     (2)     #-831     (14)
PAR$V_ATHI                     =00000003      143     (2)     #-818     (14)
PAR$V_ATLO                     =00000002      143     (2)     #-814     (14)
PAR$V_NODEF                    =00000001      143     (2)     #-243     (4)     #-336     (6)     #-419     (8)     #-829     (14)
                                                               #-848     (14)    #-905     (14)
PAR$_BIN                       =00000002      143     (2)
PAR$_DEC                       =0000000A      143     (2)
PAR$_HEX                       =00000010      143     (2)
PAR$_NO                        =00000000      143     (2)     #-527     (10)
PAR$_OCT                       =00000008      143     (2)
PAR$_YES                       =00000001      143     (2)     #-530     (10)
PRNT_PRMT                       00000000-R    155     (2)     #-241     (4)     #-334     (6)     #-417     (8)     #-491     (10)
                                                               #-617     (12)
PROMPT                          00000004      801     (13)    #-872     (14)
QA$AOB_FLAGS                    00000000-XR                     130     (2)       246     (4)       339     (6)       422     (8)
                                                                494     (10)      622     (12)      626     (12)
QA$K_ABORT_NOW                 =00000007      145     (2)
QA$K_APT_PHASE_ONE             =0000000B      145     (2)
QA$K_APT_PHASE_TWO             =0000000C      145     (2)
QA$K_BAD_ADDRESS               =00000009      145     (2)
QA$K_CONTROL_C_CONT            =0000000A      145     (2)
QA$K_DEALLOCATION              =0000000E      145     (2)
QA$K_ERROR_PHASE_ONE           =00000005      145     (2)
QA$K_ERROR_PHASE_THREE         =00000007      145     (2)
QA$K_ERROR_PHASE_TWO           =00000006      145     (2)
QA$K_FAILURE                   =00000000      145     (2)
QA$K_FIRST_BRANCH_CODE         =00000000      145     (2)
QA$K_FIRST_TIME                =00000005      145     (2)
QA$K_INIT_CONTEXT_DONE         =00000003      145     (2)
QA$K_LAST_BRANCH_CODE          =00000025      145     (2)
QA$K_LOOP_ON_SUBTEST           =00000003      145     (2)
QA$K_LOOP_ON_TEST              =00000002      145     (2)
QA$K_LOOP_TEST_DONE            =00000004      145     (2)
QA$K_MEMORY_MANAGE             =0000000D      145     (2)
QA$K_MULTIPLE_PASS             =00000001      145     (2)
QA$K_NODEF                     =00000000      145     (2)     #-245     (4)     #-338     (6)     #-421     (8)     #-493     (10)
                                                               #-621     (12)    #-625     (12)
QA$K_NORMAL_START              =00000000      145     (2)
QA$K_NO_HEADER                 =00000006      145     (2)
QA$K_NUMBER_OF_CHECKS          =0000000F      145     (2)
QA$K_NUMBER_QA_FLAGS           =00000008      145     (2)
QA$K_NUMB_ROUTINE_STATES       =00000004      145     (2)
QA$K_QA_DEBUG                  =00000001      145     (2)
QA$K_QA_DONE                   =00000002      145     (2)
QA$K_RUN_BACKWARDS             =00000004      145     (2)
QA$K_SECTION                   =00000008      145     (2)
QA$K_SUCCESS                   =00000001      145     (2)
```

```
QA$MAIN                          00000000-XR                    130    (2)      247    (4)      340    (6)      423    (8)
                                                                496    (10)     629    (12)
QA$V_CHECK_DONE                  =00000003     145    (2)
QA$V_DOING_CLEANUP               =00000002     145    (2)
QA$V_ERROR_FOUND                 =00000001     145    (2)
QA$V_INIT_DONE                   =00000000     145    (2)
QUESTN                           =0000003F     147    (2)
RADIX                             00000008     801    (13)   #-842    (14)   #-884    (14)
RESPONSE                          000003FB-R   803    (14)     261    (4)      352    (6)      435    (8)
RESPONSE_OK                       00000566-R   928    (14)   #-899    (14)   #-901    (14)   #-906    (14)
RESPONSE_X                        00000569-R   930    (14)   #-825    (14)   #-827    (14)
RETRY_LOGICAL                     00000194-R   509    (10)   #-504    (10)   #-537    (10)
RETRY_RESP                        0000040B-R   810    (14)   #-913    (14)   #-926    (14)
RETRY_STRING                      000002B8-R   638    (12)   #-634    (12)   #-702    (12)   #-726    (12)
SAVABS...                        =00000020     801    (13)
SCAN$NUMERIC                      00000000-XR                    132    (2)    #-885    (14)
SCAN$SPACES                       00000000-XR                    132    (2)    #-883    (14)
SIGNED                            0000001C     801    (13)   #-823    (14)   #-892    (14)   #-897    (14)
SIZ...                           =00000001     143    (2)      143    (2)
SS$_NORMAL                       =00000001     140    (2)    #-272    (4)    #-358    (6)    #-439    (8)    #-558    (10)
                                                             #-740    (12)   #-929    (14)
SYS$FAO                           00000000-XR                    132    (2)      863    (14)
TRUE                             =00000001     145    (2)
```

! Performance indicators !

Phase	Page faults	CPU Time	Elapsed Time
Initialization	35	00:00:00.02	00:00:00.19
Command processing	962	00:00:00.27	00:00:00.88
Pass 1	725	00:00:02.21	00:00:04.17
Symbol table sort	0	00:00:00.09	00:00:00.09
Pass 2	31	00:00:00.61	00:00:01.50
Symbol table output	2	00:00:00.05	00:00:00.10
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	6	00:00:00.22	00:00:00.36
Assembler run totals	1765	00:00:03.48	00:00:07.29

```
The working set limit was 2400 pages.
137253 bytes (269 pages) of virtual memory were used to buffer the intermediate code.
There were 30 pages of symbol table space allocated to hold 349 non-local and 50 local symbols.
935 source lines were read in Pass 1, producing 56 object records in Pass 2.
34 pages of virtual memory were used to define 22 macros.
```

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              8
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                5
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       7
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                20

533 GETS were required to define 20 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 120 DECLARATIONS
(2) 157 ASCII STRING PARSE ROUTINE.
(7) 526 SCAN$SYMBOL Scan symbol
(9) 623 SCAN$COMPARE Compare strings
(11) 686 SCAN$NUMERIC Scan number
(13) 830 SCAN$SEARCHLIST Search list for unique string
(15) 907 SCAN$DEVICE Scan a device name
(16) 984 Breakup File name into parts

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element PARSE.MAR
0000     2 ; *1     6-FEB-1986 15:21:31 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element PARSE.MAR
0000     4         .TITLE  PARSE   ASCII STRING PARSE ROUTINE.
0000     5         .IDENT  /07-20/
0000     6         .NoShow Conditionals
0000     7
0000     8 ;
0000     9 ; Copyright (c) 1977, 1982, 1983, 1985
0000    10 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    11 ;
0000    12 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0000    13 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
0000    14 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
0000    15 ; MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
0000    16 ; EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
0000    17 ; TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
0000    18 ; REMAIN IN DEC.
0000    19 ;
0000    20 ; THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
0000    21 ; AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
0000    22 ; CORPORATION.
0000    23 ;
0000    24 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0000    25 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    26
0000    27 ;++
0000    28 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR.
0000    29 ;
0000    30 ; ABSTRACT:
0000    31 ;
0000    32 ; ENVIRONMENT:
0000    33 ;
0000    34 ; AUTHOR:       KEN CHAPMAN     10-NOV-77       VERSION 01.
0000    35 ;
0000    36 ; MODIFIED BY:
0000    37 ;                KEN CHAPMAN     02-FEB-78       VERSION 02 (ESSAA-3.07).
0000    38 ;       01       ADDED QUADWORD DATA CAPABILITY.
0000    39 ;       02       ADDED STRING MATCH FUNCTIO.
0000    40 ;                Roger Riggs     6-NOV-1978
0000    41 ;       03       ADDED KEYWORD MATCH FUNCTION AND MADE SOME SUBROUTINES
0000    42 ;                USEFUL FROM OTHER PARTS OF THE SUPERVISOR.
0000    43 ;       04       Modified keyword construct.
0000    44 ;                Dave Butenhof, 13-feb-1981, version 6.3
0000    45 ;       05       Add parse table command code for SYMBOL type, so CLI can
0000    46 ;                recognise $ and _ in section names.
0000    47 ;
0000    48 ;       06       - Jack Stansbury, 28-Oct-1981, Version 6.-
0000    49 ;                Fixed a few truncation errors. Also added .LIBRARY statements
0000    50 ;                for $DS and $DIAG.
0000    51 ;
0000    52 ;       07       - Dave Butenhof, 10-Nov-1981, version 6.-
0000    53 ;                Add new PARSE codes, CLI$K_COMMA and CLI$K_VALSEP.  The
0000    54 ;                former traverses the sequence "<blank>,<blank>", while the
0000    55 ;                latter traverses "<blank>(=|:)<blank>".  These will make
0000    56 ;                CLI simpler.  Added .LIBRARY for LIB, since I added CASE
0000    57 ;                macro useage
```

```
                        58 ;
                        59 ;       08      - Dave Butenhof, 11-Nov-1981, version 6.-
                        60 ;               Add another PARSE code, CLI$K_EOL to check for end of
                        61 ;               line (considering comments).
                        62 ;
                        63 ;       09      - Dave Butenhof, 11-Nov-1981, version 6.-
                        64 ;               Again, make things easier for CLI by adding extra (internal
                        65 ;               only) entry point for PARSE.  DSX$SUPERPARSE won't stop at
                        66 ;               physical end of line; it'll keep parsing the null string until
                        67 ;               told to stop.
                        68 ;
                        69 ;       10      - Dave Butenhof, 13-Nov-1981, version 6.5
                        70 ;               One more time...add CLI$K_CALL and CLI$K_RETURN functions
                        71 ;               for CLI convenience.  The parse table is just too complex.
                        72 ;               Also, CLI$K_BIFS to test subparse return code
                        73 ;
                        74 ;       11      - Dave Butenhof, 03-Feb-1982, Version 6.6
                        75 ;               Add Scan$File to allow wildcards (* and %) in file names.
                        76 ;               This is for DIRECTORY...CLI will allow them in RUN, etc;
                        77 ;               but it won't work too well.  Also, add a macro version of
                        78 ;               BREAKUP_FILE (for merging default file specs) here...it's
                        79 ;               much more code efficient than the bliss version.
                        80 ;
                        81 ;       12      Jack Stansbury, 15-Dec-1982, Version 6.10
                        82 ;               Fixed the code in TrvEol to fix a bug where a CLI$K_EOL was
                        83 ;               being done twice, and causing an error when a comment
                        84 ;               followed a DS command. The comment character was being
                        85 ;               skipped, but not the rest of the line after the '!'. Thus,
                        86 ;               the second time the TrvEol was called, R5 would point to the
                        87 ;               character after the '!'. Now I set R4 = 0 (the number of
                        88 ;               characters remaining in the line) and set R5 to point to the
                        89 ;               real end of the line (the NEWLINE character).
                        90 ;
                        91 ;       13      Bob Bergazzi    May 16,1983     Version 6.11
                        92 ;               Changed the order of the .LIB statements.
                        93 ;
                        94 ;       14      M. Baggett      Nov 16,1983     Version 6.13
                        95 ;               Allow device name of the form ' name$aaann' to be used as load
                        96 ;               devices.
                        97 ;
                        98 ;       15      RE MUSE         MAY 8,1984      Version 7.0
                        99 ;               Allow device names of the form 'node$ggan' to be used as load
                       100 ;               devices
                       101 ;
                       102 ;       16      M. Baggett      14-Nov-1984     Version 7.1
                       103 ;               Allow device names of the form '$m$ggan
                       104 ;
                       105 ;       17      M. Baggett      19-FEB-1985     Version 8.1
                       106 ;               Support ULTRIX file structure.
                       107 ;
                       108 ;       18      M. Baggett      22-May-1985     Version 8.2
                       109 ;               Change ULTRIX directory string parsing.
                       110 ;
                       111 ;       19      M. Baggett      1-Jun-1985      Version 9.0
                       112 ;               Change Ultrix filename parsing.
                       113 ;
                       114 ;       20      M. Baggett      24-Aug-1985     VDS 9.0
```

```
                        0000   115 ;
                        0000   116 ;
                        0000   117 ;
                        0000   118 ;--
```

Allow commands and qualifiers to be lower case if in ULTRIX mode.
If called from CLI module the commands and qualifiers are convert
to upper case for comparison.

```
                        0000    120          .SBTTL  DECLARATIONS
                        0000    121 ;
                        0000    122 ; INCLUDE FILES:
                        0000    123 ;
                        0000    124          .LIBRARY        /SYS$LIBRARY:LIB/                ;                      [13]
                        0000    125          .LIBRARY        /$DS/                            ;                      [13]
                        0000    126          .LIBRARY        /$DIAG/                          ;                      [13]
                        0000    127 ;
                        0000    128 ; MACROS:
                        0000    129 ;
                        0000    130
                        0000    131 ;
                        0000    132 ; EQUATED SYMBOLS:
                        0000    133 ;
                        0000    134          CLIDEF
                        0000    135          $ds_clidef
                        0000    136          $DS_DSDEF
                        0000    137          $DS_PARSE_DEF
                        0000    138          DSFDEF
                        0000    139          $DS_HPODEF
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 044C                .=0
                        0000                 .IIF    NB,HP$Q_DEVICE, HP$Q_DEVICE:
                00000008 0000                .IIF    NB,.BLKQ,       .BLKQ   1
                        0008                 .IIF    NB,HP$W_SIZE,   HP$W_SIZE:
                0000000A 0008                .IIF    NB,.BLKW,       .BLKW   1
                        000A                 .IIF    NB,HP$B_FLAGS,  HP$B_FLAGS:
                0000000B 000A                .IIF    NB,.BLKB,       .BLKB   1
                        000B                 .IIF    NB,HP$B_DRIVE,  HP$B_DRIVE:
                0000000C 000B                .IIF    NB,.BLKB,       .BLKB   1
                        000C                 .IIF    NB,HP$T_DEVICE, HP$T_DEVICE:
                00000018 000C                .IIF    NB,.BLKB,       .BLKB   12
                        0018                 .IIF    NB,HP$A_DEVICE, HP$A_DEVICE:
                0000001C 0018                .IIF    NB,.BLKL,       .BLKL   1
                        001C                 .IIF    NB,HP$A_DVA,    HP$A_DVA:
                00000020 001C                .IIF    NB,.BLKL,       .BLKL   1
                        0020                 .IIF    NB,HP$A_LINK,   HP$A_LINK:
                00000024 0020                .IIF    NB,.BLKL,       .BLKL   1
                        0024                 .IIF    NB,HP$W_VECTOR, HP$W_VECTOR:
                00000026 0024                .IIF    NB,.BLKW,       .BLKW   1
                        0026                 .IIF    NB,HP$T_TYPE,   HP$T_TYPE:
                00000032 0026                .IIF    NB,.BLKB,       .BLKB   12
                        0032                 .IIF    NB,HP$A_DEPENDENT,      HP$A_DEPENDENT:
                        0000                 .RESTORE
                00000002 0000    140 V_BIT=2
                00000001 0000    141 SS$_NORMAL=1
                00000009 0000    142 TAB =   ^X09                                 ; TAB CHARACTER                    [20]
                00000020 0000    143 SPACE = ^X20                                 ; SPACE CHARACTER                  [20]
                        0000    144 ;
                        0000    145 ; OWN STORAGE:
                        0000    146 ;
                    00000000    147          .Psect  Work, Noshr, Noexe, Wrt, Long   ;                               [10]
                        0000    148 Save_call:                                       ;                               [10]
                00000000 0000    149          .long   0                               ; Address for RETURN           [10]
                        0004    150 Save_status:                                     ; Status of CALLed subparse    [10]
                00000000 0004    151          .long   0                               ;                              [10]
```

```
                0008   152 Ultrix_filename:                                  ;                                  [19]
      00000058  0008   153         .blkb   80                                ; use for filename must be shifted
                0058   154                                                   ; to insert '/'
            00000000   155         .PSECT  Code, Shr, Exe, Nowrt, Byte
```

```
                        0000   157          .SBTTL  ASCII STRING PARSE ROUTINE.
                        0000   158 ;++
                        0000   159 ; FUNCTIONAL DESCRIPTION:
                        0000   160 ;
                        0000   161 ;       THIS ROUTINE TAKES AN ASCII STRING INPUT AND PARSES IT USING A
                        0000   162 ;       CALLER SUPPLIED PARSE TREE.  UPON A MATCH IN THE TREE, IT
                        0000   163 ;       DISPATCHES TO A CALLER SUPPLIED ACTION ROUTINE.  UPON A MISMATCH,
                        0000   164 ;       IT BRANCHS TO ANOTHER POINT IN THE PARSE TREE.
                        0000   165 ;
                        0000   166 ; CALLING SEQUENCE:
                        0000   167 ;
                        0000   168 ;       DIAGNOSTIC PROCEDURE CALL.
                        0000   169 ;
                        0000   170 ; INPUT PARAMETERS:
                        0000   171 ;
                        0000   172 ;       PARSE$_BUFADR(AP)       = INPUT COUNTED STRING ADDRESS.
                        0000   173 ;       PARSE$_TREE(AP)         = PARSE TREE ENTRY POINT.
                        0000   174 ;       PARSE$_ACTION(AP)       = SUCCESS ACTION SUBROUTINE ADDRESS.
                        0000   175 ;
                        0000   176 ; IMPLICIT INPUTS:
                        0000   177 ;
                        0000   178 ;       NONE
                        0000   179 ;
                        0000   180 ; OUTPUT PARAMETERS:
                        0000   181 ;
                        0000   182 ;       NONE
                        0000   183 ;
                        0000   184 ; IMPLICIT OUTPUTS:
                        0000   185 ;
                        0000   186 ;       RESULTS OF CALLER'S ACTION SUBROUTINE.
                        0000   187 ;
                        0000   188 ; COMPLETION CODES:
                        0000   189 ;
                        0000   190 ;       SS$_NORMAL      = STRING SUCCESSFULLY PARSED.
                        0000   191 ;       DS$_ERROR       = ERROR MATCH CODE ENCOUNTERED IN PARSE TREE.
                        0000   192 ;
                        0000   193 ; SIDE EFFECTS:
                        0000   194 ;
                        0000   195 ;       NONE
                        0000   196 ;
                        0000   197 ; REGISTER USAGE:
                        0000   198 ;
                        0000   199 ;       R0      = SCRATCH AND COMPLETION CODES.
                        0000   200 ;       R1      = SCRATCH.
                        0000   201 ;       R2      = SCRATCH
                        0000   202 ;       R3      = RADIX AND BIT MASK POINTER
                        0000   203 ;       R4      = LENGTH OF REMAINING INPUT STRING
                        0000   204 ;       R5      = ADDRESS OF REMAINING INPUT STRING
                        0000   205 ;       R7      = PARSE TREE POINTER.
                        0000   206 ;--
```

```
                    0FFC  0000   208 .entry  dsx$superparse,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>     ;                [09]
                 56   01   D0   0002   209          movl    #1, r6                          ; Don't exit on end of line [09]
                      04   11   0005   210          brb     parse_common                    ; Join common code [09]
                    0FFC  0007   211 .ENTRY  DSX$PARSE,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>
                      56   D4   0009   212          clrl    r6                              ; Exit on end of line [09]
                           000B   213 parse_common:                                        ;                [09]
               54   04 BC   7D   000B   214          MOVQ    aPARSE$_BUFADR(AP),R4           ; GET LENGTH, ADDR OF INPUT STRING
                  54   54   3C   000F   215          MOVZWL  R4, R4                          ; LENGTH.
          00000000'EF   D4   0012   216          clrl    Save_call                       ; Clear saved call address [10]
               57   08 AC   D0   0018   217          MOVL    PARSE$_TREE(AP), R7             ; TREE POINTER.
                           001C   218 TRAVERSE:
                   04 56   E8   001C   219          blbs    r6, 10$                         ; Don't check for EOL if set [09]
                      54   D5   001F   220          TSTL    R4                              ; ANY CHARACTERS LEFT IN INPUT STREAM
                      42   13   0021   221          BEQL    EXIT                            ; BRANCH IF NOT
                   F6 AF   DF   0023   222 10$:     PUSHAL  TRAVERSE                        ; FAKE A SUBROUTINE CALL. [09]
                           0026   223          case    src=(r7), type=b, -             ; Case on the dispatch codes [07]
                           0026   224                   limit=#cli$k_error, -           ;                [07]
                           0026   225                   displist=< -                    ; ...dispatch list [07]
                           0026   226                   trverr, -                       ; 0 = Error.     [07]
                           0026   227                   trvexit, -                      ; 1 = Exit.      [07]
                           0026   228                   trvbr, -                        ; 2 = Branch.    [07]
                           0026   229                   trvbif, -                       ; 3 = Conditional branch. [07]
                           0026   230                   trvspace, -                     ; 4 = Separator characters. [07]
                           0026   231                   trvnum, -                       ; 5 = Number string. [07]
                           0026   232                   trvalpha, -                     ; 6 = Alpha string. [07]
                           0026   233                   trvalnum, -                     ; 7 = Alphanumeric string. [07]
                           0026   234                   trvoct, -                       ; 8 = Octal number string. [07]
                           0026   235                   trvhex, -                       ; 9 = Hex number string. [07]
                           0026   236                   trvdec, -                       ; 10 = Decimal number string. [07]
                           0026   237                   trvstring, -                    ; 11 = Unique string. [07]
                           0026   238                   trvkeyword, -                   ; 12 = Keyword.  [07]
                           0026   239                   trvsymbol, -                    ; 13 = Symbol.   [07]
                           0026   240                   trvcomma, -                     ; 14 = <blank>comma<blank>. [07]
                           0026   241                   trvvalue, -                     ; 15 = <blank>(=|:)<blank>. [07]
                           0026   242                   trvslash, -                     ; 16 = <blank>slash<blank>. [07]
                           0026   243                   trveol, -                       ; 17 = <blank>(!|<eol>). [08]
                           0026   244                   trvcall, -                      ; 18 = Call subtree parse. [10]
                           0026   245                   trvreturn, -                    ; 19 = Return from subtree. [10]
                           0026   246                   trvbifs, -                      ; 20 = Test subparse status. [10]
                           0026   247                   trvfile -                       ; 21 = Filename (incl. '$' and '*') [11]
                           0026   248                   >                               ;                [07]
15'   80 8F   67   8F    0026                CASEb   (r7),#cli$k_error,S^#<<30001$-30000$>/2>-1
                           002B        30000$:
                      009C' 002B              .SIGNED_WORD    trverr-30000$
                      0038' 002D              .SIGNED_WORD    trvexit-30000$
                      006C' 002F              .SIGNED_WORD    trvbr-30000$
                      00B3' 0031              .SIGNED_WORD    trvbif-30000$
                      00C2' 0033              .SIGNED_WORD    trvspace-30000$
                      00D6' 0035              .SIGNED_WORD    trvnum-30000$
                      00E2' 0037              .SIGNED_WORD    trvalpha-30000$
                      00E7' 0039              .SIGNED_WORD    trvalnum-30000$
                      00C7' 003B              .SIGNED_WORD    trvoct-30000$
                      00CC' 003D              .SIGNED_WORD    trvhex-30000$
                      00D1' 003F              .SIGNED_WORD    trvdec-30000$
                      00EC' 0041              .SIGNED_WORD    trvstring-30000$
                      013B' 0043              .SIGNED_WORD    trvkeyword-30000$
                      016C' 0045              .SIGNED_WORD    trvsymbol-30000$
```

```
                0177' 0047              .SIGNED_WORD    trvcomma-30000$
                0180' 0049              .SIGNED_WORD    trvvalue-30000$
                017B' 004B              .SIGNED_WORD    trvslash-30000$
                01C0' 004D              .SIGNED_WORD    trveol-30000$
                005E' 004F              .SIGNED_WORD    trvcall-30000$
                003E' 0051              .SIGNED_WORD    trvreturn-30000$
                00A7' 0053              .SIGNED_WORD    trvbifs-30000$
                0171' 0055              .SIGNED_WORD    trvfile-30000$
                      0057      30001$:
                      0057  249
                      0057  250 ;
                      0057  251 ; NOT A SPECIAL CODE.
                      0057  252 ;
          65    67    91  0057  253         CMPB    (R7),(R5)               ; TREE CHAR MATCH INPUT STRING?
                3D    12  005A  254         BNEQ    BRANCH                  ; BRANCH IF NOT
                55    D6  005C  255         INCL    R5                      ; UPDATE ADDRESS
                54    D7  005E  256         DECL    R4                      ; COUNT THIS CHARACTER
             0085    31  0060  257         BRW     DO_ACTION               ; TO ACTION AND UPDATE TREE
                      0063  258 ;
                      0063  259 ; NORMAL EXIT CODE
                      0063  260 ;
                      0063  261 TRVEXIT:
                3C    10  0063  262         BSBB    ACTION                  ; EXECUTE CALLER ACTION ROUTINE.
                      0065  263 EXIT:
          50    01    D0  0065  264         MOVL    #SS$_NORMAL, R0         ; SET NORMAL RETURN.
                      0068  265 DSX$PARSE_X:
                04  0068  266         RET                             ; RETURN.
```

```
                                0069  ;
                                0069  ; Return special code.  Note: the PARSE call mechanism is not recursive;
                                0069  ; only one level of subtree can be used.
                                0069  ;
                                0069  trvreturn:                                  ;                                        [10]
                     36   10    0069          bsbb    action                      ; Call action routine                    [10]
  00000004'EF        50   D0    006B          movl    r0, Save_status             ; Save Call status for BIFS test         [10]
  50   00000000'EF   D0   D0    0072          movl    Save_call, r0               ; Restore saved value                    [10]
                     09   12    0079          bneq    10$                         ; Branch if saved address not 0          [10]
  50   00660002 8F   D0   D0    007B          movl    #ds$_error, r0              ; If was 0, error                        [10]
                     E4   11    0082          brb     dsx$parse_x                 ; Exit                                   [10]
      57   50        04   C1    0084  10$:    addl3   #4, r0, r7                  ; Advance to next                        [10]
                          05    0088          rsb                                 ; Do next                                [10]
                                0089
                                0089  ;
                                0089  ; Call special code.  Note: this is not recursive.  Only one level of call
                                0089  ; may be used.  The action routine will be called before the subtree parse.
                                0089  ;
                                0089  trvcall:                                    ;                                        [10]
  00000004'EF        01   D0    0089          Movl    #1, Save_status             ; Assume successful, if not specified    [10]
  00000000'EF        57   D0    0090          movl    r7, Save_call               ; Save address for return                [10]
                                0097  ;       brb     trvbr                       ; Fall through to TRVBR code             [10]
                                0097  ;
                                0097  ; BRANCH SPECIAL CODE.
                                0097  ;
                                0097  TRVBR:
                     08   10    0097          BSBB    ACTION                      ; EXECUTE CALLER ACTION ROUTINE.
                                0099  ;       BRB     BRANCH                      ; FALL INTO BRANCH
                                0099  ;
                                0099  ; HERE TO TAKE BRANCH IN TREE
                                0099  ;
                                0099  BRANCH:
        50   02 A7   32    0099          CVTWL   2(R7), R0                   ; GET DISPLACEMENT.
          57   50    C0    009D          ADDL2   R0, R7                      ; UPDATE TREE POINTER.
                     05    00A0          RSB                                 ; CONTINUE TO TRAVERSE TREE.
                                00A1  ;
                                00A1  ; DISPATCH TO CALLER'S ACTION ROUTINE.
                                00A1  ;
          5A   50    7D    00A1  ACTION: MOVQ    R0,R10                      ; COPY QUAD NUMBER TO R10-R11
          58   55    D0    00A4          MOVL    R5,R8                       ; COPY ADDRESS OF REMAINING STRING
          59   54    D0    00A7          MOVL    R4,R9                       ; COPY LENGTH OF REMAINING STRING
        50   01 A7   9A    00AA          MOVZBL  1(R7), R0                   ; GET ACTION CODE.
  52   00000000'EF   9E    00AE          MOVAB   L^DS$GL_CLIBASE,R2          ; BASE CLI DATA BASE                     [06]
          0080 8F    BB    00B5          PUSHR   #^M<R7>                     ; SAVE OUR REGS
            0C BC    16    00B9          JSB     @PARSE$_ACTION(AP)          ; GO TO ACTION ROUTINE.
          0080 8F    BA    00BC          POPR    #^M<R7>                     ; RESTORE OUR REGS
          54   59    D0    00C0          MOVL    R9,R4                       ; PUT CHARACTER COUNT BACK
          55   58    D0    00C3          MOVL    R8,R5                       ; PUT CHARACTER POINT BACK
                     05    00C6          RSB
                                00C7  ;
                                00C7  ; ERROR EXIT CODE.
                                00C7  ;
                                00C7  TRVERR:
                     D8   10    00C7          BSBB    ACTION                      ; EXECUTE CALLER ACTION ROUTINE.
  50   00660002 8F   D0   D0    00C9          MOVL    #DS$_ERROR, R0              ; SET ERROR RETURN CODE.
                     96   11    00D0          BRB     DSX$PARSE_X                 ; GO EXIT.
                                00D2  ;
```

```
                        00D2   ; BIFS conditional branch code.  This is identical to BIF, except
                        00D2   ; that it tests the saved return code from a CALL subparse instead
                        00D2   ; of R0.
                        00D2   ;
                        00D2   TRVBIFS:                                  ;                                  [10]
              CD   10   00D2           Bsbb    Action                    ; Call action routine              [10]
BE 00000004'EF   E8   00D4           Blbs    Save_status, Branch       ; Branch if OK                     [10]
              87   D5   00DB           Tstl    (r7)+                     ; Otherwise advance to next        [10]
                   05   00DD           Rsb                               ; Continue to traverse tree        [10]
                        00DE
                        00DE   ;
                        00DE   ; BIF CONDITIONAL BRANCH SPECIAL CODE.
                        00DE   ;
                        00DE   TRVBIF:
              C1   10   00DE           BSBB    ACTION                    ; EXECUTE CALLER ACTION ROUTINE.
           B6 50   E8   00E0           BLBS    R0, BRANCH                ; BRANCH IF SATISFIED.
              87   D5   00E3           TSTL    (R7)+                     ; UPDATE TREE POINTER.
                   05   00E5           RSB                               ; CONTINUE TO TRAVERSE TREE.
```

```
                                00E6   344 BRANCH_IF_NONE:
                          B1    13  00E6   345         BEQL    BRANCH                  ; Branch if Length was zero
                                00E8   346 DO_ACTION:
                          B7    10  00E8   347         BSBB    ACTION                  ; CALL ACTION ROUTINE
                          87    D5  00EA   348         TSTL    (R7)+                   ; UPDATE TREE POINTER
                                05  00EC   349         RSB                             ; CONTINUE TRAVERSE
                                00ED   350 ;
                                00ED   351 ; SPACE SPECIAL CODE.
                                00ED   352 ;
                                00ED   353 TRVSPACE:
                        0162    30  00ED   354         BSBW    SCAN$SPACE              ; CHECK FOR SPACES
                          F4    11  00F0   355         BRB     BRANCH_IF_NONE          ; TAKE BRANCH IF NO SPACES OR TABS
                                00F2   356 ;
                                00F2   357 ; NUMERIC VALUE CODE.
                                00F2   358 ;
                                00F2   359 TRVOCT:
                    53    08    D0  00F2   360         MOVL    #8, R3                  ; SET RADIX TO OCTAL.
                          11    11  00F5   361         BRB     TRVNUMA
                                00F7   362 TRVHEX:
                    53    10    D0  00F7   363         MOVL    #16, R3                 ; SET RADIX TO HEXIDECIMAL.
                          0C    11  00FA   364         BRB     TRVNUMA
                                00FC   365 TRVDEC:
                    53    0A    D0  00FC   366         MOVL    #10, R3                 ; SET RADIX TO DECIMAL.
                          07    11  00FF   367         BRB     TRVNUMA
                                0101   368 TRVNUM:
          53  00000000'EF    D0  0101   369         MOVL    L^DS$GL_RADIX, R3       ; GET DEFAULT RADIX.                    [06]
                                0108   370 TRVNUMA:
                      01CB    30  0108   371         BSBW    SCAN$NUMERIC            ; SCAN SOMETHING NUMERIC
                        D9    11  010B   372         BRB     BRANCH_IF_NONE          ; TAKE BRANCH IF NOTHING FOUND
                                010D   373 ;
                                010D   374 ; ALPHA CHECK.
                                010D   375 ;
                                010D   376 TRVALPHA:
                      010C    30  010D   377         BSBW    SCAN$ALPHA              ; CHECK FOR ALPHA                       [07]
                        D4    11  0110   378         BRB     BRANCH_IF_NONE          ; DO ACTION IF FOUND ELSE BRANCH
                                0112   379 ;
                                0112   380 ; ALPHA-NUMERIC CHECK.
                                0112   381 ;
                                0112   382 TRVALNUM:
                      0119    30  0112   383         BSBW    SCAN$ALPHANUM           ; SPAN ALPHA-NUMERIC                    [07]
                        CF    11  0115   384         BRB     BRANCH_IF_NONE          ; DO ACTION IF FOUND ELSE BRANCH
                                0117   385 ;
                                0117   386 ; UNIQUE STRING MATCH.
                                0117   387 ;
                                0117   388 .enabl  lsb                               ; Allow access to BRW BRANCH            [10]
                                0117   389 TRVSTRING:
                  53  04 A7    9E  0117   390         MOVAB   4(R7), R3               ; GET POINTER TO ASCIC.
                    52  83    9A  011B   391         MOVZBL  (R3)+, R2               ; GET ASCII COUNT.
                                011E   392
                      34 56     E9  011E   393         BLBC    R6,130$                 ; Ignore if not called from CLI module  [20]
28 00000000'EF  00000000'8F     E1  0121   394         BBC     #ULTRIX_V_MODE,ULTRIX_FLAGS,130$  ; BRANCH IF NOT ULTRIX  [20]
                        51    D4  012D   395         CLRL    R1                      ; CLEAR INDEX                           [20]
                    50  54    D0  012F   396         MOVL    R4,R0                   ; LENGTH OF TOTAL COMMAND STRING        [20]
                    52  54    D1  0132   397         CMPL    R4,R2                   ; CHECK LENGTH AGAINST PATTERN TO MATCH [20]
                        03    15  0135   398         BLEQ    110$                    ; RETAIN SHORTER LENGTH                 [20]
                    50  52    D0  0137   399         MOVL    R2,R0                   ;                                       [20]
                  20  6541    91  013A   400 110$:   CMPB    (R5)[R1],#SPACE         ; EXIT IF SPACE                         [20]
```

```
                      15   13  013E   401          BEQL    130$                    ; END OF SECTION TO COMPARE                [20]
                09  6541   91  0140   402          CMPB    (R5)[R1],#TAB           ; EXIT IF TAB                              [20]
                      0F   13  0144   403          BEQL    130$                    ; END OF SECTION TO COMPARE                [20]
             04 6541   06   E1  0146   404          BBC     #6,(R5)[R1],120$        ; SKIP IF NOT ALPHA CHAR                   [20]
                6541   20   8A  014B   405          BICB2   #32,(R5)[R1]            ; FORCE Character TO UPPER CASE            [20]
         FFE5 51   01   50   9D  014F   406 120$:    ACBB    R0,#1,R1,110$           ; CHECK TOTAL SECTION                      [20]
                                0155   407
                    0129   30  0155   408 130$:    BSBW    SCAN$COMPARE            ; COMPARE
                      37   19  0158   409          BLSS    20$                     ; TAKE BRANCH IF NO MATCH                  [10]
                    FF44   30  015A   410          BSBW    ACTION                  ; GO DO CALLER ACTION.
                      87   D5  015D   411          TSTL    (R7)+                   ; UPDATE TREE POINTER.
                50    87   9A  015F   412          MOVZBL  (R7)+, R0               ; GET ASCIC COUNT.
                57    50   C0  0162   413          ADDL2   R0, R7                  ; PAST THE ASCII.
                           05  0165   414          RSB                             ; CONTINUE TO TRAVERSE TREE.
```

```
                     0166   416 ;
                     0166   417 ; KEYWORD MATCH ROUTINE
                     0166   418 ;
                     0166   419 TRVKEYWORD:
          00A1   30  0166   420         BSBW    SCAN$SYMBOL             ; SCAN A SYMBOL
            26   13  0169   421         BEQL    20$                     ; IF NO SYMBOL, TAKE BRANCH
       7E   50   D0  016B   422         MOVL    R0,-(SP)                ; SAVE STRING LENGTH
    53   06 A7   32  016E   423         CVTWL   6(R7),R3                ; Get offset to keyword table
    53     57    C0  0172   424         ADDL    R7,R3                   ; Make absolute address of table
          01FA   30  0175   425         BSBW    SCAN$SEARCHLIST         ; LOCATE SYMBOL IN TABLE
            1A   14  0178   426         BGTR    30$                     ; Exit if ambigious
            0F   19  017A   427         BLSS    10$                     ; IF NOT FOUND TAKE BRANCH
    04 A7   50   B1  017C   428         CMPW    R0,4(R7)                ; CORRECT KEYWORD
            09   12  0180   429         BNEQ    10$                     ; NO, TAKE BRANCH
          FF1C   30  0182   430         BSBW    ACTION                  ; DO ACTION ROUTINE
    57    08   C0  0185   431         ADDL2   #8,R7                   ; UPDATE TREE POINTER
            8E   D5  0188   432         TSTL    (SP)+                   ; REMOVE SYMBOL LENGTH
                 05  018A   433         RSB                             ; NEXT TREE JUNCTURE
    54    6E   C0  018B   434 10$:    ADDL    (SP),R4                 ; ADJUST INPUT STRING LENGTH BY SYMBOL
    55    8E   C2  018E   435         SUBL    (SP)+,R5                ; ADJUST INPUT STRING ADDR BY SYMBOL
          FF05   31  0191   436 20$:    BRW     BRANCH                  ; TAKE FAILURE BRANCH
          FECE   31  0194   437 30$:    BRW     EXIT                    ; TAKE EXIT IF AMBIGIOUS
                     0197   438 .dsabl  lsb                             ;                                       [10]
                     0197   439 ;
                     0197   440 ; Symbol match routine
                     0197   441 ;
                     0197   442 TRVSYMBOL:
            71   10  0197   443         BSBB    SCAN$SYMBOL             ; Search for symbol
          FF4A   31  0199   444         BRW     BRANCH_IF_NONE          ; Handle tree decision point
                     019C   445 ;
                     019C   446 ; Filename match routine
                     019C   447 ;
                     019C   448 TrvFile:                                ;                                       [11]
          00A1   30  019C   449         BsbW    Scan$File               ; Scan over filename                    [11]
          FF44   31  019F   450         BrW     Branch_If_None          ; Handle tree decision point            [11]
                     01A2   451 ;
                     01A2   452 ; Traverse a string consisting of blanks and a comma.  If the comma is not
                     01A2   453 ; found, the input string is unaffected: if the comma is found, then the
                     01A2   454 ; comma and all preceding and following blanks are skipped.
                     01A2   455 ;
                     01A2   456 trvcomma:                               ;                                       [07]
            53   D4  01A2   457         clrl    r3                      ; Set up ',' code                       [07]
            08   11  01A4   458         brb     trv_comma_value         ; Use common routine                    [07]
                     01A6   459
                     01A6   460 ;
                     01A6   461 ; Traverse a string consisting of blanks and a slash.  If the slash is not
                     01A6   462 ; found, the input string is unaffected: if the slash is found, then the
                     01A6   463 ; slash and all preceding and following blanks are skipped
                     01A6   464 ;
                     01A6   465 trvslash:                               ;                                       [07]
    53      01   D0  01A6   466         movl    #1, r3                  ; Set up '/' code                       [07]
            03   11  01A9   467         brb     trv_comma_value         ; Use common routine                    [07]
                     01AB   468
                     01AB   469 ;
                     01AB   470 ; Traverse a string consisting of blanks and either an '=' or a ':'.  This
                     01AB   471 ; is primarily for qualifier values.  The code from TRV_COMMA_VALUE on is
                     01AB   472 ; common between this function and the TRVCOMMA function.
```

```
                        01AB   ;
                        01AB   trvvalue:
        53   02   D0    01AB           movl    #2, r3                  ; Set up '=' code                       [07]
                        01AE
                        01AE   trv_comma_value:
             38   BB    01AE           pushr   #^M<r3,r4,r5>           ; Save current descriptor               [07]
           009F   30    01B0           bsbw    scan$space              ; Skip any spaces we might find         [07]
             50   D4    01B3           clrl    r0                      ; Assume didn't find anything           [07]
             54   D5    01B5           tstl    r4                      ; Any characters remaining?             [07]
             0E   15    01B7           bleq    10$                     ; If not, can't be either               [07]
             54   D7    01B9           decl    r4                      ; Anticipate finding it                 [07]
                        01BB           case    src=(sp), type=b, -     ; Case on type code                     [07]
                        01BB                    limit=#0, displist=< -  ;                                       [07]
                        01BB                   10$, -                  ; 0 is ','                              [07]
                        01BB                   20$, -                  ; 1 is '/'                              [07]
                        01BB                   30$ -                   ; 2 is '=' or ':'                       [07]
                        01BB                   >                       ;                                       [07]
  02'   00   6E   8F    01BB           CASEb   (sp),#0,S^#<<30003$-30002$>/2>-1
                        01BF       30002$:
                0008'   01BF           .SIGNED_WORD    10$-30002$
                000D'   01C1           .SIGNED_WORD    20$-30002$
                0012'   01C3           .SIGNED_WORD    30$-30002$
                        01C5       30003$:
             1D   11    01C5           brb     60$                     ; No go                                 [07]
        2C   85   91    01C7   10$:    cmpb    (r5)+, #^A","           ; Compare next character to ','         [07]
             0E   11    01CA           brb     40$                     ; Check it out                          [07]
        2F   85   91    01CC   20$:    cmpb    (r5)+, #^A"/"           ; Is it a '/'?                          [07]
             09   11    01CF           brb     40$                     ; Check it out                          [07]
        3D   85   91    01D1   30$:    cmpb    (r5)+, #^A"="           ; Is is an '='?                         [07]
             06   13    01D4           beql    50$                     ; Yep, OK                               [07]
     3A   FF A5   91    01D6           cmpb    -1(r5), #^A":"          ; Otherwise, is it an ':'?              [07]
             08   12    01DA   40$:    bneq    60$                     ; If not, failure                       [07]
             74   10    01DC   50$:    bsbb    scan$space              ; Skip trailing spaces, too             [07]
     04 AE   54   7D    01DE           movq    r4, 4(sp)               ; Replace the saved descriptor          [07]
             50   D6    01E2           incl    r0                      ; We found something                    [07]
             38   BA    01E4   60$:    popr    #^M<r3,r4,r5>           ; Restore registers                     [07]
             50   D5    01E6           tstl    r0                      ; Check if we found anything            [07]
           FEFB   31    01E8           brw     branch_if_none          ; And finish up command                 [07]
                        01EB
                        01EB   ;
                        01EB   ; TRVEOL
                        01EB   ; Skip spaces and tabs; if next character is an '!' or if there are no
                        01EB   ; more characters, then success; else failure (take MISS branch).
                        01EB   ;
             30   BB    01EB   TrvEol: pushr   #^M<r4,r5>              ; Save the input descriptor             [08]
             63   10    01ED           bsbb    scan$space              ; Skip spaces if any are there          [08]
             54   D5    01EF           tstl    r4                      ; Check remaining length                [08]
             0C   13    01F1           beql    10$                     ; Branch to check                       [08]
             54   D7    01F3           decl    r4                      ; Downcount for "!"                     [08]
        21   85   91    01F5           cmpb    (r5)+, #^A"!"           ; Otherwise, check for comment          [08]
             05   13    01F8           beql    10$                     ; OK, do action routine                 [08]
             30   BA    01FA           popr    #^M<r4,r5>              ; Restore registers                     [08]
           FE9A   31    01FC           brw     branch                  ; Take MISS branch                      [08]
                        01FF
  55   55   54   C1    01FF   10$:    AddL3   R4,R5,R5                ; Point R5 to the <CR> character        [12]
             54   D4    0203           ClrL    R4                      ; No more characters in the line        [12]
             03   BA    0205           popr    #^M<r0,r1>              ; Remove saved registers from stack     [08]
```

```
                FEDE   31  0207   524        brw     do_action               ; Do the action routine                 [08]
```

```
                        526          .SBTTL  SCAN$SYMBOL     Scan symbol
020A    527 ;++
020A    528 ; FUNCTIONAL DESCRIPTION:
020A    529 ;
020A    530 ;       SCAN$SYMBOL     Skips characters of the set (A-Z, a-z, 0-9, $, _) .
020A    531 ;       SCAN$SPACE      Skips spaces and tabs.
020A    532 ;       SCAN$ALPHA      Skips characters of the set (A-Z,a-z).
020A    533 ;       SCAN$ALPHANUM   Skips characters of the set (A-z,a-z,0-9).
020A    534 ;       SCAN$SPANC      Skips characters of the set specified by R3
020A    535 ;
020A    536 ; CALLING SEQUENCE:
020A    537 ;
020A    538 ;       BSBW    SCAN$SYMBOL
020A    539 ;       BSBW    SCAN$ALPHA
020A    540 ;       BSBW    SCAN$ALPHANUM
020A    541 ;       BSBW    SCAN$SPACE
020A    542 ;       BSBW    SCAN$SPANC
020A    543 ;
020A    544 ; INPUT PARAMETERS:
020A    545 ;
020A    546 ;       R3      Address of bit mask for valid characters (SCAN$SPANC only)
020A    547 ;       R4      Length of input string
020A    548 ;       R5      Address of input string
020A    549 ;
020A    550 ; IMPLICIT INPUTS:      NONE
020A    551 ;
020A    552 ; OUTPUT PARAMETERS:
020A    553 ;
020A    554 ;       R0      Length of symbol
020A    555 ;       R1      Address of symbol
020A    556 ;       R3      Address of the bit mask used for validity
020A    557 ;       R4      Updated length of input string
020A    558 ;       R5      Updated address of input string
020A    559 ;
020A    560 ; IMPLICIT OUTPUTS:     NONE
020A    561 ;
020A    562 ; COMPLETION CODES:     N/A
020A    563 ;
020A    564 ; SIDE EFFECTS:         NONE
020A    565 ;
020A    566 ; REGISTER USAGE:
020A    567 ;
020A    568 ;       R0      Length of symbol
020A    569 ;       R1      Address of symbol
020A    570 ;       R3      Address of bit mask used for validity
020A    571 ;       R4      Current remaining length of input string
020A    572 ;       R5      Current address of input string
020A    573 ;
020A    574 ; CONDITION CODES:
020A    575 ;
020A    576 ;       Z-bit   Set if length of symbol=0, else set
020A    577 ;       N-bit   Zero
020A    578 ;--
```

```
                                020A   580          .ENABL  LSB
                                020A   581 SCAN$SYMBOL::
                          58    10  020A   582          BSBB    10$                     ; Address Mask and branch to common
                                020C   583 DS$GT_VSYMBOL::
07FFFFFE 87FFFFFE 03FF0010 00000000  020C   584          .LONG   ^X00000000,^X03FF0010,^X87FFFFFE,^X07FFFFFE
                                021C   585
                                021C   586 SCAN$ALPHA::
                          46    10  021C   587          BSBB    10$                     ; Address Mask and branch to common
                                021E   588 DS$GT_VALPHA::
07FFFFFE 07FFFFFE 00000000 00000000  021E   589          .LONG   ^X00000000,^X00000000,^X07FFFFFE,^X07FFFFFE
                                022E   590
                                022E   591 SCAN$ALPHANUM::
                          34    10  022E   592          BSBB    10$                     ; Address Mask and branch to common
                                0230   593 DS$GT_VALPHANUM::
07FFFFFE 07FFFFFE 03FF0000 00000000  0230   594          .LONG   ^X00000000,^X03FF0000,^X07FFFFFE,^X07FFFFFE
                                0240   595
                                0240   596 Scan$File::
                          22    10  0240   597          BsbB    10$                     ; Address Mask and branch to common
                                0242   598 DS$GT_VFILE::
07FFFFFE 87FFFFFE 03FF0430 00000000  0242   599          .Long   ^X00000000,^X03FF0430,^X87FFFFFE,^X07FFFFFE
                                0252   600
                                0252   601 SCAN$SPACES::
                                0252   602 SCAN$SPACE::
                          10    10  0252   603          BSBB    10$                     ; Address Mask and branch to common
                                0254   604 DS$GT_VSPACE::
00000000 00000000 00000001 00000200  0254   605          .LONG   ^X00000200,^X00000001,^X00000000,^X00000000
                                0264   606
                          08    BA  0264   607 10$:      POPR    #^M<R3>                 ; Get address of mask to R3
                                0266   608                                            ; Fall into SCAN$SPANC
                                0266   609          .DSABL  LSB
                                0266   610
                                0266   611 SCAN$SPANC::
                    54    54    3C  0266   612          MOVZWL  R4,R4                   ; Trim to just length
                    51    55    D0  0269   613          MOVL    R5,R1                   ; Copy start of string
                          09    11  026C   614          BRB     20$                     ; Start with count of byte
                    50    65    9A  026E   615 10$:     MOVZBL  (R5),R0                 ; Fetch a character
                 05 63    50    E1  0271   616          BBC     R0,(R3),30$             ; Branch if not valid
                          55    D6  0275   617          INCL    R5                      ; Update address
                       F4 54    F4  0277   618 20$:     SOBGEQ  R4,10$                  ; Decrement count and branch if more
                          54    D6  027A   619 30$:     INCL    R4                      ; Fix count of characters remaining
              50    55    51    C3  027C   620          SUBL3   R1,R5,R0                ; Calculate the length just scanned
                                05  0280   621 40$:     RSB                             ; Return
```

```
                        0281    623          .SBTTL  SCAN$COMPARE    Compare strings
                        0281    624 ;++
                        0281    625 ; FUNCTIONAL DESCRIPTION:
                        0281    626 ;
                        0281    627 ;       This routine performs the same function as the CMPC3
                        0281    628 ;       machine instruction but does not use the instructions.
                        0281    629 ;
                        0281    630 ; CALLING SEQUENCE:
                        0281    631 ;
                        0281    632 ;       BSBW    SCAN$COMPARE
                        0281    633 ;
                        0281    634 ; INPUT PARAMETERS:
                        0281    635 ;
                        0281    636 ;       R2      Length of string 1
                        0281    637 ;       R3      Address of string1
                        0281    638 ;       R4      Length of string 2
                        0281    639 ;       R5      Address of string 2
                        0281    640 ;
                        0281    641 ; IMPLICIT INPUTS:      NONE
                        0281    642 ;
                        0281    643 ; OUTPUT PARAMETERS:
                        0281    644 ;
                        0281    645 ;       R0      Length of matching section
                        0281    646 ;       R1      Address of start of string1
                        0281    647 ;       R2      Length of uncompared string 1
                        0281    648 ;       R3      Address of Uncompared byte in string 1
                        0281    649 ;       R4      Length of Uncompared string 2
                        0281    650 ;       R5      Address of uncompared byte in string 2
                        0281    651 ;
                        0281    652 ; IMPLICIT OUTPUTS:     NONE
                        0281    653 ;
                        0281    654 ; SIDE EFFECTS:         NONE
                        0281    655 ;
                        0281    656 ; COMPLETION CODES:     N/A
                        0281    657 ;
                        0281    658 ; CONDITION CODES:
                        0281    659 ;
                        0281    660 ;       Z-bit   Set if Exact match, either string1 or string exhausted
                        0281    661 ;       N-bit   Set if NO characters matched
                        0281    662 ;       C-bit   unpredictable
                        0281    663 ;       V-bit   unpredictable
                        0281    664 ;--
```

```
                     0281   666 SCAN$COMPARE::
54   54   3C   0281   667          MOVZWL  R4,R4                   ; Trim length
     50   D4   0284   668          CLRL    R0                      ; Clear length of matched string
     52   D5   0286   669          TSTL    R2                      ; Any in string1?
     15   13   0288   670          BEQL    20$                     ; Branch if none
     54   D5   028A   671 10$:     TSTL    R4                      ; Any in string2?
     11   13   028C   672          BEQL    20$                     ; Branch if string2 exhausted
65   63   91   028E   673          CMPB    (R3),(R5)               ; Compare a byte
     0C   12   0291   674          BNEQ    20$                     ; Branch if no match
     50   D6   0293   675          INCL    R0                      ; Count character in match
     53   D6   0295   676          INCL    R3                      ; Update string1 address
     55   D6   0297   677          INCL    R5                      ; Update string2 address
                0299   678
     54   D7   0299   679          DECL    R4                      ; Count down characters in string2
     52   D7   029B   680          DECL    R2                      ; Count down characters in string1
     EB   14   029D   681          BGTR    10$                     ; Branch if string1 NOT exhausted
                029F   682 20$:
01   50   D1   029F   683          CMPL    R0,#1                   ; Set condition codes from match length
                05   02A2   684          RSB
```

```
                        02A3   686          .SBTTL  SCAN$NUMERIC    Scan number
                        02A3   687 ;++
                        02A3   688 ; FUNCTIONAL DESCRIPTION:
                        02A3   689 ;
                        02A3   690 ;       This routine can be called to scan and convert a ascii
                        02A3   691 ;       number to a signed, quadword value:
                        02A3   692 ;       The input form is: [+!-] [% B!b!D!d!O!o!X!x] [+!-]<digit-list>
                        02A3   693 ;       If the radix override is not present then the input radix is used for
                        02A3   694 ;       conversion.
                        02A3   695 ;
                        02A3   696 ; CALLING SEQUENCE:
                        02A3   697 ;
                        02A3   698 ;       BSBW    SCAN$NUMERIC
                        02A3   699 ;
                        02A3   700 ; INPUT PARAMETERS:
                        02A3   701 ;
                        02A3   702 ;       R3      Radix for conversion
                        02A3   703 ;       R4      Length of input string
                        02A3   704 ;       R5      Address of input string
                        02A3   705 ;
                        02A3   706 ; IMPLICIT INPUTS:      NONE
                        02A3   707 ;
                        02A3   708 ; OUTPUT PARAMETERS:
                        02A3   709 ;
                        02A3   710 ;       R0/R1   Signed Quadword value, both zero if no conversion
                        02A3   711 ;       R3      Updated conversion radix
                        02A3   712 ;       R4      Updated length of string
                        02A3   713 ;       R5      Updated address of string
                        02A3   714 ;
                        02A3   715 ; CONDITION CODES:
                        02A3   716 ;
                        02A3   717 ;       Z-bit   Set if No digits scanned
                        02A3   718 ;       N-Bit   Unpredictable
                        02A3   719 ;       C-bit   Unpredictable
                        02A3   720 ;       V-bit   Unpredictable
                        02A3   721 ;
                        02A3   722 ; IMPLICIT OUTPUTS:      NONE
                        02A3   723 ;
                        02A3   724 ; COMPLETION CODES:      N/A
                        02A3   725 ;
                        02A3   726 ; SIDE EFFECTS:          NONE
                        02A3   727 ;
                        02A3   728 ; REGISTER USAGE:
                        02A3   729 ;
                        02A3   730 ;       R0/R1   Signed quadword value
                        02A3   731 ;       R2      Current character
                        02A3   732 ;       R3      Radix for conversion
                        02A3   733 ;       R4      Length remaining in string
                        02A3   734 ;       R5      Address of next avail character
                        02A3   735 ;--
                        02A3   736
                        02A3   737 DS$GT_VHEX::
0000007E 0000007E 03FF0000 00000000     02A3   738          .LONG   0,^X03FF0000,^X7E,^X7E
                        02B3   739 BASE_LIST:
08 0A 02 00 78 6F 64 62 58 4F 44 42     02B3   740          .ASCII  "BDOXbdox"<0><2><10><8><16><2><10><8><16>
                   10 08 0A 02 10       02BF
```

```
                                02C4   SCAN$DECIMAL::
                53   0A   D0   02C4           MOVL    #10,R3                  ; Set radix
                     0D   11   02C7           BRB     SCAN$NUMERIC
                                02C9
                                02C9   SCAN$OCTAL::
                53   08   D0   02C9           MOVL    #8,R3                   ; Set radix
                     08   11   02CC           BRB     SCAN$NUMERIC
                                02CE
                                02CE   SCAN$BINARY::
                53   02   D0   02CE           MOVL    #2,R3                   ; Set radix
                     03   11   02D1           BRB     SCAN$NUMERIC
                                02D3
                                02D3   SCAN$HEX::
                53   10   D0   02D3           MOVL    #16,R3                  ; Set radix
                                02D6
                                02D6   SCAN$NUMERIC::
                54   54   3C   02D6           MOVZWL  R4,R4                   ; Trim length
                     30   BB   02D9           PUSHR   #^M<R4,R5>              ; Save in case have to backup
                                02DB
                     5D   10   02DB           BSBB    CHECK_SIGN              ; Check for sign value
                     50   DD   02DD           PUSHL   R0                      ; Save sign, 0=positive,1=negative
                     70   10   02DF           BSBB    CHECK_RADIX             ; Set R3 from possible radix change
                     57   10   02E1           BSBB    CHECK_SIGN              ; Check for sign value again
                6E   50   C8   02E3           BISL    R0,(SP)                 ; Set negative if sign encountered
                                02E6
                                02E6   CHECK_DIGIT:
                     55   DD   02E6           PUSHL   R5                      ; Save current position
                     50   7C   02E8           CLRQ    R0                      ; Clear accumulator
                     2D   11   02EA           BRB     70$                     ; Start by counting characters
                52   65   9A   02EC   40$:    MOVZBL  (R5),R2                 ; Get the character
           28 B0 AF   52   E1   02EF           BBC     R2,DS$GT_VHEX,80$       ; Finish if not valid digit
              03 52   06   E1   02F4           BBC     #6,R2,50$               ; Branch if not A-F
                52   09   C0   02F8           ADDL    #9,R2                   ; Offset "A" to %XA
              52   F0 8F   8A   02FB   50$:    BICB    #^C15,R2                ; Clear extra bits
                53   52   D1   02FF           CMPL    R2,R3                   ; Compare with radix
                     18   18   0302           BGEQ    80$                     ; Assume end of number
                     55   D6   0304           INCL    R5                      ; Update string address
           7E   51   53   C5   0306           MULL3   R3,R1,-(SP)             ; Radix * high order
                     50   D5   030A           TSTL    R0                      ; If low order sign bit set
                     03   18   030C           BGEQ    60$                     ; Branch if not
                6E   53   C0   030E           ADDL    R3,(SP)                 ; Compinsate for unsiged arith
      50   52   50   53   7A   0311   60$:    EMUL    R3,R0,R2,R0             ; Radix * old number + new digit
                51   8E   C0   0316           ADDL    (SP)+,R1                ; Include extra high part
                   D0 54   F4   0319   70$:    SOBGEQ  R4,40$                  ; Branch if another character present
                     54   D6   031C   80$:    INCL    R4                      ; Restore count
                     04   BA   031E           POPR    #^MR2                   ; Get position when started digits
                   0B 8E   E9   0320           BLBC    (SP)+,90$               ; Branch if No sign or "+" sign
                50   50   D2   0323           MCOML   R0,R0                   ; Complement Low order
                51   51   D2   0326           MCOML   R1,R1                   ; Complement High order
                     50   D6   0329           INCL    R0                      ; Inc Low order = Negated
                51   00   D8   032B           ADWC    #0,R1                   ; Inc High order with Carry from low
                5E   08   C0   032E   90$:    ADDL    #8,SP                   ; Remove R4/R5 from stack
                55   52   D1   0331           CMPL    R2,R5                   ; Set Z-bit from number of digits
                          05   0334           RSB                             ; Return to caller
                                0335   INVALID:
                     50   7C   0335           CLRQ    R0                      ; Clear R0/R1, clear V-bit
                     30   BA   0337           POPR    #^M<R4,R5>              ; Restore registers
```

```
                     05  0339   799          RSB                             ; Return to caller
                         033A   800
                         033A   801 CHECK_SIGN:
                50   D4  033A   802          CLRL    R0                      ; Assume positive
                54   D5  033C   803          TSTL    R4                      ; Check for sign character
                10   15  033E   804          BLEQ    40$                     ; Branch if no sign, therefore no digits
              65     2B  91  0340   805          CMPB    #^A"+",(R5)             ; Positive?
                     07  13  0343   806          BEQL    30$                     ; Yes, use and skip
              65     2D  91  0345   807          CMPB    #^A"-",(R5)             ; Negative?
                     06  12  0348   808          BNEQ    40$                     ; No, Not sign
                50   D7  034A   809          DECL    R0                      ; Mark negative
                         034C   810 30$:
                55   D6  034C   811          INCL    R5                      ; Remove character
                54   D7  034E   812          DECL    R4                      ; Remove character
                         0350   813 40$:
                     05  0350   814          RSB                             ; Return
                         0351   815
                         0351   816 CHECK_RADIX:
                02   54  D1  0351   817          CMPL    R4,#2                   ; Enough chars for radix mod?
                     1B  19  0354   818          BLSS    30$                     ; No, skip check
              65     25  91  0356   819          CMPB    #^A"%",(R5)             ; Start of radix modifier?
                     16  12  0359   820          BNEQ    30$                     ; No, Finish and exit
            52   FF54  CF  035B   821          MOVAB   BASE_LIST,R2            ; Address of valid base list
          01 A5      82  91  0360   822 10$:     CMPB    (R2)+,1(R5)             ; match?
                     FA  1F  0364   823          BLSSU   10$                     ; Continue unless end of table
                     09  12  0366   824          BNEQ    30$                     ; Return invalid if no match here
           53   08 A2  9A  0368   825 20$:     MOVZBL  8(R2),R3                ; Fetch modified base
                54   02  C2  036C   826          SUBL2   #2,R4                   ; Decrement by characters used
                85   B5  036F   827          TSTW    (R5)+                   ; Pass over characters used
                     05  0371   828 30$:     RSB                             ; Return
```

```
0372    830          .SBTTL  SCAN$SEARCHLIST Search list for unique string
0372    831 ;++
0372    832 ; FUNCTIONAL DESCRIPTION:
0372    833 ;
0372    834 ;       This routine can be used to validate a keyword in a list of the form:
0372    835 ;       .WORD   count,offset-item1,offset-item2.....
0372    836 ;       The offsets are self relative, i.e. ITEM-.
0372    837 ;
0372    838 ; CALLING SEQUENCE:
0372    839 ;
0372    840 ;       BSBW    SCAN$SEARCHLIST
0372    841 ;
0372    842 ; INPUT PARAMETERS:
0372    843 ;
0372    844 ;       R0      Length of string to be searched for
0372    845 ;       R1      Address of string to be search for
0372    846 ;       R3      Address of Keyword table
0372    847 ;
0372    848 ; IMPLICIT INPUTS:      NONE
0372    849 ;
0372    850 ; OUTPUT PARAMETERS:
0372    851 ;
0372    852 ;       R0      Index of first string that matched
0372    853 ;       R1      Address of ASCIC string that matched
0372    854 ;       R2-R5   Preserved across call
0372    855 ;
0372    856 ; IMPLICIT OUTPUTS:      NONE
0372    857 ;
0372    858 ; COMPLETION CODES:      N/A
0372    859 ;
0372    860 ; CONDITION CODES:
0372    861 ;
0372    862 ;       Z-Bit   Set if exactly 1 match
0372    863 ;       N-bit   Set if no matchs
0372    864 ;       V-bit   zero
0372    865 ;       C-bit   zero
0372    866 ;
0372    867 ; SIDE EFFECTS:          NONE
0372    868 ;--
```

```
                          0372   870 SCAN$SEARCHLIST::
          50    50   3C   0372   871          MOVZWL  R0,R0                    ; Trim length
                3F   BB   0375   872          PUSHR   #^M<R0,R1,R2,R3,R4,R5>   ; Save registers
                7E   7C   0377   873          CLRQ    -(SP)                    ; Space for Index 0(SP), Address 4(SP)
                7E   D4   0379   874          CLRL    -(SP)                    ; Count of matches
                          037B   875
          52    83   3C   037B   876          MOVZWL  (R3)+,R2                 ; Get count of strings to match
       53     6342   3E   037E   877          MOVAW   (R3)[R2],R3              ; Point past last word
                2E   11   0382   878          BRB     60$                      ; Start by counting
                          0384   879 10$:
          55    73   32   0384   880          CVTWL   -(R3),R5                 ; Get offset to ASCIC string
                29   13   0387   881          BEQL    60$                      ; Skip it if offset=0
          55    53   C0   0389   882          ADDL    R3,R5                    ; Make it absolute
          54    85   9A   038C   883          MOVZBL  (R5)+,R4                 ; Fetch length of ASCIC string
                21   13   038F   884          BEQL    60$                      ; Branch if null string, try next
                          0391   885 20$:
       50    0C AE   7D   0391   886          MOVQ    12(SP),R0                ; Restore original len,addr
          54    50   D1   0395   887          CMPL    R0,R4                    ; compare
                18   14   0398   888          BGTR    60$                      ; Branch if input longer than string
                05   11   039A   889          BRB     40$                      ; Start by counting character
                          039C   890 30$:
          85    81   91   039C   891          CMPB    (R1)+,(R5)+              ; Compare a byte
                11   12   039F   892          BNEQ    60$                      ; Mismatch, try next string
             F8 50   F4   03A1   893 40$:     SOBGEQ  R0,30$                   ; Branch if more characters in input
                6E   D6   03A4   894          INCL    (SP)                     ; Count this match
       04 AE    52   D0   03A6   895          MOVL    R2,4(SP)                 ; Save index of string match
          55    63   32   03AA   896          CVTWL   (R3),R5                  ; Get offset to ASCIC
 08 AE    55    53   C1   03AD   897          ADDL3   R3,R5,8(SP)              ; Save address of match entry
                          03B2   898 60$:
             CF 52   F4   03B2   899          SOBGEQ  R2,10$                   ; If not last string, do next
                          03B5   900
          50    8E   D0   03B5   901          MOVL    (SP)+,R0                 ; Get count of matches
          6E    8E   7D   03B8   902          MOVQ    (SP)+,(SP)               ; Remove saved R0/R1
          01    50   D1   03BB   903          CMPL    R0,#1                    ; set condition codes from # of matchs
                3F   BA   03BE   904          POPR    #^M<R0,R1,R2,R3,R4,R5>   ; index, address, restore R2,R3,R4,R5
                     05   03C0   905          RSB                              ; Return
```

```
                        907          .SBTTL  SCAN$DEVICE     Scan a device name
                        908 ;++
                        909 ; FUNCTIONAL DESCRIPTION:
                        910 ;
                        911 ;       This routine can be used to scan a device name of the form:
                        912 ;       ggan[:] , gg is generic device name a is single letter A-z,
                        913 ;       and n is a decimal number in the range 0-255.
                        914 ;
                        915 ; CALLING SEQUENCE:
                        916 ;
                        917 ;       BSBW    SCAN$DEVICE
                        918 ;
                        919 ; INPUT PARAMETERS:
                        920 ;
                        921 ;       R4      Length of input string to scan
                        922 ;
                        923 ;       R5      Address of input string to be scanned
                        924 ;
                        925 ; IMPLICIT INPUTS:      NONE
                        926 ;
                        927 ; OUTPUT PARAMETERS:
                        928 ;
                        929 ;       R0      <0,16> length of name scanned, <16,16> unit number
                        930 ;       R1      Address of device name
                        931 ;       R4      Updated input string length
                        932 ;       R5      Updated input string address
                        933 ;
                        934 ; COMPLETION CODES:
                        935 ;
                        936 ; CONDITION CODES:
                        937 ;
                        938 ;           Z-bit   Set if no device present
                        939 ;
                        940 ; IMPLICIT OUTPUTS:     NONE
                        941 ;
                        942 ; SIDE EFFECTS:         NONE
                        943 ;
                        944 ;--
```

```
                                  03C1   946 SCAN$DEVICE::
                 54   54   3C   03C1   947          MOVZWL  R4,R4                  ; Trim length
                      30   BB   03C4   948          PUSHR   #^M<R4,R5>             ; Save input pointers
                      30   BB   03C6   949          PUSHR   #^M<R4,R5>             ; Save input pointers
                      55   D6   03C8   950          INCL    R5                     ; Point past the first          [16]
                      54   D7   03CA   951          DECL    R4                     ; Character                     [16]
                    FE5F   30   03CC   952          BSBW    SCAN$ALPHANUM          ; check name                    [15]
                 24   65   91   03CF   953          CMPB    (R5),#^A"$"            ; is this a long device name ?  [15]
                      08   12   03D2   954          BNEQ    5$                     ; if not then continue          [15]
                      55   D6   03D4   955          INCL    R5                     ; else skip '$'                 [15]
                      54   D7   03D6   956          DECL    R4                     ; skip character                [15]
                      8E   7C   03D8   957          CLRQ    (SP)+                  ; reset stack                   [15]
                      02   11   03DA   958          BRB     7$                     ; go check generic              [15]
                                03DC   959 5$:                                     ;                               [15]
                      30   BA   03DC   960          POPR    #^M<R4,R5>             ; restore original registers    [15]
                                03DE   961 7$:                                     ;                               [15]
                    FE3B   30   03DE   962          BSBW    SCAN$ALPHA             ; Get an alpha field
                      23   13   03E1   963          BEQL    40$                    ; Branch if not present
                    FEDE   30   03E3   964          BSBW    SCAN$DECIMAL           ; Scan a decimal number
                      03   12   03E6   965          BNEQ    10$                    ; Branch if number scanned
                 50   01   CE   03E8   966          MNEGL   #1,R0                  ; Force sign bit on
      6E   55   04 AE   C3   03EB   967 10$:       SUBL3   4(SP),R5,(SP)          ; Length of name is new position- old
           02 AE   50   B0   03F0   968          MOVW    R0,2(SP)               ; Save unit number in top of length
                      54   D7   03F4   969          DECL    R4                     ; Subtract for length of ":"
                      07   19   03F6   970          BLSS    20$                    ; Branch if no character there
                 3A   85   91   03F8   971          CMPB    (R5)+,#^A":"           ; Check for optional ":"
                      04   13   03FB   972          BEQL    30$                    ; Branch if present
                      55   D7   03FD   973          DECL    R5                     ; Fix address
                      54   D6   03FF   974 20$:     INCL    R4                     ; Fix length
                      03   BA   0401   975 30$:     POPR    #^M<R0,R1>             ; Get length, address of device name
                      50   B5   0403   976          TSTW    R0                     ; Set condition codes, from length
                           05   0405   977          RSB                            ; Return to caller
                                0406   978 40$:
                      50   7C   0406   979          CLRQ    R0                     ; Clear length, address
                      30   BA   0408   980          POPR    #^M<R4,R5>             ; restore pointers
                           05   040A   981          RSB                            ; Return
                                040B   982
```

```
                                040B  .Subtitle       Breakup File name into parts
                                040B
                                040B  ;++
                                040B  ; Function:
                                040B  ;       Break up fields of a filename spec so that they can be merged by
                                040B  ;       repeated calls to this routine.  If any of the filespec fields are
                                040B  ;       present, the descriptor for that field is overlayed over the
                                040B  ;       appropriate field of the output file block
                                040B  ;
                                040B  ; Inputs:
                                040B  ;       04(Ap)  Length of filename string
                                040B  ;       08(Ap)  Address of filename string
                                040B  ;       12(Ap)  Address of file block:
                                040B  ;
                                040B  ; Output:
                                040B  ;       12(Ap)  Address of file block:
                                040B  ;                       (00) :  Descriptor of device part (incl. ':')
                                040B  ;                       (08) :  Descriptor of directory part (incl. '[' & ']')
                                040B  ;                       (16) :  Descriptor of filename part
                                040B  ;                       (24) :  Descriptor of file type part (incl. '.')
                                040B  ;                       (32) :  Descriptor of version part (incl. ';')
                                040B  ;
                                040B  ;       ALTERNATE ULTRIX FILE STRUCTURE in file block:
                                040B  ;
                                040B  ;                       (00) :  Descriptor of device part (incl. ':')
                                040B  ;                       (08) :  Descriptor of partition (incl '(' and ')')
                                040B  ;                       (16) :  Descriptor for directory (includes imbeded '/' )
                                040B  ;                       (24) :  Descriptor for file name.(only if none of the above
                                040B  ;                                                   was not specified)
                                040B  ;--
                                040B
                                040B  OverLay:                                          ; Utility routine                [11]
     52    54    50    C3       040B          SubL3   R0, R4, R2                        ; Calculate length of field      [11]
                52    D6       040F          IncL    R2                                ; .. include terminator          [11]
          53    55    D0       0411          MovL    R5, R3                            ; Field starts at 'pivot'        [11]
        6647    52    7D       0414          MovQ    R2, (R6)[R7]                      ; Move to correct descriptor     [11]
     55    51    01    C1       0418          AddL3   #1, R1, R5                        ; Update string pointer          [11]
     54    50    01    C3       041C          SubL3   #1, R0, R4                        ; .. and length                  [11]
                      05       0420          Rsb                                       ; And return                     [11]
                               0421
                    00FC       0421  .Entry BreakUp_File, ^M<R2, R3, R4, R5, R6, R7>   ; Breakup_File routine           [11]
     54    04 AC    D0       0423          MovL    04(Ap), R4                        ; Get length of filespec         [11]
                59    15       0427          BLeq    10$                               ; Skip ahead (exit)              [11]
     55    08 AC    D0       0429          MovL    08(Ap), R5                        ; Get address                    [11]
     56    0C AC    D0       042D          MovL    12(Ap), R6                        ; Get address of file block      [11]
                7E    94       0431          CLRB    -(SP)                             ; Clear a flag for ODS           [19]
 65    54    5B 8F    3A       0433          LOCC    #^A"[", R4, (R5)                  ; Find how to parse string       [19]
                1A    12       0438          BNEQ    8$                                ; Branch to treat as ODS         [19]
     65    54    3C    3A       043A          LOCC    #^A"<", R4, (R5)                  ; Find how to parse string       [19]
                14    12       043E          BNEQ    8$                                ; Branch to treat as ODS         [19]
     65    54    28    3A       0440          LOCC    #^A"(", R4, (R5)                  ; Find how to parse string       [19]
                0C    12       0444          BNEQ    7$                                ; Branch to treat as ULTRIX      [19]
     00000000'8F    E1       0446          BBC     #ULTRIX_V_MODE,-                  ; As a last resort use current   [19]
  02 00000000'EF              044C                  L^ULTRIX_FLAGS,8$                 ; State for parsing              [19]
                6E    96       0452  7$:     INCB    (SP)                              ; Flag as ULTRIX                 [19]
          7E    01    90       0454  8$:     movb    #1,-(sp)                          ; Flag to assume ULTRIX filename[19]
     65    54    3A    3A       0457          LocC    #^A":", R4, (R5)                  ; Scan for device part           [11]
```

```
                    25   13   045B  1041          BEql    10$                             ; Branch if none                [11]
                    6E   94   045D  1042          clrb    (sp)                            ; Signal, don't treat as file   [19]
                    57   D4   045F  1043          ClrL    R7                              ; Index                         [11]
                    A8   10   0461  1044          BsbB    OverLay                         ; Update pointers/etc.          [11]
      00000000'8F   E1   0463  1045          BBC     #ULTRIX_V_MODE,-                ; Skip if not ULTRIX            [20]
   13 00000000'EF        0469  1046                  L^ULTRIX_FLAGS,10$              ;                               [20]
                    52   D7   046F  1047          decl    R2                              ; Adjust length                 [20]
     09 6342        06   E1   0471  1048 88$:     BBC     #6,(R3)[R2],9$                  ; SKIP IF NOT ALPHA CHAR        [20]
     04 6342        05   E1   0476  1049          BBC     #5,(R3)[R2],9$                  ; SKIP IF UPPER CASE. DON'T WRITE IN
                         047B  1050                                                      ; WRITE PROTECTED [20]
        6342        20   8A   047B  1051          BICB2   #32,(R3)[R2]                    ; FORCE Device name TO UPPER CASE[20
           EF       52   F4   047F  1052 9$:      SOBGEQ  R2,88$                          ; CHECK TOTAL SECTION           [20]
                         0482  1053
                    54   D5   0482  1054 10$:     TstL    R4                              ; More String?                  [11]
                    03   14   0484  1055          BGTR    15$                             ;                               [17]
                  00C1   31   0486  1056          BRW     BreakUp_File_X                  ; If not, all done              [11]
              50    65   9A   0489  1057 15$:     MovZBL  (R5), R0                        ; Get next character            [11]
     47 01 AE       00   E1   048C  1058          BBC     #0,1(SP),60$                    ; Branch if ODS                 [19]
              28    50   91   0491  1059          CmpB    R0, #^A"("                      ; If it's a partition start     [19]
                    13   12   0494  1060          Bneq    40$                             ; .. character, then            [19]
                    50   D6   0496  1061 20$:     INCL    R0                              ; Closing ')'                   [17]
           65   54    50   3A   0498  1062          LOCC    R0,R4,(R5)                      ; Find closing character        [17]
                    03   12   049C  1063          BNEQ    30$                             ; Branch if found               [17]
                  00A9   31   049E  1064          BRW     BreakUp_File_X                  ; If not, exit                  [17]
                    6E   94   04A1  1065 30$:     clrb    (sp)                            ; Signal, don't treat as file   [19]
              57    01   D0   04A3  1066          MovL    #1, R7                          ; Setup index                   [11]
                 FF62   30   04A6  1067          BSBW    OVERLAY                         ; Update pointer/move data      [17]
           65   54    2F   3A   04A9  1068 40$:     LOCC    #^A"/",R4,(R5)                  ; Check if "directory" spec     [19]
                    07   13   04AD  1069          BEQL    50$                             ; Branch if not "directory"     [19]
        10 A6       54   7D   04AF  1070 45$:     MOVq    R4,16(R6)                       ; Let remainder be directory    [17]
                  0094   31   04B3  1071          Brw     BreakUp_File_X                  ; exit                          [19]
                    6E   95   04B6  1072 50$:     TSTB    (SP)                            ; Check if file or directory    [19]
                    F5   13   04B8  1073          beql    45$                             ; Branch if treat as directory  [19]
     18 A6      54    01   C1   04BA  1074          ADDL3   #1,R4,24(R6)                    ; Let it be file name.          [19]
00000009'EF     65    54   28   04BF  1075          MOVC3   R4,(R5),Ultrix_filename+1       ; Shift over the string         [19]
   00000008'EF        2F   90   04C7  1076          MOVB    #^A"/", Ultrix_filename         ; Put delimiter in front        [19]
  1C A6    00000008'EF   9E   04CE  1077          MOVAB   Ultrix_filename,28(R6)          ; Set address of shifted string [19]
                    72   11   04D6  1078          Brb     BreakUp_File_X                  ; exit                          [19]
        5B 8F       50   91   04D8  1079 60$:     CmpB    R0, #^A"["                      ; If it's a directory start     [11]
                    05   13   04DC  1080          BEql    80$                             ; .. character, then            [11]
                 3C 50   91   04DE  1081          CmpB    R0, #^A"<"                      ; .. use it                     [11]
                    11   12   04E1  1082          BNeq    100$                            ; ..                            [11]
                    50   02   80   04E3  1083 80$:     AddB2   #2, R0                          ; Form closing character        [11]
              65    54   50   3A   04E6  1084          LocC    R0, R4, (R5)                    ; Is there a corresponding      [11]
                    02   12   04EA  1085          BNeq    90$                             ; .. closing char (']' or '>')? [11]
                    5C   11   04EC  1086          Brb     BreakUp_File_X                  ; If not, exit                  [11]
                    57   01   D0   04EE  1087 90$:     MovL    #1, R7                          ; Setup index                   [11]
                       FF17   30   04F1  1088          BsbW    OverLay                         ; If it's OK, use it            [11]
              65    54   2E   3A   04F4  1089 100$:    LocC    #^A".", R4, (R5)                ; Is there a file type?         [11]
                    55   51   D1   04F8  1090          CmpL    R1, R5                          ; If yes, and no name, go       [11]
                    24   13   04FB  1091          BEql    120$                            ;                               [11]
                    50   D5   04FD  1092          TstL    R0                              ; Was it found at all?          [11]
                    09   12   04FF  1093          BNeq    110$                            ; If so, get file name          [11]
              65    54   3B   3A   0501  1094          LocC    #^A";", R4, (R5)                ; Was there a version?          [11]
                    55   51   D1   0505  1095          CmpL    R1, R5                          ; If it's right here,           [11]
                    38   13   0508  1096          BEql    140$                            ; .. use it as filename term.   [11]
                         050A  1097 110$:                                                 ; R1 points past end of name    [11]
```

```
                52   51   55   C3   050A  1098          SubL3   R5, R1, R2                      ; Get name length                [11]
                     53   55   D0   050E  1099          MovL    R5, R3                          ; Address of start of name       [11]
                  10 A6   52   7D   0511  1100          MovQ    R2, 16(R6)                      ; Move to output                 [11]
                     54   50   7D   0515  1101          MovQ    R0, R4                          ; Skip to terminator             [11]
                          54   D5   0518  1102          TstL    R4                              ; Any file left?                 [11]
                          2E   15   051A  1103          BLeq    BreakUp_File_X                  ; If not, exit now               [11]
                     65   2E   91   051C  1104          CmpB    #^A".", (R5)                    ; Is there a type?               [11]
                          21   12   051F  1105          BNeq    140$                            ; If not, check version          [11]
                               0521  1106 120$:                                                 ; Next character is '.'; type    [11]
                          54   D7   0521  1107          DecL    R4                              ; Skip past '.' to check for     [11]
                          25   19   0523  1108          BLss    BreakUp_File_X                  ; Exit if no more                [11]
                          55   D6   0525  1109          IncL    R5                              ; .. '.' or ';' for version      [11]
                65   54   3B   3A   0527  1110          LocC    #^A";", R4, (R5)                ; Is there a version?            [11]
                          04   12   052B  1111          BNeq    130$                            ; Yep, go off                    [11]
                65   54   2E   3A   052D  1112          LocC    #^A".", R4, (R5)                ; Alternate syntax for version   [11]
                               0531  1113                                                       ; R0, R1 at version or end       [11]
                52   51   55   C3   0531  1114 130$:     SubL3   R5, R1, R2                      ; Calculate length of            [11]
                          52   D6   0535  1115          IncL    R2                              ; .. the file type string        [11]
                53   55   01   C3   0537  1116          SubL3   #1, R5, R3                      ; And it's address               [11]
                  18 A6   52   7D   053B  1117          MovQ    R2, 24(R6)                      ; And move it to output          [11]
                     54   50   7D   053F  1118          MovQ    R0, R4                          ; Update to terminator/end       [11]
                          54   D5   0542  1119 140$:     TstL    R4                              ; Is there more file?            [11]
                          04   15   0544  1120          BLeq    BreakUp_File_X                  ; If not, exit                   [11]
                  20 A6   54   7D   0546  1121          MovQ    R4, 32(R6)                      ; Use rest of string as version  [11]
                               054A  1122 BreakUp_File_X:                                       ; Exit routine                   [11]
                     50   01   D0   054A  1123          MovL    #1, R0                          ; Set up status return           [11]
                          04   054D  1124          Ret                                     ; And then return, of course    [11]
                               054E  1125
                               054E  1126          .END
```

```
$$ARGS                          = 00000004     D
$$T1                            = 00000014     D
ACTION                            000000A1 R   D   03
BASE_LIST                         000002B3 R   D   03
BRANCH                            00000099 R   D   03
BRANCH_IF_NONE                    000000E6 R   D   03
BREAKUP_FILE                      00000421 RG  D   03
BREAKUP_FILE_X                    0000054A R   D   03
CHECK_DIGIT                       000002E6 R   D   03
CHECK_RADIX                       00000351 R   D   03
CHECK_SIGN                        0000033A R   D   03
CLI$K_ALNUM                     = 00000087     D
CLI$K_ALPHA                     = 00000086     D
CLI$K_BIF                       = 00000083     D
CLI$K_BIFS                      = 00000094     D
CLI$K_BR                        = 00000082     D
CLI$K_BUFSIZ                    = 00000100     D
CLI$K_CALL                      = 00000092     D
CLI$K_COMMA                     = 0000008E     D
CLI$K_DEC                       = 0000008A     D
CLI$K_EOL                       = 00000091     D
CLI$K_ERROR                     = 00000080     D
CLI$K_EXIT                      = 00000081     D
CLI$K_FILE                      = 00000095     D
CLI$K_HEX                       = 00000089     D
CLI$K_KEYWORD                   = 0000008C     D
CLI$K_NUM                       = 00000085     D
CLI$K_OCT                       = 00000088     D
CLI$K_RETURN                    = 00000093     D
CLI$K_SIZE                        0000044C     D
CLI$K_SLASH                     = 00000090     D
CLI$K_SPACE                     = 00000084     D
CLI$K_STRING                    = 0000008B     D
CLI$K_SYMBOL                    = 0000008D     D
CLI$K_VALUE                     = 0000008F     D
CLI$L_ADDRESS                     00000018     D
CLI$L_COMMAND                     00000004     D
CLI$L_DATA                        0000001C     D
CLI$L_FLAGS                       00000000     D
CLI$L_FLAGS2                      00000444     D
CLI$L_LAST                        00000024     D
CLI$L_NEXT                        00000030     D
CLI$L_PASS                        0000002C     D
CLI$L_SUBT                        00000028     D
CLI$L_TEMP_BASE                   00000448     D
CLI$L_TEST                        00000020     D
CLI$M_START_OR_RUN              = 00000008     D
CLI$Q_BUFQWD                      00000034     D
CLI$Q_FILE                        00000008     D
CLI$Q_SECTION                     00000010     D
CLI$Q_TIME                        0000043C     D
CLI$T_BUFFER                      0000003C     D
CLI$V_ADAPTER                   = 00000018     D
CLI$V_ADR                       = 0000000B     D
CLI$V_ASCII                     = 00000013     D
CLI$V_BASE_QUAL                 = 00000002     D
CLI$V_BREAK                     = 0000000A     D
CLI$V_BRIEF                     = 0000001B     D
CLI$V_BYTE                      = 0000000D     D
CLI$V_CLEAR                     = 00000002     D
CLI$V_DEC                       = 00000010     D
CLI$V_DEFAULT                   = 0000000C     D
CLI$V_DEPOSIT                   = 00000019     D
CLI$V_EVENT                     = 00000008     D
CLI$V_EXAM                      = 00000005     D
CLI$V_FLAGS                     = 00000009     D
CLI$V_HEX                       = 00000012     D
CLI$V_KERNEL                    = 00000017     D
CLI$V_LOAD                      = 00000006     D
CLI$V_LONG                      = 0000000F     D
CLI$V_NEXT                      = 00000001     D
CLI$V_NOALLOC                   = 00000000     D
CLI$V_NOTNUF                    = 00000001     D
CLI$V_OCT                       = 00000011     D
CLI$V_PREG                      = 0000001A     D
CLI$V_QA                        = 00000007     D
CLI$V_QACKLOOPLOOPS             = 0000001C     D
CLI$V_QAERRORPRINTS             = 0000001B     D
CLI$V_QAMULTIPLEPASS            = 0000001F     D
CLI$V_QASUBTESTLOOPS            = 0000001E     D
CLI$V_QATESTLOOPS               = 0000001D     D
CLI$V_REG                       = 00000014     D
CLI$V_REQUIRED                  = 00000000     D
CLI$V_RUN                       = 00000015     D
CLI$V_SET                       = 00000003     D
CLI$V_SHOW                      = 00000004     D
CLI$V_START_OR_RUN              = 00000003     D
CLI$V_VALSEC                    = 00000016     D
CLI$V_WORD                      = 0000000E     D
DO_ACTION                         000000E8 R   D   03
DS$GL_CLIBASE                     ********     X   03
DS$GL_RADIX                       ********     X   03
DS$GT_VALPHA                      0000021E RG  D   03
DS$GT_VALPHANUM                   00000230 RG  D   03
DS$GT_VFILE                       00000242 RG  D   03
DS$GT_VHEX                        000002A3 RG  D   03
DS$GT_VSPACE                      00000254 RG  D   03
DS$GT_VSYMBOL                     0000020C RG  D   03
DS$K_ERROR                      = 00000002     D
DS$K_NORMAL                     = 00000001     D
DS$K_SEVERE                     = 00000004     D
DS$K_SUBSYS                     = 00000066     D
DS$K_WARNING                    = 00000000     D
DS$M_ABRTFLG                    = 00000040     D
DS$M_BADTIME                    = 00100000     D
DS$M_BATCH                      = 00400000     D
DS$M_BRKCLR                     = 00001000     D
DS$M_BRKPT                      = 00000800     D
DS$M_CHARFLG                    = 00000100     D
DS$M_CMDFLG                     = 00000080     D
DS$M_CTRLC                      = 00000001     D
DS$M_CTRLO                      = 00010000     D
DS$M_DEVFLG                     = 00000200     D
DS$M_DISABLCC                   = 01000000     D
```

```
DS$M_DONFLG                     = 00002000     D
DS$M_ERRFLG                     = 00000010     D
DS$M_EXCEPT                     = 00080000     D
DS$M_EXETST                     = 00040000     D
DS$M_HLTFLG                     = 00000008     D
DS$M_LODFLG                     = 00000002     D
DS$M_MEMMGT                     = 00008000     D
DS$M_NI                         = 04000000     D
DS$M_OUTPUT                     = 00800000     D
DS$M_RUBFLG                     = 00000020     D
DS$M_SCRIPT                     = 00200000     D
DS$M_SETIMR                     = 02000000     D
DS$M_STRFLG                     = 00000004     D
DS$M_SUBT                       = 00004000     D
DS$M_SYSFLG                     = 00000400     D
DS$M_TIMED                      = 02000000     D
DS$M_TIMED_OUT                  = 08000000     D
DS$M_TIMRON                     = 00020000     D
DS$V_ABRTFLG                    = 00000006     D
DS$V_BADTIME                    = 00000014     D
DS$V_BATCH                      = 00000016     D
DS$V_BRKCLR                     = 0000000C     D
DS$V_BRKPT                      = 0000000B     D
DS$V_CHARFLG                    = 00000008     D
DS$V_CMDFLG                     = 00000007     D
DS$V_CTRLC                      = 00000000     D
DS$V_CTRLO                      = 00000010     D
DS$V_DEVFLG                     = 00000009     D
DS$V_DISABLCC                   = 00000018     D
DS$V_DONFLG                     = 0000000D     D
DS$V_ERRFLG                     = 00000004     D
DS$V_EXCEPT                     = 00000013     D
DS$V_EXETST                     = 00000012     D
DS$V_HLTFLG                     = 00000003     D
DS$V_LODFLG                     = 00000001     D
DS$V_MEMMGT                     = 0000000F     D
DS$V_NI                         = 0000001A     D
DS$V_OUTPUT                     = 00000017     D
DS$V_RUBFLG                     = 00000005     D
DS$V_SCRIPT                     = 00000015     D
DS$V_SETIMR                     = 00000019     D
DS$V_STRFLG                     = 00000002     D
DS$V_SUBT                       = 0000000E     D
DS$V_SYSFLG                     = 0000000A     D
DS$V_TIMED                      = 00000019     D
DS$V_TIMED_OUT                  = 0000001B     D
DS$V_TIMRON                     = 00000011     D
DS$_AP_NORMAL_BREAK             = 00660150     D
DS$_ARITH                       = 006600D0     D
DS$_ASBE                        = 00660118     D
DS$_BADLINK                     = 006600F0     D
DS$_BADTYPE                     = 006600E8     D
DS$_BIIC                        = 00660120     D
DS$_CHME                        = 006600A8     D
DS$_CHMK                        = 006600E0     D
DS$_DEVNAME                     = 00660108     D
DS$_ERROR                       = 00660002     D
DS$_FHWE                        = 00660068     D
DS$_FRAGBUF                     = 00660080     D
DS$_ICBUSY                      = 006600C8     D
DS$_ICERR                       = 006600C0     D
DS$_IHWE                        = 00660060     D
DS$_ILLCHAR                     = 00660018     D
DS$_ILLPAGCNT                   = 00660078     D
DS$_ILLUNIT                     = 00660100     D
DS$_INIT_FAIL                   = 00660140     D
DS$_INSFMEM                     = 00660050     D
DS$_INVCPU                      = 00660130     D
DS$_IPL2HI                      = 006600B8     D
DS$_IVADDR                      = 00660040     D
DS$_IVVECT                      = 00660038     D
DS$_KRNLSTK                     = 00660090     D
DS$_LOGIC                       = 00660070     D
DS$_MCHK                        = 00660088     D
DS$_MEM_ALLOC_ERR               = 00660138     D
DS$_MMOFF                       = 00660058     D
DS$_NEEDUNIT                    = 006600F8     D
DS$_NODE                        = 00660128     D
DS$_NOPCS                       = 00660110     D
DS$_NORMAL                      = 00660001     D
DS$_NOSUPPORT                   = 006600B1     D
DS$_NOTALLOWMP                  = 00660148     D
DS$_NOTDON                      = 00660030     D
DS$_NOTIMP                      = 006600B0     D
DS$_NULLSTR                     = 00660010     D
DS$_OVERFLOW                    = 00660008     D
DS$_POWER                       = 00660098     D
DS$_PROGERR                     = 00660020     D
DS$_SEVERE                      = 00660004     D
DS$_TRANSL                      = 006600A0     D
DS$_TRUNCATE                    = 00660028     D
DS$_UNEXPINT                    = 006600D8     D
DS$_UNSUPPDEV                   = 00660158     D
DS$_VASFULL                     = 00660048     D
DS$_WARNING                     = 00660000     D
DSX$PARSE                         00000007 RG  D  03
DSX$PARSE_X                       00000068 R   D  03
DSX$SUPERPARSE                    00000000 RG  D  03
EXIT                              00000065 R   D  03
HP$A_DEPENDENT                    00000032     D
HP$A_DEVICE                       00000018     D
HP$A_DVA                          0000001C     D
HP$A_LINK                         00000020     D
HP$B_DRIVE                        0000000B     D
HP$B_FLAGS                        0000000A     D
HP$Q_DEVICE                       00000000     D
HP$T_DEVICE                       0000000C     D
HP$T_TYPE                         00000026     D
HP$W_SIZE                         00000008     D
HP$W_VECTOR                       00000024     D
INVALID                           00000335 R   D  03
OVERLAY                           0000040B R   D  03
PARSE$_ACTION                   = 0000000C     D
PARSE$_BUFADR                   = 00000004     D
```

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PARSE$_FLAG                     =  00000010     D
PARSE$_NARGS                    =  00000004     D
PARSE$_TREE                     =  00000008     D
PARSE_COMMON                       0000000B R   D   03
SAVE_CALL                          00000000 R   D   02
SAVE_STATUS                        00000004 R   D   02
SCAN$ALPHA                         0000021C RG  D   03
SCAN$ALPHANUM                      0000022E RG  D   03
SCAN$BINARY                        000002CE RG  D   03
SCAN$COMPARE                       00000281 RG  D   03
SCAN$DECIMAL                       000002C4 RG  D   03
SCAN$DEVICE                        000003C1 RG  D   03
SCAN$FILE                          00000240 RG  D   03
SCAN$HEX                           000002D3 RG  D   03
SCAN$NUMERIC                       000002D6 RG  D   03
SCAN$OCTAL                         000002C9 RG  D   03
SCAN$SEARCHLIST                    00000372 RG  D   03
SCAN$SPACE                         00000252 RG  D   03
SCAN$SPACES                        00000252 RG  D   03
SCAN$SPANC                         00000266 RG  D   03
SCAN$SYMBOL                        0000020A RG  D   03
SIZ...                          =  00000001     D
SPACE                           =  00000020     D
SS$_NORMAL                      =  00000001     D
TAB                             =  00000009     D
TRAVERSE                           0000001C R   D   03
TRVALNUM                           00000112 R   D   03
TRVALPHA                           0000010D R   D   03
TRVBIF                             000000DE R   D   03
TRVBIFS                            000000D2 R   D   03
TRVBR                              00000097 R   D   03
TRVCALL                            00000089 R   D   03
TRVCOMMA                           000001A2 R   D   03
TRVDEC                             000000FC R   D   03
TRVEOL                             000001EB R   D   03
TRVERR                             000000C7 R   D   03
TRVEXIT                            00000063 R   D   03
TRVFILE                            0000019C R   D   03
TRVHEX                             000000F7 R   D   03
TRVKEYWORD                         00000166 R   D   03
TRVNUM                             00000101 R   D   03
TRVNUMA                            00000108 R   D   03
TRVOCT                             000000F2 R   D   03
TRVRETURN                          00000069 R   D   03
TRVSLASH                           000001A6 R   D   03
TRVSPACE                           000000ED R   D   03
TRVSTRING                          00000117 R   D   03
TRVSYMBOL                          00000197 R   D   03
TRVVALUE                           000001AB R   D   03
TRV_COMMA_VALUE                    000001AE R   D   03
ULTRIX_FILENAME                    00000008 R   D   02
ULTRIX_FLAGS                       ********     X   03
ULTRIX_V_MODE                      ********     X   03
V_BIT                           =  00000002     D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000044C (1100.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
WORK	00000058 (88.)	02 (2.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC LONG
CODE	0000054E (1358.)	03 (3.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC BYTE

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                                  +-------------------------+
                                  ! Symbol Cross Reference !
                                  +-------------------------+

SYMBOL                      VALUE        DEFINITION      REFERENCES...
------                      -----        ----------      -------------
$$ARGS                     =00000004     137    (1)      137    (1)
$$T1                       =00000014     137    (1)      137    (1)
ACTION                      000000A1-R   306    (4)    #-262    (3)    #-273    (4)    #-294    (4)    #-321    (4)
                                                        #-330    (4)    #-339    (4)    #-347    (5)    #-410    (5)
                                                        #-430    (6)
BASE_LIST                   000002B3-R   739    (11)     821    (12)
BIT...                     =00000003     138    (1)      135    (1)      136    (1)      138    (1)
BRANCH                      00000099-R   299    (4)    #-254    (3)    #-331    (4)    #-340    (4)    #-345    (5)
                                                        #-436    (6)    #-519    (6)
BRANCH_IF_NONE              000000E6-R   344    (5)    #-355    (5)    #-372    (5)    #-378    (5)    #-384    (5)
                                                        #-444    (6)    #-450    (6)    #-504    (6)
BREAKUP_FILE                00000421-R   1024   (16)
BREAKUP_FILE_X              0000054A-R   1122   (16)   #-1056   (16)   #-1064   (16)   #-1071   (16)   #-1078   (16)
                                                        #-1086   (16)   #-1103   (16)   #-1108   (16)   #-1120   (16)
CHECK_DIGIT                 000002E6-R   767    (12)
CHECK_RADIX                 00000351-R   816    (12)   #-763    (12)
CHECK_SIGN                  0000033A-R   801    (12)   #-761    (12)   #-764    (12)
CLI$K_ALNUM                =00000087     135    (1)
CLI$K_ALPHA                =00000086     135    (1)
CLI$K_BIF                  =00000083     135    (1)
CLI$K_BIFS                 =00000094     135    (1)
CLI$K_BR                   =00000082     135    (1)
CLI$K_BUFSIZ               =00000100     134    (1)      134    (1)
CLI$K_CALL                 =00000092     135    (1)
CLI$K_COMMA                =0000008E     135    (1)
CLI$K_DEC                  =0000008A     135    (1)
CLI$K_EOL                  =00000091     135    (1)
CLI$K_ERROR                =00000080     135    (1)    #-248    (3)
CLI$K_EXIT                 =00000081     135    (1)
CLI$K_FILE                 =00000095     135    (1)
CLI$K_HEX                  =00000089     135    (1)
CLI$K_KEYWORD              =0000008C     135    (1)
CLI$K_NUM                  =00000085     135    (1)
CLI$K_OCT                  =00000088     135    (1)
CLI$K_RETURN               =00000093     135    (1)
CLI$K_SIZE                  0000044C     134    (1)
CLI$K_SLASH                =00000090     135    (1)
CLI$K_SPACE                =00000084     135    (1)
CLI$K_STRING               =0000008B     135    (1)
CLI$K_SYMBOL               =0000008D     135    (1)
CLI$K_VALUE                =0000008F     135    (1)
CLI$L_ADDRESS               00000018     134    (1)
CLI$L_COMMAND               00000004     134    (1)
CLI$L_DATA                  0000001C     134    (1)
CLI$L_FLAGS                 00000000     134    (1)
CLI$L_FLAGS2                00000444     134    (1)
CLI$L_LAST                  00000024     134    (1)
CLI$L_NEXT                  00000030     134    (1)
CLI$L_PASS                  0000002C     134    (1)
CLI$L_SUBT                  00000028     134    (1)
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CLI$L_TEMP_BASE                 00000448     134    (1)
CLI$L_TEST                      00000020     134    (1)
CLI$M_START_OR_RUN             =00000008     134    (1)
CLI$Q_BUFQWD                    00000034     134    (1)
CLI$Q_FILE                      00000008     134    (1)
CLI$Q_SECTION                   00000010     134    (1)
CLI$Q_TIME                      0000043C     134    (1)
CLI$T_BUFFER                    0000003C     134    (1)
CLI$V_ADAPTER                  =00000018     134    (1)
CLI$V_ADR                      =0000000B     134    (1)
CLI$V_ASCII                    =00000013     134    (1)
CLI$V_BASE_QUAL                =00000002     134    (1)
CLI$V_BREAK                    =0000000A     134    (1)
CLI$V_BRIEF                    =0000001B     134    (1)
CLI$V_BYTE                     =0000000D     134    (1)
CLI$V_CLEAR                    =00000002     134    (1)
CLI$V_DEC                      =00000010     134    (1)
CLI$V_DEFAULT                  =0000000C     134    (1)
CLI$V_DEPOSIT                  =00000019     134    (1)
CLI$V_EVENT                    =00000008     134    (1)
CLI$V_EXAM                     =00000005     134    (1)
CLI$V_FLAGS                    =00000009     134    (1)
CLI$V_HEX                      =00000012     134    (1)
CLI$V_KERNEL                   =00000017     134    (1)
CLI$V_LOAD                     =00000006     134    (1)
CLI$V_LONG                     =0000000F     134    (1)
CLI$V_NEXT                     =00000001     134    (1)
CLI$V_NOALLOC                  =00000000     134    (1)
CLI$V_NOTNUF                   =00000001     134    (1)
CLI$V_OCT                      =00000011     134    (1)
CLI$V_PREG                     =0000001A     134    (1)
CLI$V_QA                       =00000007     134    (1)
CLI$V_QACKLOOPLOOPS            =0000001C     134    (1)
CLI$V_QAERRORPRINTS            =0000001B     134    (1)
CLI$V_QAMULTIPLEPASS           =0000001F     134    (1)
CLI$V_QASUBTESTLOOPS           =0000001E     134    (1)
CLI$V_QATESTLOOPS              =0000001D     134    (1)
CLI$V_REG                      =00000014     134    (1)
CLI$V_REQUIRED                 =00000000     134    (1)
CLI$V_RUN                      =00000015     134    (1)
CLI$V_SET                      =00000003     134    (1)
CLI$V_SHOW                     =00000004     134    (1)
CLI$V_START_OR_RUN             =00000003     134    (1)      134    (1)
CLI$V_VALSEC                   =00000016     134    (1)
CLI$V_WORD                     =0000000E     134    (1)
DO_ACTION                       000000E8-R   346    (5)    #-257    (3)    #-524    (6)
DS$GL_CLIBASE                   00000000-XR                 310    (4)
DS$GL_RADIX                     00000000-XR               #-369    (5)
DS$GT_VALPHA                    0000021E-R   588    (8)
DS$GT_VALPHANUM                 00000230-R   593    (8)
DS$GT_VFILE                     00000242-R   598    (8)
DS$GT_VHEX                      000002A3-R   737    (11)     772    (12)
DS$GT_VSPACE                    00000254-R   604    (8)
DS$GT_VSYMBOL                   0000020C-R   583    (8)
DS$K_ERROR                     =00000002     136    (1)
DS$K_NORMAL                    =00000001     136    (1)
DS$K_SEVERE                    =00000004     136    (1)
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DS$K_SUBSYS	=00000066	136	(1)	136	(1)
DS$K_WARNING	=00000000	136	(1)		
DS$M_ABRTFLG	=00000040	138	(1)		
DS$M_BADTIME	=00100000	138	(1)		
DS$M_BATCH	=00400000	138	(1)		
DS$M_BRKCLR	=00001000	138	(1)		
DS$M_BRKPT	=00000800	138	(1)		
DS$M_CHARFLG	=00000100	138	(1)		
DS$M_CMDFLG	=00000080	138	(1)		
DS$M_CTRLC	=00000001	138	(1)		
DS$M_CTRLO	=00010000	138	(1)		
DS$M_DEVFLG	=00000200	138	(1)		
DS$M_DISABLCC	=01000000	138	(1)		
DS$M_DONFLG	=00002000	138	(1)		
DS$M_ERRFLG	=00000010	138	(1)		
DS$M_EXCEPT	=00080000	138	(1)		
DS$M_EXETST	=00040000	138	(1)		
DS$M_HLTFLG	=00000008	138	(1)		
DS$M_LODFLG	=00000002	138	(1)		
DS$M_MEMMGT	=00008000	138	(1)		
DS$M_NI	=04000000	138	(1)		
DS$M_OUTPUT	=00800000	138	(1)		
DS$M_RUBFLG	=00000020	138	(1)		
DS$M_SCRIPT	=00200000	138	(1)		
DS$M_SETIMR	=02000000	138	(1)		
DS$M_STRFLG	=00000004	138	(1)		
DS$M_SUBT	=00004000	138	(1)		
DS$M_SYSFLG	=00000400	138	(1)		
DS$M_TIMED	=02000000	138	(1)		
DS$M_TIMED_OUT	=08000000	138	(1)		
DS$M_TIMRON	=00020000	138	(1)		
DS$V_ABRTFLG	=00000006	138	(1)		
DS$V_BADTIME	=00000014	138	(1)		
DS$V_BATCH	=00000016	138	(1)		
DS$V_BRKCLR	=0000000C	138	(1)		
DS$V_BRKPT	=0000000B	138	(1)		
DS$V_CHARFLG	=00000008	138	(1)		
DS$V_CMDFLG	=00000007	138	(1)		
DS$V_CTRLC	=00000000	138	(1)		
DS$V_CTRLO	=00000010	138	(1)		
DS$V_DEVFLG	=00000009	138	(1)		
DS$V_DISABLCC	=00000018	138	(1)		
DS$V_DONFLG	=0000000D	138	(1)		
DS$V_ERRFLG	=00000004	138	(1)		
DS$V_EXCEPT	=00000013	138	(1)		
DS$V_EXETST	=00000012	138	(1)		
DS$V_HLTFLG	=00000003	138	(1)		
DS$V_LODFLG	=00000001	138	(1)		
DS$V_MEMMGT	=0000000F	138	(1)		
DS$V_NI	=0000001A	138	(1)		
DS$V_OUTPUT	=00000017	138	(1)		
DS$V_RUBFLG	=00000005	138	(1)		
DS$V_SCRIPT	=00000015	138	(1)		
DS$V_SETIMR	=00000019	138	(1)		
DS$V_STRFLG	=00000002	138	(1)		
DS$V_SUBT	=0000000E	138	(1)		
DS$V_SYSFLG	=0000000A	138	(1)		

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DS$V_TIMED                      =00000019      138     (1)
DS$V_TIMED_OUT                  =0000001B      138     (1)
DS$V_TIMRON                     =00000011      138     (1)
DS$_AP_NORMAL_BREAK             =00660150      136     (1)
DS$_ARITH                       =006600D0      136     (1)
DS$_ASBE                        =00660118      136     (1)
DS$_BADLINK                     =006600F0      136     (1)
DS$_BADTYPE                     =006600E8      136     (1)
DS$_BIIC                        =00660120      136     (1)
DS$_CHME                        =006600A8      136     (1)
DS$_CHMK                        =006600E0      136     (1)
DS$_DEVNAME                     =00660108      136     (1)
DS$_ERROR                       =00660002      136     (1)     #-277     (4)     #-322     (4)
DS$_FHWE                        =00660068      136     (1)
DS$_FRAGBUF                     =00660080      136     (1)
DS$_ICBUSY                      =006600C8      136     (1)
DS$_ICERR                       =006600C0      136     (1)
DS$_IHWE                        =00660060      136     (1)
DS$_ILLCHAR                     =00660018      136     (1)
DS$_ILLPAGCNT                   =00660078      136     (1)
DS$_ILLUNIT                     =00660100      136     (1)
DS$_INIT_FAIL                   =00660140      136     (1)
DS$_INSFMEM                     =00660050      136     (1)
DS$_INVCPU                      =00660130      136     (1)
DS$_IPL2HI                      =006600B8      136     (1)
DS$_IVADDR                      =00660040      136     (1)
DS$_IVVECT                      =00660038      136     (1)
DS$_KRNLSTK                     =00660090      136     (1)
DS$_LOGIC                       =00660070      136     (1)
DS$_MCHK                        =00660088      136     (1)
DS$_MEM_ALLOC_ERR               =00660138      136     (1)
DS$_MMOFF                       =00660058      136     (1)
DS$_NEEDUNIT                    =006600F8      136     (1)
DS$_NODE                        =00660128      136     (1)
DS$_NOPCS                       =00660110      136     (1)
DS$_NORMAL                      =00660001      136     (1)
DS$_NOSUPPORT                   =006600B1      136     (1)
DS$_NOTALLOWMP                  =00660148      136     (1)
DS$_NOTDON                      =00660030      136     (1)
DS$_NOTIMP                      =006600B0      136     (1)       136     (1)
DS$_NULLSTR                     =00660010      136     (1)
DS$_OVERFLOW                    =00660008      136     (1)
DS$_POWER                       =00660098      136     (1)
DS$_PROGERR                     =00660020      136     (1)
DS$_SEVERE                      =00660004      136     (1)
DS$_TRANSL                      =006600A0      136     (1)
DS$_TRUNCATE                    =00660028      136     (1)
DS$_UNEXPINT                    =006600D8      136     (1)
DS$_UNSUPPDEV                   =00660158      136     (1)
DS$_VASFULL                     =00660048      136     (1)
DS$_WARNING                     =00660000      136     (1)       136     (1)
DSX$PARSE                        00000007-R    211     (3)
DSX$PARSE_X                      00000068-R    265     (3)     #-278     (4)     #-323     (4)
DSX$SUPERPARSE                   00000000-R    208     (3)
EXIT                             00000065-R    263     (3)     #-221     (3)     #-437     (6)
INVALID                          00000335-R    796     (12)
OVERLAY                          0000040B-R    1015    (16)    #-1044    (16)    #-1067    (16)    #-1088    (16)
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PARSE$_ACTION          =0000000C     137    (1)      312    (4)
PARSE$_BUFADR          =00000004     137    (1)    #-214    (3)
PARSE$_FLAG            =00000010     137    (1)
PARSE$_NARGS           =00000004     137    (1)
PARSE$_TREE            =00000008     137    (1)    #-217    (3)
PARSE_COMMON            0000000B-R   213    (3)    #-210    (3)
SAVE_CALL               00000000-R   148    (1)    #-216    (3)    #-275    (4)    #-288    (4)
SAVE_STATUS             00000004-R   150    (1)    #-274    (4)    #-287    (4)    #-331    (4)
SCAN$ALPHA              0000021C-R   586    (8)    #-377    (5)    #-962    (16)
SCAN$ALPHANUM           0000022E-R   591    (8)    #-383    (5)    #-952    (16)
SCAN$BINARY             000002CE-R   750    (12)
SCAN$COMPARE            00000281-R   666    (10)   #-408    (5)
SCAN$DECIMAL            000002C4-R   742    (12)   #-964    (16)
SCAN$DEVICE             000003C1-R   946    (16)
SCAN$FILE               00000240-R   596    (8)    #-449    (6)
SCAN$HEX                000002D3-R   754    (12)
SCAN$NUMERIC            000002D6-R   757    (12)   #-371    (5)    #-744    (12)   #-748    (12)   #-752    (12)
SCAN$OCTAL              000002C9-R   746    (12)
SCAN$SEARCHLIST         00000372-R   870    (14)   #-425    (6)
SCAN$SPACE              00000252-R   602    (8)    #-354    (5)    #-479    (6)    #-499    (6)    #-512    (6)
SCAN$SPACES             00000252-R   601    (8)
SCAN$SPANC              00000266-R   611    (8)
SCAN$SYMBOL             0000020A-R   581    (8)    #-420    (6)    #-443    (6)
SIZ...                 =00000001     138    (1)      138    (1)
SPACE                  =00000020     143    (1)    #-400    (5)
SS$_NORMAL             =00000001     141    (1)    #-264    (3)
TAB                    =00000009     142    (1)    #-402    (5)
TRAVERSE                0000001C-R   218    (3)      222    (3)
TRVALNUM                00000112-R   382    (5)      248    (3)
TRVALPHA                0000010D-R   376    (5)      248    (3)
TRVBIF                  000000DE-R   338    (4)      248    (3)
TRVBIFS                 000000D2-R   329    (4)      248    (3)
TRVBR                   00000097-R   293    (4)      248    (3)
TRVCALL                 00000089-R   286    (4)      248    (3)
TRVCOMMA                000001A2-R   456    (6)      248    (3)
TRVDEC                  000000FC-R   365    (5)      248    (3)
TRVEOL                  000001EB-R   511    (6)      248    (3)
TRVERR                  000000C7-R   320    (4)      248    (3)
TRVEXIT                 00000063-R   261    (3)      248    (3)
TRVFILE                 0000019C-R   448    (6)      248    (3)
TRVHEX                  000000F7-R   362    (5)      248    (3)
TRVKEYWORD              00000166-R   419    (6)      248    (3)
TRVNUM                  00000101-R   368    (5)      248    (3)
TRVNUMA                 00000108-R   370    (5)    #-361    (5)    #-364    (5)    #-367    (5)
TRVOCT                  000000F2-R   359    (5)      248    (3)
TRVRETURN               00000069-R   272    (4)      248    (3)
TRVSLASH                000001A6-R   465    (6)      248    (3)
TRVSPACE                000000ED-R   353    (5)      248    (3)
TRVSTRING               00000117-R   389    (5)      248    (3)
TRVSYMBOL               00000197-R   442    (6)      248    (3)
TRVVALUE                000001AB-R   474    (6)      248    (3)
TRV_COMMA_VALUE         000001AE-R   477    (6)    #-458    (6)    #-467    (6)
ULTRIX_FILENAME         00000008-R   152    (1)     1075    (16)   #-1076   (16)     1077    (16)
ULTRIX_FLAGS            00000000-XR                 1037    (16)     1046   (16)     394     (5)
ULTRIX_V_MODE           00000000-XR               #-1036    (16)   #-1045   (16)   #-394     (5)
V_BIT                  =00000002     140    (1)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.01	00:00:00.19
Command processing	928	00:00:00.27	00:00:00.83
Pass 1	566	00:00:01.61	00:00:03.03
Symbol table sort	0	00:00:00.09	00:00:00.08
Pass 2	24	00:00:00.58	00:00:01.23
Symbol table output	2	00:00:00.05	00:00:00.13
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	5	00:00:00.18	00:00:00.33
Assembler run totals	1554	00:00:02.79	00:00:05.82

The working set limit was 2400 pages.
74202 bytes (145 pages) of virtual memory were used to buffer the intermediate code.
There were 20 pages of symbol table space allocated to hold 289 non-local and 67 local symbols.
1126 source lines were read in Pass 1, producing 41 object records in Pass 2.
22 pages of virtual memory were used to define 15 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	5
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	2
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	6
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	13

313 GETS were required to define 13 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element PCSDATA.B32
;    0002  0      ! *2     7-OCT-1987 14:02:32 BERGAZZI "UPGRADE TO PCS REV 99"
;    0003  0      ! *1     6-FEB-1986 15:21:41 DS ""
;    0004  0      ! DEC/CMS REPLACEMENT HISTORY, Element PCSDATA.B32
;    0005  0      %TITLE '*** PCSDATA patch bits and microwords'
;    0006  0      MODULE PCSDATA(                    ! Module description
;    0007  0                     IDENT = '06-01'                                    !G:2
;    0008  0                     ) =
;    0009  0      !++
;    0010  0      ! COPYRIGHT (c) 1980, 1983, 1987, 1988                           !G:2
;    0011  0      ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
;    0012  0      !
;    0013  0      ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
;    0014  0      ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
;    0015  0      ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
;    0016  0      ! MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
;    0017  0      ! EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
;    0018  0      ! TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
;    0019  0      ! REMAIN IN DEC.
;    0020  0      !
;    0021  0      ! THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
;    0022  0      ! AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
;    0023  0      ! CORPORATION.
;    0024  0      !
;    0025  0      ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
;    0026  0      ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
;    0027  0      !-
```

```
;    0029  0     !++
;    0030  0     ! Facility:
;    0031  0     !
;    0032  0     !       Diagnostic Supervisor
;    0033  0     !
;    0034  0     ! Abstract:
;    0035  0     !
;    0036  0     !       The function of this module is to store two data structures:
;    0037  0     !       1) 8K of PCS patch bits (= 2 pages of 8-bit bytes). A patch bit
;    0038  0     !       indicates if the corresponding microword is patched.
;    0039  0     !       2) 1K of 80-bit patch microwords (= 20 pages of 8-bit bytes). The
;    0040  0     !       patch microword contains the actual patch.
;    0041  0     !
;    0042  0     ! Author:
;    0043  0     !
;    0044  0     !       Bob Bergazzi
;    0045  0     !
;    0046  0     ! Creation Date:
;    0047  0     !
;    0048  0     !       19-Nov-1982
;    0049  0     !
;    0050  0     ! Version:
;    0051  0     !
;    0052  0     !       6.10
;    0053  0     !
;    0054  0     ! Modified By:
;    0055  0     !
;    0056  0     !       1       Bob Bergazzi    Feb. 24, 1983   Version 6.11
;    0057  0     !               Inclusion of version CMT096 microcode patches.
;    0058  0     !
;    0059  0     !       2       Bob Bergazzi    May 17, 1983    Version 6.11
;    0060  0     !               Changed the order of searching libraries.
;    0061  0     !
;    0062  0     !       3       Bob Bergazzi    Oct. 25, 1983   Version 6.13
;    0063  0     !               Inclusion of version CMT098 microcode patches.
;    0064  0     !                                                                       !G:2
;    0065  0     !               Bob Bergazzi    Oct. 2, 1987    Version 10.10           !G:2
;    0066  0     !               Included version 99 microcode patches.                  !G:2
;    0067  0     !--
```

```
;    0069  0     %SBTTL  'Libraries'
;    0070  1     BEGIN                           ! Begin the Module_Name module
;    0071  1
;    0072  1     LIBRARY
;    0073  1             '$Diag';                ! Use Diag.L32 first        [02]                    !G:2
;    0074  1
;    0075  1     LIBRARY
;    0076  1             '$DS';                  ! Use Ds.L32 second         [02]                    !G:2
;    0077  1
;    0078  1     LIBRARY
;    0079  1             '$CRD';                 ! Use CRD.L32 third
;    0080  1
;    0081  1     LIBRARY
;    0082  1             'Sys$Library:Lib';      ! Use Lib as last resort
```

```
;    0084  1     %SBTTL  'Table of Contents'
;    0085  1
;    0086  1                                    ! List of routine names
;    0087  1                                    ! This module contains only data, no                    !G:2
;    0088  1                                    ! routines                                              !G:2
```

```
;    0090  1     %SBTTL  'Psect Definitions'
;    0091  1
;    0092  1     PSECT
;    0093  1         PLIT    = Data (NOEXECUTE,   SHARE, NOWRITE, ADDRESSING_MODE (LONG_RELATIVE));
;    0094  1
;    0095  1     PSECT
;    0096  1         CODE    = Code (  EXECUTE,   SHARE, NOWRITE, ADDRESSING_MODE (LONG_RELATIVE));
;    0097  1
;    0098  1     PSECT
;    0099  1         OWN     = Work (NOEXECUTE, NOSHARE,   WRITE, ADDRESSING_MODE (LONG_RELATIVE));
;    0100  1
;    0101  1     PSECT
;    0102  1         GLOBAL  = Work (NOEXECUTE, NOSHARE,   WRITE, ADDRESSING_MODE (LONG_RELATIVE));
```

```
;    0104  1     %SBTTL  'Module-Global Static Storage'
;    0105  1
;    0106  1             ModNam ('PCSDATA');             ! Module name for ErrSup macro
;    0107  1
;    0108  1     global bind
;    0109  1             ds$ga_patch_bit = uplit long (
;    0110  1                                             rep 7 of (%x'FFFFFFFF'),                    !G:2
;    0111  1                                             rep 1 of (%x'BFFFFFFF'),                    !G:2
;    0112  1                                             rep 30 of (%x'FFFFFFFF'),                   !G:2
;    0113  1                                             rep 1 of (%x'FFFFDFFF'),
;    0114  1                                             rep 24 of (%x'FFFFFFFF'),
;    0115  1                                             rep 1 of (%x'FFFFFFDF'),
;    0116  1                                             rep 34 of (%x'FFFFFFFF'),
;    0117  1                                             rep 1 of (%x'FFFFBFFF'),
;    0118  1                                             rep 5 of (%x'FFFFFFFF'),
;    0119  1                                             rep 1 of (%x'FFFBFFFF'),
;    0120  1                                             rep 1 of (%x'FFFFFBFF'),
;    0121  1                                             rep 11 of (%x'FFFFFFFF'),
;    0122  1                                             rep 1 of (%x'F7FFFFFF'),
;    0123  1                                             rep 5 of (%x'FFFFFFFF'),
;    0124  1                                             rep 1 of (%x'DFFFFFFF'),
;    0125  1                                             rep 1 of (%x'FFFFFFFF'),                    !G:2
;    0126  1                                             rep 1 of (%x'FFFFFFFD'),                    !G:2
;    0127  1                                             rep 26 of (%x'FFFFFFFF'),                   !G:2
;    0128  1                                             rep 1 of (%x'FFFFF5FF'),                    !G:2
;    0129  1                                             rep 20 of (%x'FFFFFFFF'),                   !G:2
;    0130  1                                             rep 1 of (%x'F7FFFFFF'),                    !G:2
;    0131  1                                             rep 1 of (%x'FFFFFFFF'),                    !G:2
;    0132  1                                             rep 1 of (%x'FBFFFFFF'),
;    0133  1                                             rep 1 of (%x'FFFFFFF7'),
;    0134  1                                             rep 3 of (%x'FFFFFFFF'),
;    0135  1                                             rep 1 of (%x'7FFFFFFF'),
;    0136  1                                             rep 75 of (%x'FFFFFFFF')) : bitvector[8192] weak,
;    0137  1             ds$ga_patch_uwd = uplit (
;    0138  1                                     rep 1 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',  !G:2
;    0139  1                                     %x'48000364',%x'00472839',%x'03640300',%x'28394800',            !G:2
;    0140  1                                     %x'03000047',%x'48000364',%x'00472839',%x'03640300',            !G:2
;    0141  1                                     %x'28394800',%x'03000047',%x'48000364',%x'00472839',            !G:2
;    0142  1                                     %x'03640300',%x'2F184800',%x'B3798E70',%x'C2405B24'),            !G:2
;    0143  1                                     rep 1 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',  !G:2
;    0144  1                                     %x'48000364',%x'00472839',%x'03640300',%x'28394800',            !G:2
;    0145  1                                     %x'03000047',%x'48000364',%x'00472839',%x'03640300',            !G:2
;    0146  1                                     %x'28394800',%x'03000047',%x'48000364',%x'00472839',            !G:2
;    0147  1                                     %x'03640300',%x'2CCB4800',%x'02005D80',%x'08105924'),            !G:2
;    0148  1                                     rep 1 of (%x'847070B0',%x'C371AF05',%x'2839D81D',%x'03000047',  !G:2
;    0149  1                                     %x'48000364',%x'00472839',%x'03640300',%x'2EBA4800',            !G:2
;    0150  1                                     %x'03010470',%x'1263C370',%x'04702EBA',%x'C3700301',            !G:2
;    0151  1                                     %x'28391263',%x'03000047',%x'48000364',%x'00472839',            !G:2
;    0152  1                                     %x'03640300',%x'28394800',%x'03000047',%x'48000364'),            !G:2
;    0153  1                                     rep 1 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',  !G:2
;    0154  1                                     %x'48000364',%x'00472839',%x'03640300',%x'28394800',
;    0155  1                                     %x'03000047',%x'48000364',%x'00472839',%x'03640300',
;    0156  1                                     %x'28394800',%x'03000047',%x'48000364',%x'00472839',
;    0157  1                                     %x'03640300',%x'28394800',%x'03000047',%x'48000364'),
;    0158  1                                     rep 1 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',
;    0159  1                                     %x'48000364',%x'00472839',%x'03640300',%x'28394800',
;    0160  1                                     %x'03000047',%x'48000364',%x'00472839',%x'03640300',
```

```
;   0161  1                    %x'33554800',%x'03078470',%x'59E5D538',%x'00472839',
;   0162  1                    %x'03640300',%x'17E84800',%x'03020470',%x'186BC124'),                    !G:2
;   0163  1                    rep 1 of (%x'84702946',%x'C1200303',%x'2839586B',%x'03000047',           !G:2
;   0164  1                    %x'48000364',%x'00472839',%x'03640300',%x'28394800',                     !G:2
;   0165  1                    %x'03000047',%x'48000364',%x'00472839',%x'03640300',                     !G:2
;   0166  1                    %x'28394800',%x'03000047',%x'48000364',%x'00472839',                     !G:2
;   0167  1                    %x'03640300',%x'28394800',%x'03000047',%x'48000364'),                    !G:2
;   0168  1                    rep 19 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',          !G:2
;   0169  1                    %x'48000364',%x'00472839',%x'03640300',%x'28394800',
;   0170  1                    %x'03000047',%x'48000364',%x'00472839',%x'03640300',
;   0171  1                    %x'28394800',%x'03000047',%x'48000364',%x'00472839',
;   0172  1                    %x'03640300',%x'28394800',%x'03000047',%x'48000364'),
;   0173  1                    rep 1 of (%x'4A703038',%x'002403D8',%x'170A4604',%x'03140470',
;   0174  1                    %x'48440080',%x'05D0E944',%x'03647B00',%x'32D34800',
;   0175  1                    %x'03D84A70',%x'480003A4',%x'00472839',%x'03640300',
;   0176  1                    %x'28394800',%x'03000047',%x'48000364',%x'48703E80',
;   0177  1                    %x'71100300',%x'2839881A',%x'03000047',%x'48000364'),
;   0178  1                    rep 11 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',
;   0179  1                    %x'48000364',%x'00472839',%x'03640300',%x'28394800',
;   0180  1                    %x'03000047',%x'48000364',%x'00472839',%x'03640300',
;   0181  1                    %x'28394800',%x'03000047',%x'48000364',%x'00472839',
;   0182  1                    %x'03640300',%x'28394800',%x'03000047',%x'48000364'),
;   0183  1                    rep 1 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',
;   0184  1                    %x'48000364',%x'00472839',%x'03640300',%x'16EC4800',
;   0185  1                    %x'03040470',%x'04525924',%x'047096F2',%x'C120A303',
;   0186  1                    %x'28399801',%x'03000047',%x'48000364',%x'00472839',
;   0187  1                    %x'03640300',%x'28394800',%x'03000047',%x'48000364'),
;   0188  1                    rep 1 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',
;   0189  1                    %x'48000364',%x'5DB03038',%x'59240200',%x'96F48E01',
;   0190  1                    %x'A3008470',%x'1801C120',%x'387032EE',%x'03640308',
;   0191  1                    %x'3339CE40',%x'03000470',%x'48000364',%x'00472839',
;   0192  1                    %x'03640300',%x'28394800',%x'03000047',%x'48000364'),
;   0193  1                    rep 2 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',           !G:2
;   0194  1                    %x'48000364',%x'00472839',%x'03640300',%x'28394800',                     !G:2
;   0195  1                    %x'03000047',%x'48000364',%x'00472839',%x'03640300',                     !G:2
;   0196  1                    %x'28394800',%x'03000047',%x'48000364',%x'00472839',                     !G:2
;   0197  1                    %x'03640300',%x'28394800',%x'03000047',%x'48000364'),                    !G:2
;   0198  1                    rep 1 of (%x'00472839',%x'03640300',%x'168A4800',%x'03400470',           !G:2
;   0199  1                    %x'08405B70',%x'0470168C',%x'5B240140',%x'167E0820',                     !G:2
;   0200  1                    %x'01400470',%x'C8433B70',%x'8470AAE1',%x'C1006F00',                     !G:2
;   0201  1                    %x'28399863',%x'03000047',%x'48000364',%x'00472839',                     !G:2
;   0202  1                    %x'03640300',%x'28394800',%x'03000047',%x'48000364'),                    !G:2
;   0203  1                    rep 13 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',          !G:2
;   0204  1                    %x'48000364',%x'00472839',%x'03640300',%x'28394800',                     !G:2
;   0205  1                    %x'03000047',%x'48000364',%x'00472839',%x'03640300',                     !G:2
;   0206  1                    %x'28394800',%x'03000047',%x'48000364',%x'00472839',                     !G:2
;   0207  1                    %x'03640300',%x'28394800',%x'03000047',%x'48000364'),                    !G:2
;   0208  1                    rep 1 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',           !G:2
;   0209  1                    %x'48000364',%x'00472839',%x'03640300',%x'28394800',                     !G:2
;   0210  1                    %x'03000047',%x'48000364',%x'00472839',%x'03640300',                     !G:2
;   0211  1                    %x'28394800',%x'03000047',%x'48000364',%x'04702B22',                     !G:2
;   0212  1                    %x'5B240140',%x'28390820',%x'03000047',%x'48000364'),                    !G:2
;   0213  1                    rep 17 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',          !G:2
;   0214  1                    %x'48000364',%x'00472839',%x'03640300',%x'28394800',
;   0215  1                    %x'03000047',%x'48000364',%x'00472839',%x'03640300',
;   0216  1                    %x'28394800',%x'03000047',%x'48000364',%x'00472839',
;   0217  1                    %x'03640300',%x'28394800',%x'03000047',%x'48000364'),
```

```
;    0218  1                    rep 1 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',
;    0219  1                    %x'48000364',%x'00472839',%x'03640300',%x'28B14800',
;    0220  1                    %x'03D80470',%x'086D03A4',%x'54E0158D',%x'C9240302',
;    0221  1                    %x'28AE9812',%x'03010470',%x'186CC538',%x'00472839',
;    0222  1                    %x'03640300',%x'158C4800',%x'03010470',%x'D86CC524'),
;    0223  1                    rep 5 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',
;    0224  1                    %x'48000364',%x'00472839',%x'03640300',%x'28394800',
;    0225  1                    %x'03000047',%x'48000364',%x'00472839',%x'03640300',
;    0226  1                    %x'28394800',%x'03000047',%x'48000364',%x'00472839',
;    0227  1                    %x'03640300',%x'28394800',%x'03000047',%x'48000364'),
;    0228  1                    rep 1 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',
;    0229  1                    %x'48000364',%x'0470284C',%x'C5380301',%x'15BD186C',
;    0230  1                    %x'03010470',%x'586CC524',%x'05F0284D',%x'59240338',
;    0231  1                    %x'15BA085B',%x'03000420',%x'48000364',%x'04703FC4',
;    0232  1                    %x'C3700B01',%x'15BB186B',%x'0301CBF0',%x'181BC138'),
;    0233  1                    rep 17 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',        !G:2
;    0234  1                    %x'48000364',%x'00472839',%x'03640300',%x'28394800',                   !G:2
;    0235  1                    %x'03000047',%x'48000364',%x'00472839',%x'03640300',                   !G:2
;    0236  1                    %x'28394800',%x'03000047',%x'48000364',%x'00472839',                   !G:2
;    0237  1                    %x'03640300',%x'28394800',%x'03000047',%x'48000364'),                  !G:2
;    0238  1                    rep 1 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',         !G:2
;    0239  1                    %x'48000364',%x'4A702FD0',%x'C1020308',%x'2839561B',                   !G:2
;    0240  1                    %x'03000047',%x'48000364',%x'00472839',%x'03640300',                   !G:2
;    0241  1                    %x'28394800',%x'03000047',%x'48000364',%x'00472839',                   !G:2
;    0242  1                    %x'03640300',%x'28394800',%x'03000047',%x'48000364'),                  !G:2
;    0243  1                    rep 4 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',         !G:2
;    0244  1                    %x'48000364',%x'00472839',%x'03640300',%x'28394800',                   !G:2
;    0245  1                    %x'03000047',%x'48000364',%x'00472839',%x'03640300',                   !G:2
;    0246  1                    %x'28394800',%x'03000047',%x'48000364',%x'00472839',                   !G:2
;    0247  1                    %x'03640300',%x'28394800',%x'03000047',%x'48000364'),                  !G:2
;    0248  1                    rep 1 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',         !G:2
;    0249  1                    %x'48000364',%x'047014F3',%x'59E40002',%x'14F6C857',                   !G:2
;    0250  1                    %x'66008530',%x'5600AF71',%x'00472839',%x'03640300',                   !G:2
;    0251  1                    %x'28394800',%x'03000047',%x'48000364',%x'047014F8',                   !G:2
;    0252  1                    %x'00A0A700',%x'14F8C812',%x'A3000470',%x'881200A0'),                  !G:2
;    0253  1                    rep 1 of (%x'047038E8',%x'03646700',%x'38E88800',%x'64D85870',         !G:2
;    0254  1                    %x'88008164',%x'00472839',%x'03640300',%x'28394800',                   !G:2
;    0255  1                    %x'03000047',%x'48000364',%x'00472839',%x'03640300',                   !G:2
;    0256  1                    %x'28394800',%x'03000047',%x'48000364',%x'00472839',                   !G:2
;    0257  1                    %x'03640300',%x'28394800',%x'03000047',%x'48000364'),                  !G:2
;    0258  1                    rep 1 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',         !G:2
;    0259  1                    %x'48000364',%x'00472839',%x'03640300',%x'28394800',
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;    0265  1                    %x'A3010470',%x'D80BC100',%x'047014AC',%x'03640300',
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;    0268  1                    rep 1 of (%x'04709492',%x'C920A705',%x'1494D80B',%x'03D86070',
;    0269  1                    %x'48005BE4',%x'04701491',%x'C5240302',%x'14AC986C',
;    0270  1                    %x'03010470',%x'D86BC370',%x'04709496',%x'C920A310',
;    0271  1                    %x'149A180C',%x'03004870',%x'C81A5924',%x'047014A1',
;    0272  1                    %x'03640300',%x'9498C800',%x'A3008470',%x'D80BC920'),
;    0273  1                    rep 1 of (%x'0470149B',%x'59240338',%x'54A3885B',%x'03000470',
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;   0275  1                                  %x'03D84A70',%x'881A0010',%x'4A7054A3',%x'C1100302',
;   0276  1                                  %x'149ED81A',%x'03384A70',%x'88005BE4',%x'4870149F',
;   0277  1                                  %x'59240300',%x'14A0C81A',%x'03000470',%x'48000364'),
;   0278  1                                  rep 1 of (%x'04703FC0',%x'03640F00',%x'54A34800',%x'03010470',
;   0279  1                                  %x'186CC538',%x'0470003F',%x'03640B00',%x'14A40800',
;   0280  1                                  %x'03000570',%x'48000364',%x'E87014A5',%x'CB700301',
;   0281  1                                  %x'14A69800',%x'03006470',%x'086B0364',%x'607014A7',
;   0282  1                                  %x'CB700305',%x'14A89800',%x'03D85070',%x'481B5BE4'),
;   0283  1                                  rep 1 of (%x'E07014A9',%x'CB700306',%x'14AA9800',%x'03D85070',
;   0284  1                                  %x'C81B5BE4',%x'607014AB',%x'59240300',%x'3FC1480B',
;   0285  1                                  %x'0B000470',%x'88000364',%x'647014AD',%x'03640300',
;   0286  1                                  %x'343AC869',%x'A7040470',%x'5809C920',%x'00472839',
;   0287  1                                  %x'03640300',%x'28394800',%x'03000047',%x'48000364'),
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;   0289  1                                  %x'48000364',%x'00472839',%x'03640300',%x'28394800',                    !G:2
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;   0292  1                                  %x'03640300',%x'28394800',%x'03000047',%x'48000364'),                   !G:2
;   0293  1                                  rep 1 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',          !G:2
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;   0295  1                                  %x'03000047',%x'48000364',%x'00472839',%x'03640300',                    !G:2
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;   0297  1                                  %x'03640300',%x'28394800',%x'03000047',%x'48000364'),                   !G:2
;   0298  1                                  rep 9 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',          !G:2
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;   0301  1                                  %x'28394800',%x'03000047',%x'48000364',%x'00472839',
;   0302  1                                  %x'03640300',%x'28394800',%x'03000047',%x'48000364'),
;   0303  1                                  rep 1 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',
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;   0306  1                                  %x'28394800',%x'03000047',%x'48000364',%x'84703031',                    !G:2
;   0307  1                                  %x'DB240331',%x'28395862',%x'03000047',%x'48000364'),                   !G:2
;   0308  1                                  rep 1 of (%x'00472839',%x'03640300',%x'28394800',%x'03000047',
;   0309  1                                  %x'48000364',%x'00472839',%x'03640300',%x'28394800',
;   0310  1                                  %x'03000047',%x'48000364',%x'00472839',%x'03640300',
;   0311  1                                  %x'28394800',%x'03000047',%x'48000364',%x'00472839',
;   0312  1                                  %x'03640300',%x'28394800',%x'03000047',%x'48000364')) : patchvector[4096] weak;
;   0313  1
;   0314  1     END                                  ! End of PCSDATA module
;   0315  0     ELUDOM


                                                                .TITLE  PCSDATA *** PCSDATA patch bits and microwords
                                                                .IDENT  \06-01\

                                                                .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                  41  54  41  44  53  43  50  07  00000 P.AAA:  .ASCII  <7>\PCSDATA\                                ;
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                                      FFFFFFFF# 00028         .LONG   -1[30]                                       ;
                                      FFFFDFFF  000A0         .LONG   -8193                                        ;
                                      FFFFFFFF# 000A4         .LONG   -1[24]                                       ;
                                      FFFFFFDF  00104         .LONG   -33                                          ;
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                                      FFFFBFFF  00190         .LONG   -16385                                       ;
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                                                FFFFFFFF  00194          .LONG   -1[5]                                                   ;
                                                FFFBFFFF  001A8          .LONG   -262145                                                 ;
                                                FFFFFBFF  001AC          .LONG   -1025                                                   ;
                                                FFFFFFFF  001B0          .LONG   -1[11]                                                  ;
                                                F7FFFFFF  001DC          .LONG   -134217729                                              ;
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                                                DFFFFFFF  001F4          .LONG   -536870913                                              ;
                                                FFFFFFFF  001F8          .LONG   -1                                                      ;
                                                FFFFFFFD  001FC          .LONG   -3                                                      ;
                                                FFFFFFFF  00200          .LONG   -1[26]                                                  ;
                                                FFFFF5FF  00268          .LONG   -2561                                                   ;
                                                FFFFFFFF  0026C          .LONG   -1[20]                                                  ;
                                                F7FFFFFF  002BC          .LONG   -134217729                                              ;
                                                FFFFFFFF  002C0          .LONG   -1                                                      ;
                                                FBFFFFFF  002C4          .LONG   -67108865                                               ;
                                                FFFFFFF7  002C8          .LONG   -9                                                      ;
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                                                7FFFFFFF  002D8          .LONG   2147483647                                              ;
                                                FFFFFFFF  002DC          .LONG   -1[75]                                                  ;
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                                                                                 56886016, 790120448, -1283879312, -                     ;
                                                                                 -1035969756                                             ;
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00472839  48000364  03000047  28394800  03640300  00472839  02B18         .LONG   4663353, 56886016, 674842624, 50331719, -   ;
03640300  00472839  48000364  03000047  28394800  03640300  02B30                 1207960420, 4663353, 56886016, 674842624, - ;
28394800  03640300  00472839  48000364  03000047  28394800  02B48                 50331719, 1207960420, 4663353, 56886016, -  ;
                                        48000364  03000047  02B60                 674842624, 50331719, 1207960420, 4663353, - ;
                                                                                  56886016, 674842624, 50331719, 1207960420   ;
00472839  48000364  03000047  28394800  03640300  00472839  02B68         .LONG   4663353, 56886016, 674842624, 50331719, -   ;
03640300  00472839  48000364  03000047  28394800  03640300  02B80                 1207960420, 4663353, 56886016, 674842624, - ;
28395862  DB240331  84703031  48000364  03000047  28394800  02B98                 50331719, 1207960420, 4663353, 56886016, -  ;
                                        48000364  03000047  02BB0                 674842624, 50331719, 1207960420, -          ;
                                                                                  -2073022415, -618396879, 674846818, -       ;
                                                                                  50331719, 1207960420                        ;
00472839  48000364  03000047  28394800  03640300  00472839  02BB8         .LONG   4663353, 56886016, 674842624, 50331719, -   ;
03640300  00472839  48000364  03000047  28394800  03640300  02BD0                 1207960420, 4663353, 56886016, 674842624, - ;
28394800  03640300  00472839  48000364  03000047  28394800  02BE8                 50331719, 1207960420, 4663353, 56886016, -  ;
                                        48000364  03000047  02C00                 674842624, 50331719, 1207960420, 4663353, - ;
                                                                                  56886016, 674842624, 50331719, 1207960420   ;
```

```
                                                    $MODULE=            P.AAA
                                                    DS$GA_PATCH_BIT==   P.AAB
                                                    DS$GA_PATCH_UWD==   P.AAC


;                                  PSECT SUMMARY
;
;       Name                     Bytes                        Attributes
;
;  DATA                            11272  NOVEC,NOWRT,  RD ,NOEXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)



Symbol            Type  Defined  Referenced ...
--------------- -------- ----- ---------------
$ER             Comptime   106
$MODULE         Bind       106
DS$GA_PATCH_BIT GlobBind   109
DS$GA_PATCH_UWD GlobBind   137
MODNAM          Macro    Lib02   106
PATCHVECTOR     Structur Lib02   312


                CROSS REFERENCE MAP

Line #      Event          File ...
-----  ---------------  ---------
    1  Source (start)   DISK$DS:[DS.LOCAL.RELEASE.WORK]PCSDATA.B32;1
    6  Module PCSDATA
   73  Library #1       DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
   76  Library #2       DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
   79  Library #3       DISK$DS:[DS.LOCAL.RELEASE.WORK]CRD.L32;1
   82  Library #4       SYS$COMMON:[SYSLIB]LIB.L32;3
  315  Eludom PCSDATA


        KEY TO REFERENCE TYPE FLAGS

            .   Fetch
            =   Store
            c   Routine call
            a   Address use
            @   Indirect use
            e   External, external routine, or external literal declaration
            f   Forward or forward routine declaration
            h   Condition handler enabling
            m   Map declaration
            u   Undeclare declaration


;                              Library Statistics
;
;                                        -------- Symbols --------      Pages       Processing
```

```
;       File                                    Total    Loaded   Percent      Mapped      Time
;
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
;                                                942         0         0          96      00:00.0
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
;                                                675         2         0          47      00:00.0
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]CRD.L32;1
;                                                486         0         0          62      00:00.0
;  SYS$COMMON:[SYSLIB]LIB.L32;3                21522         0         0        1156      00:01.0




;                                       COMMAND QUALIFIERS

;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:PCSDATA.B32

; Size:         0 code + 11272 data bytes
; Run Time:        00:04.0
; Elapsed Time:    00:06.9
; Lines/CPU Min:    4725
; Lexemes/CPU-Min: 54210
; Memory Used:  61 pages
; Compilation Complete
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element PCSLOAD750.B32
;    0002  0      ! *1     6-FEB-1986 15:21:44 DS ""
;    0003  0      ! DEC/CMS REPLACEMENT HISTORY, Element PCSLOAD750.B32
;    0004  0      %TITLE 'PCSLOAD750 Module'
;    0005  0      MODULE PCSLOAD750 (                    ! loads PCS microcode into COMET
;    0006  0                         IDENT = '06-03'
;    0007  0                         ) =
;    0008  0      !++
;    0009  0      ! COPYRIGHT (c) 1980, 1981, 1983, 1984
;    0010  0      ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
;    0011  0      !
;    0012  0      ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
;    0013  0      ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
;    0014  0      ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
;    0015  0      ! MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
;    0016  0      ! EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
;    0017  0      ! TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
;    0018  0      ! REMAIN IN DEC.
;    0019  0      !
;    0020  0      ! THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
;    0021  0      ! AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
;    0022  0      ! CORPORATION.
;    0023  0      !
;    0024  0      ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
;    0025  0      ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
;    0026  0      !-
```

```
;    0028  0      !++
;    0029  0      ! Facility:
;    0030  0      !
;    0031  0      !       Diagnostic Supervisor
;    0032  0      !
;    0033  0      ! Abstract:
;    0034  0      !
;    0035  0      !       This module loads the PCS microcode, which is contained in the
;    0036  0      !       PCSDATA module, into the PCS RAMs. The "PCS" consists of two parts:
;    0037  0      !       1) Patch bits, which indicate if a corresponding microword is patched,
;    0038  0      !       and 2) Patch microwords, which contain the actual patch.
;    0039  0      !
;    0040  0      ! Author:
;    0041  0      !
;    0042  0      !       Bob Bergazzi
;    0043  0      !
;    0044  0      ! Creation Date:
;    0045  0      !
;    0046  0      !       22-Nov-1982
;    0047  0      !
;    0048  0      ! Version:
;    0049  0      !
;    0050  0      !       6.10
;    0051  0      !
;    0052  0      ! Modified By:
;    0053  0      !
;    0054  0      !       01      Bob Bergazzi    May 17, 1983    Version 6.11
;    0055  0      !               Changed the order of searching libraries.
;    0056  0      !
;    0057  0      !       02      Bob Bergazzi    Oct. 21, 1983   Version 6.13
;    0058  0      !               Added INITPCS command routine, DSV$INITPCS
;    0059  0      !
;    0060  0      !       03      Bob Bergazzi    Mar. 1, 1984    Version 7.0
;    0061  0      !               Changed module name to PCSLOAD750
;    0062  0      !--
```

```
;    0064  0     %SBTTL  'Libraries'
;    0065  1     BEGIN                           ! Begin the Module_Name module
;    0066  1
;    0067  1     LIBRARY
;    0068  1             '$Diag';                ! Use Diag.L32 first
;    0069  1
;    0070  1     LIBRARY
;    0071  1             '$DS';                  ! Use Ds.L32 second
;    0072  1
;    0073  1     LIBRARY
;    0074  1             '$CRD';                 ! Use CRD.L32 third
;    0075  1
;    0076  1     LIBRARY
;    0077  1             'Sys$Library:Lib';      ! Use Lib as last resort
```

```
;    0079  1     %SBTTL  'Table of Contents'
;    0080  1
;    0081  1     forward routine
;    0082  1         dsx$loadpcs,                        ! Interface to calling routine
;    0083  1         pcs$check,                          ! Verify COMET and existence of PCS
;    0084  1         pcs$load$pbits : novalue,                   ! Load the patch bits
;    0085  1         pcs$load$uwds : novalue,                    ! Load the microwords
;    0086  1         dsv$initpcs : novalue;              ! Init the PCS                          [02]
;    0087  1
;    0088  1     external
;    0089  1         ds$ga_patch_bit : bitvector[8192] addressing_mode (long_relative),
;    0090  1         ds$ga_patch_uwd : patchvector[4096] addressing_mode (long_relative);
;    0091  1
;    0092  1     bind
;    0093  1         pcs_select_reg = %X'00F0C000' : long;
```

```
;    0095  1     %SBTTL  'Psect Definitions'
;    0096  1
;    0097  1     PSECT
;    0098  1         PLIT    = Data (NOEXECUTE,   SHARE, NOWRITE, ADDRESSING_MODE (LONG_RELATIVE));
;    0099  1
;    0100  1     PSECT
;    0101  1         CODE    = Code (  EXECUTE,   SHARE, NOWRITE, ADDRESSING_MODE (WORD_RELATIVE));
;    0102  1
;    0103  1     PSECT
;    0104  1         OWN     = Work (NOEXECUTE, NOSHARE,   WRITE, ADDRESSING_MODE (LONG_RELATIVE));
;    0105  1
;    0106  1     PSECT
;    0107  1         GLOBAL  = Work (NOEXECUTE, NOSHARE,   WRITE, ADDRESSING_MODE (LONG_RELATIVE));
```

```
;   0109  1     %SBTTL  'PCSLOAD750-Static Storage'
;   0110  1
;   0111  1             ModNam ('PCSLOAD750');          ! Module name for ErrSup macro
```

```
;    0113  1     %SBTTL 'DSX$LOADPCS Routine'
;    0114  1
;    0115  1     global routine dsx$loadpcs =
;    0116  1
;    0117  1     !++
;    0118  1     ! Functional Description:
;    0119  1     !
;    0120  1     !       This routine controls the loading of the PCS. It calls pcs$check, pcs$load$pbits,
;    0121  1     !       and pcs$load$uwds to perform the work, and returns a status code to the user.
;    0122  1     !       Loading the patch bits must be done before loading the microwords because doing it
;    0123  1     !       vice versa causes a microword to be corrupted.
;    0124  1     !
;    0125  1     ! Formal Input Parameters:
;    0126  1     !
;    0127  1     !       None
;    0128  1     !
;    0129  1     ! Formal Output Parameters:
;    0130  1     !
;    0131  1     !       None
;    0132  1     !
;    0133  1     ! Side Effects:
;    0134  1     !
;    0135  1     !       None
;    0136  1     !
;    0137  1     ! Completion Codes:
;    0138  1     !
;    0139  1     !       ds$_normal      - Service successfully completed.
;    0140  1     !       ds$_nopcs       - PCS not available on this cpu.
;    0141  1     !--
```

```
;   0143  2     begin                                   ! routine dsx$loadpcs
;   0144  2     if (not pcs$check()) then return ds$_nopcs;
;   0145  2     pcs$load$pbits();
;   0146  2     pcs$load$uwds();
;   0147  2     return ds$_normal
;   0148  1     end;                                    ! routine dsx$loadpcs


                                                                    .TITLE  PCSLOAD750 PCSLOAD750 Module
                                                                    .IDENT  \06-03\

                                                                    .PSECT  DATA,NOWRT,NOEXE,  SHR,2

            30  35  37  44  41  4F  4C  53  43  50  0A  00000 P.AAA:  .ASCII  <10>\PCSLOAD750\                          ;

                                                          PCS_SELECT_REG=     15777792
                                                          $MODULE=            P.AAA
                                                                    .EXTRN  DS$GA_PATCH_BIT
                                                                    .EXTRN  DS$GA_PATCH_UWD

                                                                    .PSECT  CODE,NOWRT,  SHR,2

                                                 0000 00000         .ENTRY  DSX$LOADPCS, Save nothing                  ; 0115
                        0000V  CF            00  FB 00002         CALLS   #0, PCS$CHECK                              ; 0144
                               08            50  E8 00007         BLBS    R0, 1$                                     ;
                               50 00660110   8F  D0 0000A         MOVL    #6684944, R0                               ;
                                                04 00011         RET                                                ;
                        0000V  CF            00  FB 00012 1$:     CALLS   #0, PCS$LOAD$PBITS                         ; 0145
                        0000V  CF            00  FB 00017         CALLS   #0, PCS$LOAD$UWDS                          ; 0146
                               50 00660001   8F  D0 0001C         MOVL    #6684673, R0                               ; 0147
                                                04 00023         RET                                                ;

; Routine Size:  36 bytes,    Routine Base:  CODE + 0000
```

```
;    0150  1     %SBTTL 'PCS$CHECK Routine'
;    0151  1
;    0152  1     routine pcs$check =
;    0153  1
;    0154  1     !++
;    0155  1     ! Functional Description:
;    0156  1     !
;    0157  1     !       This routine checks if running on a COMET by examining the processor SID register which
;    0158  1     !       was stored in dsa$gl_sid. If running on a COMET then the same register is examined in
;    0159  1     !       order to determine if a PCS is present. A microcode level of 95 or greater indicates that
;    0160  1     !       PCS is present.
;    0161  1     !
;    0162  1     ! Formal Input Parameters:
;    0163  1     !
;    0164  1     !       None
;    0165  1     !
;    0166  1     ! Formal Output Parameters:
;    0167  1     !
;    0168  1     !       None
;    0169  1     !
;    0170  1     ! Side Effects:
;    0171  1     !
;    0172  1     !       None
;    0173  1     !
;    0174  1     ! Completion Codes:
;    0175  1     !
;    0176  1     !       ds$_normal      - This is a COMET and PCS is present.
;    0177  1     !       ds$_error       - This is not a COMET or it is a COMET but PCS is not present.
;    0178  1     !--
```

```
;   0180  2     begin                                   ! routine pcs$check
;   0181  2
;   0182  2     $ds_dsadef
;   0183  2
;   0184  2     map
;   0185  2             dsa$gl_sid : block;
;   0186  2
;   0187  2     literal
;   0188  2         microcode_level = 95;
;   0189  2
;   0190  3     if (.dsa$gl_sid[pr$v_sid_type] eql pr$_sid_typ750) and (.dsa$gl_sid<8,8> geq microcode_level)
;   0191  2         then return ds$_normal
;   0192  2         else return ds$_error
;   0193  2
;   0194  1     end;                                    ! routine pcs$check


                                                        DSA$AL_APTMAIL=     65024
                                                        DSA$GL_FLAGS=       65024
                                                        DSA$GL_APTCOM=      65028
                                                        DSA$GL_PASSES=      65032
                                                        DSA$GL_UNITS=       65036
                                                        DSA$GL_SECTNO=      65040
                                                        DSA$GL_SID=         65044
                                                        DSA$GL_MSGTYP=      65088
                                                        DSA$GL_ERRNO=       65092
                                                        DSA$GL_EVENT=       65096
                                                        DSA$GL_SUBTNO=      65100
                                                        DSA$GL_TESTNO=      65104
                                                        DSA$GL_PASSNO=      65108
                                                        DSA$GL_DEVLEN=      65112
                                                        DSA$GL_DEVNAM=      65116
                                                        DSA$GL_MSGPTR=      65128


                                  0000 00000 PCS$CHECK:
                                                        .WORD   Save nothing                        ; 0152
                     02 0000FE17   9F  91 00002         CMPB    a#^X0000FE17, #2                    ; 0190
                                   12  12 00009         BNEQ    1$                                  ;
                5F   8F 0000FE15   9F  91 0000B         CMPB    a#^X0000FE15, #95                   ;
                                   08  1F 00013         BLSSU   1$                                  ;
                     50 00660001   8F  D0 00015         MOVL    #6684673, R0                        ; 0191
                                       04 0001C         RET                                         ;
                     50 00660002   8F  D0 0001D 1$:     MOVL    #6684674, R0                        ; 0192
                                       04 00024         RET                                         ;

; Routine Size:  37 bytes,    Routine Base:  CODE + 0024
```

```
;    0196  1     %SBTTL 'PCS$LOAD$PBITS Routine'
;    0197  1
;    0198  1     routine pcs$load$pbits : novalue =
;    0199  1
;    0200  1     !++
;    0201  1     ! Functional Description:
;    0202  1     !
;    0203  1     !       This routine loads the patch bits. First, enable for writing the patch bit area by
;    0204  1     !       setting bit 0 of location %X'00F0C000' to a one. Then, copy one bit at a time from
;    0205  1     !       location ds$ga_patch_bit to bit 0 of successive longwords beginning at %X'00F00000'
;    0206  1     !       and ending at %X'00F07FFC'.
;    0207  1     !
;    0208  1     ! Formal Input Parameters:
;    0209  1     !
;    0210  1     !       None
;    0211  1     !
;    0212  1     ! Formal Output Parameters:
;    0213  1     !
;    0214  1     !       None
;    0215  1     !
;    0216  1     ! Side Effects:
;    0217  1     !
;    0218  1     !       None
;    0219  1     !
;    0220  1     ! Completion Codes:
;    0221  1     !
;    0222  1     !       None
;    0223  1     !--
```

```
;   0225  2     begin                                   ! routine pcs$load$pbits
;   0226  2
;   0227  2     bind
;   0228  2         pcs_patch_store = %X'00F00000' : vector[8192,long];
;   0229  2
;   0230  2     pcs_select_reg = %X'00000001';                                  ! enable for loading the patch bits
;   0231  2
;   0232  2     incr i from 0 to 8191 do                                        ! load the patch bits
;   0233  2         pcs_patch_store[.i] = .ds$ga_patch_bit[.i]
;   0234  2
;   0235  1     end;                                    ! routine pcs$load$pbits


                                                        PCS_PATCH_STORE=    15728640


                                                  0000 00000 PCS$LOAD$PBITS:
                                                                  .WORD   Save nothing                                  ; 0198
                        00F0C000   9F            01  D0 00002         MOVL    #1, a#^X00F0C000                             ; 0230
                                                 50  D4 00009         CLRL    I                                            ; 0232
                     51            50            02  78 0000B 1$:     ASHL    #2, I, R1                                    ; 0233
00F00000   E1 00000000G  EF        01            50  EF 0000F         EXTZV   I, #1, DS$GA_PATCH_BIT, 15728640(R1)         ;
                     E7            50 00001FFF   8F  F3 0001C         AOBLEQ  #8191, I, 1$                                 ;
                                                     04 00024         RET                                                  ; 0235

; Routine Size:  37 bytes,    Routine Base:  CODE + 0049
```

```
;    0237  1      %SBTTL 'PCS$LOAD$uWDS Routine'
;    0238  1
;    0239  1      routine pcs$load$uwds : novalue =
;    0240  1
;    0241  1      !++
;    0242  1      ! Functional Description:
;    0243  1      !
;    0244  1      !       This routine loads the microwords and enables the PCS. First, enable for writing the patch
;    0245  1      !       microwords by setting bit 0 at location %X'00F0C000' to zero. Then copy 20 bits at a time
;    0246  1      !       from ds$ga_patch_uwd to successive longwords beginning at %X'00F08000 and ending at
;    0247  1      !       %X'00F0BFFC'. When the last 20 bits are copied, also set bit 20, which turns on the PCS.
;    0248  1      !
;    0249  1      ! Formal Input Parameters:
;    0250  1      !
;    0251  1      !       None
;    0252  1      !
;    0253  1      ! Formal Output Parameters:
;    0254  1      !
;    0255  1      !       None
;    0256  1      !
;    0257  1      ! Side Effects:
;    0258  1      !
;    0259  1      !       None
;    0260  1      !
;    0261  1      ! Completion Codes:
;    0262  1      !
;    0263  1      !       None
;    0264  1      !--
```

```
;   0266  2     begin                                   ! routine pcs$load$uwds
;   0267  2
;   0268  2     literal
;   0269  2         pcs_enable_bit = %x'00100000';
;   0270  2
;   0271  2     bind
;   0272  2         pcs_uword_store = %x'00F08000' : vector[4096,long];
;   0273  2
;   0274  2     pcs_select_reg = %x'00000000';                          ! enable for writing the microwords
;   0275  2
;   0276  2     incr i from 1 to 4095 do
;   0277  2         pcs_uword_store[.i] = .ds$ga_patch_uwd[.i];         ! load most of the microwords
;   0278  2
;   0279  3     pcs_uword_store[0] = (.ds$ga_patch_uwd[0] or pcs_enable_bit)   ! load the last microword and enable the PCS
;   0280  3
;   0281  1     end;                                    ! routine pcs$load$uwds


                                                        PCS_UWORD_STORE=    15761408


                                                 001C 00000 PCS$LOAD$UWDS:
                                                                  .WORD   Save R2,R3,R4                                  ; 0239
                                  54 00000000G  EF  9E 00002      MOVAB   DS$GA_PATCH_UWD, R4                            ;
                                     00F0C000   9F  D4 00009      CLRL    @#^X00F0C000                                   ; 0274
                                  50            01  D0 0000F      MOVL    #1, I                                          ; 0276
                        52        50            02  78 00012 1$:  ASHL    #2, I, R2                                      ; 0277
                        51        50            08  C7 00016      DIVL3   #8, I, R1                                      ;
                                  51            14  C4 0001A      MULL2   #20, R1                                        ;
          7E            00        50            01  7A 0001D      EMUL    #1, I, #0, -(SP)                               ;
          53            53        8E            08  7B 00022      EDIV    #8, (SP)+, R3, R3                              ;
                                  53            14  C4 00027      MULL2   #20, R3                                        ;
00F08000  E2          6441        14            53  EF 0002A      EXTZV   R3, #20, DS$GA_PATCH_UWD[R1], 15761408(R2)     ;
                        D6        50 00000FFF   8F  F3 00034      AOBLEQ  #4095, I, 1$                                   ;
          50            64        14            00  EF 0003C      EXTZV   #0, #20, DS$GA_PATCH_UWD, R0                   ; 0279
             00F08000   9F        50 00100000   8F  C9 00041      BISL3   #1048576, R0, @#^X00F08000                     ;
                                                    04 0004D      RET                                                    ; 0281

; Routine Size:  78 bytes,    Routine Base:  CODE + 006E


;   0282  1
```

```
;    0284  1      %SBTTL 'DSV$INITPCS Routine'                    !                    begin   [02]
;    0285  1
;    0286  1      global routine dsv$initpcs : novalue =
;    0287  1
;    0288  1      !++
;    0289  1      ! Functional Description:
;    0290  1      !
;    0291  1      !       This routine is called by CLI in response to an INITPCS command. If we are running on an 11/750
;    0292  1      !       which has a PCS, the PCS microcode is read from the console TU58 in PCS750.BIN and overwritten
;    0293  1      !       onto the supervisor's on-board image of the PCS microcode. If the file is not on the TU58, then
;    0294  1      !       the supervisor's on board image remains the same. Then, whichever version of PCS microcode has
;    0295  1      !       been loaded into the supervisor, is loaded into the 11/750's PCS.
;    0296  1      !
;    0297  1      ! Formal Input Parameters:
;    0298  1      !
;    0299  1      !       None
;    0300  1      !
;    0301  1      ! Formal Output Parameters:
;    0302  1      !
;    0303  1      !       None
;    0304  1      !
;    0305  1      ! Side Effects:
;    0306  1      !
;    0307  1      !       None
;    0308  1      !
;    0309  1      ! Completion Codes:
;    0310  1      !
;    0311  1      !       None
;    0312  1      !--
```

```
;   0314  2     begin
;   0315  2
;   0316  2     external routine
;   0317  2         dsr$completion : jsb_0;
;   0318  2
;   0319  2     bind
;   0320  2         pcsfile = %ascid 'CSA0:PCS750.BIN';
;   0321  2
;   0322  2     local
;   0323  2         status;
;   0324  2
;   0325  2     own
;   0326  2         pcs_length,
;   0327  2         pcs_attr;
;   0328  2
;   0329  3     if (not pcs$check())
;   0330  3         then $printi ($ascic ('?? This cpu does not have a PCS!/'))
;   0331  3         else begin
; P 0332  3             status = $ds_load (file=pcsfile, default=pcsfile, length=512*22, address=ds$ga_patch_bit,
;   0333  3                         retlen=pcs_length, retrec=pcs_attr);
;   0334  3             if .status then dsx$loadpcs ()
;   0335  3                        else dsr$completion (.status);
;   0336  3             end
;   0337  1     end;


                                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                                                        0000B           .BLKB   1
4E  49  42  2E  30  35  37  53  43  50  3A  30  41  53  43  0000C P.AAC:  .ASCII  \CSA0:PCS750.BIN\<0>                    ;
                                                    00  0001B                                                          ;
                                            010E000F    0001C P.AAB:    .LONG   17694735                                  ;
                                            00000000'   00020           .ADDRESS P.AAC                                    ;
6F  64  20  75  70  63  20  73  69  68  54  20  3F  3F  21  00024 P.AAD:  .ASCII  \!?? This cpu does not have a PCS!/\    ;
50  20  61  20  65  76  61  68  20  74  6F  6E  20  73  65  00033                                                          ;
                                        2F  21  53  43  00042                                                          ;

                                                                        .PSECT  WORK,NOEXE,2

                                                        00000 PCS_LENGTH:
                                                                        .BLKB   4
                                                        00004 PCS_ATTR:
                                                                        .BLKB   4

                                                              PCSFILE=          P.AAB
                                                                        .EXTRN  DSR$COMPLETION, DSX$PRINTI
                                                                        .EXTRN  DS$LOAD

                                                                        .PSECT  CODE,NOWRT,  SHR,2

                                                  0FFC 00000            .ENTRY  DSV$INITPCS, Save R2,R3,R4,R5,R6,R7,R8,R9,- ; 0286
                                                                                R10,R11                                   ;
                                  53 00000000'  EF  9E 00002            MOVAB   PCSFILE, R3                               ;
                            FF5A  CF            00  FB 00009            CALLS   #0, PCS$CHECK                             ; 0329
                                  0B            50  E8 0000E            BLBS    R0, 1$                                    ;
                                        08      A3  9F 00011            PUSHAB  P.AAD                                     ; 0330
```

```
                    00000000G  9F          01  FB 00014        CALLS   #1, a#DSX$PRINTI                    ;
                                               04 0001B        RET                                        ;
                                           01  DD 0001C 1$:    PUSHL   #1                                 ; 0333
                                 00000000'  EF  9F 0001E        PUSHAB  PCS_ATTR                           ;
                                 00000000'  EF  9F 00024        PUSHAB  PCS_LENGTH                         ;
                                 00000000G  EF  9F 0002A        PUSHAB  DS$GA_PATCH_BIT                    ;
                              7E     2C00   8F  3C 00030        MOVZWL  #11264, -(SP)                      ;
                                           53  DD 00035        PUSHL   R3                                 ;
                                           53  DD 00037        PUSHL   R3                                 ;
                    00000000G  9F          07  FB 00039        CALLS   #7, a#DS$LOAD                      ;
                              52           50  D0 00040        MOVL    R0, STATUS                         ;
                              06           52  E9 00043        BLBC    STATUS, 2$                         ; 0334
                        FEF9  CF           00  FB 00046        CALLS   #0, DSX$LOADPCS                    ;
                                               04 0004B        RET                                        ;
                              50           52  D0 0004C 2$:    MOVL    STATUS, R0                         ; 0335
                                        0000G  30 0004F        BSBW    DSR$COMPLETION                     ;
                                               04 00052        RET                                        ; 0337

; Routine Size:  83 bytes,    Routine Base:  CODE + 00BC


;   0338  1     end                                  ! end of pcsload750 module
;   0339  0     eludom




;                                  PSECT SUMMARY
;
;       Name                    Bytes                        Attributes
;
;  DATA                            70  NOVEC,NOWRT,  RD ,NOEXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  CODE                           271  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  WORK                             8  NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
```

Symbol	Type	Defined	Referenced ...
$ASCIC	Macro	Lib01	330
$DS_DSADEF	Macro	Lib01	182
$DS_LOAD	KeyWMacr	Lib01	332
$ER	Comptime	111	
$MODULE	Bind	111	
$PRINTI	Macro	Lib02	330
DS$GA_PATCH_BIT	External	89	233. 333a
DS$GA_PATCH_UWD	External	90	277. 279.
DS$LOAD	ExtRout	333	333c
DS$_ERROR	Literal	Lib01	192
DS$_NOPCS	Literal	Lib01	144
DS$_NORMAL	Literal	Lib01	147 191
DSA$AL_APTMAIL	Bind	182	182
DSA$GL_APTCOM	Bind	182	
DSA$GL_DEVLEN	Bind	182	
DSA$GL_DEVNAM	Bind	182	
DSA$GL_ERRNO	Bind	182	
DSA$GL_EVENT	Bind	182	
DSA$GL_FLAGS	Bind	182	
DSA$GL_MSGPTR	Bind	182	
DSA$GL_MSGTYP	Bind	182	
DSA$GL_PASSES	Bind	182	
DSA$GL_PASSNO	Bind	182	
DSA$GL_SECTNO	Bind	182	
DSA$GL_SID	Bind	182	185m 190
DSA$GL_SUBTNO	Bind	182	
DSA$GL_TESTNO	Bind	182	
DSA$GL_UNITS	Bind	182	
DSR$COMPLETION	ExtRout	317	335c
DSV$INITPCS	GlobRout	286	86f
DSX$LOADPCS	GlobRout	115	82f 334c
DSX$PRINTI	ExtRout	330	330c
I	Local	232	233.
	Local	276	277.
JSB_0	Linkage	Lib02	317
MICROCODE_LEVEL	Literal	188	190
MODNAM	Macro	Lib02	111
PATCHVECTOR	Structur	Lib02	90
PCS$CHECK	Routine	152	83f 144c 329c
PCS$LOAD$PBITS	Routine	198	84f 145c
PCS$LOAD$UWDS	Routine	239	85f 146c
PCSFILE	Bind	320	333a
PCS_ATTR	Own	327	333a
PCS_ENABLE_BIT	Literal	269	279
PCS_LENGTH	Own	326	333a
PCS_PATCH_STORE	Bind	228	233
PCS_SELECT_REG	Bind	93	230 274
PCS_UWORD_STORE	Bind	272	277 279
PR$V_SID_TYPE	Macro	Lib04	190
PR$_SID_TYP750	Literal	Lib04	190
STATUS	Local	323	332= 334. 335.

```
                CROSS REFERENCE MAP

Line #      Event          File ...
-----  ---------------  ---------
    1  Source (start)   DISK$DS:[DS.LOCAL.RELEASE.WORK]PCSLOAD750.B32;1
    5  Module PCSLOAD750
   68  Library #1       DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
   71  Library #2       DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
   74  Library #3       DISK$DS:[DS.LOCAL.RELEASE.WORK]CRD.L32;1
   77  Library #4       SYS$COMMON:[SYSLIB]LIB.L32;3
  339  Eludom PCSLOAD750


        KEY TO REFERENCE TYPE FLAGS

            .   Fetch
            =   Store
            c   Routine call
            a   Address use
            @   Indirect use
            e   External, external routine, or external literal declaration
            f   Forward or forward routine declaration
            h   Condition handler enabling
            m   Map declaration
            u   Undeclare declaration


;                              Library Statistics
;
;                                          -------- Symbols --------      Pages       Processing
;       File                               Total    Loaded   Percent      Mapped      Time
;
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
;                                            942         6         0         96         00:00.0
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
;                                            675         4         0         47         00:00.0
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]CRD.L32;1
;                                            486         0         0         62         00:00.0
;  SYS$COMMON:[SYSLIB]LIB.L32;3             21522         2         0       1156         00:01.0




;                                  COMMAND QUALIFIERS

;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:PCSLOAD750.B32

; Size:          271 code + 78 data bytes
; Run Time:         00:02.1
; Elapsed Time:     00:04.7
; Lines/CPU Min:     9549
; Lexemes/CPU-Min: 31042
; Memory Used:  83 pages
; Compilation Complete
```

Table of contents

(1)   196   Libraries, Macros, and Equated Symbols
(1)   225   Work Psect Declarations
(1)   338   Data Psect Declarations
(1)   356   DSV$SetPage Routine - Set terminal page size
(1)   412   DSV$ShowPage Routine - Show terminal page size
(1)   458   DSX$Type_Out Routine - Do actual print
(1)   698   DSX$Print Routine - Load type code byte
(1)   774   DSX$PrintX Routines - Extended print routines
(1)   944   DSX$Printrev Routine
(1)   1355   DSX$Deallocate Routine - Deallocates memory used in DSX$PRINTREV ;G:2
(1)   1400   DSX$CvtReg Routine - Mnemonic register conversion routine

```
0000    ; DEC/CMS REPLACEMENT HISTORY, Element PRINT.MAR
0000    ; *3    11-FEB-1988 13:40:30 MCCARRON "Changed copyright date etc."
0000    ; *2     8-FEB-1988 16:46:12 MCCARRON "Enhancement to printrev"
0000    ; *1     6-FEB-1986 15:21:48 DS ""
0000    ; DEC/CMS REPLACEMENT HISTORY, Element PRINT.MAR
0000            .TITLE  PRINT   *** PRINT Formatted print routines
0000            .IDENT  /10.11-3/                                                   ;G:3
0000            .NoShow Conditionals            ;                       [10]
0000
0000    ;
0000    ; Copyright (c) 1977, 1983, 1985, 1988                                      ;G:3
0000    ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    ;
0000    ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0000    ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
0000    ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
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0000    ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    ;--
```

```
                        0000     30 ;++
                        0000     31 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR
                        0000     32 ;
                        0000     33 ; ABSTRACT:
                        0000     34 ;
                        0000     35 ; ENVIRONMENT:
                        0000     36 ;
                        0000     37 ; AUTHOR:       TOM SOUTTER     10-NOV-77       VERSION 01
                        0000     38 ;
                        0000     39 ; MODIFICATIONS:
                        0000     40 ;
                        0000     41 ;       01      Roger Riggs     12-Jun-78
                        0000     42 ;               Added DSX$PRINTI similar to DSX$PRINTF but always prints even
                        0000     43 ;               in APT mode. Changed prefix on print routines to DSX$PRINTx
                        0000     44 ;
                        0000     45 ;       02      Roger Riggs     12-Jun-78
                        0000     46 ;               Added usermode cancel and setmode
                        0000     47 ;
                        0000     48 ;       03      Roger Riggs     1-OCT-1979
                        0000     49 ;               Changed W^ to L^ on DSA$GL_FLAGS references
                        0000     50 ;
                        0000     51 ;       04      Roger Riggs, 14-Jan-1979, Version 5.2
                        0000     52 ;               Added code to DSX$CVTREG to allow the user
                        0000     53 ;               to specify a code for the mnemonic string instead of
                        0000     54 ;               the string itself codes are used for transportabile
                        0000     55 ;               diagnostics and represent a generic type of data,
                        0000     56 ;               i.e. UNIBUS map register.
                        0000     57 ;
                        0000     58 ;       05      Dave Butenhof 29-apr-80
                        0000     59 ;               Use RMS for output if DS$V_BATCH flag is set (running
                        0000     60 ;               under VMS batch/command file).
                        0000     61 ;
                        0000     62 ;       06      Dave Butenhof, 16-oct-1980, version 6.1
                        0000     63 ;               Set flag DS$V_OUTPUT on PRINT call.
                        0000     64 ;               Also have print use stack buffer for FAO output to avoid
                        0000     65 ;               conflict with SCRIPT prompt formatting.
                        0000     66 ;
                        0000     67 ;       07      - Jack Stansbury, 28-Oct-1981, Version 6.-
                        0000     68 ;               Added .LIBRARY statements for $DS and $DIAG. Fixed
                        0000     69 ;               truncation errors.
                        0000     70 ;
                        0000     71 ;       08      - Dave Butenhof, 02-Nov-1981, version 6.-
                        0000     72 ;               Fix truncation error.
                        0000     73 ;
                        0000     74 ;       09      - Dave Butenhof, 16-Nov-1981, version 6.5
                        0000     75 ;               Enhance to provide capability of outputting a binary 'type
                        0000     76 ;               code' byte preceding each and every message output by the
                        0000     77 ;               Supervisor.  This is controlled by the SET [CLEAR] BINARY
                        0000     78 ;               command.
                        0000     79 ;
                        0000     80 ;       10      - Jack Stansbury, 23-Mar-1982, Version 6.?
                        0000     81 ;               Took out the RTypeMsg routine because it is now obselete
                        0000     82 ;               with typecoding and with the Print routine. Also added a
                        0000     83 ;               "!/" to the message output by the print routine when
                        0000     84 ;               Debug_The_Sucker has been set to one.
                        0000     85 ;
                        0000     86 ;       11      Jack Stansbury, 8-Apr-1982, Version 6.7
```

```
                                0000     87 ;               Added code to the DSX$TypeOut routine to call the CRD
                                0000     88 ;               routine. Also added a .Library statement for /$CRD/,
                                0000     89 ;               the new CRD library. Also changed some statements to
                                0000     90 ;               the new DS macros (Br_If_ ...).
                                0000     91 ;
                                0000     92 ;       12      Marion Baggett, 9-Apr-1982, Version 6.7
                                0000     93 ;               Ordered .library statements.
                                0000     94 ;
                                0000     95 ;       13      Jack Stansbury, 12-Apr-1982, Version 6.7
                                0000     96 ;               Changed the code in DSX$TypeOut a bit so that the CRD routine
                                0000     97 ;               is not called if the TypeCode is CRD_AutoTest. This allows CRD
                                0000     98 ;               Print's to go through without the CRD routine being called.
                                0000     99 ;
                                0000    100 ;       14      Jack Stansbury, 6-May-1982, Version 6.8
                                0000    101 ;               Added code in DSX$TypeOut to supress outputting the binary
                                0000    102 ;               typecode when CRD-AutoTest is running (which, in itself, implies
                                0000    103 ;               that the BINARY flag has been set on).
                                0000    104 ;
                                0000    105 ;       15      Jack Stansbury, 24-July-1982, Version 6.9
                                0000    106 ;               Added support for the Menu Test of CRD.
                                0000    107 ;
                                0000    108 ;       16      Bob Bergazzi    30-March-1983   Version 6.11
                                0000    109 ;               Added guts of SET PAGE command: DSV$SHOWPAGE, DSV$SETPAGE, and
                                0000    110 ;               in DSX$TYPE_OUT.
                                0000    111 ;
                                0000    112 ;       17      John Ciukaj,    2-Apr.-1983,    Version 6.11
                                0000    113 ;               - Changed references to CRD bits in DSA Flags since
                                0000    114 ;                 they were redefined to distinguish between online
                                0000    115 ;                 and offline.
                                0000    116 ;
                                0000    117 ;       18      Peter Green     18-JUL-1983     Version 6.12
                                0000    118 ;               Changed print macros to test R0 for status such that
                                0000    119 ;               on error an immediate exit occurs instead of attempting
                                0000    120 ;               to print the message.
                                0000    121 ;
                                0000    122 ;       19      Richard Brown   7-June-1984     Version 7.0
                                0000    123 ;               Added null arguments to SYS$QIO call in DSX$TYPE_OUT.
                                0000    124 ;               Changed channel number from TTIN to TTOUT in two $QIO
                                0000    125 ;               calls in DSX$TYPE_OUT, prompting for user response
                                0000    126 ;               to display next page of terminal output.
                                0000    127 ;
                                0000    128 ;       20      Ron Parker      21-Jan-1985
                                0000    129 ;               Added test for CRD online condition
                                0000    130 ;
                                0000    131 ;       21      Amy Iorio       15-Feb-1985     Version 8.1
                                0000    132 ;               Added routine for $DS_PRINTREV
                                0000    133 ;
                                0000    134 ;       22      Amy Iorio       18-Mar-1985     Version 8.2
                                0000    135 ;               Modified Printrev to work with error
                                0000    136 ;
                                0000    137 ;       23      Amy Iorio       27-Mar-1985     Version 8.2
                                0000    138 ;               Fix to Printrev (bits set and prlink print)
                                0000    139 ;
                                0000    140 ;       24      Ted Salem       8-April-1985    Version 8.2
                                0000    141 ;               Added code to interlock all print services.
                                0000    142 ;
                                0000    143 ;       25      Amy Iorio       18-April-1985   Version 8.2
```

```
0000    144 ;               Fix to Printrev (greaterbit and all bit)
0000    145 ;
0000    146 ;       26      Amy Iorio       17-May-1985     Version 8.2
0000    147 ;               Enhancement of Printrev; patch-level information
0000    148 ;               checked.
0000    149 ;
0000    150 ;       27      Amy Iorio       18-June-1985    Version 8.3
0000    151 ;               Fix to Printrev; recognize actual revision level
0000    152 ;               of zero.
0000    153 ;
0000    154 ;       28      Amy Iorio       16-Aug-1985     Version 8.3
0000    155 ;               Addition to Printrev of revision level statement.
0000    156 ;
0000    157 ;       29      Domenic Andelle 16-August-1984  Version 8.3
0000    158 ;               Made modification at DSX$PRINTX routines/print_x:
0000    159 ;               to skip jsb to kb_check if an mp system. This is
0000    160 ;               to eliminate repeating printouts from MP$_PRIMARY_
0000    161 ;               CPU_CHECK code that is called at each $DS_BREAK.
0000    162 ;
0000    163 ;       30      Amy Iorio       05-Sept-1985    Version 9.0
0000    164 ;               Made modification to DSX$PRINTREV in order to allow
0000    165 ;               more error messages for hardware revision levels to
0000    166 ;               print out.
0000    167 ;
0000    168 ;       31      Ted Salem       14-Oct-1985     Version 9.0
0000    169 ;               Modified DSX$PRINTREV so that a letter code will
0000    170 ;               be optionally printed for the hardware revision.
0000    171 ;
0000    172 ;       32      Ted Salem       15-Oct-1985     Version 9.0
0000    173 ;               Fixed the method in which the inhibit print
0000    174 ;               masks were being checked in DSX$PRINTREV
0000    175 ;
0000    176 ;       33      Ted Salem       16-Oct-1985     Version 9.0
0000    177 ;               Added code in DSX$PRINTREV to check to see if
0000    178 ;               module number exists on the argument stack.
0000    179 ;
0000    180 ;       34      Ted Salem       29-Oct-1985     Version 9.1
0000    181 ;               Put in bounds check and other error statuses.
0000    182 ;                                                               ;G:3
0000    183 ;               Paul McCarron   5-Feb-1988      Version 10.11   ;G:3
0000    184 ;               Changed DSX$PRINTREV to dynamically allocate     ;G:3
0000    185 ;               one date block for each device unit.            ;G:2
0000    186 ;                                                               ;G:2
0000    187 ;               Paul McCarron   5-Feb-1988      Version 10.11   ;G:3
0000    188 ;               Created a new routine called DSX$DEALLOCATE,    ;G:2
0000    189 ;               that deallocates the data blocks created by     ;G:3
0000    190 ;               DSX$PRINTREV.                                   ;G:2
0000    191 ;
0000    192 ;               Paul McCarron   11-Feb-1988     Version 10.11   ;G:3
0000    193 ;               Fixed copyright date etc.                       ;G:3
0000    194 ;--
```

```
                        0000    196          .Subtitle       Libraries, Macros, and Equated Symbols
                        0000    197 ;
                        0000    198 ; INCLUDE FILES:
                        0000    199 ;
                        0000    200          .Library        /Sys$Library:Lib/       ;                                [12]
                        0000    201          .Library        /$CRD/                  ; The CRD library                [11]
                        0000    202          .Library        /$DS/                   ;
                        0000    203          .Library        /$Diag/                 ;
                        0000    204 ;
                        0000    205 ; EXTERNAL REFERENCES:
                        0000    206 ;
                        0000    207 ;
                        0000    208 ; EQUATED SYMBOLS:
                        0000    209 ;
                        0000    210
                        0000    211          $SSDEF                                 ;                                [18]
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .RESTORE
                        0000    212          $DS_DSDEF                              ; DIAGNOSTIC SUPERVISOR ERROR CODES
                        0000    213          $DS_HPODEF                             ; Define HP$Q_DEVICE
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .IIF    NB,HP$Q_DEVICE, HP$Q_DEVICE:
00000008                0000                 .IIF    NB,.BLKQ,       .BLKQ   1
                        0008                 .IIF    NB,HP$W_SIZE,   HP$W_SIZE:
0000000A                0008                 .IIF    NB,.BLKW,       .BLKW   1
                        000A                 .IIF    NB,HP$B_FLAGS,  HP$B_FLAGS:
0000000B                000A                 .IIF    NB,.BLKB,       .BLKB   1
                        000B                 .IIF    NB,HP$B_DRIVE,  HP$B_DRIVE:
0000000C                000B                 .IIF    NB,.BLKB,       .BLKB   1
                        000C                 .IIF    NB,HP$T_DEVICE, HP$T_DEVICE:
00000018                000C                 .IIF    NB,.BLKB,       .BLKB   12
                        0018                 .IIF    NB,HP$A_DEVICE, HP$A_DEVICE:
0000001C                0018                 .IIF    NB,.BLKL,       .BLKL   1
                        001C                 .IIF    NB,HP$A_DVA,    HP$A_DVA:
00000020                001C                 .IIF    NB,.BLKL,       .BLKL   1
                        0020                 .IIF    NB,HP$A_LINK,   HP$A_LINK:
00000024                0020                 .IIF    NB,.BLKL,       .BLKL   1
                        0024                 .IIF    NB,HP$W_VECTOR, HP$W_VECTOR:
00000026                0024                 .IIF    NB,.BLKW,       .BLKW   1
                        0026                 .IIF    NB,HP$T_TYPE,   HP$T_TYPE:
00000032                0026                 .IIF    NB,.BLKB,       .BLKB   12
                        0032                 .IIF    NB,HP$A_DEPENDENT,      HP$A_DEPENDENT:
                        0000                 .RESTORE
                        0000    214          $DS_DSADEF                             ; CONTROL FLAG DEFINITIONS
                        0000    215          $DS_CVTDEF                             ; Define CVTREG code values
                        0000    216          DSFDEF
                        0000    217          $RABDEF                                ; Define RAB offsets
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
00000000                FE70                 .=0
                        0000                 .RESTORE
                        0000    218          $DS_TypeDef                            ; Define the TypeCode literals   [13]
                        0000    219          $CRD_Literals                          ; Define the CRD literals        [11]
                        0000    220          CLIDEF                                 ; Define CLI offsets             [16]
                        0000    221          .show                                                                  ;G:3
                        0000    222          $DS_PRINTREV_DEF                       ; Define PRINTREV variables
                        0000                 $OFFDEF PRINTREV,<LOG_UNIT,ACTUAL_REV,EXPECTED_REV,REV_TYPE,-
```

```
                0000            PRINTMASK,PRLINK,MODULENUM>
                0000                    .LIST
                0000
                0000            $DS_PRVDEF
                0000             $GBLINI
                0000            .IF     IDN <LOCAL> <GLOBAL>
                0000            .MACRO  $DEF    SYM,ALLOC,SIZ
                0000            .IIF    NB,SYM, SYM::
                0000            .IIF    NB,ALLOC,       ALLOC   SIZ
                0000            .ENDM   $DEF
                0000            .MACRO  $EQU    SYM,VAL
                0000            SYM==VAL
                0000            .ENDM   $EQU
                0000            .MACRO  $VIELD1 MOD,SEP,SYM,SIZ,MSK
                0000            SIZ...=1
                0000            .IIF    NB,SIZ, SIZ...=SIZ
                0000            .IF     NB,SYM
                0000            MOD'SEP'V_'SYM==BIT...
                0000            .IIF    NB,SIZ, MOD'SEP'S_'SYM==SIZ
                0000            .IIF    NB,MSK, MOD'SEP'M_'SYM==<<<1@SIZ...>-1>@BIT...>
                0000            .ENDC
                0000            BIT...=BIT...+SIZ...
                0000            .ENDM   $VIELD1
                0000            .IFF
                0000            .IIF    DIF <LOCAL> <LOCAL>,,ERROR ;ARG MUST BE "GLOBAL","LOCAL",OR NULL
                0000            .MACRO  $DEF    SYM,ALLOC,SIZ
                0000            .IIF    NB,SYM, SYM:
                0000            .IIF    NB,ALLOC,       ALLOC   SIZ
                0000            .ENDM   $DEF
                0000            .MACRO  $EQU    SYM,VAL
                0000            SYM=VAL
                0000            .ENDM   $EQU
                0000            .MACRO  $VIELD1 MOD,SEP,SYM,SIZ,MSK
                0000            SIZ...=1
                0000            .IIF    NB,SIZ, SIZ...=SIZ
                0000            .IF     NB,SYM
                0000            MOD'SEP'V_'SYM=BIT...
                0000            .IIF    NB,SIZ, MOD'SEP'S_'SYM=SIZ
                0000            .IIF    NB,MSK, MOD'SEP'M_'SYM=<<<1@SIZ...>-1>@BIT...>
                0000            .ENDC
                0000            BIT...=BIT...+SIZ...
                0000            .ENDM   $VIELD1
                0000            .ENDC
                0000
                0000             $vield PRV,0,<-
                0000                    <HWREV,,M>-         ; SET IF REV TYPE IS HARDWARE
                0000                    <FWREV,,M>-         ; SET IF REV TYPE IS FIRMWARE
                0000                    <PREV,,M>-          ; SET IF REV TYPE IS PATCH
                0000                    >
00000000        0000            .IIF    NB,0,   BIT...=0
                0000            .IRP    L,<                             <HWREV,,M>                              <FWREV,,M>
                0000            $VIELD1 PRV,$,L
                0000            .ENDR
                0000            $VIELD1 PRV,$,HWREV,,M
00000001        0000            SIZ...=1
                0000            .IIF    NB,,    SIZ...=
                0000            .IF     NB,HWREV
```

```
00000000  0000              PRV$V_HWREV=BIT...
          0000              .IIF    NB,,    PRV$S_HWREV=
00000001  0000              .IIF    NB,M,   PRV$M_HWREV=<<<1aSIZ...>-1>aBIT...>
          0000              .ENDC
00000001  0000              BIT...=BIT...+SIZ...
          0000
          0000
          0000              $VIELD1 PRV,$,FWREV,,M
00000001  0000              SIZ...=1
          0000              .IIF    NB,,    SIZ...=
          0000              .IF     NB,FWREV
00000001  0000              PRV$V_FWREV=BIT...
          0000              .IIF    NB,,    PRV$S_FWREV=
00000002  0000              .IIF    NB,M,   PRV$M_FWREV=<<<1aSIZ...>-1>aBIT...>
          0000              .ENDC
00000002  0000              BIT...=BIT...+SIZ...
          0000
          0000
          0000              $VIELD1 PRV,$,PREV,,M
00000001  0000              SIZ...=1
          0000              .IIF    NB,,    SIZ...=
          0000              .IF     NB,PREV
00000002  0000              PRV$V_PREV=BIT...
          0000              .IIF    NB,,    PRV$S_PREV=
00000004  0000              .IIF    NB,M,   PRV$M_PREV=<<<1aSIZ...>-1>aBIT...>
          0000              .ENDC
00000003  0000              BIT...=BIT...+SIZ...
          0000
          0000
          0000
          0000
          0000              $DS_PRMSKDEF
          0000               $GBLINI
          0000              .IF     IDN <LOCAL> <GLOBAL>
          0000              .MACRO  $DEF    SYM,ALLOC,SIZ
          0000              .IIF    NB,SYM, SYM::
          0000              .IIF    NB,ALLOC,       ALLOC   SIZ
          0000              .ENDM   $DEF
          0000              .MACRO  $EQU    SYM,VAL
          0000              SYM==VAL
          0000              .ENDM   $EQU
          0000              .MACRO  $VIELD1 MOD,SEP,SYM,SIZ,MSK
          0000              SIZ...=1
          0000              .IIF    NB,SIZ, SIZ...=SIZ
          0000              .IF     NB,SYM
          0000              MOD'SEP'V_'SYM==BIT...
          0000              .IIF    NB,SIZ, MOD'SEP'S_'SYM==SIZ
          0000              .IIF    NB,MSK, MOD'SEP'M_'SYM==<<<1aSIZ...>-1>aBIT...>
          0000              .ENDC
          0000              BIT...=BIT...+SIZ...
          0000              .ENDM   $VIELD1
          0000              .IFF
          0000              .IIF    DIF <LOCAL> <LOCAL>,,ERROR ;ARG MUST BE "GLOBAL","LOCAL",OR NULL
          0000              .MACRO  $DEF    SYM,ALLOC,SIZ
          0000              .IIF    NB,SYM, SYM:
          0000              .IIF    NB,ALLOC,       ALLOC   SIZ
          0000              .ENDM   $DEF
```

```
                     0000               .MACRO  $EQU    SYM,VAL
                     0000               SYM=VAL
                     0000               .ENDM   $EQU
                     0000               .MACRO  $VIELD1 MOD,SEP,SYM,SIZ,MSK
                     0000               SIZ...=1
                     0000               .IIF    NB,SIZ, SIZ...=SIZ
                     0000               .IF     NB,SYM
                     0000               MOD'SEP'V_'SYM=BIT...
                     0000               .IIF    NB,SIZ, MOD'SEP'S_'SYM=SIZ
                     0000               .IIF    NB,MSK, MOD'SEP'M_'SYM=<<<1@SIZ...>-1>@BIT...>
                     0000               .ENDC
                     0000               BIT...=BIT...+SIZ...
                     0000               .ENDM   $VIELD1
                     0000               .ENDC
                     0000
                     0000                $vield PRMSK,0,<-
                     0000                                <LSS,,M>-       ; IF SET INHIBITS LESS THAN MESSAGE
                     0000                                <EQL,,M>-       ; IF SET INHIBITS EQUAL TO MESSAGE
                     0000                                <GTR,,M>-       ; IF SET INHIBITS GREATER THAN MESSAGE
                     0000                                <ALWAYS,,M>-    ; IF SET INHIBITS ONLY NON-RELATIONAL MESSAG
                     0000                                <TRANSL,,M>-    ; IF SET TRANSLATE HARDWARE REV TO LETTER CO
                     0000                                >
            00000000 0000               .IIF    NB,0,   BIT...=0
                     0000               .IRP    L,<                     <LSS,,M>                        <EQL,,M>
                     0000               $VIELD1 PRMSK,$,L
                     0000               .ENDR
                     0000               $VIELD1 PRMSK,$,LSS,,M
            00000001 0000               SIZ...=1
                     0000               .IIF    NB,,    SIZ...=
                     0000               .IF     NB,LSS
            00000000 0000               PRMSK$V_LSS=BIT...
                     0000               .IIF    NB,,    PRMSK$S_LSS=
            00000001 0000               .IIF    NB,M,   PRMSK$M_LSS=<<<1@SIZ...>-1>@BIT...>
                     0000               .ENDC
            00000001 0000               BIT...=BIT...+SIZ...
                     0000
                     0000
                     0000               $VIELD1 PRMSK,$,EQL,,M
            00000001 0000               SIZ...=1
                     0000               .IIF    NB,,    SIZ...=
                     0000               .IF     NB,EQL
            00000001 0000               PRMSK$V_EQL=BIT...
                     0000               .IIF    NB,,    PRMSK$S_EQL=
            00000002 0000               .IIF    NB,M,   PRMSK$M_EQL=<<<1@SIZ...>-1>@BIT...>
                     0000               .ENDC
            00000002 0000               BIT...=BIT...+SIZ...
                     0000
                     0000
                     0000               $VIELD1 PRMSK,$,GTR,,M
            00000001 0000               SIZ...=1
                     0000               .IIF    NB,,    SIZ...=
                     0000               .IF     NB,GTR
            00000002 0000               PRMSK$V_GTR=BIT...
                     0000               .IIF    NB,,    PRMSK$S_GTR=
            00000004 0000               .IIF    NB,M,   PRMSK$M_GTR=<<<1@SIZ...>-1>@BIT...>
                     0000               .ENDC
            00000003 0000               BIT...=BIT...+SIZ...
```

```
                        0000
                        0000
                        0000            $VIELD1 PRMSK,$,ALWAYS,,M
                00000001 0000           SIZ...=1
                        0000            .IIF    NB,,    SIZ...=
                        0000            .IF     NB,ALWAYS
                00000003 0000           PRMSK$V_ALWAYS=BIT...
                        0000            .IIF    NB,,    PRMSK$S_ALWAYS=
                00000008 0000           .IIF    NB,M,   PRMSK$M_ALWAYS=<<<1aSIZ...>-1>aBIT...>
                        0000            .ENDC
                00000004 0000           BIT...=BIT...+SIZ...
                        0000
                        0000
                        0000            $VIELD1 PRMSK,$,TRANSL,,M
                00000001 0000           SIZ...=1
                        0000            .IIF    NB,,    SIZ...=
                        0000            .IF     NB,TRANSL
                00000004 0000           PRMSK$V_TRANSL=BIT...
                        0000            .IIF    NB,,    PRMSK$S_TRANSL=
                00000010 0000           .IIF    NB,M,   PRMSK$M_TRANSL=<<<1aSIZ...>-1>aBIT...>
                        0000            .ENDC
                00000005 0000           BIT...=BIT...+SIZ...
                        0000
                        0000
                        0000
                        0000
                        0000
```

```
                        0000   225          .SubTitle       Work Psect Declarations
                    00000000   226          .Psect  Work, Noshr, Noexe, Wrt, Long
                        0000   227
                        0000   228 ;
                        0000   229 ; Beginning of data structure for dsx$printrev
                        0000   230 ;----------------------------------------------------------------------------
                        0000   231                                                                        ;G:3
                    00000200   0000   232 addr_128::       .blkl 128               ;Static block which holds addresses for dyna
                               0200   233
                    00000204   0200   234 firmexist$t::    .blkl 1                 ; Flag set if firm type moved    [27] ;G:2
                    00000208   0204   235 hardexist$t::    .blkl 1                 ; Flag set if hard type moved   [27]  ;G:2
                    0000020C   0208   236 patchexist$t::   .blkl 1                 ; Flag set if patch level moved into  [27] ;
                    00000210   020C   237 p_table:         .blkl 1                 ; Printrev ptable address                [21]
                    00000214   0210   238 WARECODE:        .blkl 1                 ; Printrev device type statement         [21]
                    00000218   0214   239 RELATION:        .blkl 1                 ; Printrev relational operator statement[21]
                    00000228   0218   240 DEVNAME:         .blkq 2                 ; Printrev holds device name             [21]
                    0000022C   0228   241 LOGNUM::         .blkl 1
                               022C   242
                               022C   243 ;----------------------------------------------------------------------------
                               022C   244 ; Ending of data structure for dsx$printrev
                               022C   245 ;
                0000 0000'     022C   246 QBUFF:   .WORD   DS$K_BUFSIZ,0           ; QUADWORD BUFFER DESCRIPTOR
                 00000000'     0230   247          .LONG   DS$GT_BUFFER
                               0234   248
                         00    0234   249 Width_Too_Large:        .byte   0        ; Bit 0 is set if the last line was      [16]
                               0235   250                                         ; longer than the terminal width         [16]
                    00000000   0235   251 Line_Count::     .long   0               ; current number of lines output since   [16]
                               0239   252                                         ; last PAGE                              [16]
                    00000000   0239   253 DS$GL_Page::     .long   0               ; SET PAGE 0 is default                  [16]
                               023D   254 T_Page:                                  ;                                        [16]
6D 20 65 7A 69 73 20 65 67 61 50 00'   255          .ASCIC  "Page size must be greater than 0!/"    ;                    [16]
74 61 65 72 67 20 65 62 20 74 73 75    0249
   2F 21 30 20 6E 61 68 74 20 72 65    0255
                              22       023D
                               0260   256 T_Show_Page:                              ;                                        [16]
61 70 20 6C 61 6E 69 6D 72 65 54 00'   0260   257          .ASCIC  "Terminal page size is !ZB line!%S!/"   ;                [16]
21 20 73 69 20 65 7A 69 73 20 65 67    026C
2F 21 53 25 21 65 6E 69 6C 20 42 5A    0278
                              23       0260
                               0284   258
                               0284   259
                00000000 00000000      0284   260 Q_DIVD:          .QUAD   0           ; DIVIDEND for EDIV                      [31]
                         00000000      028C   261 L_QUO:          .LONG   0           ; QUOTIENT for EDIV                      [31]
                         00000000      0290   262 L_REM:          .LONG   0           ; REMAINDER for EDIV                     [31]
                               0294   263
                               0294   264
                               00      0294   265 ACT_REV:        .BYTE   0           ; Character Storage                      [31]
03'03'03'03'03'03'03'03'03'03'03'03'   0295   266                 .BYTE   3[20]       ; init. as blanks                        [31]
            03'03'03'03'03'03'03'03'   02A1
                               00      02A9   267 EXP_REV:        .BYTE   0           ; Character Storage                      [31]
03'03'03'03'03'03'03'03'03'03'03'03'   02AA   268                 .BYTE   3[20]       ; init. as blanks                        [31]
            03'03'03'03'03'03'03'03'   02B6
                               02BE   269
                         00000008      02BE   270 FAO_DESC:       .LONG   8           ; Descriptor                             [31]
                         00000295'     02C2   271                 .LONG   ACT_REV+1   ; for                                    [31]
                              0000     02C6   272 FAO_LEN:        .WORD   0           ; with length = 0                        [31]
                               02C8   273
```

```
                                00000008  02C8   274 FAO_DESC_2:     .LONG   8                ; Descriptor                          [31]
                                000002AA' 02CC   275                 .LONG   EXP_REV+1        ; for                                 [31]
                                    0000  02D0   276 FAO_LEN_2:      .WORD   0                ; with length = 0                     [31]
                                          02D2   277
          4C 55 21 000002DA'010E0000'     02D2   278 CONTROL:         .ASCID  /!UL/            ; CONTROL STRING FOR FORMATING        [31]
                                          02DD   279
                                          02DD   280
                                          02DD   281 FMT_BEG_ERR:                              ; Printrev error message              [21]
73 69 76 65 72 20 43 41 21 2F 21 00'      02DD   282         .ASCIC  "!/!AC revision level of !AC"
66 6F 20 6C 65 76 65 6C 20 6E 6F 69       02E9
                     43 41 21 20          02F5
                              1B          02DD
                                          02F9   283
                                          02F9   284 FMT_MODULE:
          20 29 43 41 21 28 20 00'        02F9   285         .ASCIC  " (!AC) "
                                    07    02F9
                                          0301   286
                                          0301   287 FMT_END_ERR:
61 68 74 20 43 41 21 20 73 69 20 00'      0301   288         .ASCIC  " is !AC that expected by!/"-
62 20 64 65 74 63 65 70 78 65 20 74       030D
                           2F 21 79       0319
70 20 63 69 74 73 6F 6E 67 61 69 64       031C   289                 "diagnostic program.!/"-
       2F 21 2E 6D 61 72 67 6F 72         0328
43 41 21 20 20 20 20 20 20 20 20 20       0331   290                 "         !AC revision level:           !ZL!/"-
65 6C 20 6E 6F 69 73 69 76 65 72 20       033D
   2F 21 4C 5A 21 09 09 3A 6C 65 76       0349
76 65 52 20 20 20 20 20 20 20 20 20       0354   291                 "         Revision level expected by program:   !ZL!/"
20 6C 65 76 65 6C 20 6E 6F 69 73 69       0360
20 79 62 20 64 65 74 63 65 70 78 65       036C
4C 5A 21 09 3A 6D 61 72 67 6F 72 70       0378
                           2F 21          0384
                              84          0301
                                          0386   292
                                          0386   293 FMT_H_END_ERR:
61 68 74 20 43 41 21 20 73 69 20 00'      0386   294         .ASCIC  " is !AC that expected by!/"-
62 20 64 65 74 63 65 70 78 65 20 74       0392
                           2F 21 79       039E
70 20 63 69 74 73 6F 6E 67 61 69 64       03A1   295                 "diagnostic program.!/"-
       2F 21 2E 6D 61 72 67 6F 72         03AD
43 41 21 20 20 20 20 20 20 20 20 20       03B6   296                 "         !AC revision level:           !AC!/"-
65 6C 20 6E 6F 69 73 69 76 65 72 20       03C2
   2F 21 43 41 21 09 09 3A 6C 65 76       03CE
76 65 52 20 20 20 20 20 20 20 20 20       03D9   297                 "         Revision level expected by program:   !AC!/"
20 6C 65 76 65 6C 20 6E 6F 69 73 69       03E5
20 79 62 20 64 65 74 63 65 70 78 65       03F1
43 41 21 09 3A 6D 61 72 67 6F 72 70       03FD
                           2F 21          0409
                              84          0386
                                          040B   298
                                          040B   299 FMT_P_F_END:                              ; Printrev revision message           [28]
          2F 21 4C 5A 21 20 20 3A 00'     040B   300         .ASCIC  ":  !ZL!/"
                                    08    040B
                                          0414   301
                                          0414   302 FMT_H_END:                                ; Printrev revision message     [31]
          2F 21 43 41 21 20 20 3A 00'     0414   303         .ASCIC  ":  !AC!/"
                                    08    0414
                                          041D   304
```

```
                                041D   305 HARDMESSA:                          ; DSX$PRINTREV device type message      [21]
        65 72 61 77 64 72 61 48 00' 041D   306         .ASCIC  "Hardware"
                                08  041D
                                0426   307
                                0426   308 FIRMMESSA:                          ; printrev device type message          [21]
        65 72 61 77 6D 72 69 46 00' 0426   309         .ASCIC  "Firmware"
                                08  0426
                                042F   310
                                042F   311 PATCHMESSA:
        20 20 20 68 63 74 61 50 00' 042F   312         .ASCIC  "Patch   "
                                08  042F
                                0438   313
                                0438   314 LESSTHAN:                           ; DSX$PRINTREV actual rev. to expected rev[2
      6E 61 68 74 20 73 73 65 6C 00' 0438   315         .ASCIC  "less than"
                                09  0438
                                0442   316
                                0442   317 GREATTHAN:                          ; Printrev relation message             [21]
61 68 74 20 72 65 74 61 65 72 67 00' 0442   318         .ASCIC  "greater than"
                                6E  044E
                                0C  0442
                                044F   319
                                044F   320 EQUALMESS:                          ; Used in printrev, relation or revision lev
        6F 74 20 6C 61 75 71 65 00' 044F   321         .ASCIC  "equal to"                                          ;G:3
                                08  044F
                                0458   322
                                0458   323 FMT_TOOHIGH:                        ; Used in printrev when logunit # is too hig
2D 2D 2D 2D 20 2F 21 20 2F 21 20 00' 0458   324         .ASCIC  " !/ !/ ---- Logical unit # !ZL is too high.  It must be < 128. ----
69 6E 75 20 6C 61 63 69 67 6F 4C 20  0464
74 20 73 69 20 4C 5A 21 20 23 20 74  0470
74 49 20 20 2E 68 67 69 68 20 6F 6F  047C
31 20 3C 20 65 62 20 74 73 75 6D 20  0488
20 2F 21 20 2D 2D 2D 2D 20 2E 38 32  0494
                              2F 21  04A0
                                 49  0458
                                04A2   325                                                                          ;G:3
                                04A2   326 FMT_TOOMANY_MODS:                   ; Used in printrev when # of modules > 4 ;G:
2D 2D 2D 2D 20 2F 21 20 2F 21 20 00' 04A2   327         .ASCIC  " !/ !/ ---- Only allowed four modules per device ---- !/ !/" ;G:2
65 77 6F 6C 6C 61 20 79 6C 6E 4F 20  04AE
6C 75 64 6F 6D 20 72 75 6F 66 20 64  04BA
63 69 76 65 64 20 72 65 70 20 73 65  04C6
2F 21 20 2F 21 20 2D 2D 2D 2D 20 65  04D2
                                 3B  04A2
                                04DE   328                                                                          ;G:3
                           0000000D  04DE   329 CR=13
                           0000000A  04DE   330 LF=10
                                0A 0D  04DE   331 Page_String:    .ascii  <CR><LF> -      ;                          [16]
4E 52 55 54 45 52 20 73 73 65 72 50  04E0   332                           /Press RETURN for more, Control-C to exit.../   ;          [16]
43 20 2C 65 72 6F 6D 20 72 6F 66 20  04EC
20 6F 74 20 43 2D 6C 6F 72 74 6E 6F  04F8
              2E 2E 2E 74 69 78 65   0504
                                050B   333
                                050B   334 DS$GB_VDS_Debug::                   ; Make more contemporary.               [15]
                                050B   335 Debug_The_Sucker::                  ; Print typecode number if = 1          [15]
                                00  050B   336         .Byte   0               ; Initial 0                             [15]
```

```
                     050C   338          .SubTitle       Data Psect Declarations
                 00000000   339          .Psect  DATA, SHR, NOEXE, NOWRT, BYTE
                     0000   340
                     0000   341 ;+
                     0000   342 ; This address list is indexed by (-CODE-1) passed to DS$CVTREG as MNEADR
                     0000   343 ; Each address points to data in ONLY??? lists of the form:
                     0000   344 ;       CVT$T_....:
                     0000   345 ;                   .ADDRESS        10$     Address of ASCIC string
                     0000   346 ;                   .LONG   V1,...V6        Parameters V1-V6, only if required
                     0000   347 ;       10$:        .ASCIC  "mnemonic string"
                     0000   348 ;-
                     0000   349
                     0000   350 CVT$A_CODELIST:
           00000000' 0000   351          .ADDRESS        CVT$T_UBADPR    ; Args for UNIBUS datapath CVTREG
           00000000' 0004   352          .ADDRESS        CVT$T_UBAMAP    ; Args for UNIBUS MAP CVTREG
           00000000' 0008   353          .ADDRESS        CVT$T_MBASR     ; Args for MASSBUS Status CVTREG
           00000000' 000C   354          .ADDRESS        CVT$T_MBAMAP    ; Args for MASSBUS MAP CVTREG
```

```
                     0010   356          .Subtitle       DSV$SetPage Routine - Set terminal page size
                 00000000   357          .Psect  Code, Shr, Exe, Nowrt, Byte
                     0000   358 ;++                                                                          [16]
                     0000   359 ; Functional Description:                                                  [16]
                     0000   360 ;                                                                          [16]
                     0000   361 ;       This is a CLI command routine.  It loads the global DS$GL_PAGE with [16]
                     0000   362 ;       a value specified to CLI.  If the page size is out of range, an error [16]
                     0000   363 ;       message is typed and it returns a failure status code (though CLI  [16]
                     0000   364 ;       does not currently recognize return status).                       [16]
                     0000   365 ;                                                                          [16]
                     0000   366 ; Calling sequence:                                                       [16]
                     0000   367 ;                                                                          [16]
                     0000   368 ;       JSB     DSV$SETPAGE                                              [16]
                     0000   369 ;                                                                          [16]
                     0000   370 ; Input Parameters:                                                       [16]
                     0000   371 ;                                                                          [16]
                     0000   372 ;       none                                                             [16]
                     0000   373 ;                                                                          [16]
                     0000   374 ; Output Parameters:                                                      [16]
                     0000   375 ;                                                                          [16]
                     0000   376 ;       none                                                             [16]
                     0000   377 ;                                                                          [16]
                     0000   378 ; Implicit Inputs:                                                       [16]
                     0000   379 ;                                                                          [16]
                     0000   380 ;       R2 points to CLI data table                                      [16]
                     0000   381 ;                                                                          [16]
                     0000   382 ; Implicit Outputs:                                                      [16]
                     0000   383 ;                                                                          [16]
                     0000   384 ;       none                                                             [16]
                     0000   385 ;                                                                          [16]
                     0000   386 ; Side effects:                                                          [16]
                     0000   387 ;                                                                          [16]
                     0000   388 ;       Changes the value of DS$GL_PAGE variable                         [16]
                     0000   389 ;                                                                          [16]
                     0000   390 ; Status returns:                                                        [16]
                     0000   391 ;                                                                          [16]
                     0000   392 ;       0       failure (value out of range)                             [16]
                     0000   393 ;       1       success                                                  [16]
                     0000   394 ;--                                                                       [16]
```

```
                                0000   396 DSV$SetPage::                                  ;                                        [16]
          50    1C A2    D0     0000   397          MOVL    CLI$L_DATA(R2), R0           ; Get the page size                      [16]
                   0B    19     0004   398          BLSS    10$                          ; Too small?                             [16]
                                0006   399
   00000239'EF    50    D0     0006   400          MOVL    R0, DS$GL_PAGE               ; No, store the value                    [16]
                                000D   401
             50    01    D0     000D   402          MOVL    #1, R0                       ; Success                                [16]
                         05     0010   403          RSB                                  ;                                        [16]
                                0011   404
                                0011   405 10$:     $Print  -                            ; Page size out of range                 [16]
                                0011   406                  #DS$K_Type_Command_Err, -          ; typecode                       [16]
                                0011   407                  #DS$K_PrintF, -              ;                                        [16]
                                0011   408                  T_Page                       ; the message                            [16]
       0000023D'EF    9F     0011                          PUSHAB  T_Page
             7E    01    9A     0017                          movzbl  #DS$K_PrintF, -(sp)
             7E    15    98     001A                          cvtbl   #DS$K_Type_Command_Err, -(sp)
   000002D3'GF    03    FB     001D                          CALLS   #$$N+2, G^DSX$PRINT
                   50    D4     0024   409          CLRL    R0                           ; Failure                                [16]
                         05     0026   410          RSB                                  ;                                        [16]
```

```
0027          .Subtitle       DSV$ShowPage Routine - Show terminal page size
0027    ;++                                                                    [16]
0027    ; Functional Description:                                              [16]
0027    ;                                                                      [16]
0027    ;       This is a CLI command routine.  It prints the current DS$GL_PAGE.  [16]
0027    ;                                                                      [16]
0027    ; Calling sequence:                                                    [16]
0027    ;                                                                      [16]
0027    ;       JSB     DSV$SHOWPAGE                                           [16]
0027    ;                                                                      [16]
0027    ; Input Parameters:                                                    [16]
0027    ;                                                                      [16]
0027    ;       none                                                           [16]
0027    ;                                                                      [16]
0027    ; Output Parameters:                                                   [16]
0027    ;                                                                      [16]
0027    ;       none                                                           [16]
0027    ;                                                                      [16]
0027    ; Implicit Inputs:                                                     [16]
0027    ;                                                                      [16]
0027    ;       none                                                           [16]
0027    ;                                                                      [16]
0027    ; Implicit Outputs:                                                    [16]
0027    ;                                                                      [16]
0027    ;       none                                                           [16]
0027    ;                                                                      [16]
0027    ; Side effects:                                                        [16]
0027    ;                                                                      [16]
0027    ;       none                                                           [16]
0027    ;                                                                      [16]
0027    ; Status returns:                                                      [16]
0027    ;                                                                      [16]
0027    ;       1       success                                                [16]
0027    ;--                                                                    [16]
```

```
                                0027   447 DSV$ShowPage::                                  ;                                        [16]
      50   00000239'EF    9A   0027   448          MOVZBL  L^DS$GL_Page, R0                ; Get the current page size              [16]
                                002E   449          $Print  -                               ; Print with typecode                    [16]
                                002E   450                  #DS$K_Type_Command_Out, -           ; typecode                       [16]
                                002E   451                  #DS$K_PrintF, -                 ; the type of PRINT routine              [16]
                                002E   452                  T_Show_Page, -                  ; the message                            [16]
                                002E   453                  R0                              ; the page size                          [16]
                     50    DD   002E                        PUSHL   R0
            00000260'EF    9F   0030                        PUSHAB  T_Show_Page
                 7E   01   9A   0036                        movzbl  #DS$K_PrintF, -(sp)
                 7E   16   98   0039                        cvtbl   #DS$K_Type_Command_Out, -(sp)
      000002D3'GF    04    FB   003C                        CALLS   #$$N+2, G^DSX$PRINT
                 50   01   D0   0043   454          MOVL    #1, R0                          ; Success                                [16]
                           05   0046   455          RSB                                     ;                                        [16]
                                0047   456
```

```
0047          .Subtitle       DSX$Type_Out Routine - Do actual print
00000047      .Psect  Code, Shr, Exe, Nowrt, Byte
0047  ;++
0047  ; Functional Description:
0047  ;
0047  ;       This routine does the actual work of outputting.  If the flag
0047  ;       DSA$V_BATCH is set, then it will use RMS to output to a file
0047  ;       (presumably) otherwise it will use QIO.  This routine also does        [16]
0047  ;       the work for SET PAGE online and standalone by traipsing through       [16]
0047  ;       the ouput buffer and comparing the number of linefeeds to the value    [16]
0047  ;       specified by the most recent SET PAGE command.  The routine also must  [16]
0047  ;       predict where the VDS and VMS will insert a CRLF due to the line being [16]
0047  ;       too long for the current terminal width.;
0047  ;
0047  ; Input Parameters:
0047  ;
0047  ;       4(ap)           Length of string to output
0047  ;       8(ap)           Address of string
0047  ;
0047  ; Output Parameters:
0047  ;
0047  ;       none
0047  ;
0047  ; Implicit Inputs:
0047  ;
0047  ;       DS$GB_WIDTH     terminal width
0047  ;       DS$GL_PAGE      terminal page size
0047  ;
0047  ; Implicit Outputs:
0047  ;
0047  ;       none
0047  ;
0047  ; Side effects:
0047  ;
0047  ;       If either the CRD_AutoTest bit or the CRD_MenuTest bit is set (in the  [15]
0047  ;       DSA flags), this routine will call a CRD routine to determine if the   [15]
0047  ;       output should actually be printed. If the CRD routine returns success, [15]
0047  ;       do NOT print.                                                          [15]
0047  ;
0047  ; Status returns:
0047  ;
0047  ;       Any code from QIOW or PUT
0047  ;--
```

```
                    00FC  0047   502 .Entry DSX$Type_Out, ^M<R2,R3,R4,R5,R6,R7>              ;                          [16]
                          0049   503
00000000'EF    1A    91   0049   504         CmpB    #DS$K_Type_CRD_AutoTest, - ; Compare the current typecode to ...[13]
                          0050   505                   L^DS$GB_TypeCode       ; ... to CRD_AutoTest. The same?          [13]
               35    13   0050   506         Beql    50$                      ; If same, branch to print it.            [13]
                          0052   507                                          ; If not same, continue ...               [13]
                          0052   508
                          0052   509         Br_If_CRD_AutoTest_Off  10$      ; If under Auto Test, then branch         [17]
0000FE00'EF    0B    E0   0052              BBS     #DSA$V_CRD_Autotest_Off, -       ; If bit set, branch              [36]
               12         0059                        L^DSA$GL_Flags, 10$            ;                                 [36]
                          005A   510         Br_If_CRD_MenuTest_Off  10$      ; If under Menu Test, then branch         [17]
0000FE00'EF    10    E0   005A              BBS     #DSA$V_CRD_MenuTest_Off, -       ; If bit set, branch              [36]
               0A         0061                        L^DSA$GL_Flags, 10$            ;                                 [36]
                          0062   511         Br_If_CRD_MenuTest_On   10$      ; If under Menu Test, then branch         [20]
0000FE00'EF    12    E0   0062              BBS     #DSA$V_CRD_MenuTest_On, -        ; If bit set, branch              [36]
               02         0069                        L^DSA$GL_Flags, 10$            ;                                 [36]
               1B    11   006A   512         Brb     50$                      ; Else, not under either one.             [15]
                          006C   513
          08 AC    DD   006C   514 10$:    PushL   8(AP)                    ; Push Address as param-4                 [15]
     7E   04 AC    3C   006F   515         MovZWL  4(AP), -(SP)             ; Push Length as param-3                  [11]
7E   00000000'EF   9A   0073   516         MovZBL  L^DS$GB_TypeCode, -(SP)  ; Push TypeCode as param-2                [11]
               01    DD   007A   517         PushL   #CRD$K_TypeCode          ; Push "type of call" as param-1          [11]
00000000'FF    04    FB   007C   518         CallS   #4, @L^DS$GA_CRD_DS_Interface   ; Call indirectly the ...         [11]
                          0083   519                                          ; ... CRD$DS_Interface routine.           [11]
          01 50    E9   0083   520         BlbC    R0, 50$                  ; Print if the routine returns failure    [11]
                    04   0086   521         Ret                              ; Return if routine returns success       [11]
                          0087   522
                          0087   523 50$:    Br_If_Not_Batch 100$             ; Branch if use QIO for output            [11]
00000000'EF    16    E1   0087              BBC     #DS$V_Batch, -                   ; If bit not set, branch          [28]
               3F         008E                        L^DS$GL_Flags, 100$            ;                                 [28]
                          008F   524
                          008F   525         ;+
                          008F   526         ; We are running in Batch mode. That is, we are using RMS to output       [14]
                          008F   527         ; everything. Test to see if either CRD Auto Test or Menu Test is         [15]
                          008F   528         ; executing. If so, assume the BINARY flag has been set and remove the    [15]
                          008F   529         ; binary typecode from the start of the string.                           [15]
                          008F   530         ;-
                          008F   531
50   00000000'EF   9E   008F   532         MovAB   L^DS$Rab_Output, R0      ; Point to RAB                            [09]
     51   04 AC    3C   0096   533         MovZWL  4(AP), R1                ; Length to R1                            [14]
     52   08 AC    D0   009A   534         MovL    8(AP), R2                ; Address to R2                           [14]
                          009E   535
                          009E   536         Br_If_CRD_AutoTest_Off  60$      ; If running under Auto Test, branch      [17]
0000FE00'EF    0B    E0   009E              BBS     #DSA$V_CRD_Autotest_Off, -       ; If bit set, branch              [36]
               12         00A5                        L^DSA$GL_Flags, 60$            ;                                 [36]
                          00A6   537         Br_If_CRD_MenuTest_Off  60$      ; If running under Menu Test, branch      [17]
0000FE00'EF    10    E0   00A6              BBS     #DSA$V_CRD_MenuTest_Off, -       ; If bit set, branch              [36]
               0A         00AD                        L^DSA$GL_Flags, 60$            ;                                 [36]
                          00AE   538         Br_If_CRD_MenuTest_On   60$      ; If running under Menu Test, branch      [20]
0000FE00'EF    12    E0   00AE              BBS     #DSA$V_CRD_MenuTest_On, -        ; If bit set, branch              [36]
               02         00B5                        L^DSA$GL_Flags, 60$            ;                                 [36]
               04    11   00B6   539         Brb     70$                      ; Not either one, so skip over it         [15]
                          00B8   540
               51    D7   00B8   541 60$:    DecL    R1                       ; Length = Length - 1                     [15]
               52    D6   00BA   542         IncL    R2                       ; Address = Address + 1 (byte)            [14]
                          00BC   543
     22 A0     51    B0   00BC   544 70$:    MovW    R1, B^Rab$W_Rsz(R0)      ; Get record length                       [14]
```

```
                28 A0   52   D0  00C0   545          MovL    R2, B^Rab$L_Rbf(R0)     ; Get record address                    [14]
                                00C4   546          $Put    Rab=(R0)                ; Output string                         [09]
                        60   DF  00C4                PUSHAL  (R0)
        00000000'GF     01   FB  00C6                CALLS   #$$.TMP1,G^SYS$PUT
                            04  00CD   547          Ret                             ; Go to caller.                         [09]
                                00CE   548
                                00CE   549          ;+
                                00CE   550          ; We are not running in Batch mode - we are using QIO to output     [14]
                                00CE   551          ; everything. Perform the same check as the above performs for CRD. [14]
                                00CE   552          ;-
                                00CE   553
          03 00000000'EF        E9  00CE   554 100$:  blbc    L^ds$gb_qioact, 200$    ; Branch if QIO not active              [09]
                      0396      30  00D5   555          bsbw    reset_input             ; Reset input channel if active         [09]
                                00D8   556
                         7E     7C  00D8   557 200$:  clrq    -(sp)                   ; p5/p6 zero                            [09]
                         7E     7C  00DA   558          clrq    -(sp)                   ; p3/p4 zero                            [09]
                                00DC   559
                    51   04 AC   3C  00DC   560          MovZWL  4(AP), R1               ; Move length to R1                     [14]
                    52   08 AC   D0  00E0   561          MovL    8(AP), R2               ; Move address to R2                    [14]
                                00E4   562
                                00E4   563          Br_If_CRD_AutoTest_Off  250$    ; If running under Auto Test, branch    [17]
        0000FE00'EF     0B   E0  00E4                BBS     #DSA$V_CRD_Autotest_Off, -      ; If bit set, branch            [36]
                        12       00EB                  L^DSA$GL_Flags, 250$          ;                               [36]
                                00EC   564          Br_If_CRD_MenuTest_Off  250$    ; If running under Menu Test, branch    [17]
        0000FE00'EF     10   E0  00EC                BBS     #DSA$V_CRD_MenuTest_Off, -      ; If bit set, branch            [36]
                        0A       00F3                  L^DSA$GL_Flags, 250$          ;                               [36]
                                00F4   565          Br_If_CRD_MenuTest_On   250$    ; If running under Menu Test, branch    [20]
        0000FE00'EF     12   E0  00F4                BBS     #DSA$V_CRD_MenuTest_On, -       ; If bit set, branch            [36]
                        02       00FB                  L^DSA$GL_Flags, 250$          ;                               [36]
                        04   11  00FC   566          Brb     300$                    ; Not either one, so skip over it       [15]
                                00FE   567
                        51   D7  00FE   568 250$:  DecL    R1                      ; Length = Length - 1                   [15]
                        52   D6  0100   569          IncL    R2                      ; Address = Address + 1 (byte)          [14]
                                0102   570
                 55     51   D0  0102   571 300$:  MovL    R1, R5                  ; R5 gets length                        [16]
                        54   D4  0105   572          ClrL    R4                      ; Number of characters in current line  [16]
                 56     55   D0  0107   573 310$:  Movl    R5, R6                  ; Save original length of string        [16]
                 57     52   D0  010A   574          Movl    R2, R7                  ; Save original address of string       [16]
              00000239'EF     D5  010D   575          TstL    DS$GL_Page              ; SET PAGE 0 ?                          [16]
                        73   13  0113   576          BEql    370$                    ; Yes, go right to QIOW                 [16]
                                0115   577
00000239'EF     00000235'EF     D1  0115   578          CmpL    Line_Count, DS$GL_Page  ; Are we at page limit?                 [16]
                        03   19  0120   579          BLss    320$                    ; No                                    [16]
                      0087   31  0122   580          BrW     380$                    ; Yes, prompt user                      [16]
                                0125   581
           53   00000000'EF     9A  0125   582 320$:  MovZBL  DS$GB_Width, R3         ; Get terminal width                    [16]
                00000234'EF     94  012C   583          ClrB    Width_Too_Large         ; Clear flag indicating line too long   [16]
                                0132   584
                         55     D7  0132   585 330$:  DecL    R5                      ; Any characters left?                  [16]
                         4C     19  0134   586          BLss    355$                    ; No, we have less than a page of chars [16]
                                0136   587
                    62   0A     91  0136   588          CmpB    #^X0A, (R2)             ; LF ?                                  [16]
                         37     13  0139   589          BEql    340$                    ; Yes                                   [16]
                                013B   590
                    82   0D     91  013B   591          CmpB    #^X0D, (R2)+            ; No, CR ?                              [16]
                         04     12  013E   592          BNEq    331$                    ; No                                    [16]
                         54     D4  0140   593          ClrL    R4                      ; Yes, zero width count                 [16]
```

```
                    EE   11  0142   594          BrB     330$                      ; Continue with next character          [16]
                             0144   595
            FF A2   09   91  0144   596 331$:    CmpB    #^X09, -1(R2)             ; No, TAB ?                            [16]
                    09   12  0148   597          BNEq    335$                      ; No                                   [16]
                    54   D6  014A   598 333$:    IncL    R4                        ; Yes, add 1 to width                  [16]
                54  07   93  014C   599          BiTB    #7, R4                    ; Are we at TAB boundary?              [16]
                    F9   12  014F   600          BNEq    333$                      ; No, count another                    [16]
                    54   D7  0151   601          DecL    R4                        ; Yes, we added one to many so subtract [16]
            DB 54   53   F2  0153   602 335$:    AOBLss  R3, R4, 330$              ; Width gets larger by 1               [16]
                             0157   603          Br_If_Not_User  337$              ; S/A doesn't pad next line if TAB     [16]
     0000FE00'EF    1C   E1  0157               BBC     #DSA$V_User, -                    ; If bit not set, branch
                    05       015E                         L^DSA$GL_Flags, 337$           ;
                54  53   C2  015F   604          SubL2   R3, R4                    ; How far over the edge of width?      [16]
                    12   12  0162   605          BNEq    353$                      ; Too far, don't do extra CRLF, save R4 [16]
                             0164   606                                            ; We are at the edge of the width,     [16]
                62  0D   91  0164   607 337$:    CmpB    #^X0D, (R2)               ; If CR is next, line is not too long, [16]
                    C9   13  0167   608          BEql    330$                      ; so print CRLF also                   [16]
     00000234'EF    01   88  0169   609          BiSB    #1, Width_Too_Large       ; No CRLF there, we need to do an extra [16]
                             0170   610                                            ; CRLF if we are also at the page limit [16]
                    02   11  0170   611          BrB     350$                      ; Count another line                   [16]
                             0172   612
                    52   D6  0172   613 340$:    IncL    R2                        ; Point to next character              [16]
                    54   D4  0174   614 350$:    ClrL    R4                        ; Clear width count                    [16]
 A3 00000235'EF  00000239'EF F2  0176   615 353$:    AOBLss  DS$GL_Page, Line_Count, 320$    ; Enough for a page?           [16]
                             0182   616
                    54   D4  0182   617 355$:    ClrL    R4                        ; Clear width count                    [16]
            55   52  57   C3  0184   618          SubL3   R7, R2, R5                ; R5 gets length of this string        [16]
                             0188   619
                             0188   620 370$:
                    7E   7C  0188   621          CLRQ    -(SP)                     ; Two null arguments           [19]
                    7E   7C  018A   622          CLRQ    -(SP)                     ; Two null arguments           [19]
                    55   DD  018C   623          PushL   R5                        ; Push length of string                [16]
                    57   DD  018E   624          PushL   R7                        ; Push address of string               [16]
                             0190   625
                    7E   7C  0190   626          clrq    -(sp)                     ; astadr/astprm zero                   [14]
                    7E   D4  0192   627          clrl    -(sp)                     ; iosb zero                            [09]
                    00'  DD  0194   628          pushl   S^#io$_writevblk          ; function                             [09]
          00000000'EF    DD  0196   629          pushl   L^ds$gw_ttout             ; channel                              [09]
                    7E   D4  019C   630          clrl    -(sp)                     ; event flag                           [09]
     00000000'GF    0C   FB  019E   631          calls   #12, G^sys$qiow           ; do the qio                           [09]
                             01A5   632
            55   56  55   C3  01A5   633          SubL3   R5, R6, R5                ; R1 gets number of characters left    [16]
                    01   14  01A9   634          BGtr    380$                      ; There's more, prompt user            [16]
                         04  01AB   635          Ret                               ; None left                            [16]
                             01AC   636
     00000234'EF    01   93  01AC   637 380$:    BiTB    #1, Width_Too_Large       ; Was the last line too long?          [16]
                    29   13  01B3   638          BEql    385$                      ; No                                   [16]
                             01B5   639          $QIOW_S , -                       ; Yes, do an extra CRLF before prompt  [16]
                             01B5   640                  L^DS$GW_TTOUT, -          ; Channel number                       [16]
                             01B5   641                  S^#IO$_WRITEVBLK, -       ; Function                             [16]
                             01B5   642                  P1 = Page_String, -       ; Output buffer address                [16]
                             01B5   643                  P2 = #2                   ; Output buffer size                   [16]
                    7E   7C  01B5                       CLRQ    -(SP)
                    7E   7C  01B7                       CLRQ    -(SP)
                    02   DD  01B9                       PUSHL   #2
          000004DE'EF    DF  01BB                       PUSHAL  Page_String
                    7E   7C  01C1                       CLRQ    -(SP)
```

```
                 00   DD  01C3                          PUSHL   #0
            7E   00'  3C  01C5                          MOVZWL  S^#IO$_WRITEVBLK,-(SP)
7E   00000000'EF     3C  01C8                          MOVZWL  L^DS$GW_TTOUT,-(SP)
                 00   DD  01CF                          PUSHL   #0
00000000'GF      0C   FB  01D1                          CALLS   #12,G^SYS$QIOW
     00000234'EF     94  01D8   644          ClrB      Width_Too_Large          ; Reset width flag                    [16]
                         01DE   645
                         01DE   646 385$:   $QIOW_S , -                        ; Prompt for more output              [16]
                         01DE   647                  L^DS$GW_TTOUT, -          ; Channel number                      [16]
                         01DE   648                  #IO$_WRITEVBLK, -         ; Function code                       [16]
                         01DE   649                  P1 = Page_String, -       ; Output buffer address               [16]
                         01DE   650                  P2 = #45                  ; Output buffer size                  [16]
                 7E   7C  01DE                          CLRQ    -(SP)
                 7E   7C  01E0                          CLRQ    -(SP)
                 2D   DD  01E2                          PUSHL   #45
     000004DE'EF      DF  01E4                          PUSHAL  Page_String
                 7E   7C  01EA                          CLRQ    -(SP)
                 00   DD  01EC                          PUSHL   #0
   7E    0000'8F     3C  01EE                          MOVZWL  #IO$_WRITEVBLK,-(SP)
7E   00000000'EF     3C  01F3                          MOVZWL  L^DS$GW_TTOUT,-(SP)
                 00   DD  01FA                          PUSHL   #0
00000000'GF      0C   FB  01FC                          CALLS   #12,G^SYS$QIOW
                 7E   94  0203   651          ClrB      -(SP)                    ; Space for input buffer              [16]
            57   6E   DE  0205   652          MovAL     (SP), R7                 ; Input buffer on stack               [16]
                         0208   653 387$:   Br_If_Not_User  388$               ;                                     [16]
0000FE00'EF      1C   E1  0208                BBC       #DSA$V_User, -                  ; If bit not set, branch
                 2A       020F                            L^DSA$GL_Flags, 388$          ;
00000000'EF      01   88  0210   654          BisB      #1, DS$GB_QIOACT         ; Set input QIO active                [16]
                         0217   655                                              ; In user mode,                       [16]
                         0217   656                                              ; suppress echo of termination char   [16]
                         0217   657                                              ; because VMS sometimes echoes it and [16]
                         0217   658                                              ; sometimes doesn't.                  [16]
                         0217   659          $QIOW_S , -                        ; Read the user's response            [16]
                         0217   660                  L^DS$GW_TTIN, -           ; Channel number                      [16]
                         0217   661                  #IO$_READVBLK!IO$M_TRMNOECHO, - ; Function                    [16]
                         0217   662                  P1 = (R7), -              ; Input buffer address                [16]
                         0217   663                  P2 = #1                   ; Input buffer size                   [16]
                 7E   7C  0217                          CLRQ    -(SP)
                 7E   7C  0219                          CLRQ    -(SP)
                 01   DD  021B                          PUSHL   #1
                 67   DF  021D                          PUSHAL  (R7)
                 7E   7C  021F                          CLRQ    -(SP)
                 00   DD  0221                          PUSHL   #0
   7E    0000'8F     3C  0223                          MOVZWL  #IO$_READVBLK!IO$M_TRMNOECHO,-(SP)
7E   00000000'EF     3C  0228                          MOVZWL  L^DS$GW_TTIN,-(SP)
                 00   DD  022F                          PUSHL   #0
00000000'GF      0C   FB  0231                          CALLS   #12,G^SYS$QIOW
                 21   11  0238   664          BrB       389$                     ;                                     [16]
                         023A   665 388$:   $QIOW_S , -                        ; Read the user's response            [16]
                         023A   666                  L^DS$GW_TTIN, -           ; Channel number                      [16]
                         023A   667                  #IO$_READVBLK!IO$M_TRMNOECHO, - ; Function                    [16]
                         023A   668                  P1 = (R7), -              ; Input buffer address                [16]
                         023A   669                  P2 = #0                   ; S/A buffer works differently        [16]
                 7E   7C  023A                          CLRQ    -(SP)
                 7E   7C  023C                          CLRQ    -(SP)
                 00   DD  023E                          PUSHL   #0
                 67   DF  0240                          PUSHAL  (R7)
```

```
                    7E   7C  0242                        CLRQ    -(SP)
                    00   DD  0244                        PUSHL   #0
          7E   0000'8F   3C  0246                        MOVZWL  #IO$_READVBLK!IO$M_TRMNOECHO,-(SP)
       7E   00000000'EF   3C  024B                        MOVZWL  L^DS$GW_TTIN,-(SP)
                    00   DD  0252                        PUSHL   #0
       00000000'GF   0C   FB  0254                        CALLS   #12,G^SYS$QIOW
                0D  6E   91  025B   670 389$:    CmpB    (SP),#^X0D                  ; CR ?                                  [16]
                    0F   13  025E   671          BEql    390$                        ; Yes                                   [16]
                    8E   95  0260   672          TstB    (SP)+                       ; No, pop the input buffer in case ^C   [16]
            00000000'EF   16  0262   673          JSb     L^KB_Check                  ; Did we get ^C ?                       [16]
                    7E   94  0268   674          ClrB    -(SP)                       ; If we come back from KB_Check, then   [16]
                57  6E   DE  026A   675          MovAL   (SP), R7                    ; it was not a ^C, so try again         [16]
                    99   11  026D   676          BrB     387$                        ;                                       [16]
                    8E   95  026F   677 390$:    TstB    (SP)+                       ; Pop the input buffer                  [16]
                         0271   678              Br_If_Not_User  393$                ;                                       [16]
       0000FE00'EF   1C   E1  0271                BBC     #DSA$V_User, -                      ; If bit not set, branch
                    23       0278                          L^DSA$GL_Flags, 393$          ;
                             0279   679          $QIOW_S , -                         ; Do an extra CRLF after prompt         [16]
                             0279   680                  L^DS$GW_TTOUT, -            ; Channel number                        [16]
                             0279   681                  S^#IO$_WRITEVBLK, -         ; Function                              [16]
                             0279   682                  P1 = Page_String, -         ; Output buffer address                 [16]
                             0279   683                  P2 = #2                     ; Output buffer size                    [16]
                    7E   7C  0279                        CLRQ    -(SP)
                    7E   7C  027B                        CLRQ    -(SP)
                    02   DD  027D                        PUSHL   #2
            000004DE'EF   DF  027F                        PUSHAL  Page_String
                    7E   7C  0285                        CLRQ    -(SP)
                    00   DD  0287                        PUSHL   #0
                7E  00'  3C  0289                        MOVZWL  S^#IO$_WRITEVBLK,-(SP)
       7E   00000000'EF   3C  028C                        MOVZWL  L^DS$GW_TTOUT,-(SP)
                    00   DD  0293                        PUSHL   #0
       00000000'GF   0C   FB  0295                        CALLS   #12,G^SYS$QIOW
                             029C   684 393$:    $QIOW_S , -                         ; Do an extra CRLF after prompt         [16]
                             029C   685                  L^DS$GW_TTOUT, -            ; Channel number                        [16]
                             029C   686                  S^#IO$_WRITEVBLK, -         ; Function                              [16]
                             029C   687                  P1 = Page_String, -         ; Output buffer address                 [16]
                             029C   688                  P2 = #2                     ; Output buffer size                    [16]
                    7E   7C  029C                        CLRQ    -(SP)
                    7E   7C  029E                        CLRQ    -(SP)
                    02   DD  02A0                        PUSHL   #2
            000004DE'EF   DF  02A2                        PUSHAL  Page_String
                    7E   7C  02A8                        CLRQ    -(SP)
                    00   DD  02AA                        PUSHL   #0
                7E  00'  3C  02AC                        MOVZWL  S^#IO$_WRITEVBLK,-(SP)
       7E   00000000'EF   3C  02AF                        MOVZWL  L^DS$GW_TTOUT,-(SP)
                    00   DD  02B6                        PUSHL   #0
       00000000'GF   0C   FB  02B8                        CALLS   #12,G^SYS$QIOW
                             02BF   689
            00000000'EF   94  02BF   690 395$:    ClrB    DS$GB_QIOACT                ; Clear QIO active                      [16]
            00000235'EF   D4  02C5   691          ClrL    Line_Count                  ; Reset line counter                    [16]
                    7E   7C  02CB   692          ClrQ    -(SP)                       ; P5/P6 zero                            [16]
                    7E   7C  02CD   693          ClrQ    -(SP)                       ; P4/P3 zero                            [16]
                FE35  31  02CF   694          BrW     310$                        ; Do another page                       [16]
                    04   02D2   695          ret                                 ; Return                                [09]
                         02D3   696
```

```
02D3    698          .Subtitle       DSX$Print Routine - Load type code byte
02D3    699 ;++
02D3    700 ; Functional Description:
02D3    701 ;
02D3    702 ;       This routine is the control point for Supervisor type coding.
02D3    703 ;       It sets the typecode byte to the proper value, and calls the
02D3    704 ;       desired PRINT routine.  Any print which does not go through
02D3    705 ;       this routine, and which does not set DS$GB_TYPECODE explicitly
02D3    706 ;       will have the default (current) type code [normally 0].
02D3    707 ;
02D3    708 ; Input Parameters:
02D3    709 ;
02D3    710 ;       4(ap)           Type code value (negative of typecode indicates
02D3    711 ;                       that code is 'sticky', and will not be cleared.
02D3    712 ;       8(ap)           Which PRINTx is desired
02D3    713 ;       12(ap)          Address of ASCIC format string
02D3    714 ;       16(ap)          First FAO argument (as in DSX$PRINTx routines)
02D3    715 ;         .
02D3    716 ;         .
02D3    717 ;         .
02D3    718 ;
02D3    719 ; Output Parameters:
02D3    720 ;
02D3    721 ;       none
02D3    722 ;
02D3    723 ; Implicit Inputs:
02D3    724 ;
02D3    725 ;       none
02D3    726 ;
02D3    727 ; Implicit Outputs:
02D3    728 ;
02D3    729 ;       DS$GL_TYPECODE  set to input value.
02D3    730 ;
02D3    731 ; Side effects:
02D3    732 ;
02D3    733 ;       none
02D3    734 ;
02D3    735 ; Status returns:
02D3    736 ;
02D3    737 ;       none
02D3    738 ;--
```

```
                        0000  02D3   740 .Entry  dsx$print, ^M<>                    ;                                  [09]
                          00    DD   02D5   741          pushl   #0                 ; Allocate a zero longword         [09]
                    50    04 AC   D0   02D7   742          movl    4(ap), r0          ; Copy type code                   [09]
                          50    D5   02DB   743          tstl    r0                 ; Check typecode                   [09]
                          05    18   02DD   744          bgeq    10$                ; Branch if not sticky             [09]
                       50 50    CE   02DF   745          mnegl   r0, r0             ; If sticky, then negate and       [09]
                          6E    D6   02E2   746          incl    (sp)               ; ... mark as sticky               [09]
                                     02E4   747
            00000000'EF   50    90   02E4   748 10$:     movb    r0, L^ds$gb_typecode ; Store the thing                [09]
                                     02EB   749          case    src=8(ap),type=b,limit=#0, -  ; Case on the dispatch code  [09]
                                     02EB   750           displist=<-               ;                                  [09]
                                     02EB   751              20$, -                 ; PRINTI                           [09]
                                     02EB   752              30$, -                 ; PRINTF                           [09]
                                     02EB   753              40$, -                 ; PRINTB                           [09]
                                     02EB   754              50$>                   ; PRINTX                           [09]
         03'  00    08 AC   8F   02EB          CASEb   8(ap),#0,S^#<<30001$-30000$>/2>-1
                                     02F0       30000$:
                              0008'  02F0              .SIGNED_WORD    20$-30000$
                              000E'  02F2              .SIGNED_WORD    30$-30000$
                              0014'  02F4              .SIGNED_WORD    40$-30000$
                              001A'  02F6              .SIGNED_WORD    50$-30000$
                                     02F8       30001$:
                                     02F8   755
                    50   68'AF   9E   02F8   756 20$:     movab   B^dsx$printi, r0   ; Address for PRINTI              [09]
                          10    11   02FC   757          brb     60$                ;                                  [09]
                                     02FE   758
                    50   53'AF   9E   02FE   759 30$:     movab   B^dsx$printf, r0   ; Address for PRINTF              [09]
                          0A    11   0302   760          brb     60$                ;                                  [09]
                                     0304   761
                    50   3B'AF   9E   0304   762 40$:     movab   B^dsx$printb, r0   ; Address for PRINTB              [09]
                          04    11   0308   763          brb     60$                ;                                  [09]
                                     030A   764
                    50   2E'AF   9E   030A   765 50$:     movab   B^dsx$printx, r0   ; Address for PRINTX              [09]
                                     030E   766
         08 AC      6C    02   C3   030E   767 60$:     subl3   #2, (ap), 8(ap)    ; Shorten arg list                 [09]
                 60    08 AC   FA   0313   768          calls   8(ap), (r0)        ; Call the routine                 [09]
                       06 8E   E8   0317   769          blbs    (sp)+, 70$         ; Return if sticky type            [09]
                00000000'EF   94   031A   770          clrb    L^ds$gb_typecode   ; Otherwise clear it              [09]
                                     0320   771
                              04     0320   772 70$:     ret                        ; Return                           [09]
```

```
0321    774          .Subtitle       DSX$PrintX Routines - Extended print routines
0321    775 ;++
0321    776 ; Functional Description:
0321    777 ;
0321    778 ;       DSX$PRINTS      ROUTINE TO PRINT SUMMARY MESSAGES
0321    779 ;       DSX$PRINTX      ROUTINE TO PRINT EXTENDED MESSAGES
0321    780 ;       DSX$PRINTB      ROUTINE TO PRINT BASIC MESSAGES
0321    781 ;       DSX$PRINTF      ROUTINE TO PRINT FORCED MESSAGES
0321    782 ;       DSX$PRINTI      ROUTINE TO PRINT EVEN IN APT MODE
0321    783 ;
0321    784 ; Calling Sequence:
0321    785 ;
0321    786 ;       Procedure Call Thru Vectors In Entry
0321    787 ;
0321    788 ; Input Parameters:
0321    789 ;
0321    790 ;       (AP)            = NUMBER OF PARAMETERS + 1
0321    791 ;       4(AP)           = ADDRESS OF COUNTED ASCII FORMAT STRING
0321    792 ;       8(AP)           = FIRST PARAMETER
0321    793 ;       (AP)[(AP)]      = LAST PARAMETER
0321    794 ;
0321    795 ; Implicit Inputs:
0321    796 ;
0321    797 ;       NONE
0321    798 ;
0321    799 ; Output Parameters:
0321    800 ;
0321    801 ;       NONE
0321    802 ;
0321    803 ; Implicit Outputs:
0321    804 ;
0321    805 ;       NONE
0321    806 ;
0321    807 ; Completion Codes:
0321    808 ;
0321    809 ;       NONE
0321    810 ;
0321    811 ; Side Effects:
0321    812 ;
0321    813 ;       NONE
0321    814 ;
0321    815 ;--
```

```
                                 0321   817          .ENABL  LSB
                                 0321   818
                          0000   0321   819 .ENTRY  DSX$PRINTS,^M<>                          ; ENTRY MASK
                                 0323   820
                                 0323   821          Br_If_Not_IES   30$                    ; If summary not inhibited, go  [11]
0000FE00'EF    07    E1          0323               BBC     #DSA$V_IES, -                  ; If bit not set, branch        [29]
                     2A          032A                 L^DSA$GL_Flags, 30$                  ;                               [29]
                                 032B   822 ;         BBC     #DSA$V_IES,L^DSA$GL_FLAGS,30$  ; If summary not inhibited go
                  0131   31      032B   823          BRW     PRINT_X                        ; SUMMARY INHIBITED
                                 032E   824
                          0000   032E   825 .ENTRY  DSX$PRINTX,^M<>
                                 0330   826
                                 0330   827          Br_If_Not_IE3   10$                    ; Inhibit Level-3 flag          [11]
0000FE00'EF    06    E1          0330               BBC     #DSA$V_IE3, -                  ; If bit not set, branch        [29]
                     05          0337                 L^DSA$GL_Flags, 10$                  ;                               [29]
                                 0338   828 ;         BBC     #DSA$V_IE3,L^DSA$GL_FLAGS,10$  ; INHIBIT LEVEL-3 FLAG
                  0124   31      0338   829          BRW     PRINT_X                        ; LEVEL-3 MESSAGES INHIBITED
                                 033B   830
                          0000   033B   831 .ENTRY  DSX$PRINTB,^M<>
                                 033D   832
                                 033D   833 10$:     Br_If_Not_IE2   20$                    ; Inhibit Level-2 flag          [11]
0000FE00'EF    05    E1          033D               BBC     #DSA$V_IE2, -                  ; If bit not set, branch        [29]
                     03          0344                 L^DSA$GL_Flags, 20$                  ;                               [29]
                                 0345   834 ;10$:    BBC     #DSA$V_IE2,L^DSA$GL_FLAGS,20$  ; INHIBIT LEVEL-2 FLAG
                  0117   31      0345   835          BRW     PRINT_X                        ; LEVEL-2 INHIBITED
                                 0348   836
                                 0348   837 20$:     Br_If_Not_IE1   30$                    ; Inhibit Level-1 flag          [11]
0000FE00'EF    04    E1          0348               BBC     #DSA$V_IE1, -                  ; If bit not set, branch        [29]
                     05          034F                 L^DSA$GL_Flags, 30$                  ;                               [29]
                                 0350   838 ;20$:    BBC     #DSA$V_IE1,L^DSA$GL_FLAGS,30$  ; INHIBIT LEVEL-1 FLAG
                  010C   31      0350   839          BRW     PRINT_X                        ; LEVEL-1 INHIBITED...
                                 0353   840                                                 ; ... => ALL INHIBITED
                                 0353   841
                          0000   0353   842 .ENTRY  DSX$PRINTF,^M<>
                                 0355   843
                                 0355   844 30$:     Br_If_Not_Apt   40$                    ; If not in APT mode, proceed   [11]
0000FE00'EF    1F    E1          0355               BBC     #DSA$V_Apt, -                  ; If bit not set, branch
                     0D          035C                 L^DSA$GL_Flags, 40$                  ;
                                 035D   845          Br_If_Not_NoRpt 40$                    ; If not supressing output, go  [11]
0000FE00'EF    1B    E1          035D               BBC     #DSA$V_NoRpt, -                ; If bit not set, branch        [29]
                     05          0364                 L^DSA$GL_Flags, 40$                  ;                               [29]
                                 0365   846 ;30$:    BBC     #DSA$V_APT, -                  ; IF NOT IN APT MODE PROCEED
                                 0365   847 ;                 L^DSA$GL_FLAGS,40$
                                 0365   848 ;         BBC     #DSA$V_NORPT, -                ; APT MODE, IF NOT SUPPRESSING ...
                                 0365   849 ;                 L^DSA$GL_FLAGS,40$         ; ... OUTPUT, branch
                  00F7   31      0365   850          BRW     PRINT_X                        ; YES, IN APT MODE AND OUTPUT ...
                                 0368   851                                                 ; ... SUPPRESSED.
                                 0368   852
                          0000   0368   853 .ENTRY  DSX$PRINTI,^M<>
                                 036A   854
                                 036A   855 40$:
     50   0000FE00'EF    DE      036A   856          MOVAL   L^DSA$GL_FLAGS,R0              ; POINT TO FLAGS LONGWORD
        5E   0001'CE    9E      0371   857          MOVAB   -DS$K_BUFSIZ+1(SP),SP          ; Allocate space                [09]
  00000230'EF    01    AE      9E      0376   858          MOVAB   1(SP), L^QBUFF+4               ;                               [09]
7E   60   F7FFFFFF    8F      CB      037E   859          BICL3   #^CDSA$M_NORPT,(R0),-(SP)       ; SAVE STATE OF DSA$M_NORPT
             60   6E    CA      0386   860          BICL2   (SP),(R0)                      ; CLEAR NORPT FLAG
                                 0389   861          Set_Output                             ; Set OUTPUT flag               [11]
```

```
                00000000'EF   17   E2  0389                BBSS    #DS$V_Output, -                 ; Branch if OUTPUT bit is set to        [29]
                              00       0390                  L^DS$GL_Flags, 30002$ ; ...                                             [29]
                                       0391          30002$:                                     ; ... here. Set bit regardless.         [29]
                                       0391    862
                 7E    04 AC    01   C1  0391    863         ADDL3   #1,4(AP),-(SP)               ; COPY STRING ORIGIN
                       7E   04 BC   9A  0396    864         MOVZBL  @4(AP),-(SP)                ; COPY CONTROL STRING LENGTH
                            08 AC   DF  039A    865         PUSHAL  8(AP)                       ; ADDRESS OF INSERT LIST
                     0000022C'EF   7F  039D    866         PUSHAQ  L^QBUFF                     ; ADDRESS OF OUTPUT BUFFER DESCRIPTOR   [07]
                     00000000'EF   3F  03A3    867         PUSHAW  L^DS$GL_BUFLEN              ; ADDRESS TO RETURN STRING LENGTH       [07]
                           0C AE   7F  03A9    868         PUSHAQ  12(SP)                      ; ADDRESS OF CONTROL STRING DESCRIPTOR
                00000000'9F   06   FB  03AC    869         CALLS   #6,@#SYS$FAOL               ; DO THE EDITING
                                       03B3    870                                             ;                                       [18]
                         01   50   D1  03B3    871         CMPL    R0,#SS$_NORMAL              ; ARE PRINT MACRO'S OK, CORRECT PARAM.  [18]
                              03   13  03B6    872         BEQL    45$                         ;                                       [18]
                              00A4 31  03B8    873         BRW     PRINT_X                     ; EXIT IF NOT CORRECT.                  [18]
                                       03BB    874    45$:                                     ;                                       [18]
                                       03BB    875         Br_If_Not_Binary        60$         ; Skip funny stuff if not binary        [10]
                0000FE00'EF   01   E1  03BB                BBC     #DSA$V_Binary, -                ; If bit not set, branch                [29]
                              1A       03C2                  L^DSA$GL_Flags, 60$             ;                                       [29]
                     00000000'EF   D6  03C3    876         incl    L^ds$gl_buflen              ; Increment length of final string      [09]
                     00000230'EF   D7  03C9    877         decl    L^qbuff+4                   ; Decrment address                      [09]
                50   00000000'EF   9E  03CF    878         movab   L^ds$gb_typecode, r0        ; Get address of type code              [09]
                00000230'FF   60   90  03D6    879         movb    (r0), @L^qbuff+4            ; Set first byte of buffer = type code  [09]
                                       03DD    880
                50   0000FE68'EF   7E  03DD    881    60$:     MOVAQ   L^DSA$GQ_MSGPTR,R0          ; POINT TO TEST DESCRIPTOR
                80   00000000'EF   3C  03E4    882         MOVZWL  L^DS$GL_BUFLEN,(R0)+        ; STRING LENGTH TO MAILBOX              [07]
                51   00000230'EF   DE  03EB    883         moval   L^Qbuff+4, r1               ; Get address of Qbuff                  [09]
                          60   61   D0  03F2    884         movl    (r1), (r0)                  ; Buffer adr to mailbox                 [09]
                                       03F5    885
                                       03F5    886 ;
                                       03F5    887 ; DEBUG ***
                                       03F5    888 ;
                      4E 0000050B'EF   E9  03F5    889         blbc    L^Debug_the_sucker, 68$ ; Skip debug stuff if flag clear        [99]
                                       03FC    890         Br_If_Not_Binary        68$         ; Only do debug if BINARY is set        [10]
                0000FE00'EF   01   E1  03FC                BBC     #DSA$V_Binary, -                ; If bit not set, branch                [29]
                              46       0403                  L^DSA$GL_Flags, 68$             ;                                       [29]
                              1F   BB  0404    891         pushr   #^M<r0,r1,r2,r3,r4>         ; Make debug transparent                [99]
                           54   6E   9E  0406    892         movab   (sp), r4                    ; Save current sp                       [99]
                              12   11  0409    893         brb     62$                         ; Skip format string                    [99]
                                       040B    894
5A 21 3D 70 74 5B 00000413'010E0000'   040B    895    61$:     .ascid  "[tp=!ZB]!/"                ; Format string (with <CR><LF>)         [10]
                        2F 21 5D 42    0419
                                       041D    896
                           5E   0A   C2  041D    897    62$:     subl2   #10, sp                     ; Allocate space on stack               [99]
                                6E   9F  0420    898         pushab  (sp)                        ; Set it's address                      [99]
                           7E   0A   9A  0422    899         movzbl  #10, -(sp)                  ; And it's length                       [99]
                           53   6E   9E  0425    900         movab   (sp), r3                    ; And remember it                       [99]
                      7E   00   B1   9A  0428    901         movzbl  @(r1), -(sp)                ; Final argument for FAO                [99]
                           00   B1   94  042C    902         clrb    @(r1)                       ; Clear it out to avoid tty problems    [99]
                                63   9F  042F    903         pushab  (r3)                        ; Where to put length                   [99]
                                63   9F  0431    904         pushab  (r3)                        ; Address of result buffer              [99]
                             D5   AF   9F  0433    905         pushab  61$                         ; Address of format string              [99]
                00000000'GF   04   FB  0436    906         calls   #4, G^sys$fao               ; FAO it                                [99]
                           7E   63   7D  043D    907         movq    (r3), -(sp)                 ; Push address of result string         [99]
                      FC02 CF   02   FB  0440    908         calls   #2, dsx$type_out            ; Print it                              [99]
                           5E   64   9E  0445    909         movab   (r4), sp                    ; Restore initial stack                 [99]
                                1F   BA  0448    910         popr    #^M<r0,r1,r2,r3,r4>         ; Restore registers                     [99]
```

```
                                044A
                                044A  68$:                                        ;                                        [99]
                                044A
                                044A  ;
                                044A  ; DEBUG ***
                                044A  ;
                     61   DD    044A          pushl   (r1)                        ; Push address of buffer                 [09]
      7E   00000000'EF   3C    044C          movzwl  L^ds$gl_buflen, -(sp)       ; And length of same                     [09]
         FBEF CF   02   FB    0453          calls   #2, dsx$type_out            ; Do the actual output                   [09]
                                0458
      0000FE00'EF   8E   C8    0458  90$:    BISL2   (SP)+,L^DSA$GL_FLAGS        ; RESTORE STATE OF SUPPRESS FLAG
                                045F
                                045F  PRINT_X:
          00000000'EF   D5    045F          TSTL    MP$GR_BOOTED_PROCESSORS     ; Are we an mp system?                   [29]
                     06   12    0465          BNEQ    100$                        ; Branch if mp                           [29]
          00000000'EF   16    0467          jsb     L^kb_check                  ; Check for Control-C                    [08]
                                046D  100$:
                          04    046D          RET
                                046E
                                046E          .DSABL  LSB
                                046E
                                046E  ;+
                                046E  ; Cancel current input QIO operation and reset ^C handler
                                046E  ;-
                                046E
                                046E  RESET_INPUT:
                                046E          $CANCEL_S CHAN=L^DS$GW_TTIN         ; Cancel I/O on input channel            [07]
      7E   00000000'EF   3C    046E                  MOVZWL  L^DS$GW_TTIN,-(SP)
      00000000'GF   01   FB    0475                  CALLS   #1,G^SYS$CANCEL
                                047C          $QIOW_S CHAN=L^DS$GW_TTIN, -        ; Reset ^C handler                       [07]
                                047C                  FUNC=#IO$_SETMODE!IO$M_CTRLCAST, -
                                047C                  P1=RCTRLC
                     7E   7C    047C                  CLRQ    -(SP)
                     7E   7C    047E                  CLRQ    -(SP)
                     00   DD    0480                  PUSHL   #0
          00000000'EF   DF    0482                  PUSHAL  RCTRLC
                     7E   7C    0488                  CLRQ    -(SP)
                     00   DD    048A                  PUSHL   #0
         7E   0000'8F   3C    048C                  MOVZWL  #IO$_SETMODE!IO$M_CTRLCAST,-(SP)
      7E   00000000'EF   3C    0491                  MOVZWL  L^DS$GW_TTIN,-(SP)
                     00   DD    0498                  PUSHL   #0
      00000000'GF   0C   FB    049A                  CALLS   #12,G^SYS$QIOW
                          05    04A1          RSB                                 ; Return
                                04A2
```

```
04A2          .SBTTL  DSX$Printrev Routine
04A2    ;++
04A2    ; FUNCTIONAL DESCRIPTION:
04A2    ;
04A2    ;       This routine alerts the user to a difference between the revision
04A2    ;       level of the hardware, firmware, patch level  and the revision level
04A2    ;       the diagnostic was written for.  The operator has the choice as to
04A2    ;       whether all, some, or none of the error messages will be displayed.
04A2    ;
04A2    ; CALLING SEQUENCE:
04A2    ;
04A2    ;       $DS_PRINTREV_X
04A2    ;               CALLS   #7,a#DSX$PRINTREV
04A2    ;
04A2    ; INPUT PARAMETERS:
04A2    ;
04A2    ;       LOG_UNIT(AP)     = UNIT NUMBER OF DEVICE BEING TESTED
04A2    ;       ACTUAL_REV(AP)   = REVISION LEVEL OF UNIT BEING TESTED
04A2    ;       EXPECTED_REV(AP)= CURRENT DIAGNOSTIC'S REVISION LEVEL
04A2    ;       REV_TYPE(AP)     = HARDWARE, FIRMWARE, OR PATCH LEVEL
04A2    ;       PRINTMASK(AP)    = INHIBITS PRINTING OF SOME OR ALL MESSAGES
04A2    ;       PRLINK(AP)       = ADDRESS OF USER'S ERROR PRINT ROUTINE
04A2    ;       MODULENUM(AP)    = MODULE NUMBER BEING TESTED
04A2    ;
04A2    ; IMPLICIT INPUTS:
04A2    ;
04A2    ;       NONE
04A2    ;
04A2    ; DATA STRUCTURES:
04A2    ;                               ADDR_128                                  ;G:2
04A2    ;                   +-----------------------------+                       ;G:2
04A2    ;                   |Addr. of dev. "0" data block|                       ;G:3
04A2    ;                   +-----------------------------+                       ;G:2
04A2    ;               +4  |Addr. of dev. "1" data block|                       ;G:2
04A2    ;                   +-----------------------------+                       ;G:2
04A2    ;               +8  |Addr. of dev. "2" data block|                       ;G:3
04A2    ;                   +-----------------------------+                       ;G:2
04A2    ;                                ...                                      ;G:2
04A2    ;                                ...                                      ;G:2
04A2    ;                                ...                                      ;G:2
04A2    ;                        => Up to 128 devices                             ;G:3
04A2    ;                                                                         ;G:2
04A2    ;                                                                         ;G:2
04A2    ;                                                                         ;G:2
04A2    ;                          THE DATA BLOCK                                 ;G:2
04A2    ;                   +-------------------------+
04A2    ;                   | address of device name |                            ;G:3
04A2    ;                   +-------------------------+
04A2    ;               +4  | Module number 1        |
04A2    ;                   +-------------------------+
04A2    ;               +8  | Hardware Rev (actual)  |
04A2    ;                   +-------------------------+
04A2    ;              +12  | Firmware Rev (actual)  |
04A2    ;                   +-------------------------+
04A2    ;              +16  | Patch Revision (actual)|
04A2    ;                   +-------------------------+
04A2    ;              +20  | Module number 2        |
```

```
                                  04A2  1001 ;                    +-----------------------+
                                  04A2  1002 ;                            ...                                                  ;G:3
                                  04A2  1003 ;                            ...                                                  ;G:2
                                  04A2  1004 ;                            ...
                                  04A2  1005 ;                    ==> Up to 4 Module Numbers                                   ;G:2
                                  04A2  1006 ;                                                                                 ;G:3
                                  04A2  1007 ;
                                  04A2  1008 ; OUTPUT PARAMETERS:
                                  04A2  1009 ;
                                  04A2  1010 ;       NONE
                                  04A2  1011 ;
                                  04A2  1012 ; IMPLICIT OUTPUTS:
                                  04A2  1013 ;
                                  04A2  1014 ;       Modifications to Data Structure                                           ;G:2
                                  04A2  1015 ;
                                  04A2  1016 ; COMPLETION CODES:
                                  04A2  1017 ;
                                  04A2  1018 ;       ds$_overflow == Exceeding maximum number of devices, or modules in data stru
                                  04A2  1019 ;       ds$_illunit  == Logical unit does not exist in P-table
                                  04A2  1020 ;       ds$_badtype  == Revision type is invalid
                                  04A2  1021 ;       ds$_error    == Hardware revision is out of bounds
                                  04A2  1022 ;       ds$_normal   == Normal return status                                      ;G:2
                                  04A2  1023 ;       ds$_mem_alloc_err == Not enough memory available thru EXE$ALONONPAGED ;G:2
                                  04A2  1024 ;
                                  04A2  1025 ;
                                  04A2  1026 ; SIDE EFFECTS:
                                  04A2  1027 ;
                                  04A2  1028 ;       NONE
                                  04A2  1029 ;
                                  04A2  1030 ;--
                                  04A2  1031
                          03FC    04A2  1032 .ENTRY  DSX$PRINTREV, ^M<R2,R3,R4,R5,R6,R7,R8,R9>                                 ;G:3
                                  04A4  1033                                                                                   ;G:3
                                  04A4  1034                                                                                   ;G:2
      00000228'EF   04 AC    D0   04A4  1035         MOVL    printrev$_log_unit(AP),lognum          ; Get logunit # into lognum
00000080 8F   00000228'EF    D1   04AC  1036         CMPL    lognum,#128                            ; If lognum < 128      ;G:3
                      1C     19   04B7  1037         BLSS    0$                                     ;    okay else print message
                                  04B9  1038         $PRINT  #DS$K_TYPE_COMMAND_OUT,-               ;    declaring illegal lognu
                                  04B9  1039                 #DS$K_PRINTF,-                         ;    value and branch out ;G
                                  04B9  1040                 fmt_toohigh,-                                                     ;G:2
                                  04B9  1041                 lognum                                                            ;G:3
            00000228'EF    DD    04B9                        PUSHL   lognum
            00000458'EF    9F    04BF                        PUSHAB  fmt_toohigh
                  7E   01   9A   04C5                        movzbl  #DS$K_PRINTF, -(sp)
                  7E   16   98   04C8                        cvtbl   #DS$K_TYPE_COMMAND_OUT, -(sp)
        000002D3'GF    04    FB   04CB                        CALLS   #$$N+2, G^DSX$PRINT
                    04AB    31   04D2  1042         BRW     99$                                                               ;G:3
        59   00000228'EF    D0   04D5  1043 0$:     MOVL    lognum,R9                                                         ;G:3
                                  04DC  1044                                                                                   ;G:3
      00000000'EF49    00    D1   04DC  1045         CMPL    #0,ADDR_128[R9]                        ; Check if lognum already ex
                       32    12   04E4  1046         BNEQ    3$                                     ; If = 0 need new block so d
        51   00000044 8F    D0   04E6  1047         MOVL    #68,R1                                 ; Size of required block in
            00000000'EF    16   04ED  1048         JSB     EXE$ALONONPAGED                        ; Creates dynamic block ;G:2
                   18 50    E9   04F3  1049         BLBC    R0,2$                                  ; If low bit clear no memory
                                  04F6  1050                                                                                   ;G:2
           53   52   51    C1   04F6  1051         ADDL3   R1,R2,R3                               ; R3 - address of the upper
                       04    BB   04FA  1052         PUSHR   #^M<R2>                                ; Save current R2      ;G:3
```

```
                  62   94  04FC  1053 1$:    CLRB    (R2)                                  ; Go thru newly allocated me
          FA 52   53   F2  04FE  1054        AOBLSS  R3,R2,1$                              ;    clear it up in case exe
                  04   BA  0502  1055        POPR    #^M<R2>                               ;    gave you bad memory ;G:
                           0504  1056                                                                                ;G:2
   00000000'EF49  52   D0  0504  1057        MOVL    R2,ADDR_128[R9]                       ; Put addr in ADDR_128 ;G:2
                  12   11  050C  1058        BRB     4$                                                            ;G:3
                           050E  1059                                                                                ;G:2
     50   00660138 8F   D0  050E  1060 2$:    MOVL    #ds$_mem_alloc_err,R0                 ; Error return - no memory ;
                046F   31  0515  1061        BRW     100$                                  ; Return                ;G:2
                           0518  1062                                                                                ;G:2
   52   00000000'EF49   D0  0518  1063 3$:    MOVL    ADDR_128[R9],R2                       ; Put addr in R2        ;G:2
                           0520  1064                                                                                ;G:3
        00000204'EF     D4  0520  1065 4$:    CLRL    HARDEXIST$T                           ; clear flags           ;G:3
        00000200'EF     D4  0526  1066        CLRL    FIRMEXIST$T
        00000208'EF     D4  052C  1067        CLRL    PATCHEXIST$T
                           0532  1068
                           0532  1069 5$:    $DS_GPHARD_S    printrev$_log_unit(AP),a#p_table;Get device's p-table ;G:2
        0000020C'9F     DF  0532                      PUSHAL  a#p_table
              04 AC     DD  0538                      PUSHL   printrev$_log_unit(AP)
     00000000'9F  02    FB  053B                      CALLS   #2, a#DS$GPHARD
     56   0000020C'EF   D0  0542  1070        MOVL    p_table,R6                            ; Get address of hp-table
                  56   D5  0549  1071        TSTL    R6                                    ; If no device go to error
                  6B   13  054B  1072        BEQL    10$                                                           ;G:2
        00000218'EF     7C  054D  1073        CLRQ    DEVNAME                               ; clear name            ;G:2
     00000218'EF  66    90  0553  1074        MOVB    HP$Q_DEVICE(R6),DEVNAME               ; Length of device name
          57   04 A6    D0  055A  1075        MOVL    4(R6),R7                              ; Offset to device name
                  04   BB  055E  1076        PUSHR   #^M<R2>                               ; LOST AFTER MOVC
 00000219'EF   67  66   28  0560  1077        MOVC3   HP$Q_DEVICE(R6),(R7),DEVNAME+1        ; Put char. in devname
                  04   BA  0568  1078        POPR    #^M<R2>                               ; RESTORED              ;G:2
     56   00000218'EF   DE  056A  1079        MOVAL   DEVNAME,R6                            ; Store Adr. in reg
             62   56   D0  0571  1080        MOVL    R6,(R2)                               ; and in data structure
                           0574  1081
             52   04   C0  0574  1082        ADDL2   #4,R2                                 ; Increment Pointer
             51   04   D0  0577  1083        MOVL    #4,R1                                 ; Counter for TNAMEs
                           057A  1084                                                                                ;G:3
                  62   D5  057A  1085 6$:    TSTL    (R2)                                  ; See if TNAME there    ;G:2
                  0B   12  057C  1086        BNEQ    7$                                                            ;G:2
                           057E  1087                                                                                ;G:3
             6C   07   D1  057E  1088        CMPL    #7,(AP)                               ; Branch if module # is
                  14   12  0581  1089        BNEQ    8$                                    ; not on the stack.
          62   1C AC    D0  0583  1090        MOVL    printrev$_MODULENUM(AP),(R2)
                  0E   11  0587  1091        BRB     8$                                    ; Skip error return     ;G:3
                           0589  1092
             6C   07   D1  0589  1093 7$:    CMPL    #7,(AP)                               ; Branch if module # is
                  09   12  058C  1094        BNEQ    8$                                    ; not on the stack.
          50   1C AC    D0  058E  1095        MOVL    printrev$_MODULENUM(AP),R0            ; See if already have a T na
             62   50   D1  0592  1096        CMPL    R0,(R2)                               ; if equal tname move to har
                  05   12  0595  1097        BNEQ    9$                                                            ;G:2
                           0597  1098
             52   04   C0  0597  1099 8$:    ADDL2   #4,R2                                                         ;G:2
                  26   11  059A  1100        BRB     11$                                                           ;G:2
                           059C  1101
             52   10   C0  059C  1102 9$:    ADDL2   #16,R2                                ; Check next TNAME      ;G:2
               D8 51   F5  059F  1103        SOBGTR  R1,6$                                                         ;G:2
                           05A2  1104        $PRINT  #DS$K_TYPE_COMMAND_OUT,-              ; Data struture full [34] ;G
                           05A2  1105                #DS$K_PRINTF,-                                                ;G:2
                           05A2  1106                fmt_toomany_mods                                              ;G:2
```

```
          000004A2'EF   9F  05A2                          PUSHAB  fmt_toomany_mods
                7E   01   9A  05A8                          movzbl  #DS$K_PRINTF, -(sp)
                7E   16   98  05AB                          cvtbl   #DS$K_TYPE_COMMAND_OUT, -(sp)
      000002D3'GF   03   FB  05AE                          CALLS   #$$N+2, G^DSX$PRINT
                  03C8   31  05B5  1107          BRW     99$                                     ;
                             05B8  1108
      50   00660100 8F   D0  05B8  1109 10$:     MOVL    #DS$_ILLUNIT,R0                         ; Error return          ;G:2
                  03C5   31  05BF  1110          BRW     100$                                    ; Return                ;G:2
                             05C2  1111                                                                                   ;G:3
           10 AC   01   D1  05C2  1112 11$:     CMPL    #prv$m_hwrev,printrev$_rev_type(AP)                             ;G:2
                   22   13  05C6  1113          BEQL    14$                                     ;
              52   04   C0  05C8  1114          ADDL    #4,R2                                   ; update pointer
           10 AC   02   D1  05CB  1115          CMPL    #prv$m_fwrev,printrev$_rev_type(AP)
                   03   12  05CF  1116          BNEQ    12$                                     ; Continue
                  00EA   31  05D1  1117          BRW     25$                                     ; Firmware
                             05D4  1118                                                                                   ;G:2
              52   04   C0  05D4  1119 12$:     ADDL    #4,R2
           10 AC   04   D1  05D7  1120          CMPL    #prv$m_prev,printrev$_rev_type(AP)      ;[26]
                   03   12  05DB  1121          BNEQ    13$                                     ; Continue
                  00F7   31  05DD  1122          BRW     30$                                     ; Patch level
      50   006600E8 8F   D0  05E0  1123 13$:     MOVL    #DS$_BADTYPE,R0                         ; not hard,firmware, or patc
                  039D   31  05E7  1124          BRW     100$                                    ; Return
                             05EA  1125 ;-----------------------------------------------------------------------------
                             05EA  1126 ; Hardware rev type
                             05EA  1127 ;
   08 AC   000002BE 8F   D1  05EA  1128 14$:     CMPL    #702,PRINTREV$_ACTUAL_REV(AP)           ; Is rev. > 702     [34]
                   27   19  05F2  1129          BLSS    15$                                     ; yes, then error   [34]
   0C AC   000002BE 8F   D1  05F4  1130          CMPL    #702,PRINTREV$_EXPECTED_REV(AP)         ; Is rev. > 702     [34]
                   1D   19  05FC  1131          BLSS    15$                                     ; yes, then error   [34]
                             05FE  1132
      00000294'EF   02   90  05FE  1133          MOVB    #2,ACT_REV                              ; Set up a counted [31]
      00000295'EF   20   90  0605  1134          MOVB    #^X20,ACT_REV+1                         ; ascic string for [31]
      00000296'EF   20   90  060C  1135          MOVB    #^X20,ACT_REV+2                         ; output           [31]
                 08 AC   D5  0613  1136          TSTL    PRINTREV$_ACTUAL_REV(AP)                ; Test if rev = 0  [31]
                   0D   12  0616  1137          BNEQ    16$                                     ; if not 0 branch  [31]
                  0087   31  0618  1138          BRW     20$                                     ; print blanks     [31]
                             061B  1139
      50   00660002 8F   D0  061B  1140 15$:     MOVL    #DS$_ERROR,R0                           ; Hardware revision[34]
                  0362   31  0622  1141          BRW     100$                                    ; out of bounds    [34]
                             0625  1142
         03 14 AC   04   E0  0625  1143 16$:     BBS     #PRMSK$V_TRANSL, -
                             062A  1144                  Printrev$_PRINTMASK(AP),17$             ; Trans to code    [31]
                  004E   31  062A  1145          BRW     19$                                     ; Trans # to ascic [31]
   00000284'EF   08 AC   D0  062D  1146 17$:     MOVL    PRINTREV$_ACTUAL_REV(AP),Q_DIVD         ; Move to quadword [31]
      00000284'EF   1B   7B  0635  1147          EDIV    #27,Q_DIVD,-                            ; Use Extended Div.[31]
00000290'EF   0000028C'EF    063C  1148                  L_QUO, L_REM                            ; to find quotent  [31]
            0000028C'EF   D5  0646  1149          TSTL    L_QUO                                   ; and remainder.   [31]
                   1D   13  064C  1150          BEQL    18$                                     ; Branch if 1 - 26 [31]
   0000028C'EF   40 8F   81  064E  1151          ADDB3   #^x40,L_QUO,ACT_REV+1                   ; Compute Ax - Zx  [31]
            00000295'EF      0656
   00000290'EF   41 8F   81  065B  1152          ADDB3   #^x41,L_REM,ACT_REV+2                   ; Compute xA - xZ  [31]
            00000296'EF      0663
                  0037   31  0668  1153          BRW     20$                                     ; Continue         [31]
   00000290'EF   40 8F   81  066B  1154 18$:     ADDB3   #^x40,L_REM,ACT_REV+1                   ; Compute A - Z    [31]
            00000295'EF      0673
                  0027   31  0678  1155          BRW     20$
                             067B  1156 19$:
```

```
                                  067B          $FAO_S  CTRSTR=CONTROL,-                        ; Convert from     [31]
                                  067B                  OUTBUF=FAO_DESC,-                       ; longword to      [31]
                                  067B                  OUTLEN=FAO_LEN,-                        ; ASCII            [31]
                                  067B                  P1=PRINTREV$_ACTUAL_REV(AP)             ;                  [31]
                    08 AC    DD   067B                  PUSHL   PRINTREV$_ACTUAL_REV(AP)
                000002BE'EF  7F   067E                  PUSHAQ  FAO_DESC
                000002C6'EF  3F   0684                  PUSHAW  FAO_LEN
                000002D2'EF  7F   068A                  PUSHAQ  CONTROL
          00000000'GF   04   FB   0690                  CALLS   #$$T2,G^SYS$FAO
  00000294'EF   000002C6'EF  90   0697          MOVB    FAO_LEN,ACT_REV                         ; And form ascic   [31]
                                  06A2
  00000210'EF   0000041D'EF  DE   06A2  20$:    MOVAL   hardmessa,warecode                      ; Rev_type message
          00000204'EF   01   90   06AD          MOVB    #1,hardexist$t                          ; flag set rev type moved in
                                  06B4                                                                                ;G:3
          62    00000294'EF  D0   06B4  23$:    MOVL    ACT_REV,(R2)                            ; Put # in data structure
                     002F    31   06BB          BRW     40$
                                  06BE
                                  06BE  ;-----------------------------------------------------------------------------
                                  06BE  ; Firmware rev type
                                  06BE  ;
  00000210'EF   00000426'EF  DE   06BE  25$:    MOVAL   firmmessa,warecode                      ; Rev_type message
          00000200'EF   01   90   06C9          MOVB    #1,firmexist$t                          ; flag set rev type moved in
                                  06D0
                62    08 AC  D0   06D0  27$:    MOVL    PRINTREV$_ACTUAL_REV(AP),(R2)           ; Put # in data structure
                     0016    31   06D4          BRW     40$
                                  06D7
                                  06D7  ;-----------------------------------------------------------------------------
                                  06D7  ; Patch rev type
                                  06D7  ;
  00000210'EF   0000042F'EF  DE   06D7  30$:    MOVAL   PATCHMESSA,warecode                     ; Rev_type message
          00000208'EF   01   90   06E2          MOVB    #1,patchexist$t                         ; flag set rev type moved in
                                  06E9
                62    08 AC  D0   06E9  35$:    MOVL    PRINTREV$_ACTUAL_REV(AP),(R2)           ; Put # in data structure
                                  06ED
                00000214'EF  D4   06ED  40$:    CLRL    relation                                ; Delete previous difference
             03 14 AC   03   E0   06F3          BBS     #PRMSK$V_ALWAYS,printrev$_printmask(AP),41$ ;Print plain revision
                     00B4    31   06F8          BRW     50$                                     ; If bit is set
                                  06FB
                10 AC   01   D1   06FB  41$:    CMPL    #prv$m_hwrev,printrev$_rev_type(AP)
                        57   13   06FF          BEQL    45$                                     ;
                57    08 AC  D0   0701          MOVL    printrev$_actual_rev(AP),R7
                                  0705          $PRINT  #DS$K_TYPE_COMMAND_OUT,-                ; Typecode
                                  0705                  #DS$K_PrintF,-                          ; ...use printf
                                  0705                  fmt_beg_err,-                           ; ...message format
                                  0705                  warecode,-                              ; ...firm or hardware
                                  0705                  R6                                      ; ...device name
                        56   DD   0705                  PUSHL   R6
                00000210'EF  DD   0707                  PUSHL   warecode
                000002DD'EF  9F   070D                  PUSHAB  fmt_beg_err
                    7E   01   9A   0713                  movzbl  #DS$K_PrintF, -(sp)
                    7E   16   98   0716                  cvtbl   #DS$K_TYPE_COMMAND_OUT, -(sp)
          000002D3'GF   05   FB   0719                  CALLS   #$$N+2, G^DSX$PRINT
                    6C   07   D1   0720          CMPL    #7,(AP)                                 ; Branch if module # is
                        1B   12   0723          BNEQ    43$                                     ; not on the stack.
                    1C AC    D5   0725          TSTL    printrev$_modulenum(ap)
                        16   13   0728          BEQL    43$
                                  072A          $PRINT  #DS$K_TYPE_COMMAND_OUT,-
```

```
                                072A  1203                    #DS$K_PrintF,-
                                072A  1204                    FMT_MODULE,-
                                072A  1205                    PRINTREV$_MODULENUM(AP)
                         1C AC  DD  072A                      PUSHL   PRINTREV$_MODULENUM(AP)
                 000002F9'EF    9F  072D                      PUSHAB  FMT_MODULE
                          7E    01  9A  0733                  movzbl  #DS$K_PrintF, -(sp)
                          7E    16  98  0736                  cvtbl   #DS$K_TYPE_COMMAND_OUT, -(sp)
                 000002D3'GF    04  FB  0739                  CALLS   #$$N+2, G^DSX$PRINT
                                0740  1206 43$:    $PRINT     #DS$K_TYPE_COMMAND_OUT,-
                                0740  1207                    #DS$K_PrintF,-
                                0740  1208                    fmt_p_f_end,-
                                0740  1209                    R7                              ; ...unit revision level
                          57    DD  0740                      PUSHL   R7
                 0000040B'EF    9F  0742                      PUSHAB  fmt_p_f_end
                          7E    01  9A  0748                  movzbl  #DS$K_PrintF, -(sp)
                          7E    16  98  074B                  cvtbl   #DS$K_TYPE_COMMAND_OUT, -(sp)
                 000002D3'GF    04  FB  074E                  CALLS   #$$N+2, G^DSX$PRINT
                              0057  31  0755  1210            BRW     50$
                                0758  1211 45$:
                 57   00000294'EF    DE  0758  1212          MOVAL   ACT_REV,R7                      ; type ascic string
                                075F  1213          $PRINT    #DS$K_TYPE_COMMAND_OUT,-                ; Typecode
                                075F  1214                    #DS$K_PrintF,-                  ; ...use printf
                                075F  1215                    fmt_beg_err,-                   ; ...message format
                                075F  1216                    warecode,-                      ; ...firm or hardware
                                075F  1217                    R6                              ; ...device name
                          56    DD  075F                      PUSHL   R6
                 00000210'EF    DD  0761                      PUSHL   warecode
                 000002DD'EF    9F  0767                      PUSHAB  fmt_beg_err
                          7E    01  9A  076D                  movzbl  #DS$K_PrintF, -(sp)
                          7E    16  98  0770                  cvtbl   #DS$K_TYPE_COMMAND_OUT, -(sp)
                 000002D3'GF    05  FB  0773                  CALLS   #$$N+2, G^DSX$PRINT
                          6C    07  D1  077A  1218            CMPL    #7,(AP)                         ; Branch if module # is
                                1B  12  077D  1219            BNEQ    47$                             ; not on the stack.
                             1C AC  D5  077F  1220            TSTL    printrev$_modulenum(ap)
                                16  13  0782  1221            BEQL    47$
                                0784  1222          $PRINT    #DS$K_TYPE_COMMAND_OUT,-
                                0784  1223                    #DS$K_PrintF,-
                                0784  1224                    fmt_module,-
                                0784  1225                    PRINTREV$_MODULENUM(AP)
                             1C AC  DD  0784                  PUSHL   PRINTREV$_MODULENUM(AP)
                 000002F9'EF    9F  0787                      PUSHAB  fmt_module
                          7E    01  9A  078D                  movzbl  #DS$K_PrintF, -(sp)
                          7E    16  98  0790                  cvtbl   #DS$K_TYPE_COMMAND_OUT, -(sp)
                 000002D3'GF    04  FB  0793                  CALLS   #$$N+2, G^DSX$PRINT
                                079A  1226 47$:    $PRINT     #DS$K_TYPE_COMMAND_OUT,-
                                079A  1227                    #DS$K_PrintF,-
                                079A  1228                    fmt_h_end,-
                                079A  1229                    R7                              ; ...unit revision level
                          57    DD  079A                      PUSHL   R7
                 00000414'EF    9F  079C                      PUSHAB  fmt_h_end
                          7E    01  9A  07A2                  movzbl  #DS$K_PrintF, -(sp)
                          7E    16  98  07A5                  cvtbl   #DS$K_TYPE_COMMAND_OUT, -(sp)
                 000002D3'GF    04  FB  07A8                  CALLS   #$$N+2, G^DSX$PRINT
                                07AF  1230
             0C AC    08 AC  D1  07AF  1231 50$:    CMPL    printrev$_actual_rev(AP),printrev$_expected_rev(AP); Unit and diagno
                                17  13  07B4  1232            BEQL    60$                             ; Equal revision numbers
                                2A  1A  07B6  1233            BGTRU   70$                             ; Actual > expected
```

```
                                07B8  1234
                                07B8  1235 ;-------------------------------------------------
                                07B8  1236 ;       Actual rev. is less than Expected rev.
                                07B8  1237
                03 14 AC   00   E1  07B8  1238          BBC     #prmsk$v_lss,printrev$_printmask(AP),58$ ; if no inhibit, branch
                         01B7   31  07BD  1239          BRW     95$                                      ; else, normal return
                                07C0  1240
    00000214'EF    00000438'EF   DE  07C0  1241 58$:    MOVAL   lessthan,relation                        ; 'less than' message
                           28   11  07CB  1242          BRB     80$                                      ; branch to print
                                07CD  1243 ;-------------------------------------------------
                                07CD  1244 ;       Actual rev. is equal to Expected rev.
                                07CD  1245
                03 14 AC   01   E1  07CD  1246 60$:    BBC     #prmsk$v_eql,printrev$_printmask(AP),68$; if no inhibit, branch
                         01A2   31  07D2  1247          BRW     95$                                      ; normal return
                                07D5  1248
    00000214'EF    0000044F'EF   DE  07D5  1249 68$:    MOVAL   equalmess,relation                       ; 'equal to' message
                           13   11  07E0  1250          BRB     80$                                      ; branch to print
                                07E2  1251
                                07E2  1252 ;-------------------------------------------------
                                07E2  1253 ;       Actual rev. is greater than Expected rev.
                                07E2  1254
                03 14 AC   02   E1  07E2  1255 70$:    BBC     #prmsk$v_gtr,printrev$_printmask(AP),78$ ; if no inhibit, branch
                         018D   31  07E7  1256          BRW     95$                                      ; Normal return
                                07EA  1257                                                                      ;G:3
    00000214'EF    00000442'EF   DE  07EA  1258 78$:    MOVAL   greatthan,relation                       ; 'greater than' message
                                07F5  1259                                                              ; continue to print..
                                07F5  1260
                                07F5  1261 80$:
                     10 AC   01   D1  07F5  1262          CMPL    #prv$m_hwrev,printrev$_rev_type(AP)
                           03   13  07F9  1263          BEQL    81$                                      ; Find rev_type  [31]
                         0109   31  07FB  1264          BRW     90$                                      ; branch to print[31]
            000002A9'EF    02   90  07FE  1265 81$:    MOVB    #2,EXP_REV                               ; Set up a counted [31]
            000002AA'EF    20   90  0805  1266          MOVB    #^X20,EXP_REV+1                          ; ascic string for [31]
            000002AB'EF    20   90  080C  1267          MOVB    #^X20,EXP_REV+2                          ; output           [31]
                     0C AC   D5  0813  1268          TSTL    PRINTREV$_EXPECTED_REV(AP)               ; Test if rev = 0  [31]
                           03   12  0816  1269          BNEQ    82$                                      ; if not 0 branch  [31]
                         007D   31  0818  1270          BRW     87$                                      ; print blanks     [31]
                03 14 AC   04   E0  081B  1271 82$:    BBS     #PRMSK$V_TRANSL, -
                                0820  1272                     printrev$_PRINTMASK(AP),83$              ; Trans to code    [31]
                         004E   31  0820  1273          BRW     86$                                      ; Trans # to ascic [31]
        00000284'EF    0C AC   D0  0823  1274 83$:    MOVL    PRINTREV$_EXPECTED_REV(AP),Q_DIVD        ; Move to quadword [31]
            00000284'EF    1B   7B  082B  1275          EDIV    #27,Q_DIVD,-                             ; Use Extended Div.[31]
    00000290'EF    0000028C'EF      0832  1276                  L_QUO, L_REM                             ; to find quotent  [31]
                   0000028C'EF   D5  083C  1277          TSTL    L_QUO                                    ; and remainder.   [31]
                           1D   13  0842  1278          BEQL    85$                                      ; Branch if 1 - 26 [31]
        0000028C'EF    40 8F   81  0844  1279          ADDB3   #^x40,L_QUO,EXP_REV+1                    ; Compute Ax - Zx  [31]
                000002AA'EF      084C
        00000290'EF    41 8F   81  0851  1280          ADDB3   #^x41,L_REM,EXP_REV+2                    ; Compute xA - xZ  [31]
                000002AB'EF      0859
                         0037   31  085E  1281          BRW     87$                                      ; Continue         [31]
        00000290'EF    40 8F   81  0861  1282 85$:    ADDB3   #^x40,L_REM,EXP_REV+1                    ; Compute A - Z    [31]
                000002AA'EF      0869
                         0027   31  086E  1283          BRW     87$
                                0871  1284 86$:
                                0871  1285          $FAO_S  CTRSTR=CONTROL,-                         ; Convert from     [31]
                                0871  1286                  OUTBUF=FAO_DESC_2,-                      ; longword to      [31]
                                0871  1287                  OUTLEN=FAO_LEN_2,-                       ; ASCII            [31]
```

```
                                  0871  1288                  P1=PRINTREV$_EXPECTED_REV(AP)          ;                  [31]
                     0C AC   DD   0871                        PUSHL   PRINTREV$_EXPECTED_REV(AP)
                000002C8'EF   7F   0874                        PUSHAQ  FAO_DESC_2
                000002D0'EF   3F   087A                        PUSHAW  FAO_LEN_2
                000002D2'EF   7F   0880                        PUSHAQ  CONTROL
          00000000'GF   04   FB   0886                        CALLS   #$$T2,G^SYS$FAO
  000002A9'EF   000002D0'EF   90   088D  1289          MOVB    FAO_LEN_2,EXP_REV                      ; And form ascic   [31]
                                  0898  1290
          57   00000294'EF   DE   0898  1291 87$:     MOVAL   ACT_REV,R7                             ;                  [31]
          58   000002A9'EF   DE   089F  1292          MOVAL   EXP_REV,R8                             ;                  [31]
                                  08A6  1293          $PRINT  #DS$K_TYPE_COMMAND_OUT,-               ; Typecode
                                  08A6  1294                  #DS$K_PrintF,-                         ; ...use printf
                                  08A6  1295                  fmt_beg_err,-                          ; ...message format
                                  08A6  1296                  warecode,-                             ; ...firm or hardware
                                  08A6  1297                  R6                                     ; ...device name
                        56   DD   08A6                        PUSHL   R6
                00000210'EF   DD   08A8                        PUSHL   warecode
                000002DD'EF   9F   08AE                        PUSHAB  fmt_beg_err
                     7E   01   9A   08B4                        movzbl  #DS$K_PrintF, -(sp)
                     7E   16   98   08B7                        cvtbl   #DS$K_TYPE_COMMAND_OUT, -(sp)
          000002D3'GF   05   FB   08BA                        CALLS   #$$N+2, G^DSX$PRINT
                                  08C1  1298
                     6C   07   D1   08C1  1299          CMPL    #7,(AP)                                ; Branch if module # is
                        1B   12   08C4  1300          BNEQ    88$                                    ; not on the stack.
                     1C AC   D5   08C6  1301          TSTL    printrev$_modulenum(ap)
                        16   13   08C9  1302          BEQL    88$
                                  08CB  1303          $PRINT  #DS$K_TYPE_COMMAND_OUT,-               ; Typecode
                                  08CB  1304                  #DS$K_PrintF,-                         ; ...use printf
                                  08CB  1305                  fmt_module,-
                                  08CB  1306                  PRINTREV$_MODULENUM(AP)                ;
                     1C AC   DD   08CB                        PUSHL   PRINTREV$_MODULENUM(AP)
                000002F9'EF   9F   08CE                        PUSHAB  fmt_module
                     7E   01   9A   08D4                        movzbl  #DS$K_PrintF, -(sp)
                     7E   16   98   08D7                        cvtbl   #DS$K_TYPE_COMMAND_OUT, -(sp)
          000002D3'GF   04   FB   08DA                        CALLS   #$$N+2, G^DSX$PRINT
                                  08E1  1307
                                  08E1  1308 88$:     $PRINT  #DS$K_TYPE_COMMAND_OUT,-               ; Typecode
                                  08E1  1309                  #DS$K_PrintF,-                         ; ...use printf
                                  08E1  1310                  fmt_h_end_err,-
                                  08E1  1311                  relation,-                             ; ...relation message
                                  08E1  1312                  warecode,-                             ; ...second waretype message
                                  08E1  1313                  R7,-                                   ; ...unit revision level
                                  08E1  1314                  R8                                     ; ...diagnostic rev. level
                        58   DD   08E1                        PUSHL   R8
                        57   DD   08E3                        PUSHL   R7
                00000210'EF   DD   08E5                        PUSHL   warecode
                00000214'EF   DD   08EB                        PUSHL   relation
                00000386'EF   9F   08F1                        PUSHAB  fmt_h_end_err
                     7E   01   9A   08F7                        movzbl  #DS$K_PrintF, -(sp)
                     7E   16   98   08FA                        cvtbl   #DS$K_TYPE_COMMAND_OUT, -(sp)
          000002D3'GF   07   FB   08FD                        CALLS   #$$N+2, G^DSX$PRINT
                                  0904  1315
                   0060   31   0904  1316          BRW     93$                                    ; continue
                                  0907  1317 90$:
                                  0907  1318          $PRINT  #DS$K_TYPE_COMMAND_OUT,-               ; Typecode
                                  0907  1319                  #DS$K_PrintF,-                         ; ...use printf
                                  0907  1320                  fmt_beg_err,-                          ; ...message format
```

```
                          0907  1321                    warecode,-                              ; ...firm or hardware
                          0907  1322                    R6                                      ; ...device name
                    56    DD    0907                    PUSHL   R6
          00000210'EF     DD    0909                    PUSHL   warecode
          000002DD'EF     9F    090F                    PUSHAB  fmt_beg_err
              7E  01      9A    0915                    movzbl  #DS$K_PrintF, -(sp)
              7E  16      98    0918                    cvtbl   #DS$K_TYPE_COMMAND_OUT, -(sp)
     000002D3'GF  05      FB    091B                    CALLS   #$$N+2, G^DSX$PRINT
                          0922  1323
              6C  07      D1    0922  1324        CMPL    #7,(AP)                                 ; Branch if module # is
                  1B      12    0925  1325        BNEQ    91$                                     ; not on the stack.
                1C AC     D5    0927  1326        TSTL    printrev$_modulenum(ap)
                  16      13    092A  1327        BEQL    91$
                          092C  1328        $PRINT  #DS$K_TYPE_COMMAND_OUT,-                    ; Typecode
                          092C  1329                #DS$K_PrintF,-
                          092C  1330                FMT_MODULE,-                                    ; ...use printf
                          092C  1331                PRINTREV$_MODULENUM(AP)
                1C AC     DD    092C                    PUSHL   PRINTREV$_MODULENUM(AP)
          000002F9'EF     9F    092F                    PUSHAB  FMT_MODULE
              7E  01      9A    0935                    movzbl  #DS$K_PrintF, -(sp)
              7E  16      98    0938                    cvtbl   #DS$K_TYPE_COMMAND_OUT, -(sp)
     000002D3'GF  04      FB    093B                    CALLS   #$$N+2, G^DSX$PRINT
                          0942  1332
                          0942  1333 91$:     $PRINT  #DS$K_TYPE_COMMAND_OUT,-                    ; Typecode
                          0942  1334                #DS$K_PrintF,-                                  ; ...use printf
                          0942  1335                fmt_end_err,-
                          0942  1336                relation,-                                      ; ...relation message
                          0942  1337                warecode,-                                      ; ...second waretype message
                          0942  1338                printrev$_actual_rev(AP),-                      ; ...unit revision level
                          0942  1339                PRINTREV$_EXPECTED_REV(AP)                      ; ...diagnostic rev. level
                0C AC     DD    0942                    PUSHL   PRINTREV$_EXPECTED_REV(AP)
                08 AC     DD    0945                    PUSHL   printrev$_actual_rev(AP)
          00000210'EF     DD    0948                    PUSHL   warecode
          00000214'EF     DD    094E                    PUSHL   relation
          00000301'EF     9F    0954                    PUSHAB  fmt_end_err
              7E  01      9A    095A                    movzbl  #DS$K_PrintF, -(sp)
              7E  16      98    095D                    cvtbl   #DS$K_TYPE_COMMAND_OUT, -(sp)
     000002D3'GF  07      FB    0960                    CALLS   #$$N+2, G^DSX$PRINT
                          0967  1340
                18 AC     D5    0967  1341 93$:     TSTL    printrev$_prlink(AP)                    ; Error message to report
                  0B      13    096A  1342                BEQL    95$                             ; No message
                  09      90    096C  1343                MOVB    #ds$k_type_error_body,-         ; Set type code to error bod
          00000000'EF           096E  1344                 L^ds$gb_typecode
                          0973  1345
                18 BC     6C    0973  1346                CALLG   (AP),@printrev$_prlink(ap)      ; Call user's print routine
                          0977  1347
     50   00660001  8F    D0    0977  1348 95$:     MOVL    #DS$_NORMAL,R0                          ; No error return
                  07      11    097E  1349                BRB     100$                                    ;G:3
     50   00660002  8F    D0    0980  1350 99$:     MOVL    #DS$_ERROR,R0                           ; Bad logunit (device)# ;G:2
                  04      0987  1351 100$:    ret
                          0988  1352                                                                    ;G:3
                          0988  1353                                                                    ;G:2
```

```
                                0988  1355          .Subtitle       DSX$Deallocate Routine - Deallocates memory used in DSX$PRIN
                                0988  1356
                                0988  1357
                                0988  1358 ;++
                                0988  1359 ; FUNCTIONAL DESCRIPTION:
                                0988  1360 ;
                                0988  1361 ;       This routine is used to cleanup and deallocate the memory used in
                                0988  1362 ;       DSX$PRINTREV.  It clears all the values from ADDR_128 and deallocates
                                0988  1363 ;       all the data blocks associated with its respective devices.
                                0988  1364 ;
                                0988  1365 ; CALLING SEQUENCE:
                                0988  1366 ;
                                0988  1367 ;       CALLS#0,DSX$DEALLOCATE
                                0988  1368 ;
                                0988  1369 ; INPUT PARAMETERS:
                                0988  1370 ;
                                0988  1371 ;       NONE
                                0988  1372 ;
                                0988  1373 ; OUTPUT PARAMETERS:
                                0988  1374 ;
                                0988  1375 ;       NONE
                                0988  1376 ;
                                0988  1377 ; SIDE EFFECTS:
                                0988  1378 ;
                                0988  1379 ;       NONE
                                0988  1380 ;
                                0988  1381 ;
                           0080 0988  1382 .ENTRY  DSX$DEALLOCATE, ^M<R7>
                                098A  1383
                          57    D4  098A  1384 10$:    CLRL    R7                      ; R7 used to increment thru
                                098C  1385
 00000000'EF47                  00  D1  098C  1386 20$:    CMPL    #0,ADDR_128[R7]         ; If a non-zero entry is fou
                                1C  13  0994  1387          BEQL    30$                     ;  clear that entry and clea
 50    00000000'EF47             D0  0996  1388          MOVL    ADDR_128[R7],R0         ;  that the entry points to.
    08 AC    0044 8F             B0  099E  1389          MOVW    #68,8(R0)               ; Size of block in bytes ;G:
          00000000'EF              16  09A4  1390          JSB     EXE$DEANONPAGED         ; "Clean up" dynamically all
 00000000'EF47                  00  D0  09AA  1391          MOVL    #0,ADDR_128[R7]         ; "Clean up" longword in sta
                                09B2  1392
D2 57    00000080 8F             F2  09B2  1393 30$:    AOBLSS   #128,R7,20$             ; Used to search thru ADDR_1
                                09BA  1394
                                04  09BA  1395 40$:    RET
                                09BB  1396
                                09BB  1397
                                09BB  1398
```

```
                        09BB  1400          .Subtitle       DSX$CvtReg Routine - Mnemonic register conversion routine
                        09BB  1401 ;++
                        09BB  1402 ; FUNCTIONAL DESCRIPTION:
                        09BB  1403 ;
                        09BB  1404 ;        ASSOCIATES REGISTER BITS AND/OR FIELDS WITH ASCII MNEMONICS
                        09BB  1405 ;        GIVEN AN ASCII CONTROL STRING AND THE REGISTER CONTENTS
                        09BB  1406 ;        Instead of the mnemonic address a code may specified directing
                        09BB  1407 ;        CVTREG to use a predefined mnemonic string.  This allows
                        09BB  1408 ;        transportable diagnostics to format generic register values,
                        09BB  1409 ;        i.e. UNIBUS adapter MAP registers.
                        09BB  1410 ;
                        09BB  1411 ; CALLING SEQUENCE:
                        09BB  1412 ;
                        09BB  1413 ;        CALLG   ARGLIST,a#DS$CVTREG
                        09BB  1414 ;        CALLS   #11,a#DS$CVTREG
                        09BB  1415 ;
                        09BB  1416 ; INPUT PARAMETERS:
                        09BB  1417 ;
                        09BB  1418 ;         4(AP)  = STARTING BIT POSITION (MSB)
                        09BB  1419 ;         8(AP)  = REGISTER CONTENTS
                        09BB  1420 ;        12(AP)  = COUNTED ASCII BIT MNEMONIC STRING ADDRESS OR CODE
                        09BB  1421 ;        16(AP)  = OUTPUT BUFFER ADDRESS
                        09BB  1422 ;        20(AP)  = OUTPUT BUFFER SIZE
                        09BB  1423 ;        24(AP)  = OPTIONAL ARGUMENTS FOR MNEMONIC STRING DIRECTIVES (UP TO 6)
                        09BB  1424 ;
                        09BB  1425 ; IMPLICIT INPUTS:
                        09BB  1426 ;
                        09BB  1427 ;        NONE
                        09BB  1428 ;
                        09BB  1429 ; OUTPUT PARAMETERS:
                        09BB  1430 ;
                        09BB  1431 ;        NONE
                        09BB  1432 ;
                        09BB  1433 ; IMPLICIT OUTPUTS:
                        09BB  1434 ;
                        09BB  1435 ;        NONE
                        09BB  1436 ;
                        09BB  1437 ; COMPLETION CODES:
                        09BB  1438 ;
                        09BB  1439 ;        DS$_NORMAL
                        09BB  1440 ;        DS$_PROGERR
                        09BB  1441 ;
                        09BB  1442 ; SIDE EFFECTS:
                        09BB  1443 ;
                        09BB  1444 ;        R1 = LENGTH OF OUTPUT STRING + COUNT (NOT TRUNCATED)
                        09BB  1445 ;
                        09BB  1446 ; REGISTER USAGE:
                        09BB  1447 ;
                        09BB  1448 ;         R0  CURRENT BIT POSITION
                        09BB  1449 ;         R1  CURRENT OUTPUT BUFFER LENGTH
                        09BB  1450 ;         R2  CURRENT OUTPUT BUFFER POINTER
                        09BB  1451 ;         R3  CURRENT MNEMONIC STRING POINTER
                        09BB  1452 ;         R4  MNEMONIC STRING TERMINATOR (LAST BYTE ADDRESS + 1)
                        09BB  1453 ;         R5  FIELD SIZE
                        09BB  1454 ;         R6  EMUL OVERFLOW, EDIV QUOTIENT AND GENERAL USAGE
                        09BB  1455 ;         R7  EDIV DIVIDEND (HIGH ORDER)
                        09BB  1456 ;         R8  RADIX FOR EDIV
```

```
                09BB  1457 ;        R9  LOOP CONTROL
                09BB  1458 ;       R10  LOOP CONTROL
                09BB  1459 ;       R11  OPTIONAL ARGUMENT POINTER
                09BB  1460 ;--
```

```
                        0FFC  09BB  1462 .ENTRY DSX$CVTREG,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>
                              09BD  1463
                 6C   0B   D1  09BD  1464         CMPL    #11,(AP)                ; CHECK ARGLIST VALIDITY
                      03   13  09C0  1465         BEQL    10$                     ; OK, PROCEED
                   0199   31  09C2  1466         BRW     330$                    ; SOMETHING WRONG !
                              09C5  1467
              20   04 AC   D1  09C5  1468 10$:    CMPL    4(AP),#32               ; CHECK MSB POSITION
                      03   1F  09C9  1469         BLSSU   30$                     ; OK, PROCEED
                              09CB  1470
                   0190   31  09CB  1471 20$:    BRW     330$                    ; SOMETHING WRONG !
                              09CE  1472                                         ;
              50   04 AC   D0  09CE  1473 30$:    MOVL    4(AP),R0                ; GET STARTING BIT POSITION
                 51   01   D0  09D2  1474         MOVL    #1,R1                   ; SET UP OUTPUT LENGTH (COUNT BYTE)
           52    01   10 AC   C1  09D5  1475         ADDL3   16(AP),#1,R2            ; GET OUTPUT BUFFER ADDRESS
              5B   18 AC   DE  09DA  1476         MOVAL   24(AP),R11              ; Get address of optional args
              53   0C AC   D0  09DE  1477         MOVL    12(AP),R3               ; GET MNEMONIC STRING ADDRESS
                      1B   18  09E2  1478         BGEQ    40$                     ; Branch if string address
        53   FFFFFFFC 8F   D1  09E4  1479         CMPL    #CVT$_MAX,R3            ; Last assigned code
                      DE   14  09EB  1480         BGTR    20$                     ; Unassigned code in R3
                 53   53   CE  09ED  1481         MNEGL   R3,R3                   ; Negate it making it positive
     53   FFFFFFFC'EF43   D0  09F0  1482         MOVL    CVT$A_CODELIST-4[R3],R3 ; Address of list, use one origin
              5B   04 A3   DE  09F8  1483         MOVAL   4(R3),R11               ; Address of AUX arglist
                 53   63   D0  09FC  1484         MOVL    (R3),R3                 ; Point to ASCIC mnemonic string
                              09FF  1485
                 54   83   9A  09FF  1486 40$:    MOVZBL  (R3)+,R4                ; GET MNEMONIC STRING LENGTH
                 54   53   C0  0A02  1487         ADDL2   R3,R4                   ; GET MNEMONIC STRING TERMINATOR
                              0A05  1488                                         ;
                      06   BB  0A05  1489 50$:    PUSHR   #^M<R1,R2>              ; CURRENT OUTPUT LENGTH & ADR
                 01   51   D1  0A07  1490         CMPL    R1,#1                   ; LOOK AT OUTPUT LENGTH
                      0F   13  0A0A  1491         BEQL    70$                     ; SKIP IF EMPTY
              14 AC   51   D1  0A0C  1492         CMPL    R1,20(AP)               ; OUTPUT BUFFER FULL ?
                      04   19  0A10  1493         BLSS    60$                     ; NO, PROCEED
           52    10 AC   D0  0A12  1494         MOVL    16(AP),R2               ; YES, USE FIRST BYTE AS SCRATCH
                              0A16  1495
                 82   2C   90  0A16  1496 60$:    MOVB    #^A',',(R2)+            ; STICK IN A SEPARATOR
                      51   D6  0A19  1497         INCL    R1                      ; BUMP OUTPUT LENGTH
                              0A1B  1498                                         ;
                 54   53   D1  0A1B  1499 70$:    CMPL    R3,R4                   ; MNEMONIC STRING EXHAUSTED ?
                      46   1E  0A1E  1500         BGEQU   120$                    ; YES, GO CHECK LAST BIT
                 2C   63   91  0A20  1501         CMPB    (R3),#^A','             ; END OF THIS MNEMONIC ?
                      41   13  0A23  1502         BEQL    120$                    ; YES, GO CHECK THE BIT
                              0A25  1503                                         ;
              14 AC   51   D1  0A25  1504         CMPL    R1,20(AP)               ; OUTPUT BUFFER FULL ?
                      04   19  0A29  1505         BLSS    80$                     ; NO, PROCEED
           52    10 AC   D0  0A2B  1506         MOVL    16(AP),R2               ; YES, USE FIRST BYTE AS SCRATCH
                              0A2F  1507
                 82   63   90  0A2F  1508 80$:    MOVB    (R3),(R2)+              ; COPY CHAR TO OUTPUT BUFFER
                      51   D6  0A32  1509         INCL    R1                      ; BUMP OUTPUT LENGTH
                 3D   83   91  0A34  1510         CMPB    (R3)+,#^A'='            ; FIELD DIRECTIVE ?
                      E2   12  0A37  1511         BNEQ    70$                     ; NO, LOOP FOR NEXT CHARACTER
                      55   D4  0A39  1512         CLRL    R5                      ; YES, INITIALIZE FIELD SIZE
                              0A3B  1513                                         ;
                 54   53   D1  0A3B  1514 90$:    CMPL    R3,R4                   ; MNEMONIC STRING EXHAUSTED ?
                      03   1F  0A3E  1515         BLSSU   100$                    ; NO, PROCEED
                   011B   31  0A40  1516         BRW     330$                    ; YES, BAD PLACE TO RUN OUT OF GAS
                              0A43  1517                                         ;
           5E 8F   63   91  0A43  1518 100$:    CMPB    (R3),#^A'^'             ; NUMERIC DIRECTIVE ?
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                     2A   13  0A47  1519          BEQL    140$                    ; YES, GO EXTRACT A FIELD
                  40 8F   63  91  0A49  1520          CMPB    (R3),#^A'a'             ; INDIRECT DIRECTIVE ?
                     24   13  0A4D  1521          BEQL    140$                    ; YES, GO EXTRACT A FIELD
                             0A4F  1522                                              ;
                     56   83  9A  0A4F  1523          MOVZBL  (R3)+,R6                ; GET NEXT CHARACTER
                     56   30  C2  0A52  1524          SUBL2   #^A'0',R6               ; CONVERT TO BINARY NUMERIC
                     0C   19  0A55  1525          BLSS    110$                    ; NO GOOD, WENT NEGATIVE
                     0A   56  D1  0A57  1526          CMPL    R6,#10                  ; DECIMAL DIGIT ?
                     07   18  0A5A  1527          BGEQ    110$                    ; NO, BAD CHARACTER
              55   56   0A   55  7A  0A5C  1528          EMUL    R5,#10,R6,R5            ; EXTEND AND ADD IN DIGIT
                     D8   11  0A61  1529          BRB     90$                     ; GO BACK FOR NEXT DIGIT
                             0A63  1530
                   00F8   31  0A63  1531  110$:   BRW     330$                    ; SOMETHING WRONG !
                             0A66  1532
              05 08 AC   50  E0  0A66  1533  120$:   BBS     R0,8(AP),130$           ; ASSOCIATED BIT SET ?
                     06   BA  0A6B  1534          POPR    #^M<R1,R2>              ; NO, REMOVE CURRENT MNEMONIC
                   00B6   31  0A6D  1535          BRW     290$                    ; AND GO CLEAN UP
                             0A70  1536
                   00B0   31  0A70  1537  130$:   BRW     280$                    ; ELSE PRESERVE OUTPUT AS IS
                             0A73  1538
                     50   D6  0A73  1539  140$:   INCL    R0                      ; ADJUST FOR POSITIONING
                  50   55   C2  0A75  1540          SUBL2   R5,R0                   ; POSITION TO RIGHTMOST BIT
           56   08 AC   55   50  EF  0A78  1541          EXTZV   R0,R5,8(AP),R6          ; GET THE FIELD FROM THE REGISTER
                  40 8F   63  91  0A7E  1542          CMPB    (R3),#^A'a'             ; WAS IT AN INDIRECT DIRECTIVE ?
                     21   12  0A82  1543          BNEQ    170$                    ; NO, PROCEED WITH DIRECT CONVERSION
                     53   D6  0A84  1544          INCL    R3                      ; SKIP OVER DIRECTIVE DELIMITER
                  57   8B  D0  0A86  1545          MOVL    (R11)+,R7               ; ADDRESS OF STRING LIST
                57   04 A746  D0  0A89  1546          MOVL    4(R7)[R6],R7            ; ADDRESS OF SELECTED STRING
                  59   87  9A  0A8E  1547          MOVZBL  (R7)+,R9                ; LENGTH OF SELECTED STRING
                             0A91  1548                                              ;
                14 AC   51   D1  0A91  1549  150$:   CMPL    R1,20(AP)               ; OUTPUT BUFFER FULL ?
                     04   19  0A95  1550          BLSS    160$                    ; NO, PROCEED
                52   10 AC   D0  0A97  1551          MOVL    16(AP),R2               ; YES, USE FIRST BYTE AS SCRATCH
                             0A9B  1552
                   82   87  90  0A9B  1553  160$:   MOVB    (R7)+,(R2)+             ; COPY CHAR TO OUTPUT BUFFER
                     51   D6  0A9E  1554          INCL    R1                      ; BUMP OUTPUT LENGTH
                      EE 59   F5  0AA0  1555          SOBGTR  R9,150$                 ; LOOP TILL DONE
                     74   11  0AA3  1556          BRB     270$                    ; THEN GO CLEAN UP
                             0AA5  1557                                              ;
                     53   D6  0AA5  1558  170$:   INCL    R3                      ; SKIP OVER DIRECTIVE DELIMITER
                58 8F   63  91  0AA7  1559          CMPB    (R3),#^A'X'             ; HEX CONVERSION ?
                     0C   12  0AAB  1560          BNEQ    180$                    ; NO, TRY DECIMAL
                  58   10  D0  0AAD  1561          MOVL    #16,R8                  ; SET UP RADIX
           59   55   01  C3  0AB0  1562          SUBL3   #1,R5,R9                ; ADJUST FIELD SIZE
                  59   04  C6  0AB4  1563          DIVL2   #4,R9                   ; CONVERT TO HEX DIGIT COUNT -1
                     27   11  0AB7  1564          BRB     210$                    ; AND SKIP
                             0AB9  1565
                44 8F   63  91  0AB9  1566  180$:   CMPB    (R3),#^A'D'             ; DECIMAL CONVERSION ?
                     0C   12  0ABD  1567          BNEQ    190$                    ; NO, TRY OCTAL
                  58   0A  D0  0ABF  1568          MOVL    #10,R8                  ; SET UP RADIX
           59   03   55   C5  0AC2  1569          MULL3   R5,#3,R9                ; ADJUST FIELD SIZE
                  59   0A  C6  0AC6  1570          DIVL2   #10,R9                  ; CONVERT TO DECIMAL DIGIT COUNT -1
                     15   11  0AC9  1571          BRB     210$                    ; AND SKIP
                             0ACB  1572
                4F 8F   63  91  0ACB  1573  190$:   CMPB    (R3),#^A'O'             ; OCTAL CONVERSION ?
                     0C   12  0ACF  1574          BNEQ    200$                    ; NO, GIVE UP
                  58   08  D0  0AD1  1575          MOVL    #8,R8                   ; SET UP RADIX
```

```
                59   55   01   C3   0AD4  1576          SUBL3   #1,R5,R9                ; ADJUST FIELD SIZE
                     59   03   C6   0AD8  1577          DIVL2   #3,R9                   ; CONVERT TO OCTAL DIGIT COUNT -1
                          03   11   0ADB  1578          BRB     210$                    ; AND SKIP
                                    0ADD  1579
                        007E   31   0ADD  1580 200$:     BRW     330$                    ; SOMETHING WRONG !
                                    0AE0  1581                                          ;
                     7E   29   90   0AE0  1582 210$:     MOVB    #^A')',-(SP)            ; FOR CLARIFICATION,
                     7E   83   90   0AE3  1583          MOVB    (R3)+,-(SP)             ; RADIX DIRECTIVE IS
                     7E   28   90   0AE6  1584          MOVB    #^A'(',-(SP)            ; APPENDED TO NUMERIC DISPLAY
                5A   03   59   C1   0AE9  1585          ADDL3   R9,#3,R10               ; COPY ADJUSTED LOOP COUNT
                                    0AED  1586                                          ;
                          57   D4   0AED  1587 220$:     CLRL    R7                      ; DON'T NEED HIGH ORDER
            57  56   56   58   7B   0AEF  1588          EDIV    R8,R6,R6,R7             ; NEXT DIGIT TO R7
                     0A   57   D1   0AF4  1589          CMPL    R7,#10                  ; ALPHA DIGIT (I.E., HEX) ?
                          05   19   0AF7  1590          BLSS    230$                    ; NO, PROCEED
                     57   37   C0   0AF9  1591          ADDL2   #^A'A'-10,R7            ; YES, CONVERT TO 'HEX' ASCII
                          03   11   0AFC  1592          BRB     240$                    ; AND SKIP
                                    0AFE  1593
                     57   30   C0   0AFE  1594 230$:     ADDL2   #^A'0',R7               ; CONVERT TO ASCII DIGIT
                                    0B01  1595
                     7E   57   90   0B01  1596 240$:     MOVB    R7,-(SP)                ; STACK ASCII DIGIT
                       E6 59   F4   0B04  1597          SOBGEQ  R9,220$                 ; LOOP TILL DONE
                                    0B07  1598                                          ;
                  14 AC   51   D1   0B07  1599 250$:     CMPL    R1,20(AP)               ; OUTPUT BUFFER FULL ?
                          04   19   0B0B  1600          BLSS    260$                    ; NO, PROCEED
                52   10 AC   D0   0B0D  1601          MOVL    16(AP),R2               ; YES, USE FIRST BYTE AS SCRATCH
                                    0B11  1602
                     82   8E   90   0B11  1603 260$:     MOVB    (SP)+,(R2)+             ; STORE THE NEXT CHARACTER
                          51   D6   0B14  1604          INCL    R1                      ; BUMP OUTPUT LENGTH
                       EE 5A   F4   0B16  1605          SOBGEQ  R10,250$                ; LOOP TILL DONE
                                    0B19  1606                                          ;
                     54   53   D1   0B19  1607 270$:     CMPL    R3,R4                   ; MNEMONICS EXHAUSTED ?
                          16   1E   0B1C  1608          BGEQU   300$                    ; YES, JUST SKIP OUT QUIETLY
                     2C   63   91   0B1E  1609          CMPB    (R3),#^A','             ; LOOKING AT A COMMA ?
                          3B   12   0B21  1610          BNEQ    330$                    ; NO, THEN SOMETHING'S WRONG
                                    0B23  1611
                     5E   08   C0   0B23  1612 280$:     ADDL2   #8,SP                   ; PRESERVE OUTPUT AS IS
                                    0B26  1613
                          53   D6   0B26  1614 290$:     INCL    R3                      ; SKIP COMMA IN MNEMONICS
                          50   D7   0B28  1615          DECL    R0                      ; SHIFT TO NEXT BIT POSITION
                          08   19   0B2A  1616          BLSS    300$                    ; DONE, GO FINISH UP
                     54   53   D1   0B2C  1617          CMPL    R3,R4                   ; PERHAPS MNEMONICS EXHAUSTED
                          03   1E   0B2F  1618          BGEQU   300$                    ; IT IS, JUST MEANS DONE
                        FED1   31   0B31  1619          BRW     50$                     ; ELSE GO BACK TO DO SOME MORE
                                    0B34  1620
          00000100 8F   51   D1   0B34  1621 300$:     CMPL    R1,#1a8                 ; COUNTED FORMAT OVERFLOW ?
                          08   14   0B3B  1622          BGTR    310$                    ; YES, GO FIX IT
                  14 AC   51   D1   0B3D  1623          CMPL    R1,20(AP)               ; CALLER'S BUFFER OVERFLOW ?
                          02   14   0B41  1624          BGTR    310$                    ; YES, GO FIX IT
                          25   11   0B43  1625          BRB     350$                    ; BOTH OK, DO NORMAL THING
                                    0B45  1626                                          ;
          00000100 8F   14 AC   D1   0B45  1627 310$:     CMPL    20(AP),#1a8             ; FIND THE SMALLER ONE
                          07   19   0B4D  1628          BLSS    320$                    ; CALLER'S BUFFER IS .LSS. 256
                10 BC   FF 8F   90   0B4F  1629          MOVB    #<1a8>-1,a16(AP)        ; STORE MAX COUNT, BUFFER IS BIG ENOUGH
                          0B   11   0B54  1630          BRB     340$                    ; AND SKIP OUT
                                    0B56  1631
           10 BC   14 AC   01   83   0B56  1632 320$:     SUBB3   #1,20(AP),a16(AP)       ; COPY CALLER'S MAX LENGTH
```

```
                     03    11   0B5C  1633          BRB     340$                    ; AND SKIP OUT
                                0B5E  1634                                          ;
                  10 BC    94   0B5E  1635 330$:     CLRB    @16(AP)                 ; INDICATE NO OUTPUT
                                0B61  1636                                          ;
          50   00660020 8F    D0   0B61  1637 340$:     MOVL    #DS$_PROGERR,R0         ; INDICATE A PROBLEM
                     0C    11   0B68  1638          BRB     RCVTREGX                ; AND SKIP OUT
                                0B6A  1639                                          ;
           10 BC   51    01    83   0B6A  1640 350$:     SUBB3   #1,R1,@16(AP)           ; STORE STRING LENGTH
          50   00660001 8F    D0   0B6F  1641          MOVL    #DS$_NORMAL,R0          ; INDICATE SUCCESS
                                0B76  1642
                                0B76  1643 RCVTREGX:                                ;
                     04         0B76  1644          RET                             ; RETURN TO CALLER
                                0B77  1645
                                0B77  1646          .END
```

```
$$.TMP1                         = 00000001    D
$$.TMP2                         = 00000060
$$ARGS                          = 00000007    D
$$N                             = 00000005    D
$$T1                            = 00000001    D
$$T2                            = 00000004    D
ACT_REV                           00000294 R  D  02
ADDR_128                          00000000 RG D  02
BIT...                          = 00000005    D
CLI$K_BUFSIZ                    = 00000100    D
CLI$K_SIZE                        0000044C    D
CLI$L_ADDRESS                     00000018    D
CLI$L_COMMAND                     00000004    D
CLI$L_DATA                        0000001C    D
CLI$L_FLAGS                       00000000    D
CLI$L_FLAGS2                      00000444    D
CLI$L_LAST                        00000024    D
CLI$L_NEXT                        00000030    D
CLI$L_PASS                        0000002C    D
CLI$L_SUBT                        00000028    D
CLI$L_TEMP_BASE                   00000448    D
CLI$L_TEST                        00000020    D
CLI$M_START_OR_RUN              = 00000008    D
CLI$Q_BUFQWD                      00000034    D
CLI$Q_FILE                        00000008    D
CLI$Q_SECTION                     00000010    D
CLI$Q_TIME                        0000043C    D
CLI$T_BUFFER                      0000003C    D
CLI$V_ADAPTER                   = 00000018    D
CLI$V_ADR                       = 0000000B    D
CLI$V_ASCII                     = 00000013    D
CLI$V_BASE_QUAL                 = 00000002    D
CLI$V_BREAK                     = 0000000A    D
CLI$V_BRIEF                     = 0000001B    D
CLI$V_BYTE                      = 0000000D    D
CLI$V_CLEAR                     = 00000002    D
CLI$V_DEC                       = 00000010    D
CLI$V_DEFAULT                   = 0000000C    D
CLI$V_DEPOSIT                   = 00000019    D
CLI$V_EVENT                     = 00000008    D
CLI$V_EXAM                      = 00000005    D
CLI$V_FLAGS                     = 00000009    D
CLI$V_HEX                       = 00000012    D
CLI$V_KERNEL                    = 00000017    D
CLI$V_LOAD                      = 00000006    D
CLI$V_LONG                      = 0000000F    D
CLI$V_NEXT                      = 00000001    D
CLI$V_NOALLOC                   = 00000000    D
CLI$V_NOTNUF                    = 00000001    D
CLI$V_OCT                       = 00000011    D
CLI$V_PREG                      = 0000001A    D
CLI$V_QA                        = 00000007    D
CLI$V_QACKLOOPLOOPS             = 0000001C    D
CLI$V_QAERRORPRINTS             = 0000001B    D
CLI$V_QAMULTIPLEPASS            = 0000001F    D
CLI$V_QASUBTESTLOOPS            = 0000001E    D
CLI$V_QATESTLOOPS               = 0000001D    D
CLI$V_REG                       = 00000014    D
CLI$V_REQUIRED                  = 00000000    D
CLI$V_RUN                       = 00000015    D
CLI$V_SET                       = 00000003    D
CLI$V_SHOW                      = 00000004    D
CLI$V_START_OR_RUN              = 00000003    D
CLI$V_VALSEC                    = 00000016    D
CLI$V_WORD                      = 0000000E    D
CONTROL                           000002D2 R  D  02
CR                              = 0000000D    D
CRD$K_CRD_INITIALIZATION        = 00000000  G D
CRD$K_DS_CONTROL_C              = 00000001  G D
CRD$K_DS_FLAGS                  = 00000000  G D
CRD$K_FAILURE                   = 00000000    D
CRD$K_HOOK_POINT                = 00000000  G D
CRD$K_LAST_ACCESS_CODE          = 00000002  G D
CRD$K_LAST_DS_VARIABLE          = 00000002  G D
CRD$K_LAST_FUNCTION             = 00000002  G D
CRD$K_LAST_HOOK_POINT           = 00000001  G D
CRD$K_READ                      = 00000000  G D
CRD$K_SUCCESS                   = 00000001    D
CRD$K_TYPECODE                  = 00000001  G D
CRD$K_WRITE                     = 00000001  G D
CVT$A_CODELIST                    00000000 R  D  03
CVT$T_MBAMAP                      ********    X  03
CVT$T_MBASR                       ********    X  03
CVT$T_UBADPR                      ********    X  03
CVT$T_UBAMAP                      ********    X  03
CVT$_MAX                        = FFFFFFFC    D
CVT$_MBAMAP                     = FFFFFFFC    D
CVT$_MBASR                      = FFFFFFFD    D
CVT$_UBADPR                     = FFFFFFFF    D
CVT$_UBAMAP                     = FFFFFFFE    D
DEBUG_THE_SUCKER                  0000050B RG D  02
DEVNAME                           00000218 R  D  02
DS$GA_CRD_DS_INTERFACE            ********    X  04
DS$GB_QIOACT                      ********    X  04
DS$GB_TYPECODE                    ********    X  04
DS$GB_VDS_DEBUG                   0000050B RG D  02
DS$GB_WIDTH                       ********    X  04
DS$GL_BUFLEN                      ********    X  04
DS$GL_FLAGS                       ********    X  04
DS$GL_PAGE                        00000239 RG D  02
DS$GPHARD                         ********    X  04
DS$GT_BUFFER                      ********    X  02
DS$GW_TTIN                        ********    X  04
DS$GW_TTOUT                       ********    X  04
DS$K_BUFSIZ                       ********    X  02
DS$K_ERROR                      = 00000002    D
DS$K_NORMAL                     = 00000001    D
DS$K_PRINTB                     = 00000002    D
DS$K_PRINTF                     = 00000001    D
DS$K_PRINTI                     = 00000000    D
DS$K_PRINTX                     = 00000003    D
DS$K_SEVERE                     = 00000004    D
DS$K_SUBSYS                     = 00000066    D
DS$K_TYPE_ABORT_PROGRAM         = 00000014    D
```

```
DS$K_TYPE_ABORT_TEST            = 00000013    D     DS$M_OUTPUT                     = 00800000    D
DS$K_TYPE_COMMAND_ERR           = 00000015    D     DS$M_RUBFLG                     = 00000020    D
DS$K_TYPE_COMMAND_OUT           = 00000016    D     DS$M_SCRIPT                     = 00200000    D
DS$K_TYPE_CRD_AUTOTEST          = 0000001A    D     DS$M_SETIMR                     = 02000000    D
DS$K_TYPE_DS_PROMPT             = 00000001    D     DS$M_STRFLG                     = 00000004    D
DS$K_TYPE_DS_START              = 0000001D    D     DS$M_SUBT                       = 00004000    D
DS$K_TYPE_ERRDEV                = 00000008    D     DS$M_SYSFLG                     = 00000400    D
DS$K_TYPE_ERRHARD               = 00000006    D     DS$M_TIMED                      = 02000000    D
DS$K_TYPE_ERROR_BODY            = 00000009    D     DS$M_TIMED_OUT                  = 08000000    D
DS$K_TYPE_ERROR_END             = 0000000A    D     DS$M_TIMRON                     = 00020000    D
DS$K_TYPE_ERRPREP               = 0000001B    D     DS$RAB_OUTPUT                   ********    X    04
DS$K_TYPE_ERRSOFT               = 00000007    D     DS$V_ABRTFLG                    = 00000006    D
DS$K_TYPE_ERRSUP                = 00000004    D     DS$V_BADTIME                    = 00000014    D
DS$K_TYPE_ERRSYS                = 00000005    D     DS$V_BATCH                      = 00000016    D
DS$K_TYPE_ERR_HALT              = 0000000D    D     DS$V_BRKCLR                     = 0000000C    D
DS$K_TYPE_EXCEPTION             = 0000000C    D     DS$V_BRKPT                      = 0000000B    D
DS$K_TYPE_EXCEPTION_HEAD        = 0000000B    D     DS$V_CHARFLG                    = 00000008    D
DS$K_TYPE_FIRST_PASS            = 00000011    D     DS$V_CMDFLG                     = 00000007    D
DS$K_TYPE_GENERAL               = 00000000    D     DS$V_CTRLC                      = 00000000    D
DS$K_TYPE_GENERAL_ERROR         = 00000003    D     DS$V_CTRLO                      = 00000010    D
DS$K_TYPE_NO_TESTS              = 00000012    D     DS$V_DEVFLG                     = 00000009    D
DS$K_TYPE_PARAM_ERROR           = 0000001C    D     DS$V_DISABLCC                   = 00000018    D
DS$K_TYPE_PROGRAM_END           = 00000010    D     DS$V_DONFLG                     = 0000000D    D
DS$K_TYPE_PROGRAM_INFO          = 00000017    D     DS$V_ERRFLG                     = 00000004    D
DS$K_TYPE_PROGRAM_START         = 0000000F    D     DS$V_EXCEPT                     = 00000013    D
DS$K_TYPE_QIO_INVADP            = 00000024    D     DS$V_EXETST                     = 00000012    D
DS$K_TYPE_QIO_NODRIVER          = 00000022    D     DS$V_HLTFLG                     = 00000003    D
DS$K_TYPE_QIO_WRONGVER          = 00000023    D     DS$V_LODFLG                     = 00000001    D
DS$K_TYPE_SCRIPT_ECHO           = 00000021    D     DS$V_MEMMGT                     = 0000000F    D
DS$K_TYPE_SCRIPT_PNF            = 0000001E    D     DS$V_NI                         = 0000001A    D
DS$K_TYPE_SCRIPT_PROMPT         = 00000020    D     DS$V_OUTPUT                     = 00000017    D
DS$K_TYPE_SCRIPT_SKIP           = 0000001F    D     DS$V_RUBFLG                     = 00000005    D
DS$K_TYPE_SEQUENCE_ERROR        = 00000019    D     DS$V_SCRIPT                     = 00000015    D
DS$K_TYPE_START_ERR             = 00000018    D     DS$V_SETIMR                     = 00000019    D
DS$K_TYPE_START_LIST            = 00000025    D     DS$V_STRFLG                     = 00000002    D
DS$K_TYPE_SUMMARY               = 0000000E    D     DS$V_SUBT                       = 0000000E    D
DS$K_TYPE_USER_PROMPT           = 00000002    D     DS$V_SYSFLG                     = 0000000A    D
DS$K_WARNING                    = 00000000    D     DS$V_TIMED                      = 00000019    D
DS$M_ABRTFLG                    = 00000040    D     DS$V_TIMED_OUT                  = 0000001B    D
DS$M_BADTIME                    = 00100000    D     DS$V_TIMRON                     = 00000011    D
DS$M_BATCH                      = 00400000    D     DS$_AP_NORMAL_BREAK             = 00660150    D
DS$M_BRKCLR                     = 00001000    D     DS$_ARITH                       = 006600D0    D
DS$M_BRKPT                      = 00000800    D     DS$_ASBE                        = 00660118    D
DS$M_CHARFLG                    = 00000100    D     DS$_BADLINK                     = 006600F0    D
DS$M_CMDFLG                     = 00000080    D     DS$_BADTYPE                     = 006600E8    D
DS$M_CTRLC                      = 00000001    D     DS$_BIIC                        = 00660120    D
DS$M_CTRLO                      = 00010000    D     DS$_CHME                        = 006600A8    D
DS$M_DEVFLG                     = 00000200    D     DS$_CHMK                        = 006600E0    D
DS$M_DISABLCC                   = 01000000    D     DS$_DEVNAME                     = 00660108    D
DS$M_DONFLG                     = 00002000    D     DS$_ERROR                       = 00660002    D
DS$M_ERRFLG                     = 00000010    D     DS$_FHWE                        = 00660068    D
DS$M_EXCEPT                     = 00080000    D     DS$_FRAGBUF                     = 00660080    D
DS$M_EXETST                     = 00040000    D     DS$_ICBUSY                      = 006600C8    D
DS$M_HLTFLG                     = 00000008    D     DS$_ICERR                       = 006600C0    D
DS$M_LODFLG                     = 00000002    D     DS$_IHWE                        = 00660060    D
DS$M_MEMMGT                     = 00008000    D     DS$_ILLCHAR                     = 00660018    D
DS$M_NI                         = 04000000    D     DS$_ILLPAGCNT                   = 00660078    D
```

```
DS$_ILLUNIT                     = 00660100     D
DS$_INIT_FAIL                   = 00660140     D
DS$_INSFMEM                     = 00660050     D
DS$_INVCPU                      = 00660130     D
DS$_IPL2HI                      = 006600B8     D
DS$_IVADDR                      = 00660040     D
DS$_IVVECT                      = 00660038     D
DS$_KRNLSTK                     = 00660090     D
DS$_LOGIC                       = 00660070     D
DS$_MCHK                        = 00660088     D
DS$_MEM_ALLOC_ERR               = 00660138     D
DS$_MMOFF                       = 00660058     D
DS$_NEEDUNIT                    = 006600F8     D
DS$_NODE                        = 00660128     D
DS$_NOPCS                       = 00660110     D
DS$_NORMAL                      = 00660001     D
DS$_NOSUPPORT                   = 006600B1     D
DS$_NOTALLOWMP                  = 00660148     D
DS$_NOTDON                      = 00660030     D
DS$_NOTIMP                      = 006600B0     D
DS$_NULLSTR                     = 00660010     D
DS$_OVERFLOW                    = 00660008     D
DS$_POWER                       = 00660098     D
DS$_PROGERR                     = 00660020     D
DS$_SEVERE                      = 00660004     D
DS$_TRANSL                      = 006600A0     D
DS$_TRUNCATE                    = 00660028     D
DS$_UNEXPINT                    = 006600D8     D
DS$_UNSUPPDEV                   = 00660158     D
DS$_VASFULL                     = 00660048     D
DS$_WARNING                     = 00660000     D
DSA$AL_APTMAIL                    0000FE00     D
DSA$AT_APTTXT                     0000FA00     D
DSA$GL_APTCOM                     0000FE04     D
DSA$GL_DEVLEN                     0000FE58     D
DSA$GL_ERRNO                      0000FE44     D
DSA$GL_EVENT                      0000FE48     D
DSA$GL_FLAGS                      0000FE00     D
DSA$GL_MSGTYP                     0000FE40     D
DSA$GL_PASSES                     0000FE08     D
DSA$GL_PASSNO                     0000FE54     D
DSA$GL_SECTNO                     0000FE10     D
DSA$GL_SID                        0000FE14     D
DSA$GL_SUBTNO                     0000FE4C     D
DSA$GL_TESTNO                     0000FE50     D
DSA$GL_UNITS                      0000FE0C     D
DSA$GQ_MSGPTR                     0000FE68     D
DSA$GT_DEVNAM                     0000FE5C     D
DSA$M_NORPT                     = 08000000     D
DSA$V_APT                       = 0000001F     D
DSA$V_BINARY                    = 00000001     D
DSA$V_CRD_AUTOTEST_OFF          = 0000000B     D
DSA$V_CRD_MENUTEST_OFF          = 00000010     D
DSA$V_CRD_MENUTEST_ON           = 00000012     D
DSA$V_IE1                       = 00000004     D
DSA$V_IE2                       = 00000005     D
DSA$V_IE3                       = 00000006     D
DSA$V_IES                       = 00000007     D
DSA$V_NORPT                     = 0000001B     D
DSA$V_USER                      = 0000001C     D
DSV$SETPAGE                       00000000 RG  D  04
DSV$SHOWPAGE                      00000027 RG  D  04
DSX$CVTREG                        000009BB RG  D  04
DSX$DEALLOCATE                    00000988 RG  D  04
DSX$PRINT                         000002D3 RG  D  04
DSX$PRINTB                        0000033B RG  D  04
DSX$PRINTF                        00000353 RG  D  04
DSX$PRINTI                        00000368 RG  D  04
DSX$PRINTREV                      000004A2 RG  D  04
DSX$PRINTS                        00000321 RG  D  04
DSX$PRINTX                        0000032E RG  D  04
DSX$TYPE_OUT                      00000047 RG  D  04
EQUALMESS                         0000044F R   D  02
EXE$ALONONPAGED                   ********     X  04
EXE$DEANONPAGED                   ********     X  04
EXP_REV                           000002A9 R   D  02
FALSE                           = 00000000     D
FAO_DESC                          000002BE R   D  02
FAO_DESC_2                        000002C8 R   D  02
FAO_LEN                           000002C6 R   D  02
FAO_LEN_2                         000002D0 R   D  02
FIRMEXIST$T                       00000200 RG  D  02
FIRMMESSA                         00000426 R   D  02
FMT_BEG_ERR                       000002DD R   D  02
FMT_END_ERR                       00000301 R   D  02
FMT_H_END                         00000414 R   D  02
FMT_H_END_ERR                     00000386 R   D  02
FMT_MODULE                        000002F9 R   D  02
FMT_P_F_END                       0000040B R   D  02
FMT_TOOHIGH                       00000458 R   D  02
FMT_TOOMANY_MODS                  000004A2 R   D  02
GREATTHAN                         00000442 R   D  02
HARDEXIST$T                       00000204 RG  D  02
HARDMESSA                         0000041D R   D  02
HP$A_DEPENDENT                    00000032     D
HP$A_DEVICE                       00000018     D
HP$A_DVA                          0000001C     D
HP$A_LINK                         00000020     D
HP$B_DRIVE                        0000000B     D
HP$B_FLAGS                        0000000A     D
HP$Q_DEVICE                       00000000     D
HP$T_DEVICE                       0000000C     D
HP$T_TYPE                         00000026     D
HP$W_SIZE                         00000008     D
HP$W_VECTOR                       00000024     D
IO$M_CTRLCAST                     ********     X  04
IO$M_TRMNOECHO                    ********     X  04
IO$_READVBLK                      ********     X  04
IO$_SETMODE                       ********     X  04
IO$_WRITEVBLK                     ********     X  04
KB_CHECK                          ********     X  04
LESSTHAN                          00000438 R   D  02
LF                              = 0000000A     D
LINE_COUNT                        00000235 RG  D  02
```

```
LOGNUM                          00000228 RG D  02
L_QUO                           0000028C R  D  02
L_REM                           00000290 R  D  02
MP$GR_BOOTED_PROCESSORS         ********   X   04
OFF                           = 00000000    D
ON                            = 00000001    D
PAGE_STRING                     000004DE R  D  02
PATCHEXIST$T                    00000208 RG D  02
PATCHMESSA                      0000042F R  D  02
PRINTREV$_ACTUAL_REV          = 00000008    D
PRINTREV$_EXPECTED_REV        = 0000000C    D
PRINTREV$_LOG_UNIT            = 00000004    D
PRINTREV$_MODULENUM           = 0000001C    D
PRINTREV$_NARGS               = 00000007    D
PRINTREV$_PRINTMASK           = 00000014    D
PRINTREV$_PRLINK              = 00000018    D
PRINTREV$_REV_TYPE            = 00000010    D
PRINT_X                         0000045F R  D  04
PRMSK$M_ALWAYS                = 00000008    D
PRMSK$M_EQL                   = 00000002    D
PRMSK$M_GTR                   = 00000004    D
PRMSK$M_LSS                   = 00000001    D
PRMSK$M_TRANSL                = 00000010    D
PRMSK$V_ALWAYS                = 00000003    D
PRMSK$V_EQL                   = 00000001    D
PRMSK$V_GTR                   = 00000002    D
PRMSK$V_LSS                   = 00000000    D
PRMSK$V_TRANSL                = 00000004    D
PRV$M_FWREV                   = 00000002    D
PRV$M_HWREV                   = 00000001    D
PRV$M_PREV                    = 00000004    D
PRV$V_FWREV                   = 00000001    D
PRV$V_HWREV                   = 00000000    D
PRV$V_PREV                    = 00000002    D
P_TABLE                         0000020C R  D  02
QBUFF                           0000022C R  D  02
Q_DIVD                          00000284 R  D  02
RAB$L_RBF                     = 00000028    D
RAB$W_RSZ                     = 00000022    D
RCTRLC                          ********   X   04
RCVTREGX                        00000B76 R  D  04
RELATION                        00000214 R  D  02
RESET_INPUT                     0000046E R  D  04
SIZ...                        = 00000001    D
SS$_NORMAL                    = 00000001    D
SYS$CANCEL                      ********  GX   04
SYS$FAO                         ********   X   04
SYS$FAOL                        ********   X   04
SYS$PUT                         ********  GX   04
SYS$QIOW                        ********  GX   04
TRUE                          = 00000001    D
T_PAGE                          0000023D R  D  02
T_SHOW_PAGE                     00000260 R  D  02
WARECODE                        00000210 R  D  02
WIDTH_TOO_LARGE                 00000234 R  D  02
```

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                                    +----------------+
                                    ! Psect synopsis !
                                    +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           0000FE70  (65136.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
WORK                            0000050C  ( 1292.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR NOEXE   RD    WRT NOVEC LONG
DATA                            00000010  (   16.)  03 (  3.)  NOPIC   USR   CON   REL   LCL   SHR NOEXE   RD  NOWRT NOVEC BYTE
CODE                            00000B77  ( 2935.)  04 (  4.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD  NOWRT NOVEC BYTE
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$.TMP1	=00000001	546 (1)	546 (1)
$$.TMP2	=00000060	546 (1)	546 (1)
$$ARGS	=00000007	222 (1)	222 (1)
$$N	=00000005	1339 (1)	1041 (1) #-1106 (1) 1197 (1) 1205 (1) 1209 (1) 1217 (1) 1225 (1) 1229 (1) 1297 (1) 1306 (1) 1314 (1) 1322 (1) 1331 (1) 1339 (1) #-408 (1) 453 (1)
$$T1	=00000001	940 (1)	222 (1) 643 (1) 650 (1) 663 (1) 669 (1) 683 (1) 688 (1) 940 (1)
$$T2	=00000004	1288 (1)	1160 (1) 1288 (1)
ACT_REV	00000294-R	265 (1)	#-1133 (1) #-1134 (1) #-1135 (1) #-1151 (1) #-1152 (1) #-1154 (1) #-1161 (1) #-1166 (1) 1212 (1) 1291 (1) 271 (1)
ADDR_128	00000000-R	232 (1)	#-1045 (1) #-1057 (1) #-1063 (1) #-1386 (1) #-1388 (1) #-1391 (1)
BIT...	=00000005	222 (1)	212 (1) 215 (1) 216 (1) 218 (1) 219 (1) 222 (1)
CLI$K_BUFSIZ	=00000100	220 (1)	220 (1)
CLI$K_SIZE	0000044C	220 (1)	
CLI$L_ADDRESS	00000018	220 (1)	
CLI$L_COMMAND	00000004	220 (1)	
CLI$L_DATA	0000001C	220 (1)	#-397 (1)
CLI$L_FLAGS	00000000	220 (1)	
CLI$L_FLAGS2	00000444	220 (1)	
CLI$L_LAST	00000024	220 (1)	
CLI$L_NEXT	00000030	220 (1)	
CLI$L_PASS	0000002C	220 (1)	
CLI$L_SUBT	00000028	220 (1)	
CLI$L_TEMP_BASE	00000448	220 (1)	
CLI$L_TEST	00000020	220 (1)	
CLI$M_START_OR_RUN	=00000008	220 (1)	
CLI$Q_BUFQWD	00000034	220 (1)	
CLI$Q_FILE	00000008	220 (1)	
CLI$Q_SECTION	00000010	220 (1)	
CLI$Q_TIME	0000043C	220 (1)	
CLI$T_BUFFER	0000003C	220 (1)	
CLI$V_ADAPTER	=00000018	220 (1)	
CLI$V_ADR	=0000000B	220 (1)	
CLI$V_ASCII	=00000013	220 (1)	
CLI$V_BASE_QUAL	=00000002	220 (1)	
CLI$V_BREAK	=0000000A	220 (1)	
CLI$V_BRIEF	=0000001B	220 (1)	
CLI$V_BYTE	=0000000D	220 (1)	
CLI$V_CLEAR	=00000002	220 (1)	
CLI$V_DEC	=00000010	220 (1)	
CLI$V_DEFAULT	=0000000C	220 (1)	
CLI$V_DEPOSIT	=00000019	220 (1)	
CLI$V_EVENT	=00000008	220 (1)	
CLI$V_EXAM	=00000005	220 (1)	
CLI$V_FLAGS	=00000009	220 (1)	

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CLI$V_HEX                       =00000012     220    (1)
CLI$V_KERNEL                    =00000017     220    (1)
CLI$V_LOAD                      =00000006     220    (1)
CLI$V_LONG                      =0000000F     220    (1)
CLI$V_NEXT                      =00000001     220    (1)
CLI$V_NOALLOC                   =00000000     220    (1)
CLI$V_NOTNUF                    =00000001     220    (1)
CLI$V_OCT                       =00000011     220    (1)
CLI$V_PREG                      =0000001A     220    (1)
CLI$V_QA                        =00000007     220    (1)
CLI$V_QACKLOOPLOOPS             =0000001C     220    (1)
CLI$V_QAERRORPRINTS             =0000001B     220    (1)
CLI$V_QAMULTIPLEPASS            =0000001F     220    (1)
CLI$V_QASUBTESTLOOPS            =0000001E     220    (1)
CLI$V_QATESTLOOPS               =0000001D     220    (1)
CLI$V_REG                       =00000014     220    (1)
CLI$V_REQUIRED                  =00000000     220    (1)
CLI$V_RUN                       =00000015     220    (1)
CLI$V_SET                       =00000003     220    (1)
CLI$V_SHOW                      =00000004     220    (1)
CLI$V_START_OR_RUN              =00000003     220    (1)       220    (1)
CLI$V_VALSEC                    =00000016     220    (1)
CLI$V_WORD                      =0000000E     220    (1)
CONTROL                          000002D2-R   278    (1)       1160   (1)       1288   (1)
CR                              =0000000D     329    (1)       331    (1)
CRD$K_CRD_INITIALIZATION        =00000000     219    (1)
CRD$K_DS_CONTROL_C              =00000001     219    (1)
CRD$K_DS_FLAGS                  =00000000     219    (1)
CRD$K_FAILURE                   =00000000     219    (1)
CRD$K_HOOK_POINT                =00000000     219    (1)
CRD$K_LAST_ACCESS_CODE          =00000002     219    (1)
CRD$K_LAST_DS_VARIABLE          =00000002     219    (1)
CRD$K_LAST_FUNCTION             =00000002     219    (1)
CRD$K_LAST_HOOK_POINT           =00000001     219    (1)
CRD$K_READ                      =00000000     219    (1)
CRD$K_SUCCESS                   =00000001     219    (1)
CRD$K_TYPECODE                  =00000001     219    (1)     #-517    (1)
CRD$K_WRITE                     =00000001     219    (1)
CVT$A_CODELIST                   00000000-R   350    (1)     #-1482   (1)
CVT$T_MBAMAP                     00000000-XR                    354    (1)
CVT$T_MBASR                      00000000-XR                    353    (1)
CVT$T_UBADPR                     00000000-XR                    351    (1)
CVT$T_UBAMAP                     00000000-XR                    352    (1)
CVT$_MAX                        =FFFFFFFC     215    (1)     #-1479   (1)
CVT$_MBAMAP                     =FFFFFFFC     215    (1)       215    (1)
CVT$_MBASR                      =FFFFFFFD     215    (1)
CVT$_UBADPR                     =FFFFFFFF     215    (1)
CVT$_UBAMAP                     =FFFFFFFE     215    (1)
DEBUG_THE_SUCKER                 0000050B-R   335    (1)     #-889    (1)
DEVNAME                          00000218-R   240    (1)     #-1073   (1)     #-1074   (1)       1077   (1)       1079   (1)
DS$GA_CRD_DS_INTERFACE           00000000-XR                    518    (1)
DS$GB_QIOACT                     00000000-XR                  #-554    (1)     #-654    (1)     #-690    (1)
DS$GB_TYPECODE                   00000000-XR                  #-1344   (1)     #-505    (1)     #-516    (1)     #-748    (1)
                                                              #-770    (1)       878    (1)
DS$GB_VDS_DEBUG                  0000050B-R   334    (1)
DS$GB_WIDTH                      00000000-XR                  #-582    (1)
DS$GL_BUFLEN                     00000000-XR                    867    (1)     #-876    (1)     #-882    (1)     #-918    (1)
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DS$GL_FLAGS                     00000000-XR                      523  (1)     861  (1)
DS$GL_PAGE                      00000239-R   253     (1)     #-400  (1)    #-448  (1)    #-575  (1)    #-578  (1)
                                                             #-615  (1)
DS$GPHARD                       00000000-XR                     1069  (1)
DS$GT_BUFFER                    00000000-XR                      247  (1)
DS$GW_TTIN                      00000000-XR                    #-663  (1)    #-669  (1)    #-937  (1)    #-940  (1)
DS$GW_TTOUT                     00000000-XR                    #-629  (1)    #-643  (1)    #-650  (1)    #-683  (1)
                                                             #-688  (1)
DS$K_BUFSIZ                      00000000-XR                     246  (1)     857  (1)
DS$K_ERROR                      =00000002    212     (1)
DS$K_NORMAL                     =00000001    212     (1)
DS$K_PRINTB                     =00000002    218     (1)
DS$K_PRINTF                     =00000001    218     (1)    #-1041  (1)    #-1106  (1)    #-1197  (1)    #-1205  (1)
                                                            #-1209  (1)    #-1217  (1)    #-1225  (1)    #-1229  (1)
                                                            #-1297  (1)    #-1306  (1)    #-1314  (1)    #-1322  (1)
                                                            #-1331  (1)    #-1339  (1)    #-408   (1)    #-453   (1)
DS$K_PRINTI                     =00000000    218     (1)
DS$K_PRINTX                     =00000003    218     (1)
DS$K_SEVERE                     =00000004    212     (1)
DS$K_SUBSYS                     =00000066    212     (1)     212  (1)
DS$K_TYPE_ABORT_PROGRAM         =00000014    218     (1)
DS$K_TYPE_ABORT_TEST            =00000013    218     (1)
DS$K_TYPE_COMMAND_ERR           =00000015    218     (1)    #-408   (1)
DS$K_TYPE_COMMAND_OUT           =00000016    218     (1)    #-1041  (1)    #-1106  (1)    #-1197  (1)    #-1205  (1)
                                                            #-1209  (1)    #-1217  (1)    #-1225  (1)    #-1229  (1)
                                                            #-1297  (1)    #-1306  (1)    #-1314  (1)    #-1322  (1)
                                                            #-1331  (1)    #-1339  (1)    #-453   (1)
DS$K_TYPE_CRD_AUTOTEST          =0000001A    218     (1)    #-504   (1)
DS$K_TYPE_DS_PROMPT             =00000001    218     (1)
DS$K_TYPE_DS_START              =0000001D    218     (1)
DS$K_TYPE_ERRDEV                =00000008    218     (1)
DS$K_TYPE_ERRHARD               =00000006    218     (1)
DS$K_TYPE_ERROR_BODY            =00000009    218     (1)    #-1343  (1)
DS$K_TYPE_ERROR_END             =0000000A    218     (1)
DS$K_TYPE_ERRPREP               =0000001B    218     (1)
DS$K_TYPE_ERRSOFT               =00000007    218     (1)
DS$K_TYPE_ERRSUP                =00000004    218     (1)
DS$K_TYPE_ERRSYS                =00000005    218     (1)
DS$K_TYPE_ERR_HALT              =0000000D    218     (1)
DS$K_TYPE_EXCEPTION             =0000000C    218     (1)
DS$K_TYPE_EXCEPTION_HEAD        =0000000B    218     (1)
DS$K_TYPE_FIRST_PASS            =00000011    218     (1)
DS$K_TYPE_GENERAL               =00000000    218     (1)
DS$K_TYPE_GENERAL_ERROR         =00000003    218     (1)
DS$K_TYPE_NO_TESTS              =00000012    218     (1)
DS$K_TYPE_PARAM_ERROR           =0000001C    218     (1)
DS$K_TYPE_PROGRAM_END           =00000010    218     (1)
DS$K_TYPE_PROGRAM_INFO          =00000017    218     (1)
DS$K_TYPE_PROGRAM_START         =0000000F    218     (1)
DS$K_TYPE_QIO_INVADP            =00000024    218     (1)
DS$K_TYPE_QIO_NODRIVER          =00000022    218     (1)
DS$K_TYPE_QIO_WRONGVER          =00000023    218     (1)
DS$K_TYPE_SCRIPT_ECHO           =00000021    218     (1)
DS$K_TYPE_SCRIPT_PNF            =0000001E    218     (1)
DS$K_TYPE_SCRIPT_PROMPT         =00000020    218     (1)
DS$K_TYPE_SCRIPT_SKIP           =0000001F    218     (1)
DS$K_TYPE_SEQUENCE_ERROR        =00000019    218     (1)
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DS$K_TYPE_START_ERR          =00000018     218    (1)
DS$K_TYPE_START_LIST         =00000025     218    (1)
DS$K_TYPE_SUMMARY            =0000000E     218    (1)
DS$K_TYPE_USER_PROMPT        =00000002     218    (1)
DS$K_WARNING                 =00000000     212    (1)
DS$M_ABRTFLG                 =00000040     216    (1)
DS$M_BADTIME                 =00100000     216    (1)
DS$M_BATCH                   =00400000     216    (1)
DS$M_BRKCLR                  =00001000     216    (1)
DS$M_BRKPT                   =00000800     216    (1)
DS$M_CHARFLG                 =00000100     216    (1)
DS$M_CMDFLG                  =00000080     216    (1)
DS$M_CTRLC                   =00000001     216    (1)
DS$M_CTRLO                   =00010000     216    (1)
DS$M_DEVFLG                  =00000200     216    (1)
DS$M_DISABLCC                =01000000     216    (1)
DS$M_DONFLG                  =00002000     216    (1)
DS$M_ERRFLG                  =00000010     216    (1)
DS$M_EXCEPT                  =00080000     216    (1)
DS$M_EXETST                  =00040000     216    (1)
DS$M_HLTFLG                  =00000008     216    (1)
DS$M_LODFLG                  =00000002     216    (1)
DS$M_MEMMGT                  =00008000     216    (1)
DS$M_NI                      =04000000     216    (1)
DS$M_OUTPUT                  =00800000     216    (1)
DS$M_RUBFLG                  =00000020     216    (1)
DS$M_SCRIPT                  =00200000     216    (1)
DS$M_SETIMR                  =02000000     216    (1)
DS$M_STRFLG                  =00000004     216    (1)
DS$M_SUBT                    =00004000     216    (1)
DS$M_SYSFLG                  =00000400     216    (1)
DS$M_TIMED                   =02000000     216    (1)
DS$M_TIMED_OUT               =08000000     216    (1)
DS$M_TIMRON                  =00020000     216    (1)
DS$RAB_OUTPUT                 00000000-XR                532    (1)
DS$V_ABRTFLG                 =00000006     216    (1)
DS$V_BADTIME                 =00000014     216    (1)
DS$V_BATCH                   =00000016     216    (1)    #-523    (1)
DS$V_BRKCLR                  =0000000C     216    (1)
DS$V_BRKPT                   =0000000B     216    (1)
DS$V_CHARFLG                 =00000008     216    (1)
DS$V_CMDFLG                  =00000007     216    (1)
DS$V_CTRLC                   =00000000     216    (1)
DS$V_CTRLO                   =00000010     216    (1)
DS$V_DEVFLG                  =00000009     216    (1)
DS$V_DISABLCC                =00000018     216    (1)
DS$V_DONFLG                  =0000000D     216    (1)
DS$V_ERRFLG                  =00000004     216    (1)
DS$V_EXCEPT                  =00000013     216    (1)
DS$V_EXETST                  =00000012     216    (1)
DS$V_HLTFLG                  =00000003     216    (1)
DS$V_LODFLG                  =00000001     216    (1)
DS$V_MEMMGT                  =0000000F     216    (1)
DS$V_NI                      =0000001A     216    (1)
DS$V_OUTPUT                  =00000017     216    (1)    #-861    (1)
DS$V_RUBFLG                  =00000005     216    (1)
DS$V_SCRIPT                  =00000015     216    (1)
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DS$V_SETIMR                 =00000019     216    (1)
DS$V_STRFLG                 =00000002     216    (1)
DS$V_SUBT                   =0000000E     216    (1)
DS$V_SYSFLG                 =0000000A     216    (1)
DS$V_TIMED                  =00000019     216    (1)
DS$V_TIMED_OUT              =0000001B     216    (1)
DS$V_TIMRON                 =00000011     216    (1)
DS$_AP_NORMAL_BREAK         =00660150     212    (1)
DS$_ARITH                   =006600D0     212    (1)
DS$_ASBE                    =00660118     212    (1)
DS$_BADLINK                 =006600F0     212    (1)
DS$_BADTYPE                 =006600E8     212    (1)    #-1123   (1)
DS$_BIIC                    =00660120     212    (1)
DS$_CHME                    =006600A8     212    (1)
DS$_CHMK                    =006600E0     212    (1)
DS$_DEVNAME                 =00660108     212    (1)
DS$_ERROR                   =00660002     212    (1)    #-1140   (1)    #-1350   (1)
DS$_FHWE                    =00660068     212    (1)
DS$_FRAGBUF                 =00660080     212    (1)
DS$_ICBUSY                  =006600C8     212    (1)
DS$_ICERR                   =006600C0     212    (1)
DS$_IHWE                    =00660060     212    (1)
DS$_ILLCHAR                 =00660018     212    (1)
DS$_ILLPAGCNT               =00660078     212    (1)
DS$_ILLUNIT                 =00660100     212    (1)    #-1109   (1)
DS$_INIT_FAIL               =00660140     212    (1)
DS$_INSFMEM                 =00660050     212    (1)
DS$_INVCPU                  =00660130     212    (1)
DS$_IPL2HI                  =006600B8     212    (1)
DS$_IVADDR                  =00660040     212    (1)
DS$_IVVECT                  =00660038     212    (1)
DS$_KRNLSTK                 =00660090     212    (1)
DS$_LOGIC                   =00660070     212    (1)
DS$_MCHK                    =00660088     212    (1)
DS$_MEM_ALLOC_ERR           =00660138     212    (1)    #-1060   (1)
DS$_MMOFF                   =00660058     212    (1)
DS$_NEEDUNIT                =006600F8     212    (1)
DS$_NODE                    =00660128     212    (1)
DS$_NOPCS                   =00660110     212    (1)
DS$_NORMAL                  =00660001     212    (1)    #-1348   (1)    #-1641   (1)
DS$_NOSUPPORT               =006600B1     212    (1)
DS$_NOTALLOWMP              =00660148     212    (1)
DS$_NOTDON                  =00660030     212    (1)
DS$_NOTIMP                  =006600B0     212    (1)      212    (1)
DS$_NULLSTR                 =00660010     212    (1)
DS$_OVERFLOW                =00660008     212    (1)
DS$_POWER                   =00660098     212    (1)
DS$_PROGERR                 =00660020     212    (1)    #-1637   (1)
DS$_SEVERE                  =00660004     212    (1)
DS$_TRANSL                  =006600A0     212    (1)
DS$_TRUNCATE                =00660028     212    (1)
DS$_UNEXPINT                =006600D8     212    (1)
DS$_UNSUPPDEV               =00660158     212    (1)
DS$_VASFULL                 =00660048     212    (1)
DS$_WARNING                 =00660000     212    (1)      212    (1)
DSA$GL_FLAGS                 0000FE00                     509    (1)      510    (1)      511    (1)      536    (1)
                                                          537    (1)      538    (1)      563    (1)      564    (1)
```

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                                                    565    (1)      603    (1)      653    (1)      678    (1)
                                                    821    (1)      827    (1)      833    (1)      837    (1)
                                                    844    (1)      845    (1)      856    (1)      875    (1)
                                                    890    (1)    #-921    (1)
DSA$GQ_MSGPTR                    0000FE68           881    (1)
DSA$M_NORPT                     =08000000        #-859    (1)
DSA$V_APT                       =0000001F        #-844    (1)
DSA$V_BINARY                    =00000001        #-875    (1)      #-890    (1)
DSA$V_CRD_AUTOTEST_OFF          =0000000B        #-509    (1)      #-536    (1)      #-563    (1)
DSA$V_CRD_MENUTEST_OFF          =00000010        #-510    (1)      #-537    (1)      #-564    (1)
DSA$V_CRD_MENUTEST_ON           =00000012        #-511    (1)      #-538    (1)      #-565    (1)
DSA$V_IE1                       =00000004        #-837    (1)
DSA$V_IE2                       =00000005        #-833    (1)
DSA$V_IE3                       =00000006        #-827    (1)
DSA$V_IES                       =00000007        #-821    (1)
DSA$V_NORPT                     =0000001B        #-845    (1)
DSA$V_USER                      =0000001C        #-603    (1)      #-653    (1)      #-678    (1)
DSV$SETPAGE                      00000000-R  396    (1)
DSV$SHOWPAGE                     00000027-R  447    (1)
DSX$CVTREG                       000009BB-R  1462   (1)
DSX$DEALLOCATE                   00000988-R  1382   (1)
DSX$PRINT                        000002D3-R  740    (1)    1041    (1)      1106    (1)      1197    (1)      1205    (1)
                                                           1209    (1)      1217    (1)      1225    (1)      1229    (1)
                                                           1297    (1)      1306    (1)      1314    (1)      1322    (1)
                                                           1331    (1)      1339    (1)       408    (1)       453    (1)
DSX$PRINTB                       0000033B-R  831    (1)     762    (1)
DSX$PRINTF                       00000353-R  842    (1)     759    (1)
DSX$PRINTI                       00000368-R  853    (1)     756    (1)
DSX$PRINTREV                     000004A2-R  1032   (1)
DSX$PRINTS                       00000321-R  819    (1)
DSX$PRINTX                       0000032E-R  825    (1)     765    (1)
DSX$TYPE_OUT                     00000047-R  502    (1)     908    (1)      919    (1)
EQUALMESS                        0000044F-R  320    (1)    1249    (1)
EXE$ALONONPAGED                  00000000-XR         (1)    1048    (1)
EXE$DEANONPAGED                  00000000-XR         (1)    1390    (1)
EXP_REV                          000002A9-R  267    (1)  #-1265    (1)    #-1266    (1)    #-1267    (1)    #-1279    (1)
                                                        #-1280    (1)    #-1282    (1)    #-1289    (1)      1292    (1)
                                                         275    (1)
FALSE                           =00000000    219    (1)
FAO_DESC                         000002BE-R  270    (1)    1160    (1)
FAO_DESC_2                       000002C8-R  274    (1)    1288    (1)
FAO_LEN                          000002C6-R  272    (1)    1160    (1)    #-1161    (1)
FAO_LEN_2                        000002D0-R  276    (1)    1288    (1)    #-1289    (1)
FIRMEXIST$T                      00000200-R  234    (1)  #-1066    (1)    #-1173    (1)
FIRMMESSA                        00000426-R  308    (1)    1172    (1)
FMT_BEG_ERR                      000002DD-R  281    (1)    1197    (1)      1217    (1)      1297    (1)      1322    (1)
FMT_END_ERR                      00000301-R  287    (1)    1339    (1)
FMT_H_END                        00000414-R  302    (1)    1229    (1)
FMT_H_END_ERR                    00000386-R  293    (1)    1314    (1)
FMT_MODULE                       000002F9-R  284    (1)    1205    (1)      1225    (1)      1306    (1)      1331    (1)
FMT_P_F_END                      0000040B-R  299    (1)    1209    (1)
FMT_TOOHIGH                      00000458-R  323    (1)    1041    (1)
FMT_TOOMANY_MODS                 000004A2-R  326    (1)    1106    (1)
GREATTHAN                        00000442-R  317    (1)    1258    (1)
HARDEXIST$T                      00000204-R  235    (1)  #-1065    (1)    #-1164    (1)
HARDMESSA                        0000041D-R  305    (1)    1163    (1)
HP$Q_DEVICE                      00000000            (1)  #-1074    (1)    #-1077    (1)
```

```
IO$M_CTRLCAST                   00000000-XR                     #-940   (1)
IO$M_TRMNOECHO                  00000000-XR                     #-663   (1)    #-669   (1)
IO$_READVBLK                    00000000-XR                     #-663   (1)    #-669   (1)
IO$_SETMODE                     00000000-XR                     #-940   (1)
IO$_WRITEVBLK                   00000000-XR                     #-628   (1)    #-643   (1)    #-650   (1)    #-683   (1)
                                                                #-688   (1)
KB_CHECK                        00000000-XR                      673    (1)     926    (1)
LESSTHAN                        00000438-R      314     (1)      1241   (1)
LF                              =0000000A       330     (1)      331    (1)
LINE_COUNT                      00000235-R      251     (1)     #-578   (1)    #-615   (1)    #-691   (1)
LOGNUM                          00000228-R      241     (1)     #-1035  (1)    #-1036  (1)    #-1041  (1)    #-1043  (1)
L_QUO                           0000028C-R      261     (1)     #-1148  (1)    #-1149  (1)    #-1151  (1)    #-1276  (1)
                                                                #-1277  (1)    #-1279  (1)
L_REM                           00000290-R      262     (1)     #-1148  (1)    #-1152  (1)    #-1154  (1)    #-1276  (1)
                                                                #-1280  (1)    #-1282  (1)
MP$GR_BOOTED_PROCESSORS         00000000-XR                     #-924   (1)
OFF                             =00000000       219     (1)
ON                              =00000001       219     (1)
PAGE_STRING                     000004DE-R      331     (1)      643    (1)     650    (1)     683    (1)     688    (1)
PATCHEXIST$T                    00000208-R      236     (1)     #-1067  (1)    #-1182  (1)
PATCHMESSA                      0000042F-R      311     (1)      1181   (1)
PRINTREV$_ACTUAL_REV            =00000008       222     (1)     #-1128  (1)    #-1136  (1)    #-1146  (1)    #-1160  (1)
                                                                #-1175  (1)    #-1184  (1)    #-1192  (1)    #-1231  (1)
                                                                #-1339  (1)
PRINTREV$_EXPECTED_REV          =0000000C       222     (1)     #-1130  (1)    #-1231  (1)    #-1268  (1)    #-1274  (1)
                                                                #-1288  (1)    #-1339  (1)
PRINTREV$_LOG_UNIT              =00000004       222     (1)     #-1035  (1)    #-1069  (1)
PRINTREV$_MODULENUM             =0000001C       222     (1)     #-1090  (1)    #-1095  (1)    #-1200  (1)    #-1205  (1)
                                                                #-1220  (1)    #-1225  (1)    #-1301  (1)    #-1306  (1)
                                                                #-1326  (1)    #-1331  (1)
PRINTREV$_NARGS                 =00000007       222     (1)
PRINTREV$_PRINTMASK             =00000014       222     (1)      1144   (1)     1187   (1)     1238   (1)     1246   (1)
                                                                 1255   (1)     1272   (1)
PRINTREV$_PRLINK                =00000018       222     (1)     #-1341  (1)     1346   (1)
PRINTREV$_REV_TYPE              =00000010       222     (1)     #-1112  (1)    #-1115  (1)    #-1120  (1)    #-1190  (1)
                                                                #-1262  (1)
PRINT_X                          0000045F-R     923     (1)     #-823   (1)    #-829   (1)    #-835   (1)    #-839   (1)
                                                                #-850   (1)    #-873   (1)
PRMSK$M_ALWAYS                  =00000008       222     (1)
PRMSK$M_EQL                     =00000002       222     (1)
PRMSK$M_GTR                     =00000004       222     (1)
PRMSK$M_LSS                     =00000001       222     (1)
PRMSK$M_TRANSL                  =00000010       222     (1)
PRMSK$V_ALWAYS                  =00000003       222     (1)     #-1187  (1)
PRMSK$V_EQL                     =00000001       222     (1)     #-1246  (1)
PRMSK$V_GTR                     =00000002       222     (1)     #-1255  (1)
PRMSK$V_LSS                     =00000000       222     (1)     #-1238  (1)
PRMSK$V_TRANSL                  =00000004       222     (1)     #-1143  (1)    #-1271  (1)
PRV$M_FWREV                     =00000002       222     (1)     #-1115  (1)
PRV$M_HWREV                     =00000001       222     (1)     #-1112  (1)    #-1190  (1)    #-1262  (1)
PRV$M_PREV                      =00000004       222     (1)     #-1120  (1)
PRV$V_FWREV                     =00000001       222     (1)
PRV$V_HWREV                     =00000000       222     (1)
PRV$V_PREV                      =00000002       222     (1)
P_TABLE                          0000020C-R     237     (1)      1069   (1)    #-1070  (1)
QBUFF                            0000022C-R     246     (1)     #-858   (1)     866    (1)    #-877   (1)    #-879   (1)
                                                                 883    (1)
```

```
Q_DIVD                    00000284-R   260    (1)    #-1146   (1)    #-1147   (1)    #-1274   (1)    #-1275   (1)
RAB$L_RBF                =00000028                  #-545    (1)
RAB$W_RSZ                =00000022                  #-544    (1)
RCTRLC                    00000000-XR                 940    (1)
RCVTREGX                  00000B76-R   1643   (1)    #-1638   (1)
RELATION                  00000214-R   239    (1)    #-1186   (1)    #-1241   (1)    #-1249   (1)    #-1258   (1)
                                                     #-1314   (1)    #-1339   (1)
RESET_INPUT               0000046E-R   936    (1)    #-555    (1)
SIZ...                   =00000001     222    (1)      216    (1)      222    (1)
SS$_NORMAL               =00000001                  #-871    (1)
SYS$CANCEL                00000000-XR                 937    (1)
SYS$FAO                   00000000-XR                 1160   (1)      1288   (1)      906    (1)
SYS$FAOL                  00000000-XR                 869    (1)
SYS$PUT                   00000000-XR                 546    (1)
SYS$QIOW                  00000000-XR                 631    (1)      643    (1)      650    (1)      663    (1)
                                                      669    (1)      683    (1)      688    (1)      940    (1)
TRUE                     =00000001     219    (1)
T_PAGE                    0000023D-R   254    (1)      408    (1)
T_SHOW_PAGE               00000260-R   256    (1)      453    (1)
WARECODE                  00000210-R   238    (1)    #-1163   (1)    #-1172   (1)    #-1181   (1)    #-1197   (1)
                                                     #-1217   (1)    #-1297   (1)    #-1314   (1)    #-1322   (1)
                                                     #-1339   (1)
WIDTH_TOO_LARGE           00000234-R   249    (1)    #-583    (1)    #-609    (1)    #-637    (1)    #-644    (1)

                                        +-------------------------+
                                        ! Performance indicators !
                                        +-------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    25    00:00:00.01    00:00:00.22
Command processing               911    00:00:00.28    00:00:00.97
Pass 1                          1061    00:00:03.98    00:00:07.08
Symbol table sort                  0    00:00:00.30    00:00:00.30
Pass 2                            60    00:00:01.33    00:00:02.52
Symbol table output                2    00:00:00.07    00:00:00.16
Psect synopsis output              2    00:00:00.00    00:00:00.00
Cross-reference output             6    00:00:00.28    00:00:00.47
Assembler run totals            2069    00:00:06.25    00:00:11.72

The working set limit was 3400 pages.
255392 bytes (499 pages) of virtual memory were used to buffer the intermediate code.
There were 60 pages of symbol table space allocated to hold 981 non-local and 140 local symbols.
1646 source lines were read in Pass 1, producing 106 object records in Pass 2.
65 pages of virtual memory were used to define 48 macros.
```

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              11
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                16
DISK$DS:[DS.LOCAL.RELEASE.WORK]CRD.MLB;1                1
SYS$COMMON:[SYSLIB]LIB.MLB;2                            0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                 0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1               0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1              0
SYS$COMMON:[SYSLIB]LIB.MLB;2                            0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       16
SYS$COMMON:[SYSLIB]STARLET.MLB;2                        0
TOTALS (all libraries)                                 44

1230 GETS were required to define 44 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element PROBE.B32
;    0002  0      ! *1     6-FEB-1986 15:21:52 DS ""
;    0003  0      ! DEC/CMS REPLACEMENT HISTORY, Element PROBE.B32
;    0004  0      %title '*** PROBE Check address accessibility'
;    0005  0      module probe (                  ! Routine to test accessibility of addresses
;    0006  0                    ident = '01-05'
;    0007  0                    ) =
;    0008  0      !
;    0009  0      ! Copyright (c) 1979, 1981, 1983
;    0010  0      ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
;    0011  0      !
;    0012  0      ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
;    0013  0      ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
;    0014  0      ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
;    0015  0      ! MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
;    0016  0      ! EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
;    0017  0      ! TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
;    0018  0      ! REMAIN IN DEC.
;    0019  0      !
;    0020  0      ! THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
;    0021  0      ! AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
;    0022  0      ! CORPORATION.
;    0023  0      !
;    0024  0      ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
;    0025  0      ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
;    0026  0
;    0027  0      !++
;    0028  0      ! FACILITY: DIAGNOSTIC SUPERVISOR
;    0029  0      !
;    0030  0      ! ABSTRACT:
;    0031  0      !
;    0032  0      !       This routine tests the accessibility of an address.
;    0033  0      !
;    0034  0      ! AUTHOR:       Roger Riggs, CREATION DATE: 10-November-1979
;    0035  0      ! MODIFIED BY:
;    0036  0      !
;    0037  0      !                       - Dave Butenhof, 02-Jun-1981, version 6.4
;    0038  0      !       01              Alter library spec. for flexibility (logical name)
;    0039  0      !
;    0040  0      !       02              - Dave Butenhof, 23-Nov-1981, verison 6.5
;    0041  0      !                       Fix truncation error.
;    0042  0      !
;    0043  0      !       03              Bob Bergazzi    May 17, 1983    Version 6.11
;    0044  0      !                       Changed the order of searching libraries.
;    0045  0      !
;    0046  0      !       04              Bob Bergazzi    May 24, 1983    Version 6.12
;    0047  0      !                       Removed the call to DSR$FAULT_CLEAR from the SELECT statement
;    0048  0      !                       in the ACC$HANDLER routine. This routine was being called
;    0049  0      !                       twice, once at EXE_MCHK in EXCEPT and then here if the condition
;    0050  0      !                       was machine check.
;    0051  0      !
;    0052  0      !       05              Domenic Andella         7-Sep-83        Version 6.13
;    0053  0      !                       Deleted External reference to DSR$FAULT_CLEAR routine
;    0054  0      !--
;    0055  0
;    0056  1      begin
;    0057  1      !
```

```
;    0058  1      ! TABLE OF CONTENTS:
;    0059  1      !
;    0060  1
;    0061  1      forward routine
;    0062  1          dsx$probe,                          ! Routine to test address
;    0063  1          acc$handler;                        ! Exception handler routine for PROBE
;    0064  1
;    0065  1      !
;    0066  1      ! INCLUDE FILES:
;    0067  1      !
;    0068  1
;    0069  1      library '$DIAG';                !
;    0070  1
;    0071  1      library '$DS';                  !
;    0072  1
;    0073  1      library 'SYS$LIBRARY:STARLET.L32';
;    0074  1
;    0075  1      linkage
;    0076  1          quick = jsb;
;    0077  1
;    0078  1      !
;    0079  1      ! EXTERNAL REFERENCES:
;    0080  1      !
;    0081  1
;    0082  1      external
;    0083  1          io$gq_physical : vector [2, long]
;    0084  1              addressing_mode (long_relative);        ! Quad descriptor of I/O space
;    0085  1
;    0086  1      !
;    0087  1      ! PSECT DEFINITIONS:
;    0088  1      !
;    0089  1
;    0090  1      psect
;    0091  1          plit = data ( share, addressing_mode (long_relative));
;    0092  1
;    0093  1      psect
;    0094  1          code = sep ( read, write, share);
;    0095  1
```

```
;    0097  1      %sbttl 'DSX$PROBE'
;    0098  1
;    0099  1      global routine dsx$probe (address, length, unit) =
;    0100  1
;    0101  1      !++
;    0102  1      ! FUNCTIONAL DESCRIPTION:
;    0103  1      !
;    0104  1      !       This routine checks that the address specified can be
;    0105  1      !       accessed using instructions that access data with the specified
;    0106  1      !       length.  The Unit number reflects the device expected
;    0107  1      !       to respond to this address, (i.e. unibus adapter)
;    0108  1      !
;    0109  1      ! FORMAL PRAMETERS:
;    0110  1      !
;    0111  1      !       ADDRESS Address to be accessed
;    0112  1      !       LENGTH  Length of reference, (1,2,4)
;    0113  1      !       UNIT    Unit number of device responding to this address
;    0114  1      !
;    0115  1      ! IMPLICIT INPUTS:      NONE
;    0116  1      !
;    0117  1      ! IMPLICIT OUTPUTS:     NONE
;    0118  1      !
;    0119  1      ! COMPLETION CODES:
;    0120  1      !
;    0121  1      ! SIDE EFFECTS:
;    0122  1      !
;    0123  1      !--
;    0124  1
;    0125  2          begin
;    0126  2
;    0127  2          stacklocal
;    0128  2              ch_status : $ds_chs_decl;               ! Storage for channel status
;    0129  2
;    0130  2          local
;    0131  2              rc,
;    0132  2              scratch;
;    0133  2
;    0134  2          builtin
;    0135  2              fp;
;    0136  2
;    0137  2          .fp = acc$handler;                          ! Set exception handler
;    0138  2
;    0139  2          if .address<0, 30> gequ .io$gq_physical [0]
;    0140  2          then
;    0141  3              begin
;    0142  3
;    0143  3              if not (rc = $ds_channel (unit = .unit, func = chc$_clear)) then return .rc;
;    0144  3
;    0145  2              end;
;    0146  2
;    0147  2          case .length from 1 to 4 of
;    0148  2              set
;    0149  2
;    0150  2              [1] :
;    0151  2                  scratch = .(.address)<0, 8>;
;    0152  2
;    0153  2              [2] :
```

```
;   0154  2                 scratch = .(.address)<0, 16>;
;   0155  2
;   0156  2             [4] :
;   0157  2                 scratch = .(.address)<0, 32>;
;   0158  2
;   0159  2             [inrange, outrange] :
;   0160  2                 return ds$_error;
;   0161  2             tes;
;   0162  2
;   0163  2         if .address<0, 30> gequ .io$gq_physical [0]
;   0164  2         then
;   0165  3             begin
;   0166  3
;   0167  3             local
;   0168  3                 rc;
;   0169  3
;   0170  3             if not (rc = $ds_channel (unit = .unit, func = chc$_status, stsadr = ch_status)) then return .rc;
;   0171  3
;   0172  3             if .ch_status [chs$v_errany] neq 0 then return ds$_error;
;   0173  3
;   0174  2             end;
;   0175  2
;   0176  2         ss$_normal
;   0177  1         end;


                                                                  .TITLE  PROBE *** PROBE Check address accessibility
                                                                  .IDENT  \01-05\

                                                                  .EXTRN  IO$GQ_PHYSICAL, DS$CHANNEL

                                                                  .PSECT  SEP,  SHR,2

                                          000C 00000              .ENTRY  DSX$PROBE, Save R2,R3                          ; 0099
                        53 00000000G  9F  9E 00002              MOVAB   @#DS$CHANNEL, R3                               ;
                        52 00000000G  EF  9E 00009              MOVAB   IO$GQ_PHYSICAL, R2                             ;
                        5E            08  C2 00010              SUBL2   #8, SP                                         ;
                        6D     0000V  CF  9E 00013              MOVAB   ACC$HANDLER, (FP)                              ; 0137
   62       04   AC     1E            00  ED 00018              CMPZV   #0, #30, ADDRESS, IO$GQ_PHYSICAL               ; 0139
                                      0F  1F 0001E              BLSSU   1$                                             ;
                                      7E  7C 00020              CLRQ    -(SP)                                          ; 0143
                                      7E  7C 00022              CLRQ    -(SP)                                          ;
                                      06  DD 00024              PUSHL   #6                                             ;
                                 0C   AC  DD 00026              PUSHL   UNIT                                           ;
                        63            06  FB 00029              CALLS   #6, DS$CHANNEL                                 ;
                        48            50  E9 0002C              BLBC    RC, 9$                                         ;
                  03    01       08   AC  CF 0002F 1$:          CASEL   LENGTH, #1, #3                                 ; 0147
 0016          0038   0010          000A     00034 2$:          .WORD   3$-2$,-                                        ;
                                                                        4$-2$,-                                        ;
                                                                        7$-2$,-                                        ;
                                                                        5$-2$                                          ;
                                      2E  11 0003C              BRB     7$                                             ; 0160
                        50       04   BC  9A 0003E 3$:          MOVZBL  @ADDRESS, SCRATCH                              ; 0151
                                      0A  11 00042              BRB     6$                                             ;
                        50       04   BC  3C 00044 4$:          MOVZWL  @ADDRESS, SCRATCH                              ; 0154
                                      04  11 00048              BRB     6$                                             ;
                        50       04   BC  D0 0004A 5$:          MOVL    @ADDRESS, SCRATCH                              ; 0157
```

```
        62      04   AC          1E          00  ED 0004E 6$:    CMPZV   #0, #30, ADDRESS, IO$GQ_PHYSICAL          ; 0163
                                             1E  1F 00054        BLSSU   8$                                        ;
                                             7E  7C 00056        CLRQ    -(SP)                                     ; 0170
                                       08    AE  9F 00058        PUSHAB  CH_STATUS                                 ;
                                 7E          07  7D 0005B        MOVQ    #7, -(SP)                                 ;
                                       0C    AC  DD 0005E        PUSHL   UNIT                                      ;
                                 63          06  FB 00061        CALLS   #6, DS$CHANNEL                            ;
                                 10          50  E9 00064        BLBC    RC, 9$                                    ;
                                 0F          6E  93 00067        BITB    CH_STATUS, #15                            ; 0172
                                             08  13 0006A        BEQL    8$                                        ;
                                 50 00660002 8F  D0 0006C 7$:    MOVL    #6684674, R0                              ;
                                                 04 00073        RET                                               ;
                                 50          01  D0 00074 8$:    MOVL    #1, R0                                    ; 0177
                                                 04 00077 9$:    RET                                               ;

; Routine Size:  120 bytes,    Routine Base:  SEP + 0000


;   0178  1
```

```
;    0180  1      %sbttl 'ACC$HANDLER'
;    0181  1
;    0182  1      global routine acc$handler (signal, mechanism) =
;    0183  1
;    0184  1      !++
;    0185  1      ! FUNCTIONAL DESCRIPTION:
;    0186  1      !
;    0187  1      !       This condition handler routine can be used to field any exceptions
;    0188  1      !       that indicate memory is in accessable.
;    0189  1      !       It does an SYS$UNWIND to the level of the caller of the routine
;    0190  1      !       that generated the condition.  The conditions trapped are
;    0191  1      !       DS$_MCHK, SS$_ACCVIO, and SS$_TRANSL.  The value of the aborted
;    0192  1      !       routine will be one of these values.
;    0193  1      !
;    0194  1      ! FORMAL PARAMETERS:
;    0195  1      !
;    0196  1      !       SIGNAL          Address of standard signal array
;    0197  1      !       MECHANISM       Address of mechanism array
;    0198  1      !
;    0199  1      ! IMPLICIT INPUTS:      NONE
;    0200  1      !
;    0201  1      ! IMPLICIT OUTPUTS:     NONE
;    0202  1      !
;    0203  1      ! CONDITION CODES:
;    0204  1      !
;    0205  1      !       SS$_RESIGNAL    If condition not DS$_MCHK, DS$_TRANSL, SS$_ACCVIO
;    0206  1      !       Otherwise       The value is irrelevent.
;    0207  1      !
;    0208  1      !--
;    0209  1
;    0210  2          begin
;    0211  2
;    0212  2          map
;    0213  2              signal : ref block [, byte],
;    0214  2              mechanism : ref block [, byte];
;    0215  2
;    0216  2          select .signal [chf$l_sig_name] of
;    0217  2              set
;    0218  2
;    0219  2              [ds$_mchk, ss$_accvio, ds$_transl] :
;    0220  3                  begin
;    0221  3                  mechanism [chf$l_mch_savr0] = .signal [chf$l_sig_name];
;    0222  4                  $unwind ()
;    0223  2                  end;
;    0224  2
;    0225  2              [otherwise] :
;    0226  2                  ss$_resignal;
;    0227  2              tes
;    0228  2
;    0229  1          end;


                                                .EXTRN  SYS$UNWIND

                                 000C 00000     .ENTRY  ACC$HANDLER, Save R2,R3                 ; 0182
                      50    04   AC  D0 00002   MOVL    SIGNAL, R0                              ; 0216
```

```
                                50          04  C0 00006        ADDL2   #4, R0                          ;
                                52          60  D0 00009        MOVL    (R0), R2                        ;
                                53          01  D0 0000C        MOVL    #1, R3                          ;
                                0C          52  D1 0000F        CMPL    R2, #12                         ; 0219
                                            12  13 00012        BEQL    1$                              ;
                     00660088   8F          52  D1 00014        CMPL    R2, #6684808                    ;
                                            09  13 0001B        BEQL    1$                              ;
                     006600A0   8F          52  D1 0001D        CMPL    R2, #6684832                    ;
                                            16  12 00024        BNEQ    2$                              ;
                                            53  D4 00026 1$:    CLRL    R3                              ;
                                50      08  AC  D0 00028        MOVL    MECHANISM, R0                   ; 0221
                           0C   A0          52  D0 0002C        MOVL    R2, 12(R0)                      ;
                                            7E  7C 00030        CLRQ    -(SP)                           ; 0222
                     00000000G  00          02  FB 00032        CALLS   #2, SYS$UNWIND                  ;
                                51          50  D0 00039        MOVL    R0, R1                          ;
                                05          53  E9 0003C 2$:    BLBC    R3, 3$                          ; 0225
                                50    0918  8F  3C 0003F        MOVZWL  #2328, R0                       ; 0226
                                                04 00044 3$:    RET                                     ; 0229

; Routine Size:  69 bytes,    Routine Base:  SEP + 0078


;   0230  1
;   0231  1     end
;   0232  1
;   0233  0     eludom



;                                   PSECT SUMMARY
;
;       Name                    Bytes                       Attributes
;
;  SEP                              189  NOVEC,  WRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
```

Symbol	Type	Defined	Referenced ...
$DS_CHANNEL	KeyWMacr	Lib01	143 170
$DS_CHS_DECL	Macro	Lib01	128
$DS_CHS_F	Fieldset	Lib01	128
$UNWIND	KeyWMacr	Lib03	222
ACC$HANDLER	GlobRout	182	63f 137a
ADDRESS	RoutForm	99	139. 151a. 154a. 157a. 163.
CHC$_CLEAR	Literal	Lib01	143
CHC$_STATUS	Literal	Lib01	170
CHF$L_MCH_SAVR0	Macro	Lib03	221
CHF$L_SIG_NAME	Macro	Lib03	216 221
CHS$V_ERRANY	Field	Lib01	172.
CH_STATUS	Stackloc	128	170a 172.
DS$CHANNEL	ExtRout	143	143c 170e 170c
DS$_ERROR	Literal	Lib01	160 172
DS$_MCHK	Literal	Lib01	219
DS$_TRANSL	Literal	Lib01	219
DSX$PROBE	GlobRout	99	62f
FP	Builtin	135	137a=
IO$GQ_PHYSICAL	External	83	139. 163.
LENGTH	RoutForm	99	147.
MECHANISM	RoutForm	182	214m 221a=
QUICK	Linkage	76	
RC	Local	131	143= 143.
	Local	168	170= 170.
SCRATCH	Local	132	151= 154= 157=
SDL$STARLET_CONCAT	Macro	Lib03	222
SIGNAL	RoutForm	182	213m 216a. 221a.
SS$_ACCVIO	Literal	Lib03	219
SS$_NORMAL	Literal	Lib03	176
SS$_RESIGNAL	Literal	Lib03	226
SYS$UNWIND	ExtRout	222	222c
UNIT	RoutForm	99	143. 170.

CROSS REFERENCE MAP

Line #	Event	File ...
1	Source (start)	DISK$DS:[DS.LOCAL.RELEASE.WORK]PROBE.B32;1
5	Module PROBE	
69	Library #1	DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
71	Library #2	DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
73	Library #3	SYS$COMMON:[SYSLIB]STARLET.L32;3
233	Eludom PROBE	

```
        KEY TO REFERENCE TYPE FLAGS

            .   Fetch
            =   Store
            c   Routine call
            a   Address use
            @   Indirect use
            e   External, external routine, or external literal declaration
            f   Forward or forward routine declaration
            h   Condition handler enabling
            m   Map declaration
            u   Undeclare declaration


;                           Library Statistics
;
;                                          -------- Symbols --------      Pages       Processing
;       File                               Total    Loaded   Percent      Mapped      Time
;
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
;                                            942        40         4        96          00:00.0
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
;                                            675         0         0        47          00:00.0
;  SYS$COMMON:[SYSLIB]STARLET.L32;3         10904         7         0       642          00:00.5




;                                   COMMAND QUALIFIERS

;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:PROBE.B32

; Size:          189 code + 0 data bytes
; Run Time:         00:01.4
; Elapsed Time:     00:03.1
; Lines/CPU Min:    10355
; Lexemes/CPU-Min: 36800
; Memory Used:  69 pages
; Compilation Complete
```

Table of contents

(2)   57   DECLARATIONS
(3)   200   UDA50 Bootstrap device initialization
(4)   344   UDA50 Bootstrap driver QIO

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element PUBTDRIVR.MAR
0000     2 ; *2    11-NOV-1987 08:50:37 GEARIN "ADDED SUPPORT FOR LARGE DEVICE #"
0000     3 ; *1     6-FEB-1986 15:21:54 DS ""
0000     4 ; DEC/CMS REPLACEMENT HISTORY, Element PUBTDRIVR.MAR
0000     5         .TITLE  PUBTDRIVR - UDA50 BOOT DRIVER
0000     6         .IDENT  '10.10-2'                                                    ;G:2
0000     7
0000     8 ;
0000     9 ;*****************************************************************************
0000    10 ;*                                                                           *
0000    11 ;*  COPYRIGHT (c) 1978, 1980, 1982 BY                                        *
0000    12 ;*  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.                   *
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0000    25 ;*                                                                           *
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0000    27 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    28 ;*                                                                           *
0000    29 ;*                                                                           *
0000    30 ;*****************************************************************************
0000    31 ;
0000    32
0000    33 ;++
0000    34 ; FACILITY:     BOOTS
0000    35 ;
0000    36 ; ABSTRACT:
0000    37 ;       This module contains the bootstrap device driver for the
0000    38 ;       UDA 50 disks.
0000    39 ;
0000    40 ; ENVIRONMENT:  IPL 31, kernel mode, code must be PIC
0000    41 ;
0000    42 ; AUTHOR:  Kerbey T. Altmann,   CREATION DATE:  20-Nov-1981
0000    43 ;
0000    44 ; MODIFIED BY:
0000    45 ;
0000    46 ; [01] Dave Butenhof, 15-Apr-1982
0000    47 ;       Modify to run under VDS. Partic, change $BOOT_DRIVER macro
0000    48 ;       to exclude fields not supported by VDS, and have I/O entry
0000    49 ;       call init routine a each call (since diagnostics may be
0000    50 ;       run, etc. between calls).
0000    51 ;                                                                           ;G:2
0000    52 ;       David Gearin    06-Nov-1987                                         ;G:2
0000    53 ;       Modify move from RPB$W_UNIT from byte to word.                      ;G:2
0000    54 ;       This allows for access to large device #'s.                         ;G:2
0000    55 ;--
```

```
0000          .SBTTL  DECLARATIONS
0000    ;
0000    ;     marcros
0000    ;
0000
0000          .MACRO  $PRDEF,$GBL
0000
0000          $DEFINI PR,$GBL
0000
0000
0000    $EQU  PR$_KSP 0
0000    $EQU  PR$_ESP 1
0000    $EQU  PR$_SSP 2
0000    $EQU  PR$_USP 3
0000    $EQU  PR$_ISP 4
0000    $EQU  PR$_P0BR        8
0000    $EQU  PR$_P0LR        9
0000    $EQU  PR$_P1BR        10
0000    $EQU  PR$_P1LR        11
0000    $EQU  PR$_SBR 12
0000    $EQU  PR$_SLR 13
0000    $EQU  PR$_PCBB        16
0000    $EQU  PR$_SCBB        17
0000    $EQU  PR$_IPL 18
0000    $EQU  PR$_ASTLVL      19
0000    $EQU  PR$_SIRR        20
0000    $EQU  PR$_SISR        21
0000    $EQU  PR$_ICCS        24
0000    $EQU  PR$_NICR        25
0000    $EQU  PR$_ICR 26
0000    $EQU  PR$_TODR        27
0000    $EQU  PR$_RXCS        32
0000    $EQU  PR$_RXDB        33
0000    $EQU  PR$_TXCS        34
0000    $EQU  PR$_TXDB        35
0000    $EQU  PR$_ACCS        40
0000    $EQU  PR$_ACCR        41
0000    $EQU  PR$_MAPEN       56
0000    $EQU  PR$_TBIA        57
0000    $EQU  PR$_TBIS        58
0000    $EQU  PR$_PME 61
0000    $EQU  PR$_SID 62
0000    $EQU  PR$_TBCHK       63
0000    $EQU  PR$V_SID_SN     0
0000    $EQU  PR$S_SID_SN     12
0000    $EQU  PR$V_SID_PL     12
0000    $EQU  PR$S_SID_PL     3
0000    $EQU  PR$V_SID_ECO    15
0000    $EQU  PR$S_SID_ECO    9
0000    $EQU  PR$V_SID_TYPE   24
0000    $EQU  PR$S_SID_TYPE   8
0000    $EQU  PR$_SID_TYP780  1
0000    $EQU  PR$_SID_TYP750  2
0000    $EQU  PR$_SID_TYP730  3
0000    $EQU  PR$_SID_TYP7VV  4
0000    $EQU  PR$_SID_TYPMAX  4
0000    $EQU  PR$_WCSA        44
```

```
0000   $EQU   PR$_WCSD        45
0000   $EQU   PR$_SBIFS       48
0000   $EQU   PR$_SBIS        49
0000   $EQU   PR$_SBISC       50
0000   $EQU   PR$_SBIMT       51
0000   $EQU   PR$_SBIER       52
0000   $EQU   PR$_SBITA       53
0000   $EQU   PR$_SBIQC       54
0000   $EQU   PR$_CMIERR      23
0000   $EQU   PR$_CSRS        28
0000   $EQU   PR$_CSRD        29
0000   $EQU   PR$_CSTS        30
0000   $EQU   PR$_CSTD        31
0000   $EQU   PR$_TBDR        36
0000   $EQU   PR$_CADR        37
0000   $EQU   PR$_MCESR       38
0000   $EQU   PR$_CAER        39
0000   $EQU   PR$_UBRESET     55
0000   $EQU   PR$_PAMACC      64
0000   $EQU   PR$_PAMLOC      65
0000   $EQU   PR$_CSWP        66
0000   $EQU   PR$_CRBT        67
0000   $EQU   PR$_MCTL1       68
0000   $EQU   PR$_MCTL2       69
0000   $EQU   PR$_MGEN        70
0000   $EQU   PR$_MTBER       71
0000   $EQU   PR$_MEAR        72
0000   $EQU   PR$_MDCR1       73
0000   $EQU   PR$_MEDR        74
0000   $EQU   PR$_MECCR       75
0000
0000           $DEFEND PR,$GBL,DEF
0000
0000           .ENDM   $PRDEF
0000   ;
0000   ; INCLUDE FILES:
0000   ;
0000
0000           $BTDDEF                          ; Boot device types
0000           .SAVE   LOCAL_BLOCK
0000           .RESTORE
0000           $IODEF                           ; I/O function codes
0000           .SAVE   LOCAL_BLOCK
0000           .RESTORE
0000           $MSCPDEF                         ; MSCP definitions
0000           .SAVE   LOCAL_BLOCK
0000           .RESTORE
0000           $PRDEF                           ; Processor registers
0000           .SAVE   LOCAL_BLOCK
0000           .RESTORE
0000           $PTEDEF                          ; Page table entries
0000           .SAVE   LOCAL_BLOCK
0000           .RESTORE
0000           $RPBDEF                          ; RPB offsets
0000           .SAVE   LOCAL_BLOCK
0000           .RESTORE
0000           $SSDEF                           ; Status codes
```

```
                     0000              .SAVE   LOCAL_BLOCK
                     0000              .RESTORE
                     0000  159         $UBADEF                         ; UBA definitions
                     0000              .SAVE   LOCAL_BLOCK
                     0000              .RESTORE
                     0000  160         $UBIDEF                         ; 11/750 UBA definitions
                     0000              .SAVE   LOCAL_BLOCK
                     0000              .RESTORE
                     0000  161         $VADEF                          ; Virtual addresses
                     0000              .SAVE   LOCAL_BLOCK
                     0000              .RESTORE
                     0000  162
                     0000  163
                     0000  164 ;
                     0000  165 ; EQUATED SYMBOLS:
                     0000  166 ;
                     0000  167
00000000             0000  168         UDAIP   = 0
00000002             0000  169         UDASA   = 2
00000001             0000  170         GO      = 1
00008000             0000  171         OWN     = 1a15
0000000B             0000  172         S1      = 11
0000000E             0000  173         S4      = 14
000001EE             0000  174         UMR     = 494          ; Last-1 UNIBUS Mapping Register
                     0000  175
                     0000  176 ;
                     0000  177 ; OWN STORAGE:
                     0000  178 ;
                     0000  179
                     0000  180 ;
                     0000  181 ; Boot driver table entry
                     0000  182 ;
                     0000  183
                00000000   184 .Psect  Bootdrivr_2,    page    ; Define psect allocation
                     0000  185
                     0000  186         $BOOT_DRIVER    DEVTYPE = BTD$K_UDA,-   ; Device type (UDA50)
                     0000  187                         SIZE = UD_DRVSIZ,-      ; Driver size
                     0000  188                         ADDR = START,-          ; Driver starting address
                     0000  189                         ENTRY = UD_DRIVER       ; Driver entry point
                00000000             .PSECT  BOOTDRIVR_4
                    FFFF  0000       .WORD   -1
                    0011  0002       .WORD   BTD$K_UDA
            00000000  0004           .LONG   0
            000002E8' 0008           .LONG   UD_DRVSIZ
            00000000' 000C           .LONG   START-$TABLE
            00000280' 0010           .LONG   UD_DRIVER-START
            00000000' 0014           .LONG   -START
                00000000             .PSECT  BOOTDRIVR_2
                     0000  190 ;                     UNIT_INIT = UD_INIT,-   ; Driver unit init entry
                     0000  191 ;                     DRIVRNAME = DSKDRVNAME,-; Driver disk name
                     0000  192 ;                     AUXDRNAME = PRTDRVNAME  ; Driver port name
                     0000  193
                     0000  194 START:
                     0000  195 ;DSKDRVNAME:
                     0000  196 ;       .ASCIC  /DUDRIVER.EXE/          ; Disk class driver filename
                     0000  197 ;PRTDRVNAME:
                     0000  198 ;       .ASCIC  /PUDRIVER.EXE/          ; Port driver filename
```

```
                                0000   200          .SBTTL  UDA50 Bootstrap device initialization
                                0000   201
                                0000   202 ;++
                                0000   203 ;
                                0000   204 ; Inputs:
                                0000   205 ;
                                0000   206 ;       R9 -->  RPB
                                0000   207 ;
                                0000   208 ; Outputs:
                                0000   209 ;
                                0000   210 ;       R0 - status code
                                0000   211 ;
                                0000   212 ;--
                                0000   213
                          01FC  0000   214 .Entry UD_INIT, ^M<R2,R3,R4,R5,R6,R7,R8>
                                0002   215
                                0002   216          .ENABLE LSB
                                0002   217
                    50    38    DB  0002   218          MFPR    #PR$_MAPEN, R0          ; Get the mapping status
                                0005   219 ;        BLBS    R0,10$                  ; If virtual, skip some set up
                                0005   220 ;
                                0005   221 ; Set up the SYSTEMID for the local UDA.
                                0005   222 ;
                                0005   223 ;        MOVL    RPB$L_IOVEC(R9),R1      ; Point to iovec
                                0005   224 ;        CLRB    B^<BOO$GB_UMR_DP-BOO$AL_VECTOR>(R1) ; Set for Direct Data Path
                                0005   225 ;        INCL    VMB$L_FLAGS(AP)         ; Set a flag to load SCS code
                                0005   226 ;        MOVL    RPB$L_BOOTR2(R9),-
                                0005   227 ;                VMB$B_SYSTEMID(AP)      ; Low 32 bits is CSR of UDA
                                0005   228 ;        MOVW    RPB$L_BOOTR1(R9),-
                                0005   229 ;                VMB$B_SYSTEMID+4(AP)    ; Hi 16 bits is TR of UBA
                                0005   230 ;        BBSS    #47,VMB$B_SYSTEMID(AP),10$ ; Set bit 47
                                0005   231 ;
                                0005   232 ; Set up an interrupt vector.
                                0005   233 ;
                                0005   234 ;10$:   MOVW    #<127*4>,RPB$W_R0UBVEC(R9) ; Use the highest possible
                                0005   235 ;
                                0005   236 ; Set up a UNIBUS mapping register(s) to cover the ring and buffers.
                                0005   237 ; To make things easy, we will grab the last two register (494 & 495).
                                0005   238 ; These registers are necessary since the ring area will be accessed by
                                0005   239 ; the controller which is a UNIBUS device that does not do any mapping.
                                0005   240 ;
          56    0003DC00 8F     D0  0005   241          MOVL    #<UMRa9>, R6            ; Set up a constant
                52    0200'CF   9E  000C   242          MOVAB   W^INTTBL, R2            ; Get the address of the ring
    51    52    0000009C'EF     CB  0011   243          BICL3   BYTE_OFF, R2, R1        ; Get the byte offset in page
           02 A2    51    56     C9  0019   244          BISL3   R6, R1, 2(R2)           ; Set in the UNIBUS addr
              02 A2    10'     C0  001E   245          ADDL    S^#<RING-INTTBL>,2(R2)  ; Make it the ring address
       52    52    15    09     EF  0022   246          EXTZV   #VA$V_VPN,#VA$S_VPN,R2,R2 ; Get the page frame
                                0027   247          ASSUME  RPB$L_ADPVIR EQ RPB$L_ADPPHY+4
                53    5C A940   D0  0027   248          MOVL    RPB$L_ADPPHY(R9)[R0],R3 ; Get correct pointer to UBA reg
                                002C   249          ASSUME  RPB$L_CSRVIR EQ RPB$L_CSRPHY+4
                57    54 A940   D0  002C   250          MOVL    RPB$L_CSRPHY(R9)[R0],R7 ; Get correct address of device CSR
                        0C 50     E9  0031   251          BLBC    R0,20$                  ; If clr, then physical
                52    50 B942   D0  0034   252          MOVL    @RPB$L_SVASPT(R9)[R2],R2; Virtual, get physical
          52     FFE00000 8F     CA  0039   253          BICL    #^C<PTE$M_PFN>,R2       ; Now a physical PFN
                54    0FB8 C3   DE  0040   254 20$:     MOVAL   UBA$L_MAP+<UMR*4>(R3),R4; Get the last two UMR's
    84    52     000000E0'EF     C9  0045   255          BISL3   VALID,R2,(R4)+           ; Set as valid w/PFN
                           52     D6  004D   256          INCL    R2                      ; Set next page just in case
```

```
                64   52   000000E0'EF   C9  004F   257          BISL3   VALID,R2,(R4)           ; Set as valid w/PFN
                                        0057   258 ;
                                        0057   259 ; Now go thru the ridiculously complicated startup sequence.  This is a
                                        0057   260 ; fugue in four parts.
                                        0057   261 ;
                          58   02   D0  0057   262          MOVL    #2,R8                   ; Make two tries at this
                      53  0200'CF   9E  005A   263 RETRY:   MOVAB   W^INTTBL, R3
                          52   0B   D0  005F   264          MOVL    #S1, R2                 ; Step flag
                               67   B4  0062   265          CLRW    UDAIP(R7)               ; Poke the controller's CSR
                                        0064   266 ;
                                        0064   267 ; Wait 10 seconds.
                                        0064   268 ;
                                        0064   269 TIME:
                                        0064   270          TIMEDWAIT TIME=#1000*1000,-             ; wait for 10 seconds
                                        0064   271                    INS1    = <MOVW UDASA(R7),R4>,- ; check the setup register
                                        0064   272                    INS2    = <BLSS 25$>,-          ; bit 15 set ?
                                        0064   273                    INS3    = <BBS  R2,R4,25$>,-    ; done with this step ?
                                        0064   274                    DONELBL = 25$                   ; label for exiting wait loop
                          50   01   3C  0064          MOVZWL  #SS$_NORMAL,R0
51   00000000'GF   000F4240 8F   C5  0067          MULL3   #1000*1000,G^EXE$GL_TENUSEC,R1
                               7E   D4  0073          CLRL    -(SP)
                                        0075      30000$:
                     54   02 A7   B0  0075          MOVW UDASA(R7),R4
                               13   19  0079          BLSS    25$
                     0F 54     52   E0  007B          BBS     R2,R4,25$
                6E   00000000'GF   D0  007F          MOVL    G^EXE$GL_UBDELAY,(SP)
                          FD 6E   F5  0086      30001$: SOBGTR  (SP),30001$
                          E9 51   F5  0089          SOBGTR  R1,30000$
                               50   D4  008C          CLRL    R0
                                        008E      25$:
                               8E   D5  008E          TSTL    (SP)+
                             0D 50   E8  0090   275          BLBS    R0,26$                  ; br if not timed out
                                        0093   276
                             C4 58   F5  0093   277 ERROR:   SOBGTR  R8,RETRY                ; Try once again
                      50     0054 8F   3C  0096   278          MOVZWL  #SS$_CTRLERR,R0         ; Set failure status
                                   04   009B   279          RET
                                        009C   280 BYTE_OFF:
                                FFFFFE00   009C   281          .LONG   ^C<^X1FF>               ; Mask for byte offset in page
                                        00A0   282
                                        00A0   283 26$:
                                   54   B5  00A0   284          TSTW    R4                      ; check status register for error
                                   EF   19  00A2   285          BLSS    ERROR                   ; br if error
                                        00A4   286
                           02 A7   83   B0  00A4   287 30$:     MOVW    (R3)+,UDASA(R7)         ; Send the controller the next step
                           B8 52   0E   F3  00A8   288          AOBLEQ  #S4,R2,TIME             ; Set for next step
                                        00AC   289 ;
                                        00AC   290 ; Initialization complete.  Write the packet address in the ring.
                                        00AC   291 ;
                        51   0250'CF   9E  00AC   292          MOVAB   W^RSPPKT, R1            ; Get the address of response packet
                          51    E8 AF   CA  00B1   293          BICL    BYTE_OFF, R1
0210'CF                   51      56   C9  00B5   294          BISL3   R6, R1, W^RD            ; Set byte offset in ring desc
                        51   021C'CF   9E  00BB   295          MOVAB   W^CMDPKT, R1            ; Get the address of command packet
                        55      51   D0  00C0   296          MOVL    R1,R5                   ; Save pointer
                          51    D6 AF   CA  00C3   297          BICL    BYTE_OFF, R1
0214'CF                   51      56   C9  00C7   298          BISL3   R6, R1,W^CD             ; Set byte offset in ring desc
                                        00CD   299 ;
                                        00CD   300 ; Now bring the device on-line
```

```
                          00CD   ;
          85    01    D0  00CD           MOVL    #1,(R5)+                  ; Set command ref number
     85    64 A9    3C  00D0           MOVZWL  RPB$W_UNIT(R9),(R5)+      ; Put unit number in cmd packet field ;G:2
          85    09    9A  00D4           MOVZBL  #MSCP$K_OP_ONLIN,(R5)+    ; Set opcode to bring drive online
                85    7C  00D7           CLRQ    (R5)+                     ; Clear byte count, buff desc
                65    7C  00D9           CLRQ    (R5)                      ;  buff desc and LBN
             01CE    30  00DB           BSBW    IO                        ; Send it out
                      04  00DE           RET
                          00DF
                          00DF
                          00DF           .DISABLE LSB
             000000E0     00DF           .=<.+1>&-2
             80000000     00E0   VALID:  .LONG   ^X80000000                ; SIgn bit set
                          00E4   Ds$Gb_Uda50_Init::                        ; Global label
                          00E4   Init:                                     ; convenient local label
                      00  00E4           .Byte   0                         ; .. init flag
                          00E5   ;
                          00E5   ; RINGS
                          00E5   ;
                          00E5   ;
                          00E5
                          00E5   .Align  Page
                          0200
                   8000   0200   INTTBL: .WORD   OWN                 ; Step 1 pattern
             00000000     0202           .LONG   0                   ; Step 2 & 3 pattern
                   0001   0206           .WORD   GO
                          0208
             0000 0000    0208           .WORD   0,0                 ; Reserved
                   0000   020C   CMDINT: .WORD   0                   ; Command status word
                   0000   020E   RSPINT: .WORD   0                   ; Response status word
                          0210   RING:
             00000000     0210   RD:     .LONG   0                   ; UNIBUS address of response ring
             00000000     0214   CD:     .LONG   0                   ; UNIBUS address of command ring
                          0218   ;
                   0030   0218           .WORD   48                  ; Length of message
                   0001   021A           .WORD   1                   ; ID
                   0001   021C   CMDPKT: .WORD   1
             0000024C     021E           .BLKW   23                  ; Full envelope
                          024C   ;
             00000250     024C           .BLKW   2
                          0250   UDA_Response::                      ; Global label for CONFIG
             00000280     0250   RSPPKT: .BLKW   24
```

```
                                0280   344          .SBTTL  UDA50 Bootstrap driver QIO
                                0280   345
                                0280   346 ;++
                                0280   347 ;
                                0280   348 ; Inputs:
                                0280   349 ;
                                0280   350 ;       R3      - base address of adapter's register space
                                0280   351 ;       R5      - lbn for current piece of transfer
                                0280   352 ;       R6      - contains 0
                                0280   353 ;       R7      - address of the device's CSR
                                0280   354 ;       R8      - size of transfer in bytes
                                0280   355 ;       R9      - address of the RPB
                                0280   356 ;       R10     - starting address of transfer (byte offset in first
                                0280   357 ;                 page ORed with starting map register number)
                                0280   358 ;       R11     - LBN at start of transfer
                                0280   359 ;
                                0280   360 ;       FUNC(AP)- I/O operation (IO$_READLBLK or IO$_WRITELBLK only)
                                0280   361 ;       SIZE(AP)- Size of transfer in bytes
                                0280   362 ;       MODE(AP)- Address interpretation mode (0 = physical, 1 = virtual)
                                0280   363 ;
                                0280   364 ; Implicit inputs:
                                0280   365 ;
                                0280   366 ;       RPB$W_UNIT      - RPB field containing boot device unit number
                                0280   367 ;
                                0280   368 ; Outputs:
                                0280   369 ;
                                0280   370 ;       R0 - status code
                                0280   371 ;
                                0280   372 ;               SS$_NORMAL      - successful transfer
                                0280   373 ;               SS$_NOSUCHDEV   - unsupported device
                                0280   374 ;               SS$_CTRLERR     - fatal controller error
                                0280   375 ;
                                0280   376 ;       R3 - must be preserved
                                0280   377 ;
                                0280   378 ;
                                0280   379 ;--
                                0280   380
                    00000010    0280   381 FUNC = 16
                    00000014    0280   382 MODE = 20
                                0280   383
                                0280   384 UD_DRIVER:                                ; UDA50 device driver.
                                0280   385
                                0280   386 ;
                                0280   387 ; Start out by re-initing the UDA if it hasn't been inited yet,
                                0280   388 ; or if there was an error previously.
                                0280   389 ;
                                0280   390
  0D FE60 CF    E8              0280   391         BlbS    W^Init, 10$             ; Branch if already set
FD76 CF    00   FB              0285   392         CallS   #0, Ud_Init             ; Call init code
      51 50    E9              028A   393         BlbC    R0, Error1              ; Exit if error
FE52 CF    01   90              028D   394         MovB    #1, W^Init              ; Set init byte
                                0292   395
                                0292   396 ;
                                0292   397 ; Translate the I/O function code into a device-dependent function
                                0292   398 ; code for this disk.
                                0292   399 ;
                                0292   400
```

```
                8E AF    21    90  0292   401 10$:    MOVB    #MSCP$K_OP_READ, -      ; Assume read
                                    0296   402                 CMDPKT+MSCP$B_OPCODE
                20   10 AC    D1  0296   403          CMPL    FUNC(AP),#IO$_WRITELBLK ; Check for write function
                        04    12  029A   404          BNEQ    20$                     ; No, do read
                84 AF    22    90  029C   405          MOVB    #MSCP$K_OP_WRITE, -     ; Set write function code
                                    02A0   406                 CMDPKT+MSCP$B_OPCODE
                94 AF    55    D0  02A0   407 20$:     MOVL    R5,CMDPKT+MSCP$L_LBN    ; Set the logical block number
                80 AF    58    D0  02A4   408          MOVL    R8,CMDPKT+MSCP$L_BYTE_CNT ; Set the byte count
                80 AF    5A    D0  02A8   409          MOVL    R10,CMDPKT+MSCP$B_BUFFER; Set the UNIBUS map register
                54   02 A7    B0  02AC   410 IO:      MOVW    UDASA(R7),R4            ; Controller offline?
                        2C    12  02B0   411          BNEQ    ERROR1                  ; Yep, error out
          FF5D CF    8000 8F    A8  02B2   412          BISW    #OWN, CD+2              ; Set controller ownership
          FF52 CF    8000 8F    A8  02B9   413          BISW    #OWN, RD+2              ; Ditto
                54    67    B0  02C0   414          MOVW    UDAIP(R7),R4            ; Tell controller to read
                54   02 A7    B0  02C3   415          MOVW    UDASA(R7),R4            ; Any problems?
                        15    12  02C7   416          BNEQ    ERROR1                  ; Yes
                54   02 A7    B0  02C9   417 30$:     MovW    UdaSa(R7), R4           ; Any problems?
                        0F    12  02CD   418          BNeq    Error1                  ; Yes
                   FF3F CF    B5  02CF   419          TSTW    RD+2                    ; Any response back?
                        F4    19  02D3   420          BLSS    30$                     ; No, spin until there is
                     82 AF    B5  02D5   421          TSTW    RSPPKT+MSCP$W_STATUS    ; Any drive errors?
                        04    12  02D8   422          BNEQ    ERROR1                  ; Yes
                                    02DA   423
                                    02DA   424 ;
                                    02DA   425 ; Transfer is complete. Return with success status code.
                                    02DA   426 ;
                   50    01    3C  02DA   427          MOVZWL  #SS$_NORMAL,R0          ; SET COMPLETION CODE
                        05    05  02DD   428          RSB                             ; AND RETURN
                                    02DE   429 ;
                                    02DE   430 ; Error occured during transfer.  Return and retry.
                                    02DE   431 ;
                                    02DE   432
                                    02DE   433 ERROR1:
             FE02 CF    94  02DE   434          ClrB    W^Init                  ; Must re-init next time
50           0054 8F    3C  02E2   435          MOVZWL  #SS$_CTRLERR,R0         ; Set failure status
                        05    05  02E7   436          RSB                             ; Return to BOOTDRIVR
                                    02E8   437
                 000002E8  02E8   438 UD_DRVSIZ=.-START
                                    02E8   439
                                    02E8   440          .END
```

```
$TABLE                          = 00000000 R   D   03
BTD$K_UDA                       = 00000011     D
BYTE_OFF                          0000009C R   D   02
CD                                00000214 R   D   02
CMDINT                            0000020C R   D   02
CMDPKT                            0000021C R   D   02
DS$GB_UDA50_INIT                  000000E4 RG  D   02
ERROR                             00000093 R   D   02
ERROR1                            000002DE R   D   02
EXE$GL_TENUSEC                    ********     X   02
EXE$GL_UBDELAY                    ********     X   02
FUNC                            = 00000010     D
GO                              = 00000001     D
INIT                              000000E4 R   D   02
INTTBL                            00000200 R   D   02
IO                                000002AC R   D   02
IO$_WRITELBLK                   = 00000020     D
MODE                            = 00000014     D
MSCP$B_BUFFER                   = 00000010     D
MSCP$B_OPCODE                   = 00000008     D
MSCP$K_OP_ONLIN                 = 00000009     D
MSCP$K_OP_READ                  = 00000021     D
MSCP$K_OP_WRITE                 = 00000022     D
MSCP$L_BYTE_CNT                 = 0000000C     D
MSCP$L_LBN                      = 0000001C     D
MSCP$W_STATUS                   = 0000000A     D
OWN                             = 00008000     D
PR$_MAPEN                       = 00000038     D
PTE$M_PFN                       = 001FFFFF     D
RD                                00000210 R   D   02
RETRY                             0000005A R   D   02
RING                              00000210 R   D   02
RPB$L_ADPPHY                    = 0000005C     D
RPB$L_ADPVIR                    = 00000060     D
RPB$L_CSRPHY                    = 00000054     D
RPB$L_CSRVIR                    = 00000058     D
RPB$L_SVASPT                    = 00000050     D
RPB$W_UNIT                      = 00000064     D
RSPINT                            0000020E R   D   02
RSPPKT                            00000250 R   D   02
S1                              = 0000000B     D
S4                              = 0000000E     D
SS$_CTRLERR                     = 00000054     D
SS$_NORMAL                      = 00000001     D
START                             00000000 R   D   02
TIME                              00000064 R   D   02
UBA$L_MAP                       = 00000800     D
UDAIP                           = 00000000     D
UDASA                           = 00000002     D
UDA_RESPONSE                      00000250 RG  D   02
UD_DRIVER                         00000280 R   D   02
UD_DRVSIZ                       = 000002E8     D
UD_INIT                           00000000 RG  D   02
UMR                             = 000001EE     D
VA$S_VPN                        = 00000015     D
VA$V_VPN                        = 00000009     D
VALID                             000000E0 R   D   02
```

```
                                    +----------------+
                                    ! Psect synopsis !
                                    +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           00000000  (    0.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
BOOTDRIVR_2                     000002E8  (  744.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC PAGE
BOOTDRIVR_4                     00000018  (   24.)  03 (  3.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$TABLE	=00000000-R	189 (2)	189 (2)
BTD$K_UDA	=00000011		189 (2)
BYTE_OFF	0000009C-R	280 (3)	#-243 (3) #-293 (3) #-297 (3)
CD	00000214-R	333 (3)	#-298 (3) #-412 (4)
CMDINT	0000020C-R	329 (3)	
CMDPKT	0000021C-R	337 (3)	295 (3) #-402 (4) #-406 (4) #-407 (4)
			#-408 (4) #-409 (4)
DS$GB_UDA50_INIT	000000E4-R	314 (3)	
ERROR	00000093-R	277 (3)	#-285 (3)
ERROR1	000002DE-R	433 (4)	#-393 (4) #-411 (4) #-416 (4) #-418 (4)
			#-422 (4)
EXE$GL_TENUSEC	00000000-XR		#-274 (3)
EXE$GL_UBDELAY	00000000-XR		#-274 (3)
FUNC	=00000010	381 (4)	#-403 (4)
GO	=00000001	170 (2)	326 (3)
INIT	000000E4-R	315 (3)	#-391 (4) #-394 (4) #-434 (4)
INTTBL	00000200-R	324 (3)	242 (3) #-245 (3) 263 (3)
IO	000002AC-R	410 (4)	#-307 (3)
IO$_WRITELBLK	=00000020		#-403 (4)
MODE	=00000014	382 (4)	
MSCP$B_BUFFER	=00000010		#-409 (4)
MSCP$B_OPCODE	=00000008		#-402 (4) #-406 (4)
MSCP$K_OP_ONLIN	=00000009		#-304 (3)
MSCP$K_OP_READ	=00000021		#-401 (4)
MSCP$K_OP_WRITE	=00000022		#-405 (4)
MSCP$L_BYTE_CNT	=0000000C		#-408 (4)
MSCP$L_LBN	=0000001C		#-407 (4)
MSCP$W_STATUS	=0000000A		#-421 (4)
OWN	=00008000	171 (2)	324 (3) #-412 (4) #-413 (4)
PR$_MAPEN	=00000038		#-218 (3)
PTE$M_PFN	=001FFFFF		#-253 (3)
RD	00000210-R	332 (3)	#-294 (3) #-413 (4) #-419 (4)
RETRY	0000005A-R	263 (3)	#-277 (3)
RING	00000210-R	331 (3)	#-245 (3)
RPB$L_ADPPHY	=0000005C		247 (3) #-248 (3)
RPB$L_ADPVIR	=00000060		247 (3)
RPB$L_CSRPHY	=00000054		249 (3) #-250 (3)
RPB$L_CSRVIR	=00000058		249 (3)
RPB$L_SVASPT	=00000050		#-252 (3)
RPB$W_UNIT	=00000064		#-303 (3)
RSPINT	0000020E-R	330 (3)	
RSPPKT	00000250-R	342 (3)	292 (3) #-421 (4)
S1	=0000000B	172 (2)	#-264 (3)
S4	=0000000E	173 (2)	#-288 (3)
SS$_CTRLERR	=00000054		#-278 (3) #-435 (4)
SS$_NORMAL	=00000001		#-274 (3) #-427 (4)
START	00000000-R	194 (2)	189 (2) 438 (4)
TIME	00000064-R	269 (3)	#-288 (3)
UBA$L_MAP	=00000800		254 (3)
UDAIP	=00000000	168 (2)	#-265 (3) #-414 (4)

```
UDASA                           =00000002     169    (2)    #-274    (3)    #-287    (3)    #-410    (4)    #-415    (4)
                                                            #-417    (4)
UDA_RESPONSE                     00000250-R   341    (3)
UD_DRIVER                        00000280-R   384    (4)      189    (2)
UD_DRVSIZ                       =000002E8     438    (4)      189    (2)
UD_INIT                          00000000-R   214    (3)      392    (4)
UMR                             =000001EE     174    (2)    #-241    (3)      254    (3)
VA$S_VPN                        =00000015                   #-246    (3)
VA$V_VPN                        =00000009                   #-246    (3)
VALID                            000000E0-R   313    (3)    #-255    (3)    #-257    (3)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	22	00:00:00.04	00:00:00.19
Command processing	895	00:00:00.30	00:00:00.84
Pass 1	770	00:00:02.75	00:00:03.97
Symbol table sort	0	00:00:00.47	00:00:00.46
Pass 2	144	00:00:00.82	00:00:01.43
Symbol table output	2	00:00:00.01	00:00:00.06
Psect synopsis output	2	00:00:00.02	00:00:00.07
Cross-reference output	3	00:00:00.04	00:00:00.04
Assembler run totals	1840	00:00:04.46	00:00:07.07

```
The working set limit was 2400 pages.
169684 bytes (332 pages) of virtual memory were used to buffer the intermediate code.
There were 90 pages of symbol table space allocated to hold 1676 non-local and 9 local symbols.
440 source lines were read in Pass 1, producing 109 object records in Pass 2.
20 pages of virtual memory were used to define 19 macros.
```

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	8
SYS$COMMON:[SYSLIB]STARLET.MLB;2	6
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	15

```
1715 GETS were required to define 15 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element QACHECKS.B32
;    0002  0      ! *2    19-OCT-1987 17:32:57 LI "Modified loop-on-subtest"
;    0003  0      ! *1     6-FEB-1986 15:21:56 DS ""
;    0004  0      ! DEC/CMS REPLACEMENT HISTORY, Element QACHECKS.B32
;    0005  0      %TITLE '*** QA Check Routines'
;    0006  0      MODULE QACHECKS (
;    0007  0                ADDRESSING_MODE (EXTERNAL = LONG_RELATIVE),
;    0008  0                IDENT = '10.10-02'                                    !G:2
;    0009  0                ) =
;    0010  0      !
;    0011  0      ! COPYRIGHT (c) 1979, 1981, 1983
;    0012  0      ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
;    0013  0      !
;    0014  0      ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
;    0015  0      ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
;    0016  0      ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
;    0017  0      ! MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
;    0018  0      ! EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
;    0019  0      ! TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
;    0020  0      ! REMAIN IN DEC.
;    0021  0      !
;    0022  0      ! THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
;    0023  0      ! AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
;    0024  0      ! CORPORATION.
;    0025  0      !
;    0026  0      ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
;    0027  0      ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
;    0028  0
;    0029  0      !++
;    0030  0      ! FACILITY: DIAGNOSTIC SUPERVISOR
;    0031  0      !
;    0032  0      ! ABSTRACT:
;    0033  0      !
;    0034  0      !       This module contains the check routines required to perform QA on diagnostic programs.
;    0035  0      !
;    0036  0      ! AUTHOR:
;    0037  0      !
;    0038  0      !       Jack Stansbury
;    0039  0      !
;    0040  0      ! CREATION DATE:
;    0041  0      !
;    0042  0      !               15-October-1981, Version 6.5-00
;    0043  0      !       00      Put in code for all the support routines plus the following check routines: QA$Normal_Start,
;    0044  0      !               QA$Multiple_Pass, QA$Loop_On_Test, QA$Run_Backwards.
;    0045  0      !
;    0046  0      ! MODIFIED:
;    0047  0      !
;    0048  0      !       01      14-December-1981, Jack Stansbury, Version 6.5-01
;    0049  0      !               Added remaining QA check routines. Separated the check routines (into QACHECKS.B32) and the
;    0050  0      !               support routines (QAMAIN.B32) because the QA.B32 module was getting too large!
;    0051  0      !
;    0052  0      !       02      19-Jan-1983, Jack Stansbury, Version 6.10 (?)
;    0053  0      !               Took out the Error Phase One check because it doesn't work properly with
;    0054  0      !               issuing error messages from subroutines in the diagnostic program.
;    0055  0      !
;    0056  0      !       03      Bob Bergazzi    May 17, 1983    Version 6.11
;    0057  0      !               Changed the order of searching libraries.
```

```
;   0058  0     !                                                                                       !G:2
;   0059  0     !               Daniel Li       Oct 19, 1987    Version 10.10                           !G:2
;   0060  0     !               Modified QA$Loop_On_Subtest to reset ds$gl_subtest to 0 when last test was done.  !G:2
;   0061  0     !                                                                                       !G:2
;   0062  0     !--
```

```
;   0064  0     %SBTTL  'Table of Contents'
;   0065  1     BEGIN
;   0066  1     !
;   0067  1     ! TABLE OF CONTENTS:
;   0068  1     !
;   0069  1
;   0070  1     FORWARD ROUTINE
;   0071  1             QA$Normal_Start         :           ADDRESSING_MODE (LONG_RELATIVE),
;   0072  1             QA$Multiple_Pass        :           ADDRESSING_MODE (LONG_RELATIVE),
;   0073  1             QA$Loop_On_Test         :           ADDRESSING_MODE (LONG_RELATIVE),
;   0074  1             QA$Loop_On_Subtest      :           ADDRESSING_MODE (LONG_RELATIVE),        !                    [01]
;   0075  1             QA$Run_Backwards        :           ADDRESSING_MODE (LONG_RELATIVE);        !                    [02]
```

```
;    0077  1     %SBTTL  'Libraries'
;    0078  1     !
;    0079  1     ! LIBRARIES:
;    0080  1     !
;    0081  1
;    0082  1     LIBRARY
;    0083  1             '$DIAG';                !                                   [03]
;    0084  1
;    0085  1     LIBRARY
;    0086  1             '$DS';                  !                                   [03]
;    0087  1
;    0088  1     LIBRARY
;    0089  1             'SYS$LIBRARY:LIB';      !                                   [03]
```

```
;    0091  1      %SBTTL  'Included Macros and Literals'
;    0092  1      !
;    0093  1      ! INCLUDED MACROS AND LITERALS
;    0094  1      !
;    0095  1
;    0096  1              $DS_QADEF;                      ! Define the branch codes.
;    0097  1              $DS_DSADEF;                     ! Define the DSA flags.
;    0098  1              DSQA;                           ! Define the DSQA$K_ constants for the routine names.
;    0099  1              DS_QADEFS;                      ! Define the common QA definitions like QA$K_.          [1]
```

```
;    0101  1      %SBTTL  'External Routines'
;    0102  1      !
;    0103  1      ! EXTERNAL ROUTINE REFERENCES:
;    0104  1      !
;    0105  1
;    0106  1      EXTERNAL ROUTINE
;    0107  1              QA$Find_User_Call_Frame :          ADDRESSING_MODE (LONG_RELATIVE),      ! Find the user's last frame.   [01]
;    0108  1              QA$Print_Forced_Errors  : NOVALUE ADDRESSING_MODE (LONG_RELATIVE),      ! Print the Forced-Error table. [01]
;    0109  1              QA$Add_Forced_Error     : NOVALUE ADDRESSING_MODE (LONG_RELATIVE),      ! Add a forced error.           [01]
;    0110  1              QA$Add_QA_Error         : NOVALUE ADDRESSING_MODE (LONG_RELATIVE),      ! Add a QA error.               [01]
;    0111  1
;    0112  1              DSX$Abort;
```

```
;    0114  1     %SBTTL  'External Own Storage'
;    0115  1     !
;    0116  1     ! EXTERNAL OWN STORAGE
;    0117  1     !
;    0118  1
;    0119  1     EXTERNAL
;    0120  1             DS$GL_FSTTEST,                  ! First test to execute
;    0121  1             DS$GL_LSTTEST,                  ! Last test to execute
;    0122  1             DS$GL_SUBTEST,                  ! The subtest to loop on                    [01]
;    0123  1
;    0124  1             DS$GL_CLIBASE,                  ! Base of CLI data table
;    0125  1
;    0126  1             QA$W_TestLoops    : WORD,       ! These are defined in the QAFLAGS module.  [02]
;    0127  1             QA$W_SubtestLoops : WORD,       ! They contain the current settings of the
;    0128  1             QA$W_MultiplePass : WORD,       ! QA flags.
;    0129  1
;    0130  1             !+                                                                          [1]
;    0131  1             ! The following are defined in the QAMAIN.B32 module.                       [1]
;    0132  1             !-                                                                          [1]
;    0133  1
;    0134  1             QA$AOB_Routine_State : BITVECTOR,   !                                       [1]
;    0135  1             QA$AOB_Check_State   : BITVECTOR,   !                                       [1]
;    0136  1             QA$AOB_Flags         : BITVECTOR,   !                                       [1]
;    0137  1                                                                                 !G:2
;    0138  1             QA$W_Branch       : WORD,       !                                           [1]
;    0139  1             QA$W_Error_Number : WORD,       !                                           [1]
;    0140  1             QA$W_Save_Test    : SIGNED WORD,! The saved starting test number.           [1]
;    0141  1             QA$W_Save_Last    : SIGNED WORD;! The saved ending test number.             [1]
```

```
;    0143  1     %SBTTL  'Psect Definitions'
;    0144  1     !
;    0145  1     ! PSECT DEFINITIONS:
;    0146  1     !
;    0147  1
;    0148  1     PSECT
;    0149  1             Plit   = Data (NoExecute, Share, NoWrite,
;    0150  1                      Addressing_Mode (Long_Relative));
;    0151  1
;    0152  1     PSECT
;    0153  1             Code   = Code (Execute, Share, NoWrite,
;    0154  1                      Addressing_Mode (Long_Relative));
;    0155  1
;    0156  1     PSECT
;    0157  1             Own    = Work (NoExecute, NoShare, Write,
;    0158  1                      Addressing_Mode (Long_Relative));
;    0159  1
;    0160  1     PSECT
;    0161  1             Global = Work (NoExecute, NoShare, Write,
;    0162  1                      Addressing_Mode (Long_Relative));
```

```
;    0164  1     %SBTTL  'Local Macro Definitions'
;    0165  1     !
;    0166  1     ! LOCAL MACRO DEFINITIONS:
;    0167  1     !
;    0168  1
;    0169  1     MACRO
;    0170  1             !+
;    0171  1             ! Usage:
;    0172  1             !       ASSERT ((.A GTR .B), 'A <= B');
;    0173  1             !
;    0174  1             ! If the specified condition is not true, a call to the Logic_Error macro is made with the specified
;    0175  1             ! message string. ASSERT is turned on whenever the compilation is made with the /VARIANT:n qualifier,
;    0176  1             ! where n <> 0.
;    0177  1             !-
;    0178  1
; M  0179  1             ASSERT (Condition, Assert_String) =
; M  0180  1                     %IF %VARIANT
; M  0181  1                     %THEN
; M  0182  1                             (
; M  0183  1                             IF (NOT (Condition)) THEN
; M  0184  1                                     Logic_Error (Assert_String)
; M  0185  1                             )
; M  0186  1                     %ELSE
; M  0187  1                             ! No code put in.
; M  0188  1                     %FI
;    0189  1             %;
;    0190  1
;    0191  1     MACRO
;    0192  1             !+
;    0193  1             ! Usage:
;    0194  1             !       Logic_Error ('String to be printed out');
;    0195  1             !
;    0196  1             ! This macro is used whenever a logic error is detected. It is called from ASSERT whenever the assertion
;    0197  1             ! is false. This can be called anywhere else where an error is known to exist and and expression does not
;    0198  1             ! have to be evaluated to determine whether or not an error exists.
;    0199  1             !-
;    0200  1
; M  0201  1             Logic_Error (Error_String) =
; M  0202  1                     (
; M  0203  1                     BIND
; M  0204  1                             ES = $ASCIC ('!/**QA Internal Error: ', Error_String, '!/');    !                    [1]
; M  0205  1
; M  0206  1                     $DS_PRINTF (ES);
; M  0207  1                     )
;    0208  1             %;
;    0209  1
```

```
;    0211  1      MACRO
;    0212  1              !+
;    0213  1              ! This macro is used only in the debugging stages. It's only parameter is a string giving, e.g., the
;    0214  1              ! name of a routine. DEBUG is turned on whenever the compilation is made with the /VARIANT:n qualifier,
;    0215  1              ! where n <> 0.
;    0216  1              !-
;    0217  1
; M  0218  1              DEBUG (Debug_String) =
; M  0219  1                      %IF %VARIANT
; M  0220  1                      %THEN
; M  0221  1                              (
; M  0222  1                              IF (.QA$AOB_Flags [QA$K_QA_Debug]) THEN
; M  0223  1                                      $DS_PRINTF ($ASCIC ('!/', Debug_String, '!/'))
; M  0224  1                              )
; M  0225  1                      %ELSE
; M  0226  1                              ! No code put in.
; M  0227  1                      %FI
;    0228  1              %;
;    0229  1
;    0230  1      MACRO
;    0231  1              !+
;    0232  1              ! Define a macro that takes an expression as an argument. The value of this macro is either
;    0233  1              ! one or zero. All bits but the least significant one are cleared.
;    0234  1              !-
;    0235  1
; M  0236  1              Boolean (Expression) =
;    0237  1                      ((Expression) AND 1) %;
```

```
;    0239  1      %SBTTL  'Module-Global Static Storage'
;    0240  1
;    0241  1      !
;    0242  1      ! MODULE-GLOBAL DECLARATIONS:
;    0243  1      !
;    0244  1
;    0245  1              MODNAM ('QACHECKS');                    ! Define module name                    [1]
```

```
%SBTTL  'ASCIC Bindings'

!+
! These are the error messages output by the check routines when they find a QA error.
!-

GLOBAL BIND                                                    !                                                    [01]
        QA$T_Operator_Request_Message =                        !                                                    [01]
                $ASCIC ('!/**QA ERROR** Program requested operator intervention.!/');

BIND                                                           !                                                    [01]
        Cleanup_Error_Message =
                $ASCIC ('!/**QA ERROR** Error reported in cleanup code!/'),

        Error_Reported_Message =
                $ASCIC ('!/**QA ERROR** Error reported!/'),

        !+
        ! One of these messages in printed AFTER one of the above three is printed.                                [02]
        !-

        Normal_Start_Message =
                $ASCIC ('**QA ERROR** Normal start check failed!/'),                          !                    [02]

        Multiple_Pass_Message =
                $ASCIC ('**QA ERROR** Multiple pass check failed!/'),                         !                    [02]

        Infinite_Test_Message =
                $ASCIC ('**QA ERROR** Infinite loop-on-test check failed!/'),                 !                    [02]

        Infinite_Subtest_Message =                                                            !                    [01]
                $ASCIC ('**QA ERROR** Infinite loop-on-subtest check failed!/'),              !                    [02]

        Run_Backwards_Message =
                $ASCIC ('**QA ERROR** Run individual tests in reverse order check failed!/');  !                    [02]
```

```
;    0283  1      !+
;    0284  1      ! These are the header lines that each check routine will print in its own initialization code section.
;    0285  1      ! The first three are defined globally because QA$Dump uses them.
;    0286  1      !-
;    0287  1
;    0288  1      GLOBAL BIND
;    0289  1              QA$T_Header_1 =
;    0290  1                      $ASCIC ('!^!/!/!25** QUALITY ASSURANCE !26**!/'),
;    0291  1
;    0292  1              QA$T_Header_2 =
;    0293  1                      $ASCIC ('!10* !38<PROGRAM: !AC!> REV: !UL.!UL!/'),
;    0294  1
;    0295  1              QA$T_Header_3 =
;    0296  1                      $ASCIC ('!23* !%D!/!/');
```

```
;   0298  1     BIND
;   0299  1
;   0300  1             Header_NS =
;   0301  1                     $ASCIC ('!28* Normal Start!/!/'),
;   0302  1
;   0303  1             Header_MP =
;   0304  1                     $ASCIC ('!28* Multiple Pass!/!/'),
;   0305  1
;   0306  1             Header_LT =
;   0307  1                     $ASCIC ('!24* Infinite Loop-On-Test!/!/'),
;   0308  1
;   0309  1             Header_LS =                                     !                                   [01]
;   0310  1                     $ASCIC ('!22* Infinite Loop-On-Subtest!/!/'),   !                           [01]
;   0311  1
;   0312  1             Header_RB =
;   0313  1                     $ASCIC ('!25* Run Tests Backwards!/!/');        !                           [02]
```

```
;    0315  1      %SBTTL 'QA$Normal_Start'
;    0316  1
;    0317  1      GLOBAL ROUTINE QA$Normal_Start (Hook_Point) =
;    0318  1
;    0319  1      !++
;    0320  1      ! FUNCTIONAL DESCRIPTION:
;    0321  1      !
;    0322  1      !       This routine performs the Normal Start QA check.
;    0323  1      !
;    0324  1      ! CALLER:
;    0325  1      !
;    0326  1      !       QA$Main
;    0327  1      !
;    0328  1      ! FORMAL PARAMETERS:
;    0329  1      !
;    0330  1      !       Hook_Point : The point in the Supervisor from which this routine was called. This is a constant value.
;    0331  1      !                    The constants are defined in the DSQA macro.
;    0332  1      !
;    0333  1      ! IMPLICIT INPUTS:
;    0334  1      !
;    0335  1      !       DSA$GL_FLAGS longword.
;    0336  1      !       QA$AOB_Check_State bitvector.
;    0337  1      !
;    0338  1      ! IMPLICIT OUTPUTS:
;    0339  1      !
;    0340  1      !       NONE
;    0341  1      !
;    0342  1      ! COMPLETION CODES:
;    0343  1      !
;    0344  1      !       0 - QA error detected; unsuccessful return
;    0345  1      !       1 - No QA errors; successful return
;    0346  1      !
;    0347  1      ! SIDE EFFECTS:
;    0348  1      !
;    0349  1      !       NONE
;    0350  1      !
;    0351  1      !--
```

```
;    0353  2      BEGIN
;    0354  2              SELECTONE .Hook_Point OF
;    0355  2                      SET
;    0356  2                      [DSQA$K_Start_VRReStart]:
;    0357  3                              BEGIN
;    0358  3                              $DS_PRINTF (QA$T_Header_1);
;    0359  3                              $DS_PRINTF (QA$T_Header_2, .L$A_NAME, .L$L_REV, .L$L_UPDATE);
;    0360  3                              $DS_PRINTF (QA$T_Header_3, 0);  ! 0 is for the current time
;    0361  3                              $DS_PRINTF (Header_NS);
;    0362  3
;    0363  3                              QA$AOB_Routine_State [QA$V_Init_Done] = True;   ! Done init'ing
;    0364  4                              RETURN (QA$K_Success)
;    0365  2                              END;
;    0366  2
;    0367  2                      [DSQA$K_Error_Error_End]:
;    0368  3                              BEGIN
;    0369  3                              IF (.QA$AOB_Routine_State [QA$V_Doing_Cleanup]) THEN
;    0370  4                                      $DS_PRINTF (Cleanup_Error_Message)
;    0371  3                              ELSE
;    0372  3                                      $DS_PRINTF (Error_Reported_Message);
;    0373  3
;    0374  3                              $DS_PRINTF (Normal_Start_Message);              !                                       [02]
;    0375  3
;    0376  3                              QA$Add_QA_Error (QA$K_Normal_Start);
;    0377  3                              QA$AOB_Routine_State [QA$V_Error_Found] = True;
;    0378  3                              !+
;    0379  3                              ! Return unsucessfully.
;    0380  3                              !-
;    0381  2                              END;
;    0382  2
;    0383  2                      [DSQA$K_Dispat_DSX$EndPass_Mid]:
;    0384  3                              BEGIN
;    0385  3                              DSA$V_TRACE                                     = Off;  ! Turn TRACE bit off.           [01]
;    0386  3                              QA$AOB_Check_State [QA$K_Normal_Start]  = Off;  ! Stop Normal Start check.             [01]
;    0387  3                              QA$AOB_Check_State [QA$K_Multiple_Pass] = On;   ! Start Multiple Pass check.           [01]
;    0388  3                              QA$AOB_Routine_State [QA$V_Check_Done]  = True; ! Indicate end of this check.          [01]
;    0389  4                              RETURN (QA$K_Success)
;    0390  4
;    0391  2                              END;
```

```
;    0393  2                    !+
;    0394  2                    ! The following are not used in this check. So, just return Success for them.
;    0395  2                    !-
;    0396  2
;    0397  2                    [DSQA$K_Dispat_Before_Init,
;    0398  2                     DSQA$K_Dispat_After_Init,
;    0399  2                     DSQA$K_Dispat_CallTest,
;    0400  2                     DSQA$K_Dispat_DSX$EndPass_Bgn,        !                                    [01]
;    0401  2                     DSQA$K_Dispat_DSX$EndPass_End,        !                                    [01]
;    0402  2                     DSQA$K_Dispat_Done_Tests,             !                                    [01]
;    0403  2
;    0404  2                     DSQA$K_Error_Error_Bgn,               !                                    [01]
;    0405  2
;    0406  2                     DSQA$K_Loop_DSX$BgnSub,
;    0407  2                     DSQA$K_Loop_DSX$EndSub,
;    0408  2                     DSQA$K_Loop_DSX$CkLoop,
;    0409  2
;    0410  2                     DSQA$K_QA_DSX$Branch]:
;    0411  3                             BEGIN
;    0412  4                             RETURN (QA$K_Success)
;    0413  2                             END;
;    0414  2
;    0415  2                    [OTHERWISE]:
;    0416  3                             BEGIN
;    0417  4                             Logic_Error ('Normal Start, Illegal Hook_Point')
;    0418  2                             END;
;    0419  2                    TES;
;    0420  2
;    0421  2                !+
;    0422  2                ! Come to here only if a QA error was found. Return QA$K_Failure to QA$Main, which then takes
;    0423  2                ! appropriate action.
;    0424  2                !-
;    0425  2
;    0426  3                RETURN (QA$K_Failure)
;    0427  1        END;


                                                                .TITLE  QACHECKS *** QA Check Routines
                                                                .IDENT  \10.10-02\

                                                                .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                                53  4B  43  45  48  43  41  51  08  00000 P.AAA:   .ASCII  <8>\QACHECKS\                                ;
2A  2A  52  4F  52  52  45  20  41  51  2A  2A  2F  21  39  00009 P.AAB:   .ASCII  \9!/**QA ERROR** Program requested operat\       ;
73  65  75  71  65  72  20  6D  61  72  67  6F  72  50  20  00018                                                                    ;
                        74  61  72  65  70  6F  20  64  65  74  00027                                                                ;
6E  6F  69  74  6E  65  76  72  65  74  6E  69  20  72  6F  00031           .ASCII  \or intervention.!/\                               ;
                                                2F  21  2E  00040                                                                    ;
2A  2A  52  4F  52  52  45  20  41  51  2A  2A  2F  21  2F  00043 P.AAC:   .ASCII  \/!/**QA ERROR** Error reported in cleanu\       ;
64  65  74  72  6F  70  65  72  20  72  6F  72  72  45  20  00052                                                                    ;
                        75  6E  61  65  6C  63  20  6E  69  20  00061                                                                ;
                            2F  21  65  64  6F  63  20  70  0006B           .ASCII  \p code!/\                                         ;
2A  2A  52  4F  52  52  45  20  41  51  2A  2A  2F  21  1F  00073 P.AAD:   .ASCII  <31>\!/**QA ERROR** Error reported!/\             ;
64  65  74  72  6F  70  65  72  20  72  6F  72  72  45  20  00082                                                                    ;
                                                    2F  21  00091                                                                    ;
4E  20  2A  2A  52  4F  52  52  45  20  41  51  2A  2A  28  00093 P.AAE:   .ASCII  \(**QA ERROR** Normal start check failed!\       ;
65  68  63  20  74  72  61  74  73  20  6C  61  6D  72  6F  000A2                                                                    ;
```

```
                    21  64  65  6C  69  61  66  20  6B  63  000B1                                                  ;
                                                    2F  000BB          .ASCII  \/\                                  ;
4D  20  2A  2A  52  4F  52  52  45  20  41  51  2A  2A  29  000BC P.AAF:  .ASCII  \)**QA ERROR** Multiple pass check failed\  ;
68  63  20  73  73  61  70  20  65  6C  70  69  74  6C  75  000CB                                                  ;
                    64  65  6C  69  61  66  20  6B  63  65  000DA                                                  ;
                                                    2F  21  000E4          .ASCII  \!/\                                 ;
49  20  2A  2A  52  4F  52  52  45  20  41  51  2A  2A  31  000E6 P.AAG:  .ASCII  \1**QA ERROR** Infinite loop-on-test chec\  ;
6E  6F  2D  70  6F  6F  6C  20  65  74  69  6E  69  66  6E  000F5                                                  ;
                    63  65  68  63  20  74  73  65  74  2D  00104                                                  ;
                    2F  21  64  65  6C  69  61  66  20  6B  0010E          .ASCII  \k failed!/\                         ;
49  20  2A  2A  52  4F  52  52  45  20  41  51  2A  2A  34  00118 P.AAH:  .ASCII  \4**QA ERROR** Infinite loop-on-subtest c\  ;
6E  6F  2D  70  6F  6F  6C  20  65  74  69  6E  69  66  6E  00127                                                  ;
                    63  20  74  73  65  74  62  75  73  2D  00136                                                  ;
        2F  21  64  65  6C  69  61  66  20  6B  63  65  68  00140          .ASCII  \heck failed!/\                      ;
52  20  2A  2A  52  4F  52  52  45  20  41  51  2A  2A  41  0014D P.AAI:  .ASCII  \A**QA ERROR** Run individual tests in re\  ;
74  20  6C  61  75  64  69  76  69  64  6E  69  20  6E  75  0015C                                                  ;
                    65  72  20  6E  69  20  73  74  73  65  0016B                                                  ;
65  68  63  20  72  65  64  72  6F  20  65  73  72  65  76  00175          .ASCII  \verse order check failed!/\         ;
                2F  21  64  65  6C  69  61  66  20  6B  63  00184                                                  ;
55  51  20  2A  2A  35  32  21  2F  21  2F  21  5E  21  25  0018F P.AAJ:  .ASCII  \%!^!/!/!25** QUALITY ASSURANCE !26**!/\   ;
45  43  4E  41  52  55  53  53  41  20  59  54  49  4C  41  0019E                                                  ;
                            2F  21  2A  2A  36  32  21  20  001AD                                                  ;
52  47  4F  52  50  3C  38  33  21  20  2A  30  31  21  26  001B5 P.AAK:  .ASCII  \&!10* !38<PROGRAM: !AC!> REV: !UL.!UL!/\  ;
20  3A  56  45  52  20  3E  21  43  41  21  20  3A  4D  41  001C4                                                  ;
                        2F  21  4C  55  21  2E  4C  55  21  001D3                                                  ;
        2F  21  2F  21  44  25  21  20  2A  33  32  21  0C  001DC P.AAL:  .ASCII  <12>\!23* !%D!/!/\                   ;
74  53  20  6C  61  6D  72  6F  4E  20  2A  38  32  21  15  001E9 P.AAM:  .ASCII  <21>\!28* Normal Start!/!/\          ;
                                2F  21  2F  21  74  72  61  001F8                                                  ;
20  65  6C  70  69  74  6C  75  4D  20  2A  38  32  21  16  001FF P.AAN:  .ASCII  <22>\!28* Multiple Pass!/!/\         ;
                            2F  21  2F  21  73  73  61  50  0020E                                                  ;
20  65  74  69  6E  69  66  6E  49  20  2A  34  32  21  1E  00216 P.AAO:  .ASCII  <30>\!24* Infinite Loop-On-Test!/!/\   ;
21  2F  21  74  73  65  54  2D  6E  4F  2D  70  6F  6F  4C  00225                                                  ;
                                                    2F  00234                                                  ;
20  65  74  69  6E  69  66  6E  49  20  2A  32  32  21  21  00235 P.AAP:  .ASCII  \!!22* Infinite Loop-On-Subtest!/!/\   ;
74  73  65  74  62  75  53  2D  6E  4F  2D  70  6F  6F  4C  00244                                                  ;
                                            2F  21  2F  21  00253                                                  ;
73  74  73  65  54  20  6E  75  52  20  2A  35  32  21  1C  00257 P.AAQ:  .ASCII  <28>\!25* Run Tests Backwards!/!/\     ;
    2F  21  2F  21  73  64  72  61  77  6B  63  61  42  20  00266                                                  ;
61  6E  72  65  74  6E  49  20  41  51  2A  2A  2F  21  39  00274 P.AAR:  .ASCII  \9!/**QA Internal Error: Normal Start, Il\  ;
6C  61  6D  72  6F  4E  20  3A  72  6F  72  72  45  20  6C  00283                                                  ;
                    6C  49  20  2C  74  72  61  74  53  20  00292                                                  ;
6E  69  6F  50  5F  6B  6F  6F  48  20  6C  61  67  65  6C  0029C          .ASCII  \legal Hook_Point!/\                 ;
                                                2F  21  74  002AB                                                  ;

                                                                DSA$AL_APTMAIL=     65024
                                                                DSA$GL_FLAGS=       65024
                                                                DSA$GL_APTCOM=      65028
                                                                DSA$GL_PASSES=      65032
                                                                DSA$GL_UNITS=       65036
                                                                DSA$GL_SECTNO=      65040
                                                                DSA$GL_SID=         65044
                                                                DSA$GL_MSGTYP=      65088
                                                                DSA$GL_ERRNO=       65092
                                                                DSA$GL_EVENT=       65096
                                                                DSA$GL_SUBTNO=      65100
                                                                DSA$GL_TESTNO=      65104
                                                                DSA$GL_PASSNO=      65108
```

```
                                DSA$GL_DEVLEN=      65112
                                DSA$GL_DEVNAM=      65116
                                DSA$GL_MSGPTR=      65128
                                $MODULE=            P.AAA
                                QA$T_OPERATOR_REQUEST_MESSAGE==
                                                    P.AAB
                                CLEANUP_ERROR_MESSAGE=
                                                    P.AAC
                                ERROR_REPORTED_MESSAGE=
                                                    P.AAD
                                NORMAL_START_MESSAGE=
                                                    P.AAE
                                MULTIPLE_PASS_MESSAGE=
                                                    P.AAF
                                INFINITE_TEST_MESSAGE=
                                                    P.AAG
                                INFINITE_SUBTEST_MESSAGE=
                                                    P.AAH
                                RUN_BACKWARDS_MESSAGE=
                                                    P.AAI
                                QA$T_HEADER_1==     P.AAJ
                                QA$T_HEADER_2==     P.AAK
                                QA$T_HEADER_3==     P.AAL
                                HEADER_NS=          P.AAM
                                HEADER_MP=          P.AAN
                                HEADER_LT=          P.AAO
                                HEADER_LS=          P.AAP
                                HEADER_RB=          P.AAQ
                                ES=                 P.AAR
                                        .EXTRN  QA$FIND_USER_CALL_FRAME
                                        .EXTRN  QA$PRINT_FORCED_ERRORS
                                        .EXTRN  QA$ADD_FORCED_ERROR
                                        .EXTRN  QA$ADD_QA_ERROR
                                        .EXTRN  DSX$ABORT, DS$GL_FSTTEST
                                        .EXTRN  DS$GL_LSTTEST, DS$GL_SUBTEST
                                        .EXTRN  DS$GL_CLIBASE, QA$W_TESTLOOPS
                                        .EXTRN  QA$W_SUBTESTLOOPS
                                        .EXTRN  QA$W_MULTIPLEPASS
                                        .EXTRN  QA$AOB_ROUTINE_STATE
                                        .EXTRN  QA$AOB_CHECK_STATE
                                        .EXTRN  QA$AOB_FLAGS, QA$W_BRANCH
                                        .EXTRN  QA$W_ERROR_NUMBER
                                        .EXTRN  QA$W_SAVE_TEST, QA$W_SAVE_LAST
                                        .EXTRN  DS$PRINTF

                                        .PSECT  CODE,NOWRT,  SHR,2

                          007C 00000    .ENTRY  QA$NORMAL_START, Save R2,R3,R4,R5,R6        ; 0317
56 00000000G   EF   9E 00002    MOVAB   QA$AOB_CHECK_STATE, R6                              ;
55 00000000G   EF   9E 00009    MOVAB   QA$AOB_ROUTINE_STATE, R5                            ;
54 00000000G   9F   9E 00010    MOVAB   a#DS$PRINTF, R4                                     ;
53 00000000'   EF   9E 00017    MOVAB   QA$T_HEADER_1, R3                                   ;
52         04   AC   D0 0001E    MOVL    HOOK_POINT, R2                                  ; 0354
12              52   D1 00022    CMPL    R2, #18                                         ; 0356
                2B   12 00025    BNEQ    1$                                              ;
                53   DD 00027    PUSHL   R3                                              ; 0358
64              01   FB 00029    CALLS   #1, DS$PRINTF                                   ;
```

```
                        7E 0000020C   9F  7D 0002C          MOVQ    a#^X0000020C, -(SP)                    ; 0359
                           00000208   9F  DD 00033          PUSHL   a#^X00000208                           ;
                                 26   A3  9F 00039          PUSHAB  QA$T_HEADER_2                          ;
                        64           04  FB 0003C          CALLS   #4, DS$PRINTF                          ;
                                     7E  D4 0003F          CLRL    -(SP)                                  ; 0360
                                 4D  A3  9F 00041          PUSHAB  QA$T_HEADER_3                          ;
                        64           02  FB 00044          CALLS   #2, DS$PRINTF                          ;
                                 5A  A3  9F 00047          PUSHAB  HEADER_NS                              ; 0361
                        64           01  FB 0004A          CALLS   #1, DS$PRINTF                          ;
                        65           01  88 0004D          BISB2   #1, QA$AOB_ROUTINE_STATE               ; 0363
                                     6B  11 00050          BRB     9$                                     ; 0364
                        05           52  D1 00052 1$:      CMPL    R2, #5                                 ; 0367
                                     26  12 00055          BNEQ    4$                                     ;
                06      65           02  E1 00057          BBC     #2, QA$AOB_ROUTINE_STATE, 2$           ; 0369
                                FEB4 C3  9F 0005B          PUSHAB  CLEANUP_ERROR_MESSAGE                  ; 0370
                                     04  11 0005F          BRB     3$                                     ;
                                FEE4 C3  9F 00061 2$:      PUSHAB  ERROR_REPORTED_MESSAGE                 ; 0372
                        64           01  FB 00065 3$:      CALLS   #1, DS$PRINTF                          ;
                                FF04 C3  9F 00068          PUSHAB  NORMAL_START_MESSAGE                   ; 0374
                        64           01  FB 0006C          CALLS   #1, DS$PRINTF                          ;
                                     7E  D4 0006F          CLRL    -(SP)                                  ; 0376
           00000000G    EF           01  FB 00071          CALLS   #1, QA$ADD_QA_ERROR                    ;
                        65           02  88 00078          BISB2   #2, QA$AOB_ROUTINE_STATE               ; 0377
                                     4B  11 0007B          BRB     11$                                    ;
                                     52  D5 0007D 4$:      TSTL    R2                                     ; 0383
                                     12  12 0007F          BNEQ    5$                                     ;
           0000FE01     9F           04  8A 00081          BICB2   #4, a#^X0000FE01                       ; 0385
                        66           01  8A 00088          BICB2   #1, QA$AOB_CHECK_STATE                 ; 0386
                        66           02  88 0008B          BISB2   #2, QA$AOB_CHECK_STATE                 ; 0387
                        65           08  88 0008E          BISB2   #8, QA$AOB_ROUTINE_STATE               ; 0388
                                     2A  11 00091          BRB     9$                                     ; 0389
                                     05  15 00093 5$:      BLEQ    6$                                     ; 0400
                        02           52  D1 00095          CMPL    R2, #2                                 ; 0401
                                     23  15 00098          BLEQ    9$                                     ;
                        06           52  D1 0009A 6$:      CMPL    R2, #6                                 ; 0404
                                     1E  13 0009D          BEQL    9$                                     ;
                        09           52  D1 0009F          CMPL    R2, #9                                 ; 0406
                                     05  19 000A2          BLSS    7$                                     ;
                        0B           52  D1 000A4          CMPL    R2, #11                                ; 0408
                                     14  15 000A7          BLEQ    9$                                     ;
                        11           52  D1 000A9 7$:      CMPL    R2, #17                                ; 0410
                                     0F  13 000AC          BEQL    9$                                     ;
                        13           52  D1 000AE          CMPL    R2, #19                                ; 0397
                                     05  19 000B1          BLSS    8$                                     ;
                        15           52  D1 000B3          CMPL    R2, #21                                ; 0399
                                     05  15 000B6          BLEQ    9$                                     ;
                        18           52  D1 000B8 8$:      CMPL    R2, #24                                ; 0402
                                     04  12 000BB          BNEQ    10$                                    ;
                        50           01  D0 000BD 9$:      MOVL    #1, R0                                 ; 0412
                                         04 000C0          RET                                            ;
                                00E5 C3  9F 000C1 10$:     PUSHAB  ES                                     ; 0417
                        64           01  FB 000C5          CALLS   #1, DS$PRINTF                          ;
                                     50  D4 000C8 11$:     CLRL    R0                                     ; 0426
                                         04 000CA          RET                                            ;

; Routine Size:  203 bytes,    Routine Base:  CODE + 0000
```

```
;   0428  1
```

```
;    0430  1      %SBTTL 'QA$Multiple_Pass'
;    0431  1
;    0432  1      GLOBAL ROUTINE QA$Multiple_Pass (Hook_Point) =
;    0433  1
;    0434  1      !++
;    0435  1      ! FUNCTIONAL DESCRIPTION:
;    0436  1      !
;    0437  1      !       This routine performs the QA Multiple Pass check.
;    0438  1      !
;    0439  1      ! CALLER(S):
;    0440  1      !
;    0441  1      !       QA$Main
;    0442  1      !
;    0443  1      ! FORMAL PARAMETERS:
;    0444  1      !
;    0445  1      !       Hook_Point : The point in the Supervisor from which this routine was called. This is a constant value.
;    0446  1      !                    The constants are defined in the DSQA macro.
;    0447  1      !
;    0448  1      ! IMPLICIT INPUTS:
;    0449  1      !
;    0450  1      !       NONE
;    0451  1      !
;    0452  1      ! IMPLICIT OUTPUTS:
;    0453  1      !
;    0454  1      !       NONE
;    0455  1      !
;    0456  1      ! COMPLETION CODES:
;    0457  1      !
;    0458  1      !       0 - QA error detected; unsuccessful return
;    0459  1      !       1 - No QA errors; successful return
;    0460  1      !
;    0461  1      ! SIDE EFFECTS:
;    0462  1      !
;    0463  1      !       NONE
;    0464  1      !
;    0465  1      !--
```

```
;    0467  2     BEGIN
;    0468  2             SELECTONE .Hook_Point OF
;    0469  2                     SET
;    0470  2                     [DSQA$K_Start_VRReStart]:                !                                          [01]
;    0471  3                             BEGIN
;    0472  3                             MAP                              !                                          [01]
;    0473  3                                     DS$GL_CLIBASE : BLOCK [, BYTE]; ! Access the CLI date vector.      [01]
;    0474  3
;    0475  3                             $DS_PRINTF (QA$T_Header_1);
;    0476  3                             $DS_PRINTF (QA$T_Header_2, .L$A_NAME, .L$L_REV, .L$L_UPDATE);
;    0477  3                             $DS_PRINTF (QA$T_Header_3, 0);
;    0478  3                             $DS_PRINTF (Header_MP);
;    0479  3
;    0480  3                             DS$GL_CLIBASE [CLI$L_PASS] = .QA$W_MultiplePass;! Set number of passes to requested amt.[01]
;    0481  3                             QA$AOB_Routine_State [QA$V_Init_Done] = True;   ! Done init'ing
;    0482  4                             RETURN (QA$K_Success)
;    0483  2                             END;
;    0484  2
;    0485  2                     [DSQA$K_Error_Error_End]:
;    0486  3                             BEGIN
;    0487  3                             IF (.QA$AOB_Routine_State [QA$V_Doing_Cleanup]) THEN    !                   [01]
;    0488  4                                     $DS_PRINTF (Cleanup_Error_Message)      !                          [01]
;    0489  3                             ELSE                                            !                          [01]
;    0490  3                                     $DS_PRINTF (Error_Reported_Message);    !                          [01]
;    0491  3
;    0492  3                             $DS_PRINTF (Multiple_Pass_Message);             !                          [02]
;    0493  3
;    0494  3                             QA$Add_QA_Error (QA$K_Multiple_Pass);
;    0495  3                             QA$AOB_Routine_State [QA$V_Error_Found] = True
;    0496  3                             !+
;    0497  3                             ! Return unsucessfully.
;    0498  3                             !-
;    0499  2                             END;
;    0500  2
;    0501  2                     [DSQA$K_Dispat_DSX$EndPass_Mid]:         !                                          [01]
;    0502  3                             BEGIN
;    0503  3                             !+                                                                         [01]
;    0504  3                             ! All done the Multiple Pass check. Clean up.                              [01]
;    0505  3                             !-                                                                         [01]
;    0506  3
;    0507  3                             QA$AOB_Check_State [QA$K_Multiple_Pass] = Off;  ! Stop Multiple Pass check.  [01]
;    0508  3                             QA$AOB_Check_State [QA$K_Loop_On_Test]  = On;   ! Start Loop on Test check. [01]
;    0509  3                             QA$AOB_Routine_State [QA$V_Check_Done]  = True; ! Indicate check is done.   [01]
;    0510  4                             RETURN (QA$K_Success)                           !                          [01]
;    0511  2                             END;
```

```
;    0513  2                    !+
;    0514  2                    ! The following are not used in this check.
;    0515  2                    !-
;    0516  2
;    0517  2                    [DSQA$K_Dispat_Before_Init,
;    0518  2                     DSQA$K_Dispat_After_Init,              !                                          [01]
;    0519  2                     DSQA$K_Dispat_CallTest,
;    0520  2                     DSQA$K_Dispat_DSX$EndPass_Bgn,         !                                          [01]
;    0521  2                     DSQA$K_Dispat_DSX$EndPass_End,         !                                          [01]
;    0522  2                     DSQA$K_Dispat_Done_Tests,              !                                          [01]
;    0523  2
;    0524  2                     DSQA$K_Error_Error_Bgn,                !                                          [01]
;    0525  2
;    0526  2                     DSQA$K_Loop_DSX$BgnSub,
;    0527  2                     DSQA$K_Loop_DSX$EndSub,
;    0528  2                     DSQA$K_Loop_DSX$CkLoop,
;    0529  2
;    0530  2                     DSQA$K_QA_DSX$Branch]:
;    0531  3                             BEGIN
;    0532  4                             RETURN (QA$K_Success)
;    0533  2                             END;
;    0534  2
;    0535  2                    [OTHERWISE]:
;    0536  3                             BEGIN
;    0537  4                             Logic_Error ('Multiple Pass, Illegal Hook_Point')
;    0538  2                             END;
;    0539  2                    TES;
;    0540  3                RETURN (QA$K_Failure)
;    0541  1        END;


                                                                .PSECT  DATA,NOWRT,NOEXE,  SHR,2

61  6E  72  65  74  6E  49  20  41  51  2A  2A  2F  21  3A   002AE P.AAS:  .ASCII  \:!/**QA Internal Error: Multiple Pass, I\  ;
70  69  74  6C  75  4D  20  3A  72  6F  72  72  45  20  6C   002BD                                                          ;
                    49  20  2C  73  73  61  50  20  65  6C   002CC                                                          ;
69  6F  50  5F  6B  6F  6F  48  20  6C  61  67  65  6C  6C   002D6          .ASCII  \llegal Hook_Point!/\                   ;
                                        2F  21  74  6E  002E5                                                          ;

                                                                ES=                 P.AAS

                                                                .PSECT  CODE,NOWRT,  SHR,2

                                                    007C 00000          .ENTRY  QA$MULTIPLE_PASS, Save R2,R3,R4,R5,R6       ; 0432
                                56 00000000G    EF   9E 00002          MOVAB   QA$AOB_CHECK_STATE, R6                      ;
                                55 00000000G    EF   9E 00009          MOVAB   QA$AOB_ROUTINE_STATE, R5                    ;
                                54 00000000G    9F   9E 00010          MOVAB   a#DS$PRINTF, R4                             ;
                                53 00000000'    EF   9E 00017          MOVAB   QA$T_HEADER_1, R3                           ;
                                52       04     AC   D0 0001E          MOVL    HOOK_POINT, R2                              ; 0468
                                12              52   D1 00022          CMPL    R2, #18                                     ; 0470
                                                36   12 00025          BNEQ    1$                                          ;
                                                53   DD 00027          PUSHL   R3                                          ; 0475
                                64              01   FB 00029          CALLS   #1, DS$PRINTF                               ;
                                7E 0000020C     9F   7D 0002C          MOVQ    a#^X0000020C, -(SP)                         ; 0476
                                   00000208     9F   DD 00033          PUSHL   a#^X00000208                                ;
```

```
                                  26   A3  9F 00039          PUSHAB  QA$T_HEADER_2                                  ;
                          64           04  FB 0003C          CALLS   #4, DS$PRINTF                                  ;
                                       7E  D4 0003F          CLRL    -(SP)                                          ; 0477
                                  4D   A3  9F 00041          PUSHAB  QA$T_HEADER_3                                  ;
                          64           02  FB 00044          CALLS   #2, DS$PRINTF                                  ;
                                  70   A3  9F 00047          PUSHAB  HEADER_MP                                      ; 0478
                          64           01  FB 0004A          CALLS   #1, DS$PRINTF                                  ;
                 00000000G  EF 00000000G  EF  3C 0004D        MOVZWL  QA$W_MULTIPLEPASS, DS$GL_CLIBASE+44            ; 0480
                          65           01  88 00058          BISB2   #1, QA$AOB_ROUTINE_STATE                       ; 0481
                                       64  11 0005B          BRB     9$                                             ; 0482
                          05           52  D1 0005D 1$:      CMPL    R2, #5                                         ; 0485
                                       26  12 00060          BNEQ    4$                                             ;
                 06       65           02  E1 00062          BBC     #2, QA$AOB_ROUTINE_STATE, 2$                   ; 0487
                                  FEB4 C3  9F 00066          PUSHAB  CLEANUP_ERROR_MESSAGE                          ; 0488
                                       04  11 0006A          BRB     3$                                             ;
                                  FEE4 C3  9F 0006C 2$:      PUSHAB  ERROR_REPORTED_MESSAGE                         ; 0490
                          64           01  FB 00070 3$:      CALLS   #1, DS$PRINTF                                  ;
                                  FF2D C3  9F 00073          PUSHAB  MULTIPLE_PASS_MESSAGE                          ; 0492
                          64           01  FB 00077          CALLS   #1, DS$PRINTF                                  ;
                                       01  DD 0007A          PUSHL   #1                                             ; 0494
                 00000000G  EF           01  FB 0007C          CALLS   #1, QA$ADD_QA_ERROR                            ;
                          65           02  88 00083          BISB2   #2, QA$AOB_ROUTINE_STATE                       ; 0495
                                       44  11 00086          BRB     11$                                            ;
                                       52  D5 00088 4$:      TSTL    R2                                             ; 0501
                                       0B  12 0008A          BNEQ    5$                                             ;
                          66           02  8A 0008C          BICB2   #2, QA$AOB_CHECK_STATE                         ; 0507
                          66           04  88 0008F          BISB2   #4, QA$AOB_CHECK_STATE                         ; 0508
                          65           08  88 00092          BISB2   #8, QA$AOB_ROUTINE_STATE                       ; 0509
                                       2A  11 00095          BRB     9$                                             ; 0510
                                       05  15 00097 5$:      BLEQ    6$                                             ; 0520
                          02           52  D1 00099          CMPL    R2, #2                                         ; 0521
                                       23  15 0009C          BLEQ    9$                                             ;
                          06           52  D1 0009E 6$:      CMPL    R2, #6                                         ; 0524
                                       1E  13 000A1          BEQL    9$                                             ;
                          09           52  D1 000A3          CMPL    R2, #9                                         ; 0526
                                       05  19 000A6          BLSS    7$                                             ;
                          0B           52  D1 000A8          CMPL    R2, #11                                        ; 0528
                                       14  15 000AB          BLEQ    9$                                             ;
                          11           52  D1 000AD 7$:      CMPL    R2, #17                                        ; 0530
                                       0F  13 000B0          BEQL    9$                                             ;
                          13           52  D1 000B2          CMPL    R2, #19                                        ; 0517
                                       05  19 000B5          BLSS    8$                                             ;
                          15           52  D1 000B7          CMPL    R2, #21                                        ; 0519
                                       05  15 000BA          BLEQ    9$                                             ;
                          18           52  D1 000BC 8$:      CMPL    R2, #24                                        ; 0522
                                       04  12 000BF          BNEQ    10$                                            ;
                          50           01  D0 000C1 9$:      MOVL    #1, R0                                         ; 0532
                                           04 000C4          RET                                                    ;
                                  011F C3  9F 000C5 10$:     PUSHAB  ES                                             ; 0537
                          64           01  FB 000C9          CALLS   #1, DS$PRINTF                                  ;
                                       50  D4 000CC 11$:     CLRL    R0                                             ; 0540
                                           04 000CE          RET                                                    ;

; Routine Size:  207 bytes,    Routine Base:  CODE + 00CB
```

```
;    0543  1      %SBTTL 'QA$Loop_On_Test'
;    0544  1
;    0545  1      GLOBAL ROUTINE QA$Loop_On_Test (Hook_Point) =
;    0546  1
;    0547  1      !++
;    0548  1      ! FUNCTIONAL DESCRIPTION:
;    0549  1      !
;    0550  1      !       This routine performs the QA Loop on Test check.
;    0551  1      !
;    0552  1      ! CALLER(S):
;    0553  1      !
;    0554  1      !       QA$Main
;    0555  1      !
;    0556  1      ! FORMAL PARAMETERS:
;    0557  1      !
;    0558  1      !       Hook_Point : The point in the Supervisor from which this routine was called. This is a constant value.
;    0559  1      !                    The constants are defined in the DSQA macro.
;    0560  1      !
;    0561  1      ! IMPLICIT INPUTS:
;    0562  1      !
;    0563  1      !       NONE
;    0564  1      !
;    0565  1      ! IMPLICIT OUTPUTS:
;    0566  1      !
;    0567  1      !       NONE
;    0568  1      !
;    0569  1      ! COMPLETION CODES:
;    0570  1      !
;    0571  1      !       0 - QA error detected; unsuccessful return
;    0572  1      !       1 - No QA errors; successful return
;    0573  1      !
;    0574  1      ! SIDE EFFECTS:
;    0575  1      !
;    0576  1      !       NONE
;    0577  1      !
;    0578  1      !--
```

```
2       BEGIN
2               OWN
2                       Loop_Counter : WORD;
2
2               SELECTONE .Hook_Point OF
2                       SET
2                       [DSQA$K_Start_VRReStart]:
3                               BEGIN
3                               MAP                                     !                                                       [01]
3                                       DS$GL_CLIBASE : BLOCK [, BYTE]; ! Access the CLI data vector.                       [01]
3
3                               !+
3                               ! The initializations required for this check and that are specific to this
3                               ! check must be done here.
3                               !+
3
3                               Loop_Counter = 1;                       ! Loop counter for each test.                       [01]
3                               QA$AOB_Flags [QA$K_Loop_Test_Done] = True;
3
3                               $DS_PRINTF (QA$T_Header_1);
3                               $DS_PRINTF (QA$T_Header_2, .L$A_NAME, .L$L_REV, .L$L_UPDATE);
3                               $DS_PRINTF (QA$T_Header_3, 0);
3                               $DS_PRINTF (Header_LT);
3
3                               DS$GL_CLIBASE [CLI$L_PASS] = 1; ! Reset to one pass after the Multiple Pass check.      [01]
3                               QA$AOB_Routine_State [QA$V_Init_Done] = True;   ! Done init'ing
4                               RETURN (QA$K_Success)
2                               END;
2
2                       [DSQA$K_Error_Error_End]:
3                               BEGIN
3                               IF (.QA$AOB_Routine_State [QA$V_Doing_Cleanup]) THEN    !                                   [01]
4                                       $DS_PRINTF (Cleanup_Error_Message)      !                                           [01]
3                               ELSE                                            !                                           [01]
3                                       $DS_PRINTF (Error_Reported_Message);    !                                           [01]
3
3                               $DS_PRINTF (Infinite_Test_Message);             !                                           [02]
3
3                               QA$Add_QA_Error (QA$K_Loop_On_Test);
3                               QA$AOB_Routine_State [QA$V_Error_Found] = True
2                               END;
```

```
;    0622  2                    [DSQA$K_Dispat_DSX$EndPass_Mid]:        !                                                [01]
;    0623  3                            BEGIN
;    0624  3                            !+
;    0625  3                            ! All done the Loop on Test check. Clean up.                                 [01]
;    0626  3                            !-
;    0627  3
;    0628  3                            QA$AOB_Check_State [QA$K_Loop_On_Test]    = Off;
;    0629  3                            QA$AOB_Check_State [QA$K_Loop_On_Subtest] = On;
;    0630  3                            QA$AOB_Routine_State [QA$V_Check_Done]    = True;
;    0631  3                            QA$AOB_Flags [QA$K_First_Time]            = True;       ! For the next check (LS).      [01]
;    0632  4                            RETURN (QA$K_Success)
;    0633  2                            END;
;    0634  2
;    0635  2                    [DSQA$K_Dispat_CallTest]:
;    0636  3                            BEGIN
;    0637  3                            IF (.Loop_Counter EQL .QA$W_TestLoops) THEN
;    0638  4                                    BEGIN
;    0639  4                                    Loop_Counter = 1;
;    0640  4                                    QA$AOB_Flags [QA$K_Loop_Test_Done] = True
;    0641  4                                    END
;    0642  3                            ELSE
;    0643  4                                    BEGIN
;    0644  4                                    Loop_Counter = .Loop_Counter + 1;
;    0645  4                                    QA$AOB_Flags [QA$K_Loop_Test_Done] = False
;    0646  3                                    END;
;    0647  4                            RETURN (QA$K_Success)
;    0648  2                            END;
```

```
;   0650  2                     !+
;   0651  2                     ! The following are not used in this check.
;   0652  2                     !-
;   0653  2
;   0654  2                     [DSQA$K_Dispat_Before_Init,
;   0655  2                      DSQA$K_Dispat_After_Init,              !                                    [01]
;   0656  2                      DSQA$K_Dispat_DSX$EndPass_Bgn,         !                                    [01]
;   0657  2                      DSQA$K_Dispat_DSX$EndPass_End,         !                                    [01]
;   0658  2                      DSQA$K_Dispat_Done_Tests,              !                                    [01]
;   0659  2
;   0660  2                      DSQA$K_Error_Error_Bgn,                !                                    [01]
;   0661  2
;   0662  2                      DSQA$K_Loop_DSX$BgnSub,
;   0663  2                      DSQA$K_Loop_DSX$EndSub,
;   0664  2                      DSQA$K_Loop_DSX$CkLoop,
;   0665  2
;   0666  2                      DSQA$K_QA_DSX$Branch]:
;   0667  3                             BEGIN
;   0668  4                             RETURN (QA$K_Success)
;   0669  2                             END;
;   0670  2
;   0671  2                     [OTHERWISE]:
;   0672  3                             BEGIN
;   0673  4                             Logic_Error ('Loop on Test, Illegal Hook_Point')
;   0674  2                             END;
;   0675  2                     TES;
;   0676  3             RETURN (QA$K_Failure)
;   0677  1     END;


                                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

61  6E  72  65  74  6E  49  20  41  51  2A  2A  2F  21  39  002E9 P.AAT:  .ASCII  \9!/**QA Internal Error: Loop on Test, Il\  ;
6F  20  70  6F  6F  4C  20  3A  72  6F  72  72  45  20  6C  002F8                                                            ;
                    6C  49  20  2C  74  73  65  54  20  6E  00307                                                            ;
6E  69  6F  50  5F  6B  6F  6F  48  20  6C  61  67  65  6C  00311         .ASCII  \legal Hook_Point!/\                        ;
                                            2F  21  74  00320                                                            ;

                                                                        .PSECT  WORK,NOEXE,2

                                                        00000 LOOP_COUNTER:
                                                                        .BLKB   2

                                                              ES=                P.AAT


                                                                        .PSECT  CODE,NOWRT,  SHR,2

                                                  01FC 00000            .ENTRY  QA$LOOP_ON_TEST, Save R2,R3,R4,R5,R6,R7,R8  ; 0545
                                  58 00000000G  EF  9E 00002            MOVAB   QA$AOB_CHECK_STATE, R8                      ;
                                  57 00000000'  EF  9E 00009            MOVAB   LOOP_COUNTER, R7                            ;
                                  56 00000000G  EF  9E 00010            MOVAB   QA$AOB_ROUTINE_STATE, R6                    ;
                                  55 00000000G  EF  9E 00017            MOVAB   QA$AOB_FLAGS, R5                            ;
                                  54 00000000G  9F  9E 0001E            MOVAB   @#DS$PRINTF, R4                             ;
                                  53 00000000'  EF  9E 00025            MOVAB   QA$T_HEADER_1, R3                           ;
                                  52       04   AC  D0 0002C            MOVL    HOOK_POINT, R2                              ; 0584
```

```
                    12          52  D1 00030        CMPL    R2, #18                                  ; 0586
                                39  12 00033        BNEQ    1$                                       ;
                    67          01  B0 00035        MOVW    #1, LOOP_COUNTER                         ; 0596
                    65          10  88 00038        BISB2   #16, QA$AOB_FLAGS                        ; 0597
                                53  DD 0003B        PUSHL   R3                                       ; 0599
                    64          01  FB 0003D        CALLS   #1, DS$PRINTF                            ;
                    7E 0000020C 9F  7D 00040        MOVQ    @#^X0000020C, -(SP)                      ; 0600
                       00000208 9F  DD 00047        PUSHL   @#^X00000208                             ;
                            26  A3  9F 0004D        PUSHAB  QA$T_HEADER_2                            ;
                    64          04  FB 00050        CALLS   #4, DS$PRINTF                            ;
                                7E  D4 00053        CLRL    -(SP)                                    ; 0601
                            4D  A3  9F 00055        PUSHAB  QA$T_HEADER_3                            ;
                    64          02  FB 00058        CALLS   #2, DS$PRINTF                            ;
                          0087  C3  9F 0005B        PUSHAB  HEADER_LT                                ; 0602
                    64          01  FB 0005F        CALLS   #1, DS$PRINTF                            ;
          00000000G EF          01  D0 00062        MOVL    #1, DS$GL_CLIBASE+44                     ; 0604
                    66          01  88 00069        BISB2   #1, QA$AOB_ROUTINE_STATE                 ; 0605
                                58  11 0006C        BRB     7$                                       ; 0606
                    05          52  D1 0006E 1$:    CMPL    R2, #5                                   ; 0609
                                26  12 00071        BNEQ    4$                                       ;
        06          66          02  E1 00073        BBC     #2, QA$AOB_ROUTINE_STATE, 2$             ; 0611
                          FEB4  C3  9F 00077        PUSHAB  CLEANUP_ERROR_MESSAGE                    ; 0612
                                04  11 0007B        BRB     3$                                       ;
                          FEE4  C3  9F 0007D 2$:    PUSHAB  ERROR_REPORTED_MESSAGE                   ; 0614
                    64          01  FB 00081 3$:    CALLS   #1, DS$PRINTF                            ;
                          FF57  C3  9F 00084        PUSHAB  INFINITE_TEST_MESSAGE                    ; 0616
                    64          01  FB 00088        CALLS   #1, DS$PRINTF                            ;
                                02  DD 0008B        PUSHL   #2                                       ; 0618
          00000000G EF          01  FB 0008D        CALLS   #1, QA$ADD_QA_ERROR                      ;
                    66          02  88 00094        BISB2   #2, QA$AOB_ROUTINE_STATE                 ; 0619
                                66  11 00097        BRB     14$                                      ;
                                52  D5 00099 4$:    TSTL    R2                                       ; 0622
                                0E  12 0009B        BNEQ    5$                                       ;
                    68          04  8A 0009D        BICB2   #4, QA$AOB_CHECK_STATE                   ; 0628
                    68          08  88 000A0        BISB2   #8, QA$AOB_CHECK_STATE                   ; 0629
                    66          08  88 000A3        BISB2   #8, QA$AOB_ROUTINE_STATE                 ; 0630
                    65          20  88 000A6        BISB2   #32, QA$AOB_FLAGS                        ; 0631
                                49  11 000A9        BRB     12$                                      ; 0632
                    15          52  D1 000AB 5$:    CMPL    R2, #21                                  ; 0635
                                18  12 000AE        BNEQ    8$                                       ;
          00000000G EF          67  B1 000B0        CMPW    LOOP_COUNTER, QA$W_TESTLOOPS             ; 0637
                                08  12 000B7        BNEQ    6$                                       ;
                    67          01  B0 000B9        MOVW    #1, LOOP_COUNTER                         ; 0639
                    65          10  88 000BC        BISB2   #16, QA$AOB_FLAGS                        ; 0640
                                33  11 000BF        BRB     12$                                      ;
                                67  B6 000C1 6$:    INCW    LOOP_COUNTER                             ; 0644
                    65          10  8A 000C3        BICB2   #16, QA$AOB_FLAGS                        ; 0645
                                2C  11 000C6 7$:    BRB     12$                                      ; 0647
                                52  D5 000C8 8$:    TSTL    R2                                       ; 0656
                                05  15 000CA        BLEQ    9$                                       ;
                    02          52  D1 000CC        CMPL    R2, #2                                   ; 0657
                                23  15 000CF        BLEQ    12$                                      ;
                    06          52  D1 000D1 9$:    CMPL    R2, #6                                   ; 0660
                                1E  13 000D4        BEQL    12$                                      ;
                    09          52  D1 000D6        CMPL    R2, #9                                   ; 0662
                                05  19 000D9        BLSS    10$                                      ;
                    0B          52  D1 000DB        CMPL    R2, #11                                  ; 0664
```

```
                                14  15 000DE          BLEQ    12$                                  ;
                        11      52  D1 000E0 10$:     CMPL    R2, #17                              ; 0666
                                0F  13 000E3          BEQL    12$                                  ;
                        13      52  D1 000E5          CMPL    R2, #19                              ; 0654
                                05  19 000E8          BLSS    11$                                  ;
                        14      52  D1 000EA          CMPL    R2, #20                              ; 0655
                                05  15 000ED          BLEQ    12$                                  ;
                        18      52  D1 000EF 11$:     CMPL    R2, #24                              ; 0658
                                04  12 000F2          BNEQ    13$                                  ;
                        50      01  D0 000F4 12$:     MOVL    #1, R0                               ; 0668
                                    04 000F7          RET                                          ;
                            015A C3  9F 000F8 13$:     PUSHAB  ES                                   ; 0673
                        64      01  FB 000FC          CALLS   #1, DS$PRINTF                        ;
                                50  D4 000FF 14$:     CLRL    R0                                   ; 0676
                                    04 00101          RET                                          ;

; Routine Size:  258 bytes,    Routine Base:  CODE + 019A
```

```
;    0679  1      %SBTTL 'QA$Loop_On_Subtest'
;    0680  1
;    0681  1      GLOBAL ROUTINE QA$Loop_On_Subtest (Hook_Point) =        !                                   Start of [1]
;    0682  1
;    0683  1      !++
;    0684  1      ! FUNCTIONAL DESCRIPTION:
;    0685  1      !
;    0686  1      !       This routine performs the QA Loop on Subtest check.
;    0687  1      !
;    0688  1      ! CALLER(S):
;    0689  1      !
;    0690  1      !       QA$Main
;    0691  1      !
;    0692  1      ! FORMAL PARAMETERS:
;    0693  1      !
;    0694  1      !       Hook_Point : The point in the Supervisor from which this routine was called. This is a constant value.
;    0695  1      !                    The constants are defined in the DSQA macro.
;    0696  1      !
;    0697  1      ! IMPLICIT INPUTS:
;    0698  1      !
;    0699  1      !       NONE
;    0700  1      !
;    0701  1      ! IMPLICIT OUTPUTS:
;    0702  1      !
;    0703  1      !       NONE
;    0704  1      !
;    0705  1      ! COMPLETION CODES:
;    0706  1      !
;    0707  1      !       0 - QA error detected; unsuccessful return
;    0708  1      !       1 - No QA errors; successful return
;    0709  1      !
;    0710  1      ! SIDE EFFECTS:
;    0711  1      !
;    0712  1      !       NONE
;    0713  1      !
;    0714  1      !--
```

```
;   0716  2     BEGIN
;   0717  2             MAP                                                 !                                                   [01]
;   0718  2                     DS$GL_CLIBASE : BLOCK [, BYTE];             ! Access the Cli data vector                         [01]
;   0719  2
;   0720  2             SELECTONE .Hook_Point OF
;   0721  2                     SET
;   0722  2                     [DSQA$K_Start_VRReStart]:                   !                                                   [01]
;   0723  3                             BEGIN
;   0724  3                             !+
;   0725  3                             ! The initializations required for this check and that are specific to this check
;   0726  3                             ! must be done here.
;   0727  3                             !+
;   0728  3
;   0729  3                             IF (.QA$AOB_Flags [QA$K_First_Time]) THEN       !                                       [01]
;   0730  4                                     BEGIN
;   0731  4                                     $DS_PRINTF (QA$T_Header_1);
;   0732  4                                     $DS_PRINTF (QA$T_Header_2, .L$A_NAME, .L$L_REV, .L$L_UPDATE);
;   0733  4                                     $DS_PRINTF (QA$T_Header_3, 0);
;   0734  4                                     $DS_PRINTF (Header_LS);
;   0735  4
;   0736  4                                     QA$AOB_Routine_State [QA$V_Init_Done] = True;   ! Done initializing
;   0737  4                                     QA$AOB_Flags [QA$K_First_Time]        = False;  ! No more first time            [01]
;   0738  4                                     QA$AOB_Flags [QA$K_No_Header]         = False;  ! Print the header              [01]
;   0739  4
;   0740  4                                     !+
;   0741  4                                     ! Set up the subtest and pass numbers for looping on a subtest.                 [01]
;   0742  4                                     !-
;   0743  4
;   0744  4                                     DS$GL_CLIBASE [CLI$L_TEST] = .QA$W_Save_Test;   ! Set the test to loop on       [01]
;   0745  4                                     DS$GL_CLIBASE [CLI$L_LAST] = .QA$W_Save_Test;   ! Set the last test to loop on  [01]
;   0746  4                                     DS$GL_CLIBASE [CLI$L_SUBT] = 1;                 ! Set the subtest to loop on    [01]
;   0747  4                                     DS$GL_CLIBASE [CLI$L_PASS] = .QA$W_SubtestLoops;! Set the no. of loops          [01]
;   0748  4                                     END                         !                                                   [01]
```

```
;   0750  3                 ELSE                                  !                                                  [01]
;   0751  4                         BEGIN                         !                                                  [01]
;   0752  4                         !+
;   0753  4                         ! This is the nth (n > 1) time we have gotten to the VRReStart label. Thus, we  [01]
;   0754  4                         ! got there by a branch from the EndSub routine, executed when the required     [01]
;   0755  4                         ! number of loops on a subtest had been done. Thus, go onto the next subtest in [01]
;   0756  4                         ! the same test. This implies that if the subtest just completed was the last   [01]
;   0757  4                         ! subtest in that test, then the increment below will cause the subtest to not  [01]
;   0758  4                         ! be found in the next execution of that test. So, the test will return to the  [01]
;   0759  4                         ! Dispatch routine, where the test number will be incremented and the subtest   [01]
;   0760  4                         ! number will be reset to one. Thus, if x is the last subtest number in         [01]
;   0761  4                         ! test a, and test b follows test a, the sequence will be as follows:           [01]
;   0762  4                         ! Test a.x-1, VRReStart, Test a.x, VrReStart, Test a, Dispatch, Test b.1,       [01]
;   0763  4                         ! VrReStart, Test b.2, etc. Note that the above gives only those subtest        [01]
;   0764  4                         ! numbers (x-1, x, 1, etc.) that will be looped on. Note that all the subtests  [01]
;   0765  4                         ! prior to that subtest number would be executed before looping on the nth      [01]
;   0766  4                         ! subtest. I must also reset the Test, Last, and Pass areas in the Cli          [01]
;   0767  4                         ! data vector because they get destroyed somewhere (Init_Context?).             [01]
;   0768  4                         !-
;   0769  4
;   0770  4                         QA$AOB_Flags [QA$K_No_Header] = True;           ! Do not print header anymore   [01]
;   0771  4
;   0772  4                         DS$GL_CLIBASE [CLI$L_SUBT] = .DS$GL_SUBTEST + 1;! Do next subtest               [01]
;   0773  4                         DS$GL_CLIBASE [CLI$L_TEST] = .DS$GL_FSTTEST;    ! Reset first test number       [01]
;   0774  4                         DS$GL_CLIBASE [CLI$L_LAST] = .DS$GL_FSTTEST;    ! Reset last test number        [01]
;   0775  4                         DS$GL_CLIBASE [CLI$L_PASS] = .QA$W_SubtestLoops;! Reset pass number             [01]
;   0776  3                         END;                          !                                                  [01]
;   0777  4                 RETURN (QA$K_Success)
;   0778  2                 END;
```

```
;    0780  2                    [DSQA$K_Error_Error_End]:
;    0781  3                            BEGIN
;    0782  3                            IF (.QA$AOB_Routine_State [QA$V_Doing_Cleanup]) THEN    !                    [01]
;    0783  4                                    $DS_PRINTF (Cleanup_Error_Message)              !                    [01]
;    0784  3                            ELSE                                                    !                    [01]
;    0785  3                                    $DS_PRINTF (Error_Reported_Message);            !                    [01]
;    0786  3
;    0787  3                            $DS_PRINTF (Infinite_Subtest_Message);                  !                    [02]
;    0788  3
;    0789  3                            QA$Add_QA_Error (QA$K_Loop_On_Subtest);
;    0790  3                            QA$AOB_Routine_State [QA$V_Error_Found] = True
;    0791  2                            END;
;    0792  2
;    0793  2                    [DSQA$K_Dispat_DSX$EndPass_Mid]:
;    0794  3                            BEGIN
;    0795  3                            !+
;    0796  3                            ! All done the Loop on Subtest check. Clean up. Restore the first and last test    [01]
;    0797  3                            ! numbers just in case....                                                        [01]
;    0798  3                            !-
;    0799  3
;    0800  3                            DS$GL_CLIBASE [CLI$L_TEST] = .QA$W_Save_Test;   ! Restore the old first test #   [01]
;    0801  3                            DS$GL_CLIBASE [CLI$L_LAST] = .QA$W_Save_Last;   ! Restore the old last test #    [01]
;    0802  3
;    0803  3                            QA$AOB_Check_State [QA$K_Loop_On_Subtest] = Off;
;    0804  3                            QA$AOB_Check_State [QA$K_Run_Backwards]   = On;
;    0805  3                            QA$AOB_Routine_State [QA$V_Check_Done]    = True;
;    0806  3                            QA$AOB_Flags [QA$K_No_Header]             = False;      ! Print header again  [01]
;    0807  4                            RETURN (QA$K_Success)
;    0808  2                            END;
;    0809  2                                                                                                  !G:2
;    0810  2                    [DSQA$K_Dispat_Done_Tests]:                                  !                    !G:
;    0811  3                            BEGIN                                                ! Reset ds$gl_subtest to 0 !G:2
;    0812  3                            DS$GL_SUBTEST = 0;                                   ! when the last test was done !G:2
;    0813  3                            RETURN (QA$K_Success);                               !                    !G:2
;    0814  2                            END;                                                                      !G:2
```

```
;    0816  2                    !+
;    0817  2                    ! The following are not used in this check.
;    0818  2                    !-
;    0819  2
;    0820  2                    [DSQA$K_Dispat_Before_Init,
;    0821  2                     DSQA$K_Dispat_After_Init,              !                                    [01]
;    0822  2                     DSQA$K_Dispat_CallTest,                !                                    [01]
;    0823  2                     DSQA$K_Dispat_DSX$EndPass_Bgn,         !                                    [01]
;    0824  2                     DSQA$K_Dispat_DSX$EndPass_End,         !                                    [01]
;    0825  2
;    0826  2                     DSQA$K_Error_Error_Bgn,                !                                    [01]
;    0827  2
;    0828  2                     DSQA$K_Loop_DSX$BgnSub,
;    0829  2                     DSQA$K_Loop_DSX$EndSub,
;    0830  2                     DSQA$K_Loop_DSX$CkLoop,
;    0831  2
;    0832  2                     DSQA$K_QA_DSX$Branch]:
;    0833  3                             BEGIN
;    0834  4                             RETURN (QA$K_Success)
;    0835  2                             END;
;    0836  2
;    0837  2                    [OTHERWISE]:
;    0838  3                             BEGIN
;    0839  4                             Logic_Error ('Loop on Subtest, Illegal Hook_Point')
;    0840  2                             END;
;    0841  2                    TES;
;    0842  3                RETURN (QA$K_Failure)
;    0843  1        END;


                                                    .PSECT  DATA,NOWRT,NOEXE,  SHR,2

61 6E 72 65 74 6E 49 20 41 51 2A 2A 2F 21 3C 00323 P.AAU:   .ASCII  \<!/**QA Internal Error: Loop on Subtest,\  ;
6F 20 70 6F 6F 4C 20 3A 72 6F 72 72 45 20 6C 00332                                                          ;
                  2C 74 73 65 74 62 75 53 20 6E 00341                                                       ;
50 5F 6B 6F 6F 48 20 6C 61 67 65 6C 6C 49 20 0034B          .ASCII  \ Illegal Hook_Point!/\                 ;
                     2F 21 74 6E 69 6F 0035A                                                                ;

                                                ES=                 P.AAU

                                                    .PSECT  CODE,NOWRT,  SHR,2

                                        0FFC 00000          .ENTRY  QA$LOOP_ON_SUBTEST, Save R2,R3,R4,R5,R6,R7,-; 0681
                                                                    R8,R9,R10,R11                               ;
                                5B 00000000G   EF  9E 00002         MOVAB   QA$AOB_CHECK_STATE, R11             ;
                                5A 00000000G   EF  9E 00009         MOVAB   DS$GL_FSTTEST, R10                  ;
                                59 00000000G   EF  9E 00010         MOVAB   DS$GL_SUBTEST, R9                   ;
                                58 00000000G   EF  9E 00017         MOVAB   QA$W_SAVE_TEST, R8                  ;
                                57 00000000G   EF  9E 0001E         MOVAB   QA$AOB_FLAGS, R7                    ;
                                56 00000000G   EF  9E 00025         MOVAB   QA$AOB_ROUTINE_STATE, R6            ;
                                55 00000000G   9F  9E 0002C         MOVAB   @#DS$PRINTF, R5                     ;
                                54 00000000'   EF  9E 00033         MOVAB   QA$T_HEADER_1, R4                   ;
                                53 00000000G   EF  9E 0003A         MOVAB   DS$GL_CLIBASE+32, R3                ;
                                52       04    AC  D0 00041         MOVL    HOOK_POINT, R2                      ; 0720
                                12             52  D1 00045         CMPL    R2, #18                             ; 0722
```

```
                                                59  12 00048          BNEQ    3$                                      ;
                    3B              67          05  E1 0004A          BBC     #5, QA$AOB_FLAGS, 1$                    ; 0729
                                                54  DD 0004E          PUSHL   R4                                      ; 0731
                                    65          01  FB 00050          CALLS   #1, DS$PRINTF                           ;
                                    7E 0000020C 9F  7D 00053          MOVQ    @#^X0000020C, -(SP)                     ; 0732
                                       00000208 9F  DD 0005A          PUSHL   @#^X00000208                            ;
                                           26   A4  9F 00060          PUSHAB  QA$T_HEADER_2                           ;
                                    65          04  FB 00063          CALLS   #4, DS$PRINTF                           ;
                                                7E  D4 00066          CLRL    -(SP)                                   ; 0733
                                           4D   A4  9F 00068          PUSHAB  QA$T_HEADER_3                           ;
                                    65          02  FB 0006B          CALLS   #2, DS$PRINTF                           ;
                                         00A6   C4  9F 0006E          PUSHAB  HEADER_LS                               ; 0734
                                    65          01  FB 00072          CALLS   #1, DS$PRINTF                           ;
                                    66          01  88 00075          BISB2   #1, QA$AOB_ROUTINE_STATE                ; 0736
                                    67          60  8F 8A 00078       BICB2   #96, QA$AOB_FLAGS                       ; 0737
                                    63          68  32 0007C          CVTWL   QA$W_SAVE_TEST, DS$GL_CLIBASE+32        ; 0744
                              04    A3          68  32 0007F          CVTWL   QA$W_SAVE_TEST, DS$GL_CLIBASE+36        ; 0745
                              08    A3          01  D0 00083          MOVL    #1, DS$GL_CLIBASE+40                    ; 0746
                                                10  11 00087          BRB     2$                                      ;
                                    67          40  8F 88 00089 1$:   BISB2   #64, QA$AOB_FLAGS                      ; 0770
                        08    A3                69  01  C1 0008D      ADDL3   #1, DS$GL_SUBTEST, DS$GL_CLIBASE+40     ; 0772
                                    63          6A  D0 00092          MOVL    DS$GL_FSTTEST, DS$GL_CLIBASE+32         ; 0773
                              04    A3          6A  D0 00095          MOVL    DS$GL_FSTTEST, DS$GL_CLIBASE+36         ; 0774
                              0C    A3 00000000G EF 3C 00099 2$:      MOVZWL  QA$W_SUBTESTLOOPS, DS$GL_CLIBASE+44     ; 0747
                                                78  11 000A1          BRB     11$                                     ; 0777
                                    05          52  D1 000A3 3$:      CMPL    R2, #5                                  ; 0780
                                                25  12 000A6          BNEQ    6$                                      ;
                                    06          66  02 E1 000A8       BBC     #2, QA$AOB_ROUTINE_STATE, 4$            ; 0782
                                         FEB4   C4  9F 000AC          PUSHAB  CLEANUP_ERROR_MESSAGE                   ; 0783
                                                04  11 000B0          BRB     5$                                      ;
                                         FEE4   C4  9F 000B2 4$:      PUSHAB  ERROR_REPORTED_MESSAGE                  ; 0785
                                    65          01  FB 000B6 5$:      CALLS   #1, DS$PRINTF                           ;
                                           89   A4  9F 000B9          PUSHAB  INFINITE_SUBTEST_MESSAGE                ; 0787
                                    65          01  FB 000BC          CALLS   #1, DS$PRINTF                           ;
                                                03  DD 000BF          PUSHL   #3                                      ; 0789
                  00000000G         EF          01  FB 000C1          CALLS   #1, QA$ADD_QA_ERROR                     ;
                                    66          02  88 000C8          BISB2   #2, QA$AOB_ROUTINE_STATE                ; 0790
                                                59  11 000CB          BRB     13$                                     ;
                                                52  D5 000CD 6$:      TSTL    R2                                      ; 0793
                                                1A  12 000CF          BNEQ    7$                                      ;
                                    63          68  32 000D1          CVTWL   QA$W_SAVE_TEST, DS$GL_CLIBASE+32        ; 0800
                              04    A3 00000000G EF 32 000D4          CVTWL   QA$W_SAVE_LAST, DS$GL_CLIBASE+36        ; 0801
                                    6B          08  8A 000DC          BICB2   #8, QA$AOB_CHECK_STATE                  ; 0803
                                    6B          10  88 000DF          BISB2   #16, QA$AOB_CHECK_STATE                 ; 0804
                                    66          08  88 000E2          BISB2   #8, QA$AOB_ROUTINE_STATE                ; 0805
                                    67          40  8F 8A 000E5       BICB2   #64, QA$AOB_FLAGS                       ; 0806
                                                30  11 000E9          BRB     11$                                     ; 0807
                                    18          52  D1 000EB 7$:      CMPL    R2, #24                                 ; 0810
                                                04  12 000EE          BNEQ    8$                                      ;
                                                69  D4 000F0          CLRL    DS$GL_SUBTEST                           ; 0812
                                                27  11 000F2          BRB     11$                                     ; 0813
                                                52  D5 000F4 8$:      TSTL    R2                                      ; 0823
                                                05  15 000F6          BLEQ    9$                                      ;
                                    02          52  D1 000F8          CMPL    R2, #2                                  ; 0824
                                                1E  15 000FB          BLEQ    11$                                     ;
                                    06          52  D1 000FD 9$:      CMPL    R2, #6                                  ; 0826
                                                19  13 00100          BEQL    11$                                     ;
```

```
                    09          52  D1 00102        CMPL    R2, #9                          ; 0828
                                05  19 00105        BLSS    10$                             ;
                    0B          52  D1 00107        CMPL    R2, #11                         ; 0830
                                0F  15 0010A        BLEQ    11$                             ;
                    11          52  D1 0010C 10$:   CMPL    R2, #17                         ; 0832
                                0A  13 0010F        BEQL    11$                             ;
                    13          52  D1 00111        CMPL    R2, #19                         ; 0820
                                09  19 00114        BLSS    12$                             ;
                    15          52  D1 00116        CMPL    R2, #21                         ; 0822
                                04  14 00119        BGTR    12$                             ;
                    50          01  D0 0011B 11$:   MOVL    #1, R0                          ; 0834
                                    04 0011E        RET                                     ;
                          0194  C4  9F 0011F 12$:   PUSHAB  ES                              ; 0839
                    65          01  FB 00123        CALLS   #1, DS$PRINTF                   ;
                                50  D4 00126 13$:   CLRL    R0                              ; 0842
                                    04 00128        RET                                     ;

; Routine Size:  297 bytes,    Routine Base:  CODE + 029C
```

```
;    0845  1      %SBTTL 'QA$Run_Backwards'
;    0846  1
;    0847  1      GLOBAL ROUTINE QA$Run_Backwards (Hook_Point) =
;    0848  1
;    0849  1      !++
;    0850  1      ! FUNCTIONAL DESCRIPTION:
;    0851  1      !
;    0852  1      !       This routine performs the QA Run Backwards check.
;    0853  1      !
;    0854  1      ! CALLER(S):
;    0855  1      !
;    0856  1      !       QA$Main
;    0857  1      !
;    0858  1      ! FORMAL PARAMETERS:
;    0859  1      !
;    0860  1      !       Hook_Point : The point in the Supervisor from which this routine
;    0861  1      !                    was called. This is a constant value. The constants are
;    0862  1      !                    defined in the DSQA macro.
;    0863  1      !
;    0864  1      ! IMPLICIT INPUTS:
;    0865  1      !
;    0866  1      !       NONE
;    0867  1      !
;    0868  1      ! IMPLICIT OUTPUTS:
;    0869  1      !
;    0870  1      !       NONE
;    0871  1      !
;    0872  1      ! COMPLETION CODES:
;    0873  1      !
;    0874  1      !       0 - QA error detected; unsuccessful return
;    0875  1      !       1 - No QA errors; successful return
;    0876  1      !
;    0877  1      ! SIDE EFFECTS:
;    0878  1      !
;    0879  1      !       NONE
;    0880  1      !
;    0881  1      !--
```

```
;    0883  2     BEGIN
;    0884  2             SELECTONE .Hook_Point OF
;    0885  2                     SET
;    0886  2                     [DSQA$K_Start_VRReStart]:                !                                          [01]
;    0887  3                             BEGIN
;    0888  3                             !+
;    0889  3                             ! The initializations required for this check and that are specific to this check
;    0890  3                             ! must be done here.
;    0891  3                             !-
;    0892  3
;    0893  3                             $DS_PRINTF (QA$T_Header_1);
;    0894  3                             $DS_PRINTF (QA$T_Header_2, .L$A_NAME, .L$L_REV, .L$L_UPDATE);
;    0895  3                             $DS_PRINTF (QA$T_Header_3, 0);
;    0896  3                             $DS_PRINTF (Header_RB);
;    0897  3
;    0898  3                             QA$AOB_Routine_State [QA$V_Init_Done] = True;   ! Done init'ing
;    0899  4                             RETURN (QA$K_Success)
;    0900  2                             END;
;    0901  2
;    0902  2                     [DSQA$K_Error_Error_End]:
;    0903  3                             BEGIN
;    0904  3                             IF (.QA$AOB_Routine_State [QA$V_Doing_Cleanup]) THEN    !                  [01]
;    0905  4                                     $DS_PRINTF (Cleanup_Error_Message)      !                          [01]
;    0906  3                             ELSE                                            !                          [01]
;    0907  3                                     $DS_PRINTF (Error_Reported_Message);    !                          [01]
;    0908  3
;    0909  3                             $DS_PRINTF (Run_Backwards_Message);             !                          [02]
;    0910  3
;    0911  3                             QA$Add_QA_Error (QA$K_Run_Backwards);
;    0912  3                             QA$AOB_Routine_State [QA$V_Error_Found] = True
;    0913  2                             END;
;    0914  2
;    0915  2                     [DSQA$K_Dispat_DSX$EndPass_Mid]:         !                                          [01]
;    0916  3                             BEGIN
;    0917  3                             QA$AOB_Check_State [QA$K_Run_Backwards]    = Off;
;    0918  3                             QA$AOB_Routine_State [QA$V_Check_Done]     = True;
;    0919  3                             QA$AOB_Flags [QA$K_First_Time]             = True;       ! For the next check   [01]
;    0920  4                             RETURN (QA$K_Success)
;    0921  2                             END;
;    0922  2
;    0923  2                     [DSQA$K_Dispat_After_Init]:              !                                          [01]
;    0924  3                             BEGIN                           !                                          [01]
;    0925  3                             DSA$GL_TESTNO = .DS$GL_LSTTEST; ! Start at the last requested test number (i.e.,  [01]
;    0926  3                                                             ! at 'y' in /TEST:x:y), or else at L$A_TSTCNT.  [01]
;    0927  4                             RETURN (QA$K_Success)           !                                          [01]
;    0928  2                             END;
```

```
;   0930  2                    !+
;   0931  2                    ! The following are not used in this check.
;   0932  2                    !-
;   0933  2
;   0934  2                    [DSQA$K_Dispat_Before_Init,
;   0935  2                     DSQA$K_Dispat_CallTest,                 !                                    [01]
;   0936  2                     DSQA$K_Dispat_DSX$EndPass_Bgn,          !                                    [01]
;   0937  2                     DSQA$K_Dispat_DSX$EndPass_End,          !                                    [01]
;   0938  2                     DSQA$K_Dispat_Done_Tests,               !                                    [01]
;   0939  2
;   0940  2                     DSQA$K_Error_Error_Bgn,                 !                                    [01]
;   0941  2
;   0942  2                     DSQA$K_Loop_DSX$BgnSub,
;   0943  2                     DSQA$K_Loop_DSX$EndSub,
;   0944  2                     DSQA$K_Loop_DSX$CkLoop,
;   0945  2
;   0946  2                     DSQA$K_QA_DSX$Branch]:
;   0947  3                            BEGIN
;   0948  4                            RETURN (QA$K_Success)
;   0949  2                            END;
;   0950  2
;   0951  2                    [OTHERWISE]:
;   0952  3                            BEGIN
;   0953  4                            Logic_Error ('Run Backwards, Illegal Hook_Point')
;   0954  2                            END;
;   0955  2                    TES;
;   0956  3              RETURN (QA$K_Failure)
;   0957  1      END;


                                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

61  6E  72  65  74  6E  49  20  41  51  2A  2A  2F  21  3A  00360 P.AAV:  .ASCII  \:!/**QA Internal Error: Run Backwards, I\  ;
61  42  20  6E  75  52  20  3A  72  6F  72  72  45  20  6C  0036F                                                            ;
                    49  20  2C  73  64  72  61  77  6B  63  0037E                                                            ;
69  6F  50  5F  6B  6F  6F  48  20  6C  61  67  65  6C  6C  00388         .ASCII  \llegal Hook_Point!/\                        ;
                                            2F  21  74  6E  00397                                                            ;

                                                                ES=                 P.AAV


                                                                        .PSECT  CODE,NOWRT,  SHR,2

                                                  003C 00000            .ENTRY  QA$RUN_BACKWARDS, Save R2,R3,R4,R5           ; 0847
                                55 00000000G  EF  9E 00002            MOVAB   QA$AOB_ROUTINE_STATE, R5                     ;
                                54 00000000G  9F  9E 00009            MOVAB   @#DS$PRINTF, R4                              ;
                                53 00000000'  EF  9E 00010            MOVAB   QA$T_HEADER_1, R3                            ;
                                52        04  AC  D0 00017            MOVL    HOOK_POINT, R2                               ; 0884
                                12            52  D1 0001B            CMPL    R2, #18                                      ; 0886
                                              2C  12 0001E            BNEQ    1$                                           ;
                                              53  DD 00020            PUSHL   R3                                           ; 0893
                                64            01  FB 00022            CALLS   #1, DS$PRINTF                                ;
                                7E 0000020C   9F  7D 00025            MOVQ    @#^X0000020C, -(SP)                          ; 0894
                                   00000208   9F  DD 0002C            PUSHL   @#^X00000208                                 ;
                                        26    A3  9F 00032            PUSHAB  QA$T_HEADER_2                                ;
                                64            04  FB 00035            CALLS   #4, DS$PRINTF                                ;
```

```
                                        7E  D4 00038          CLRL    -(SP)                                  ; 0895
                                  4D    A3  9F 0003A          PUSHAB  QA$T_HEADER_3                          ;
                          64            02  FB 0003D          CALLS   #2, DS$PRINTF                          ;
                                00C8    C3  9F 00040          PUSHAB  HEADER_RB                              ; 0896
                          64            01  FB 00044          CALLS   #1, DS$PRINTF                          ;
                          65            01  88 00047          BISB2   #1, QA$AOB_ROUTINE_STATE               ; 0898
                                        7F  11 0004A          BRB     9$                                     ; 0899
                          05            52  D1 0004C 1$:      CMPL    R2, #5                                 ; 0902
                                        25  12 0004F          BNEQ    4$                                     ;
                06        65            02  E1 00051          BBC     #2, QA$AOB_ROUTINE_STATE, 2$           ; 0904
                                FEB4    C3  9F 00055          PUSHAB  CLEANUP_ERROR_MESSAGE                  ; 0905
                                        04  11 00059          BRB     3$                                     ;
                                FEE4    C3  9F 0005B 2$:      PUSHAB  ERROR_REPORTED_MESSAGE                 ; 0907
                          64            01  FB 0005F 3$:      CALLS   #1, DS$PRINTF                          ;
                                  BE    A3  9F 00062          PUSHAB  RUN_BACKWARDS_MESSAGE                  ; 0909
                          64            01  FB 00065          CALLS   #1, DS$PRINTF                          ;
                                        04  DD 00068          PUSHL   #4                                     ; 0911
          00000000G       EF            01  FB 0006A          CALLS   #1, QA$ADD_QA_ERROR                    ;
                          65            02  88 00071          BISB2   #2, QA$AOB_ROUTINE_STATE               ; 0912
                                        60  11 00074          BRB     11$                                    ;
                                        52  D5 00076 4$:      TSTL    R2                                     ; 0915
                                        13  12 00078          BNEQ    5$                                     ;
          00000000G       EF            10  8A 0007A          BICB2   #16, QA$AOB_CHECK_STATE                ; 0917
                          65            08  88 00081          BISB2   #8, QA$AOB_ROUTINE_STATE               ; 0918
          00000000G       EF            20  88 00084          BISB2   #32, QA$AOB_FLAGS                      ; 0919
                                        3E  11 0008B          BRB     9$                                     ; 0920
                          14            52  D1 0008D 5$:      CMPL    R2, #20                                ; 0923
                                        0D  12 00090          BNEQ    6$                                     ;
          0000FE50        9F 00000000G  EF  D0 00092          MOVL    DS$GL_LSTTEST, @#^X0000FE50            ; 0925
                                        2C  11 0009D          BRB     9$                                     ; 0927
                                        52  D5 0009F 6$:      TSTL    R2                                     ; 0936
                                        05  15 000A1          BLEQ    7$                                     ;
                          02            52  D1 000A3          CMPL    R2, #2                                 ; 0937
                                        23  15 000A6          BLEQ    9$                                     ;
                          06            52  D1 000A8 7$:      CMPL    R2, #6                                 ; 0940
                                        1E  13 000AB          BEQL    9$                                     ;
                          09            52  D1 000AD          CMPL    R2, #9                                 ; 0942
                                        05  19 000B0          BLSS    8$                                     ;
                          0B            52  D1 000B2          CMPL    R2, #11                                ; 0944
                                        14  15 000B5          BLEQ    9$                                     ;
                          11            52  D1 000B7 8$:      CMPL    R2, #17                                ; 0946
                                        0F  13 000BA          BEQL    9$                                     ;
                          13            52  D1 000BC          CMPL    R2, #19                                ; 0934
                                        0A  13 000BF          BEQL    9$                                     ;
                          15            52  D1 000C1          CMPL    R2, #21                                ; 0935
                                        05  13 000C4          BEQL    9$                                     ;
                          18            52  D1 000C6          CMPL    R2, #24                                ; 0938
                                        04  12 000C9          BNEQ    10$                                    ;
                          50            01  D0 000CB 9$:      MOVL    #1, R0                                 ; 0948
                                            04 000CE          RET                                            ;
                                01D1    C3  9F 000CF 10$:     PUSHAB  ES                                     ; 0953
                          64            01  FB 000D3          CALLS   #1, DS$PRINTF                          ;
                                        50  D4 000D6 11$:     CLRL    R0                                     ; 0956
                                            04 000D8          RET                                            ;

; Routine Size:  217 bytes,    Routine Base:  CODE + 03C5
```

```
;    0959  1      !%SBTTL 'QA$Error_Phase_One'
;    0960  1      !
;    0961  1      !GLOBAL ROUTINE QA$Error_Phase_One (Hook_Point) =       !                                    Start of [1]
;    0962  1      !
;    0963  1      !!++
;    0964  1      !! FUNCTIONAL DESCRIPTION:
;    0965  1      !!
;    0966  1      !!      This routine performs Phase One of the QA Error check.
;    0967  1      !!
;    0968  1      !! CALLER(S):
;    0969  1      !!
;    0970  1      !!      QA$Main
;    0971  1      !!
;    0972  1      !! FORMAL PARAMETERS:
;    0973  1      !!
;    0974  1      !!      Hook_Point : The point in the Supervisor from which this routine
;    0975  1      !!                   was called. This is a constant value. The constants are
;    0976  1      !!                   defined in the DSQA macro.
;    0977  1      !!
;    0978  1      !! IMPLICIT INPUTS:
;    0979  1      !!
;    0980  1      !!      NONE
;    0981  1      !!
;    0982  1      !! IMPLICIT OUTPUTS:
;    0983  1      !!
;    0984  1      !!      NONE
;    0985  1      !!
;    0986  1      !! COMPLETION CODES:
;    0987  1      !!
;    0988  1      !!      0 - QA error detected; unsuccessful return
;    0989  1      !!      1 - No QA errors; successful return
;    0990  1      !!
;    0991  1      !! SIDE EFFECTS:
;    0992  1      !!
;    0993  1      !!--
```

```
;    0994  1      !
;    0995  1      !BEGIN
;    0996  1      !       OWN
;    0997  1      !               Abort_Now : BYTE,                               ! When 1, abort the diagnostic
;    0998  1      !               Last_Branch_PC;                                 ! The PC of the last branch macro executed
;    0999  1      !
;    1000  1      !       MAP
;    1001  1      !               DS$GL_CLIBASE : BLOCK [, BYTE];
;    1002  1      !
;    1003  1      !       LITERAL                                                 ! Used to set the Last_Branch_PC so as to insure
;    1004  1      !               QA$K_Bad_PC = %X'FFFFFFFF';                     ! that the PC is not found.
;    1005  1      !
;    1006  1      !       SELECTONE .Hook_Point OF
;    1007  1      !               SET
;    1008  1      !               [DSQA$K_Start_VRReStart]:
;    1009  1      !                       BEGIN
;    1010  1      !                       IF (.QA$AOB_Flags [QA$K_First_Time]) THEN
;    1011  1      !                               BEGIN
;    1012  1      !                               $DS_PRINTF (QA$T_Header_1);
;    1013  1      !                               $DS_PRINTF (QA$T_Header_2, .L$A_NAME, .L$L_REV, .L$L_UPDATE);
;    1014  1      !                               $DS_PRINTF (QA$T_Header_3, 0);                  ! 0 is for the current time
;    1015  1      !                               $DS_PRINTF (Header_E1);
;    1016  1      !
;    1017  1      !                               Last_Branch_PC = 0;                             ! Zero means do next error call
;    1018  1      !                               Abort_Now = False;                              ! Do not abort on next one
;    1019  1      !                               QA$AOB_Flags [QA$K_First_Time] = False;         ! Not first time anymore
;    1020  1      !                               QA$AOB_Flags [QA$K_No_Header]  = False;         ! Print the header only once
;    1021  1      !
;    1022  1      !                               DS$GL_CLIBASE [CLI$L_PASS] = 1;                 ! One pass
;    1023  1      !                               DS$GL_CLIBASE [CLI$L_SUBT] = 0;                 ! No looping on subtests
;    1024  1      !                               DS$GL_CLIBASE [CLI$L_TEST] = .QA$W_Save_Test;   ! First test number
;    1025  1      !                               DS$GL_CLIBASE [CLI$L_LAST] = .QA$W_Save_Last;   ! Last test number
;    1026  1      !
;    1027  1      !                               QA$AOB_Routine_State [QA$V_Init_Done] = True;   ! Done initializing
;    1028  1      !                               END
;    1029  1      !                       ELSE
;    1030  1      !                               BEGIN
;    1031  1      !                               QA$AOB_Flags [QA$K_No_Header] = True;           ! Print no more header till done
;    1032  1      !
;    1033  1      !                               DS$GL_CLIBASE [CLI$L_PASS] = 1;                 ! One pass
;    1034  1      !                               DS$GL_CLIBASE [CLI$L_SUBT] = 0;                 ! No looping on subtests
;    1035  1      !                               DS$GL_CLIBASE [CLI$L_TEST] = .DSA$GL_TestNo;    ! Set to same test number
;    1036  1      !                               DS$GL_CLIBASE [CLI$L_LAST] = .QA$W_Save_Last;   ! Last test number
;    1037  1      !                               END;
;    1038  1      !                       RETURN (QA$K_Success)
;    1039  1      !                       END;
```

```
;    1040  1      !
;    1041  1      !                [DSQA$K_Error_Error_End]:
;    1042  1      !                        BEGIN
;    1043  1      !                        IF ((.Abort_Now) AND (NOT .QA$AOB_Routine_State [QA$V_Doing_Cleanup])) THEN
;    1044  1      !                                BEGIN
;    1045  1      !                                MAP
;    1046  1      !                                        DSA$GL_ERRNO : WORD;                    ! In the DS, it is a word.
;    1047  1      !                                !+
;    1048  1      !                                ! This error call was forced. Add the error number to the forced error summary table
;    1049  1      !                                ! and abort the diagnostic. This will cause the DSX$Abort routine to branch back to
;    1050  1      !                                ! the VRReStart routine, and start over again. Note: use the error number that the
;    1051  1      !                                ! RRepError routine stores in DSA$GL_ErrNo, rather than that passes to the Branch
;    1052  1      !                                ! routine. The former number is more accurate.
;    1053  1      !                                !-
;    1054  1      !                                QA$Add_Forced_Error (.DSA$GL_ERRNO);            ! Add another forced error
;    1055  1      !                                Abort_Now = False;                              ! Reset for next time
;    1056  1      !                                DSX$Abort ();                                   ! Abort the diagnostic
;    1057  1      !                                !+
;    1058  1      !                                ! The above Abort will not come back to here.
;    1059  1      !                                !-
;    1060  1      !                                END
;    1061  1      !                        ELSE
;    1062  1      !                                BEGIN
;    1063  1      !                                !+
;    1064  1      !                                ! This error call was not forced. Therefore, it is a QA error. Print the
;    1065  1      !                                ! appropriate error message and return Failure.
;    1066  1      !                                !-
;    1067  1      !                                IF (.QA$AOB_Routine_State [QA$V_Doing_Cleanup]) THEN
;    1068  1      !                                        $DS_PRINTF (Cleanup_Error_Message)
;    1069  1      !                                ELSE
;    1070  1      !                                        $DS_PRINTF (Error_Reported_Message);
;    1071  1      !                                QA$Add_QA_Error (QA$K_Error_Phase_One);
;    1072  1      !                                QA$AOB_Routine_State [QA$V_Error_Found] = True;
;    1073  1      !                                END;
;    1074  1      !                        !+
;    1075  1      !                        ! Return Failure.
;    1076  1      !                        !-
;    1077  1      !                        END;
;    1078  1      !
;    1079  1      !                [DSQA$K_Dispat_Done_Tests]:
;    1080  1      !                        BEGIN
;    1081  1      !                        !+
;    1082  1      !                        ! We have done all the tests. Set Abort_Now to False so that the error macros in
;    1083  1      !                        ! the initialization code are not done again.
;    1084  1      !                        !-
;    1085  1      !                        Abort_Now      = False;
;    1086  1      !                        Last_Branch_PC = QA$K_Bad_PC;
;    1087  1      !                        RETURN (QA$K_Success)
;    1088  1      !                        END;
```

```
;    1089  1      !
;    1090  1      !                [DSQA$K_Dispat_DSX$EndPass_Mid]:
;    1091  1      !                        BEGIN
;    1092  1      !                        QA$AOB_Check_State [QA$K_Error_Phase_One]  = Off;       ! Stop Phase One check.
;    1093  1      !                        QA$AOB_Check_State [QA$K_Error_Phase_Two]  = On;        ! Start Phase Two check.
;    1094  1      !                        QA$AOB_Flags [QA$K_No_Header]              = False;     ! Print headers again.
;    1095  1      !
;    1096  1      !                        QA$Print_Forced_Errors ();                              ! Print the table.
;    1097  1      !
;    1098  1      !                        QA$AOB_Routine_State [QA$V_Check_Done]     = True;      ! Indicate end of this check.
;    1099  1      !                        RETURN (QA$K_Success)
;    1100  1      !                        END;
;    1101  1      !
;    1102  1      !                [DSQA$K_QA_DSX$Branch]:
;    1103  1      !                        BEGIN
;    1104  1      !                        LOCAL
;    1105  1      !                                Frame_Start,
;    1106  1      !                                Saved_PC;
;    1107  1      !
;    1108  1      !                        IF (NOT QA$Find_User_Call_Frame (Frame_Start)) THEN
;    1109  1      !                                RETURN (QA$K_Failure);
;    1110  1      !
;    1111  1      !                        BEGIN
;    1112  1      !                                BIND
;    1113  1      !                                        Call_Frame = .Frame_Start : BLOCK [, BYTE];
;    1114  1      !
;    1115  1      !                                Saved_PC = .Call_Frame [SF$L_SAVE_PC]
;    1116  1      !                        END;
;    1117  1      !
;    1118  1      !                        IF (.Last_Branch_PC EQL 0) THEN
;    1119  1      !                                BEGIN
;    1120  1      !                                Last_Branch_PC = .Saved_PC;
;    1121  1      !                                Abort_Now      = True;
;    1122  1      !                                QA$W_Branch    = Boolean (NOT .QA$W_Branch);
;    1123  1      !                                END
;    1124  1      !                        ELSE IF (.Last_Branch_PC EQL .Saved_PC) THEN
;    1125  1      !                                BEGIN
;    1126  1      !                                Last_Branch_PC = 0;
;    1127  1      !                                END;
;    1128  1      !                        !+
;    1129  1      !                        ! ELSE:
;    1130  1      !                        !       I have not yet found the correct branch macro. Keep looking.
;    1131  1      !                        !-
;    1132  1      !                        RETURN (QA$K_Success)
;    1133  1      !                        END;
```

```
;    1134  1      !
;    1135  1      !                   !+
;    1136  1      !                   ! The following are not used in this check. So, just return Success for them.
;    1137  1      !                   !-
;    1138  1      !
;    1139  1      !                   [DSQA$K_Dispat_Before_Init,
;    1140  1      !                    DSQA$K_Dispat_After_Init,
;    1141  1      !                    DSQA$K_Dispat_CallTest,
;    1142  1      !                    DSQA$K_Dispat_DSX$EndPass_Bgn,        !                                    [01]
;    1143  1      !                    DSQA$K_Dispat_DSX$EndPass_End,        !                                    [01]
;    1144  1      !
;    1145  1      !                    DSQA$K_Error_Error_Bgn,               !                                    [01]
;    1146  1      !
;    1147  1      !                    DSQA$K_Loop_DSX$BgnSub,
;    1148  1      !                    DSQA$K_Loop_DSX$EndSub,
;    1149  1      !                    DSQA$K_Loop_DSX$CkLoop]:
;    1150  1      !                           BEGIN
;    1151  1      !                           RETURN (QA$K_Success)
;    1152  1      !                           END;
;    1153  1      !
;    1154  1      !                   [OTHERWISE]:
;    1155  1      !                           BEGIN
;    1156  1      !                           Logic_Error ('Error Phase One, Illegal Hook_Point')
;    1157  1      !                           END;
;    1158  1      !                   TES;
;    1159  1      !
;    1160  1      !           !+
;    1161  1      !           ! Come to here only if a QA error was found. Return QA$K_Failure to QA$Main, which then takes
;    1162  1      !           ! the appropriate action.
;    1163  1      !           !-
;    1164  1      !
;    1165  1      !           RETURN (QA$K_Failure)
;    1166  1      !END;
```

```
;    1167  1      !
;    1168  1      !%SBTTL 'QA$Error_Phase_Two'
;    1169  1      !
;    1170  1      !GLOBAL ROUTINE QA$Error_Phase_Two (Hook_Point) =
;    1171  1      !
;    1172  1      !!++
;    1173  1      !! FUNCTIONAL DESCRIPTION:
;    1174  1      !!
;    1175  1      !!      This routine performs Phase Two of the QA Error check.
;    1176  1      !!
;    1177  1      !! CALLER(S):
;    1178  1      !!
;    1179  1      !!      QA$Main
;    1180  1      !!
;    1181  1      !! FORMAL PARAMETERS:
;    1182  1      !!
;    1183  1      !!      Hook_Point : The point in the Supervisor from which this routine
;    1184  1      !!                   was called. This is a constant value. The constants are
;    1185  1      !!                   defined in the DSQA macro.
;    1186  1      !!
;    1187  1      !! IMPLICIT INPUTS:
;    1188  1      !!
;    1189  1      !!      NONE
;    1190  1      !!
;    1191  1      !! IMPLICIT OUTPUTS:
;    1192  1      !!
;    1193  1      !!      NONE
;    1194  1      !!
;    1195  1      !! COMPLETION CODES:
;    1196  1      !!
;    1197  1      !!      0 - QA error detected; unsuccessful return
;    1198  1      !!      1 - No QA errors; successful return
;    1199  1      !!
;    1200  1      !! SIDE EFFECTS:
;    1201  1      !!
;    1202  1      !!--
;    1203  1      !
;    1204  1      !BEGIN
;    1205  1      !       RETURN (QA$K_Failure)
;    1206  1      !END;
```

```
;    1207  1      !
;    1208  1      !xSBTTL 'QA$Error_Phase_Three'
;    1209  1      !
;    1210  1      !GLOBAL ROUTINE QA$Error_Phase_Three (Hook_Point) =
;    1211  1      !
;    1212  1      !!++
;    1213  1      !! FUNCTIONAL DESCRIPTION:
;    1214  1      !!
;    1215  1      !!      This routine performs Phase Three of the QA Error check.
;    1216  1      !!
;    1217  1      !! CALLER(S):
;    1218  1      !!
;    1219  1      !!      QA$Main
;    1220  1      !!
;    1221  1      !! FORMAL PARAMETERS:
;    1222  1      !!
;    1223  1      !!      Hook_Point : The point in the Supervisor from which this routine
;    1224  1      !!                   was called. This is a constant value. The constants are
;    1225  1      !!                   defined in the DSQA macro.
;    1226  1      !!
;    1227  1      !! IMPLICIT INPUTS:
;    1228  1      !!
;    1229  1      !!      NONE
;    1230  1      !!
;    1231  1      !! IMPLICIT OUTPUTS:
;    1232  1      !!
;    1233  1      !!      NONE
;    1234  1      !!
;    1235  1      !! COMPLETION CODES:
;    1236  1      !!
;    1237  1      !!      0 - QA error detected; unsuccessful return
;    1238  1      !!      1 - No QA errors; successful return
;    1239  1      !!
;    1240  1      !! SIDE EFFECTS:
;    1241  1      !!
;    1242  1      !!--
;    1243  1      !
;    1244  1      !BEGIN
;    1245  1      !       RETURN (QA$K_Failure)
;    1246  1      !END;
```

```
;   1248  1     %SBTTL 'End of Module QACHECKS'
;   1249  1
;   1250  0     END ELUDOM
```

```
;                                  PSECT SUMMARY
;
;       Name                    Bytes                        Attributes
;
;  DATA                           923  NOVEC,NOWRT,  RD ,NOEXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  CODE                          1182  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  WORK                             2  NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
```

Symbol	Type	Defined	Referenced ...										
$ASCIC	Unbound		204	223									
	Macro	Lib01	255	259	262	269	272	275	278	281	290	293	296
			301	304	307	310	313	417	537	673	839	953	
$DS_DSADEF	Macro	Lib01	97										
$DS_PRINTF	Unbound		206	223									
	Macro	Lib01	358	359	360	361	370	372	374	417	475	476	477
			478	488	490	492	537	599	600	601	602	612	614
			616	673	731	732	733	734	783	785	787	839	893
			894	895	896	905	907	909	953				
$DS_QADEF	Macro	Lib01	96										
$EQULST	Macro	Lib03	96	98	99								
$ER	Comptime	245											
$MODULE	Bind	245											
ASSERT	Macro	179											
ASSERT_STRING	MacrForm	179	184										
BOOLEAN	Macro	236											
CLEANUP_ERROR_MESSAGE	Bind	258	370a	488a	612a	783a	905a						
CLI$L_LAST	Macro	Lib02	745	774	801								
CLI$L_PASS	Macro	Lib02	480	604	747	775							
CLI$L_SUBT	Macro	Lib02	746	772									
CLI$L_TEST	Macro	Lib02	744	773	800								
CONDITION	MacrForm	179	183										
DEBUG	Macro	218											
DEBUG_STRING	MacrForm	218	223										
DS$GL_CLIBASE	External	124	473m	480=	589m	604=	718m	744=	745=	746=	747=	772=	773=
			774=	775=	800=	801=							
DS$GL_FSTTEST	External	120	773.	774.									
DS$GL_LSTTEST	External	121	925.										
DS$GL_SUBTEST	External	122	772.	812=									
DS$K_BBC	Literal	96											
DS$K_BBCC	Literal	96											
DS$K_BBCCI	Literal	96											
DS$K_BBCS	Literal	96											
DS$K_BBS	Literal	96											

Symbol	Type	Defined	Referenced ...										
DS$K_BBSC	Literal	96											
DS$K_BBSS	Literal	96											
DS$K_BBSSI	Literal	96											
DS$K_BCC_M	Literal	96											
DS$K_BCS_M	Literal	96											
DS$K_BEQLU_B	Literal	96											
DS$K_BEQLU_M	Literal	96											
DS$K_BEQL_B	Literal	96											
DS$K_BEQL_M	Literal	96											
DS$K_BERROR	Literal	96											
DS$K_BGEQU_B	Literal	96											
DS$K_BGEQU_M	Literal	96											
DS$K_BGEQ_B	Literal	96											
DS$K_BGEQ_M	Literal	96											
DS$K_BGTRU_B	Literal	96											
DS$K_BGTRU_M	Literal	96											
DS$K_BGTR_B	Literal	96											
DS$K_BGTR_M	Literal	96											
DS$K_BLBC	Literal	96											
DS$K_BLBS	Literal	96											
DS$K_BLEQU_B	Literal	96											
DS$K_BLEQU_M	Literal	96											
DS$K_BLEQ_B	Literal	96											
DS$K_BLEQ_M	Literal	96											
DS$K_BLSSU_B	Literal	96											
DS$K_BLSSU_M	Literal	96											
DS$K_BLSS_B	Literal	96	99										
DS$K_BLSS_M	Literal	96											
DS$K_BNEQU_B	Literal	96											
DS$K_BNEQU_M	Literal	96											
DS$K_BNEQ_B	Literal	96											
DS$K_BNEQ_M	Literal	96											
DS$K_BNERROR	Literal	96	99										
DS$K_BVC_M	Literal	96											
DS$K_BVS_M	Literal	96											
DS$K_DS_STARTING_LOCATION	Literal	99											
DS$PRINTF	ExtRout	358	358c	359e	359c	360e	360c	361e	361c	370e	370c	372e	372c
			374e	374c	417e	417c	475e	475c	476e	476c	477e	477c	478e
			478c	488e	488c	490e	490c	492e	492c	537e	537c	599e	599c
			600e	600c	601e	601c	602e	602c	612e	612c	614e	614c	616e
			616c	673e	673c	731e	731c	732e	732c	733e	733c	734e	734c
			783e	783c	785e	785c	787e	787c	839e	839c	893e	893c	894e
			894c	895e	895c	896e	896c	905e	905c	907e	907c	909e	909c
			953e	953c									
DSA$AL_APTMAIL	Bind	97	97										
DSA$GL_APTCOM	Bind	97											
DSA$GL_DEVLEN	Bind	97											
DSA$GL_DEVNAM	Bind	97											
DSA$GL_ERRNO	Bind	97											
DSA$GL_EVENT	Bind	97											
DSA$GL_FLAGS	Bind	97	385										
DSA$GL_MSGPTR	Bind	97											
DSA$GL_MSGTYP	Bind	97											
DSA$GL_PASSES	Bind	97											
DSA$GL_PASSNO	Bind	97											

Symbol	Type	Defined	Referenced ...				
DSA$GL_SECTNO	Bind	97					
DSA$GL_SID	Bind	97					
DSA$GL_SUBTNO	Bind	97					
DSA$GL_TESTNO	Bind	97	925				
DSA$GL_UNITS	Bind	97					
DSA$V_TRACE	Macro	Lib01	385				
DSQA	Macro	Lib02	98				
DSQA$K_DISPAT_AFTER_INIT	Literal	98	398	518	655	821	923
DSQA$K_DISPAT_BEFORE_INIT	Literal	98	397	517	654	820	934
DSQA$K_DISPAT_CALLTEST	Literal	98	399	519	635	822	935
DSQA$K_DISPAT_DONE_TESTS	Literal	98	402	522	658	810	938
DSQAK_DISPAT_DSXENDPASS_BGN	Literal	98	400	520	656	823	936
DSQAK_DISPAT_DSXENDPASS_END	Literal	98	401	521	657	824	937
DSQAK_DISPAT_DSXENDPASS_MID	Literal	98	383	501	622	793	915
DSQA$K_DISPAT_DS_CLEANUP_BGN	Literal	98					
DSQA$K_DISPAT_DS_CLEANUP_END	Literal	98					
DSQA$K_DUMMY_1	Literal	98					
DSQA$K_ERROR_ERROR_BGN	Literal	98	404	524	660	826	940
DSQA$K_ERROR_ERROR_END	Literal	98	367	485	609	780	902
DSQA$K_KERNEL_INIT_CONTEXT	Literal	98					
DSQAK_LOOP_DSXBGNSUB	Literal	98	406	526	662	828	942
DSQAK_LOOP_DSXCKLOOP	Literal	98	408	528	664	830	944
DSQAK_LOOP_DSXENDSUB	Literal	98	407	527	663	829	943
DSQAK_PARAM_DSXGETADDRESS	Literal	98					
DSQAK_PARAM_DSXGETDATA	Literal	98					
DSQAK_PARAM_DSXGETLOGICAL	Literal	98					
DSQAK_PARAM_DSXGETSTRING	Literal	98					
DSQAK_PARAM_DSXGETVIELD	Literal	98					
DSQAK_QA_DSXBRANCH	Literal	98	410	530	666	832	946
DSQA$K_START_BEFORE_HEADER	Literal	98					
DSQA$K_START_VRRESTART	Literal	98	356	470	586	722	886
DSQA$K_START_VRSTART	Literal	98					
DSX$ABORT	ExtRout	112					
DS_QADEFS	Macro	Lib02	99				
ERROR_REPORTED_MESSAGE	Bind	261	372a	490a	614a	785a	907a
ERROR_STRING	MacrForm	201	204				
ES	Unbound		204	206			
	Bind	417	417a				
	Bind	537	537a				
	Bind	673	673a				
	Bind	839	839a				
	Bind	953	953a				
EXPRESSION	MacrForm	236	237				
FALSE	Literal	99	645	737	738	806	
GET1ST_	Macro	Lib03	96	98	99		
GET2ND_	Unbound		96	98	99		
HEADER_LS	Bind	309	734a				
HEADER_LT	Bind	306	602a				
HEADER_MP	Bind	303	478a				
HEADER_NS	Bind	300	361a				
HEADER_RB	Bind	312	896a				
HOOK_POINT	RoutForm	317	354.				
	RoutForm	432	468.				
	RoutForm	545	584.				
	RoutForm	681	720.				

Symbol	Type	Defined	Referenced ...
	RoutForm	847	884.
INFINITE_SUBTEST_MESSAGE	Bind	277	787a
INFINITE_TEST_MESSAGE	Bind	274	616a
L$A_NAME	Literal	Lib01	359 476 600 732 894
L$L_REV	Literal	Lib01	359 476 600 732 894
L$L_UPDATE	Literal	Lib01	359 476 600 732 894
LOGIC_ERROR	Unbound		184
	Macro	201	417 537 673 839 953
LOOP_COUNTER	Own	582	596= 637. 639= 644= 644.
MODNAM	Macro	Lib02	245
MULTIPLE_PASS_MESSAGE	Bind	271	492a
NORMAL_START_MESSAGE	Bind	268	374a
NUL2ND_	Macro	Lib03	96 98 99
OFF	Literal	99	385 386 507 628 803 917
ON	Literal	99	387 508 629 804
QA$ADD_FORCED_ERROR	ExtRout	109	
QA$ADD_QA_ERROR	ExtRout	110	376c 494c 618c 789c 911c
QA$AOB_CHECK_STATE	External	135	386= 387= 507= 508= 628= 629= 803= 804= 917=
QA$AOB_FLAGS	Unbound		222
	External	136	597= 631= 640= 645= 729. 737= 738= 770= 806= 919=
QA$AOB_ROUTINE_STATE	External	134	363= 369. 377= 388= 481= 487. 495= 509= 605= 611. 619=
			630= 736= 782. 790= 805= 898= 904. 912= 918=
QA$FIND_USER_CALL_FRAME	ExtRout	107	
QA$K_ABORT_NOW	Literal	99	
QA$K_APT_PHASE_ONE	Literal	99	
QA$K_APT_PHASE_TWO	Literal	99	
QA$K_BAD_ADDRESS	Literal	99	
QA$K_CONTROL_C_CONT	Literal	99	
QA$K_DEALLOCATION	Literal	99	
QA$K_ERROR_PHASE_ONE	Literal	99	
QA$K_ERROR_PHASE_THREE	Literal	99	
QA$K_ERROR_PHASE_TWO	Literal	99	
QA$K_FAILURE	Literal	99	426 540 676 842 956
QA$K_FIRST_BRANCH_CODE	Literal	99	
QA$K_FIRST_TIME	Literal	99	631 729 737 919
QA$K_INIT_CONTEXT_DONE	Literal	99	
QA$K_LAST_BRANCH_CODE	Literal	99	
QA$K_LOOP_ON_SUBTEST	Literal	99	629 789 803
QA$K_LOOP_ON_TEST	Literal	99	508 618 628
QA$K_LOOP_TEST_DONE	Literal	99	597 640 645
QA$K_MEMORY_MANAGE	Literal	99	
QA$K_MULTIPLE_PASS	Literal	99	387 494 507
QA$K_NODEF	Literal	99	
QA$K_NORMAL_START	Literal	99	376 386
QA$K_NO_HEADER	Literal	99	738 770 806
QA$K_NUMBER_OF_CHECKS	Literal	99	
QA$K_NUMBER_QA_FLAGS	Literal	99	
QA$K_NUMB_ROUTINE_STATES	Literal	99	
QA$K_QA_DEBUG	Unbound		222
	Literal	99	
QA$K_QA_DONE	Literal	99	
QA$K_RUN_BACKWARDS	Literal	99	804 911 917
QA$K_SECTION	Literal	99	
QA$K_SUCCESS	Literal	99	364 389 412 482 510 532 606 632 647 668 777
			807 813 834 899 920 927 948

Symbol	Type	Defined	Referenced ...										
QA$LOOP_ON_SUBTEST	GlobRout	681	74f										
QA$LOOP_ON_TEST	GlobRout	545	73f										
QA$MULTIPLE_PASS	GlobRout	432	72f										
QA$NORMAL_START	GlobRout	317	71f										
QA$PRINT_FORCED_ERRORS	ExtRout	108											
QA$RUN_BACKWARDS	GlobRout	847	75f										
QA$T_HEADER_1	GlobBind	289	358a	475a	599a	731a	893a						
QA$T_HEADER_2	GlobBind	292	359a	476a	600a	732a	894a						
QA$T_HEADER_3	GlobBind	295	360a	477a	601a	733a	895a						
QA$T_OPERATOR_REQUEST_MESSAGE	GlobBind	254											
QA$V_CHECK_DONE	Literal	99	388	509	630	805	918						
QA$V_DOING_CLEANUP	Literal	99	369	487	611	782	904						
QA$V_ERROR_FOUND	Literal	99	377	495	619	790	912						
QA$V_INIT_DONE	Literal	99	363	481	605	736	898						
QA$W_BRANCH	External	138											
QA$W_ERROR_NUMBER	External	139											
QA$W_MULTIPLEPASS	External	128	480.										
QA$W_SAVE_LAST	External	141	801.										
QA$W_SAVE_TEST	External	140	744.	745.	800.								
QA$W_SUBTESTLOOPS	External	127	747.	775.									
QA$W_TESTLOOPS	External	126	637.										
RUN_BACKWARDS_MESSAGE	Bind	280	909a										
TRUE	Literal	99	363	377	388	481	495	509	597	605	619	630	631
			640	736	770	790	805	898	912	918	919		

CROSS REFERENCE MAP

Line #	Event	File ...
1	Source (start)	DISK$DS:[DS.LOCAL.RELEASE.WORK]QACHECKS.B32;1
6	Module QACHECKS	
83	Library #1	DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
86	Library #2	DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
89	Library #3	SYS$COMMON:[SYSLIB]LIB.L32;3
1250	Eludom QACHECKS	

KEY TO REFERENCE TYPE FLAGS

.	Fetch
=	Store
c	Routine call
a	Address use
@	Indirect use
e	External, external routine, or external literal declaration
f	Forward or forward routine declaration
h	Condition handler enabling
m	Map declaration
u	Undeclare declaration

; Library Statistics
;

```
;                                        -------- Symbols --------      Pages      Processing
;       File                             Total    Loaded   Percent      Mapped     Time
;
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
;                                          942         8         0          96        00:00.0
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
;                                          675         7         1          47        00:00.0
;  SYS$COMMON:[SYSLIB]LIB.L32;3          21522         3         0        1156        00:00.9




;                                    COMMAND QUALIFIERS

;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:QACHECKS.B32

; Size:         1182 code + 925 data bytes
; Run Time:        00:05.9
; Elapsed Time:    00:08.7
; Lines/CPU Min:   12820
; Lexemes/CPU-Min:113179
; Memory Used:  178 pages
; Compilation Complete
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element QAFLAGS.B32
;    0002  0      ! *1     6-FEB-1986 15:22:00 DS ""
;    0003  0      ! DEC/CMS REPLACEMENT HISTORY, Element QAFLAGS.B32
;    0004  0      %TITLE '*** Setting and Showing QA Flags'
;    0005  0      MODULE QAFLAGS (
;    0006  0                IDENT = '6.6-04'
;    0007  0                ) =
;    0008  0      !
;    0009  0      ! COPYRIGHT (c) 1979, 1981, 1983
;    0010  0      ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
;    0011  0      !
;    0012  0      ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
;    0013  0      ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
;    0014  0      ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
;    0015  0      ! MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
;    0016  0      ! EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
;    0017  0      ! TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
;    0018  0      ! REMAIN IN DEC.
;    0019  0      !
;    0020  0      ! THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
;    0021  0      ! AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
;    0022  0      ! CORPORATION.
;    0023  0      !
;    0024  0      ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
;    0025  0      ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
;    0026  0
;    0027  0      !++
;    0028  0      ! FACILITY: DIAGNOSTIC SUPERVISOR
;    0029  0      !
;    0030  0      ! ABSTRACT:
;    0031  0      !
;    0032  0      !       This module contains the routines required to SET and SHOW the
;    0033  0      !       various QA flags.
;    0034  0      !
;    0035  0      ! AUTHOR:
;    0036  0      !
;    0037  0      !       Jack Stansbury
;    0038  0      !
;    0039  0      ! CREATION DATE:
;    0040  0      !
;    0041  0      !       25-October-1981
;    0042  0      !
;    0043  0      ! MODIFIED:
;    0044  0      !
;    0045  0      !       01      Jack Stansbury, 21-Nov-1981, Version 6.5
;    0046  0      !               Added INITIAL attributes to the flag word storage.
;    0047  0      !
;    0048  0      !       02      Jack Stansbury, 14-Jan-1982, Version 6.6
;    0049  0      !               Changed the lower limit on the QASUBTESTLOOPS DS flag from
;    0050  0      !               1 to 2. This makes the Loop_On_Subtest routine much easier.
;    0051  0      !               Also changed the Out of Range message to say "greater than or
;    0052  0      !               equal to" rather than just "greater than".
;    0053  0      !
;    0054  0      !       03      Jack Stansbury, 20-Jan-1983, Version 6.11
;    0055  0      !               Took out all references to CkLoopLoops and ErrorPrints.
;    0056  0      !
;    0057  0      !       04      Bob Bergazzi    May 17, 1983    Version 6.11
```

```
;   0058  0     !               Changed the order of searching libraries.
;   0059  0     !--
```

```
;    0061  1     BEGIN
;    0062  1     %SBTTL  'Libraries'
;    0063  1     !
;    0064  1     ! LIBRARIES:
;    0065  1     !
;    0066  1
;    0067  1     LIBRARY '$DIAG';                    !                                   [04]
;    0068  1
;    0069  1     LIBRARY '$DS';                      !                                   [04]
;    0070  1
;    0071  1     LIBRARY 'SYS$LIBRARY:LIB';
```

```
;    0073  1      %SBTTL  'Table of Contents'
;    0074  1      !
;    0075  1      ! TABLE OF CONTENTS:
;    0076  1      !
;    0077  1
;    0078  1      FORWARD ROUTINE
;    0079  1              VRSetQA         : JSB_CLI,
;    0080  1              VRShowQA        : JSB_CLI;
```

```
;    0082  1      %SBTTL  'Psect Definitions'
;    0083  1      !
;    0084  1      ! PSECT DEFINITIONS:
;    0085  1      !
;    0086  1
;    0087  1      PSECT
;    0088  1              Plit   = Data (NoExecute, Share, NoWrite,
;    0089  1                             Addressing_Mode (Long_Relative));
;    0090  1
;    0091  1      PSECT
;    0092  1              Code   = Code (Execute, Share, NoWrite);
;    0093  1
;    0094  1      PSECT
;    0095  1              Own    = Work (NoExecute, NoShare, Write,
;    0096  1                             Addressing_Mode (Long_Relative));
;    0097  1
;    0098  1      PSECT
;    0099  1              Global = Work (NoExecute, NoShare, Write,
;    0100  1                             Addressing_Mode (Long_Relative));
```

```
;    0102  1      %SBTTL  'Literals'
;    0103  1      !
;    0104  1      ! MODULE-GLOBAL LITERALS:
;    0105  1      !
;    0106  1      LITERAL
;    0107  1              QA$K_TestLoops_Def      = 100,          ! Defaults for the 5 QA flags
;    0108  1              QA$K_SubtestLoops_Def   = 100,
;    0109  1              QA$K_MultiplePass_Def   = 10,
;    0110  1
;    0111  1              QA$K_Success            = 1,            ! Routine Success or
;    0112  1              QA$K_Failure            = 0;            !   Failure
;    0113  1
;    0114  1      LITERAL
;    0115  1              !+
;    0116  1              ! Shorthand forms for the QA flags
;    0117  1              !
;    0118  1              !       TL => TestLoops
;    0119  1              !       SL => SubtestLoops
;    0120  1              !       MP => MultiplePass
;    0121  1              !-
;    0122  1
;    0123  1              QATL_Low        = 1,    ! Lower limit of QATESTLOOPS
;    0124  1              QATL_High       = 32767,! Upper limit of QATESTLOOPS
;    0125  1
;    0126  1              QASL_Low        = 2,    ! Lower limit of QASUBTESTLOOPS                 [02]
;    0127  1              QASL_High       = 32767,! Upper limit of QASUBTESTLOOPS
;    0128  1
;    0129  1              QAMP_Low        = 1,    ! Lower limit of QAMULTIPLEPASS
;    0130  1              QAMP_High       = 32767;! Upper limit of QAMULTIPLEPASS
;    0131  1
```

```
;    0133  1     %SBTTL  'Static Storage'
;    0134  1     !
;    0135  1     ! MODULE-GLOBAL DECLARATIONS:
;    0136  1     !
;    0137  1
;    0138  1     GLOBAL
;    0139  1             !+
;    0140  1             ! For storing the current values of the QA flags.
;    0141  1             !-
;    0142  1
;    0143  1             QA$W_TestLoops          : WORD INITIAL (QA$K_TestLoops_Def),
;    0144  1             QA$W_SubtestLoops       : WORD INITIAL (QA$K_SubtestLoops_Def),
;    0145  1             QA$W_MultiplePass       : WORD INITIAL (QA$K_MultiplePass_Def);
```

```
;    0147  1     %SBTTL  'Global Bindings'
;    0148  1     !
;    0149  1     ! Module-Global Bindings
;    0150  1     !
;    0151  1     BIND
;    0152  1             QAMP_Out = $ASCIC ('QAMULTIPLEPASS'),
;    0153  1             QATL_Out = $ASCIC ('QATESTLOOPS'),
;    0154  1             QASL_Out = $ASCIC ('QASUBTESTLOOPS');
```

```
;    0156  1      %SBTTL 'VRSetQA'
;    0157  1
;    0158  1      GLOBAL ROUTINE VRSetQA (Cli_Base) : JSB_CLI =
;    0159  1
;    0160  1      !++
;    0161  1      ! FUNCTIONAL DESCRIPTION:
;    0162  1      !
;    0163  1      !       This routine is called from the CLI module. It sets the specified
;    0164  1      !       QA flag to the requested value (within limits).
;    0165  1      !
;    0166  1      ! CALLER(S):
;    0167  1      !
;    0168  1      !       CLI
;    0169  1      !
;    0170  1      ! FORMAL PARAMETERS:
;    0171  1      !
;    0172  1      !       R2 - Points to the CLI data table base.
;    0173  1      !
;    0174  1      ! IMPLICIT INPUTS:
;    0175  1      !
;    0176  1      !       Cli_Base [CLI$L_FLAGS] - Indicates which flag to change.
;    0177  1      !       Cli_Base [CLI$L_DATA]  - Indicates the new desired value of the flag.
;    0178  1      !
;    0179  1      ! IMPLICIT OUTPUTS:
;    0180  1      !
;    0181  1      !       New value(s) for the QAx variables declared above.
;    0182  1      !
;    0183  1      ! COMPLETION CODES:
;    0184  1      !
;    0185  1      !       0 - Failure, value out of range.
;    0186  1      !       1 - Success.
;    0187  1      !
;    0188  1      ! SIDE EFFECTS:
;    0189  1      !
;    0190  1      !       Changes the value of the specifed flag, iff the value requested is
;    0191  1      !       within range.
;    0192  1      !--
```

```
;    0194  1
;    0195  2     BEGIN
;    0196  2             MAP
;    0197  2                     Cli_Base : REF BLOCK [, BYTE];
;    0198  2
;    0199  2             LOCAL
;    0200  2                     New_Value;
;    0201  2
;    0202  2             BIND
;    0203  2                     Out_Of_Range_Message =
;    0204  2                             $ASCIC ('!AC must be greater than or equal to !UW and less than or equal to !UW.!/');   !
;    0205  2
;    0206  2             MACRO
; M  0207  2                     Check_Case (Short_Name, Data_Name, Cli_Name) =
; M  0208  2                             [.Cli_Base [%NAME ('CLI$V_', Cli_Name)]]:
; M  0209  2                                     IF (
; M  0210  2                                        (.New_Value LSS %NAME (Short_Name, '_Low'))
; M  0211  2                                       OR
; M  0212  2                                        (.New_Value GTR %NAME (Short_Name, '_High'))
; M  0213  2                                        )
; M  0214  2                                     THEN
; M  0215  2                                             BEGIN
; M  0216  2                                             $DS_PRINTF (
; M  0217  2                                                     Out_Of_Range_Message,
; M  0218  2                                                     %NAME (Short_Name, '_Out'),
; M  0219  2                                                     %NAME (Short_name, '_Low'),
; M  0220  2                                                     %NAME (Short_Name, '_High')
; M  0221  2                                                         );
; M  0222  2                                             RETURN (QA$K_Failure)
; M  0223  2                                             END
; M  0224  2                                     ELSE
; M  0225  2                                             Data_Name = .New_Value
;    0226  2                             %;
```

```
;    0228  2
;    0229  2              New_Value = .Cli_Base [CLI$L_DATA];
;    0230  2
;    0231  2              SELECTONE 1 OF
;    0232  2                      SET
;    0233  2                      Check_Case (QATL, QA$W_TestLoops,    QATestLoops);
;    0234  2                      Check_Case (QASL, QA$W_SubtestLoops, QASubtestLoops);
;    0235  2                      Check_Case (QAMP, QA$W_MultiplePass, QAMultiplePass);
;    0236  2                      [.Cli_Base [CLI$V_DEFAULT]]:
;    0237  2                              !
;    0238  2                              ! Set all of them to their defaults:
;    0239  2                              !
;    0240  3                              BEGIN
;    0241  3                              QA$W_TestLoops    = QA$K_TestLoops_Def;
;    0242  3                              QA$W_SubtestLoops = QA$K_SubtestLoops_Def;
;    0243  3                              QA$W_MultiplePass = QA$K_MultiplePass_Def
;    0244  3                              END
;    0245  2                      TES;
;    0246  2
;    0247  3              RETURN (QA$K_Success)
;    0248  1      END;


                                                                .TITLE  QAFLAGS *** Setting and Showing QA Flags
                                                                .IDENT  \6.6-04\

                                                                .PSECT  WORK,NOEXE,2

                                                        0064  00000 QA$W_TESTLOOPS::
                                                                .WORD   100                                     ;
                                                        0064  00002 QA$W_SUBTESTLOOPS::
                                                                .WORD   100                                     ;
                                                        000A  00004 QA$W_MULTIPLEPASS::
                                                                .WORD   10                                      ;

                                                                .PSECT  DATA,NOWRT,NOEXE,  SHR,2

53  53  41  50  45  4C  50  49  54  4C  55  4D  41  51  0E  00000 P.AAA:   .ASCII  <14>\QAMULTIPLEPASS\                     ;
            53  50  4F  4F  4C  54  53  45  54  41  51  0B  0000F P.AAB:   .ASCII  <11>\QATESTLOOPS\                      ;
53  50  4F  4F  4C  54  53  45  54  42  55  53  41  51  0E  0001B P.AAC:   .ASCII  <14>\QASUBTESTLOOPS\                   ;
72  67  20  65  62  20  74  73  75  6D  20  43  41  21  49  0002A P.AAD:   .ASCII  \I!AC must be greater than or equal to !U\  ;
65  20  72  6F  20  6E  61  68  74  20  72  65  74  61  65  00039                                                       ;
                    55  21  20  6F  74  20  6C  61  75  71  00048                                                       ;
6E  61  68  74  20  73  73  65  6C  20  64  6E  61  20  57  00052           .ASCII  \W and less than or equal to !UW.!/\          ;
55  21  20  6F  74  20  6C  61  75  71  65  20  72  6F  20  00061                                                       ;
                                        2F  21  2E  57  00070                                                       ;

                                                        QAMP_OUT=               P.AAA
                                                        QATL_OUT=               P.AAB
                                                        QASL_OUT=               P.AAC
                                                        OUT_OF_RANGE_MESSAGE=
                                                                                P.AAD
                                                                .EXTRN  DS$PRINTF

                                                                .PSECT  CODE,NOWRT,  SHR,2

                                                        53  DD  00000 VRSETQA::
```

```
                                                                 PUSHL   R3                                              ; 0158
                                53        1C    A2  D0 00002      MOVL    28(CLI_BASE), NEW_VALUE                         ; 0229
                          23    62              1D  E1 00006      BBC     #29, (CLI_BASE), 3$                             ; 0233
                                                09  15 0000A      BLEQ    1$                                              ;
                             00007FFF   8F       53  D1 0000C      CMPL    NEW_VALUE, #32767                               ;
                                                0F  15 00013      BLEQ    2$                                              ;
                                7E      7FFF    8F  3C 00015 1$:  MOVZWL  #32767, -(SP)                                  ;
                                                01  DD 0001A      PUSHL   #1                                              ;
                                    00000000'   EF  9F 0001C      PUSHAB  QATL_OUT                                        ;
                                                51  11 00022      BRB     8$                                              ;
                             00000000'  EF              53  B0 00024 2$:  MOVW    NEW_VALUE, QA$W_TESTLOOPS               ;
                                                76  11 0002B      BRB     11$                                             ; 0231
                          26    62              1E  E1 0002D 3$:  BBC     #30, (CLI_BASE), 6$                             ; 0234
                                02              53  D1 00031      CMPL    NEW_VALUE, #2                                   ;
                                                09  19 00034      BLSS    4$                                              ;
                             00007FFF   8F       53  D1 00036      CMPL    NEW_VALUE, #32767                               ;
                                                0F  15 0003D      BLEQ    5$                                              ;
                                7E      7FFF    8F  3C 0003F 4$:  MOVZWL  #32767, -(SP)                                  ;
                                                02  DD 00044      PUSHL   #2                                              ;
                                    00000000'   EF  9F 00046      PUSHAB  QASL_OUT                                        ;
                                                27  11 0004C      BRB     8$                                              ;
                             00000000'  EF              53  B0 0004E 5$:  MOVW    NEW_VALUE, QA$W_SUBTESTLOOPS            ;
                                                4C  11 00055      BRB     11$                                             ; 0231
                                                62  D5 00057 6$:  TSTL    (CLI_BASE)                                      ; 0235
                                                32  18 00059      BGEQ    10$                                             ;
                                                53  D5 0005B      TSTL    NEW_VALUE                                       ;
                                                09  15 0005D      BLEQ    7$                                              ;
                             00007FFF   8F       53  D1 0005F      CMPL    NEW_VALUE, #32767                               ;
                                                1C  15 00066      BLEQ    9$                                              ;
                                7E      7FFF    8F  3C 00068 7$:  MOVZWL  #32767, -(SP)                                  ;
                                                01  DD 0006D      PUSHL   #1                                              ;
                                    00000000'   EF  9F 0006F      PUSHAB  QAMP_OUT                                        ;
                                    00000000'   EF  9F 00075 8$:  PUSHAB  OUT_OF_RANGE_MESSAGE                            ;
                          00000000G     9F              04  FB 0007B      CALLS   #4, a#DS$PRINTF                         ;
                                                24  11 00082      BRB     12$                                             ;
                             00000000'  EF              53  B0 00084 9$:  MOVW    NEW_VALUE, QA$W_MULTIPLEPASS            ;
                                                16  11 0008B      BRB     11$                                             ; 0231
                       12       62              0C  E1 0008D 10$: BBC     #12, (CLI_BASE), 11$                            ; 0236
                             00000000'  EF  00640064    8F  D0 00091      MOVL    #6553700, QA$W_TESTLOOPS                ; 0241
                             00000000'  EF              0A  B0 0009C      MOVW    #10, QA$W_MULTIPLEPASS                  ; 0243
                                50              01  D0 000A3 11$:  MOVL    #1, R0                                          ; 0247
                                                02  11 000A6      BRB     13$                                             ;
                                                50  D4 000A8 12$:  CLRL    R0                                              ;
                                                08  BA 000AA 13$:  POPR    #^M<R3>                                         ;
                                                    05 000AC      RSB                                                     ;

; Routine Size:  173 bytes,    Routine Base:  CODE + 0000

;   0249  1
```

```
;    0251  1      %SBTTL 'VRShowQA'
;    0252  1
;    0253  1      GLOBAL ROUTINE VRShowQA (Cli_Base) : JSB_CLI =
;    0254  1
;    0255  1      !++
;    0256  1      ! FUNCTIONAL DESCRIPTION:
;    0257  1      !
;    0258  1      !       This global routine is called from the CLI module. It shows the
;    0259  1      !       current value of the specified QA flag.
;    0260  1      !
;    0261  1      ! CALLER(S):
;    0262  1      !
;    0263  1      !       CLI
;    0264  1      !
;    0265  1      ! FORMAL PARAMETERS:
;    0266  1      !
;    0267  1      !       R2 - Points to the CLI data-table base.
;    0268  1      !
;    0269  1      ! IMPLICIT INPUTS:
;    0270  1      !
;    0271  1      !       Cli_Base [CLI$L_FLAGS] - Indicates which flag to "SHOW".
;    0272  1      !
;    0273  1      ! IMPLICIT OUTPUTS:
;    0274  1      !
;    0275  1      !       NONE
;    0276  1      !
;    0277  1      ! COMPLETION CODES:
;    0278  1      !
;    0279  1      !       1 - Success.
;    0280  1      !
;    0281  1      ! SIDE EFFECTS:
;    0282  1      !
;    0283  1      !       NONE
;    0284  1      !--
```

```
;    0286  1
;    0287  2     BEGIN
;    0288  2             MAP
;    0289  2                 Cli_Base : REF BLOCK [, BYTE];
;    0290  2
;    0291  2             BIND
;    0292  2                 Output_String   = $ASCIC ('!AC is set to !UW.!/'),
;    0293  2                 Default_String  = $ASCIC ('The default for !AC is !UW.!/');
;    0294  2
;    0295  2
;    0296  2             MACRO
; M  0297  2                 Check_Case (Short_Name, Data_Name, Cli_Name) =
; M  0298  2                     [.Cli_Base [%NAME ('CLI$V_', Cli_Name)]]:
; M  0299  2                         $DS_PRINTF (Output_String,
; M  0300  2                                     %NAME (Short_Name, '_Out'),
; M  0301  2                                     .Data_Name)
;    0302  2                 %;
```

```
;   0304  2
;   0305  2              SELECTONE 1 OF
;   0306  2                      SET
;   0307  2                      Check_Case (QATL, QA$W_TestLoops,    QATestLoops);
;   0308  2                      Check_Case (QASL, QA$W_SubtestLoops, QASubtestLoops);
;   0309  2                      Check_Case (QAMP, QA$W_MultiplePass, QAMultiplePass);
;   0310  2                      [.Cli_Base [CLI$V_DEFAULT]]:
;   0311  3                              BEGIN
; P 0312  3                              $DS_PRINTF (Default_String, QAMP_Out,
;   0313  3                                          QA$K_MultiplePass_Def);
;   0314  3
; P 0315  3                              $DS_PRINTF (Default_String, QATL_Out,
;   0316  3                                          QA$K_TestLoops_Def);
;   0317  3
; P 0318  3                              $DS_PRINTF (Default_String, QASL_Out,
;   0319  4                                          QA$K_SubtestLoops_Def)
;   0320  2                              END;
;   0321  2                      TES;
;   0322  2
;   0323  3              RETURN (QA$K_Success)
;   0324  1      END;


                                                                  .PSECT  DATA,NOWRT,NOEXE,  SHR,2

20  6F  74  20  74  65  73  20  73  69  20  43  41  21  14  00074 P.AAE:  .ASCII  <20>\!AC is set to !UW.!/\                ;
                                    2F  21  2E  57  55  21  00083                                                          ;
6F  66  20  74  6C  75  61  66  65  64  20  65  68  54  1D  00089 P.AAF:  .ASCII  <29>\The default for !AC is !UW.!/\        ;
2F  21  2E  57  55  21  20  73  69  20  43  41  21  20  72  00098                                                          ;

                                                                OUTPUT_STRING=      P.AAE
                                                                DEFAULT_STRING=     P.AAF


                                                                  .PSECT  CODE,NOWRT,  SHR,2

                    0F          62          1D  E1 00000 VRSHOWQA::
                                                                  BBC     #29, (CLI_BASE), 1$                        ; 0307
                                7E 00000000'  EF  3C 00004        MOVZWL  QA$W_TESTLOOPS, -(SP)                      ;
                                   00000000'  EF  9F 0000B        PUSHAB  QATL_OUT                                   ;
                                              24  11 00011        BRB     3$                                         ;
                    0F          62          1E  E1 00013 1$:    BBC     #30, (CLI_BASE), 2$                        ; 0308
                                7E 00000000'  EF  3C 00017        MOVZWL  QA$W_SUBTESTLOOPS, -(SP)                   ;
                                   00000000'  EF  9F 0001E        PUSHAB  QASL_OUT                                   ;
                                              11  11 00024        BRB     3$                                         ;
                                              62  D5 00026 2$:    TSTL    (CLI_BASE)                                 ; 0309
                                              15  18 00028        BGEQ    4$                                         ;
                                7E 00000000'  EF  3C 0002A        MOVZWL  QA$W_MULTIPLEPASS, -(SP)                   ;
                                   00000000'  EF  9F 00031        PUSHAB  QAMP_OUT                                   ;
                                   00000000'  EF  9F 00037 3$:    PUSHAB  OUTPUT_STRING                              ;
                                              40  11 0003D        BRB     5$                                         ;
                    43          62          0C  E1 0003F 4$:    BBC     #12, (CLI_BASE), 6$                        ; 0310
                                              0A  DD 00043        PUSHL   #10                                        ; 0313
                                   00000000'  EF  9F 00045        PUSHAB  QAMP_OUT                                   ;
                                   00000000'  EF  9F 0004B        PUSHAB  DEFAULT_STRING                             ;
                       00000000G  9F          03  FB 00051        CALLS   #3, a#DS$PRINTF                            ;
```

```
                        7E        64   8F  9A 00058          MOVZBL  #100, -(SP)                          ; 0316
                           00000000'   EF  9F 0005C          PUSHAB  QATL_OUT                             ;
                           00000000'   EF  9F 00062          PUSHAB  DEFAULT_STRING                       ;
                 00000000G 9F          03  FB 00068          CALLS   #3, a#DS$PRINTF                      ;
                        7E        64   8F  9A 0006F          MOVZBL  #100, -(SP)                          ; 0319
                           00000000'   EF  9F 00073          PUSHAB  QASL_OUT                             ;
                           00000000'   EF  9F 00079          PUSHAB  DEFAULT_STRING                       ;
                 00000000G 9F          03  FB 0007F 5$:      CALLS   #3, a#DS$PRINTF                      ;
                        50             01  D0 00086 6$:      MOVL    #1, R0                               ; 0323
                                           05 00089          RSB                                          ;

; Routine Size:  138 bytes,    Routine Base:  CODE + 00AD
```

```
;   0326  1     %SBTTL 'End of Module QAFLAGS'
;   0327  1
;   0328  0     END ELUDOM



;                                  PSECT SUMMARY
;
;       Name                    Bytes                          Attributes
;
;  WORK                              6  NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  DATA                            167  NOVEC,NOWRT,  RD ,NOEXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  CODE                            311  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)



Symbol                  Type  Defined  Referenced ...
--------------------- -------- ----- ----------------
$ASCIC                Macro    Lib01   152     153     154     204     292     293
$DS_PRINTF            Unbound          216     299
                      Macro    Lib01   233     234     235     307     308     309     312     315     318
CHECK_CASE            Macro      207   233     234     235
                      Macro      297   307     308     309
CLI$L_DATA            Macro    Lib02   229
CLI$V_DEFAULT         Macro    Lib02   236     310
CLI$V_QAMULTIPLEPASS  Macro    Lib02   235     309
CLI$V_QASUBTESTLOOPS  Macro    Lib02   234     308
CLI$V_QATESTLOOPS     Macro    Lib02   233     307
CLI_BASE              Unbound          208     298
                      RoutForm   158   197m    229a.   233a.   234a.   235a.   236a.
                      RoutForm   253   289m    307a.   308a.   309a.   310a.
CLI_NAME              MacrForm   207   208
                      MacrForm   297   298
DATA_NAME             MacrForm   207   225
                      MacrForm   297   301
DEFAULT_STRING        Bind       293   313a    316a    319a
DS$PRINTF             ExtRout    233   233c    234e    234c    235e    235c    307e    307c    308e    308c    309e    309c    313e
                                       313c    316e    316c    319e    319c
JSB_CLI               Linkage  Lib02    79      80     158     253
NEW_VALUE             Unbound          210     212     225
                      Local      200   229=    233.    234.    235.
OUTPUT_STRING         Unbound          299
                      Bind       292   307a    308a    309a
OUT_OF_RANGE_MESSAGE  Unbound          217
                      Bind       203   233a    234a    235a
QA$K_FAILURE          Unbound          222
                      Literal    112   233     234     235
QA$K_MULTIPLEPASS_DEF Literal    109   145     243     313
QA$K_SUBTESTLOOPS_DEF Literal    108   144     242     319
QA$K_SUCCESS          Literal    111   247     323
QA$K_TESTLOOPS_DEF    Literal    107   143     241     316
QA$W_MULTIPLEPASS     Global     145   145=    235=    243=    309.
```

Symbol	Type	Defined	Referenced ...				
QA$W_SUBTESTLOOPS	Global	144	144=	234=	242=	308.	
QA$W_TESTLOOPS	Global	143	143=	233=	241=	307.	
QAMP_HIGH	Literal	130	235				
QAMP_LOW	Literal	129	235				
QAMP_OUT	Bind	152	235a	309a	313a		
QASL_HIGH	Literal	127	234				
QASL_LOW	Literal	126	234				
QASL_OUT	Bind	154	234a	308a	319a		
QATL_HIGH	Literal	124	233				
QATL_LOW	Literal	123	233				
QATL_OUT	Bind	153	233a	307a	316a		
SHORT_NAME	MacrForm	207	210	212	218	219	220
	MacrForm	297	300				
VRSETQA	GlobRout	158	79f				
VRSHOWQA	GlobRout	253	80f				

CROSS REFERENCE MAP

Line #	Event	File ...
1	Source (start)	DISK$DS:[DS.LOCAL.RELEASE.WORK]QAFLAGS.B32;1
5	Module QAFLAGS	
67	Library #1	DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
69	Library #2	DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
71	Library #3	SYS$COMMON:[SYSLIB]LIB.L32;3
328	Eludom QAFLAGS	

KEY TO REFERENCE TYPE FLAGS

.	Fetch
=	Store
c	Routine call
a	Address use
a	Indirect use
e	External, external routine, or external literal declaration
f	Forward or forward routine declaration
h	Condition handler enabling
m	Map declaration
u	Undeclare declaration

Library Statistics

File	Symbols Total	Symbols Loaded	Symbols Percent	Pages Mapped	Processing Time
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1	942	2	0	96	00:00.0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1	675	6	0	47	00:00.0
SYS$COMMON:[SYSLIB]LIB.L32;3	21522	0	0	1156	00:00.8

```
;                                       COMMAND QUALIFIERS

;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:QAFLAGS.B32

; Size:         311 code + 173 data bytes
; Run Time:        00:02.1
; Elapsed Time:    00:04.6
; Lines/CPU Min:    9371
; Lexemes/CPU-Min: 54085
; Memory Used:  99 pages
; Compilation Complete
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element QAMAIN.B32
;    0002  0      ! *1     6-FEB-1986 15:22:02 DS ""
;    0003  0      ! DEC/CMS REPLACEMENT HISTORY, Element QAMAIN.B32
;    0004  0      %TITLE '*** QA Routines'
;    0005  0      MODULE QAMAIN (
;    0006  0                ADDRESSING_MODE (EXTERNAL = LONG_RELATIVE),
;    0007  0                IDENT = '1-08'
;    0008  0                ) =
;    0009  0      !
;    0010  0      ! COPYRIGHT (c) 1979, 1981, 1983
;    0011  0      ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
;    0012  0      !
;    0013  0      ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
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;    0015  0      ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
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;    0027  0      !
;    0028  0      !++
;    0029  0      ! FACILITY:
;    0030  0      !
;    0031  0      !       DIAGNOSTIC SUPERVISOR
;    0032  0      !
;    0033  0      ! ABSTRACT:
;    0034  0      !
;    0035  0      !       This module contains the support routines required to perform QA on diagnostic programs.
;    0036  0      !
;    0037  0      ! AUTHOR:
;    0038  0      !
;    0039  0      !       Jack Stansbury
;    0040  0      !
;    0041  0      ! CREATION DATE:
;    0042  0      !
;    0043  0      !               15-October-1981, Version 6.5-00
;    0044  0      !       00      Put in code for all the support routines plus the following check routines: QA$Normal_Start,
;    0045  0      !               QA$Multiple_Pass, QA$Loop_On_Test, QA$Run_Backwards.
```

```
;    0047  0      ! MODIFIED:
;    0048  0      !
;    0049  0      !       01      Jack Stansbury, 14-December-1981, Version 6.6
;    0050  0      !               Added remaining QA check routines. Split QA.B32 into two different modules: QAMAIN.B32
;    0051  0      !               (this one) and QACHECKS.B32. While this one contains the support routines, the latter contains
;    0052  0      !               the actual check routines.
;    0053  0      !
;    0054  0      !       02      Jack Stansbury, 5-Jan-1982, Version 6.6
;    0055  0      !               Changed the code in QA$Dump to not print R0 and R1 in the register dump. There is no need to
;    0056  0      !               print these since they are not saved by the CALLx instructions.
;    0057  0      !
;    0058  0      !       03      Jack Stansbury, 1-Feb-1982, Version 6.6
;    0059  0      !               Released the three Supervisors to BSDE to find bugs. This includes all the check routine up to
;    0060  0      !               and including the Error Phase One check.
;    0061  0      !
;    0062  0      !       04      Jack Stansbury, 1-Feb-1982, Version 6.6
;    0063  0      !               Changed the headings on the two table printouts to make the table name more distinctive.
;    0064  0      !
;    0065  0      !       05      Jack Stansbury, 11-Feb-1982, Version 6.6X
;    0066  0      !               Changed the DSX$Branch routine so as to make it compatible with Sam Duncan! He wanted R0 saved
;    0067  0      !               across the branch macro code expansion, so I made significant changes to both the branch macros
;    0068  0      !               (in DIAG.*) and to this branch routine. All of that just for Sam!
;    0069  0      !
;    0070  0      !       06      Jack Stansbury, 27-July-1982, Version 6.9
;    0071  0      !               Changed the spelling of the VDS ^C handler variable.
;    0072  0      !
;    0073  0      !       07      Jack Stansbury, 19-Jan-1983, Version 6.10 (?)
;    0074  0      !               Took out all the references to any of the checks above the Run Backwards check. This
;    0075  0      !               includes taking out the previously entered Error Phase One check. It doesn't work
;    0076  0      !               properly with subroutines in diagnostic programs.
;    0077  0      !
;    0078  0      !       08      Bob Bergazzi    May 17, 1983    Version 6.11
;    0079  0      !               Changed the order of searching libraries.
;    0080  0      !--
```

```
;    0082  0     %SBTTL  'Linkage Definitions'
;    0083  1     BEGIN
;    0084  1     !
;    0085  1     ! LINKAGE DEFINITIONS
;    0086  1     !
;    0087  1
;    0088  1     LINKAGE
;    0089  1             !+
;    0090  1             ! For the DSX$Branch routine, the last three parameters are passed in the STANDARD manner. That is      [05]
;    0091  1             ! by an offset to the AP on the stack. The first parameter passed is general register R0. Also,         [05]
;    0092  1             ! register R1 should be preserved in the routine. DSX$Branch is defined to be a VALUE routine also, so  [05]
;    0093  1             ! that values can be returned in R0. This is not compatible with the VAX calling standard however.     [05]
;    0094  1             !-
;    0095  1             Call_DSX$Branch = CALL (REGISTER=0, STANDARD, STANDARD, STANDARD) : PRESERVE (1);                !      [05]
```

```
;    0097  1     %SBTTL  'Table of Contents'
;    0098  1     !
;    0099  1     ! TABLE OF CONTENTS:
;    0100  1     !
;    0101  1
;    0102  1     FORWARD ROUTINE
;    0103  1             DSX$Branch                  :             ADDRESSING_MODE (LONG_RELATIVE) Call_DSX$Branch,        !       [05]
;    0104  1             QA$Abort_QA                 :  NOVALUE    ADDRESSING_MODE (LONG_RELATIVE),        !               [02]
;    0105  1             QA$Add_Forced_Error         :  NOVALUE    ADDRESSING_MODE (LONG_RELATIVE),        !               [02]
;    0106  1             QA$Add_QA_Error             :  NOVALUE    ADDRESSING_MODE (LONG_RELATIVE),
;    0107  1             QA$Control_C_Handler        :             ADDRESSING_MODE (LONG_RELATIVE),        !               [06]
;    0108  1             QA$Dump                     :  NOVALUE    ADDRESSING_MODE (LONG_RELATIVE),
;    0109  1             QA$Find_User_Call_Frame     :             ADDRESSING_MODE (LONG_RELATIVE),
;    0110  1             QA$Init                     :  NOVALUE    ADDRESSING_MODE (LONG_RELATIVE),
;    0111  1             QA$Main                     :  NOVALUE    ADDRESSING_MODE (LONG_RELATIVE),
;    0112  1             QA$Print_Forced_Errors      :  NOVALUE    ADDRESSING_MODE (LONG_RELATIVE),        !               [02]
;    0113  1             QA$Print_Overall_Errors     :  NOVALUE    ADDRESSING_MODE (LONG_RELATIVE);        !               [02]
```

```
;    0115  1      %SBTTL  'Libraries'
;    0116  1      !
;    0117  1      ! LIBRARIES:
;    0118  1      !
;    0119  1
;    0120  1      LIBRARY
;    0121  1              '$DIAG';                    !                                   [08]
;    0122  1
;    0123  1      LIBRARY
;    0124  1              '$DS';                      !                                   [08]
;    0125  1
;    0126  1      LIBRARY
;    0127  1              'SYS$LIBRARY:LIB';
```

```
;    0129  1     %SBTTL  'Included Macros and Literals'
;    0130  1     !
;    0131  1     ! INCLUDED MACROS AND LITERALS
;    0132  1     !
;    0133  1
;    0134  1             $DS_QADEF;                      ! Define the branch-codes.
;    0135  1             $DS_DSADEF;                     ! Define DSA flags
;    0136  1             DSQA;                           ! The DSQA$K_ constants for the routine/label names.
;    0137  1             DS_QADEFS;                      ! Common QA definitions like QA$K_.
```

```
;    0139  1     %SBTTL  'External Routines'
;    0140  1     !
;    0141  1     ! EXTERNAL ROUTINE REFERENCES:
;    0142  1     !
;    0143  1
;    0144  1     EXTERNAL ROUTINE
;    0145  1
;    0146  1             QA$Normal_Start         :             ADDRESSING_MODE (LONG_RELATIVE),
;    0147  1             QA$Multiple_Pass        :             ADDRESSING_MODE (LONG_RELATIVE),
;    0148  1             QA$Loop_On_Test         :             ADDRESSING_MODE (LONG_RELATIVE),
;    0149  1             QA$Loop_On_Subtest      :             ADDRESSING_MODE (LONG_RELATIVE),      !                    [01]
;    0150  1             QA$Run_Backwards        :             ADDRESSING_MODE (LONG_RELATIVE),
;    0151  1
;    0152  1             EXE$AloNonPaged         : JSB_ALLOC   ADDRESSING_MODE (LONG_RELATIVE),      !                    [01]
;    0153  1             EXE$DeaNonPaged         : JSB_DEALL   ADDRESSING_MODE (LONG_RELATIVE),      !                    [01]
;    0154  1
;    0155  1             DSV$ShowDevice          : JSB_CLI,          ! Pass parameter in R2
;    0156  1             DSV$ShowSelect          : JSB_CLI,          ! Pass parameter in R2
;    0157  1             DSX$Abort,                                  ! Pass no parameters,
;    0158  1                                                         ! (take no prisoners).
;    0159  1             VRShowFlg               : JSB_NONE,         ! No parameters required
;    0160  1             VRShowEf                : JSB_NONE;         ! No parameters required
```

```
;    0162  1     %SBTTL  'External Own Storage'
;    0163  1     !
;    0164  1     ! EXTERNAL OWN STORAGE
;    0165  1     !
;    0166  1
;    0167  1     EXTERNAL
;    0168  1             DS$GL_FSTTEST,                          ! First test to execute
;    0169  1             DS$GL_LSTTEST,                          ! Last test to execute
;    0170  1
;    0171  1             DS$GA_DS_Ctrl_C_First,                  ! DS address of 1st ^C routine handler          [06]
;    0172  1
;    0173  1             DS$GL_CLIBASE,                          ! Base of CLI data table
;    0174  1
;    0175  1             DS$GB_WIDTH,                            ! Width of the terminal                         [02]
;    0176  1
;    0177  1             !+
;    0178  1             ! These are defined in the QAFLAGS module. They contain
;    0179  1             ! the current settings of the QA flags.
;    0180  1             !-
;    0181  1
;    0182  1             QA$W_TestLoops    : WORD,
;    0183  1             QA$W_SubtestLoops : WORD,
;    0184  1             QA$W_MultiplePass : WORD,
;    0185  1
;    0186  1             QA$T_Header_1,                          ! The three lines printed at the top            [01]
;    0187  1             QA$T_Header_2,                          ! of a page.                                    [01]
;    0188  1             QA$T_Header_3,                          !                                               [01]
;    0189  1
;    0190  1             QA$T_Operator_Request_Message;          ! The QA error message for requesting operator input  [02]
;    0191  1                                                     ! with no default value given. It is declared in the  [02]
;    0192  1                                                     ! QACHECKS module because all the error messages are  [02]
;    0193  1                                                     ! declared there!                                     [02]
```

```
;    0195  1      %SBTTL  'Psect Definitions'
;    0196  1      !
;    0197  1      ! PSECT DEFINITIONS:
;    0198  1      !
;    0199  1
;    0200  1      PSECT
;    0201  1              Plit   = Data (NoExecute, Share, NoWrite,
;    0202  1                             Addressing_Mode (Long_Relative));
;    0203  1
;    0204  1      PSECT
;    0205  1              Code   = Code (Execute, Share, NoWrite,
;    0206  1                             Addressing_Mode (Long_Relative));
;    0207  1
;    0208  1      PSECT
;    0209  1              Own    = Work (NoExecute, NoShare, Write,
;    0210  1                             Addressing_Mode (Long_Relative));
;    0211  1
;    0212  1      PSECT
;    0213  1              Global = Work (NoExecute, NoShare, Write,
;    0214  1                             Addressing_Mode (Long_Relative));
```

```
;    0216  1     %SBTTL  'Local Macro Definitions'
;    0217  1     !
;    0218  1     ! LOCAL MACRO DEFINITIONS:
;    0219  1     !
;    0220  1
;    0221  1     MACRO
;    0222  1             !+
;    0223  1             ! Usage:
;    0224  1             !       ASSERT ((.A GTR .B), 'A <= B');
;    0225  1             !
;    0226  1             ! If the specified condition is not true, a call to the Logic_Error macro is made with the specified
;    0227  1             ! message string. ASSERT is turned on whenever the compilation is made with the /VARIANT:n qualifier,
;    0228  1             ! where n <> 0.
;    0229  1             !-
;    0230  1
; M  0231  1             ASSERT (Condition, Assert_String) =
; M  0232  1                     %IF %VARIANT
; M  0233  1                     %THEN
; M  0234  1                             (
; M  0235  1                             IF (NOT (Condition)) THEN
; M  0236  1                                     Logic_Error (Assert_String)
; M  0237  1                             )
; M  0238  1                     %ELSE
; M  0239  1                             ! No code put in.
; M  0240  1                     %FI
;    0241  1             %;
;    0242  1
;    0243  1     MACRO
;    0244  1             !+
;    0245  1             ! Usage:
;    0246  1             !       Logic_Error ('String to be printed out');
;    0247  1             !
;    0248  1             ! This macro is used whenever a logic error is detected. It is called from ASSERT whenever the
;    0249  1             ! assertion is false. It can also be called whenever an expression need not be evaluated before
;    0250  1             ! determining that something is wrong.
;    0251  1             !-
;    0252  1
; M  0253  1             Logic_Error (Error_String) =
; M  0254  1                     (
; M  0255  1                     BIND
; M  0256  1                             ES = $ASCIC ('!/**QA Internal Error: ', Error_String, '!/');    !                    [01]
; M  0257  1
; M  0258  1                     $DS_PRINTF (ES);
; M  0259  1                     )
;    0260  1             %;
;    0261  1
;    0262  1     MACRO                                                                                                       [02]
;    0263  1             !+                                                                                                  [02]
;    0264  1             ! Define a macro that will expand into the declaration for the Forced-Error records.                [02]
;    0265  1             !-                                                                                                  [02]
;    0266  1
; M  0267  1             Error_Record =                                                                                      [02]
; M  0268  1                     REF BLOCK [, LONG] FIELD (Forced_Error_Fields)  !                                           [02]
;    0269  1             %;                                                                                                  [02]
```

```
;   0271  1     MACRO
;   0272  1             !+
;   0273  1             ! Usage:
;   0274  1             !
;   0275  1             ! This macro is used only in the debugging stages. It's only parameter is a string giving, e.g.,
;   0276  1             ! the name of a routine. DEBUG is turned on whenever the compilation is made with the
;   0277  1             ! /VARIANT:n qualifier, where n <> 0.
;   0278  1             !-
;   0279  1
; M 0280  1             DEBUG (Debug_String) =
; M 0281  1                     %IF %VARIANT
; M 0282  1                     %THEN
; M 0283  1                             (
; M 0284  1                             IF (.QA$AOB_Flags [QA$K_QA_Debug]) THEN
; M 0285  1                                     $DS_PRINTF ($ASCIC ('!/', Debug_String, '!/'))
; M 0286  1                             )
; M 0287  1                     %ELSE
; M 0288  1                             ! No code put in.
; M 0289  1                     %FI
;   0290  1             %;
;   0291  1
;   0292  1     MACRO                                                   !                                                   [02]
;   0293  1             !+                                                                                                  [02]
;   0294  1             ! Define a macro that takes an expression as an argument. The value of this macro is either one or [02]
;   0295  1             ! zero. All bits but the least significant one are cleared.                                         [02]
;   0296  1             !-                                                                                                  [02]
;   0297  1
; M 0298  1             Boolean (Expression) =                          !                                                   [02]
; M 0299  1                     ((Expression) AND 1)                    !                                                   [02]
;   0300  1             %;                                              !                                                   [02]
```

```
;    0302  1      %SBTTL  'Module-Global Literals'
;    0303  1
;    0304  1      !+                                                                                  [02]
;    0305  1      ! MODULE-GLOBAL LITERALS                                                            [02]
;    0306  1      !-                                                                                  [02]
;    0307  1
;    0308  1      LITERAL                                    !                                        [02]
;    0309  1              QA$K_Nil = 0,                      ! Pascal NIL. Use address zero, since it is inacessible.[02]
;    0310  1
;    0311  1              QA$K_Forced_Error_Record_Size = 16,  ! The size of the record for the forced-error records.  [02]
;    0312  1
;    0313  1              QA$K_Last_Check = QA$K_Run_Backwards;  ! The last check currently implemented. This must       [07]
;    0314  1                                                 ! change as more check routines are added.               [07]
```

```
;   0316  1     %SBTTL  'Field Definitions'
;   0317  1
;   0318  1     !                                                                                    [02]
;   0319  1     ! MODULE-GLOBAL FIELD DEFINITIONS                                                    [02]
;   0320  1     !                                                                                    [02]
;   0321  1
;   0322  1     FIELD                                                  !                             [02]
;   0323  1             Forced_Error_Fields =                          !                             [02]
;   0324  1                     SET                                    !                             [02]
;   0325  1                     QA$VW_Error_Number    = [0, 0,  16, 0],  !                             [02]
;   0326  1                     QA$VW_Test_Number     = [0, 16, 16, 0],  !                             [02]
;   0327  1                     QA$VL_Error_Count     = [1, 0,  32, 0],  !                             [02]
;   0328  1                     QA$VL_Subtest_Number  = [2, 0,  32, 0],  !                             [02]
;   0329  1                     Qa$VA_Next_Error      = [3, 0,  32, 0]   !                             [02]
;   0330  1                     TES;                                   !                             [02]
```

```
;    0332  1      %SBTTL  'Module-Global Static Storage'
;    0333  1
;    0334  1      !
;    0335  1      ! MODULE-GLOBAL DECLARATIONS:
;    0336  1      !
;    0337  1
;    0338  1              MODNAM ('QAMAIN');                                  ! Define module name.
;    0339  1      OWN
;    0340  1              QA$AW_Overall_Error_Table : VECTOR [QA$K_Number_Of_Checks, WORD];
;    0341  1                                                                  ! A vector containing the number of
;    0342  1                                                                  ! errors encountered in each of
;    0343  1                                                                  ! the checks.
;    0344  1
;    0345  1      !       QA$A_Error_List_Head,                               ! Pointer to head of a linked list of Forced-Error      [07]
;    0346  1      !                                                           ! records.                                              [07]
;    0347  1      !
;    0348  1      !       QA$A_Prev_Test_Tail;                                ! Pointer to the previous test's last record in the     [07]
;    0349  1      !                                                           ! Forced-Error linked list.                             [07]
```

```
%SBTTL  'Supervisor-Global Static Storage'

!+
! SUPERVISOR-GLOBAL DECLARATIONS:
!-

GLOBAL
        QA$W_Branch       : WORD,                          ! Storage for passing the branch-code                [01]
                                                           ! from DSX$BRANCH to QA$MAIN.                        [01]

        QA$W_Error_Number : WORD,                          ! Storage for passing the error number               [01]
                                                           ! from DSX$BRANCH to QA$MAIN.                        [01]

        QA$W_Save_Test    : SIGNED WORD,                   ! Save the x in /TEST:x:y from the command line.     [02]

        QA$W_Save_Last    : SIGNED WORD,                   ! Save the y in /TEST:x:y from the command line.     [02]

        QA$L_Saved_DSA_Flags,                              ! Save the DSA flags before starting QA              [01]
                                                           ! and restore and end of QA execution.               [01]

        QA$AOB_Routine_State : BITVECTOR [QA$K_Numb_Routine_States],    !                                   [02]
                                                           ! The Routine State vector. This vector keeps track  [02]
                                                           ! of the current state that a check routine is in.   [02]

        QA$AOB_Check_State : BITVECTOR [QA$K_Number_Of_Checks],
                                                           ! The check state bitvector. It contains one and only
                                                           ! one bit = 1 implying that the check bound to that bit
                                                           ! position is currently being performed.

        QA$AOB_Flags       : BITVECTOR [QA$K_Number_QA_Flags];
                                                           ! QA$AOB_Flags [QA$K_NoDef] =
                                                           !   1 => No default was given for ASK...
                                                           !   0 => A default was given for ASK...
                                                           !
                                                           ! QA$AOB_Flags [QA$K_QA_Debug] =
                                                           !   1 => Debugging is turned on
                                                           !   0 => No debugging messages
                                                           !
                                                           ! QA$AOB_Flags [QA$K_QA_Done] =
                                                           !   1 => QA is finished
                                                           !   0 => QA is not finished
                                                           !
                                                           ! QA$AOB_Flags [QA$K_Init_Context_Done] =
                                                           !   1 => Init_Context was done
                                                           !   0 => Init_Context has not been done
                                                           !
                                                           ! QA$AOB_Flags [QA$K_Loop_Test_Done] =
                                                           !   1 => Finished looping on the current test
                                                           !   0 => Loop at least once more on the current test
```

```
;    0401  1      %SBTTL 'DSX$BRANCH'
;    0402  1
;    0403  1      GLOBAL ROUTINE DSX$Branch (Register_0, Branch_Code, Error_Number, Branch_Value) : Call_DSX$Branch =
;    0404  1
;    0405  1      !++
;    0406  1      ! FUNCTIONAL DESCRIPTION:
;    0407  1      !
;    0408  1      !       This global routine is called by the $DS_Branch macros. It decides if the branch should be taken.
;    0409  1      !       If the QA flag is set, it will call QA$Main, which calls the appropriate check routine. NOTE:
;    0410  1      !       This routine preserves R1 and attempts to preserve R0 when not forcing an error. At most, the low
;    0411  1      !       bit of R0 will be changed.
;    0412  1      !
;    0413  1      ! FORMAL PARAMETERS:
;    0414  1      !
;    0415  1      !       Register_0    : The general register R0.
;    0416  1      !
;    0417  1      !       Branch_Code   : A literal defining what type of branch is being executed by the diagnostic.
;    0418  1      !
;    0419  1      !       Error_Number  : A diagnostic error number.
;    0420  1      !
;    0421  1      !       Branch_Value  : The value that will determine whether or not the branch should actually be taken.
;    0422  1      !
;    0423  1      ! CALLER(S):
;    0424  1      !
;    0425  1      !       The diagnostic program.
;    0426  1      !
;    0427  1      ! IMPLICIT INPUTS:
;    0428  1      !
;    0429  1      !       NONE
;    0430  1      !
;    0431  1      ! IMPLICIT OUTPUTS:
;    0432  1      !
;    0433  1      !       NONE
;    0434  1      !
;    0435  1      ! COMPLETION CODES:
;    0436  1      !
;    0437  1      !       See below.                                                                          [05]
;    0438  1      !
;    0439  1      ! SIDE EFFECTS:
;    0440  1      !
;    0441  1      !       If running QA and this branch should be reversed, the low bit of R0 will be cleared. If not running QA, [05]
;    0442  1      !       the low bit of R0 will be set or cleared as mandated by the type of branch and by the Branch_Value.     [05]
;    0443  1      !       Under all other conditions, R0 will be left as is. Note: Register_0, the first parameter, is actually   [05]
;    0444  1      !       general register R0.
;    0445  1      !
;    0446  1      !--
```

```
;   0448  2     BEGIN
;   0449  2             LOCAL
;   0450  2                     Save_Register_0,                                    !                                   [05]
;   0451  2                     Branch : BYTE;                                      !                                   [05]
;   0452  2
;   0453  2             Save_Register_0 = .Register_0;                              !                                   [05]
;   0454  2
;   0455  2             CASE .Branch_Code
;   0456  2                 FROM QA$K_First_Branch_Code TO QA$K_Last_Branch_Code OF
;   0457  2                     SET
;   0458  2                     !+
;   0459  2                     ! These are the BLISS specific branch codes.
;   0460  2                     !-
;   0461  2                     [DS$K_BLSS_B] :
;   0462  2                             Branch = (.Branch_Value LSS 0);
;   0463  2
;   0464  2                     [DS$K_BLSSU_B] :
;   0465  2                             Branch = (.Branch_Value LSSU 0);
;   0466  2
;   0467  2                     [DS$K_BLEQ_B] :
;   0468  2                             Branch = (.Branch_Value LEQ 0);
;   0469  2
;   0470  2                     [DS$K_BLEQU_B] :
;   0471  2                             Branch = (.Branch_Value LEQU 0);
;   0472  2
;   0473  2                     [DS$K_BEQL_B] :
;   0474  2                             Branch = (.Branch_Value EQL 0);
;   0475  2
;   0476  2                     [DS$K_BEQLU_B] :
;   0477  2                             Branch = (.Branch_Value EQLU 0);
;   0478  2
;   0479  2                     [DS$K_BGEQ_B] :
;   0480  2                             Branch = (.Branch_Value GEQ 0);
;   0481  2
;   0482  2                     [DS$K_BGEQU_B] :
;   0483  2                             Branch = (.Branch_Value GEQU 0);
;   0484  2
;   0485  2                     [DS$K_BGTR_B] :
;   0486  2                             Branch = (.Branch_Value GTR 0);
;   0487  2
;   0488  2                     [DS$K_BGTRU_B] :
;   0489  2                             Branch = (.Branch_Value GTRU 0);
;   0490  2
;   0491  2                     [DS$K_BNEQ_B] :
;   0492  2                             Branch = (.Branch_Value NEQ 0);
;   0493  2
;   0494  2                     [DS$K_BNEQU_B] :
;   0495  2                             Branch = (.Branch_Value NEQU 0);
```

```
;    0497  2                    !+
;    0498  2                    ! For these MACRO specific branch codes, the Branch_Value is the PSL at the time
;    0499  2                    ! of the call. "To branch or not to branch" is based on this PSL.
;    0500  2                    !-
;    0501  2
;    0502  2                    [DS$K_BLSS_M] :
;    0503  3                            BEGIN
;    0504  3                            MAP
;    0505  3                                    Branch_Value : BLOCK [, BYTE];
;    0506  3
;    0507  3                            Branch = .Branch_Value [PSL$V_N]
;    0508  2                            END;
;    0509  2
;    0510  2                    [DS$K_BLSSU_M] :
;    0511  3                            BEGIN
;    0512  3                            MAP
;    0513  3                                    Branch_Value : BLOCK [, BYTE];
;    0514  3
;    0515  3                            Branch = .Branch_Value [PSL$V_C]
;    0516  2                            END;
;    0517  2
;    0518  2                    [DS$K_BLEQ_M] :
;    0519  3                            BEGIN
;    0520  3                            MAP
;    0521  3                                    Branch_Value : BLOCK [, BYTE];
;    0522  3
;    0523  3                            Branch = .Branch_Value [PSL$V_N] OR
;    0524  3                                     .Branch_Value [PSL$V_Z]
;    0525  2                            END;
;    0526  2
;    0527  2                    [DS$K_BLEQU_M] :
;    0528  3                            BEGIN
;    0529  3                            MAP
;    0530  3                                    Branch_Value : BLOCK [, BYTE];
;    0531  3
;    0532  3                            Branch = .Branch_Value [PSL$V_C] OR
;    0533  3                                     .Branch_Value [PSL$V_Z]
;    0534  2                            END;
;    0535  2
;    0536  2                    [DS$K_BEQL_M] :
;    0537  3                            BEGIN
;    0538  3                            MAP
;    0539  3                                    Branch_Value : BLOCK [, BYTE];
;    0540  3
;    0541  3                            Branch = .Branch_Value [PSL$V_Z]
;    0542  2                            END;
```

```
;    0544  2                    [DS$K_BEQLU_M] :
;    0545  3                            BEGIN
;    0546  3                            MAP
;    0547  3                                    Branch_Value : BLOCK [, BYTE];
;    0548  3
;    0549  3                            Branch = .Branch_Value [PSL$V_Z]
;    0550  2                            END;
;    0551  2
;    0552  2                    [DS$K_BGEQ_M] :
;    0553  3                            BEGIN
;    0554  3                            MAP
;    0555  3                                    Branch_Value : BLOCK [, BYTE];
;    0556  3
;    0557  3                            Branch = NOT .Branch_Value [PSL$V_N]
;    0558  2                            END;
;    0559  2
;    0560  2                    [DS$K_BGEQU_M] :
;    0561  3                            BEGIN
;    0562  3                            MAP
;    0563  3                                    Branch_Value : BLOCK [, BYTE];
;    0564  3
;    0565  3                            Branch = NOT .Branch_Value [PSL$V_C]
;    0566  2                            END;
;    0567  2
;    0568  2                    [DS$K_BGTR_M] :
;    0569  3                            BEGIN
;    0570  3                            MAP
;    0571  3                                    Branch_Value : BLOCK [, BYTE];
;    0572  3
;    0573  3                            Branch = (NOT .Branch_Value [PSL$V_N]) OR
;    0574  4                                     (NOT .Branch_Value [PSL$V_Z])
;    0575  2                            END;
;    0576  2
;    0577  2                    [DS$K_BGTRU_M] :
;    0578  3                            BEGIN
;    0579  3                            MAP
;    0580  3                                    Branch_Value : BLOCK [, BYTE];
;    0581  3
;    0582  3                            Branch = (NOT .Branch_Value [PSL$V_C]) OR
;    0583  4                                     (NOT .Branch_Value [PSL$V_Z])
;    0584  2                            END;
;    0585  2
;    0586  2                    [DS$K_BNEQ_M] :
;    0587  3                            BEGIN
;    0588  3                            MAP
;    0589  3                                    Branch_Value : BLOCK [, BYTE];
;    0590  3
;    0591  3                            Branch = NOT .Branch_Value [PSL$V_Z]
;    0592  2                            END;
```

```
;    0594  2                    [DS$K_BNEQU_M] :
;    0595  3                            BEGIN
;    0596  3                            MAP
;    0597  3                                    Branch_Value : BLOCK [, BYTE];
;    0598  3
;    0599  3                            Branch = NOT .Branch_Value [PSL$V_Z]
;    0600  2                            END;
;    0601  2
;    0602  2                    [DS$K_BVS_M] :
;    0603  3                            BEGIN
;    0604  3                            MAP
;    0605  3                                    Branch_Value : BLOCK [, BYTE];
;    0606  3
;    0607  3                            Branch = .Branch_Value [PSL$V_V]
;    0608  2                            END;
;    0609  2
;    0610  2                    [DS$K_BVC_M] :
;    0611  3                            BEGIN
;    0612  3                            MAP
;    0613  3                                    Branch_Value : BLOCK [, BYTE];
;    0614  3
;    0615  3                            Branch = NOT .Branch_Value [PSL$V_V]
;    0616  2                            END;
;    0617  2
;    0618  2                    [DS$K_BCS_M] :
;    0619  3                            BEGIN
;    0620  3                            MAP
;    0621  3                                    Branch_Value : BLOCK [, BYTE];
;    0622  3
;    0623  3                            Branch = .Branch_Value [PSL$V_C]
;    0624  2                            END;
;    0625  2
;    0626  2                    [DS$K_BCC_M] :
;    0627  3                            BEGIN
;    0628  3                            MAP
;    0629  3                                    Branch_Value : BLOCK [, BYTE];
;    0630  3
;    0631  3                            Branch = NOT .Branch_Value [PSL$V_C]
;    0632  2                            END;
;    0633  2
;    0634  2                    [DS$K_BBS] :
;    0635  2                            Branch = .Branch_Value <0, 1, 0>;
;    0636  2
;    0637  2                    [DS$K_BBC] :
;    0638  2                            Branch = NOT .Branch_Value <0, 1, 0>;
```

```
;    0640  2                    !+
;    0641  2                    ! These are passed the value returned by the BUILTIN function for that branch (i.e.,
;    0642  2                    ! TESTBITSS for BBSS, etc.). Thus, the branch is based upon the value of the low bit.
;    0643  2                    !-
;    0644  2
;    0645  2                    [DS$K_BBSS] :
;    0646  2                            Branch = .Branch_Value <0, 1, 0>;
;    0647  2
;    0648  2                    [DS$K_BBCS] :
;    0649  2                            Branch = .Branch_Value <0, 1, 0>;
;    0650  2
;    0651  2                    [DS$K_BBSC] :
;    0652  2                            Branch = .Branch_Value <0, 1, 0>;
;    0653  2
;    0654  2                    [DS$K_BBCC] :
;    0655  2                            Branch = .Branch_Value <0, 1, 0>;
;    0656  2
;    0657  2                    [DS$K_BBSSI] :
;    0658  2                            Branch = .Branch_Value <0, 1, 0>;
;    0659  2
;    0660  2                    [DS$K_BBCCI] :
;    0661  2                            Branch = .Branch_Value <0, 1, 0>;
;    0662  2
;    0663  2                    !+
;    0664  2                    ! These are passed the value of the data whose low bit is being checked.
;    0665  2                    !-
;    0666  2
;    0667  2                    [DS$K_BLBS] :
;    0668  2                            Branch = .Branch_Value <0, 1, 0>;
;    0669  2
;    0670  2                    [DS$K_BLBC] :
;    0671  2                            Branch = NOT .Branch_Value <0, 1, 0>;
;    0672  2
;    0673  2                    !+
;    0674  2                    ! Treat the BERROR branch macro the same as the BNERROR branch macro. This means that the value [05]
;    0675  2                    ! of R0 will remain the same for the two cases of QA not running and of QA running but not      [05]
;    0676  2                    ! forcing errors. When QA is running and this branch macro should be reversed-sensed (yuch),   [05]
;    0677  2                    ! then R0 will return from a BERROR with the low bit complemented (as will happen with a       [05]
;    0678  2                    ! BNERROR). However, upon return from this routine, the branch macro for BERROR will do a BLBC [05]
;    0679  2                    ! instruction, as oposed to doing a BLBS (which is what the BNERROR macro will do). So, these  [05]
;    0680  2                    ! two branch macros will save the contents of R0 for the two cases above. They will also return [05]
;    0681  2                    ! the complemented low bit of R0 when forcing errors.                                          [05]
;    0682  2                    !-
;    0683  2
;    0684  2                    [DS$K_BERROR] :                         !                                                      [05]
;    0685  2                            Branch = .Branch_Value <0, 1, 0>;       ! These two should be the same.               [05]
;    0686  2
;    0687  2                    [DS$K_BNERROR] :                        !                                                      [05]
;    0688  2                            Branch = .Branch_Value <0, 1, 0>;       !                                             [05]
;    0689  2                    TES;
```

```
;   0691  2             !+
;   0692  2             ! If not running QA, simply return an indication of whether or not to branch.
;   0693  2             !-
;   0694  2
;   0695  2             IF (NOT .DSA$V_QA) THEN
;   0696  3                     BEGIN                                   !                                   [05]
;   0697  3                     Save_Register_0 <0, 1, 0> = .Branch <0, 1, 0>;  !                                   [05]
;   0698  4                     RETURN (.Save_Register_0)               !                                   [05]
;   0699  2                     END;                                    !                                   [05]
;   0700  2
;   0701  2             !+
;   0702  2             ! Make the Branch value a one or a zero by clearing out all the other bits.                [02]
;   0703  2             !-
;   0704  2
;   0705  2             Branch = Boolean (.Branch);                     !                                   [02]
;   0706  2
;   0707  2             !+
;   0708  2             ! Save the error number and branch value. Call QA$Main with the appropriate branch code.
;   0709  2             !-
;   0710  2
;   0711  2             QA$W_Branch       = .Branch;
;   0712  2             QA$W_Error_Number = .Error_Number;
;   0713  2
;   0714  2             QA$MAIN (DSQA$K_QA_DSX$Branch);
;   0715  2
;   0716  2             !+
;   0717  2             ! Set the low bit of R0 to what was set up in the Error Phase One routine in the QA$W_Branch variable.  [05]
;   0718  2             ! If I am forcing errors, the low bit of R0 can change.                                  [05]
;   0719  2             !-
;   0720  2
;   0721  2             Save_Register_0 <0, 1, 0> = .QA$W_Branch <0, 1, 0>;          !                                   [05]
;   0722  3             RETURN (.Save_Register_0)                                    !                                   [05]
;   0723  1     END;


                                                        .TITLE  QAMAIN *** QA Routines
                                                        .IDENT  \1-08\

                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

                    4E  49  41  4D  41  51  06  00000 P.AAA:  .ASCII  <6>\QAMAIN\                                  ;

                                                        .PSECT  WORK,NOEXE,2

                                                00000 QA$AW_OVERALL_ERROR_TABLE:
                                                        .BLKB   30
                                                0001E QA$W_BRANCH::
                                                        .BLKB   2
                                                00020 QA$W_ERROR_NUMBER::
                                                        .BLKB   2
                                                00022 QA$W_SAVE_TEST::
                                                        .BLKB   2
                                                00024 QA$W_SAVE_LAST::
                                                        .BLKB   2
                                                00026   .BLKB   2
                                                00028 QA$L_SAVED_DSA_FLAGS::
                                                        .BLKB   4
```

```
                                                  0002C QA$AOB_ROUTINE_STATE::
                                                                .BLKB   1
                                                  0002D         .BLKB   3
                                                  00030 QA$AOB_CHECK_STATE::
                                                                .BLKB   2
                                                  00032         .BLKB   2
                                                  00034 QA$AOB_FLAGS::
                                                                .BLKB   1

                                                        DSA$AL_APTMAIL=     65024
                                                        DSA$GL_FLAGS=       65024
                                                        DSA$GL_APTCOM=      65028
                                                        DSA$GL_PASSES=      65032
                                                        DSA$GL_UNITS=       65036
                                                        DSA$GL_SECTNO=      65040
                                                        DSA$GL_SID=         65044
                                                        DSA$GL_MSGTYP=      65088
                                                        DSA$GL_ERRNO=       65092
                                                        DSA$GL_EVENT=       65096
                                                        DSA$GL_SUBTNO=      65100
                                                        DSA$GL_TESTNO=      65104
                                                        DSA$GL_PASSNO=      65108
                                                        DSA$GL_DEVLEN=      65112
                                                        DSA$GL_DEVNAM=      65116
                                                        DSA$GL_MSGPTR=      65128
                                                        $MODULE=            P.AAA
                                                                .EXTRN  QA$NORMAL_START
                                                                .EXTRN  QA$MULTIPLE_PASS
                                                                .EXTRN  QA$LOOP_ON_TEST
                                                                .EXTRN  QA$LOOP_ON_SUBTEST
                                                                .EXTRN  QA$RUN_BACKWARDS
                                                                .EXTRN  EXE$ALONONPAGED
                                                                .EXTRN  EXE$DEANONPAGED
                                                                .EXTRN  DSV$SHOWDEVICE, DSV$SHOWSELECT
                                                                .EXTRN  DSX$ABORT, VRSHOWFLG
                                                                .EXTRN  VRSHOWEF, DS$GL_FSTTEST
                                                                .EXTRN  DS$GL_LSTTEST, DS$GA_DS_CTRL_C_FIRST
                                                                .EXTRN  DS$GL_CLIBASE, DS$GB_WIDTH
                                                                .EXTRN  QA$W_TESTLOOPS, QA$W_SUBTESTLOOPS
                                                                .EXTRN  QA$W_MULTIPLEPASS
                                                                .EXTRN  QA$T_HEADER_1, QA$T_HEADER_2
                                                                .EXTRN  QA$T_HEADER_3, QA$T_OPERATOR_REQUEST_MESSAGE

                                                                .PSECT  CODE,NOWRT,  SHR,2

                                          001E 00000            .ENTRY  DSX$BRANCH, Save R1,R2,R3,R4                    ; 0403
                          54 00000000'  EF   9E 00002           MOVAB   QA$W_BRANCH, R4                                 ;
                          52            50   D0 00009           MOVL    REGISTER_0, SAVE_REGISTER_0                     ; 0453
                  27      00        04  AC   CF 0000C           CASEL   BRANCH_CODE, #0, #39                            ; 0455
0066          005D      0059          0050     00011 1$:        .WORD   2$-1$,-                                         ;
0078          006F      0066          0066     00019                    3$-1$,-                                         ;
0085          0085      0085          007C     00021                    4$-1$,-                                         ;
00A0          0098      0101          0090     00029                    5$-1$,-                                         ;
00F6          00BA      00B2          00B2     00031                    5$-1$,-                                         ;
00DE          00DE      00CA          00C2     00039                    5$-1$,-                                         ;
00F6          0101      00EE          00E6     00041                    6$-1$,-                                         ;
0101          0101      00F6          0101     00049                    7$-1$,-                                         ;
```

```
        0101            0101            0101            0101        00051
        0101            0101            00F6            0101        00059

                                                                                8$-1$,-                                                                 ;
                                                                                9$-1$,-                                                                 ;
                                                                                9$-1$,-                                                                 ;
                                                                                9$-1$,-                                                                 ;
                                                                                11$-1$,-                                                                ;
                                                                                27$-1$,-                                                                ;
                                                                                12$-1$,-                                                                ;
                                                                                13$-1$,-                                                                ;
                                                                                15$-1$,-                                                                ;
                                                                                15$-1$,-                                                                ;
                                                                                17$-1$,-                                                                ;
                                                                                25$-1$,-                                                                ;
                                                                                18$-1$,-                                                                ;
                                                                                19$-1$,-                                                                ;
                                                                                21$-1$,-                                                                ;
                                                                                21$-1$,-                                                                ;
                                                                                22$-1$,-                                                                ;
                                                                                24$-1$,-                                                                ;
                                                                                27$-1$,-                                                                ;
                                                                                25$-1$,-                                                                ;
                                                                                27$-1$,-                                                                ;
                                                                                25$-1$,-                                                                ;
                                                                                27$-1$,-                                                                ;
                                                                                27$-1$,-                                                                ;
                                                                                27
```

```
                                        0C   AC  D5 00098          TSTL    BRANCH_VALUE                                  ;
                                             7B  13 0009B          BEQL    28$                                           ;
                                             51  D6 0009D 10$:     INCL    R1                                            ;
                                             77  11 0009F          BRB     28$                                           ;
     51       0C   AC          01            03  EF 000A1 11$:     EXTZV   #3, #1, BRANCH_VALUE, R1                      ; 0507
                                             6F  11 000A7          BRB     28$                                           ;
     51       0C   AC          01            03  EF 000A9 12$:     EXTZV   #3, #1, BRANCH_VALUE, R1                      ; 0524
                                             06  11 000AF          BRB     14$                                           ;
     51       0C   AC          01            00  EF 000B1 13$:     EXTZV   #0, #1, BRANCH_VALUE, R1                      ; 0533
     53       0C   AC          01            02  EF 000B7 14$:     EXTZV   #2, #1, BRANCH_VALUE, R3                      ;
                   50          51            53  89 000BD          BISB3   R3, R1, BRANCH                                ;
                                             58  11 000C1          BRB     29$                                           ;
     51       0C   AC          01            02  EF 000C3 15$:     EXTZV   #2, #1, BRANCH_VALUE, R1                      ; 0549
                                             4D  11 000C9 16$:     BRB     28$                                           ;
     51       0C   AC          01            03  EF 000CB 17$:     EXTZV   #3, #1, BRANCH_VALUE, R1                      ; 0557
                                             3A  11 000D1          BRB     26$                                           ;
     51       0C   AC          01            03  EF 000D3 18$:     EXTZV   #3, #1, BRANCH_VALUE, R1                      ; 0574
                                             06  11 000D9          BRB     20$                                           ;
     51       0C   AC          01            00  EF 000DB 19$:     EXTZV   #0, #1, BRANCH_VALUE, R1                      ; 0583
     53       0C   AC          01            02  EF 000E1 20$:     EXTZV   #2, #1, BRANCH_VALUE, R3                      ;
                               53            53  D2 000E7          MCOML   R3, R3                                        ;
                               51            53  CA 000EA          BICL2   R3, R1                                        ;
                                             1E  11 000ED          BRB     26$                                           ;
     51       0C   AC          01            02  EF 000EF 21$:     EXTZV   #2, #1, BRANCH_VALUE, R1                      ; 0599
                                             16  11 000F5          BRB     26$                                           ;
     51       0C   AC          01            01  EF 000F7 22$:     EXTZV   #1, #1, BRANCH_VALUE, R1                      ; 0607
                                             19  11 000FD 23$:     BRB     28$                                           ;
     51       0C   AC          01            01  EF 000FF 24$:     EXTZV   #1, #1, BRANCH_VALUE, R1                      ; 0615
                                             06  11 00105          BRB     26$                                           ;
     51       0C   AC          01            00  EF 00107 25$:     EXTZV   #0, #1, BRANCH_VALUE, R1                      ; 0671
                               50            51  92 0010D 26$:     MCOMB   R1, BRANCH                                    ;
                                             09  11 00110          BRB     29$                                           ;
     51       0C   AC          01            00  EF 00112 27$:     EXTZV   #0, #1, BRANCH_VALUE, R1                      ; 0688
                               50            51  90 00118 28$:     MOVB    R1, BRANCH                                    ;
                                  0000FE01   9F  95 0011B 29$:     TSTB    @#^X0000FE01                                  ; 0695
                                             07  19 00121          BLSS    30$                                           ;
     52           01          00            50  F0 00123          INSV    BRANCH, #0, #1, SAVE_REGISTER_0               ; 0697
                                             1E  11 00128          BRB     31$                                           ; 0698
     51           50          01            00  EF 0012A 30$:     EXTZV   #0, #1, BRANCH, R1                            ; 0705
                               50            51  90 0012F          MOVB    R1, BRANCH                                    ;
                               64            50  9B 00132          MOVZBW  BRANCH, QA$W_BRANCH                           ; 0711
                         02    A4       08   AC  B0 00135          MOVW    ERROR_NUMBER, QA$W_ERROR_NUMBER               ; 0712
                                             11  DD 0013A          PUSHL   #17                                           ; 0714
                   00000000V   EF            01  FB 0013C          CALLS   #1, QA$MAIN                                   ;
     52           01          00            64  F0 00143          INSV    QA$W_BRANCH, #0, #1, SAVE_REGISTER_0          ; 0721
                               50            52  D0 00148 31$:     MOVL    SAVE_REGISTER_0, R0                           ; 0722
                                             04  0014B             RET                                                   ;

; Routine Size:  332 bytes,    Routine Base:  CODE + 0000
```

```
%SBTTL 'QA$Abort_QA'

ROUTINE QA$Abort_QA : NOVALUE =                          !                                  This whole routine is [02]

!++
! FUNCTIONAL DESCRIPTION:
!
!       Dump out debugging information, print the overall error summary table, restore the DSA flags,
!       and abort the diagnostic (which will cause DS_CLEANUP to be executed, then branches to BEGIN).
!
! CALLERS:
!
!       QA$Main
!
! FORMAL PARAMETERS:
!
!       NONE
!
! IMPLICIT INPUTS:
!
!       DSA$V_QA            - The QA bit in the DSA flags. It is cleared to indicate QA is no longer running.
!       QA$L_Saved_QA_Flags - The saved DSA flags. The flags are restored here to what they were before
!                             the START/QA (or RUN/QA) command started executing.
!
! IMPLICIT OUTPUTS:
!
!       Debugging information, Overall Error Summary Table, and an abortion message.
!
! COMPLETION CODES:
!
!       NONE - This routine does not return to its caller(s). It calls the DSX$Abort routine, which
!              branches to BEGIN, which goes back to DS$Cli.
!
! SIDE EFFECTS:
!
!       The diagnostic is aborted.
!
!--
```

```
;   0764  2     BEGIN                                                   !                                                       [02]
;   0765  2             QA$Dump ();                                     ! Dump out information for the user                     [02]
;   0766  2             QA$Print_Overall_Errors ();                     ! Print the summary table                               [02]
;   0767  2             DSA$GL_FLAGS = .QA$L_Saved_DSA_Flags;           ! Restore DSA flags                                     [02]
;   0768  2             QA$Init ();                                     ! Initialize for next run                               [02]
;   0769  2             DSA$V_QA = Off;                                 ! Turn off QA                                           [02]
;   0770  2             DSX$Abort ()                                    ! Abort the diagnostic because of the error             [02]
;   0771  2                                                             ! that was found. DSX$Abort will not return to here!    [02]
;   0772  1     END;



                                                  0000 00000 QA$ABORT_QA:
                                                                  .WORD   Save nothing                                    ; 0727
                        00000000V  EF            00  FB 00002     CALLS   #0, QA$DUMP                                     ; 0765
                        00000000V  EF            00  FB 00009     CALLS   #0, QA$PRINT_OVERALL_ERRORS                     ; 0766
                        0000FE00   9F 00000000'  EF  D0 00010     MOVL    QA$L_SAVED_DSA_FLAGS, a#^X0000FE00              ; 0767
                        00000000V  EF            00  FB 0001B     CALLS   #0, QA$INIT                                     ; 0768
                        0000FE01   9F       80   8F  8A 00022     BICB2   #128, a#^X0000FE01                              ; 0769
                        00000000G  EF            00  FB 0002A     CALLS   #0, DSX$ABORT                                   ; 0770
                                                     04 00031     RET                                                     ; 0772

; Routine Size:  50 bytes,    Routine Base:  CODE + 014C
```

```
%SBTTL 'QA$Add_Forced_Error'

GLOBAL ROUTINE QA$Add_Forced_Error (Error_Number : WORD) : NOVALUE =

!++
! FUNCTIONAL DESCRIPTION:
!
!       This routine adds an error to the Forced Error Summary Table.
!
! CALLER (S):
!
!       The Error check routines.
!
! FORMAL PARAMETERS:
!
!       Error_Number : The DS error number.
!
! IMPLICIT INPUTS:
!
!       QA$A_Error_List_Head - Pointer to the head of a linked list of Forced-Error data entries.
!       QA$A_Prev_Test_Tail  - Pointer to the previous test's last entry in the linked list.
!
! IMPLICIT OUTPUTS:
!
!       NONE
!
! COMPLETION CODES:
!
!       NONE
!
! SIDE EFFECTS:
!
!       Adds a record to the linked list of forced-error records.
!
! FIGURES:
!
!       The Forced-Error Record:
!
!       ------------------------------------------------------------------------------------------------
!       |             |             |                       |                       |                       |
!       |Error_Number| Test_Number|       Error_Count      |      Subtest_Number    |       Next_Error      |
!       |     |       |     |       |     |     |     |     |     |     |     |     |     |     |     |     |
!       ------------------------------------------------------------------------------------------------
!       Error_Number   - The error number passed to the $DS_ERRxxxx routine.
!       Test_Number    - The test that the error occurred in.
!       Error_Count    - The number of times that error has been forced.
!       Subtest_Number - The subtest that the error occurred in.
!       Next_Error     - The pointer to the next Forced-Error record in the linked list, or nil.
!--
```

```
;    0824  1     %SBTTL 'New'
;    0825  2     BEGIN
;    0826  2     !       !++
;    0827  2     !       ! FUNCTIONAL DESCRIPTION:
;    0828  2     !       !
;    0829  2     !       !       This routine returns a 16-byte vector for use by the QA$Add_Forced_Error routine.
;    0830  2     !       !
;    0831  2     !       ! CALLER (S):
;    0832  2     !       !
;    0833  2     !       !       QA$K_Add_Forced_Error
;    0834  2     !       !
;    0835  2     !       ! FORMAL PARAMETERS:
;    0836  2     !       !
;    0837  2     !       !       Record_Ptr - Contains the address of the 16-byte vector.
;    0838  2     !       !
;    0839  2     !       ! IMPLICIT INPUTS:
;    0840  2     !       !
;    0841  2     !       !       NONE
;    0842  2     !       !
;    0843  2     !       ! IMPLICIT OUTPUTS:
;    0844  2     !       !
;    0845  2     !       !       NONE
;    0846  2     !       !
;    0847  2     !       ! COMPLETION CODES:
;    0848  2     !       !
;    0849  2     !       !       NONE
;    0850  2     !       !
;    0851  2     !       ! SIDE EFFECTS:
;    0852  2     !       !
;    0853  2     !       !       Will abort the QA sequence if the returned size of the vector is not 16, or if the vector
;    0854  2     !       !       cannot be allocated.
;    0855  2     !       !
;    0856  2     !       !--
```

```
;   0857  2     !
;   0858  2     !       ROUTINE New (Record_Ptr) : NOVALUE =
;   0859  2     !       BEGIN
;   0860  2     !               LOCAL
;   0861  2     !                       Returned_Size;
;   0862  2     !
;   0863  2     !               IF (NOT EXE$AloNonPaged (QA$K_Forced_Error_Record_Size; Returned_Size, .Record_Ptr)) THEN
;   0864  2     !                       BEGIN
;   0865  2     !                       Logic_Error ('Cannot allocate forced-error record');
;   0866  2     !                       QA$Abort_QA ();
;   0867  2     !                       END;
;   0868  2     !
;   0869  2     !               IF (.Returned_Size NEQ QA$K_Forced_Error_Record_Size) THEN
;   0870  2     !                       BEGIN
;   0871  2     !                       Logic_Error ('Wrong size forced-error record allocated');
;   0872  2     !                       QA$Abort_QA ();
;   0873  2     !                       END;
;   0874  2     !       END;
```

```
;    0875  2      !
;    0876  2      !%SBTTL 'Add_Error_Record'
;    0877  2      !
;    0878  2      !       ROUTINE Add_Error_Record (Record_Ptr, Error_Number : WORD) : NOVALUE =
;    0879  2      !
;    0880  2      !       !++
;    0881  2      !       ! FUNCTIONAL DESCRIPTION:
;    0882  2      !       !
;    0883  2      !       !       This routine adds one record to the linked list of forced-error records. It also fills in the
;    0884  2      !       !       fields of the new record. The Error_Count is assumed to be one. The Test and Subtest numbers
;    0885  2      !       !       are taken from the DSA area. This assumes that the forced-error is being added as they occur
;    0886  2      !       !       (i.e., there is no change in the test/subtest numbers from the time the error is forced to the
;    0887  2      !       !       time it is added).
;    0888  2      !       !
;    0889  2      !       ! CALLER (S):
;    0890  2      !       !
;    0891  2      !       !       QA$Add_Forced_Error
;    0892  2      !       !
;    0893  2      !       ! FORMAL PARAMETERS:
;    0894  2      !       !
;    0895  2      !       !       Record_Ptr      - Contains the address of the record which will preceed this new record.
;    0896  2      !       !       Error_Number    - The error number that will be stored in the new record.
;    0897  2      !       !
;    0898  2      !       ! IMPLICIT INPUTS:
;    0899  2      !       !
;    0900  2      !       !       DSA$GL_TESTNO - The DSA test number.
;    0901  2      !       !       DSA$GL_SUBTNO - The DSA subtest number.
;    0902  2      !       !
;    0903  2      !       ! IMPLICIT OUTPUTS:
;    0904  2      !       !
;    0905  2      !       !       NONE
;    0906  2      !       !
;    0907  2      !       ! COMPLETION CODES:
;    0908  2      !       !
;    0909  2      !       !       NONE
;    0910  2      !       !
;    0911  2      !       ! SIDE EFFECTS:
;    0912  2      !       !
;    0913  2      !       !       NONE
;    0914  2      !       !
;    0915  2      !       !--
```

```
;    0916  2      !
;    0917  2      !       BEGIN
;    0918  2      !               LOCAL
;    0919  2      !                       New_Record_Ptr;
;    0920  2      !
;    0921  2      !               MAP
;    0922  2      !                       DSA$GL_TESTNO : WORD,
;    0923  2      !                       Record_Ptr    : Error_Record;
;    0924  2      !
;    0925  2      !               New (New_Record_Ptr);
;    0926  2      !
;    0927  2      !               BEGIN
;    0928  2      !                       MAP
;    0929  2      !                               New_Record_Ptr : Error_Record;
;    0930  2      !
;    0931  2      !                       New_Record_Ptr [QA$VW_Error_Number]   = .Error_Number;
;    0932  2      !                       New_Record_Ptr [QA$VW_Test_Number]    = .DSA$GL_TESTNO;
;    0933  2      !                       New_Record_Ptr [QA$VL_Subtest_Number] = .DSA$GL_SUBTNO;
;    0934  2      !                       New_Record_Ptr [QA$VL_Error_Count]    = 1;
;    0935  2      !                       New_Record_Ptr [QA$VA_Next_Error]     = .Record_Ptr [QA$VA_Next_Error]
;    0936  2      !               END;
;    0937  2      !
;    0938  2      !               Record_Ptr [QA$VA_Next_Error] = .New_Record_Ptr;
;    0939  2      !       END;
```

```
;    0940  2      !
;    0941  2      !%SBTTL 'QA$Add_Forced_Error'
;    0942  2      !
;    0943  2      !       LOCAL
;    0944  2      !               Test : WORD,                            ! The DSA$GL_TESTNO.
;    0945  2      !
;    0946  2      !               Subtest,                                ! The DSA$GL_SUBTNO.
;    0947  2      !
;    0948  2      !               Prev_Record_Ptr,                        ! The pointer to the record before the Record_Ptr record.
;    0949  2      !
;    0950  2      !               Record_Ptr;                             ! The pointer used to sneak through the linked list.
;    0951  2      !
;    0952  2      !       !+
;    0953  2      !       ! Check to see if the Error_List_Head is nil. If so, this is the first record to be added. Add a new
;    0954  2      !       ! record that contains all zero fields. Then, add another record after this one that will contain the
;    0955  2      !       ! correct information. The null record is used to make adding the first record easier. It also helps
;    0956  2      !       ! facilitate adding records before the first record. Set both of the global linked list pointers to
;    0957  2      !       ! point to this null record.
;    0958  2      !       !-
;    0959  2      !
;    0960  2      !       IF (.QA$A_Error_List_Head EQL QA$K_Nil) THEN
;    0961  2      !               BEGIN
;    0962  2      !               LOCAL
;    0963  2      !                       New_Record_Ptr;
;    0964  2      !
;    0965  2      !               New (New_Record_Ptr);
;    0966  2      !
;    0967  2      !               BEGIN
;    0968  2      !                       MAP
;    0969  2      !                               New_Record_Ptr : Error_Record;
;    0970  2      !
;    0971  2      !               New_Record_Ptr [QA$VW_Error_Number]   = 0;
;    0972  2      !               New_Record_Ptr [QA$VW_Test_Number]    = 0;
;    0973  2      !               New_Record_Ptr [QA$VL_Subtest_Number] = 0;
;    0974  2      !               New_Record_Ptr [QA$VL_Error_Count]    = 0;
;    0975  2      !               New_Record_Ptr [QA$VA_Next_Error]     = QA$K_Nil;
;    0976  2      !               END;
;    0977  2      !
;    0978  2      !               Add_Error_Record (.New_Record_Ptr, .Error_Number);
;    0979  2      !
;    0980  2      !               QA$A_Prev_Test_Tail  = .New_Record_Ptr;
;    0981  2      !               QA$A_Error_List_Head = .New_Record_Ptr;
;    0982  2      !               RETURN
;    0983  2      !               END;
```

```
;    0984  2      !
;    0985  2      !       !+
;    0986  2      !       ! Start looking at the current head of the linked list that has all the test and subtest numbers
;    0987  2      !       ! the same. This list appears at the end of the forced-error linked list.
;    0988  2      !       !-
;    0989  2      !
;    0990  2      !       BEGIN
;    0991  2      !               MAP
;    0992  2      !                       QA$A_Prev_Test_Tail : Error_Record;
;    0993  2      !
;    0994  2      !               Prev_Record_Ptr = .QA$A_Prev_Test_Tail;
;    0995  2      !               Record_Ptr      = .QA$A_Prev_Test_Tail [QA$VA_Next_Error]
;    0996  2      !       END;
;    0997  2      !
;    0998  2      !       BEGIN
;    0999  2      !               MAP
;    1000  2      !                       Record_Ptr : Error_Record;
;    1001  2      !
;    1002  2      !               Test    = .Record_Ptr [QA$VW_Test_Number];
;    1003  2      !               Subtest = .Record_Ptr [QA$VL_Subtest_Number]
;    1004  2      !       END;
;    1005  2      !
;    1006  2      !       !+
;    1007  2      !       ! Check the start of the last link of like test/subtest numbers. See if this forced error happened
;    1008  2      !       ! in a new test and/or subtest. If so, add one record to the end of this list.
;    1009  2      !       !-
;    1010  2      !
;    1011  2      !       IF ((.Test NEQ .DSA$GL_TESTNO) OR (.Subtest NEQ .DSA$GL_SUBTNO)) THEN
;    1012  2      !               BEGIN
;    1013  2      !               !+
;    1014  2      !               ! Then we have forced an error call in a new test and/or subtest. Find the end of the linked list
;    1015  2      !               ! of forced-errors and add a new record onto the end. Save a pointer to the previous end record.
;    1016  2      !               !-
;    1017  2      !               MAP
;    1018  2      !                       Record_Ptr : Error_Record;
;    1019  2      !
;    1020  2      !               While (.Record_Ptr [QA$VA_Next_Error] NEQ QA$K_Nil) DO
;    1021  2      !                       Record_Ptr = .Record_Ptr [QA$VA_Next_Error];
;    1022  2      !
;    1023  2      !               QA$A_Prev_Test_Tail = .Record_Ptr;
;    1024  2      !
;    1025  2      !               Add_Error_Record (.Record_Ptr, .Error_Number);
;    1026  2      !               RETURN
;    1027  2      !               END;
```

```
;    1028  2      !
;    1029  2      !       !+
;    1030  2      !       ! Thus, at this point we do NOT have:
;    1031  2      !       !       1. A new list (i.e., no records).
;    1032  2      !       !       2. A new test and/or subtest number (i.e., the error number being added happened in the same
;    1033  2      !       !          test and subtest as the previously-added error number happened in.
;    1034  2      !       ! So, look along the error numbers in the linked list of records whose test/subtest numbers match for the
;    1035  2      !       ! correct place to insert this error number.
;    1036  2      !       !-
;    1037  2      !
;    1038  2      !       BEGIN
;    1039  2      !               MAP
;    1040  2      !                       Record_Ptr : Error_Record;
;    1041  2      !
;    1042  2      !               LOCAL
;    1043  2      !                       Curr_Error_Number;
;    1044  2      !
;    1045  2      !               WHILE (1) DO
;    1046  2      !                       BEGIN
;    1047  2      !                       Curr_Error_Number = .Record_Ptr [QA$VW_Error_Number];
;    1048  2      !
;    1049  2      !                       IF (.Curr_Error_Number LSS .Error_Number) THEN
;    1050  2      !                               BEGIN
;    1051  2      !                               !+
;    1052  2      !                               ! If the next one is nil, add the new one at the end. If it is not nil,
;    1053  2      !                               ! advance the pointer and continue looping.
;    1054  2      !                               !-
;    1055  2      !                               IF (.Record_Ptr [QA$VA_Next_Error] EQL QA$K_Nil) THEN
;    1056  2      !                                       BEGIN
;    1057  2      !                                       Add_Error_Record (.Record_Ptr, .Error_Number);
;    1058  2      !                                       RETURN
;    1059  2      !                                       END
;    1060  2      !                               ELSE
;    1061  2      !                                       BEGIN
;    1062  2      !                                       Prev_Record_Ptr = .Record_Ptr;
;    1063  2      !                                       Record_Ptr      = .Record_Ptr [QA$VA_Next_Error]
;    1064  2      !                                       END
;    1065  2      !                               END
;    1066  2      !                       ELSE IF (.Curr_Error_Number EQL .Error_Number) THEN
;    1067  2      !                               BEGIN
;    1068  2      !                               !+
;    1069  2      !                               ! This error number is already in the linked list. Add one to the total number
;    1070  2      !                               ! of times it has occurred.
;    1071  2      !                               !-
;    1072  2      !                               Record_Ptr [QA$VL_Error_Count] = .Record_Ptr [QA$VL_Error_Count] + 1;
;    1073  2      !                               RETURN
;    1074  2      !                               END
;    1075  2      !                       ELSE                    ! Curr_Error_Number GTR Error_Number
;    1076  2      !                               BEGIN
;    1077  2      !                               !+
;    1078  2      !                               ! This error number belongs just before the current record being looked at.
;    1079  2      !                               ! Therefore, add a new record there.
;    1080  2      !                               !-
;    1081  2      !                               Add_Error_Record (.Prev_Record_Ptr, .Error_Number);
;    1082  2      !                               RETURN
;    1083  2      !                               END;
;    1084  2      !                       END;                    ! WHILE ...
```

```
;   1085  2     !       END;                              ! BEGIN ...
;   1086  2
;   1087  2             1;                                !
;   1088  2
;   1089  1     END;


                                                0000 00000         .ENTRY  QA$ADD_FORCED_ERROR, Save nothing          ; 0776
                                                  04 00002         RET                                                ; 1089

; Routine Size:  3 bytes,    Routine Base:  CODE + 017E
```

```
;    1091  1     %SBTTL 'QA$Add_QA_Error'
;    1092  1
;    1093  1     GLOBAL ROUTINE QA$Add_QA_Error (Routine_Constant) : NOVALUE =
;    1094  1
;    1095  1     !++
;    1096  1     ! FUNCTIONAL DESCRIPTION:
;    1097  1     !
;    1098  1     !       This routine adds an error to the QA$AW_Overall_Error_Table word vector.
;    1099  1     !
;    1100  1     ! CALLER(S):
;    1101  1     !
;    1102  1     !       The check routines.
;    1103  1     !
;    1104  1     ! FORMAL PARAMETERS:
;    1105  1     !
;    1106  1     !       Routine_Constant - One of the QA$K_check-name constants.
;    1107  1     !
;    1108  1     ! IMPLICIT INPUTS:
;    1109  1     !
;    1110  1     !       QA$AW_Overall_Error_Table
;    1111  1     !
;    1112  1     ! IMPLICIT OUTPUTS:
;    1113  1     !
;    1114  1     !       NONE
;    1115  1     !
;    1116  1     ! COMPLETION CODES:
;    1117  1     !
;    1118  1     !       NONE
;    1119  1     !
;    1120  1     ! SIDE EFFECTS:
;    1121  1     !
;    1122  1     !       Adds one to the Routine_Constant entry in the QA$AW_Overall_Error_Table.
;    1123  1     !
;    1124  1     !--
;    1125  1
;    1126  2     BEGIN
;    1127  2             QA$AW_Overall_Error_Table [.Routine_Constant] =
;    1128  2                     .QA$AW_Overall_Error_Table [.Routine_Constant] + 1
;    1129  1     END;



                                        0000 00000          .ENTRY  QA$ADD_QA_ERROR, Save nothing                   ; 1093
                                50      04   AC   D0 00002  MOVL    ROUTINE_CONSTANT, R0                            ; 1127
                                   00000000'EF40   B6 00006  INCW    QA$AW_OVERALL_ERROR_TABLE[R0]                   ; 1128
                                               04 0000D      RET                                                     ; 1129

; Routine Size:  14 bytes,    Routine Base:  CODE + 0181
```

```
%SBTTL  'QA$Control_C_Handler'

ROUTINE QA$Control_C_Handler =                          !                                                   [06]

!++                                                                                                         [06]
! FUNCTIONAL DESCRIPTION:                                                                                   [06]
!                                                                                                           [06]
!       This routine is called by the Supervisor's Control-C (i.e., ^C) handler, KB_Check in the KERNEL.MAR [06]
!       module. It will abort QA. This routine is set up as a handler by QA$Main.                          [06]
!                                                                                                           [06]
! FORMAL PARAMETERS:                                                                                        [06]
!                                                                                                           [06]
!       NONE.                                                                                               [06]
!                                                                                                           [06]
! CALLER(S):                                                                                                [06]
!                                                                                                           [06]
!       KB_CHECK in the KERNEL.MAR module.                                                                  [06]
!                                                                                                           [06]
! IMPLICIT INPUTS:                                                                                          [06]
!                                                                                                           [06]
!       NONE                                                                                                [06]
!                                                                                                           [06]
! IMPLICIT OUTPUTS:                                                                                         [06]
!                                                                                                           [06]
!       NONE                                                                                                [06]
!                                                                                                           [06]
! COMPLETION CODES:                                                                                         [06]
!                                                                                                           [06]
!       None, really. It is defined as a VALUE routine howver, because KB_CHECK looks at the return status [06]
!       by this routine (however, this routine does not return)!                                            [06]
!                                                                                                           [06]
! SIDE EFFECTS:                                                                                             [06]
!                                                                                                           [06]
!       Aborts the diagnostic and the QA sequence of checks. There are no completion codes because control does [06]
!       not return to here after the DSX$Abort routine call. Control will eventually get to DS$Cli in the  [06]
!       CLI.MAR module.                                                                                     [06]
!                                                                                                           [06]
!--                                                                                                          [06]
```

```
;   1170  2     BEGIN                                                   !                                                   [06]
;   1171  2             $DS_CNTRLC (DISABL=1);                          ! Disable Control-C's                               [06]
;   1172  2             DSA$GL_FLAGS = .QA$L_Saved_DSA_Flags;           ! Restore DSA flags                                 [06]
;   1173  2             QA$Init ();                                     ! Initialize for next run                           [06]
;   1174  2             DSA$V_QA = Off;                                 ! Turn off QA                                       [06]
;   1175  2             DSX$Abort ();                                   ! Abort the diagnostic, return to CLI.              [06]
;   1176  3             RETURN (1)                                      ! This will never be executed, because of the       [06]
;   1177  3                                                             ! above Abort.                                      [06]
;   1178  1     END;                                                    !                                                   [06]


                                                                .EXTRN  DS$CNTRLC

                                                  0000 00000 QA$CONTROL_C_HANDLER:
                                                                .WORD   Save nothing                                    ; 1133
                                                  01  DD 00002  PUSHL   #1                                              ; 1171
                                                  7E  D4 00004  CLRL    -(SP)                                           ;
                  00000000G  9F                   02  FB 00006  CALLS   #2, @#DS$CNTRLC                                 ;
                  0000FE00   9F 00000000'         EF  D0 0000D  MOVL    QA$L_SAVED_DSA_FLAGS, @#^X0000FE00              ; 1172
                  00000000V  EF                   00  FB 00018  CALLS   #0, QA$INIT                                     ; 1173
                  0000FE01   9F        80         8F  8A 0001F  BICB2   #128, @#^X0000FE01                              ; 1174
                  00000000G  EF                   00  FB 00027  CALLS   #0, DSX$ABORT                                   ; 1175
                             50                   01  D0 0002E  MOVL    #1, R0                                          ; 1176
                                                      04 00031  RET                                                       ;

; Routine Size:  50 bytes,    Routine Base:  CODE + 018F
```

```
;    1180  1      %SBTTL 'QA$Dump'
;    1181  1
;    1182  1      ROUTINE QA$Dump : NOVALUE =
;    1183  1
;    1184  1      !++
;    1185  1      ! FUNCTIONAL DESCRIPTION:
;    1186  1      !
;    1187  1      !       This routine dumps pertinent information whenever a QA error is
;    1188  1      !       detected. If the users diagnostic has been aborted (i.e., an
;    1189  1      !       INIT_CONTEXT has been done), this routine will fail because the
;    1190  1      !       user's call frames are gone.
;    1191  1      !
;    1192  1      ! CALLER:
;    1193  1      !
;    1194  1      !       QA$Main - This routine should be called when a QA error is
;    1195  1      !                 detected. QA$Main should be its only caller.
;    1196  1      !
;    1197  1      ! FORMAL PARAMETERS:
;    1198  1      !
;    1199  1      !       NONE
;    1200  1      !
;    1201  1      ! IMPLICIT INPUTS:
;    1202  1      !
;    1203  1      !       Various DSA and diagnostic header (i.e., L$x_) values and flags.
;    1204  1      !
;    1205  1      ! IMPLICIT OUTPUTS:
;    1206  1      !
;    1207  1      !       If possible, helpful debugging information is printed.
;    1208  1      !
;    1209  1      ! COMPLETION CODES:
;    1210  1      !
;    1211  1      !       NONE
;    1212  1      !
;    1213  1      ! SIDE EFFECTS:
;    1214  1      !
;    1215  1      !       NONE
;    1216  1      !
;    1217  1      !--
```

```
;    1219  2      BEGIN
;    1220  2              BUILTIN
;    1221  2                      FP, SP, AP,
;    1222  2                      MOVPSL;
;    1223  2
;    1224  2              LITERAL
;    1225  2                      Reg_Not_Saved      = %X'00000000',      ! Special value to indicate that the register wasn't saved
;    1226  2                      Max_Regs_Saved     = 12;                ! Maximum that can be saved in a call frame.
;    1227  2
;    1228  2              LOCAL
;    1229  2                      Frame_Start,                            ! Start of the user's call frame
;    1230  2
;    1231  2                      !+
;    1232  2                      ! Stuff contained in a call frame:
;    1233  2                      !-
;    1234  2
;    1235  2                      Diag_PSW : WORD,                        ! Only get PSW - not PSL
;    1236  2                      Register_Mask,                          ! Call frame register mask
;    1237  2                      Diag_AP,
;    1238  2                      Diag_FP,
;    1239  2                      Diag_PC,                                ! Saved registers
;    1240  2                      Diag_SP,
;    1241  2
;    1242  2                      Number_Of_Regs;                         ! Number of regs in the register save mask
;    1243  2
;    1244  2              LOCAL
;    1245  2                      Fake_CLI_Table : VECTOR [4, LONG],              ! Fake DS$GL_CLIBASE
;    1246  2                      Reg_Vector     : VECTOR [Max_Regs_Saved, LONG]; ! Store 12 registers
;    1247  2
;    1248  2              BIND
;    1249  2                      Dump_Header_4 = $ASCIC ('!25* QA ERROR DETECTED!/!/'),
;    1250  2                      Dump_Line_1   = $ASCIC ('Test: !3UL!9* Subtest: !3UL!6* Pass: !3UL!9* Section: !AC!/!/'),   !    [02]
;    1251  2                      Dump_Line_2   = $ASCIC ('R2:  !8XL(X)!2* R3:  !8XL(X)!2* R4:  !8XL(X)!2* R5:  !8XL(X)!/'),  !    [02]
;    1252  2                      Dump_Line_3   = $ASCIC ('R6:  !8XL(X)!2* R7:  !8XL(X)!2* R8:  !8XL(X)!2* R9:  !8XL(X)!/'),  !    [02]
;    1253  2                      Dump_Line_4   = $ASCIC ('R10: !8XL(X)!2* R11: !8XL(X)!2* AP:  !8XL(X)!2* FP:  !8XL(X)!/'),  !    [02]
;    1254  2                      Dump_Line_5   = $ASCIC ('SP:  !8XL(X)!2* PC:  !8XL(X)!2* PSW: !8XW(X)!/'),                  !    [07]
;    1255  2                      Dump_Line_7   = $ASCIC ('!/SHOW FLAGS:!/'),                                                 !    [07]
;    1256  2                      Dump_Line_8   = $ASCIC ('!/SHOW EVENT FLAGS:!/'),                                           !    [07]
;    1257  2                      Dump_Line_9   = $ASCIC ('!/SHOW DEVICE:!/'),                                                !    [07]
;    1258  2                      Dump_Line_10  = $ASCIC ('!/SHOW SELECTED:!/');                                              !    [07]
```

```
;    1260  2      !+
;    1261  2      ! Picture of a call frame:
;    1262  2      !
;    1263  2      !       ------------------------------------------------------------------------
;    1264  2      !       |                    PUSHx arguments for the CALLx                     | High Memory
;    1265  2      !       ------------------------------------------------------------------------
;    1266  2      !       |                                          | Number of arguments       | :(AP)
;    1267  2      !       ------------------------------------------------------------------------
;    1268  2      !       |                       Saved R11                                      | +n+4
;    1269  2      !       ------------------------------------------------------------------------
;    1270  2      !       |                       Saved R10                                      | +n
;    1271  2      !       ------------------------------------------------------------------------
;    1272  2      !                                    .
;    1273  2      !                                    .
;    1274  2      !                                    .
;    1275  2      !       ------------------------------------------------------------------------
;    1276  2      !       |                       Saved R0                                       | +20
;    1277  2      !       ------------------------------------------------------------------------
;    1278  2      !       |                       Saved PC                                       | +16
;    1279  2      !       ------------------------------------------------------------------------
;    1280  2      !       |                       Saved FP                                       | +12
;    1281  2      !       ------------------------------------------------------------------------
;    1282  2      !       |                       Saved AP                                       | +8
;    1283  2      !       ------------------------------------------------------------------------
;    1284  2      !       | SPA | S | 0 |Register save mask <11:0>|          PSW <15:5>        |   0   | +4
;    1285  2      !       ------------------------------------------------------------------------
;    1286  2      !       |                  Condition Handler (Initially Zero)                  | :(FP) - Low Memory
;    1287  2      !       ------------------------------------------------------------------------
;    1288  2      !       |                  Start of called routine's stack area                |
;    1289  2      !       ------------------------------------------------------------------------
;    1290  2      !-
```

```
;    1292  2              !+
;    1293  2              ! Print the header lines for this routine.
;    1294  2              !-
;    1295  2
;    1296  2              $DS_PRINTF (QA$T_Header_1);                              !                                                  [01]
;    1297  2              $DS_PRINTF (QA$T_Header_2, .L$A_NAME, .L$L_REV, .L$L_UPDATE);   !                                           [01]
;    1298  2              $DS_PRINTF (QA$T_Header_3, 0);                           ! Specify 0 to get system time.                   [01]
;    1299  2              $DS_PRINTF (Dump_Header_4);
;    1300  2
;    1301  2              !+
;    1302  2              ! Print the test number, subtest number, pass number, and section name.
;    1303  2              !-
;    1304  2
;    1305  3              BEGIN
;    1306  3                      BIND
;    1307  3                              Sec_Name_Table = ((.L$A_SECNAM) + 4) : VECTOR [, LONG];
;    1308  3
; P  1309  3                      $DS_PRINTF (Dump_Line_1, .DSA$GL_TESTNO,
; P  1310  3                                  .DSA$GL_SUBTNO, .DSA$GL_PASSNO,
;    1311  4                                  .Sec_Name_Table [.DSA$GL_SECTNO])
;    1312  2              END;
;    1313  2
;    1314  2              !+
;    1315  2              ! If an Init_Context has been done, then cannot follow stack frames back to the user's last
;    1316  2              ! call frame. Therefore, just print above lines and return.
;    1317  2              !-
;    1318  2
;    1319  2              IF (.QA$AOB_Flags [QA$K_Init_Context_Done]) THEN
;    1320  3                      BEGIN
;    1321  3                      QA$AOB_Flags [QA$K_Init_Context_Done] = False;  ! Turn it back off
;    1322  3                      RETURN
;    1323  2                      END;
```

```
;   1325  2          !+
;   1326  2          ! If cannot follow stack frames back to the user's program, the Find_User_Call_Frame routine will
;   1327  2          ! print an error message.
;   1328  2          !-
;   1329  2
;   1330  2          IF (NOT QA$Find_User_Call_Frame (Frame_Start)) THEN
;   1331  3                  BEGIN
;   1332  3                  RETURN                                  ! Failure
;   1333  2                  END;
;   1334  2
;   1335  2          !+
;   1336  2          ! Frame_Start now equals the start of the user's last call frame. Set Diag_FP equal to the start of
;   1337  2          ! the frame that was just found. This frame is the one from which I am extracting everything, so it
;   1338  2          ! makes sense to use the FP that points to this frame. This is done instead of using the FP that is
;   1339  2          ! contained in the frame we are looking at (i.e., that points to the frame of the caller of the
;   1340  2          ! user's routine that bombed).
;   1341  2          !-
;   1342  2
;   1343  3          BEGIN
;   1344  3                  BIND
;   1345  3                          Call_Frame = .Frame_Start : BLOCK [, BYTE];
;   1346  3
;   1347  3                  Diag_PSW        = .Call_Frame [SF$W_SAVE_PSW];
;   1348  3                  Register_Mask   = .Call_Frame [SF$V_SAVE_MASK];
;   1349  3                  Diag_AP         = .Call_Frame [SF$L_SAVE_AP];
;   1350  3                  Diag_FP         = .Frame_Start;
;   1351  3                  Diag_PC         = .Call_Frame [SF$L_SAVE_PC];
;   1352  2          END;
```

```
;    1354  2              !+
;    1355  2              ! Get those registers that were saved. Assume Reg_Not_Saved for non-saved ones. This will only get
;    1356  2              ! those registers that were saved in the user's last call frame. That is, those registers saved by
;    1357  2              ! the last called Supervisor routine, which through a series of CALL's, BSBW's, etc. got to here.
;    1358  2              ! However, those Supervisor routines which, by virtue of their being called by the diagnostic,        [02]
;    1359  2              ! cause a QA error must have all the registers (i.e., R2 through R11) saved in the entry mask for     [02]
;    1360  2              ! their routine. This allows the following code to access all these registers.                       [02]
;    1361  2              !-
;    1362  2
;    1363  2              INCR Reg_Number FROM 0 TO (Max_Regs_Saved - 1) DO
;    1364  2                      Reg_Vector [.Reg_Number] = Reg_Not_Saved;
;    1365  2
;    1366  2              !+
;    1367  2              ! Number_Of_Regs will actually end up to be one less than the actual number of registers that were
;    1368  2              ! saved. This is so that I can use it to index the Start_Registers vector, which starts at zero, not one!
;    1369  2              !-
;    1370  2
;    1371  2              Number_Of_Regs = -1;
;    1372  2
;    1373  2              INCR Bit_Number FROM 0 TO (Max_Regs_Saved - 1) DO
;    1374  3                      BEGIN
;    1375  3                      BIND
;    1376  3                              !+
;    1377  3                              ! Start_registers is the start of a vector of saved registers in the call frame. This
;    1378  3                              ! vector starts at offset 20 from the start of the frame.
;    1379  3                              !-
;    1380  3
;    1381  3                              Start_Registers = ((.Frame_Start) + 20) : VECTOR [, LONG];
;    1382  3
;    1383  3                      MAP
;    1384  3                              Register_Mask   : BITVECTOR [32];       ! Reference as a Bit Vector
;    1385  3
;    1386  3                      IF (.Register_Mask [.Bit_Number]) THEN
;    1387  4                              BEGIN
;    1388  4
;    1389  4                              Number_Of_Regs = .Number_Of_Regs + 1;
;    1390  4                              Reg_Vector [.Bit_Number] = .Start_Registers [.Number_Of_Regs];
;    1391  3                              END;
;    1392  2                      END;
```

```
;    1394  2              Number_Of_Regs = .Number_Of_Regs + 1;
;    1395  2
;    1396  2              !+
;    1397  2              ! Number_Of_Regs now equals the actual number of registers that were saved in the call frame.
;    1398  2              ! Compute the value of the Stack Pointer before the user's CALLx was executed. This is found
;    1399  2              ! by computing the size of the last call frame put on by the user. This size is the added to
;    1400  2              ! the starting address of the call frame and the stack pointer alignment is added in,
;    1401  2              ! producing the value of the SP.
;    1402  2              !-
;    1403  2
;    1404  3              BEGIN
;    1405  3                      BIND
;    1406  3                              Call_Frame = .Frame_Start : BLOCK [, BYTE];
;    1407  3
;    1408  3                      Diag_SP = .Frame_Start +                        ! Start of call frame
;    1409  3                                (5 * 4) +                             ! 5 longwords
;    1410  3                                (.Number_Of_Regs * 4) +               ! Longword for each reg
;    1411  3                                .Call_Frame [SF$V_STACKOFFS];         ! SPA
;    1412  2              END;
;    1413  2
;    1414  2              !+
;    1415  2              ! Print the registers and the PSW. Do not print R0 and R1 since they may not be correct.          [02]
;    1416  2              !-
;    1417  2
;    1418  2              $DS_PRINTF (Dump_line_2, .Reg_Vector [2],  .Reg_Vector [3],  .Reg_Vector [4],  .Reg_Vector [5]);   !    [02]
;    1419  2              $DS_PRINTF (Dump_line_3, .Reg_Vector [6],  .Reg_Vector [7],  .Reg_Vector [8],  .Reg_Vector [9]);   !    [02]
;    1420  2              $DS_PRINTF (Dump_line_4, .Reg_Vector [10], .Reg_Vector [11], .Diag_AP,         .Diag_FP);          !    [02]
;    1421  2              $DS_PRINTF (Dump_line_5, .Diag_SP,         .Diag_PC,         .Diag_PSW);                        !    [02]
```

```
;    1423  2              !+
;    1424  2              ! Print the control flags, event flags, and selected devices.
;    1425  2              !-
;    1426  2
;    1427  2              $DS_PRINTF (Dump_line_7);
;    1428  2              VRShowFlg ();                                   ! Show the control flags
;    1429  2
;    1430  2              $DS_PRINTF (Dump_line_8);
;    1431  2              VRShowEf  ();                                   ! Show the event flags
;    1432  2
;    1433  2              !+
;    1434  2              ! Set up a fake CLI database table. This is needed because the following two routines access the
;    1435  2              ! CLI$Q_FILE quadword in this table in order to determine what device should be SHOW'n. All that
;    1436  2              ! is needed in this table is a null quadword at the CLI$Q_FILE offset. Zero out the entire table
;    1437  2              ! to play it safe though. Only 4 longwords are allocated since the FILE quadword starts at the
;    1438  2              ! third longword in the real CLI table.
;    1439  2              !-
;    1440  2
;    1441  2              INCR I FROM 0 TO 3 DO
;    1442  2                      Fake_CLI_Table [.I] = 0;
;    1443  2
;    1444  2              $DS_PRINTF (Dump_line_9);
;    1445  2              DSV$ShowDevice (Fake_CLI_Table);                ! Show the devices
;    1446  2
;    1447  2              $DS_PRINTF (Dump_line_10);
;    1448  2              DSV$ShowSelect (Fake_CLI_Table)                 ! Show the selected devices
;    1449  1      END;


                                                                .PSECT  DATA,NOWRT,NOEXE,  SHR,2

20 52 4F 52 52 45 20 41 51 20 2A 35 32 21 1A  00007 P.AAB:   .ASCII  <26>\!25* QA ERROR DETECTED!/!/\                ;
      2F 21 2F 21 44 45 54 43 45 54 45 44      00016                                                               ;
20 2A 39 21 4C 55 33 21 20 3A 74 73 65 54 3D  00022 P.AAC:   .ASCII  \=Test: !3UL!9* Subtest: !3UL!6* Pass: !3\     ;
36 21 4C 55 33 21 20 3A 74 73 65 74 62 75 53  00031                                                               ;
                  33 21 20 3A 73 73 61 50 20 2A 00040                                                             ;
20 3A 6E 6F 69 74 63 65 53 20 2A 39 21 4C 55  0004A           .ASCII  \UL!9* Section: !AC!/!/\                     ;
                        2F 21 2F 21 43 41 21  00059                                                               ;
32 21 29 58 28 4C 58 38 21 20 20 3A 32 52 3E  00060 P.AAD:   .ASCII  \>R2:  !8XL(X)!2* R3:  !8XL(X)!2* R4:  !8\     ;
21 29 58 28 4C 58 38 21 20 20 3A 33 52 20 2A  0006F                                                               ;
                  38 21 20 20 3A 34 52 20 2A 32 0007E                                                             ;
21 20 20 3A 35 52 20 2A 32 21 29 58 28 4C 58  00088           .ASCII  \XL(X)!2* R5:  !8XL(X)!/\                    ;
                        2F 21 29 58 28 4C 58 38 00097                                                             ;
32 21 29 58 28 4C 58 38 21 20 20 3A 36 52 3E  0009F P.AAE:   .ASCII  \>R6:  !8XL(X)!2* R7:  !8XL(X)!2* R8:  !8\     ;
21 29 58 28 4C 58 38 21 20 20 3A 37 52 20 2A  000AE                                                               ;
                  38 21 20 20 3A 38 52 20 2A 32 000BD                                                             ;
21 20 20 3A 39 52 20 2A 32 21 29 58 28 4C 58  000C7           .ASCII  \XL(X)!2* R9:  !8XL(X)!/\                    ;
                        2F 21 29 58 28 4C 58 38 000D6                                                             ;
32 21 29 58 28 4C 58 38 21 20 3A 30 31 52 3E  000DE P.AAF:   .ASCII  \>R10: !8XL(X)!2* R11: !8XL(X)!2* AP:  !8\     ;
21 29 58 28 4C 58 38 21 20 3A 31 31 52 20 2A  000ED                                                               ;
                  38 21 20 20 3A 50 41 20 2A 32 000FC                                                             ;
21 20 20 3A 50 46 20 2A 32 21 29 58 28 4C 58  00106           .ASCII  \XL(X)!2* FP:  !8XL(X)!/\                    ;
                        2F 21 29 58 28 4C 58 38 00115                                                             ;
32 21 29 58 28 4C 58 38 21 20 20 3A 50 53 2E  0011D P.AAG:   .ASCII  \.SP:  !8XL(X)!2* PC:  !8XL(X)!2* PSW: !8\     ;
21 29 58 28 4C 58 38 21 20 20 3A 43 50 20 2A  0012C                                                               ;
                  38 21 20 3A 57 53 50 20 2A 32 0013B                                                             ;
```

```
                                                
```

```
54      06  A1          0C          00  EF 00090        EXTZV   #0, #12, 6(R1), REGISTER_MASK                ; 1348
                        57      08  A1  D0 00096        MOVL    8(R1), DIAG_AP                               ; 1349
                        56          51  D0 0009A        MOVL    R1, DIAG_FP                                  ; 1350
                        55      10  A1  D0 0009D        MOVL    16(R1), DIAG_PC                              ; 1351
                                    50  D4 000A1        CLRL    REG_NUMBER                                   ; 1363
                                04 AE40  D4 000A3 3$:   CLRL    REG_VECTOR[REG_NUMBER]                       ; 1364
                F8          50          0B  F3 000A7        AOBLEQ  #11, REG_NUMBER, 3$                          ;
                            50          01  CE 000AB        MNEGL   #1, NUMBER_OF_REGS                           ; 1371
                            53      14  A1  9E 000AE        MOVAB   20(R1), R3                                   ; 1381
                                    52  D4 000B2        CLRL    BIT_NUMBER                                   ; 1373
                08          54          52  E1 000B4 4$:   BBC     BIT_NUMBER, REGISTER_MASK, 5$                ; 1386
                                    50  D6 000B8        INCL    NUMBER_OF_REGS                               ; 1389
                        04 AE42       6340  D0 000BA        MOVL    (R3)[NUMBER_OF_REGS], REG_VECTOR-            ; 1390
                                                                  [BIT_NUMBER]                                 ;
                F0          52          0B  F3 000C0 5$:   AOBLEQ  #11, BIT_NUMBER, 4$                          ; 1373
                                    50  D6 000C4        INCL    NUMBER_OF_REGS                               ; 1394
                            50       6140  DE 000C6        MOVAL   (R1)[NUMBER_OF_REGS], R0                     ; 1410
51      07  A1          02          06  EF 000CA        EXTZV   #6, #2, 7(R1), R1                            ; 1411
                            52      14 A140  9E 000D0        MOVAB   20(R1)[R0], DIAG_SP                          ; 1410
                                    18  AE  DD 000D5        PUSHL   REG_VECTOR+20                                ; 1418
                                    18  AE  DD 000D8        PUSHL   REG_VECTOR+16                                ;
                                    18  AE  DD 000DB        PUSHL   REG_VECTOR+12                                ;
                                    18  AE  DD 000DE        PUSHL   REG_VECTOR+8                                 ;
                                    59  AA  9F 000E1        PUSHAB  DUMP_LINE_2                                  ;
                            69          05  FB 000E4        CALLS   #5, DS$PRINTF                                ;
                                    28  AE  DD 000E7        PUSHL   REG_VECTOR+36                                ; 1419
                                    28  AE  DD 000EA        PUSHL   REG_VECTOR+32                                ;
                                    28  AE  DD 000ED        PUSHL   REG_VECTOR+28                                ;
                                    28  AE  DD 000F0        PUSHL   REG_VECTOR+24                                ;
                                  0098  CA  9F 000F3        PUSHAB  DUMP_LINE_3                                  ;
                            69          05  FB 000F7        CALLS   #5, DS$PRINTF                                ;
                                    56  DD 000FA        PUSHL   DIAG_FP                                      ; 1420
                                    57  DD 000FC        PUSHL   DIAG_AP                                      ;
                                    38  AE  DD 000FE        PUSHL   REG_VECTOR+44                                ;
                                    38  AE  DD 00101        PUSHL   REG_VECTOR+40                                ;
                                  00D7  CA  9F 00104        PUSHAB  DUMP_LINE_4                                  ;
                            69          05  FB 00108        CALLS   #5, DS$PRINTF                                ;
                            7E          58  3C 0010B        MOVZWL  DIAG_PSW, -(SP)                              ; 1421
                                    24  BB 0010E        PUSHR   #^M<R2,R5>                                   ;
                                  0116  CA  9F 00110        PUSHAB  DUMP_LINE_5                                  ;
                            69          04  FB 00114        CALLS   #4, DS$PRINTF                                ;
                                  0145  CA  9F 00117        PUSHAB  DUMP_LINE_7                                  ; 1427
                            69          01  FB 0011B        CALLS   #1, DS$PRINTF                                ;
                               00000000G  EF  16 0011E        JSB     VRSHOWFLG                                    ; 1428
                                  0155  CA  9F 00124        PUSHAB  DUMP_LINE_8                                  ; 1430
                            69          01  FB 00128        CALLS   #1, DS$PRINTF                                ;
                               00000000G  EF  16 0012B        JSB     VRSHOWEF                                     ; 1431
                                    50  D4 00131        CLRL    I                                            ; 1441
                                34 AE40  D4 00133 6$:   CLRL    FAKE_CLI_TABLE[I]                            ; 1442
                F8          50          03  F3 00137        AOBLEQ  #3, I, 6$                                    ;
                                  016B  CA  9F 0013B        PUSHAB  DUMP_LINE_9                                  ; 1444
                            69          01  FB 0013F        CALLS   #1, DS$PRINTF                                ;
                            52      34  AE  9E 00142        MOVAB   FAKE_CLI_TABLE, R2                           ; 1445
                               00000000G  EF  16 00146        JSB     DSV$SHOWDEVICE                               ;
                                  017C  CA  9F 0014C        PUSHAB  DUMP_LINE_10                                 ; 1447
                            69          01  FB 00150        CALLS   #1, DS$PRINTF                                ;
                            52      34  AE  9E 00153        MOVAB   FAKE_CLI_TABLE, R2                           ; 1448
```

```
                                00000000G  EF  16 00157        JSB     DSV$SHOWSELECT                          ;
                                               04 0015D        RET                                             ; 1449

; Routine Size:  350 bytes,    Routine Base:  CODE + 01C1
```

```
;    1451  1      %SBTTL  'QA$Find_User_Call_Frame'
;    1452  1
;    1453  1      GLOBAL ROUTINE QA$Find_User_Call_Frame (Frame_Start) =
;    1454  1
;    1455  1      !++
;    1456  1      ! FUNCTIONAL DESCRIPTION:
;    1457  1      !
;    1458  1      !       Find the user's last call frame by following the linked list
;    1459  1      !       of call frames. Find the first call frame whose saved PC is
;    1460  1      !       less than the starting location of the Supervisor. This should
;    1461  1      !       insure that that call frame was put on the stack when the user
;    1462  1      !       called a Supervisor service routine. This called frame will
;    1463  1      !       contain the saved PC, AP, FP, PSW, perhaps some of the general
;    1464  1      !       registers, and (indirectly) the SP.
;    1465  1      !
;    1466  1      ! CALLER:
;    1467  1      !
;    1468  1      !       QA$Dump - to find the call frame so it can print the debugging
;    1469  1      !                 information.
;    1470  1      !
;    1471  1      ! FORMAL PARAMETERS:
;    1472  1      !
;    1473  1      !       Frame_Start - will contain the starting location of the
;    1474  1      !                     found call frame.
;    1475  1      !
;    1476  1      ! IMPLICIT INPUTS:
;    1477  1      !
;    1478  1      !       NONE
;    1479  1      !
;    1480  1      ! IMPLICIT OUTPUTS:
;    1481  1      !
;    1482  1      !       Messages indicating that the call frame list cannot be followed.
;    1483  1      !
;    1484  1      ! COMPLETION CODES:
;    1485  1      !
;    1486  1      !       R0 EQL 1 => Success, Frame_Start contains the starting location
;    1487  1      !                                of the call frame.
;    1488  1      !       R0 EQL 1 => Failure, Frame_Start contains crap.
;    1489  1      !
;    1490  1      ! SIDE EFFECTS:
;    1491  1      !
;    1492  1      !       Hopefully none.
;    1493  1      !
;    1494  1      !--
```

```
;    1496  2      BEGIN
;    1497  2              BIND
;    1498  2                      FP_Ptr = .Frame_Start;
;    1499  2
;    1500  2              BUILTIN
;    1501  2                      FP, PROBEW;
;    1502  2
;    1503  2              LITERAL
;    1504  2                      Max_Frames_Checked = 25;                ! Maximum number of frames to check
;    1505  2
;    1506  2              LOCAL
;    1507  2                      Last_PC,
;    1508  2                      Number_Frames_Checked;
```

```
;    1510  2              !+
;    1511  2              ! Find the last call frame put on the stack by the user. Verify that the FP in the call frame
;    1512  2              ! can be accessed. This partially insures that I am not following invalid call frames.
;    1513  2              !-
;    1514  2
;    1515  2              FP_Ptr = .FP;                                   ! Start at the current FP
;    1516  2              Number_Frames_Checked = 0;
;    1517  2
;    1518  2              WHILE 1 DO
;    1519  3                      BEGIN
;    1520  3
;    1521  3                      IF (NOT PROBEW (%REF (0), %REF (3), .FP_Ptr)) THEN
;    1522  4                              BEGIN
;    1523  4                              BIND
;P   1524  4                                      Invalid_Call_Frame = $ASCIC
;    1525  4                                              ('!/**QA Internal Error: Invalid call frame. FP = !XL(X).!/!/'); !      [01]
;    1526  4
;    1527  4                              $DS_PRINTF (Invalid_Call_Frame, .FP_Ptr);
;    1528  5                              RETURN (QA$K_Failure)
;    1529  3                              END;
;    1530  3
;    1531  3                      IF ((Number_Frames_Checked = .Number_Frames_Checked + 1) GTR Max_Frames_Checked) THEN
;    1532  4                              BEGIN
;    1533  4                              BIND
;P   1534  4                                      Too_Many_Frames = $ASCIC
;    1535  4                              ('!/**QA Internal Error: Cannot follow stack frames back to the diagnostic!/!/'); !      [01]
;    1536  4
;    1537  4                              $DS_PRINTF (Too_Many_Frames);
;    1538  5                              RETURN (QA$K_Failure)
;    1539  3                              END;
;    1540  3
;    1541  3                      !+
;    1542  3                      ! The contents of FP_Ptr is the starting address of the current frame being looked at. Pick out the
;    1543  3                      ! PC from the call frame. If this PC is less than the starting location of the Supervisor, then this
;    1544  3                      ! call frame must be the last call frame of the user. If not, backtrack to the next call frame.
;    1545  3                      !-
;    1546  3
;    1547  3                      Last_PC = .(.FP_Ptr + 16);              ! PC is offset 16 from the start of the call frame.
;    1548  3
;    1549  3                      IF (.Last_PC LSS DS$K_DS_Starting_Location) THEN
;    1550  4                              BEGIN
;    1551  5                              RETURN (QA$K_Success)
;    1552  3                              END;
;    1553  3
;    1554  3                      FP_Ptr = .(.FP_Ptr + 12);               ! FP is offset 12 from the start of the call frame.
;    1555  3                      END
;    1556  1      END;


                                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

61  6E  72  65  74  6E  49  20  41  51  2A  2A  2F  21  3B  00196 P.AAL:  .ASCII  \;!/**QA Internal Error: Invalid call fra\  ;
69  6C  61  76  6E  49  20  3A  72  6F  72  72  45  20  6C  001A5                                                              ;
                  61  72  66  20  6C  6C  61  63  20  64  001B4                                                              ;
29  58  28  4C  58  21  20  3D  20  50  46  20  2E  65  6D  001BE          .ASCII  \me. FP = !XL(X).!/!/\                      ;
                              2F  21  2F  21  2E  001CD                                                                      ;
```

```
61 6E 72 65 74 6E 49 20 41 51 2A 2A 2F 21 4C 001D2 P.AAM:  .ASCII  \L!/**QA Internal Error: Cannot follow st\  ;
74 6F 6E 6E 61 43 20 3A 72 6F 72 72 45 20 6C 001E1                                                          ;
                74 73 20 77 6F 6C 6C 6F 66 20 001F0                                                         ;
6B 63 61 62 20 73 65 6D 61 72 66 20 6B 63 61 001FA          .ASCII  \ack frames back to the diagnostic!/!/\     ;
73 6F 6E 67 61 69 64 20 65 68 74 20 6F 74 20 00209                                                          ;
                2F 21 2F 21 63 69 74 00218                                                                  ;

                                                    INVALID_CALL_FRAME= P.AAL
                                                    TOO_MANY_FRAMES=    P.AAM


                                                            .PSECT  CODE,NOWRT,  SHR,2

                                                 003C 00000         .ENTRY  QA$FIND_USER_CALL_FRAME, Save R2,R3,R4,R5   ; 1453
                                  55 00000000G   9F   9E 00002      MOVAB   a#DS$PRINTF, R5                             ;
                              04  BC             5D   D0 00009      MOVL    FP, aFRAME_START                            ; 1515
                                                 53   D4 0000D      CLRL    NUMBER_FRAMES_CHECKED                       ; 1516
                                  52       04    BC   D0 0000F 1$:  MOVL    aFRAME_START, R2                            ; 1521
                           62     03             00   0D 00013      PROBEW  #0, #3, (R2)                                ;
                                                 0D   12 00017      BNEQ    2$                                          ;
                                                 52   DD 00019      PUSHL   R2                                          ; 1527
                                  00000000'      EF   9F 0001B      PUSHAB  INVALID_CALL_FRAME                          ;
                                  65             02   FB 00021      CALLS   #2, DS$PRINTF                               ;
                                                 10   11 00024      BRB     3$                                          ; 1528
                                                 53   D6 00026 2$:  INCL    NUMBER_FRAMES_CHECKED                       ; 1531
                                  19             53   D1 00028      CMPL    NUMBER_FRAMES_CHECKED, #25                  ;
                                                 0C   15 0002B      BLEQ    4$                                          ;
                                  00000000'      EF   9F 0002D      PUSHAB  TOO_MANY_FRAMES                             ; 1537
                                  65             01   FB 00033      CALLS   #1, DS$PRINTF                               ;
                                                 50   D4 00036 3$:  CLRL    R0                                          ; 1538
                                                      04 00038      RET                                                 ;
                                  54       10    A2   D0 00039 4$:  MOVL    16(R2), LAST_PC                             ; 1547
                           00010000  8F            54   D1 0003D      CMPL    LAST_PC, #65536                             ; 1549
                                                 04   18 00044      BGEQ    5$                                          ;
                                  50             01   D0 00046      MOVL    #1, R0                                      ; 1551
                                                      04 00049      RET                                                 ;
                              04  BC       0C    A2   D0 0004A 5$:  MOVL    12(R2), aFRAME_START                        ; 1554
                                                 BE   11 0004F      BRB     1$                                          ;

; Routine Size:  81 bytes,    Routine Base:  CODE + 031F
```

```
;    1558  1      %SBTTL 'QA$Init'
;    1559  1
;    1560  1      ROUTINE QA$Init : NOVALUE =
;    1561  1
;    1562  1      !++
;    1563  1      ! FUNCTIONAL DESCRIPTION:
;    1564  1      !
;    1565  1      !       This routine performs all the global initializations required
;    1566  1      !       for the QA routines. This routine must be called both when a
;    1567  1      !       START or RUN command is being processed and when a QA execution
;    1568  1      !       completes (to set up a subsequent execution).
;    1569  1      !
;    1570  1      ! CALLER(S):
;    1571  1      !
;    1572  1      !       QA$Main
;    1573  1      !
;    1574  1      ! FORMAL PARAMETERS:
;    1575  1      !
;    1576  1      !       NONE
;    1577  1      !
;    1578  1      ! IMPLICIT INPUTS:
;    1579  1      !
;    1580  1      !       The QA$AOB_Check_State bit vector.
;    1581  1      !       The QA$AW_Overall_Error_Table word vector.
;    1582  1      !       The QA$AOB_Flags bit vector.
;    1583  1      !
;    1584  1      ! IMPLICIT OUTPUTS:
;    1585  1      !
;    1586  1      !       The QA$AOB_Check_State bit vector.
;    1587  1      !       The QA$AW_Overall_Error_Table word vector.
;    1588  1      !       The QA$AOB_Flags bit vector.
;    1589  1      !
;    1590  1      ! COMPLETION CODES:
;    1591  1      !
;    1592  1      !       NONE
;    1593  1      !
;    1594  1      ! SIDE EFFECTS:
;    1595  1      !
;    1596  1      !       The QA$AOB_Check_State bit vector is zeroed.
;    1597  1      !       The QA$AW_Overall_Error_Table word vector is zeroed.
;    1598  1      !       The QA$AOB_Flags bit vector is zeroed.
;    1599  1      !--
;    1600  1
;    1601  2      BEGIN
;    1602  2              INCR Flag FROM 0 TO (QA$K_Number_QA_Flags - 1) DO
;    1603  2                      QA$AOB_Flags [.Flag] = Off;
;    1604  2
;    1605  2              INCR Bit_Pos FROM 0 TO (QA$K_Number_Of_Checks - 1) DO
;    1606  2                      QA$AOB_Check_State [.Bit_Pos] = Off;
;    1607  2
;    1608  2              INCR Error_Entry FROM 0 TO (QA$K_Number_Of_Checks - 1) DO
;    1609  2                      QA$AW_Overall_Error_Table [.Error_Entry] = 0;
;    1610  2
;    1611  2      !       QA$A_Prev_Test_Tail  = QA$K_Nil;
;    1612  2      !       QA$A_Error_List_Head = QA$K_Nil;
;    1613  2              DS$GA_DS_Ctrl_C_First = 0;       ! Disable Supervisor catching of Control-C's.          [06]
;    1614  1      END;
```

```
                                  0004 00000 QA$INIT:.WORD   Save R2                                        ; 1560
                  52 00000000'  EF  9E 00002         MOVAB   QA$AOB_FLAGS, R2                              ;
                                50  D4 00009         CLRL    FLAG                                          ; 1602
        00        62            50  E5 0000B 1$:     BBCC    FLAG, QA$AOB_FLAGS, 2$                        ; 1603
        F8        50            07  F3 0000F 2$:     AOBLEQ  #7, FLAG, 1$                                  ;
                                50  D4 00013         CLRL    BIT_POS                                       ; 1605
        00     FC A2            50  E5 00015 3$:     BBCC    BIT_POS, QA$AOB_CHECK_STATE, 4$               ; 1606
        F7        50            0E  F3 0001A 4$:     AOBLEQ  #14, BIT_POS, 3$                              ;
                                50  D4 0001E         CLRL    ERROR_ENTRY                                   ; 1608
                           CC A240  B4 00020 5$:     CLRW    QA$AW_OVERALL_ERROR_TABLE[ERROR_ENTRY]        ; 1609
        F8        50            0E  F3 00024         AOBLEQ  #14, ERROR_ENTRY, 5$                          ;
                     00000000G  EF  D4 00028         CLRL    DS$GA_DS_CTRL_C_FIRST                         ; 1613
                                    04 0002E         RET                                                   ; 1614

; Routine Size:  47 bytes,    Routine Base:  CODE + 0370
```

```
;    1616  1      %SBTTL 'QA$Main'
;    1617  1
;    1618  1      GLOBAL ROUTINE QA$Main (Hook_Point) : NOVALUE =
;    1619  1
;    1620  1      !++
;    1621  1      ! FUNCTIONAL DESCRIPTION:
;    1622  1      !
;    1623  1      !       This global routine is called from different points in the Supervisor and from the DSX$Branch
;    1624  1      !       routine. It decides, based on the QA$AOB_Check_State bit vector, which check is currently being
;    1625  1      !       executed. If a check routine returns with an unsuccessful return, this will call the QA$Dump
;    1626  1      !       routine and then halt. If the diagnostic was not run with the /QA qualifier, do nothing.
;    1627  1      !
;    1628  1      ! CALLERS:
;    1629  1      !
;    1630  1      !       DSX$Branch
;    1631  1      !       CLI
;    1632  1      !       DISPAT
;    1633  1      !       ERROR
;    1634  1      !       KERNEL
;    1635  1      !       LOOP
;    1636  1      !       PARAM
;    1637  1      !       START
;    1638  1      !
;    1639  1      ! FORMAL PARAMETERS:
;    1640  1      !
;    1641  1      !       Hook_Point : The point in the Supervisor from which this routine was called. This is a constant
;    1642  1      !       value. The constants are defined in the DSQA macro.
;    1643  1      !
;    1644  1      ! IMPLICIT INPUTS:
;    1645  1      !
;    1646  1      !       NONE
;    1647  1      !
;    1648  1      ! IMPLICIT OUTPUTS:
;    1649  1      !
;    1650  1      !       NONE
;    1651  1      !
;    1652  1      ! COMPLETION CODES:
;    1653  1      !
;    1654  1      !       NONE
;    1655  1      !
;    1656  1      ! SIDE EFFECTS:
;    1657  1      !
;    1658  1      !       NONE
;    1659  1      !
;    1660  1      !--
```

```
;    1662  2      BEGIN
;    1663  2              MACRO
;    1664  2                      !+
;    1665  2                      ! Define a macro
;    1666  2                      !
;    1667  2                      !       Check_Case (Normal_Start)
;    1668  2                      !
;    1669  2                      ! that will expand to:
;    1670  2                      !
;    1671  2                      !       [.QA$AOB_Check_State [QA$K_Normal_Start]:
;    1672  2                      !               IF (QA$Normal_Start (.Hook_Point)) THEN
;    1673  2                      !                       RETURN
;    1674  2                      !
;    1675  2                      ! for the case of the Normal Start check. That is, if the appropriate bit is set in the bit
;    1676  2                      ! vector, call the appropriate routine (corresponding to that bit) with the Hook_Point parameter
;    1677  2                      ! that was passed to QA$Main. If the routine returns successfully, return to the caller.
;    1678  2                      !-
;    1679  2
; M  1680  2                      Check_Case (Routine_Name) =
; M  1681  2                              [ .QA$AOB_Check_State
; M  1682  2                                      [ %NAME ('QA$K_', Routine_Name) ]
; M  1683  2                              ]:
; M  1684  2                                      IF (%NAME ('QA$', Routine_Name) (.Hook_Point))
; M  1685  2                                      THEN
; M  1686  2                                              RETURN
;    1687  2                      %;
;    1688  2
;    1689  2              BUILTIN
;    1690  2                      SP;
;    1691  2
;    1692  2              MAP                                             !                       [02]
;    1693  2                      DS$GL_CLIBASE : BLOCK [, BYTE];         !                       [02]
```

```
;   1695  2              IF (.QA$AOB_Flags [QA$K_QA_Debug]) THEN
; P 1696  2                      $DS_PRINTF ($ASCIC ('!/QA$Main Entry, Hook_Point = !UL.!/'),
;   1697  2                              .Hook_Point);
;   1698  2
;   1699  2              !+
;   1700  2              ! If not running QA, return.
;   1701  2              !-
;   1702  2
;   1703  2              IF (NOT .DSA$V_QA) THEN
;   1704  2                      RETURN;
;   1705  2
;   1706  2              !+
;   1707  2              ! Check several special cases of hook points:
;   1708  2              !
;   1709  2              !       a) If called from the START module, VRStart label, perform all the global initializations       [02]
;   1710  2              !          for this module. Do not call any check routines.                                            [02]
;   1711  2              !
;   1712  2              !       b) If called from the START module, VRReStart label, re-initialize the CLI vector and call     [02]
;   1713  2              !          the appropriate check routine. This hook-point is the starting point for each check.        [02]
;   1714  2              !
;   1715  2              !       c) If called from the START module, Before_Header area, and this is the first time that this    [02]
;   1716  2              !          hook point has been seen, then save the first and last test numbers after they have been    [02]
;   1717  2              !          set up by the START routine. Do not call any check routines.                                [02]
;   1718  2              !
;   1719  2              !       d) If called from one of the GET routines in the PARAM module, print a QA error message,     [02]
;   1720  2              !          find out what check routine is currently running, add an error to that routines total,     [02]
;   1721  2              !          and abort this diagnostic's QA. This is done here because each check routine has to make    [02]
;   1722  2              !          this check.                                                                                 [02]
;   1723  2              !
;   1724  2              !       e) If called from the midpoint of the EndPass routine in the DISPAT module, and the last      [02]
;   1725  2              !          check was executing, do things necessary to end the QA sequence of checks. That is,        [02]
;   1726  2              !          print the summary table, re-init for next time, turn the QA DSA bit off, and return to     [02]
;   1727  2              !          the EndPass routine. The act of turning the QA bit off will cause the EndPass routine      [02]
;   1728  2              !          to then branch to BEGIN, which then calls DS$Cli (effectively ending this QA sequence).    [02]
;   1729  2              !
;   1730  2              !       f) If called from the KERNEL module, Init_Context label, and if the QA debug flag is set,    [02]
;   1731  2              !          print a debugging message for me.                                                           [02]
;   1732  2              !
;   1733  2              !       g) If called either the beginning or the end of the DS_Cleanup routine in the DISPAT module,  [02]
;   1734  2              !          set (or clear) the Doing_Cleanup bit in the Routine_State bitvector. This tells the check   [02]
;   1735  2              !          routines if a reported error happened during Cleanup or not.                               [02]
;   1736  2              !-
```

```
;  1738  2          IF (.Hook_Point EQL DSQA$K_Start_VRStart) THEN          !                                                [02]
;  1739  3                  BEGIN
;  1740  3                  !+
;  1741  3                  ! Initialize QA. It should get to this hook point only when the START routine is called from    [02]
;  1742  3                  ! the DS$Cli routine. Set the Normal Start check bit so that the Normal Start routine is        [02]
;  1743  3                  ! executed first. Return to the Start module (i.e., do not execute any check routines).         [02]
;  1744  3                  ! NOTE: this hook point is seen only ONCE per QA sequence of checks (that is, once for each     [02]
;  1745  3                  ! invocation of the diagnostic with the /QA qualifier).                                         [02]
;  1746  3                  !-
;  1747  3
;  1748  3                  DS$GL_CLIBASE [CLI$L_PASS] = 1;          ! Assume one for the number of passes.                 [02]
;  1749  3                  DS$GL_CLIBASE [CLI$L_SUBT] = 0;          ! Start at first subtest.                              [02]
;  1750  3                  QA$W_Save_Test = -1;                     ! Set to -1 to indicate that it has not been saved.    [02]
;  1751  3                  QA$W_Save_Last = -1;                     ! Set to -1 to indicate that it has not been saved.    [02]
;  1752  3
;  1753  3                  QA$L_Saved_DSA_Flags = .DSA$GL_FLAGS;    ! Save the current DSA flag settings                   [02]
;  1754  3
;  1755  3                  DSA$V_BELL   = Off;                      ! Set BELL on error off                                [02]
;  1756  3                  DSA$V_HALT   = Off;                      ! Set HALT off                                         [02]
;  1757  3                  DSA$V_IE1    = Off;                      ! Set IE1 off                                          [02]
;  1758  3                  DSA$V_IE2    = Off;                      ! Set IE2 off                                          [02]
;  1759  3                  DSA$V_IE3    = Off;                      ! Set IE3 off                                          [02]
;  1760  3                  DSA$V_IES    = Off;                      ! Set IES off                                          [02]
;  1761  3                  DSA$V_LOOP   = Off;                      ! Set LOOP ON ERROR off                                [02]
;  1762  3                  DSA$V_OPER   = Off;                      ! Set OPER off                                         [02]
;  1763  3                  DSA$V_PROMPT = Off;                      ! Set PROMPT off                                       [02]
;  1764  3                  DSA$V_QUICK  = Off;                      ! Set QUICK off                                        [02]
;  1765  3                  DSA$V_SEARCH = Off;                      ! Set SEARCH off                                       [02]
;  1766  3                  DSA$V_TRACE  = On;                       ! Set TRACE flag on.                                   [02]
;  1767  3
;  1768  3                  INCR State FROM 0 TO (QA$K_Numb_Routine_States - 1) DO  !                                       [02]
;  1769  3                          QA$AOB_Routine_State [.State] = Off;            !                                       [02]
;  1770  3
;  1771  3                  QA$Init ();
;  1772  3                  DS$GA_DS_Ctrl_C_First = QA$Control_C_Handler;            ! Enable DS catching of Control-C's.   [06]
;  1773  3                  QA$AOB_Check_State [QA$K_Normal_Start] = On;
;  1774  3                  RETURN                                                   !                                       [02]
;  1775  3                  END
```

```
;  1777  2          ELSE IF (.Hook_Point EQL DSQA$K_Start_VRReStart) THEN          !                                          [02]
;  1778  3                  BEGIN                                                  !                                          [02]
;  1779  3                  !+
;  1780  3                  ! Restore the CLI vector. This is done at the start of each check routine to protect against    [02]
;  1781  3                  ! the CLI values getting lost while a check routine is executing the diagnostic. Only restore   [02]
;  1782  3                  ! the First and Last test numbers if they have been saved (i.e., if the saved First test number [02]
;  1783  3                  ! is not -1).                                                                                    [02]
;  1784  3                  !-
;  1785  3
;  1786  3                  DS$GL_CLIBASE [CLI$L_PASS] = 1;          ! Assume one for the number of passes.                  [02]
;  1787  3                  DS$GL_CLIBASE [CLI$L_SUBT] = 0;          ! Start at first subtest.                               [02]
;  1788  3
;  1789  3                  IF (.QA$W_Save_Test NEQ -1) THEN         !                                                       [02]
;  1790  4                          BEGIN                            ! The first and last tests have been saved.             [02]
;  1791  4                          DS$GL_CLIBASE [CLI$L_TEST] = .QA$W_Save_Test;   ! Restore saved first test.             [02]
;  1792  4                          DS$GL_CLIBASE [CLI$L_LAST] = .QA$W_Save_Last    ! Restore saved last test.              [02]
;  1793  4                          END                              !                                                       [02]
;  1794  3                  END                                      !                                                       [02]
;  1795  3
;  1796  2          ELSE IF (.Hook_Point EQL DSQA$K_Start_Before_Header) THEN       !                                          [02]
;  1797  3                  BEGIN
;  1798  3                  IF (.QA$W_Save_Test EQL -1) THEN         !                                                       [02]
;  1799  4                          BEGIN                            !                                                       [02]
;  1800  4                          !+
;  1801  4                          ! The first and last tests have not been saved. Save them on the first time only.       [02]
;  1802  4                          !-
;  1803  4
;  1804  4                          QA$W_Save_Test = .DS$GL_FSTTEST;! Save first test number.                               [02]
;  1805  4                          QA$W_Save_Last = .DS$GL_LSTTEST ! Save last test number.                                [02]
;  1806  3                          END;                             !                                                       [02]
;  1807  3                  RETURN                                   !                                                       [02]
;  1808  3                  END                                      !                                                       [02]
```

```
;   1810  2              ELSE IF (.Hook_Point EQL DSQA$K_Param_DSX$GetData) OR          !                    [02]
;   1811  2                      (.Hook_Point EQL DSQA$K_Param_DSX$GetVield) OR        !                    [02]
;   1812  2                      (.Hook_Point EQL DSQA$K_Param_DSX$GetAddress) OR      !                    [02]
;   1813  2                      (.Hook_Point EQL DSQA$K_Param_DSX$GetLogical) OR      !                    [02]
;   1814  2                      (.Hook_Point EQL DSQA$K_Param_DSX$GetString) THEN     !                    [02]
;   1815  3                     BEGIN                                                  !                    [02]
;   1816  3                     !+                                                                          [02]
;   1817  3                     ! User is trying to request information from the operator. It is a QA error if no  [02]
;   1818  3                     ! default value is given.                                                   [02]
;   1819  3                     !-                                                                          [02]
;   1820  3
;   1821  3                     IF (.QA$AOB_Flags [QA$K_NoDef]) THEN                   !                    [02]
;   1822  4                         BEGIN                                              !                    [02]
;   1823  4                         $DS_PRINTF (QA$T_Operator_Request_Message);        !                    [02]
;   1824  4
;   1825  5                         BEGIN                                              !                    [02]
;   1826  5                         !+                                                                      [02]
;   1827  5                         ! Find which check routine is currently running. If none are running, it is a logic  [02]
;   1828  5                         ! error. Use the number of the first-bit-set as the QA$K_ check routine constant, and  [02]
;   1829  5                         ! add an error to this check routines summary table total.              [02]
;   1830  5                         !-                                                                      [02]
;   1831  5                         LOCAL                                              !                    [02]
;   1832  5                             First_Bit_Set;             ! Return bit position                    [02]
;   1833  5
;   1834  5                         BUILTIN                                            !                    [02]
;   1835  5                             FFS;                       ! Find First Set bit                     [02]
;   1836  5
;   1837  5                         FFS (%REF (0), %REF (QA$K_Number_Of_Checks), QA$AOB_Check_State, First_Bit_Set);  !  [02]
;   1838  5
;   1839  5                         IF (.First_Bit_Set EQL QA$K_Number_Of_Checks) THEN                  !    [02]
;   1840  6                             Logic_Error ('No check state bit set - GET routine called')    !    [02]
;   1841  5                         ELSE
;   1842  6                             BEGIN                                          !                    [02]
;   1843  6                             QA$Add_QA_Error (.First_Bit_Set);              !                    [02]
;   1844  6                             QA$AOB_Routine_State [QA$V_Error_Found] = True !                    [02]
;   1845  5                             END;                                           !                    [02]
;   1846  4                         END;                                               !                    [02]
;   1847  4
;   1848  4                         QA$Abort_QA ()                 ! Abort the QA sequence                  [02]
;   1849  4                         END
;   1850  3                 ELSE
;   1851  3                     !+                                                                          [02]
;   1852  3                     ! There was a default value given for the GET supervisor call. Simply return.  [02]
;   1853  3                     !-                                                                          [02]
;   1854  3                     RETURN
;   1855  3                 END
```

```
;    1857  2          ELSE IF (.Hook_Point EQL DSQA$K_Dispat_DSX$EndPass_Mid) THEN    ! If midpoint of EndPass routine,        [02]
;    1858  3              BEGIN                                                       !                                        [02]
;    1859  3              IF (.QA$AOB_Check_State [QA$K_Last_Check]) THEN             ! If executing last check,               [02]
;    1860  4                  BEGIN                                                   ! Then                                   [02]
;    1861  4                  QA$Print_Forced_Errors ();                              ! Print the forced-errors,               [02]
;    1862  4                  DS$GL_FSTTEST = .QA$W_Save_Test;                        ! Restore the saved test number,         [02]
;    1863  4                  DS$GL_LSTTEST = .QA$W_Save_Last;                        ! Restore the saved last test number,    [02]
;    1864  4                  QA$Print_Overall_Errors ();                             ! Print the summary table,               [02]
;    1865  4                  DSA$GL_FLAGS = .QA$L_Saved_DSA_Flags;                   ! Restore the DSA flags,                 [02]
;    1866  4                  QA$Init ();                                             ! Initialize for next run,               [02]
;    1867  4                  DSA$V_QA = Off;                                         ! Turn off QA bit,                       [02]
;    1868  4                  RETURN                                                  ! And return to the EndPass routine.     [02]
;    1869  4                  END                                                     !                                        [02]
;    1870  3              END                                                         !                                        [02]
;    1871  3
;    1872  2          ELSE IF (.Hook_Point EQL DSQA$K_Kernel_Init_Context) THEN       !                                        [02]
;    1873  3              BEGIN                                                       !                                        [02]
;    1874  3              IF (.QA$AOB_Flags [QA$K_QA_Debug]) THEN                     !                                        [02]
;    1875  3                  $DS_PRINTF ($ASCIC ('!/QA_Main: Init_Context done!/')); !                                        [02]
;    1876  3              RETURN
;    1877  3              END
;    1878  3
;    1879  2          ELSE IF (.Hook_Point EQL DSQA$K_Dispat_DS_Cleanup_Bgn) THEN     !                                        [02]
;    1880  3              BEGIN                                                       !                                        [02]
;    1881  3              QA$AOB_Routine_State [QA$V_Doing_Cleanup] = True;           !                                        [02]
;    1882  3              RETURN                                                      !                                        [02]
;    1883  3              END                                                         !                                        [02]
;    1884  3
;    1885  2          ELSE IF (.Hook_Point EQL DSQA$K_Dispat_DS_Cleanup_End) THEN     !                                        [02]
;    1886  3              BEGIN                                                       !                                        [02]
;    1887  3              QA$AOB_Routine_State [QA$V_Doing_Cleanup] = False;          !                                        [02]
;    1888  3              RETURN                                                      !                                        [02]
;    1889  2              END;                                                        !                                        [02]
```

```
;   1891  2             !+
;   1892  2             ! Dispatch to the proper check routine based on what bit is set in the QA$AOB_Check_State bit vector.
;   1893  2             !-
;   1894  2
;   1895  2             SELECTONE 1 OF
;   1896  2                     SET
;   1897  2                     Check_Case (Normal_Start);
;   1898  2                     Check_Case (Multiple_Pass);
;   1899  2                     Check_Case (Loop_On_Test);
;   1900  2                     Check_Case (Loop_On_Subtest);           !                                                   [01]
;   1901  2                     Check_Case (Run_Backwards);             !                                                   [07]
;   1902  2                     [OTHERWISE]:
;   1903  3                             BEGIN
;   1904  3                             !+
;   1905  3                             ! We have found a QA internal bug. Print message for me and abort me.                [02]
;   1906  3                             !-
;   1907  3
;   1908  3                             Logic_Error ('QA$Main: No check state bit set.');       !                           [02]
;   1909  3                             DSA$GL_FLAGS = .QA$L_Saved_DSA_Flags;                   ! Restore DSA flags
;   1910  3                             QA$Init ();                                             ! Initialize for next run
;   1911  3                             DSA$V_QA = Off;                                         ! Turn off QA
;   1912  3                             DSX$Abort ();                                           ! Good way to stop QA.
;   1913  3                             RETURN
;   1914  2                             END;
;   1915  2                     TES;
;   1916  2
;   1917  2             !+
;   1918  2             ! If it gets to here, then a check routine failed. This implies that we detected a QA error.          [02]
;   1919  2             ! Abort me and the diagnostic.                                                                        [02]
;   1920  2             !-
;   1921  2
;   1922  2             QA$Abort_QA ()                                  !                                                   [02]
;   1923  1     END;


                                                                                .PSECT  DATA,NOWRT,NOEXE,  SHR,2

72  74  6E  45  20  6E  69  61  4D  24  41  51  2F  21  24  0021F P.AAN:  .ASCII  \$!/QA$Main Entry, Hook_Point = !UL.!/\      ;
3D  20  74  6E  69  6F  50  5F  6B  6F  6F  48  20  2C  79  0022E                                                             ;
                                2F  21  2E  4C  55  21  20  0023D                                                             ;
61  6E  72  65  74  6E  49  20  41  51  2A  2A  2F  21  44  00244 P.AAO:  .ASCII  \D!/**QA Internal Error: No check state b\   ;
65  68  63  20  6F  4E  20  3A  72  6F  72  72  45  20  6C  00253                                                             ;
                    62  20  65  74  61  74  73  20  6B  63  00262                                                             ;
6F  72  20  54  45  47  20  2D  20  74  65  73  20  74  69  0026C         .ASCII  \it set - GET routine called!/\             ;
    2F  21  64  65  6C  6C  61  63  20  65  6E  69  74  75  0027B                                                             ;
69  6E  49  20  3A  6E  69  61  4D  5F  41  51  2F  21  1E  00289 P.AAP:  .ASCII  <30>\!/QA_Main: Init_Context done!/\         ;
21  65  6E  6F  64  20  74  78  65  74  6E  6F  43  5F  74  00298                                                             ;
                                                        2F  002A7                                                             ;
61  6E  72  65  74  6E  49  20  41  51  2A  2A  2F  21  39  002A8 P.AAQ:  .ASCII  \9!/**QA Internal Error: QA$Main: No chec\   ;
69  61  4D  24  41  51  20  3A  72  6F  72  72  45  20  6C  002B7                                                             ;
                    63  65  68  63  20  6F  4E  20  3A  6E  002C6                                                             ;
74  65  73  20  74  69  62  20  65  74  61  74  73  20  6B  002D0         .ASCII  \k state bit set.!/\                        ;
                                                2F  21  2E  002DF                                                             ;

                                                                        ES=                 P.AAO
                                                                        ES=                 P.AAQ
```

```
                                                                  .PSECT  CODE,NOWRT,  SHR,2

                                          03FC 00000              .ENTRY  QA$MAIN, Save R2,R3,R4,R5,R6,R7,R8,R9          ; 1618
                    59 00000000G   EF   9E 00002                MOVAB   DS$GL_LSTTEST, R9                              ;
                    58 00000000G   EF   9E 00009                MOVAB   DS$GL_FSTTEST, R8                              ;
                    57 00000000'   EF   9E 00010                MOVAB   P.AAN, R7                                      ;
                    56 00000000G   9F   9E 00017                MOVAB   @#DS$PRINTF, R6                                ;
                    55 00000000G   EF   9E 0001E                MOVAB   DS$GL_CLIBASE+44, R5                           ;
                    54         A9   AF   9E 00025                MOVAB   QA$INIT, R4                                    ;
                    53 00000000'   EF   9E 00029                MOVAB   QA$AOB_CHECK_STATE, R3                         ;
        08       04 A3             01   E1 00030                BBC     #1, QA$AOB_FLAGS, 1$                           ; 1695
                              04   AC   DD 00035                PUSHL   HOOK_POINT                                     ; 1697
                                   57   DD 00038                PUSHL   R7                                             ;
                    66             02   FB 0003A                CALLS   #2, DS$PRINTF                                  ;
                       0000FE01    9F   95 0003D 1$:            TSTB    @#^X0000FE01                                   ; 1703
                                   01   19 00043                BLSS    2$                                             ;
                                        04 00045                RET                                                    ;
                    52         04   AC   D0 00046 2$:            MOVL    HOOK_POINT, R2                                 ; 1738
                    16             52   D1 0004A                CMPL    R2, #22                                        ;
                                   45   12 0004D                BNEQ    5$                                             ;
                    65             01   D0 0004F                MOVL    #1, DS$GL_CLIBASE+44                           ; 1748
                              FC   A5   D4 00052                CLRL    DS$GL_CLIBASE+40                               ; 1749
                F2 A3             01   CE 00055                MNEGL   #1, QA$W_SAVE_TEST                             ; 1750
                F8 A3 0000FE00    9F   D0 00059                MOVL    @#^X0000FE00, QA$L_SAVED_DSA_FLAGS             ; 1753
          0000FE00 9F       10FD   8F   AA 00061                BICW2   #4349, @#^X0000FE00                            ; 1762
          0000FE01 9F         61   8F   8A 0006A                BICB2   #97, @#^X0000FE01                              ; 1765
          0000FE01 9F             04   88 00072                BISB2   #4, @#^X0000FE01                               ; 1766
                                   50   D4 00079                CLRL    STATE                                          ; 1768
        00       FC A3             50   E5 0007B 3$:            BBCC    STATE, QA$AOB_ROUTINE_STATE, 4$                ; 1769
        F7           50             03   F3 00080 4$:            AOBLEQ  #3, STATE, 3$                                  ;
                    64             00   FB 00084                CALLS   #0, QA$INIT                                    ; 1771
          00000000G EF       FE1F   C4   9E 00087                MOVAB   QA$CONTROL_C_HANDLER, DS$GA_DS_CTRL_C_FIRST    ; 1772
                    63             01   88 00090                BISB2   #1, QA$AOB_CHECK_STATE                         ; 1773
                                        04 00093                RET                                                    ; 1774
                    12             52   D1 00094 5$:            CMPL    R2, #18                                        ; 1777
                                   1A   12 00097                BNEQ    6$                                             ;
                    65             01   D0 00099                MOVL    #1, DS$GL_CLIBASE+44                           ; 1786
                              FC   A5   D4 0009C                CLRL    DS$GL_CLIBASE+40                               ; 1787
              FFFF 8F         F2   A3   B1 0009F                CMPW    QA$W_SAVE_TEST, #-1                            ; 1789
                                   6C   13 000A5                BEQL    13$                                            ;
                F4 A5         F2   A3   32 000A7                CVTWL   QA$W_SAVE_TEST, DS$GL_CLIBASE+32               ; 1791
                F8 A5         F4   A3   32 000AC                CVTWL   QA$W_SAVE_LAST, DS$GL_CLIBASE+36               ; 1792
                                   60   11 000B1                BRB     13$                                            ;
                    17             52   D1 000B3 6$:            CMPL    R2, #23                                        ; 1796
                                   12   12 000B6                BNEQ    8$                                             ;
              FFFF 8F         F2   A3   B1 000B8                CMPW    QA$W_SAVE_TEST, #-1                            ; 1798
                                   01   13 000BE                BEQL    7$                                             ;
                                        04 000C0                RET                                                    ;
                F2 A3             68   B0 000C1 7$:            MOVW    DS$GL_FSTTEST, QA$W_SAVE_TEST                  ; 1804
                F4 A3             69   B0 000C5                MOVW    DS$GL_LSTTEST, QA$W_SAVE_LAST                  ; 1805
                                        04 000C9                RET                                                    ; 1807
                    0C             52   D1 000CA 8$:            CMPL    R2, #12                                        ; 1810
                                   14   13 000CD                BEQL    9$                                             ;
                    0D             52   D1 000CF                CMPL    R2, #13                                        ; 1811
                                   0F   13 000D2                BEQL    9$                                             ;
```

```
                        0E          52  D1 000D4          CMPL    R2, #14                                  ; 1812
                                    0A  13 000D7          BEQL    9$                                       ;
                        0F          52  D1 000D9          CMPL    R2, #15                                  ; 1813
                                    05  13 000DC          BEQL    9$                                       ;
                        10          52  D1 000DE          CMPL    R2, #16                                  ; 1814
                                    32  12 000E1          BNEQ    14$                                      ;
                        01     04   A3  E8 000E3 9$:      BLBS    QA$AOB_FLAGS, 10$                        ; 1821
                                        04 000E7          RET                                              ;
                     00000000G       EF  9F 000E8 10$:     PUSHAB  QA$T_OPERATOR_REQUEST_MESSAGE            ; 1823
                        66          01  FB 000EE          CALLS   #1, DS$PRINTF                            ;
   50          63       0F          00  EA 000F1          FFS     #0, #15, QA$AOB_CHECK_STATE, FIRST_BIT_SET ; 1837
                        0F          50  D1 000F6          CMPL    FIRST_BIT_SET, #15                       ; 1839
                                    08  12 000F9          BNEQ    11$                                      ;
                            25      A7  9F 000FB          PUSHAB  ES                                       ; 1840
                        66          01  FB 000FE          CALLS   #1, DS$PRINTF                            ;
                                    0B  11 00101          BRB     12$                                      ;
                                    50  DD 00103 11$:     PUSHL   FIRST_BIT_SET                            ; 1843
                  FE11  C4          01  FB 00105          CALLS   #1, QA$ADD_QA_ERROR                      ;
                    FC  A3          02  88 0010A          BISB2   #2, QA$AOB_ROUTINE_STATE                 ; 1844
                  FDDC  C4          00  FB 0010E 12$:     CALLS   #0, QA$ABORT_QA                          ; 1848
                                    58  11 00113 13$:     BRB     19$                                      ;
                                    52  D5 00115 14$:     TSTL    R2                                       ; 1857
                                    2E  12 00117          BNEQ    15$                                      ;
            50          63          04  E1 00119          BBC     #4, QA$AOB_CHECK_STATE, 19$              ; 1859
               00000000V EF         00  FB 0011D          CALLS   #0, QA$PRINT_FORCED_ERRORS               ; 1861
                        68     F2   A3  32 00124          CVTWL   QA$W_SAVE_TEST, DS$GL_FSTTEST            ; 1862
                        69     F4   A3  32 00128          CVTWL   QA$W_SAVE_LAST, DS$GL_LSTTEST            ; 1863
               00000000V EF         00  FB 0012C          CALLS   #0, QA$PRINT_OVERALL_ERRORS              ; 1864
               0000FE00 9F     F8   A3  D0 00133          MOVL    QA$L_SAVED_DSA_FLAGS, a#^X0000FE00       ; 1865
                        64          00  FB 0013B          CALLS   #0, QA$INIT                              ; 1866
               0000FE01 9F     80   8F  8A 0013E          BICB2   #128, a#^X0000FE01                       ; 1867
                                        04 00146          RET                                              ; 1868
                        08          52  D1 00147 15$:     CMPL    R2, #8                                   ; 1872
                                    0D  12 0014A          BNEQ    17$                                      ;
            01     04   A3          01  E0 0014C          BBS     #1, QA$AOB_FLAGS, 16$                    ; 1874
                                        04 00151          RET                                              ;
                            6A      A7  9F 00152 16$:     PUSHAB  P.AAP                                    ; 1875
                        66          01  FB 00155          CALLS   #1, DS$PRINTF                            ;
                                        04 00158          RET                                              ; 1876
                        03          52  D1 00159 17$:     CMPL    R2, #3                                   ; 1879
                                    05  12 0015C          BNEQ    18$                                      ;
                    FC  A3          04  88 0015E          BISB2   #4, QA$AOB_ROUTINE_STATE                 ; 1881
                                        04 00162          RET                                              ; 1882
                        04          52  D1 00163 18$:     CMPL    R2, #4                                   ; 1885
                                    05  12 00166          BNEQ    19$                                      ;
                    FC  A3          04  8A 00168          BICB2   #4, QA$AOB_ROUTINE_STATE                 ; 1887
                                        04 0016C          RET                                              ; 1888
                        0B          63  E9 0016D 19$:     BLBC    QA$AOB_CHECK_STATE, 20$                  ; 1897
                                    52  DD 00170          PUSHL   R2                                       ;
               00000000G EF         01  FB 00172          CALLS   #1, QA$NORMAL_START                      ;
                                    3A  11 00179          BRB     24$                                      ;
            0B          63          01  E1 0017B 20$:     BBC     #1, QA$AOB_CHECK_STATE, 21$              ; 1898
                                    52  DD 0017F          PUSHL   R2                                       ;
               00000000G EF         01  FB 00181          CALLS   #1, QA$MULTIPLE_PASS                     ;
                                    2B  11 00188          BRB     24$                                      ;
            0B          63          02  E1 0018A 21$:     BBC     #2, QA$AOB_CHECK_STATE, 22$              ; 1899
                                    52  DD 0018E          PUSHL   R2                                       ;
```

```
                    00000000G  EF              01  FB 00190          CALLS   #1, QA$LOOP_ON_TEST                          ;
                                               1C  11 00197          BRB     24$                                         ;
                 0B             63             03  E1 00199 22$:     BBC     #3, QA$AOB_CHECK_STATE, 23$                 ; 1900
                                               52  DD 0019D          PUSHL   R2                                          ;
                    00000000G  EF              01  FB 0019F          CALLS   #1, QA$LOOP_ON_SUBTEST                      ;
                                               0D  11 001A6          BRB     24$                                         ;
                 0D             63             04  E1 001A8 23$:     BBC     #4, QA$AOB_CHECK_STATE, 25$                 ; 1901
                                               52  DD 001AC          PUSHL   R2                                          ;
                    00000000G  EF              01  FB 001AE          CALLS   #1, QA$RUN_BACKWARDS                        ;
                               23              50  E9 001B5 24$:     BLBC    R0, 26$                                     ;
                                               04 001B8              RET                                                 ;
                                       0089    C7  9F 001B9 25$:     PUSHAB  ES                                          ; 1908
                               66              01  FB 001BD          CALLS   #1, DS$PRINTF                               ;
                    0000FE00   9F        F8    A3  D0 001C0          MOVL    QA$L_SAVED_DSA_FLAGS, @#^X0000FE00          ; 1909
                               64              00  FB 001C8          CALLS   #0, QA$INIT                                 ; 1910
                    0000FE01   9F        80    8F  8A 001CB          BICB2   #128, @#^X0000FE01                          ; 1911
                    00000000G  EF              00  FB 001D3          CALLS   #0, DSX$ABORT                               ; 1912
                                               04 001DA              RET                                                 ; 1913
                        FDDC   C4              00  FB 001DB 26$:     CALLS   #0, QA$ABORT_QA                             ; 1922
                                               04 001E0              RET                                                 ; 1923

; Routine Size:  481 bytes,    Routine Base:  CODE + 039F
```

```
;    1925  1      %SBTTL 'QA$Print_Forced_Errors'
;    1926  1
;    1927  1      GLOBAL ROUTINE QA$Print_Forced_Errors : NOVALUE =       !                                    All [02]
;    1928  1
;    1929  1      !++
;    1930  1      ! FUNCTIONAL DESCRIPTION:
;    1931  1      !
;    1932  1      !       This routine prints the Forced-Errors Summary Table, which gives the number of forced errors for the
;    1933  1      !       three Error checks.
;    1934  1      !
;    1935  1      ! CALLER(S):
;    1936  1      !
;    1937  1      !       The Error check routines.
;    1938  1      !
;    1939  1      ! FORMAL PARAMETERS:
;    1940  1      !
;    1941  1      !       NONE
;    1942  1      !
;    1943  1      ! IMPLICIT INPUTS:
;    1944  1      !
;    1945  1      !
;    1946  1      !
;    1947  1      ! IMPLICIT OUTPUTS:
;    1948  1      !
;    1949  1      !       Forced-Errors Summary Table printout.
;    1950  1      !
;    1951  1      ! COMPLETION CODES:
;    1952  1      !
;    1953  1      !       NONE
;    1954  1      !
;    1955  1      ! SIDE EFFECTS:
;    1956  1      !
;    1957  1      !       NONE
;    1958  1      !
;    1959  1      !--
```

```
;    1961  1      %SBTTL 'Dispose'
;    1962  2      BEGIN                                                                  ! Print_Forced_Errors Routine
;    1963  2      !
;    1964  2      !       !++
;    1965  2      !       ! FUNCTIONAL DESCRIPTION:
;    1966  2      !       !
;    1967  2      !       !       This routine disposes of a 16-byte vector.
;    1968  2      !       !
;    1969  2      !       ! CALLER (S):
;    1970  2      !       !
;    1971  2      !       !       QA$Print_Forced_Errors
;    1972  2      !       !
;    1973  2      !       ! FORMAL PARAMETERS:
;    1974  2      !       !
;    1975  2      !       !       Record_Ptr - Contains the address of the 16-byte vector.
;    1976  2      !       !
;    1977  2      !       ! IMPLICIT INPUTS:
;    1978  2      !       !
;    1979  2      !       !       NONE
;    1980  2      !       !
;    1981  2      !       ! IMPLICIT OUTPUTS:
;    1982  2      !       !
;    1983  2      !       !       NONE
;    1984  2      !       !
;    1985  2      !       ! COMPLETION CODES:
;    1986  2      !       !
;    1987  2      !       !       NONE
;    1988  2      !       !
;    1989  2      !       ! SIDE EFFECTS:
;    1990  2      !       !
;    1991  2      !       !       NONE
;    1992  2      !       !
;    1993  2      !       !--
```

```
;    1994  2      !
;    1995  2      !
;    1996  2      ! ROUTINE Dispose (Record_Ptr) : NOVALUE =
;    1997  2      !       BEGIN
;    1998  2      !               MAP
;    1999  2      !                       Record_Ptr : REF VECTOR [, WORD];               ! Treat the Record_Ptr as a vector of words
;    2000  2      !
;    2001  2      !               Record_Ptr [4] = QA$K_Forced_Error_Record_Size;         ! Put in the size of the data structure
;    2002  2      !               EXE$DeaNonPaged (.Record_Ptr);                          ! Deallocate it
;    2003  2      !       END;
```

```
;    2004  2      !
;    2005  2      !xSBTTL 'QA$Print_Forced_Errors'
;    2006  2      !       !+
;    2007  2      !       ! The are the strings that get printed in the table.
;    2008  2      !       !-
;    2009  2      !
;    2010  2      !       BIND
;    2011  2      !               Header_Line_1 =                                         !                                       [04]
;    2012  2      !                       $ASCIC ('!^!/!/!#* Summary of Forced-Errors!/'),!                                       [04]
;    2013  2      !
;    2014  2      !               Header_Line_2 =                                         !                                       [04]
;    2015  2      !                       $ASCIC ('!#* ------------------------!/!/'),    !                                       [04]
;    2016  2      !
;    2017  2      !               Test_Subtest_Line_1 =
;    2018  2      !                       $ASCIC ('Test !3UW   Subtest !3UL!/'),
;    2019  2      !
;    2020  2      !               Test_Subtest_Line_2 =
;    2021  2      !                       $ASCIC ('!8*-   !11*-!/'),
;    2022  2      !
;    2023  2      !               Error_Count_Line =
;    2024  2      !                       $ASCIC ('!5UW-!4<!UL!> '),
;    2025  2      !
;    2026  2      !               Eol_Line =
;    2027  2      !                       $ASCIC ('!/');
;    2028  2      !
;    2029  2      !       LITERAL
;    2030  2      !               QA$K_Error_Count_Line_Len = 11,                 ! The length (in chars) of the                  [04]
;    2031  2      !                                                               ! Error_Count_Line line.                        [04]
;    2032  2      !
;    2033  2      !               QA$K_Minimum_Width = 24;                        ! The minimum width that can be used to print
;    2034  2      !                                                               ! the forced-error table. Currently this is the
;    2035  2      !                                                               ! length of the Header_Line.
;    2036  2      !
;    2037  2      !       LOCAL
;    2038  2      !               Number_Of_Error_Counts : WORD,                  ! The number of error number/error counts to
;    2039  2      !                                                               ! print per line.
;    2040  2      !
;    2041  2      !               Number_Printed : WORD,                          ! The running total of the number of error
;    2042  2      !                                                               ! number/error counts printed per line.
;    2043  2      !
;    2044  2      !               Record_Ptr,                                     ! The pointer that is used to acess all the
;    2045  2      !                                                               ! records in the linked list.
;    2046  2      !
;    2047  2      !               Temp_Ptr,                                       ! The pointer to dispose.
;    2048  2      !
;    2049  2      !               Width : WORD,                                   ! The maximum width of the output line.         [04]
;    2050  2      !
;    2051  2      !               Test : WORD,                                    ! The Test_Number from the forced-error record.
;    2052  2      !
;    2053  2      !               Subtest;                                        ! The Subtest_Number from the forced-error record.
```

```
;    2054  2      !
;    2055  2      !       Width                   = MAXU (QA$K_Minimum_Width, .DS$GB_WIDTH);      !                       [04]
;    2056  2      !       Number_Of_Error_Counts = .Width  / QA$K_Error_Count_Line_Len;            !                       [04]
;    2057  2      !
;    2058  2      !       $DS_PRINTF (Header_Line_1, ((.Width - QA$K_Minimum_Width + 1) / 2));    !                       [04]
;    2059  2      !       $DS_PRINTF (Header_Line_2, ((.Width - QA$K_Minimum_Width + 1) / 2));    !                       [04]
;    2060  2      !
;    2061  2      !       !+
;    2062  2      !       ! If it exists, skip the first null record and dispose of it.
;    2063  2      !       !-
;    2064  2      !
;    2065  2      !       Record_Ptr = .QA$A_Error_List_Head;
;    2066  2      !
;    2067  2      !       IF (.Record_Ptr NEQ QA$K_Nil) THEN
;    2068  2      !               BEGIN
;    2069  2      !                       MAP
;    2070  2      !                               QA$A_Error_List_Head : Error_Record;
;    2071  2      !
;    2072  2      !                       QA$A_Error_List_Head = .QA$A_Error_List_Head [QA$VA_Next_Error];
;    2073  2      !                       Dispose (.Record_Ptr);
;    2074  2      !                       Record_Ptr = .QA$A_Error_List_Head
;    2075  2      !               END;
```

```
;    2076  2      !
;    2077  2      !       WHILE (.QA$A_Error_List_Head NEQ QA$K_Nil) DO
;    2078  2      !               BEGIN
;    2079  2      !               MAP
;    2080  2      !                       Record_Ptr : Error_Record;
;    2081  2      !
;    2082  2      !               Test            = .Record_Ptr [QA$VW_Test_Number];
;    2083  2      !               Subtest         = .Record_Ptr [QA$VL_Subtest_Number];
;    2084  2      !               Number_Printed = 0;
;    2085  2      !
;    2086  2      !               $DS_PRINTF (Test_Subtest_Line_1, .Test, .Subtest);
;    2087  2      !               $DS_PRINTF (Test_Subtest_Line_2);
;    2088  2      !
;    2089  2      !               DO
;    2090  2      !                       BEGIN
;    2091  2      !                       $DS_PRINTF (Error_Count_Line,
;    2092  2      !                               .Record_Ptr [QA$VW_Error_Number],
;    2093  2      !                               .Record_Ptr [QA$VL_Error_Count]);
;    2094  2      !
;    2095  2      !                       IF ((Number_Printed = .Number_Printed + 1) EQL .Number_Of_Error_Counts) THEN
;    2096  2      !                               BEGIN
;    2097  2      !                               Number_Printed = 0;
;    2098  2      !                               $DS_PRINTF (Eol_Line);
;    2099  2      !                               END;
;    2100  2      !
;    2101  2      !                       Temp_Ptr                = .Record_Ptr;
;    2102  2      !                       Record_Ptr              = .Record_Ptr [QA$VA_Next_Error];
;    2103  2      !                       QA$A_Error_List_Head = .Record_Ptr;
;    2104  2      !
;    2105  2      !                       Dispose (.Temp_Ptr);
;    2106  2      !
;    2107  2      !                       IF (.Record_Ptr EQL QA$K_Nil) THEN
;    2108  2      !                               EXITLOOP;
;    2109  2      !                       END
;    2110  2      !               UNTIL ((.Test NEQ .Record_Ptr [QA$VW_Test_Number]) OR
;    2111  2      !                       (.Subtest NEQ .Record_Ptr [QA$VL_Subtest_Number]));
;    2112  2      !
;    2113  2      !               $DS_PRINTF (Eol_Line);
;    2114  2      !               IF (.Number_Printed NEQ 0) THEN
;    2115  2      !                       $DS_PRINTF (Eol_Line)
;    2116  2      !               END;
;    2117  2      !
;    2118  2      !       QA$A_Prev_Test_Tail  = QA$K_Nil;
;    2119  2      !       QA$A_Error_List_Head = QA$K_Nil;
;    2120  2
;    2121  2              1;                                      !                                       [07]
;    2122  2
;    2123  1      END;


                                        0000 00000          .ENTRY  QA$PRINT_FORCED_ERRORS, Save nothing        ; 1927
                                          04 00002          RET                                                 ; 2123

; Routine Size:  3 bytes,    Routine Base:  CODE + 0580
```

```
;    2125  1      %SBTTL 'QA$Print_Overall_Errors'
;    2126  1
;    2127  1      ROUTINE QA$Print_Overall_Errors : NOVALUE =
;    2128  1
;    2129  1      !++
;    2130  1      ! FUNCTIONAL DESCRIPTION:
;    2131  1      !
;    2132  1      !       This routine prints the Overall Error Summary Table, which summarizes the results for one QA execution
;    2133  1      !       of the diagnostic.
;    2134  1      !
;    2135  1      ! CALLER(S):
;    2136  1      !
;    2137  1      !       QA$Main
;    2138  1      !
;    2139  1      ! FORMAL PARAMETERS:
;    2140  1      !
;    2141  1      !       NONE
;    2142  1      !
;    2143  1      ! IMPLICIT INPUTS:
;    2144  1      !
;    2145  1      !       QA$W_MultiplePass          - The number of passes to make for the Multiple Pass Check.
;    2146  1      !       QA$W_TestLoops             - The number of loops for the Infinite Loop-On-Test Check.
;    2147  1      !       QA$W_SubtestLoops          - The number of loops for the Infinite Loop-On-Subtest Check.
;    2148  1      !       QA$AW_Overall_Error_Table - The number of errors that occurred in each check.
;    2149  1      !
;    2150  1      ! IMPLICIT OUTPUTS:
;    2151  1      !
;    2152  1      !       Overall Error Summary Table printout.
;    2153  1      !
;    2154  1      ! COMPLETION CODES:
;    2155  1      !
;    2156  1      !       NONE
;    2157  1      !
;    2158  1      ! SIDE EFFECTS:
;    2159  1      !
;    2160  1      !       NONE
;    2161  1      !
;    2162  1      !--
```

```
;    2164  2      BEGIN
;    2165  2
;    2166  2              !+
;    2167  2              ! The are the strings that get printed in each line of the Overall Error Summary Table.
;    2168  2              !-
;    2169  2
;    2170  2              BIND
;    2171  2                      Header_Line_1 =                                                 !                       [04]
;    2172  2                              $ASCIC ('!^!/!/!11* Overall Error Summary Table!/'),    !                       [04]
;    2173  2
;    2174  2                      Header_Line_2 =                                                 !                       [04]
;    2175  2                              $ASCIC ('!11* --------------------------!/'),           !                       [04]
;    2176  2
;    2177  2                      Header_Line_3 =                                                 !                       [04]
;    2178  2                              $ASCIC ('QA Checklist Item!16* Number of Errors!/'),
;    2179  2
;    2180  2                      Header_Line_4 =                                                 !                       [04]
;    2181  2                              $ASCIC ('!17*-!16* !16*-!/'),
;    2182  2
;    2183  2                      NS_Line =
;    2184  2                              $ASCIC ('!41<Normal Start!50*.!>!UW!/'),
;    2185  2
;    2186  2                      MP_Line =
;    2187  2                              $ASCIC ('!41<Multiple Pass (!UW passes)!50*.!>!UW!/'),
;    2188  2
;    2189  2                      LT_Line =
;    2190  2                              $ASCIC ('!41<Infinite Loop-On-Test (!UW passes)!50*.!>!UW!/'),
;    2191  2
;    2192  2                      LS_Line =                                                                       !       [01]
;    2193  2                              $ASCIC ('!41<Infinite Loop-On-Subtest (!UW passes)!50*.!>!UW!/'),       !       [01]
;    2194  2
;    2195  2                      RB_Line =
;    2196  2                              $ASCIC ('!41<Run Tests Backwards!50*.!>!UW!/'),
;    2197  2
;    2198  2                      OK_Line =                                                               !       [01]
;    2199  2                              $ASCIC ('!/** QA ** !16AC passed Auto-QA portion of Quality Assurance Checklist!/');
```

```
;    2201  2              !+
;    2202  2              ! If the /TEST qualifier was given, do not print this table out. This prevents someone from running QA  [02]
;    2203  2              ! on only a small portion of the diagnostic, and having that portion work. The following must therefore [02]
;    2204  2              ! be true:                                                                                              [02]
;    2205  2              !       .DS$GL_FSTTEST = 1                                                                             [02]
;    2206  2              !       .DS$GL_LSTTEST = ..L$A_TSTCNT                                                                  [02]
;    2207  2              ! If either one of these is false, simply return. Note: accept the following if a diagnsotic contains  [02]
;    2208  2              ! x tests: /TEST:1:x.
;    2209  2              !-
;    2210  2
;    2211  2              IF ((.DS$GL_FSTTEST NEQ 1) OR (.DS$GL_LSTTEST NEQ ..L$A_TSTCNT)) THEN   !                             [02]
;    2212  2                  RETURN;                                                             !                             [02]
;    2213  2
;    2214  2              !+
;    2215  2              ! Print header lines.
;    2216  2              !-
;    2217  2
;    2218  2              $DS_PRINTF (Header_Line_1);                                             !                             [04]
;    2219  2              $DS_PRINTF (Header_Line_2);                                             !                             [04]
;    2220  2              $DS_PRINTF (Header_Line_3);                                             !                             [04]
;    2221  2              $DS_PRINTF (Header_Line_4);                                             !                             [04]
;    2222  2
;    2223  2              !+
;    2224  2              ! Print each line for the checks, until a non-zero error count is
;    2225  2              ! reached, or until the last check. If all the checks were non-zero,
;    2226  2              ! print the "passed QA" message.
;    2227  2              !-
```

```
;    2229  2              !+
;    2230  2              ! Print and check Normal Start errors
;    2231  2              !-
;    2232  2
; P  2233  2              $DS_PRINTF (NS_Line,
;    2234  2                      .QA$AW_Overall_Error_Table [QA$K_Normal_Start]);
;    2235  2
;    2236  2              IF (.QA$AW_Overall_Error_Table [QA$K_Normal_Start] NEQ 0) THEN
;    2237  2                  RETURN;
;    2238  2
;    2239  2              !+
;    2240  2              ! Print and check Multiple Pass errors
;    2241  2              !-
;    2242  2
; P  2243  2              $DS_PRINTF (MP_Line, .QA$W_MultiplePass,
;    2244  2                      .QA$AW_Overall_Error_Table [QA$K_Multiple_Pass]);
;    2245  2
;    2246  2              IF (.QA$AW_Overall_Error_Table [QA$K_Multiple_Pass] NEQ 0) THEN
;    2247  2                  RETURN;
;    2248  2
;    2249  2              !+
;    2250  2              ! Print and check Loop-On-Test erros
;    2251  2              !-
;    2252  2
; P  2253  2              $DS_PRINTF (LT_Line, .QA$W_TestLoops,
;    2254  2                      .QA$AW_Overall_Error_Table [QA$K_Loop_On_Test]);
;    2255  2
;    2256  2              IF (.QA$AW_Overall_Error_Table [QA$K_Loop_On_Test] NEQ 0) THEN
;    2257  2                  RETURN;
;    2258  2
;    2259  2              !+                                                                  [01]
;    2260  2              ! Print and check Loop-On-Subtest errors                            [01]
;    2261  2              !-                                                                  [01]
;    2262  2
; P  2263  2              $DS_PRINTF (LS_Line, .QA$W_SubtestLoops,                !           [01]
;    2264  2                      .QA$AW_Overall_Error_Table [QA$K_Loop_On_Subtest]);        !  [01]
;    2265  2
;    2266  2              IF (.QA$AW_Overall_Error_Table [QA$K_Loop_On_Subtest] NEQ 0) THEN  !  [01]
;    2267  2                  RETURN;                                                        !  [01]
```

```
;   2269  2            !+
;   2270  2            ! Print and check Run Tests Backwards errors
;   2271  2            !-
;   2272  2
; P 2273  2            $DS_PRINTF (RB_Line,
;   2274  2                    .QA$AW_Overall_Error_Table [QA$K_Run_Backwards]);
;   2275  2
;   2276  2            IF (.QA$AW_Overall_Error_Table [QA$K_Run_Backwards] NEQ 0) THEN
;   2277  2                    RETURN;
;   2278  2
;   2279  2            $DS_PRINTF (OK_Line, .L$A_NAME);
;   2280  2
;   2281  2            RETURN
;   2282  1      END;


                                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

65  76  4F  20  2A  31  31  21  2F  21  2F  21  5E  21  28  002E2 P.AAR:  .ASCII  \(!^!/!/!11* Overall Error Summary Table!\  ;
6D  6D  75  53  20  72  6F  72  72  45  20  6C  6C  61  72  002F1                                                          ;
                    21  65  6C  62  61  54  20  79  72  61  00300                                                          ;
                                                        2F  0030A          .ASCII  \/\                                          ;
2D  2D  2D  2D  2D  2D  2D  2D  2D  20  2A  31  31  21  22  0030B P.AAS:  .ASCII  \"!11* ---------------------------!/\       ;
2D  2D  2D  2D  2D  2D  2D  2D  2D  2D  2D  2D  2D  2D  2D  0031A                                                          ;
                                        2F  21  2D  2D  2D  00329                                                          ;
49  20  74  73  69  6C  6B  63  65  68  43  20  41  51  28  0032E P.AAT:  .ASCII  \(QA Checklist Item!16* Number of Errors!\  ;
20  72  65  62  6D  75  4E  20  2A  36  31  21  6D  65  74  0033D                                                          ;
                    21  73  72  6F  72  72  45  20  66  6F  0034C                                                          ;
                                                        2F  00356          .ASCII  \/\                                          ;
2A  36  31  21  20  2A  36  31  21  2D  2A  37  31  21  11  00357 P.AAU:  .ASCII  <17>\!17*-!16* !16*-!/\                     ;
                                                2F  21  2D  00366                                                          ;
61  74  53  20  6C  61  6D  72  6F  4E  3C  31  34  21  1C  00369 P.AAV:  .ASCII  <28>\!41<Normal Start!50*.!>!UW!/\          ;
    2F  21  57  55  21  3E  21  2E  2A  30  35  21  74  72  00378                                                          ;
50  20  65  6C  70  69  74  6C  75  4D  3C  31  34  21  2A  00386 P.AAW:  .ASCII  \*!41<Multiple Pass (!UW passes)!50*.!>!U\  ;
73  65  73  73  61  70  20  57  55  21  28  20  73  73  61  00395                                                          ;
                    55  21  3E  21  2E  2A  30  35  21  29  003A4                                                          ;
                                                2F  21  57  003AE          .ASCII  \W!/\                                        ;
4C  20  65  74  69  6E  69  66  6E  49  3C  31  34  21  32  003B1 P.AAX:  .ASCII  \2!41<Infinite Loop-On-Test (!UW passes)!\  ;
55  21  28  20  74  73  65  54  2D  6E  4F  2D  70  6F  6F  003C0                                                          ;
                    21  29  73  65  73  73  61  70  20  57  003CF                                                          ;
                2F  21  57  55  21  3E  21  2E  2A  30  35  003D9          .ASCII  \50*.!>!UW!/\                                ;
4C  20  65  74  69  6E  69  66  6E  49  3C  31  34  21  35  003E4 P.AAY:  .ASCII  \5!41<Infinite Loop-On-Subtest (!UW passe\  ;
20  74  73  65  74  62  75  53  2D  6E  4F  2D  70  6F  6F  003F3                                                          ;
                    65  73  73  61  70  20  57  55  21  28  00402                                                          ;
    2F  21  57  55  21  3E  21  2E  2A  30  35  21  29  73  0040C          .ASCII  \s)!50*.!>!UW!/\                             ;
20  73  74  73  65  54  20  6E  75  52  3C  31  34  21  23  0041A P.AAZ:  .ASCII  \#!41<Run Tests Backwards!50*.!>!UW!/\      ;
21  2E  2A  30  35  21  73  64  72  61  77  6B  63  61  42  00429                                                          ;
                                    2F  21  57  55  21  3E  00438                                                          ;
36  31  21  20  2A  2A  20  41  51  20  2A  2A  2F  21  48  0043E P.ABA:  .ASCII  \H!/** QA ** !16AC passed Auto-QA portion\  ;
2D  6F  74  75  41  20  64  65  73  73  61  70  20  43  41  0044D                                                          ;
                    6E  6F  69  74  72  6F  70  20  41  51  0045C                                                          ;
73  73  41  20  79  74  69  6C  61  75  51  20  66  6F  20  00466          .ASCII  \ of Quality Assurance Checklist!/\          ;
73  69  6C  6B  63  65  68  43  20  65  63  6E  61  72  75  00475                                                          ;
                                                2F  21  74  00484                                                          ;

                                                                HEADER_LINE_1=      P.AAR
```

```
                                        HEADER_LINE_2=      P.AAS
                                        HEADER_LINE_3=      P.AAT
                                        HEADER_LINE_4=      P.AAU
                                        NS_LINE=            P.AAV
                                        MP_LINE=            P.AAW
                                        LT_LINE=            P.AAX
                                        LS_LINE=            P.AAY
                                        RB_LINE=            P.AAZ
                                        OK_LINE=            P.ABA


                                                .PSECT  CODE,NOWRT,  SHR,2

                                001C 00000 QA$PRINT_OVERALL_ERRORS:
                                                .WORD   Save R2,R3,R4                           ; 2127
                    54 00000000'  EF  9E 00002          MOVAB   QA$AW_OVERALL_ERROR_TABLE, R4       ;
                    53 00000000G  9F  9E 00009          MOVAB   @#DS$PRINTF, R3                     ;
                    52 00000000'  EF  9E 00010          MOVAB   HEADER_LINE_1, R2                   ;
                    01 00000000G  EF  D1 00017          CMPL    DS$GL_FSTTEST, #1                   ; 2211
                                  78  12 0001E          BNEQ    1$                                  ;
                    50 00000254   9F  D0 00020          MOVL    @#^X00000254, R0                    ;
                    60 00000000G  EF  D1 00027          CMPL    DS$GL_LSTTEST, (R0)                 ;
                                  78  12 0002E          BNEQ    2$                                  ;
                                  52  DD 00030          PUSHL   R2                                  ; 2218
                    63            01  FB 00032          CALLS   #1, DS$PRINTF                       ;
                            29    A2  9F 00035          PUSHAB  HEADER_LINE_2                       ; 2219
                    63            01  FB 00038          CALLS   #1, DS$PRINTF                       ;
                            4C    A2  9F 0003B          PUSHAB  HEADER_LINE_3                       ; 2220
                    63            01  FB 0003E          CALLS   #1, DS$PRINTF                       ;
                            75    A2  9F 00041          PUSHAB  HEADER_LINE_4                       ; 2221
                    63            01  FB 00044          CALLS   #1, DS$PRINTF                       ;
                    7E            64  3C 00047          MOVZWL  QA$AW_OVERALL_ERROR_TABLE, -(SP)    ; 2234
                          0087    C2  9F 0004A          PUSHAB  NS_LINE                             ;
                    63            02  FB 0004E          CALLS   #2, DS$PRINTF                       ;
                                  64  B5 00051          TSTW    QA$AW_OVERALL_ERROR_TABLE           ; 2236
                                  62  12 00053          BNEQ    3$                                  ;
                    7E      02    A4  3C 00055          MOVZWL  QA$AW_OVERALL_ERROR_TABLE+2, -(SP)  ; 2244
                    7E 00000000G  EF  3C 00059          MOVZWL  QA$W_MULTIPLEPASS, -(SP)            ;
                          00A4    C2  9F 00060          PUSHAB  MP_LINE                             ;
                    63            03  FB 00064          CALLS   #3, DS$PRINTF                       ;
                            02    A4  B5 00067          TSTW    QA$AW_OVERALL_ERROR_TABLE+2         ; 2246
                                  4B  12 0006A          BNEQ    3$                                  ;
                    7E      04    A4  3C 0006C          MOVZWL  QA$AW_OVERALL_ERROR_TABLE+4, -(SP)  ; 2254
                    7E 00000000G  EF  3C 00070          MOVZWL  QA$W_TESTLOOPS, -(SP)               ;
                          00CF    C2  9F 00077          PUSHAB  LT_LINE                             ;
                    63            03  FB 0007B          CALLS   #3, DS$PRINTF                       ;
                            04    A4  B5 0007E          TSTW    QA$AW_OVERALL_ERROR_TABLE+4         ; 2256
                                  34  12 00081          BNEQ    3$                                  ;
                    7E      06    A4  3C 00083          MOVZWL  QA$AW_OVERALL_ERROR_TABLE+6, -(SP)  ; 2264
                    7E 00000000G  EF  3C 00087          MOVZWL  QA$W_SUBTESTLOOPS, -(SP)            ;
                          0102    C2  9F 0008E          PUSHAB  LS_LINE                             ;
                    63            03  FB 00092          CALLS   #3, DS$PRINTF                       ;
                            06    A4  B5 00095          TSTW    QA$AW_OVERALL_ERROR_TABLE+6         ; 2266
                                  1D  12 00098 1$:      BNEQ    3$                                  ;
                    7E      08    A4  3C 0009A          MOVZWL  QA$AW_OVERALL_ERROR_TABLE+8, -(SP)  ; 2274
                          0138    C2  9F 0009E          PUSHAB  RB_LINE                             ;
                    63            02  FB 000A2          CALLS   #2, DS$PRINTF                       ;
```

```
                    08   A4  B5 000A5          TSTW    QA$AW_OVERALL_ERROR_TABLE+8                 ; 2276
                         0D  12 000A8 2$:      BNEQ    3$                                          ;
              00000208   9F  DD 000AA          PUSHL   @#^X00000208                                ; 2279
                  015C   C2  9F 000B0          PUSHAB  OK_LINE                                     ;
          63             02  FB 000B4          CALLS   #2, DS$PRINTF                               ;
                             04 000B7 3$:      RET                                                 ; 2281

; Routine Size:  184 bytes,    Routine Base:  CODE + 0583
```

```
;   2284  1     %SBTTL 'End of Module QAMAIN'
;   2285  1
;   2286  0     END ELUDOM
```

```
;                                  PSECT SUMMARY
;
;       Name                    Bytes                          Attributes
;
;  DATA                          1159  NOVEC,NOWRT,  RD ,NOEXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  WORK                            53  NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  CODE                          1595  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
```

Symbol	Type	Defined	Referenced ...										
$ASCIC	Unbound		256	285									
	Macro	Lib01	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1524
			1534	1696	1840	1875	1908	2172	2175	2178	2181	2184	2187
			2190	2193	2196	2199							
$DS_CNTRLC	KeyWMacr	Lib01	1171										
$DS_DSADEF	Macro	Lib01	135										
$DS_PRINTF	Unbound		258	285									
	Macro	Lib01	1296	1297	1298	1299	1309	1418	1419	1420	1421	1427	1430
			1444	1447	1527	1537	1696	1823	1840	1875	1908	2218	2219
			2220	2221	2233	2243	2253	2263	2273	2279			
$DS_QADEF	Macro	Lib01	134										
$EQULST	Macro	Lib03	134	136	137								
$ER	Comptime	338											
$MODULE	Bind	338											
AP	Builtin	1221											
ASSERT	Macro	231											
ASSERT_STRING	MacrForm	231	236										
BIT_NUMBER	Local	1373	1386.	1390.									
BIT_POS	Local	1605	1606.										
BOOLEAN	Macro	298	705										
BRANCH	Local	451	462=	465=	468=	471=	474=	477=	480=	483=	486=	489=	492=
			495=	507=	515=	523=	532=	541=	549=	557=	565=	573=	582=
			591=	599=	607=	615=	623=	631=	635=	638=	646=	649=	652=
			655=	658=	661=	668=	671=	685=	688=	697.	705=	705.	711.
BRANCH_CODE	RoutForm	403	455.										
BRANCH_VALUE	RoutForm	403	462.	465.	468.	471.	474.	477.	480.	483.	486.	489.	492.
			495.	505m	507.	513m	515.	521m	523.	524.	530m	532.	533.
			539m	541.	547m	549.	555m	557.	563m	565.	571m	573.	574.
			580m	582.	583.	589m	591.	597m	599.	605m	607.	613m	615.
			621m	623.	629m	631.	635.	638.	646.	649.	652.	655.	658.
			661.	668.	671.	685.	688.						
CALL_DSX$BRANCH	Linkage	95	103	403									
CALL_FRAME	Bind	1345	1347.	1348.	1349.	1351.							
	Bind	1406	1411.										

Symbol	Type	Defined	Referenced ...					
CHECK_CASE	Macro	1680	1897	1898	1899	1900	1901	
CLI$L_LAST	Macro	Lib02	1792					
CLI$L_PASS	Macro	Lib02	1748	1786				
CLI$L_SUBT	Macro	Lib02	1749	1787				
CLI$L_TEST	Macro	Lib02	1791					
CONDITION	MacrForm	231	235					
DEBUG	Macro	280						
DEBUG_STRING	MacrForm	280	285					
DIAG_AP	Local	1237	1349=	1420.				
DIAG_FP	Local	1238	1350=	1420.				
DIAG_PC	Local	1239	1351=	1421.				
DIAG_PSW	Local	1235	1347=	1421.				
DIAG_SP	Local	1240	1408=	1421.				
DS$CNTRLC	ExtRout	1171	1171c					
DS$GA_DS_CTRL_C_FIRST	External	171	1613=	1772=				
DS$GB_WIDTH	External	175						
DS$GL_CLIBASE	External	173	1693m	1748=	1749=	1786=	1787=	1791=	1792=
DS$GL_FSTTEST	External	168	1804.	1862=	2211.			
DS$GL_LSTTEST	External	169	1805.	1863=	2211.			
DS$K_BBC	Literal	134	637					
DS$K_BBCC	Literal	134	654					
DS$K_BBCCI	Literal	134	660					
DS$K_BBCS	Literal	134	648					
DS$K_BBS	Literal	134	634					
DS$K_BBSC	Literal	134	651					
DS$K_BBSS	Literal	134	645					
DS$K_BBSSI	Literal	134	657					
DS$K_BCC_M	Literal	134	626					
DS$K_BCS_M	Literal	134	618					
DS$K_BEQLU_B	Literal	134	476					
DS$K_BEQLU_M	Literal	134	544					
DS$K_BEQL_B	Literal	134	473					
DS$K_BEQL_M	Literal	134	536					
DS$K_BERROR	Literal	134	684					
DS$K_BGEQU_B	Literal	134	482					
DS$K_BGEQU_M	Literal	134	560					
DS$K_BGEQ_B	Literal	134	479					
DS$K_BGEQ_M	Literal	134	552					
DS$K_BGTRU_B	Literal	134	488					
DS$K_BGTRU_M	Literal	134	577					
DS$K_BGTR_B	Literal	134	485					
DS$K_BGTR_M	Literal	134	568					
DS$K_BLBC	Literal	134	670					
DS$K_BLBS	Literal	134	667					
DS$K_BLEQU_B	Literal	134	470					
DS$K_BLEQU_M	Literal	134	527					
DS$K_BLEQ_B	Literal	134	467					
DS$K_BLEQ_M	Literal	134	518					
DS$K_BLSSU_B	Literal	134	464					
DS$K_BLSSU_M	Literal	134	510					
DS$K_BLSS_B	Literal	134	137	461				
DS$K_BLSS_M	Literal	134	502					
DS$K_BNEQU_B	Literal	134	494					
DS$K_BNEQU_M	Literal	134	594					
DS$K_BNEQ_B	Literal	134	491					

Symbol	Type	Defined	Referenced ...
DS$K_BNEQ_M	Literal	134	586
DS$K_BNERROR	Literal	134	137 687
DS$K_BVC_M	Literal	134	610
DS$K_BVS_M	Literal	134	602
DS$K_DS_STARTING_LOCATION	Literal	137	1549
DS$PRINTF	ExtRout	1296	1296c 1297e 1297c 1298e 1298c 1299e 1299c 1311e 1311c 1418e 1418c 1419e 1419c 1420e 1420c 1421e 1421c 1427e 1427c 1430e 1430c 1444e 1444c 1447e 1447c 1527e 1527c 1537e 1537c 1697e 1697c 1823e 1823c 1840e 1840c 1875e 1875c 1908e 1908c 2218e 2218c 2219e 2219c 2220e 2220c 2221e 2221c 2234e 2234c 2244e 2244c 2254e 2254c 2264e 2264c 2274e 2274c 2279e 2279c
DSA$AL_APTMAIL	Bind	135	135
DSA$GL_APTCOM	Bind	135	
DSA$GL_DEVLEN	Bind	135	
DSA$GL_DEVNAM	Bind	135	
DSA$GL_ERRNO	Bind	135	
DSA$GL_EVENT	Bind	135	
DSA$GL_FLAGS	Bind	135	695 767 769 1172 1174 1703 1753 1755 1756 1757 1758 1759 1760 1761 1762 1763 1764 1765 1766 1865 1867 1909 1911
DSA$GL_MSGPTR	Bind	135	
DSA$GL_MSGTYP	Bind	135	
DSA$GL_PASSES	Bind	135	
DSA$GL_PASSNO	Bind	135	1311
DSA$GL_SECTNO	Bind	135	1311
DSA$GL_SID	Bind	135	
DSA$GL_SUBTNO	Bind	135	1311
DSA$GL_TESTNO	Bind	135	1311
DSA$GL_UNITS	Bind	135	
DSA$V_BELL	Macro	Lib01	1755
DSA$V_HALT	Macro	Lib01	1756
DSA$V_IE1	Macro	Lib01	1757
DSA$V_IE2	Macro	Lib01	1758
DSA$V_IE3	Macro	Lib01	1759
DSA$V_IES	Macro	Lib01	1760
DSA$V_LOOP	Macro	Lib01	1761
DSA$V_OPER	Macro	Lib01	1762
DSA$V_PROMPT	Macro	Lib01	1763
DSA$V_QA	Macro	Lib01	695 769 1174 1703 1867 1911
DSA$V_QUICK	Macro	Lib01	1764
DSA$V_SEARCH	Macro	Lib01	1765
DSA$V_TRACE	Macro	Lib01	1766
DSQA	Macro	Lib02	136
DSQA$K_DISPAT_AFTER_INIT	Literal	136	
DSQA$K_DISPAT_BEFORE_INIT	Literal	136	
DSQA$K_DISPAT_CALLTEST	Literal	136	
DSQA$K_DISPAT_DONE_TESTS	Literal	136	
DSQAK_DISPAT_DSXENDPASS_BGN	Literal	136	
DSQAK_DISPAT_DSXENDPASS_END	Literal	136	
DSQAK_DISPAT_DSXENDPASS_MID	Literal	136	1857
DSQA$K_DISPAT_DS_CLEANUP_BGN	Literal	136	1879
DSQA$K_DISPAT_DS_CLEANUP_END	Literal	136	1885
DSQA$K_DUMMY_1	Literal	136	
DSQA$K_ERROR_ERROR_BGN	Literal	136	
DSQA$K_ERROR_ERROR_END	Literal	136	

Symbol	Type	Defined	Referenced ...					
DSQA$K_KERNEL_INIT_CONTEXT	Literal	136	1872					
DSQAK_LOOP_DSXBGNSUB	Literal	136						
DSQAK_LOOP_DSXCKLOOP	Literal	136						
DSQAK_LOOP_DSXENDSUB	Literal	136						
DSQAK_PARAM_DSXGETADDRESS	Literal	136	1812					
DSQAK_PARAM_DSXGETDATA	Literal	136	1810					
DSQAK_PARAM_DSXGETLOGICAL	Literal	136	1813					
DSQAK_PARAM_DSXGETSTRING	Literal	136	1814					
DSQAK_PARAM_DSXGETVIELD	Literal	136	1811					
DSQAK_QA_DSXBRANCH	Literal	136	714					
DSQA$K_START_BEFORE_HEADER	Literal	136	1796					
DSQA$K_START_VRRESTART	Literal	136	1777					
DSQA$K_START_VRSTART	Literal	136	1738					
DSV$SHOWDEVICE	ExtRout	155	1445c					
DSV$SHOWSELECT	ExtRout	156	1448c					
DSX$ABORT	ExtRout	157	770c	1175c	1912c			
DSX$BRANCH	GlobRout	403	103f					
DS_QADEFS	Macro	Lib02	137					
DUMP_HEADER_4	Bind	1249	1299a					
DUMP_LINE_1	Bind	1250	1311a					
DUMP_LINE_10	Bind	1258	1447a					
DUMP_LINE_2	Bind	1251	1418a					
DUMP_LINE_3	Bind	1252	1419a					
DUMP_LINE_4	Bind	1253	1420a					
DUMP_LINE_5	Bind	1254	1421a					
DUMP_LINE_7	Bind	1255	1427a					
DUMP_LINE_8	Bind	1256	1430a					
DUMP_LINE_9	Bind	1257	1444a					
ERROR_ENTRY	Local	1608	1609.					
ERROR_NUMBER	RoutForm	403	712.					
	RoutForm	776						
ERROR_RECORD	Macro	267						
ERROR_STRING	MacrForm	253	256					
ES	Unbound		256	258				
	Bind	1840	1840a					
	Bind	1908	1908a					
EXE$ALONONPAGED	ExtRout	152						
EXE$DEANONPAGED	ExtRout	153						
EXPRESSION	MacrForm	298	299					
FAKE_CLI_TABLE	Local	1245	1442=	1445a	1448a			
FALSE	Literal	137	1321	1887				
FFS	Builtin	1835	1837					
FIRST_BIT_SET	Local	1832	1837=	1839.	1843.			
FLAG	Local	1602	1603.					
FORCED_ERROR_FIELDS	Unbound		268					
	Fieldset	324						
FP	Builtin	1221						
	Builtin	1501	1515.					
FP_PTR	Bind	1498	1515=	1521.	1527.	1547.	1554=	1554.
FRAME_START	Local	1229	1330a	1345.	1350.	1381.	1406.	1408.
	RoutForm	1453	1498.					
GET1ST_	Macro	Lib03	134	136	137			
GET2ND_	Unbound		134	136	137			
HEADER_LINE_1	Bind	2171	2218a					
HEADER_LINE_2	Bind	2174	2219a					

Symbol	Type	Defined	Referenced ...
HEADER_LINE_3	Bind	2177	2220a
HEADER_LINE_4	Bind	2180	2221a
HOOK_POINT	Unbound		1684
	RoutForm	1618	1697. 1738. 1777. 1796. 1810. 1811. 1812. 1813. 1814. 1857. 1872. 1879. 1885. 1897. 1898. 1899. 1900. 1901.
I	Local	1441	1442.
INVALID_CALL_FRAME	Bind	1524	1527a
JSB_ALLOC	Linkage	Lib02	152
JSB_CLI	Linkage	Lib02	155 156
JSB_DEALL	Linkage	Lib02	153
JSB_NONE	Linkage	Lib02	159 160
L$A_NAME	Literal	Lib01	1297 2279
L$A_SECNAM	Literal	Lib01	1307
L$A_TSTCNT	Literal	Lib01	2211
L$L_REV	Literal	Lib01	1297
L$L_UPDATE	Literal	Lib01	1297
LAST_PC	Local	1507	1547= 1549.
LOGIC_ERROR	Unbound		236
	Macro	253	1840 1908
LS_LINE	Bind	2192	2264a
LT_LINE	Bind	2189	2254a
MAX_FRAMES_CHECKED	Literal	1504	1531
MAX_REGS_SAVED	Literal	1226	1246 1363 1373
MODNAM	Macro	Lib02	338
MOVPSL	Builtin	1222	
MP_LINE	Bind	2186	2244a
NS_LINE	Bind	2183	2234a
NUL2ND_	Macro	Lib03	134 136 137
NUMBER_FRAMES_CHECKED	Local	1508	1516= 1531= 1531.
NUMBER_OF_REGS	Local	1242	1371= 1389= 1389. 1390. 1394= 1394. 1410.
OFF	Literal	137	769 1174 1603 1606 1755 1756 1757 1758 1759 1760 1761 1762 1763 1764 1765 1769 1867 1911
OK_LINE	Bind	2198	2279a
ON	Literal	137	1766 1773
PROBEW	Builtin	1501	1521
PSL$V_C	Macro	Lib03	515 532 565 582 623 631
PSL$V_N	Macro	Lib03	507 523 557 573
PSL$V_V	Macro	Lib03	607 615
PSL$V_Z	Macro	Lib03	524 533 541 549 574 583 591 599
QA$ABORT_QA	Routine	727	104f 1848c 1922c
QA$ADD_FORCED_ERROR	GlobRout	776	105f
QA$ADD_QA_ERROR	GlobRout	1093	106f 1843c
QA$AOB_CHECK_STATE	Unbound		1681
	Global	375	1606= 1773= 1837. 1859. 1897. 1898. 1899. 1900. 1901.
QA$AOB_FLAGS	Unbound		284
	Global	380	1319. 1321= 1603= 1695. 1821. 1874.
QA$AOB_ROUTINE_STATE	Global	371	1769= 1844= 1881= 1887=
QA$AW_OVERALL_ERROR_TABLE	Own	340	1127= 1128. 1609= 2234. 2236. 2244. 2246. 2254. 2256. 2264. 2266. 2274. 2276.
QA$CONTROL_C_HANDLER	Routine	1133	107f 1772a
QA$DUMP	Routine	1182	108f 765c
QA$FIND_USER_CALL_FRAME	GlobRout	1453	109f 1330c
QA$INIT	Routine	1560	110f 768c 1173c 1771c 1866c 1910c
QA$K_ABORT_NOW	Literal	137	
QA$K_APT_PHASE_ONE	Literal	137	

Symbol	Type	Defined	Referenced ...					
QA$K_APT_PHASE_TWO	Literal	137						
QA$K_BAD_ADDRESS	Literal	137						
QA$K_CONTROL_C_CONT	Literal	137						
QA$K_DEALLOCATION	Literal	137						
QA$K_ERROR_PHASE_ONE	Literal	137						
QA$K_ERROR_PHASE_THREE	Literal	137						
QA$K_ERROR_PHASE_TWO	Literal	137						
QA$K_FAILURE	Literal	137	1528	1538				
QA$K_FIRST_BRANCH_CODE	Literal	137	456					
QA$K_FIRST_TIME	Literal	137						
QA$K_FORCED_ERROR_RECORD_SIZE	Literal	311						
QA$K_INIT_CONTEXT_DONE	Literal	137	1319	1321				
QA$K_LAST_BRANCH_CODE	Literal	137	456					
QA$K_LAST_CHECK	Literal	313	1859					
QA$K_LOOP_ON_SUBTEST	Literal	137	1900	2264	2266			
QA$K_LOOP_ON_TEST	Literal	137	1899	2254	2256			
QA$K_LOOP_TEST_DONE	Literal	137						
QA$K_MEMORY_MANAGE	Literal	137						
QA$K_MULTIPLE_PASS	Literal	137	1898	2244	2246			
QA$K_NIL	Literal	309						
QA$K_NODEF	Literal	137	1821					
QA$K_NORMAL_START	Literal	137	1773	1897	2234	2236		
QA$K_NO_HEADER	Literal	137						
QA$K_NUMBER_OF_CHECKS	Literal	137	340	375	1605	1608	1837	1839
QA$K_NUMBER_QA_FLAGS	Literal	137	380	1602				
QA$K_NUMB_ROUTINE_STATES	Literal	137	371	1768				
QA$K_QA_DEBUG	Unbound		284					
	Literal	137	1695	1874				
QA$K_QA_DONE	Literal	137						
QA$K_RUN_BACKWARDS	Literal	137	313	1901	2274	2276		
QA$K_SECTION	Literal	137						
QA$K_SUCCESS	Literal	137	1551					
QA$LOOP_ON_SUBTEST	ExtRout	149	1900c					
QA$LOOP_ON_TEST	ExtRout	148	1899c					
QA$L_SAVED_DSA_FLAGS	Global	368	767.	1172.	1753=	1865.	1909.	
QA$MAIN	GlobRout	1618	111f	714c				
QA$MULTIPLE_PASS	ExtRout	147	1898c					
QA$NORMAL_START	ExtRout	146	1897c					
QA$PRINT_FORCED_ERRORS	GlobRout	1927	112f	1861c				
QA$PRINT_OVERALL_ERRORS	Routine	2127	113f	766c	1864c			
QA$RUN_BACKWARDS	ExtRout	150	1901c					
QA$T_HEADER_1	External	186	1296a					
QA$T_HEADER_2	External	187	1297a					
QA$T_HEADER_3	External	188	1298a					
QA$T_OPERATOR_REQUEST_MESSAGE	External	190	1823a					
QA$VA_NEXT_ERROR	Field	329						
QA$VL_ERROR_COUNT	Field	327						
QA$VL_SUBTEST_NUMBER	Field	328						
QA$VW_ERROR_NUMBER	Field	325						
QA$VW_TEST_NUMBER	Field	326						
QA$V_CHECK_DONE	Literal	137						
QA$V_DOING_CLEANUP	Literal	137	1881	1887				
QA$V_ERROR_FOUND	Literal	137	1844					
QA$V_INIT_DONE	Literal	137						
QA$W_BRANCH	Global	358	711=	721.				

```
Symbol                          Type  Defined  Referenced ...
------------------------------ -------- ----- ---------------
QA$W_ERROR_NUMBER               Global     361   712=
QA$W_MULTIPLEPASS               External   184  2244.
QA$W_SAVE_LAST                  Global     366  1751=   1792.   1805=   1863.
QA$W_SAVE_TEST                  Global     364  1750=   1789.   1791.   1798.   1804=   1862.
QA$W_SUBTESTLOOPS               External   183  2264.
QA$W_TESTLOOPS                  External   182  2254.
RB_LINE                         Bind      2195  2274a
REGISTER_0                      RoutForm   403   453.
REGISTER_MASK                   Local     1236  1348=   1384m   1386.
REG_NOT_SAVED                   Literal   1225  1364
REG_NUMBER                      Local     1363  1364.
REG_VECTOR                      Local     1246  1364=   1390=   1418.   1419.   1420.
ROUTINE_CONSTANT                RoutForm  1093  1127.   1128.
ROUTINE_NAME                    MacrForm  1680  1682    1684
SAVE_REGISTER_0                 Local      450   453=    697=    698.    721=    722.
SEC_NAME_TABLE                  Bind      1307  1311.
SF$L_SAVE_AP                    Macro    Lib03  1349
SF$L_SAVE_PC                    Macro    Lib03  1351
SF$V_SAVE_MASK                  Macro    Lib03  1348
SF$V_STACKOFFS                  Macro    Lib03  1411
SF$W_SAVE_PSW                   Macro    Lib03  1347
SP                              Builtin   1221
                                Builtin   1690
START_REGISTERS                 Bind      1381  1390.
STATE                           Local     1768  1769.
TOO_MANY_FRAMES                 Bind      1534  1537a
TRUE                            Literal    137  1844    1881
VRSHOWEF                        ExtRout    160  1431c
VRSHOWFLG                       ExtRout    159  1428c


                CROSS REFERENCE MAP

Line #      Event          File ...
-----  ---------------  ---------
    1  Source (start)   DISK$DS:[DS.LOCAL.RELEASE.WORK]QAMAIN.B32;1
    5  Module QAMAIN
  121  Library #1       DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
  124  Library #2       DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
  127  Library #3       SYS$COMMON:[SYSLIB]LIB.L32;3
 2286  Eludom QAMAIN
```

```
        KEY TO REFERENCE TYPE FLAGS

            .   Fetch
            =   Store
            c   Routine call
            a   Address use
            @   Indirect use
            e   External, external routine, or external literal declaration
            f   Forward or forward routine declaration
            h   Condition handler enabling
            m   Map declaration
            u   Undeclare declaration


;                           Library Statistics
;
;                                        -------- Symbols --------      Pages       Processing
;       File                             Total    Loaded   Percent      Mapped      Time
;
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
;                                          942        23         2        96          00:00.0
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
;                                          675        11         1        47          00:00.0
;  SYS$COMMON:[SYSLIB]LIB.L32;3          21522        12         0      1156          00:00.8




;                                   COMMAND QUALIFIERS

;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:QAMAIN.B32

; Size:          1595 code + 1212 data bytes
; Run Time:         00:08.6
; Elapsed Time:     00:12.6
; Lines/CPU Min:    15967
; Lexemes/CPU-Min:102419
; Memory Used:  345 pages
; Compilation Complete
```

Table of contents

(1) 146 Libraries and Equated Symbols
(1) 294 External Symbols
(1) 409 EXE$QIO QIO DISPATCHING ROUTINE
(2) 514 QIO$INITIALIZE Initialize QIO database
(4) 571 QIO$CLEANUP Remove old QIO database
(5) 670 QIO$ADDUNIT Add a unit to the QIO database
(7) 929 INI_MBADP BUILD ADP AND INITIALIZE MBA
(9) 1026 INI_UBADP BUILD ADP AND INITIALIZE UBA
(10) 1083 INI_DRADP BUILD ADP AND INITIALIZE DRA
(12) 1180 MAXIMIZE ACCESS MODE
(13) 1206 BUG$CHECK Bugcheck notification routine
(14) 1241 QIO$LOAD_DB Insert unit into data base
(16) 1523 DB_ERROR ERROR LOADING DATABASE
(16) 1595 I/O DATABASE INTERLOCKS
(17) 1603 IOGEN$CNTRL_INI Initialize a controller
(18) 1657 MEMORY ALLOCATION SUBROUTINES
(19) 1699 ADPLINK Link adapter to end of ADP list
(19) 1733 Exe$PwrTimChk - Check reasonable interval since power recovery ;[14]

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element QIO.MAR
0000     2 ; *8    29-APR-1987 16:00:57 MARTIN "MODIFIED FOR PSTAR"
0000     3 ; *7    26-MAR-1987 14:19:23 MARTIN "REF TO PSTAR"
0000     4 ; *6    17-MAR-1987 10:46:56 MARTIN "FIX"
0000     5 ; *5    29-MAY-1986 08:31:14 MUSE "<no reason given>"
0000     6 ; *4    28-MAY-1986 13:34:19 MUSE "<no reason given>"
0000     7 ; *3    28-MAY-1986 12:38:03 MUSE "<no reason given>"
0000     8 ; *2    13-MAY-1986 14:02:43 SALEM "DONE"
0000     9 ; *1     6-FEB-1986 15:22:06 DS ""
0000    10 ; DEC/CMS REPLACEMENT HISTORY, Element QIO.MAR
0000    11         .TITLE  QIO
0000    12         .IDENT  /09-28/                                                    ;G:6
0000    13         .NoShow Conditionals
0000    14         .DSABL  GBL
0000    15
0000    16 ;
0000    17 ; Copyright (c) 1977, 1982, 1984,1985,1987                              ;G:6
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0000    34
0000    35 ;++
0000    36 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR.
0000    37 ;
0000    38 ; ABSTRACT:
0000    39 ;
0000    40 ; ENVIRONMENT:
0000    41 ;
0000    42 ; AUTHOR:       KEN CHAPMAN     10-NOV-77       VERSION 01.
0000    43 ; MODIFIED BY:
0000    44 ;               N. HOWGATE      20-FEB-78       VERSION 02 (ESSAA-4.00).
0000    45 ;       01      QIO SUPPORT
0000    46 ;               TOM SOUTTER     22-FEB-78
0000    47 ;       02      ADDED CALL TO VMS/QIO HANDLER
0000    48 ;               R. RIGGS        1-OCT-78        VERSION 3 (ESSAA-5.00)
0000    49 ;       03      INCLUDED QIO DATABASE INITIALIZATION ROUTINES
0000    50 ;               N.Howgate       26-Jun-79       Version 4 (ESSAA-5.01)
0000    51 ;       04      Add support for 11/750
0000    52 ;               Roger Riggs     03-NOV-1979
0000    53 ;       05      Added code to load drivers if not found in
0000    54 ;               IOC$GL_DPTLIST
0000    55 ;       06      Added fudge to generate 2 vectors for LPA11K
0000    56 ;               Roger Riggs, 5-Feb-1980, Version 5.2
0000    57 ;       07      Revamped setup of ACF block, Added code to maintain reference
```

```
0000     58 ;              count in DPT headers, added code to handle headers on drivers
0000     59 ;              header contains the number of vectors for unibus  devices
0000     60 ;              Removes need for fudge in edit 06.
0000     61 ;--
0000     62 ;
0000     63 ;        08    John Ciukaj     5-May-80        Version 5.4
0000     64 ;
0000     65 ;                Added Dummy return for QIO related calls
0000     66 ;
0000     67 ;              Dave Butenhof   18-jun-1980,    version 5.5
0000     68 ;        09    Remove all dummy returns from this module, and move to
0000     69 ;              new module VMSDUMMY.
0000     70 ;              Roger Riggs, 10-Aug-1980
0000     71 ;        10    Use QIO driver prefix from controller instead of device
0000     72 ;              this allows for terminals to be connected to more than
0000     73 ;              one type of Async controller.  The first prefix
0000     74 ;              encountered while linking back through the P-tables is
0000     75 ;              used.
0000     76 ;
0000     77 ;        11    - Jack Stansbury, 22-Oct-1981, Version 6.-
0000     78 ;              Fixed truncation errors. Also added .LIBRARY statements
0000     79 ;              for $DS and $DIAG. Also changed .PSECT SEP to WORK, CODE,
0000     80 ;              and DATA where appropriate.
0000     81 ;
0000     82 ;        12    - Jack Stansbury, 12-Nov-1981, Version 6.-
0000     83 ;              Changed the HALTD to HALT.
0000     84 ;
0000     85 ;        13    Marion Baggett, 9-Apr-1982, Version 6.7
0000     86 ;              Added .NoShow Conditionals after .IDENT statement.
0000     87 ;
0000     88 ;        14    Jack Stansbury, July 1, 1982, Version 6.8
0000     89 ;              Added the 'real' Exe$PwrTimChk routine.
0000     90 ;
0000     91 ;        15    Marion Baggett, 24-Sept-1982, Version 6.9
0000     92 ;              Changed the CASE instruction since WRITEVBLK and READVBLK
0000     93 ;              are to far away and a JMP was need.
0000     94 ;
0000     95 ;        16    Richard E. Muse, 9 January, 1984, Version 6.14
0000     96 ;              Added $PRDEF macro definition - VMS Version 4 change.
0000     97 ;
0000     98 ;        17    Domenic Andella, 9-Apr-1984, Version 6.14
0000     99 ;              Added code in FILL_ACF to handle case where
0000    100 ;              an SBIA is attached, and it is necessary to
0000    101 ;              'backtrack' another level.
0000    102 ;
0000    103 ;        18    Bob Bergazzi    24-Apr-1984     Version 7.0
0000    104 ;                      - Changed FILL_ACF to set up R3 with the CSR
0000    105 ;                        address for the subsequent call to FIND_ADP.
0000    106 ;                      - Changed FIND_ADP routine to compare ADP$L_CSR
0000    107 ;                        instead of ADP$W_TR. This accomodates the VENUS
0000    108 ;                        cpu with multiple SBIs.
0000    109 ;                      - Changed INI_DRADP to add 100 or 300 to SCB_BASE
0000    110 ;                        depending on which SBI the adapter is connected to.
0000    111 ;                      - Removed UBINT... code from INI_UBADP since it
0000    112 ;                        only needs the size of that code (UBINTSZ), which
0000    113 ;                        is defined in ONLY8600.
0000    114 ;
```

```
0000    115 ;       19      Ron Parker      1-NOV-1984
0000    116 ;               - Fixed truncation errors
0000    117 ;
0000    118 ;       20      Bob Bergazzi    Nov. 26, 1984   Version 8.0
0000    119 ;               Added DWBUA to list of known adapter types.
0000    120 ;
0000    121 ;       21      Ted Salem       Feb. 6, 1985    Version 8.1
0000    122 ;               Added code to in order to read and write
0000    123 ;               accross the NI.
0000    124 ;
0000    125 ;       22      Ted Salem       March 19, 1985  Version 8.2
0000    126 ;               Changed EXE$QIO to do a proper return to MP$INTERLOCK.
0000    127 ;
0000    128 ;       24      R.E.Muse        17 June 1985
0000    129 ;               added code to read the nautilus TODR register
0000    130 ;
0000    131 ;       25      J. Baranski     28-Jan-1986
0000    132 ;               Added .EXTERN DS$GK_SID to fix undefined DS$GK_SID.
0000    133 ;                                                                       ;G:2
0000    134 ;       26      Ted Salem       15-May-1986                             ;G:2
0000    135 ;               Made change #18 to be defined as weak                   ;G:2
0000    136 ;                                                                       ;G:4
0000    137 ;       27      Richard E. Muse 28-May-1986                             ;G:4
0000    138 ;               fixed call to ds$load. use dummy buf addr to fool       ;G:4
0000    139 ;               error checking in ds$load so we can get file size.      ;G:4
0000    140 ;                                                                       ;G:6
0000    141 ;       28      Ingrid Martin   13-Mar-1987                             ;G:6
0000    142 ;               Added code so that RRR can read the TODR the same       ;G:7
0000    143 ;               way as Nautilus.                                        ;G:6
0000    144 ;-
```

```
                        0000    146          .Sbttl  Libraries and Equated Symbols
                        0000    147
                        0000    148 ;
                        0000    149 ; INCLUDE FILES:
                        0000    150 ;
                        0000    151          .Library        /SYS$LIBRARY:LIB/
                        0000    152          .LIBRARY        /$DS/                   ;                               [11]
                        0000    153          .LIBRARY        /$DIAG/                 ;                               [11]
                        0000    154
                        0000    155 ;
                        0000    156 ; MACROS:
                        0000    157 ;
                        0000    158          .MACRO  $PRDEF,$GBL                             ; [16]
                        0000    159
                        0000    160
                        0000    161          $DEFINI PR,$GBL
                        0000    162
                        0000    163
                        0000    164  $EQU    PR$_KSP 0
                        0000    165  $EQU    PR$_ESP 1
                        0000    166  $EQU    PR$_SSP 2
                        0000    167  $EQU    PR$_USP 3
                        0000    168  $EQU    PR$_ISP 4
                        0000    169  $EQU    PR$_P0BR        8
                        0000    170  $EQU    PR$_P0LR        9
                        0000    171  $EQU    PR$_P1BR        10
                        0000    172  $EQU    PR$_P1LR        11
                        0000    173  $EQU    PR$_SBR 12
                        0000    174  $EQU    PR$_SLR 13
                        0000    175  $EQU    PR$_PCBB        16
                        0000    176  $EQU    PR$_SCBB        17
                        0000    177  $EQU    PR$_IPL 18
                        0000    178  $EQU    PR$_ASTLVL      19
                        0000    179  $EQU    PR$_SIRR        20
                        0000    180  $EQU    PR$_SISR        21
                        0000    181  $EQU    PR$_ICCS        24
                        0000    182  $EQU    PR$_NICR        25
                        0000    183  $EQU    PR$_ICR 26
                        0000    184  $EQU    PR$_TODR        27
                        0000    185  $EQU    PR$_RXCS        32
                        0000    186  $EQU    PR$_RXDB        33
                        0000    187  $EQU    PR$_TXCS        34
                        0000    188  $EQU    PR$_TXDB        35
                        0000    189  $EQU    PR$_ACCS        40
                        0000    190  $EQU    PR$_ACCR        41
                        0000    191  $EQU    PR$_MAPEN       56
                        0000    192  $EQU    PR$_TBIA        57
                        0000    193  $EQU    PR$_TBIS        58
                        0000    194  $EQU    PR$_PME 61
                        0000    195  $EQU    PR$_SID 62
                        0000    196  $EQU    PR$_TBCHK       63
                        0000    197  $EQU    PR$V_SID_SN     0
                        0000    198  $EQU    PR$S_SID_SN     12
                        0000    199  $EQU    PR$V_SID_PL     12
                        0000    200  $EQU    PR$S_SID_PL     3
                        0000    201  $EQU    PR$V_SID_ECO    15
                        0000    202  $EQU    PR$S_SID_ECO    9
```

```
                     0000   203  $EQU    PR$V_SID_TYPE   24
                     0000   204  $EQU    PR$S_SID_TYPE   8
                     0000   205  $EQU    PR$_SID_TYP780  1
                     0000   206  $EQU    PR$_SID_TYP750  2
                     0000   207  $EQU    PR$_SID_TYP730  3
                     0000   208  $EQU    PR$_SID_TYP7VV  4
                     0000   209  $EQU    PR$_SID_TYPMAX  4
                     0000   210  $EQU    PR$_WCSA        44
                     0000   211  $EQU    PR$_WCSD        45
                     0000   212  $EQU    PR$_SBIFS       48
                     0000   213  $EQU    PR$_SBIS        49
                     0000   214  $EQU    PR$_SBISC       50
                     0000   215  $EQU    PR$_SBIMT       51
                     0000   216  $EQU    PR$_SBIER       52
                     0000   217  $EQU    PR$_SBITA       53
                     0000   218  $EQU    PR$_SBIQC       54
                     0000   219  $EQU    PR$_CMIERR      23
                     0000   220  $EQU    PR$_CSRS        28
                     0000   221  $EQU    PR$_CSRD        29
                     0000   222  $EQU    PR$_CSTS        30
                     0000   223  $EQU    PR$_CSTD        31
                     0000   224  $EQU    PR$_TBDR        36
                     0000   225  $EQU    PR$_CADR        37
                     0000   226  $EQU    PR$_MCESR       38
                     0000   227  $EQU    PR$_CAER        39
                     0000   228  $EQU    PR$_UBRESET     55
                     0000   229  $EQU    PR$_PAMACC      64
                     0000   230  $EQU    PR$_PAMLOC      65
                     0000   231  $EQU    PR$_CSWP        66
                     0000   232  $EQU    PR$_CRBT        67
                     0000   233  $EQU    PR$_MCTL1       68
                     0000   234  $EQU    PR$_MCTL2       69
                     0000   235  $EQU    PR$_MGEN        70
                     0000   236  $EQU    PR$_MTBER       71
                     0000   237  $EQU    PR$_MEAR        72
                     0000   238  $EQU    PR$_MDCR1       73
                     0000   239  $EQU    PR$_MEDR        74
                     0000   240  $EQU    PR$_MECCR       75
                     0000   241  $EQU    PR$_SID_TYP8NN  6                                       ;G:8
                     0000   242  $EQU    PR$_SID_TYP8RR  17      ; RRR sid type ^X11 [28]        ;G:8
                     0000   243          $DEFEND PR,$GBL,DEF
                     0000   244
                     0000   245          .ENDM   $PRDEF
                     0000   246          $PRDEF                          ; CALL PRDEF MACRO
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .RESTORE
                     0000   247
                     0000   248 ;
                     0000   249 ; EQUATED SYMBOLS:
                     0000   250 ;
0000000A             0000   251          LF = 10                         ; [21]
0000000D             0000   252          CR = 13                         ; [21]
00000002             0000   253          CRLF_LENGTH = 2                 ; [21]
                     0000   254
                     0000   255
                     0000   256          .NLIST  MEB
                     0000   257          $ACFDEF
```

```
                        0000            .SAVE   LOCAL_BLOCK
                        0000            .IIF    NB,ACF$L_ADAPTER,       ACF$L_ADAPTER:
                        0000                            .BLKL   1
                        0004            .IIF    NB,ACF$L_CONFIGREG,     ACF$L_CONFIGREG:
                        0004                            .BLKL   1
                        0008            .IIF    NB,ACF$W_AVECTOR,       ACF$W_AVECTOR:
                        0008                            .BLKW   1
                        000A            .IIF    NB,ACF$B_AUNIT, ACF$B_AUNIT:
                        000A                            .BLKB   1
                        000B            .IIF    NB,ACF$B_AFLAG, ACF$B_AFLAG:
                        000B                            .BLKB   1
                        000C            .IIF    NB,ACF$L_CONTRLREG,     ACF$L_CONTRLREG:
                        000C                            .BLKL   1
                        0010            .IIF    NB,ACF$W_CVECTOR,       ACF$W_CVECTOR:
                        0010                            .BLKW   1
                        0012            .IIF    NB,ACF$B_CUNIT, ACF$B_CUNIT:
                        0012                            .BLKB   1
                        0013            .IIF    NB,ACF$B_CNUMVEC,       ACF$B_CNUMVEC:
                        0013                            .BLKB   1
                        0014            .IIF    NB,ACF$L_DEVNAME,       ACF$L_DEVNAME:
                        0014                            .BLKL   1
                        0018            .IIF    NB,ACF$L_DRVNAME,       ACF$L_DRVNAME:
                        0018                            .BLKL   1
                        001C            .IIF    NB,ACF$W_MAXUNITS,      ACF$W_MAXUNITS:
                        001C                            .BLKW   1
                        001E                            .BLKW   1
                        0020            .IIF    NB,ACF$C_LENGTH,        ACF$C_LENGTH:
                        0020            .IIF    NB,ACF$K_LENGTH,        ACF$K_LENGTH:
                        0000            .RESTORE
                        0000    258     $ADPDEF
                        0000            .SAVE   LOCAL_BLOCK
                        0000            .PSECT  $ABS$,ABS
                        0020            .=0
                        0000            .IIF    NB,ADP$L_CSR,   ADP$L_CSR:
                        0000                            .BLKL   1
                        0004            .IIF    NB,ADP$L_LINK,  ADP$L_LINK:
                        0004                            .BLKL   1
                        0008            .IIF    NB,ADP$W_SIZE,  ADP$W_SIZE:
                        0008                            .BLKW   1
                        000A            .IIF    NB,ADP$B_TYPE,  ADP$B_TYPE:
                        000A                            .BLKB   1
                        000B            .IIF    NB,ADP$B_NUMBER,        ADP$B_NUMBER:
                        000B                            .BLKB   1
                        000C            .IIF    NB,ADP$W_TR,    ADP$W_TR:
                        000C                            .BLKW   1
                        000E            .IIF    NB,ADP$W_ADPTYPE,       ADP$W_ADPTYPE:
                        000E                            .BLKW   1
                        0010            .IIF    NB,ADP$L_VECTOR,        ADP$L_VECTOR:
                        0010            .IIF    NB,ADP$L_CRB,   ADP$L_CRB:
                        0010                            .BLKL   1
                        0014            .IIF    NB,ADP$C_MBAADPLEN,     ADP$C_MBAADPLEN:
                        0014            .IIF    NB,ADP$K_MBAADPLEN,     ADP$K_MBAADPLEN:
                        0014            .IIF    NB,ADP$C_DRADPLEN,      ADP$C_DRADPLEN:
                        0014            .IIF    NB,ADP$K_DRADPLEN,      ADP$K_DRADPLEN:
                        0014            .IIF    NB,ADP$L_DPQFL, ADP$L_DPQFL:
                        0014            .IIF    NB,ADP$L_PRQQFL,        ADP$L_PRQQFL:
                        0014                            .BLKL   1
```

```
                     0018                .IIF    NB,ADP$L_DPQBL, ADP$L_DPQBL:
                     0018                .IIF    NB,ADP$L_PRQQBL,        ADP$L_PRQQBL:
0000001C             0018                        .BLKL   1
                     001C                .IIF    NB,ADP$L_MRQFL, ADP$L_MRQFL:
                     001C                .IIF    NB,ADP$L_SHB,   ADP$L_SHB:
00000020             001C                        .BLKL   1
                     0020                .IIF    NB,ADP$L_MRQBL, ADP$L_MRQBL:
                     0020                .IIF    NB,ADP$B_PORT,  ADP$B_PORT:
00000021             0020                        .BLKB   1
00000024             0021                        .BLKB   3
                     0024                .IIF    NB,ADP$W_DPBITMAP,      ADP$W_DPBITMAP:
00000026             0024                        .BLKW   1
                     0026                .IIF    NB,ADP$W_MRBITMAP,      ADP$W_MRBITMAP:
00000064             0026                        .BLKW   31
                     0064                .IIF    NB,ADP$L_INTD,  ADP$L_INTD:
00000070             0064                        .BLKL   3
                     0070                .IIF    NB,ADP$C_MPMADPLEN,     ADP$C_MPMADPLEN:
                     0070                .IIF    NB,ADP$K_MPMADPLEN,     ADP$K_MPMADPLEN:
                     0070                .IIF    NB,ADP$C_UBAADPLEN,     ADP$C_UBAADPLEN:
                     0070                .IIF    NB,ADP$K_UBAADPLEN,     ADP$K_UBAADPLEN:
                     0000                .RESTORE
                     0000    259         $ALLOCDEF
                     0000    260         $CCBDEF
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
00000000             0070                .=0
                     0000                .IIF    NB,CCB$L_UCB,   CCB$L_UCB:
00000004             0000                        .BLKL   1
                     0004                .IIF    NB,CCB$L_WIND,  CCB$L_WIND:
00000008             0004                        .BLKL   1
                     0008                .IIF    NB,CCB$B_STS,   CCB$B_STS:
00000009             0008                        .BLKB   1
                     0009                .IIF    NB,CCB$B_AMOD,  CCB$B_AMOD:
0000000A             0009                        .BLKB   1
                     000A                .IIF    NB,CCB$W_IOC,   CCB$W_IOC:
0000000C             000A                        .BLKW   1
                     000C                .IIF    NB,CCB$L_DIRP,  CCB$L_DIRP:
00000010             000C                        .BLKL   1
                     0010                .IIF    NB,CCB$C_LENGTH,        CCB$C_LENGTH:
                     0010                .IIF    NB,CCB$K_LENGTH,        CCB$K_LENGTH:
                     0000                .RESTORE
                     0000    261         $CRBDEF
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
00000000             0070                .=0
                     0000                .IIF    NB,CRB$L_WQFL,  CRB$L_WQFL:
00000004             0000                        .BLKL   1
                     0004                .IIF    NB,CRB$L_WQBL,  CRB$L_WQBL:
00000008             0004                        .BLKL   1
                     0008                .IIF    NB,CRB$W_SIZE,  CRB$W_SIZE:
0000000A             0008                        .BLKW   1
                     000A                .IIF    NB,CRB$B_TYPE,  CRB$B_TYPE:
0000000B             000A                        .BLKB   1
0000000C             000B                        .BLKB   1
                     000C                .IIF    NB,CRB$W_REFC,  CRB$W_REFC:
0000000E             000C                        .BLKW   1
                     000E                .IIF    NB,CRB$B_MASK,  CRB$B_MASK:
```

```
                     0000000F  000E                              .BLKB   1
                     00000010  000F                              .BLKB   1
                               0010              .IIF    NB,CRB$L_LINK,  CRB$L_LINK:
                     00000014  0010                              .BLKL   1
                               0014              .IIF    NB,CRB$L_INTD,  CRB$L_INTD:
                     00000038  0014                              .BLKL   9
                               0038              .IIF    NB,CRB$C_LENGTH,        CRB$C_LENGTH:
                               0038              .IIF    NB,CRB$K_LENGTH,        CRB$K_LENGTH:
                               0038              .IIF    NB,CRB$L_INTD2, CRB$L_INTD2:
                     0000005C  0038                              .BLKL   9
                               0000              .RESTORE
                               0000    262       $DCDEF
                               0000              .SAVE   LOCAL_BLOCK
                               0000              .PSECT  $ABS$,ABS
                     00000000  0070              .=0
                               0000              .RESTORE
                               0000    263       $DDBDEF
                               0000              .SAVE   LOCAL_BLOCK
                               0000              .PSECT  $ABS$,ABS
                     00000000  0070              .=0
                               0000              .IIF    NB,DDB$L_LINK,  DDB$L_LINK:
                     00000004  0000                              .BLKL   1
                               0004              .IIF    NB,DDB$L_UCB,   DDB$L_UCB:
                     00000008  0004                              .BLKL   1
                               0008              .IIF    NB,DDB$W_SIZE,  DDB$W_SIZE:
                     0000000A  0008                              .BLKW   1
                               000A              .IIF    NB,DDB$B_TYPE,  DDB$B_TYPE:
                     0000000B  000A                              .BLKB   1
                     0000000C  000B                              .BLKB   1
                               000C              .IIF    NB,DDB$L_DDT,   DDB$L_DDT:
                     00000010  000C                              .BLKL   1
                               0010              .IIF    NB,DDB$L_ACPD,  DDB$L_ACPD:
                     00000013  0010                              .BLKB   3
                               0013              .IIF    NB,DDB$B_ACPCLASS,      DDB$B_ACPCLASS:
                     00000014  0013                              .BLKB   1
                               0014              .IIF    NB,DDB$T_NAME,  DDB$T_NAME:
                     00000015  0014                              .BLKB   1
                     00000024  0015                              .BLKB   15
                               0024              .IIF    NB,DDB$T_DRVNAME,       DDB$T_DRVNAME:
                     00000025  0024                              .BLKB   1
                     00000034  0025                              .BLKB   15
                               0034              .IIF    NB,DDB$C_LENGTH,        DDB$C_LENGTH:
                               0034              .IIF    NB,DDB$K_LENGTH,        DDB$K_LENGTH:
                               0000              .RESTORE
                               0000    264       $DDTDEF
                               0000              .SAVE   LOCAL_BLOCK
                               0000              .PSECT  $ABS$,ABS
                     00000000  0070              .=0
                               0000              .IIF    NB,DDT$L_START, DDT$L_START:
                     00000004  0000                              .BLKL   1
                               0004              .IIF    NB,DDT$L_UNSOLINT,      DDT$L_UNSOLINT:
                     00000008  0004                              .BLKL   1
                               0008              .IIF    NB,DDT$L_FDT,   DDT$L_FDT:
                     0000000C  0008                              .BLKL   1
                               000C              .IIF    NB,DDT$L_CANCEL,        DDT$L_CANCEL:
                     00000010  000C                              .BLKL   1
                               0010              .IIF    NB,DDT$L_REGDUMP,       DDT$L_REGDUMP:
```

```
00000014  0010                                  .BLKL   1
          0014                  .IIF    NB,DDT$W_DIAGBUF,       DDT$W_DIAGBUF:
00000016  0014                                  .BLKW   1
          0016                  .IIF    NB,DDT$W_ERRORBUF,      DDT$W_ERRORBUF:
00000018  0016                                  .BLKW   1
          0018                  .IIF    NB,DDT$L_UNITINIT,      DDT$L_UNITINIT:
0000001C  0018                                  .BLKL   1
          001C                  .IIF    NB,DDT$L_ALTSTART,      DDT$L_ALTSTART:
00000020  001C                                  .BLKL   1
          0000                  .RESTORE
          0000    265           $DPTDEF
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  0070                  .=0
          0000                  .IIF    NB,DPT$L_FLINK, DPT$L_FLINK:
00000004  0000                                  .BLKL   1
          0004                  .IIF    NB,DPT$L_BLINK, DPT$L_BLINK:
00000008  0004                                  .BLKL   1
          0008                  .IIF    NB,DPT$W_SIZE,  DPT$W_SIZE:
0000000A  0008                                  .BLKW   1
          000A                  .IIF    NB,DPT$B_TYPE,  DPT$B_TYPE:
0000000B  000A                                  .BLKB   1
          000B                  .IIF    NB,DPT$B_REFC,  DPT$B_REFC:
0000000C  000B                                  .BLKB   1
          000C                  .IIF    NB,DPT$B_ADPTYPE,       DPT$B_ADPTYPE:
0000000D  000C                                  .BLKB   1
          000D                  .IIF    NB,DPT$B_FLAGS, DPT$B_FLAGS:
0000000E  000D                                  .BLKB   1
          000E                  .IIF    NB,DPT$W_UCBSIZE,       DPT$W_UCBSIZE:
00000010  000E                                  .BLKW   1
          0010                  .IIF    NB,DPT$W_INITTAB,       DPT$W_INITTAB:
00000012  0010                                  .BLKW   1
          0012                  .IIF    NB,DPT$W_REINITTAB,     DPT$W_REINITTAB:
00000014  0012                                  .BLKW   1
          0014                  .IIF    NB,DPT$W_UNLOAD,        DPT$W_UNLOAD:
00000016  0014                                  .BLKW   1
          0016                  .IIF    NB,DPT$W_MAXUNITS,      DPT$W_MAXUNITS:
00000018  0016                                  .BLKW   1
          0018                  .IIF    NB,DPT$W_VERSION,       DPT$W_VERSION:
0000001A  0018                                  .BLKW   1
0000001E  001A                                  .BLKL   1
          001E                  .IIF    NB,DPT$T_NAME,  DPT$T_NAME:
0000002A  001E                                  .BLKB   12
          002A                  .IIF    NB,DPT$C_LENGTH,        DPT$C_LENGTH:
          002A                  .IIF    NB,DPT$K_LENGTH,        DPT$K_LENGTH:
          0000                  .RESTORE
          0000    266           $DYNDEF GLOBAL
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  0070                  .=0
          0000                  .RESTORE
          0000    267           $IDBDEF
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  0070                  .=0
          0000                  .IIF    NB,IDB$L_CSR,   IDB$L_CSR:
00000004  0000                                  .BLKL   1
```

```
                        0004                .IIF    NB,IDB$L_OWNER, IDB$L_OWNER:
                        0004                        .BLKL   1
                        0008                .IIF    NB,IDB$W_SIZE,  IDB$W_SIZE:
                        0008                        .BLKW   1
                        000A                .IIF    NB,IDB$B_TYPE,  IDB$B_TYPE:
                        000A                        .BLKB   1
                        000B                        .BLKB   1
                        000C                .IIF    NB,IDB$W_UNITS, IDB$W_UNITS:
                        000C                        .BLKW   1
                        000E                        .BLKW   1
                        0010                .IIF    NB,IDB$L_ADP,   IDB$L_ADP:
                        0010                        .BLKL   1
                        0014                .IIF    NB,IDB$L_UCBLST,        IDB$L_UCBLST:
                        0014                        .BLKL   8
                        0034                .IIF    NB,IDB$C_LENGTH,        IDB$C_LENGTH:
                        0034                .IIF    NB,IDB$K_LENGTH,        IDB$K_LENGTH:
                        0000                .RESTORE
                        0000    268         $IODEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                        0070                .=0
                        0000                .RESTORE
                        0000    269         $PRDEF
                        0000    270         $PSLDEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                        0070                .=0
                        0000                .RESTORE
                        0000    271         $QIODEF
                        0000    272         $SYSGMSGDEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                        0070                .=0
                        0000                .RESTORE
                        0000    273         $UBADEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                        0070                .=0
                        0000                .RESTORE
                        0000    274         $UCBDEF
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                        0070                .=0
                        0000                .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                        0000                .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
                        0000                        .BLKL   1
                        0004                .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                        0004                .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
                        0004                        .BLKL   1
                        0008                .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
                        0008                        .BLKW   1
                        000A                .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
                        000A                        .BLKB   1
                        000B                .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
                        000B                        .BLKB   1
                        000C                .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                        000C                .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
```

```
                    000C                .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
0000000D            000C                        .BLKB   1
00000010            000D                        .BLKB   3
                    0010                .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                    0010                .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
00000014            0010                        .BLKL   1
                    0014                .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                    0014                .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                    0014                .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
00000016            0014                        .BLKW   1
                    0016                .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
00000018            0016                        .BLKW   1
                    0018                .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                    0018                .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
0000001A            0018                        .BLKW   1
                    001A                .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                    001A                .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
0000001C            001A                        .BLKW   1
                    001C                .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
00000020            001C                        .BLKL   1
                    0020                .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
00000024            0020                        .BLKL   1
                    0024                .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
00000028            0024                        .BLKL   1
                    0028                .IIF    NB,UCB$L_PID,   UCB$L_PID:
0000002C            0028                        .BLKL   1
                    002C                .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
00000030            002C                        .BLKL   1
                    0030                .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
00000034            0030                        .BLKL   1
                    0034                .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
00000038            0034                        .BLKL   1
                    0038                .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
00000039            0038                        .BLKB   1
                    0039                .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
0000003A            0039                        .BLKB   1
                    003A                .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
0000003C            003A                        .BLKW   1
                    003C                .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
                    003C                .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
                    003C                .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
0000003D            003C                        .BLKB   1
                    003D                .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
                    003D                .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
0000003E            003D                        .BLKB   1
                    003E                .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
                    003E                .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
0000003F            003E                        .BLKB   1
                    003F                .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
00000040            003F                        .BLKB   1
                    0040                .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
00000044            0040                        .BLKL   1
                    0044                .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
00000048            0044                        .BLKL   1
                    0048                .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
0000004A            0048                        .BLKW   1
                    004A                .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
```

```
                        004A            .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
0000004B  004A                                  .BLKB   1
                        004B            .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
0000004C  004B                                  .BLKB   1
                        004C            .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
00000050  004C                                  .BLKL   1
                        0050            .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
00000052  0050                                  .BLKW   1
                        0052            .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
                        0052            .IIF    NB,UCB$B_STATE, UCB$B_STATE:
00000053  0052                                  .BLKB   1
                        0053            .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
00000054  0053                                  .BLKB   1
                        0054            .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
00000058  0054                                  .BLKL   1
                        0058            .IIF    NB,UCB$W_STS,   UCB$W_STS:
0000005A  0058                                  .BLKW   1
                        005A            .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
0000005C  005A                                  .BLKW   1
                        005C            .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
                        005C            .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
00000060  005C                                  .BLKL   1
                        0060            .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
00000064  0060                                  .BLKL   1
                        0064            .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
                        0064            .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
00000068  0064                                  .BLKL   1
                        0068            .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
0000006C  0068                                  .BLKL   1
                        006C            .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
0000006E  006C                                  .BLKW   1
                        006E            .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
00000070  006E                                  .BLKW   1
                        0070            .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
00000071  0070                                  .BLKB   1
                        0071            .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
00000072  0071                                  .BLKB   1
                        0072            .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074  0072                                  .BLKW   1
                        0074            .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
                        0074            .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000  0074          . = 0
                        0000            .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002  0000                                  .BLKW   1
00000074  0002          . = 116
                        0074            .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078  0074                                  .BLKL   1
                        0078            .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C  0078                                  .BLKL   1
                        007C            .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080  007C                                  .BLKL   1
                        0080            .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084  0080                                  .BLKL   1
                        0084            .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088  0084                                  .BLKL   1
                        0088            .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C  0088                                  .BLKL   1
```

```
                     008C                .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090             008C                        .BLKL   1
                     0090                .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
                     0090                .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074             0090                . = 116
                     0074                .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075             0074                        .BLKB   1
                     0075                .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076             0075                        .BLKB   1
                     0076                .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077             0076                        .BLKB   1
                     0077                .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078             0077                        .BLKB   1
                     0078                .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C             0078                        .BLKL   1
0000007E             007C                        .BLKW   1
                     007E                .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080             007E                        .BLKW   1
                     0080                .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084             0080                        .BLKL   1
00000080             0084                . = 128
00000084             0080                        .BLKL   1
                     0084                .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088             0084                        .BLKL   1
                     0088                .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A             0088                        .BLKW   1
                     008A                .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C             008A                        .BLKW   1
                     008C                .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
                     008C                .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E             008C                        .BLKW   1
                     008E                .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090             008E                        .BLKW   1
                     0090                .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092             0090                        .BLKW   1
                     0092                .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
00000094             0092                        .BLKW   1
                     0094                .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095             0094                        .BLKB   1
                     0095                .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096             0095                        .BLKB   1
                     0096                .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098             0096                        .BLKW   1
00000096             0098                . = 150
00000098             0096                        .BLKW   1
                     0098                .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C             0098                        .BLKL   1
                     009C                .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0             009C                        .BLKL   1
                     00A0                .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
000000A4             00A0                        .BLKL   1
                     00A4                .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
000000A6             00A4                        .BLKW   1
                     00A6                .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
000000A7             00A6                        .BLKB   1
000000A8             00A7                        .BLKB   1
00000074             00A8                . = 116
```

```
                00000078  0074                          .BLKL   1
                0000007C  0078                          .BLKL   1
                00000080  007C                          .BLKL   1
                00000084  0080                          .BLKL   1
                00000088  0084                          .BLKL   1
                0000008C  0088                          .BLKL   1
                          008C              .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
                00000090  008C                          .BLKL   1
                00000094  0090                          .BLKL   1
                00000098  0094                          .BLKL   1
                0000009C  0098                          .BLKL   1
                          009C              .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
                0000009D  009C                          .BLKB   1
                          009D              .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
                0000009E  009D                          .BLKB   1
                          009E              .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
                0000009F  009E                          .BLKB   1
                000000A0  009F                          .BLKB   1
                          00A0              .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
                000000A1  00A0                          .BLKB   1
                          00A1              .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
                000000A2  00A1                          .BLKB   1
                          00A2              .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
                000000A3  00A2                          .BLKB   1
                000000A4  00A3                          .BLKB   1
                          00A4              .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
                000000A5  00A4                          .BLKB   1
                          00A5              .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
                000000A7  00A5                          .BLKW   1
                000000A8  00A7                          .BLKB   1
                          00A8              .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
                000000AC  00A8                          .BLKL   1
                000000B0  00AC                          .BLKL   1
                000000B4  00B0                          .BLKL   1
                000000B8  00B4                          .BLKL   1
                          00B8              .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
                000000BC  00B8                          .BLKL   1
                          00BC              .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
                          00BC              .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
                00000074  00BC              . = 116
                          0074              .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
                00000078  0074                          .BLKL   1
                          0078              .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
                0000007C  0078                          .BLKL   1
                          007C              .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
                0000007E  007C                          .BLKW   1
                00000080  007E                          .BLKW   1
                          0000              .RESTORE
                          0000    275       $VECDEF
                          0000              .SAVE   LOCAL_BLOCK
                          0000              .PSECT  $ABS$,ABS
                00000000  00BC              .=0
                          0000              .IIF    NB,VEC$Q_DISPATCH,      VEC$Q_DISPATCH:
                00000008  0000                          .BLKQ   1
                          0008              .IIF    NB,VEC$L_IDB,   VEC$L_IDB:
                0000000C  0008                          .BLKL   1
                          000C              .IIF    NB,VEC$L_INITIAL,       VEC$L_INITIAL:
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00000010  000C                                  .BLKL   1
          0010                  .IIF    NB,VEC$W_MAPREG,        VEC$W_MAPREG:
00000012  0010                                  .BLKW   1
          0012                  .IIF    NB,VEC$B_NUMREG,        VEC$B_NUMREG:
00000013  0012                                  .BLKB   1
          0013                  .IIF    NB,VEC$B_DATAPATH,      VEC$B_DATAPATH:
00000014  0013                                  .BLKB   1
          0014                  .IIF    NB,VEC$L_ADP,   VEC$L_ADP:
00000018  0014                                  .BLKL   1
          0018                  .IIF    NB,VEC$L_UNITINIT,      VEC$L_UNITINIT:
0000001C  0018                                  .BLKL   1
          001C                  .IIF    NB,VEC$L_START, VEC$L_START:
00000020  001C                                  .BLKL   1
          0020                  .IIF    NB,VEC$L_UNITDISC,      VEC$L_UNITDISC:
00000024  0020                                  .BLKL   1
          0024                  .IIF    NB,VEC$C_LENGTH,        VEC$C_LENGTH:
          0024                  .IIF    NB,VEC$K_LENGTH,        VEC$K_LENGTH:
          0000                  .RESTORE
          0000    276           $DS_TYPEDEF
          0000    277           CMKDEF
          0000    278
          0000    279           $DS_QIODVR_DEF                  ; Offsets in driver header
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  00BC                  .=0
00000008  0000                  .IIF    NB,.BLKQ,       .BLKQ   1
          0008                  .IIF    NB,DVR$W_SIZE,  DVR$W_SIZE:
0000000A  0008                  .IIF    NB,.BLKW,       .BLKW   1
          000A                  .IIF    NB,DVR$B_TYPE,  DVR$B_TYPE:
0000000B  000A                  .IIF    NB,.BLKB,       .BLKB   1
          000B                  .IIF    NB,DVR$B_CNUMVEC,       DVR$B_CNUMVEC:
0000000C  000B                  .IIF    NB,.BLKB,       .BLKB   1
          000C                  .IIF    NB,DVR$W_GENERIC,       DVR$W_GENERIC:
0000000E  000C                  .IIF    NB,.BLKW,       .BLKW   1
          000E                  .IIF    NB,DVR$W_DPT,   DVR$W_DPT:
00000010  000E                  .IIF    NB,.BLKW,       .BLKW   1
          0010                  .IIF    NB,DVR$L_IDENT, DVR$L_IDENT:
00000014  0010                  .IIF    NB,.BLKL,       .BLKL   1
          0014                  .IIF    NB,DVR$C_LEN,   DVR$C_LEN:
          0000                  .RESTORE
          0000    280           $DS_HPODEF
          0000                  .SAVE   LOCAL_BLOCK
          0000                  .PSECT  $ABS$,ABS
00000000  00BC                  .=0
          0000                  .IIF    NB,HP$Q_DEVICE, HP$Q_DEVICE:
00000008  0000                  .IIF    NB,.BLKQ,       .BLKQ   1
          0008                  .IIF    NB,HP$W_SIZE,   HP$W_SIZE:
0000000A  0008                  .IIF    NB,.BLKW,       .BLKW   1
          000A                  .IIF    NB,HP$B_FLAGS,  HP$B_FLAGS:
0000000B  000A                  .IIF    NB,.BLKB,       .BLKB   1
          000B                  .IIF    NB,HP$B_DRIVE,  HP$B_DRIVE:
0000000C  000B                  .IIF    NB,.BLKB,       .BLKB   1
          000C                  .IIF    NB,HP$T_DEVICE, HP$T_DEVICE:
00000018  000C                  .IIF    NB,.BLKB,       .BLKB   12
          0018                  .IIF    NB,HP$A_DEVICE, HP$A_DEVICE:
0000001C  0018                  .IIF    NB,.BLKL,       .BLKL   1
          001C                  .IIF    NB,HP$A_DVA,    HP$A_DVA:
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                00000020  001C                .IIF    NB,.BLKL,       .BLKL   1
                          0020                .IIF    NB,HP$A_LINK,   HP$A_LINK:
                00000024  0020                .IIF    NB,.BLKL,       .BLKL   1
                          0024                .IIF    NB,HP$W_VECTOR, HP$W_VECTOR:
                00000026  0024                .IIF    NB,.BLKW,       .BLKW   1
                          0026                .IIF    NB,HP$T_TYPE,   HP$T_TYPE:
                00000032  0026                .IIF    NB,.BLKB,       .BLKB   12
                          0032                .IIF    NB,HP$A_DEPENDENT,      HP$A_DEPENDENT:
                          0000                .RESTORE
                          0000    281         $DS_RH780_DEF
                          0000                .SAVE   LOCAL_BLOCK
                          0000                .PSECT  $ABS$,ABS
                00000032  00BC                .=HP$A_DEPENDENT
                          0032                .IIF    NB,HP$B_RH780_TR,       HP$B_RH780_TR:
                          0032                .IIF    NB,RH780$B_TR,  RH780$B_TR:
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,HP$B_RH780_BR,       HP$B_RH780_BR:
                          0033                .IIF    NB,RH780$B_BR,  RH780$B_BR:
                00000034  0033                .IIF    NB,.BLKB,       .BLKB   1
                          0034                .IIF    NB,HP$K_RH780_LEN,      HP$K_RH780_LEN:
                          0034                .IIF    NB,RH780$K_LEN, RH780$K_LEN:
                          0000                .RESTORE
                          0000    282         $DS_DW780_DEF
                          0000                .SAVE   LOCAL_BLOCK
                          0000                .PSECT  $ABS$,ABS
                00000032  00BC                .=HP$A_DEPENDENT
                          0032                .IIF    NB,DW780$B_TR,  DW780$B_TR:
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,DW780$B_BR,  DW780$B_BR:
                00000034  0033                .IIF    NB,.BLKB,       .BLKB   1
                          0034                .IIF    NB,DW780$K_LEN, DW780$K_LEN:
                          0000                .RESTORE
                          0000    283         $DS_DR780_DEF
                          0000                .SAVE   LOCAL_BLOCK
                          0000                .PSECT  $ABS$,ABS
                00000032  00BC                .=HP$A_DEPENDENT
                          0032                .IIF    NB,DR780$B_TR,  DR780$B_TR:
                00000033  0032                .IIF    NB,.BLKB,       .BLKB   1
                          0033                .IIF    NB,DR780$B_BR,  DR780$B_BR:
                00000034  0033                .IIF    NB,.BLKB,       .BLKB   1
                          0034                .IIF    NB,DR780$B_SELF,        DR780$B_SELF:
                00000035  0034                .IIF    NB,.BLKB,       .BLKB   1
                          0035                .IIF    NB,DR780$B_CONFIG,      DR780$B_CONFIG:
                00000036  0035                .IIF    NB,.BLKB,       .BLKB   1
                          0036                .IIF    NB,DR780$B_UUT, DR780$B_UUT:
                00000037  0036                .IIF    NB,.BLKB,       .BLKB   1
                          0037                .IIF    NB,DR780$K_LEN, DR780$K_LEN:
                          0000                .RESTORE
                          0000    284         $DS_SCBDEF
                          0000    285         $DS_LOAD_DEF
                          0000    286         $DS_DW750_DEF
                          0000                .SAVE   LOCAL_BLOCK
                          0000                .PSECT  $ABS$,ABS
                00000032  0200                .=HP$A_DEPENDENT
                          0032                .IIF    NB,DW750$K_LEN, DW750$K_LEN:
                          0000                .RESTORE
                          0000    287         $DS_DSDEF
```

```
                                0000   288          $DS_DSADEF
                                0000   289
                                0000   290          DSFDEF
                                0000   291
                                0000   292          .LIST MEB
```

```
                                0000   294          .Subtitle       External Symbols
                                0000   295
                                0000   296          .EXTRN  DS$BREAK
                                0000   297          .EXTRN  IOC$GL_ADPLIST, IOC$GL_DEVLIST, IOC$GL_DPTLIST
                                0000   298          .EXTRN  EXE$ALONONPAGED,EXE$DEANONPAGED
                                0000   299          .EXTRN  IO$TESTCSR_L,   IO$TESTCSR_W
                                0000   300          .EXTRN  DSX$PRINT,      DS_ERRSUP,      DS$GPHARD
                                0000   301          .EXTRN  DS$LOAD,        DSR$COMPLETION
                                0000   302          .EXTRN  MBA$INITIAL,    MBA$INT,        UBA$UNEXINT
                                0000   303          .EXTRN  DR$INITIAL,     DR$INT
                                0000   304          .EXTRN  SCB_BASE,       SCB_IMAGE,      UBADP_CPU
                                0000   305          .EXTRN  DS$K_CCB,       VMS$QIO,        IOGEN$CONN_VEC
                                0000   306          .EXTRN  WRITEVBLK,      READVBLK,       PREADVBLK
                                0000   307          .EXTRN  SS$_INSFMEM,    SS$_NORMAL,     SS$_IVCHAN
                                0000   308          .EXTRN  IOC$INITDRV,    SCAN$SEARCHLIST,SCAN$ALPHA
                                0000   309          .EXTRN  IOC$IOPOST,     EXE$FORKDSPTH,  IOC$REINITDRV
                                0000   310          .EXTRN  LOC$PTDESC,     QIOCLEAN_CPU
                                0000   311          .EXTRN  IOC$RTN
                                0000   312          .EXTRN  DS$GL_FLAGS,    DS$GK_SID                                       ;[21][25]
                                0000   313          .EXTRN  REMOTE_NODE_CONTROL_LEVEL, SEND_CONSOLE_RESPONSE        ;[21]
                                0000   314
                                0000   315 ;
                                0000   316 ;       Weak symbols
                                0000   317
                                0000   318          .WEAK   TODR_BYTE_CNT,  CONSOLEAAA_FLAGS, TODR_STORE, DS$M_TODR_ACTIVE
                                0000   319          .WEAK   REMOTE_NODE_CONTROL_LEVEL, SEND_CONSOLE_RESPONSE        ;[21]
                                0000   320          .WEAK   UBA$INITIAL,    UBINTSZ                         ;[18][26]     ;G:2
                                0000   321          .WEAK   TXCS$V_RDY
```

```
                                00000000   323          .PSECT  Data, NoExe, Shr, NoWrt, Long   ;                                [11]
                                    0000   324
                                    0000   325          MODNAM  QIO
                         4F 49 51 00'       0000      $MODULE:          .ASCIC  \QIO\
                                    03      0000
                                    0004   326
                                    0004   327 EXE$GL_PWRDONE::                          ; End time for power up interval        [14]
                         00000000           0004   328          .LONG   0                ; Done now                              [14]
                                    0008   329
                                    0008   330 AUNKFUNC:
20 6E 77 6F 6E 6B 6E 55 20 3F 3F 00'        0008   331          .ASCIC  \?? Unknown QIO function or channel number zero.\
6E 6F 69 74 63 6E 75 66 20 4F 49 51         0014
20 6C 65 6E 6E 61 68 63 20 72 6F 20         0020
2E 6F 72 65 7A 20 72 65 62 6D 75 6E         002C
                                  2F        0008
                                    0038   332
                                    0038   333          .ALIGN  LONG
                                    0038   334 CTL$GW_NMIOCH::          ; NUMBER OF CHANNELS
                               FFFF'        0038   335          .WORD   DS$K_CCB - 1
                                    003A   336
                                    003A   337 CTL$GW_CHINDX::          ; MAXIMUM CHANNEL INDEX + 1
                               0000'        003A   338          .WORD   DS$K_CCB @ 4
                                    003C   339
                                    003C   340 MBINT_DISP:                              ;INTERRUPT DISPATCHER MODEL
                            3C      BB      003C   341          PUSHR   #^M<R2,R3,R4,R5>
                   00000000 9F      16      003E   342          JSB     @#0
                                    0044   343
                                    0044   344 UBINT_DISP::
                            3F      BB      0044   345          PUSHR   #^M<R0,R1,R2,R3,R4,R5>
                                    0046   346
                                    0046   347 T_NODRIVER:
21 20 52 45 56 49 52 44 20 3F 3F 00'        0046   348          .ASCIC  "?? DRIVER !AS NOT FOUND FOR !AS!/"
44 4E 55 4F 46 20 54 4F 4E 20 53 41         0052
       2F 21 53 41 21 20 52 4F 46 20        005E
                                  21        0046
                                    0068   349
                                    0068   350 T_WRONGVER:
49 4D 20 54 4E 45 44 49 20 3F 3F 00'        0068   351          .ASCIC  "?? IDENT MISMATCH, !AS=!UW, SUPERVISOR=!UW!/"
3D 53 41 21 20 2C 48 43 54 41 4D 53         0074
49 56 52 45 50 55 53 20 2C 57 55 21         0080
          2F 21 57 55 21 3D 52 4F 53        008C
                                  2C        0068
                                    0095   352
                                    0095   353 T_INVADP:
49 20 53 49 20 43 41 21 20 3F 3F 00'        0095   354          .ASCIC  "?? !AC IS INCORRECT ADAPTER TYPE FOR !AS!/"
41 44 41 20 54 43 45 52 52 4F 43 4E         00A1
4F 46 20 45 50 59 54 20 52 45 54 50         00AD
                2F 21 53 41 21 20 52        00B9
                                  2A        0095
                                    00C0   355
                                    00C0   356
                                    00C0   357 T_CRLF:
                               0A 0D        00C0   358          .ASCII  <CR><LF>         ;       [21]
                                    00C2   359 ;
                                    00C2   360 ; Table to convert adapter name to adapter type, Parallel to T_KNOWN_DEV
                                    00C2   361 ;
                                    00C2   362 T_ADAPTER_TYPE:
```

```
                    01  00C2   363          .BYTE   AT$_UBA                 ; DW780
                    00  00C3   364          .BYTE   AT$_MBA                 ; RH780
                    01  00C4   365          .BYTE   AT$_UBA                 ; DW750
                    00  00C5   366          .BYTE   AT$_MBA                 ; RH750
                    01  00C6   367          .BYTE   AT$_UBA                 ; DW730
                    02  00C7   368          .BYTE   AT$_DR                  ; RH780
                    01  00C8   369          .BYTE   AT$_UBA                 ; DWBUA                         [20]
                        00C9   370
                        00C9   371 T_KNOWN_DEV:
                0007'   00C9   372          .WORD   $_KNOWN
                000E'   00CB   373          .WORD   10$-.
                0012'   00CD   374          .WORD   20$-.
                0016'   00CF   375          .WORD   30$-.
                001A'   00D1   376          .WORD   40$-.
                001E'   00D3   377          .WORD   50$-.
                0022'   00D5   378          .WORD   60$-.
                0026'   00D7   379          .WORD   70$-.
            00000007    00D9   380 $_KNOWN=<.-T_KNOWN_DEV-1>/2
30 38 37 57 44 00'      00D9   381 10$:     .ASCIC  "DW780"
                05      00D9
30 38 37 48 52 00'      00DF   382 20$:     .ASCIC  "RH780"
                05      00DF
30 35 37 57 44 00'      00E5   383 30$:     .ASCIC  "DW750"
                05      00E5
30 35 37 48 52 00'      00EB   384 40$:     .ASCIC  "RH750"
                05      00EB
30 33 37 57 44 00'      00F1   385 50$:     .ASCIC  "DW730"
                05      00F1
30 38 37 52 44 00'      00F7   386 60$:     .ASCIC  "DR780"
                05      00F7
41 55 42 57 44 00'      00FD   387 70$:     .ASCIC  "DWBUA"                 ;       [20]
                05      00FD
```

```
                00000000          .Psect  Work, NoExe, NoShr, Wrt, Long   ;                                [11]
                    0000  QIO$L_ALLOCATE:
        00000000    0000          .LONG                                   ; BYTES ALLOCATED TO QIO DATA STRUCTURES
                    0004
                00  0004  LASTCHAR :       .BYTE   0                      ; Last character written over the NI    [21]
                    0005
                    0005  LOAD_FLAGS:                                     ;CONTROL BLOCKS CREATED FLAGS
        00000006    0005          .BLKB   1
                    0006          _VIELD  LOAD,0,<-                       ; FLAG DEFINTIONS
                    0006                  <DDB,,M>,-                      ;  DDB CREATED
                    0006                  <CRB,,M>,-                      ;  CRB CREATED
                    0006                  <IDB,,M>,-                      ;  IDB CREATED
                    0006                  <UCB,,M>,-                      ;  UCB CREATED
                    0006                  >
                    0006  DDB_BLINK:                                      ;DDB BACKWARD LINK
        0000000A    0006          .BLKL   1
                    000A
                    000A  UCB_BLINK:                                      ;UCB BACKWARD LINK
        0000000E    000A          .BLKL   1
```

```
                          000E   409          .SBTTL  EXE$QIO          QIO DISPATCHING ROUTINE
                      00000000   410          .PSECT  Code, Exe, Shr, NoWrt, Long     ;                                [11]
                          0000   411 ;++
                          0000   412 ; FUNCTIONAL DESCRIPTION:
                          0000   413 ;
                          0000   414 ;
                          0000   415 ; CALLING SEQUENCE:
                          0000   416 ;
                          0000   417 ;       NONE
                          0000   418 ;
                          0000   419 ; INPUT PARAMETERS:     NONE
                          0000   420 ;
                          0000   421 ; IMPLICIT INPUTS:      NONE
                          0000   422 ;
                          0000   423 ; OUTPUT PARAMETERS:    NONE
                          0000   424 ;
                          0000   425 ; IMPLICIT OUTPUTS:     NONE
                          0000   426 ;
                          0000   427 ; COMPLETION CODES:     NONE
                          0000   428 ;
                          0000   429 ; SIDE EFFECTS:         NONE
                          0000   430 ;
                          0000   431 ;--
                        0FDC   0000   432 .ENTRY  EXE$QIO,^M<R2,R3,R4,R6,R7,R8,R9,R10,R11>
                          0002   433
                          0002   434          Br_If_NI  5$                    ; if NI do not call Vms QIO in any case [21]
          00000000'EF   1A   E0   0002          BBS     #DS$V_NI, -                     ; If bit set, branch             [49]
                        42       0009                    L^DS$GL_Flags, 5$               ;                                [49]
                          000A   435
                    08 AC   B5   000A   436          TSTW    QIO$_CHAN(AP)           ; LOOK AT CHANNEL NUMBER
                       3D   13   000D   437          BEQL    5$                      ; IF 0, DO "DS" CONSOLE I/O
          00000000'EF   6C   FA   000F   438          CALLG   (AP),L^VMS$QIO                  ; Else call VMS/QIO handler      [11]
                          0016   439          Br_if_MP  3$
    05000000 8F   00000000'8F   D1   0016          CMPL    #DS$GK_SID,#^X05000000          ; Branch if Scorpio [61]
                       28   13   0021          BEQL    3$                              ; Yes, branch
    06000000 8F   00000000'8F   D1   0023          CMPL    #DS$GK_SID,#^X06000000          ; Branch if Nautilus [61]
                       1B   13   002E          BEQL    3$                              ; Yes, branch
    11000000 8F   00000000'8F   D1   0030          CMPL    #DS$GK_SID,#^X11000000          ; Branch if RRR [69]             ;G:20
                       0E   13   003B          BEQL    3$                                                               ;G:18
    0A000000 8F   00000000'8F   D1   003D          CMPL    #DS$GK_SID,#^X0A000000          ; Branch if LLL [69]             ;G:20
                       01   13   0048          BEQL    3$                                                               ;G:22
                            05   004A   440          RSB                             ;  and return to ENTRY                [22]
                            04   004B   441 3$:      RET                             ;  and return to ENTRYMP              [22]
                          004C   442                                                  ;
                          004C   443
                          004C   444 5$:
                          004C   445
         50   0C AC   06   00   EF   004C   446          EXTZV   #IO$V_FCODE,#IO$S_FCODE, -
                          0052   447                  QIO$_FUNC(AP),R0        ; Get function code
                          0052   448          CASE    R0,TYPE=L,LIMIT=#IO$_WRITEVBLK,DISPLIST=<-
                          0052   449                  30$, -                  ; Function ^X30
                          0052   450                  40$, -                  ; Function ^X31
                          0052   451                  20$, -                  ; Function ^X32
                          0052   452                  20$, -                  ; Function ^X33
                          0052   453                  20$, -                  ; Function ^X34
                          0052   454                  20$, -                  ; Function ^X35
                          0052   455                  20$, -                  ; Function ^X36
```

```
                                0052   456                  40$>                            ; Function ^X37
                      07' 30 50  CF 0052                CASEL   R0,#IO$_WRITEVBLK,S^#<<30001$-30000$>/2>-1
                                0056            30000$:
                             005D' 0056                 .SIGNED_WORD    30$-30000$
                             006B' 0058                 .SIGNED_WORD    40$-30000$
                             0010' 005A                 .SIGNED_WORD    20$-30000$
                             0010' 005C                 .SIGNED_WORD    20$-30000$
                             0010' 005E                 .SIGNED_WORD    20$-30000$
                             0010' 0060                 .SIGNED_WORD    20$-30000$
                             0010' 0062                 .SIGNED_WORD    20$-30000$
                             006B' 0064                 .SIGNED_WORD    40$-30000$
                                0066            30001$:
                                0066   457
                                0066   458 20$:     ERRSUP_S        MSGADR=AUNKFUNC
                00000000'EF    DF 0066                         PUSHAL  $MODULE
                00000008'EF    DF 006C                         PUSHAL  AUNKFUNC
                          01   DD 0072                         PUSHL   #$ER
                00000000'EF    03 FB 0074                      CALLS   #3, DS_ERRSUP
                          50   D4 007B   459          CLRL    R0                              ; Return error                  [22]
                                007D   460          Br_if_MP  23$
    05000000 8F 00000000'8F    D1 007D                CMPL    #DS$GK_SID,#^X05000000          ; Branch if Scorpio [61]
                          28   13 0088                BEQL    23$                             ; Yes, branch
    06000000 8F 00000000'8F    D1 008A                CMPL    #DS$GK_SID,#^X06000000          ; Branch if Nautilus [61]
                          1B   13 0095                BEQL    23$                             ; Yes, branch
    11000000 8F 00000000'8F    D1 0097                CMPL    #DS$GK_SID,#^X11000000          ; Branch if RRR [69]            ;G:20
                          0E   13 00A2                BEQL    23$                                                             ;G:18
    0A000000 8F 00000000'8F    D1 00A4                CMPL    #DS$GK_SID,#^X0A000000          ; Branch if LLL [69]            ;G:20
                          01   13 00AF                BEQL    23$                                                             ;G:22
                          05   00B1   461          RSB                                     ;  and return to ENTRY            [22]
                          04   00B2   462 23$:     RET                                     ;  and return to ENTRYMP          [22]
                                00B3   463
                                00B3   464 30$:     Br_If_NI   50$                          ; If NI then write accross the Net.  [21]
    00000000'EF    1A    E0 00B3                BBS     #DS$V_NI, -                         ; If bit set, branch                [49]
                          14   00BA                        L^DS$GL_Flags, 50$              ;                                   [49]
                                00BB   465
                                00BB   466 35$:
         00000000'EF      17 00BB   467          JMP     WRITEVBLK                       ; Changed BRW to JMP                [15]
                                00C1   468                                                 ;                                   [15]
                                00C1   469 40$:     Br_If_NI   60$                          ; If NI then read buffer from the Net.  [21]
    00000000'EF    1A    E0 00C1                BBS     #DS$V_NI, -                         ; If bit set, branch                [49]
                          26   00C8                        L^DS$GL_Flags, 60$              ;                                   [49]
                                00C9   470
                                00C9   471 45$:
         00000000'EF      17 00C9   472          JMP     READVBLK                        ; Changed BRW to JMP                [15]
                                00CF   473                                                 ;                                   [15]
                          7E   D4 00CF   474 50$:     CLRL    -(SP)                           ; ZERO to indicate no-data-lost     [21]
                       20 AC   DD 00D1   475          PUSHL   QIO$_P2(AP)                     ; Push length of ascii string       [21]
                       1C AC   DD 00D4   476          PUSHL   QIO$_P1(AP)                     ; Push address of ascii string      [21]
    00000000'EF        03   FB 00D7   477          CALLS   #3,SEND_CONSOLE_RESPONSE ; WRITE over the network                   [21]
                                00DE   478
     52    20 AC       01   C3 00DE   479          SUBL3   #1,QIO$_P2(AP),R2               ; Calculate offset of last character writen
           52    1C AC  C0 00E3   480          ADDL2   QIO$_P1(AP),R2                  ; and add it to the address of the string.
    00000004'EF        62   90 00E7   481          MOVB    (R2),LASTCHAR                   ; Store the last character writen   [21]
                                00EE   482
                          04   00EE   483          RET                                     ; Return                            [21]
                                00EF   484
                          37   91 00EF   485 60$:     CMPB    #IO$_READPROMPT,-           ; Check if we are doing a READPROMPT    [21]
```

```
                 0C AC      00F1                    QIO$_FUNC(AP)
                    27   12 00F3          BNEQ    80$                     ; If not, then just read packet          [21]
      00000004'EF   0A   91 00F5          CMPB    #LF,LASTCHAR            ; See if last char. written was a line feed
                    11   13 00FC          BEQL    70$                                                              ;[21]
                    7E   D4 00FE          CLRL    -(SP)                   ;  if not, then                          [21]
                    02   DD 0100          PUSHL   #CRLF_LENGTH            ;  push length of Cr Lf                  [21]
          000000C0'EF   9F 0102          PUSHAB  T_CRLF                  ;  push address of Cr Lf                 [21]
      00000000'EF   03   FB 0108          CALLS   #3,SEND_CONSOLE_RESPONSE ; WRITE Cr Lf over the network          [21]
                           010F
                    7E   D4 010F  70$:    CLRL    -(SP)                   ; Now write the prompt:                  [21]
             7E   2C AC   7D 0111          MOVQ    QIO$_P5(AP),-(SP)       ; Push the address and length of Prompt [21]
      00000000'EF   03   FB 0115          CALLS   #3,SEND_CONSOLE_RESPONSE ; WRITE Prompt over the network         [21]
                           011C
                 10 AC   DD 011C  80$:    PUSHL   QIO$_IOSB(AP)           ; Push address of IO status block        [21]
                           011F                                            ; which will contain thelength of input [21]
                           011F                                            ; upon return.                           [21]
                 1C AC   DD 011F          PUSHL   QIO$_P1(AP)             ; Push address of input buffer           [21]
      00000000'EF   02   FB 0122          CALLS   #2,REMOTE_NODE_CONTROL_LEVEL  ; READ from the Network            [21]
             51   10 BC   DE 0129          MOVAL   @QIO$_IOSB(AP),R1       ; Get the address of the IO status block[21]
          61   61   10   78 012D          ASHL    #16,(R1),(R1)           ; Shift character count to 2nd word      [21]
               61   50   B0 0131          MOVW    R0,(R1)                 ; Store operation status in 1st word     [21]
               51   04   C0 0134          ADDL    #4,R1                   ; Point to third word                    [21]
               81   00   B0 0137          MOVW    #0,(R1)+                ; Store terminator character in 3rd word[21]
               81   00   B0 013A          MOVW    #0,(R1)+                ; Store the terminator size in 4th word [21]
                         04 013D          RET                             ; Return                                 [21]
                           013E
                           013E
```

```
                                013E   514          .SBTTL  QIO$INITIALIZE  Initialize QIO database
                                013E   515 ;++
                                013E   516 ; FUNCTIONAL DESCRIPTION:
                                013E   517 ;
                                013E   518 ;       This routine will initialize all of the the database that needs it.
                                013E   519 ;       It resets the DRIVER prologue queue.
                                013E   520 ;
                                013E   521 ; CALLING SEQUENCE:
                                013E   522 ;
                                013E   523 ;       BSBW    QIO$INITIALIZE
                                013E   524 ;
                                013E   525 ; INPUT PARAMETERS:     NONE
                                013E   526 ;
                                013E   527 ; IMPLICIT INPUTS:      NONE
                                013E   528 ;
                                013E   529 ; OUTPUT PARAMETERS:    NONE
                                013E   530 ;
                                013E   531 ; IMPLICIT OUTPUTS:     NONE
                                013E   532 ;
                                013E   533 ; COMPLETION CODES:     NONE
                                013E   534 ;
                                013E   535 ; SIDE EFFECTS:         NONE
                                013E   536 ;--
                                013E   537
                           0000 013E   538 .ENTRY  QIO$INITIALIZE,^M<>
                                0140   539
      51  00000000'EF    DE    0140   540         MOVAL   L^IOC$GL_DPTLIST,R1     ; GET ADDRESS OF DRIVER QUEUE LISTHEAD  [11]
          61    51       D0    0147   541         MOVL    R1,(R1)                 ; INIT FLINK
        04 A1   51       D0    014A   542         MOVL    R1,4(R1)                ; INIT BLINK
                                014E   543
  00000000'EF           D4    014E   544         CLRL    L^IOC$GL_DEVLIST        ; CLEAR DDB HEADER LIST                 [11]
  00000000'EF           D4    0154   545         CLRL    L^IOC$GL_ADPLIST        ; CLEAR ADAPTER HEADER LIST             [11]
  00000000'EF           D4    015A   546         CLRL    L^QIO$L_ALLOCATE        ; CLEAR QIO MEMORY ALLOCATED            [11]
                                0160   547
                             04 0160   548         RET                             ; RETURN
```

```
                                0161   550 ;+
                                0161   551 ; Find DPT given driver name descriptor in R2,R3
                                0161   552 ;-
                                0161   553 LOC$DPT:
                 007C 8F    BB  0161   554          PUSHR   #^M<R2,R3,R4,R5,R6>     ; Save descriptor of driver name
          5B  00000000'EF    9E  0165   555          MOVAB   L^IOC$GL_DPTLIST,R11    ; Address of DPT list head              [11]
                    56  5B   D0  016C   556          MOVL    R11,R6                  ; Save list header
                                016F   557
                    5B  6B   D0  016F   558 10$:     MOVL    DPT$L_FLINK(R11),R11    ; Link to next DPT
                50  5B  56   C3  0172   559          SUBL3   R6,R11,R0               ; End of list?, R0 = ZERO if so
                        15   13  0176   560          BEQL    20$                     ; Branch if end
                                0178   561
                    52  6E   7D  0178   562          MOVQ    (SP),R2                 ; Get descriptor of driver name
                  51   1E AB   9E  017B   563          MOVAB   DPT$T_NAME(R11),R1      ; Get address of driver name
                    50  81   9A  017F   564          MOVZBL  (R1)+,R0                ; Get length
        63  52  00  61  50   2D  0182   565          CMPC5   R0,(R1),#0,R2,(R3)      ; Same?
                        E5   12  0188   566          BNEQ    10$                     ; Branch if not
                    50  00'  D0  018A   567          MOVL    S^#SS$_NORMAL,R0        ; Success
                 007C 8F    BA  018D   568 20$:     POPR    #^M<R2,R3,R4,R5,R6>     ; Restore
                            05  0191   569          RSB                             ; Return R11 has DPT if R0=SS$_NORMAL
```

```
                                0192   571          .SBTTL  QIO$CLEANUP     Remove old QIO database
                                0192   572 ;++
                                0192   573 ; FUNCTIONAL DESCRIPTION:
                                0192   574 ;
                                0192   575 ;       This routine is used to remove and release all of the
                                0192   576 ;       QIO data base.
                                0192   577 ;       Every ADP is deallocated while restoring the SCB for each.
                                0192   578 ;       Scan thru the DDB list, making a list on the stack of the CRB's
                                0192   579 ;       present and deallocating each UCB and then the DDB.
                                0192   580 ;       Finally deallocate the space for each CRB and corresponding IDB.
                                0192   581 ;
                                0192   582 ; CALLING SEQUENCE:
                                0192   583 ;
                                0192   584 ;       CALLG   (SP),QIO$CLEANUP
                                0192   585 ;
                                0192   586 ; INPUT PARAMETERS:     NONE
                                0192   587 ;
                                0192   588 ; IMPLICIT INPUTS:      NONE
                                0192   589 ;
                                0192   590 ; OUTPUT PARAMETERS:    NONE
                                0192   591 ;
                                0192   592 ; IMPLICIT OUTPUTS:     NONE
                                0192   593 ;
                                0192   594 ; COMPLETION CODES:     NONE
                                0192   595 ;
                                0192   596 ; SIDE EFFECTS:
                                0192   597 ;
                                0192   598 ;       The current QIO database is destroyed.
                                0192   599 ;--
                                0192   600
                       007C     0192   601 .ENTRY  QIO$CLEANUP,^M<R2,R3,R4,R5,R6>
                                0194   602
 55  00000000'EF    DE          0194   603         MOVAL   SCB_BASE,R5                 ; BASE SCB
 54  00000000'EF    DE          019B   604         MOVAL   SCB_IMAGE,R4                ; BASE SCB IMAGE
                                01A2   605         DSBINT                              ; Don't allow interruptions
        7E   12    DB          01A2                       MFPR    S^#PR$_IPL,-(SP)
        12   1F    DA          01A5                       MTPR    #31,S^#PR$_IPL
                                01A8   606
 53  00000000'EF    DE          01A8   607         MOVAL   L^IOC$GL_ADPLIST,R3         ; POINT TO ADAPTER HEADER                   [11]
        50   63    D0          01AF   608 10$:     MOVL    (R3),R0                     ; POINT TO FIRST ADAPTER BLOCK
  00000000'EF    16          01B2   609         JSB     QIOCLEAN_CPU                        ; Do CPU specific QIO cleanup       [11]
00A0 C5  00A0 C4  D0          01B8   610         MOVL    SCB$L_SFTLVL8(R4), -
                                01BF   611                 SCB$L_SFTLVL8(R5)        ; RETURN SOFT VECTOR OF FORK DISPATCH
0090 C5  0090 C4  D0          01BF   612         MOVL    SCB$L_SFTLVL4(R4), -
                                01C6   613                 SCB$L_SFTLVL4(R5)        ; RETURN SOFT VECTOR OF IOPOST
```

```
                7E   D4  01C6          CLRL    -(SP)                      ; TERMINATOR FOR CRB LIST
                         01C8
56   00000000'EF   D0  01C8  30$:    MOVL    L^IOC$GL_DEVLIST,R6        ; GET FIRST DDB                    [11]
                3F   13  01CF          BEQL    100$                       ; BRANCH IF NONE
                         01D1
     50    04 A6   D0  01D1          MOVL    DDB$L_UCB(R6),R0           ; POINT TO FIRST UCB
     55    20 A0   D0  01D5          MOVL    UCB$L_CRB(R0),R5           ; GET CRB ADDRESS
                         01D9  40$:
        51    6E   9E  01D9          MOVAB   (SP),R1                    ; POINT TO FIRST ELIGIBLE
                20   BB  01DC          PUSHR   #^MR5                      ; ASSUME NOT A DUPLICATE
                61   D5  01DE  50$:    TSTL    (R1)                       ; VALID
                07   13  01E0          BEQL    60$                        ; BRANCH IF AT END OF LIST
        55    81   D1  01E2          CMPL    (R1)+,R5                   ; SAME?
                F7   12  01E5          BNEQ    50$                        ; BRANCH IF NOT THE SAME
                8E   D5  01E7          TSTL    (SP)+                      ; REMOVE DUPLICATE CRB
                         01E9  60$:
     55    10 A5   D0  01E9          MOVL    CRB$L_LINK(R5),R5          ; LINK TO NEXT CRB
                EA   12  01ED          BNEQ    40$                        ; CHECK IT
                         01EF  70$:
     55    D8 A6   DE  01EF          MOVAL   DDB$L_UCB-UCB$L_LINK(R6),R5 ; FIRST UCB
     55    2C A5   D0  01F3  80$:    MOVL    UCB$L_LINK(R5),R5          ; LINK TO NEXT UCB
                08   13  01F7          BEQL    90$                        ; BRANCH IF NONE
        50    55   D0  01F9          MOVL    R5,R0                      ; COPY ADDRESS
              08E5   30  01FC          BSBW    QIO$DEALLOCATE             ; RELEASE THE SPACE
                F2   11  01FF          BRB     80$                        ; NEXT UCB
                         0201  90$:
        50    56   D0  0201          MOVL    R6,R0                      ; COPY DDB ADDRESS
00000000'EF    66   D0  0204          MOVL    DDB$L_LINK(R6),L^IOC$GL_DEVLIST ;                             [11]
              08D6   30  020B          BSBW    QIO$DEALLOCATE             ; RELEASE THE DDB
                B8   11  020E          BRB     30$                        ; NEXT DDB
                         0210  100$:
        56    8E   D0  0210          MOVL    (SP)+,R6                   ; GET CRB FROM STACK
                0F   13  0213          BEQL    110$                       ; BRANCH IF LAST ONE
     50    1C A6   D0  0215          MOVL    CRB$L_INTD+VEC$L_IDB(R6),R0 ; POINT TO IDB
              08C8   30  0219          BSBW    QIO$DEALLOCATE             ; RELEASE THE IDB
        50    56   D0  021C          MOVL    R6,R0                      ; COPY CRB ADDRESS
              08C2   30  021F          BSBW    QIO$DEALLOCATE             ; RELEASE THE CRB
                EC   11  0222          BRB     100$                       ; CHECK FOR MORE CRB'S
                         0224  110$:
                         0224
51   00000000'EF   DE  0224          MOVAL   L^IOC$GL_DPTLIST,R1        ; Address of header                [11]
        50    51   D0  022B          MOVL    R1,R0                      ; Duplicate
        50    60   D0  022E  130$:   MOVL    DPT$L_FLINK(R0),R0         ; Link to next
        51    50   D1  0231          CMPL    R0,R1                      ; Point back to header?
                05   13  0234          BEQL    140$                       ; Branch if back to header
           0B A0   94  0236          CLRB    DPT$B_REFC(R0)             ; Clear reference count
                F3   11  0239          BRB     130$                       ; next DPT
                         023B  140$:
                         023B          ENBINT                             ; Enable interrupts again
        12    8E   DA  023B                  MTPR    (SP)+,S^#PR$_IPL
52   00000000'EF   D0  023E          MOVL    QIO$L_ALLOCATE,R2          ; SHOULD ALL BE DEALLOCATED
                11   13  0245          BEQL    120$                       ; BRANCH IF IT WAS
                         0247          ERRSUP_S
     00000000'EF   DF  0247                  PUSHAL  $MODULE
                00   DD  024D                  PUSHL   #0
                02   DD  024F                  PUSHL   #$ER
00000000'EF    03   FB  0251                  CALLS   #3, DS_ERRSUP
```

```
                    0258   667 120$:
              04    0258   668          RET
```

```
0259    670          .SBTTL  QIO$ADDUNIT     Add a unit to the QIO database
0259    671 ;++
0259    672 ; FUNCTIONAL DESCRIPTION:
0259    673 ;
0259    674 ;       This routine takes all the necessary steps to
0259    675 ;       insert a unit into the QIO database, including adding
0259    676 ;       ADP's, CRB's, IDB's, DDB's and UCB's.
0259    677 ;       The generic name of the device is used to locate the
0259    678 ;       device driver for the device.  Starting with the specified
0259    679 ;       device fields are copied from the P-table to the ACF block
0259    680 ;       which contains all the information necessary to build the
0259    681 ;       QIO database.  For unknown devices the unit and vector information
0259    682 ;       is copied. For a TM03 the unit is copied to only one of two fields.
0259    683 ;       For channels, (DR780, RH780 & DW780) the configuration register is set
0259    684 ;       and the ACF is complete. For all non-channel devices this process
0259    685 ;       is repeated for the link device, and then for it's link device...etc.
0259    686 ;       Note that it is impossible to catch the case where the TM03 is
0259    687 ;       omitted from the link chain for a magtape drive... i.e. no
0259    688 ;       error is reported.  Errors are reported if the channel is omitted.
0259    689 ;
0259    690 ; CALLING SEQUENCE:
0259    691 ;
0259    692 ;       CALLG/S arglist/count,QIO$ADDUNIT
0259    693 ;
0259    694 ; INPUT PARAMETERS:
0259    695 ;
0259    696 ;       0(AP)   #1
0259    697 ;       4(AP)   Address of P-table
0259    698 ;
0259    699 ; IMPLICIT INPUTS:
0259    700 ;
0259    701 ;       Existing QIO database
0259    702 ;
0259    703 ; OUTPUT PARAMETERS:    NONE
0259    704 ;
0259    705 ; IMPLICIT OUTPUTS:
0259    706 ;
0259    707 ;       The QIO database may be updated.
0259    708 ;
0259    709 ; COMPLETION CODE:
0259    710 ;
0259    711 ;       SS$_NORMAL      if successful
0259    712 ;
0259    713 ; REGISTER USAGE:
0259    714 ;
0259    715 ;       R3      TR number of adapter
0259    716 ;       R4      Adapter CSR address
0259    717 ;       R5      Address of Driver Prologue Table
0259    718 ;       R6      Address of ADP
0259    719 ;       AP      Address of current P-table
0259    720 ;       R7      Address of ACF block
0259    721 ;       R10     Address of Adapter P-table
0259    722 ;       R11     Address of Controller P-table
0259    723 ;       AP      Address of Unit P-table
0259    724 ;
0259    725 ; SIDE EFFECTS:         NONE
0259    726 ;--
```

```
                     0259   727          $OFFSET 0,NEGATIVE,< -
                     0259   728          <FILE,12>, -                    ; File name of driver
                     0259   729          <FILEDESC,8>, -                 ; Descriptor of driver file name
                     0259   730          <FILEDEF,8>, -                  ; Default descriptor
                     0259   731          <LENGTH,4>, -                   ; Longword to recieve file length
                     0259   732          <ACF,ACF$C_LENGTH>, -           ; Place to build an ACF
                     0259   733          <LOCAL,0>>
                     0259                .SAVE   LOCAL_BLOCK
                     0259                .PSECT $ABS$ ABS
            00000000 FE70                .=0
            FFFFFFF4 0000                .BLKB   -12
                     FFF4        FILE:
            FFFFFFEC FFF4                .BLKB   -8
                     FFEC        FILEDESC:
            FFFFFFE4 FFEC                .BLKB   -8
                     FFE4        FILEDEF:
            FFFFFFE0 FFE4                .BLKB   -4
                     FFE0        LENGTH:
            FFFFFFC0 FFE0                .BLKB   -ACF$C_LENGTH
                     FFC0        ACF:
                     FFC0        LOCAL:
                   00000259              .RESTORE
```

```
                     0FFC  0259    735 .ENTRY  QIO$ADDUNIT,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>
                           025B    736
         5E   C0 AD   9E  025B    737         MOVAB   LOCAL(FP),SP            ; Allocate stack based storage
         57   C0 AD   9E  025F    738         MOVAB   ACF(FP),R7              ; Base ACF
   50  00000000'EF   DE  0263    739         MOVAL   SCB_BASE,R0             ; Base SCB
                           026A    740
         5C   04 AC   D0  026A    741         MOVL    4(AP),AP                ; Address P-table
                           026E    742
   55    04 AC   01   C1  026E    743         ADDL3   #1,HP$Q_DEVICE+4(AP),R5 ; Point past "_"
      54   6C   01   C3  0273    744         SUBL3   #1,HP$Q_DEVICE(AP),R4   ; Length of device name
       00000000'EF   16  0277    745         JSB     SCAN$ALPHA              ; Determine length of alphabetic
          52   50   D0  027D    746         MOVL    R0,R2                   ; Save length of name
          51   50   C0  0280    747         ADDL    R0,R1                   ; Point past string
          7E   71   90  0283    748 10$:    MOVB    -(R1),-(SP)             ; Copy device name onto stack
            FA 50   F5  0286    749         SOBGTR  R0,10$                  ; Count them all
          7E   52   90  0289    750         MOVB    R2,-(SP)                ; Make it ASCIC
                           028C    751
         14 A7   6E   9E  028C    752         MOVAB   (SP),ACF$L_DEVNAME(R7)  ; Set address of device name
                           0290    753
          56   5C   D0  0290    754         MOVL    AP,R6                   ; Copy P-table address
         51   26 A6   9E  0293    755 20$:    MOVAB   HP$T_TYPE(R6),R1        ; Address of device type
          50   81   9A  0297    756         MOVZBL  (R1)+,R0                ; Get length of device type
       00000000'EF   16  029A    757         JSB     LOC$PTDESC              ; Locate this PT-descriptor
                13   13  02A0    758         BEQL    40$                     ; Branch to NODRIVER
                           02A2    759
          51   80   9A  02A2    760         MOVZBL  (R0)+,R1                ; Get length of type name
      50   02 A041   9E  02A5    761         MOVAB   2(R0)[R1],R0            ; Get address of driver prefix
          52   60   3C  02AA    762         MOVZWL  (R0),R2                 ; Get prefix
                0E   12  02AD    763         BNEQ    50$                     ; Branch if valid prefix
         56   20 A6   D0  02AF    764         MOVL    HP$A_LINK(R6),R6        ; Link to previous device
                DE   12  02B3    765         BNEQ    20$                     ; Check for prefix in controller
   50   006600B1 8F   D0  02B5    766 40$:    MOVL    #DS$_NOSUPPORT,R0       ; No QIO support for device
                04   04  02BC    767         RET                             ; Exit
                           02BD    768
                           02BD    769 ;+
                           02BD    770 ; Locate driver, given generic device prefix in R2
                           02BD    771 ;-
   50   00000000'EF   7E  02BD    772 50$:    MOVAQ   L^IOC$GL_DPTLIST,R0     ; Point to driver listhead              [11]
          55   50   D0  02C4    773         MOVL    R0,R5                   ; Copy listhead
          55   65   D0  02C7    774 60$:    MOVL    DPT$L_FLINK(R5),R5      ; Link to next driver
          55   50   D1  02CA    775         CMPL    R0,R5                   ; At end?
               09   13  02CD    776 70$:    BEQL    LOAD_DRIVER             ; Branch if more drivers to check
        1F A5   52   B1  02CF    777         CMPW    R2,DPT$T_NAME+1(R5)     ; Match driver prefix
               F2   12  02D3    778         BNEQ    60$                     ; Try again no match
             00CE   31  02D5    779         BRW     FILL_ACF                ; Branch since driver found
```

```
                                02D8   781 ;+
                                02D8   782 ; Load device driver
                                02D8   783 ; Inputs:       R2 - 2 character generic device name
                                02D8   784 ; Outputs:      R4 - Address of DPT
                                02D8   785 ;-
                                02D8   786 LOAD_DRIVER:
      F4 AD    3F515645 8F    D0  02D8   787          MOVL    #^A"EVQ?",FILE(FP)       ; Set first part of name
               F7 AD    52    B0  02E0   788          MOVW    R2,FILE+3(FP)            ; Insert generic device name
      F9 AD    4558452E 8F    D0  02E4   789          MOVL    #^A".EXE",FILE+5(FP)     ; Read .EXE file
               EC AD    09    D0  02EC   790          MOVL    #9,FILEDESC(FP)          ; Set length of file spec
            F0 AD    F4 AD   9E  02F0   791          MOVAB   FILE(FP),FILEDESC+4(FP)  ; Set address of file spec
                     E4 AD   7C  02F5   792          CLRQ    FILEDEF(FP)              ; Clear default descriptor
                             02F8   793
                     E0 AD   DF  02F8   794          PUSHAL  LENGTH(FP)               ; Address to return length of file
                        01   DD  02FB   795          PUSHL   #1                       ; fake buf addr to fool ds$load [27]  ;G:4
                        7E   D4  02FD   796          CLRL    -(SP)                    ; Length of buffer, and address [27]  ;G:5
                     E4 AD   7F  02FF   797          PUSHAQ  FILEDEF(FP)              ; Address of default
                     EC AD   7F  0302   798          PUSHAQ  FILEDESC(FP)             ; Address of file spec
                        05   DD  0305   799          PUSHL   #5                       ; Length of arg list
          00000000'EF    6E   FA  0307   800          CALLG   (SP),DS$LOAD             ; Locate existence and length of file
                     1D 50   E8  030E   801          BLBS    R0,50$                   ; Branch if file found
                        01   BB  0311   802          PUSHR   #^M<R0>                  ; Save status code
                        6C   9F  0313   803          PUSHAB  HP$Q_DEVICE(AP)          ; Name of device
                     EC AD   9F  0315   804          PUSHAB  FILEDESC(FP)             ; descriptor of file name
                00000046'EF   9F  0318   805          PUSHAB  L^T_NODRIVER             ; Address of edit string                [11]
                     7E   01   9A  031E   806          movzbl  #ds$k_printf,-(sp)       ; use PRINTF                            [13]
                     7E   22   98  0321   807          cvtbl   #ds$k_type_qio_nodriver,-(sp)    ; code                          [13]
          00000000'GF    05   FB  0324   808          CALLS   #5, G^DSX$PRINT          ; Print the error                       [13]
                        01   BA  032B   809          POPR    #^M<R0>                  ; Restore failing DS$LOAD status
                        04   032D   810          RET                              ; Exit
                             032E   811
                51   E0 AD   D0  032E   812 50$:    MOVL    LENGTH(FP),R1            ; Length of memory required
               00000000'EF   16  0332   813          JSB     EXE$ALONONPAGED          ; Allocate the memory for the driver
                     07 50   E8  0338   814          BLBS    R0,55$                   ; Continue if OK
               00000000'EF   16  033B   815          JSB     DSR$COMPLETION           ; Print the error
                        04   0341   816          RET                              ; Return
                             0342   817
                   53   51   3C  0342   818 55$:    MOVZWL  R1,R3                    ; Save length of file
                0C AE   51   3C  0345   819          MOVZWL  R1,LOAD$_LENGTH(SP)      ; Store length to read
                10 AE   52   D0  0349   820          MOVL    R2,LOAD$_ADDRESS(SP)     ; Store address of buffer
          00000000'EF   8E   FB  034D   821          CALLS   (SP)+,DS$LOAD            ; Now read the file
                     08 50   E8  0354   822          BLBS    R0,60$                   ; Continue if OK
               00000000'EF   16  0357   823          JSB     DSR$COMPLETION           ; Print the error
                        2D   11  035D   824          BRB     70$                      ; Error return, release driver space
                             035F   825
                08 A2   53   B0  035F   826 60$:    MOVW    R3,DVR$W_SIZE(R2)        ; Stash size of driver
      10 A2    FFFF0001 8F   D1  0363   827          CMPL    #DVR$_IDENT,-
                                036B   828                  DVR$L_IDENT(R2)          ; Is ident version same as supervisor?
                        2B   13  036B   829          BEQL    80$                      ; Branch if so
               FFFF0001 8F   DD  036D   830          PUSHL   #DVR$_IDENT              ; Correct ident
                     10 A2   DD  0373   831          PUSHL   DVR$L_IDENT(R2)          ; Current ident
                     EC AD   7F  0376   832          PUSHAQ  FILEDESC(FP)             ; Address of driver
               00000068'EF   9F  0379   833          PUSHAB  L^T_WRONGVER             ; Edit string                           [11]
                     7E   01   9A  037F   834          movzbl  #ds$k_printf,-(sp)       ; Use PRINTF                            [13]
                     7E   23   98  0382   835          cvtbl   #ds$K_type_qio_wrongver,-(sp)    ; code                          [13]
          00000000'GF    06   FB  0385   836          CALLS   #6, G^DSX$PRINT          ; Print the error                       [13]
                             038C   837 ;
```

```
                                  038C   ; Release the driver and return error
                                  038C   ;
                50    52    D0    038C   70$:    MOVL    R2,R0                    ; Point to buffer
          00000000'EF       16    038F          JSB     EXE$DEANONPAGED          ; Release the space
                      50    D4    0395          CLRL    R0                       ; Error return
                            04    0397          RET                              ; Exit
                                  0398
            55    14 A2     9E    0398   80$:    MOVAB   DVR$C_LEN(R2),R5         ; Base driver prologue table
                  08 A5     B4    039C          CLRW    DPT$W_SIZE(R5)           ; Clear size of DPT, catch bugs later
      00000000'EF     65    0E    039F          INSQUE  (R5),IOC$GL_DPTLIST      ; Insert in queue
```

```
                        03A6   849 ;+
                        03A6   850 ; Fill ACF block
                        03A6   851 ;-
                        03A6   852 FILL_ACF:
          18 A7   1E A5  9E 03A6   853         MOVAB   DPT$T_NAME(R5),-
                        03AB   854                 ACF$L_DRVNAME(R7)       ; Address of driver name
                        03AB   855
                        03AB   856
             5B   20 AC  D0 03AB   857         MOVL    HP$A_LINK(AP),R11       ; Address of Controller P-TABLE
                    03  12 03AF   858         BNEQ    20$                     ; Branch if real controller
                 5B 5C  D0 03B1   859         MOVL    AP,R11                  ; Use unit for controller
             5A   20 AB  D0 03B4   860 20$:   MOVL    HP$A_LINK(R11),R10      ; Address of Adapter P-TABLE
                    06  12 03B8   861         BNEQ    40$                     ; Branch if real adapter
                 5A 5B  D0 03BA   862         MOVL    R11,R10                 ; Use controller for adapter
                 5B 5C  D0 03BD   863         MOVL    AP,R11                  ; Use unit for controller
                        03C0   864
     41494253 8F   27 AA  D1 03C0   865 40$:   CMPL    HP$T_TYPE+1(R10),#^A"SBIA" ; SBIA attached?                     ;[17
                    06  12 03C8   866         BNEQ    45$                     ; Branch if not                         ;[17
                 5A 5B  D0 03CA   867         MOVL    R11,R10                 ; backtrack through ptables             ;[17
                 5B 5C  D0 03CD   868         MOVL    AP,R11                  ; ...                                   ;[17
                        03D0   869
             51   26 AA  9E 03D0   870 45$:   MOVAB   HP$T_TYPE(R10),R1       ; Address of adapter type               ;[17
                50   81  9A 03D4   871         MOVZBL  (R1)+,R0                ; Length of adapter type
          53   000000C9'EF  9E 03D7   872         MOVAB   L^T_KNOWN_DEV,R3        ; Point to list of known types          [11]
               00000000'EF  16 03DE   873         JSB     SCAN$SEARCHLIST         ; Locate which type it is
                    29  12 03E4   874         BNEQ    60$                     ; Branch if unknown adapter..error
          52   000000C2'EF40  9A 03E6   875         MOVZBL  T_ADAPTER_TYPE[R0],R2   ; Get adapter type
             0C A5   52  91 03EE   876         CMPB    R2,DPT$B_ADPTYPE(R5)    ; Correct type of adapter?
                    1B  13 03F2   877         BEQL    60$                     ; Branch if correct
                    6C  9F 03F4   878 50$:   PUSHAB  HP$Q_DEVICE(AP)         ; Address of device name descriptor
                 26 AA  9F 03F6   879         PUSHAB  HP$T_TYPE(R10)          ; Address of adapter type
               00000095'EF  9F 03F9   880         PUSHAB  T_INVADP                ; Address of text
                   7E   01  9A 03FF   881         movzbl  #ds$k_printf,-(sp)      ; Use PRINTF                            [13]
                   7E   24  98 0402   882         cvtbl   #ds$k_type_qio_invadp,-(sp)     ; code                          [13]
          00000000'GF   05  FB 0405   883         CALLS   #5, G^DSX$PRINT         ; Print the error                       [13]
                    50  D4 040C   884         CLRL    R0                      ; Error return
                    04  04 040E   885         RET
                        040F   886
                54   18 AA  D0 040F   887 60$:   MOVL    HP$A_DEVICE(R10),R4     ; Get adapter CSR address
          53    54   04   0D  EF 0413   888         EXTZV   #13,#4,R4,R3            ; Get TR number or SLOT-16
                     06F6  30 0418   889         BSBW    FIND_ADP                ; Locate adapter control block
                  1E 50  E8 041B   890         BLBS    R0,70$                  ; Branch if found
                  3C'AF  9F 041E   891         PUSHAB  B^70$                   ; Dummy BSBW return
                        0421   892         CASE    R2,LIMIT=#AT$_MBA,TYPE=L,DISPLIST=-
                        0421   893                 <INI_MBADP,INI_UBADP,INI_DRADP>
          02'   00   52   CF  0421         CASEL   R2,#AT$_MBA,S^#<<30003$-30002$>/2>-1
                        0425   30002$:
                   007B' 0425         .SIGNED_WORD    INI_MBADP-30002$
                   016F' 0427         .SIGNED_WORD    INI_UBADP-30002$
                   01F1' 0429         .SIGNED_WORD    INI_DRADP-30002$
                        042B   30003$:
                        042B   894         ERRSUP_S
                00000000'EF   DF 042B                 PUSHAL  $MODULE
                         00   DD 0431                 PUSHL   #0
                         03   DD 0433                 PUSHL   #$ER
          00000000'EF    03   FB 0435                 CALLS   #3, DS_ERRSUP
                        043C   895
```

```
          67   56   D0  043C   896 70$:   MOVL    R6,ACF$L_ADAPTER(R7)     ; Set ADP control block address
       04 A7   54   D0  043F   897        MOVL    R4,ACF$L_CONFIGREG(R7)   ; Set adapter csr address
    08 A7   24 AA   B0  0443   898        MOVW    HP$W_VECTOR(R10), -
                        0448   899                ACF$W_AVECTOR(R7)        ; Set adapter vector
    0A A7   0B AB   90  0448   900        MOVB    HP$B_DRIVE(R11), -
                        044D   901                ACF$B_AUNIT(R7)          ; Set adapter unit
    0C A7   18 AB   D0  044D   902        MOVL    HP$A_DEVICE(R11), -
                        0452   903                ACF$L_CONTRLREG(R7)      ; Set device csr register
    10 A7   24 AB   B0  0452   904        MOVW    HP$W_VECTOR(R11), -
                        0457   905                ACF$W_CVECTOR(R7)        ; Set Controller vector
              05   12  0457   906        BNEQ    80$                      ; Branch if real vector
    10 A7   24 AA   B0  0459   907        MOVW    HP$W_VECTOR(R10), -
                        045E   908                ACF$W_CVECTOR(R7)        ; Set Controller vector
    12 A7   0B AC   90  045E   909 80$:   MOVB    HP$B_DRIVE(AP), -
                        0463   910                ACF$B_CUNIT(R7)          ; Set controller unit
    1C A7   16 A5   B0  0463   911        MOVW    DPT$W_MAXUNITS(R5), -
                        0468   912                ACF$W_MAXUNITS(R7)       ; Set max number of units
       50   EC A5   9E  0468   913        MOVAB   -DVR$C_LEN(R5),R0        ; Base of DVR header
    13 A7   0B A0   90  046C   914        MOVB    DVR$B_CNUMVEC(R0), -
                        0471   915                ACF$B_CNUMVEC(R7)        ; Set number of controller vectors
              03   12  0471   916        BNEQ    90$                      ; Branch if really one there
          13 A7   96  0473   917        INCB    ACF$B_CNUMVEC(R7)        ; Default is one
          0B A7   94  0476   918 90$:   CLRB    ACF$B_AFLAG(R7)          ; Clear adapter flag
                        0479   919
00000733'EF   67   FA  0479   920        CALLG   (R7),L^QIO$LOAD_DB       ; Load the database                [11]
          0B A5   96  0480   921        INCB    DPT$B_REFC(R5)           ; Flag as successful
          19 50   E8  0483   922        BLBS    R0,999$                  ; Branch if it worked
          0B A5   97  0486   923        DECB    DPT$B_REFC(R5)           ; It failed, decrement the count
              50   DD  0489   924        PUSHL   R0                       ; Save return code
                        048B   925        ERRSUP_S                         ; Spaz
    00000000'EF   DF  048B                        PUSHAL  $MODULE
              00   DD  0491                        PUSHL   #0
              04   DD  0493                        PUSHL   #$ER
00000000'EF   03   FB  0495                        CALLS   #3, DS_ERRSUP
              50 8ED0  049C   926        POPL    R0                       ; Restore reason
                   04  049F   927 999$:  RET
```

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                                04A0   929          .SBTTL  INI_MBADP       BUILD ADP AND INITIALIZE MBA
                                04A0   930 ;+
                                04A0   931 ; INI_MBADP IS CALLED AFTER MAPPING THE REGISTERS FOR A MASSBUS ADAPTER.
                                04A0   932 ; AN ADAPTER CONTROL BLOCK IS ALLOCATED AND FILLED.  A CRB AND IDB ARE
                                04A0   933 ; ALSO ALLOCATED AND INITIALIZED. THE ADAPTER HARDWARE IS THEN INITIALIZED
                                04A0   934 ; BY CALLING MBA$INITIAL.
                                04A0   935 ;
                                04A0   936 ; INPUT:
                                04A0   937 ;       R3 - TR NUMBER OF MASSBUS ADAPTER
                                04A0   938 ;       R4 - CONFIGURATION REGISTER OF ADAPTER
                                04A0   939 ; OUTPUT:
                                04A0   940 ;       R6 - ADP ADDRESS
                                04A0   941 ;
                                04A0   942 ;-
                                04A0   943
                                04A0   944 INI_MBADP:
                07BC 8F   BB    04A0   945          PUSHR   #^M<R2,R3,R4,R5,R7,R8,R9,R10>
                57   53   D0    04A4   946          MOVL    R3,R7                       ; COPY TR NUMBER
                                04A7   947
                51   38   9A    04A7   948          MOVZBL  #CRB$C_LENGTH,R1            ; SET SIZE OF CRB
                   0614   30    04AA   949          BSBW    QIO$ALLOCATE                ; ALLOCATE SPACE FOR CRB
                  36 50   E9    04AD   950          BLBC    R0,70$                      ; BRANCH IF ALLOCATION FAILED
                5A   52   D0    04B0   951          MOVL    R2,R10                      ; SAVE CRB ADDRESS
             08 AA   51   B0    04B3   952          MOVW    R1,CRB$W_SIZE(R10)          ; SET DATA STRUCTURE SIZE
                                04B7   953
             51   54 8F   9A    04B7   954          MOVZBL  #IDB$C_LENGTH+<8*4>,R1      ; SET SIZE TO ALLOCATE FOR IDB
                   0603   30    04BB   955          BSBW    QIO$ALLOCATE                ; ALLOCATE SPACE FOR IDB
                  1F 50   E9    04BE   956          BLBC    R0,60$                      ; BRANCH IF ALLOCATION FAILED
                59   52   D0    04C1   957          MOVL    R2,R9                       ; COPY ADDRESS OF IDB
             08 A9   51   B0    04C4   958          MOVW    R1,IDB$W_SIZE(R9)           ; SET DATA STRUCTURE SIZE
                                04C8   959
                51   14   9A    04C8   960          MOVZBL  #ADP$C_MBAADPLEN,R1         ; SET SIZE TO ALLOCATE FOR ADP
                   05F3   30    04CB   961          BSBW    QIO$ALLOCATE                ; ALLOCATE SPACE FOR ADP
                  09 50   E9    04CE   962          BLBC    R0,50$                      ; BRANCH IF ALLOCATION FAILED
                56   52   D0    04D1   963          MOVL    R2,R6                       ; ADDRESS OF ADP
             08 A6   51   B0    04D4   964          MOVW    R1,ADP$W_SIZE(R6)           ; SET DATA STRUCTURE SIZE
                   14   11    04D8   965          BRB     100$                        ; ALL ALLOCATED FINISH INITIALIZATION
                                04DA   966
                                04DA   967
                50   59   D0    04DA   968 50$:    MOVL    R9,R0                       ; COPY ADDRESS
                   0604   30    04DD   969          BSBW    QIO$DEALLOCATE              ; RELEASE
                50   5A   D0    04E0   970 60$:    MOVL    R10,R0                      ; COPY ADDRESS OF CRB
                   05FE   30    04E3   971          BSBW    QIO$DEALLOCATE              ; RELEASE
                                04E6   972 70$:
          50    0000'8F   3C    04E6   973          MOVZWL  #SS$_INSFMEM,R0             ; RETURN CODE
                   0091   31    04EB   974          BRW     999$                        ; EXIT
```

```
                                04EE   976 100$:
                                04EE   977          DSBINT                          ; Disable interrupts
                      7E   12   DB  04EE                       MFPR    S^#PR$_IPL,-(SP)
                      12   1F   DA  04F1                       MTPR    #31,S^#PR$_IPL
                           3C   BB  04F4   978          PUSHR   #^M<R2,R3,R4,R5>        ; SAVE MOVC REGISTERS
     14 AA   00000584'EF   10'  28  04F6   979          MOVC3   S^#MBACRBLEN,L^MBACRB,CRB$L_INTD(R10) ; FILL WITH TEMPLATE      [11]
                           3C   BA  04FF   980          POPR    #^M<R2,R3,R4,R5>        ; RESTORE MOVC REGISTERS
                                0501   981
                                0501   982 ; Add offset of X100 or X300 based on SBIA number gleaned from R4.                    ;[17
                                0501   983                                                                                      ;[17
                    0A 54   19  E0  0501   984          BBS     #25,R4,110$             ; CHECK WHICH SBIA 0 OR 1                ;[17
               50   00000100'EF47  DE  0505   985          MOVAL   SCB_BASE+^X100[R7],R0   ; COMPUTE ADDRESS OF FIRST VECTOR (SBIA0);[1
                           08   11  050D   986          BRB     120$                    ; CONTINUE                               ;[17
               50   00000300'EF47  DE  050F   987 110$:   MOVAL   SCB_BASE+^X300[R7],R0   ; COMPUTE ADDRESS OF FIRST VECTOR (SBIA1);[1
                     60   15 AA  DE  0517   988 120$:   MOVAL   CRB$L_INTD+1(R10),(R0)  ; CONNECT VECTOR TO CRB CODE            ;[17
                  40 A0   15 AA  DE  051B   989          MOVAL   CRB$L_INTD+1(R10),64(R0); SAME FOR
               0080 C0   15 AA  DE  0520   990          MOVAL   CRB$L_INTD+1(R10),128(R0); ALL FOUR
               00C0 C0   15 AA  DE  0526   991          MOVAL   CRB$L_INTD+1(R10),192(R0); VECTORS
                     0A AA   05  90  052C   992          MOVB    #DYN$C_CRB,CRB$B_TYPE(R10) ; SET CORRECT TYPE
                        6A   6A  DE  0530   993          MOVAL   CRB$L_WQFL(R10),CRB$L_WQFL(R10) ; INITIALIZE WAIT QUEUE HEADER
                     04 AA   6A  DE  0533   994          MOVAL   CRB$L_WQFL(R10),CRB$L_WQBL(R10) ; FLINK AND BLINK
                     0C AA   08  B0  0537   995          MOVW    #8,CRB$W_REFC(R10)      ; SET REFERENCE COUNT
                                053B   996
                     0A A9   09  90  053B   997          MOVB    #DYN$C_IDB,IDB$B_TYPE(R9); AND TYPE CODE
                     0C A9   08  9B  053F   998          MOVZBW  #8,IDB$W_UNITS(R9)      ; Set count of units
                        69   54  D0  0543   999          MOVL    R4,IDB$L_CSR(R9)        ; SET CSR ADDRESS TO CONFIG REG 0
                     1C AA   59  D0  0546  1000          MOVL    R9,CRB$L_INTD+VEC$L_IDB(R10)    ; SET ADDRESS OF IDB INTO CRB
           20 AA   00000000'9F   9E  054A  1001          MOVAB   @#MBA$INITIAL,CRB$L_INTD+VEC$L_INITIAL(R10) ; SET ADDRESS OF CONTROL
                                0552  1002
                     0A A6   01  90  0552  1003          MOVB    #DYN$C_ADP,ADP$B_TYPE(R6); TYPE CODE
                        66   54  D0  0556  1004          MOVL    R4,ADP$L_CSR(R6)        ; SET ADDRESS OF CONFIGURATION REGISTER
                     0C A6   57  B0  0559  1005          MOVW    R7,ADP$W_TR(R6)         ; SET TR NUMBER OF ADAPTER
                     0E A6   00  B0  055D  1006          MOVW    #AT$_MBA,ADP$W_ADPTYPE(R6); SET ADAPTER TYPE TO MBA
                     10 A6   5A  D0  0561  1007          MOVL    R10,ADP$L_CRB(R6)       ; POINT ADP TO CRB
                     28 AA   56  D0  0565  1008          MOVL    R6,CRB$L_INTD+VEC$L_ADP(R10)    ; SET CRB POINTER TO ADP
                     10 A9   56  D0  0569  1009          MOVL    R6,IDB$L_ADP(R9)        ; AND INTO IDB
                        55   59  D0  056D  1010          MOVL    R9,R5                   ; ADDRESS OF IDB
                           0587   30  0570  1011          BSBW    ADPLINK                 ; LINK ADP TO END OF CHAIN
                  00000000'EF   16  0573  1012          JSB     MBA$INITIAL             ; INITIALIZE MASSBUS ADAPTER
                                0579  1013          ENBINT                          ; Re-enable interrupts
                        12   8E  DA  0579                       MTPR    (SP)+,S^#PR$_IPL
                        50   00' D0  057C  1014          MOVL    S^#SS$_NORMAL,R0        ; SUCCESSFUL
                                057F  1015
                     07BC 8F   BA  057F  1016 999$:   POPR    #^M<R2,R3,R4,R5,R7,R8,R9,R10>; RESTORE ALL REGISTERS
                           05  0583  1017          RSB                             ; RETURN
                                0584  1018
                                0584  1019 MBACRB:                                 ; SKELETON MBA CRB
                           3C   BB  0584  1020          PUSHR   #^M<R2,R3,R4,R5>        ; SAVE REGISTERS
                  00000000'9F   16  0586  1021          JSB     @#MBA$INT               ; CALL INTERRUPT DISPATCHER
                        00000000  058C  1022          .LONG   0                       ; CRB$L_INTD+VEC$L_INTD
                        00000000' 0590  1023          .LONG   MBA$INITIAL             ; CRB$L_INTD+VEC$L_INITIAL
                        00000010  0594  1024 MBACRBLEN=.-MBACRB                      ;
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                                0594  1026          .SBTTL  INI_UBADP       BUILD ADP AND INITIALIZE UBA
                                0594  1027 ;+
                                0594  1028 ; INI_UBADP ALLOCATES AND FILLS IN AN ADAPTER CONTROL BLOCK, INTERRUPT
                                0594  1029 ; DISPATCHER AND CONNECTS THEM TO THE PROPER SCB VECTORS.  A CALL IS
                                0594  1030 ; THEN MADE TO UBA$INITIAL TO INITIALIZE THE ADAPTER HARDWARE.
                                0594  1031 ;
                                0594  1032 ; INPUT:
                                0594  1033 ;       R3 - TR NUMBER
                                0594  1034 ;       R4 - CONFIGURATION REGISTER OF ADAPTER
                                0594  1035 ; OUTPUT:
                                0594  1036 ;       R6 - ADP ADDRESS
                                0594  1037 ; REGISTERS:
                                0594  1038 ;       R4 - ADAPTER CONFIGURATION REGISTER ADDR
                                0594  1039 ;       R6 - ADP ADDRESS
                                0594  1040 ;       R7 - TR NUMBER
                                0594  1041 ;-
                    00000080    0594  1042          NUMUBAVEC = 128                 ; ALLOW FOR 128 UNIBUS VECTORS
                                0594  1043
                                0594  1044 INI_UBADP:
                00BC 8F     BB  0594  1045          PUSHR   #^M<R2,R3,R4,R5,R7>     ; SAVE R2-R7
                57   53     D0  0598  1046          MOVL    R3,R7                   ; COPY TR NUMBER
            51  0270'8F     3C  059B  1047          MOVZWL  #<ADP$C_UBAADPLEN+UBINTSZ+<NUMUBAVEC*4>>,R1
                                05A0  1048                                          ; SET SIZE OF BLOCK TO ALLOCATE
                  051E      30  05A0  1049          BSBW    QIO$ALLOCATE            ; ALLOCATE SPACE FOR ADP
                03 50       E8  05A3  1050          BLBS    R0,10$                  ; EXIT IF ERROR
                  0068      31  05A6  1051          BRW     60$                     ; EXIT ON ERROR
                                05A9  1052 10$:
                                05A9  1053          DSBINT                          ; Disable interrupts
                    7E  12  DB  05A9                        MFPR    S^#PR$_IPL,-(SP)
                    12  1F  DA  05AC                        MTPR    #31,S^#PR$_IPL
                    56  52  D0  05AF  1054          MOVL    R2,R6                   ; COPY ADP ADDRESS
                08  A6  51  B0  05B2  1055          MOVW    R1,ADP$W_SIZE(R6)       ; SET SIZE INTO ADP BLOCK
                0A  A6  01  90  05B6  1056          MOVB    #DYN$C_ADP,ADP$B_TYPE(R6); AND SET TYPE OF BLOCK
                0E  A6  01  B0  05BA  1057          MOVW    #AT$_UBA,ADP$W_ADPTYPE(R6) ; SET TYPE OF ADAPTER
                    66  54  D0  05BE  1058          MOVL    R4,ADP$L_CSR(R6)        ; SET VA OF CONFIGURATION REG
                0C  A6  57  B0  05C1  1059          MOVW    R7,ADP$W_TR(R6)         ; SET TR NUMBER FOR ADAPTER
                50    14 A6  DE  05C5  1060          MOVAL   ADP$L_DPQFL(R6),R0      ; ADDRESS OF DATA PATH WAIT QUEUE
                    60  50  D0  05C9  1061          MOVL    R0,(R0)                 ; INIT QUEUE HEADER
                04  A0  50  D0  05CC  1062          MOVL    R0,4(R0)                ;
                50    1C A6  DE  05D0  1063          MOVAL   ADP$L_MRQFL(R6),R0      ; ADDRESS OF MAP WAIT QUEUE
                    60  50  D0  05D4  1064          MOVL    R0,(R0)                 ; INIT QUEUE HEADER
                04  A0  50  D0  05D7  1065          MOVL    R0,4(R0)                ;
                    50  1E  D0  05DB  1066          MOVL    #30,R0                  ; NUMBER OF WORDS-1 IN MAP BITMAP
            26 A640     01  AE  05DE  1067 20$:     MNEGW   #1,ADP$W_MRBITMAP(R6)[R0] ; SET 16 BITS OF BITMAP
                  F8    50  F4  05E3  1068          SOBGEQ  R0,20$                  ; FILL 31 * 16  => 496 BITS
                  04  A6  D4  05E6  1069          CLRL    ADP$L_LINK(R6)          ; ZAP ADAPTER CHAIN LINK
             00000000'EF  16  05E9  1070          JSB     UBA$INITIAL             ; AND INITIALIZE ADAPTER        ; 19
                  0508    30  05EF  1071          BSBW    ADPLINK                 ; LINK ADP TO END OF LIST
             00000000'EF  16  05F2  1072          JSB     UBADP_CPU               ; CALL CPU DEPENDANT CODE       ; 19
                50    10 A6  D0  05F8  1073          MOVL    ADP$L_VECTOR(R6),R0     ; GET ADDRESS OF VECTOR
            51    0080 8F     3C  05FC  1074          MOVZWL  #NUMUBAVEC,R1           ; SET NUMBER OF VECTORS
        80  00000000'EF     9E  0601  1075 50$:     MOVAB   UBA$UNEXINT,(R0)+       ; FILL VECTOR WITH UNEXPECTED INTERRUPT
                  F6  51    F5  0608  1076          SOBGTR  R1,50$                  ; DO ALL VECTOR POSITIONS
                                060B  1077          ENBINT                          ; Enable interrupts
                    12  8E  DA  060B                        MTPR    (SP)+,S^#PR$_IPL
                    50  01  D0  060E  1078          MOVL    #1,R0                   ; SUCCESS
                                0611  1079 60$:
```

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                00BC 8F    BA  0611  1080          POPR    #^M<R2,R3,R4,R5,R7>     ; RESTORE R2-R7
                           05  0615  1081          RSB                             ; AND RETURN
```

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                     0616  1083          .SBTTL  INI_DRADP       BUILD ADP AND INITIALIZE DRA
                     0616  1084 ;+
                     0616  1085 ; INI_DRADP IS CALLED AFTER MAPPING THE REGISTERS FOR A MASSBUS ADAPTER.
                     0616  1086 ; AN ADAPTER CONTROL BLOCK IS ALLOCATED AND FILLED.  A CRB AND IDB ARE
                     0616  1087 ; ALSO ALLOCATED AND INITIALIZED. THE ADAPTER HARDWARE IS THEN INITIALIZED
                     0616  1088 ; BY CALLING DRA$INITIAL.
                     0616  1089 ;
                     0616  1090 ; INPUT:
                     0616  1091 ;       R3 - TR NUMBER OF MASSBUS ADAPTER
                     0616  1092 ;       R4 - CONFIGURATION REGISTER OF ADAPTER
                     0616  1093 ; OUTPUT:
                     0616  1094 ;       R6 - ADP ADDRESS
                     0616  1095 ;
                     0616  1096 ;-
                     0616  1097
                     0616  1098 INI_DRADP:
          07BC 8F    BB   0616  1099          PUSHR   #^M<R2,R3,R4,R5,R7,R8,R9,R10>
          57   53    D0   061A  1100          MOVL    R3,R7                   ; COPY TR NUMBER
                     061D  1101
          51   38    9A   061D  1102          MOVZBL  #CRB$C_LENGTH,R1        ; SET SIZE OF CRB
               049E  30   0620  1103          BSBW    QIO$ALLOCATE            ; ALLOCATE SPACE FOR CRB
             35 50   E9   0623  1104          BLBC    R0,70$                  ; BRANCH IF ALLOCATION FAILED
          5A   52    D0   0626  1105          MOVL    R2,R10                  ; SAVE CRB ADDRESS
       08 AA   51    B0   0629  1106          MOVW    R1,CRB$W_SIZE(R10)      ; SET DATA STRUCTURE SIZE
                     062D  1107
          51   34    9A   062D  1108          MOVZBL  #IDB$C_LENGTH,R1        ; SET SIZE TO ALLOCATE FOR IDB
               048E  30   0630  1109          BSBW    QIO$ALLOCATE            ; ALLOCATE SPACE FOR IDB
             1F 50   E9   0633  1110          BLBC    R0,60$                  ; BRANCH IF ALLOCATION FAILED
          59   52    D0   0636  1111          MOVL    R2,R9                   ; COPY ADDRESS OF IDB
       08 A9   51    B0   0639  1112          MOVW    R1,IDB$W_SIZE(R9)       ; SET DATA STRUCTURE SIZE
                     063D  1113
          51   14    9A   063D  1114          MOVZBL  #ADP$C_DRADPLEN,R1      ; SET SIZE TO ALLOCATE FOR ADP
               047E  30   0640  1115          BSBW    QIO$ALLOCATE            ; ALLOCATE SPACE FOR ADP
             09 50   E9   0643  1116          BLBC    R0,50$                  ; BRANCH IF ALLOCATION FAILED
          56   52    D0   0646  1117          MOVL    R2,R6                   ; ADDRESS OF ADP
       08 A6   51    B0   0649  1118          MOVW    R1,ADP$W_SIZE(R6)       ; SET DATA STRUCTURE SIZE
               14    11   064D  1119          BRB     100$                    ; ALL ALLOCATED FINISH INITIALIZATION
                     064F  1120
                     064F  1121
          50   59    D0   064F  1122 50$:     MOVL    R9,R0                   ; COPY ADDRESS
               048F  30   0652  1123          BSBW    QIO$DEALLOCATE          ; RELEASE
          50   5A    D0   0655  1124 60$:     MOVL    R10,R0                  ; COPY ADDRESS OF CRB
               0489  30   0658  1125          BSBW    QIO$DEALLOCATE          ; RELEASE
                     065B  1126 70$:
    50    0000'8F    3C   065B  1127          MOVZWL  #SS$_INSFMEM,R0         ; RETURN CODE
               008F  31   0660  1128          BRW     999$                    ; EXIT
```

```
                                0663  1130 100$:
                                0663  1131          DSBINT                          ; Disable interrupts
                7E   12   DB    0663                        MFPR    S^#PR$_IPL,-(SP)
                12   1F   DA    0666                        MTPR    #31,S^#PR$_IPL
                     3C   BB    0669  1132          PUSHR   #^M<R2,R3,R4,R5>        ; SAVE MOVC REGISTERS
       14 AA  06F7'CF    10'   28  066B  1133          MOVC3   S^#DRACRBLEN,W^DRACRB,CRB$L_INTD(R10) ; FILL WITH TEMPLATE
                     3C   BA    0672  1134          POPR    #^M<R2,R3,R4,R5>        ; RESTORE MOVC REGISTERS
                                0674  1135
                                0674  1136 ; Add offset of X100 or X300 based on SBIA number gleaned from R4.              [18]
                                0674  1137
          0A 54      19   E0    0674  1138          BBS     #25,R4,110$             ; CHECK WHICH SBIA 0 OR 1                [18]
    50  00000100'EF47   DE    0678  1139          MOVAL   SCB_BASE+^X100[R7],R0   ; COMPUTE ADDRESS OF FIRST VECTOR (SBIA0)[18
                   08   11    0680  1140          BRB     120$                    ; CONTINUE                               [18]
    50  00000300'EF47   DE    0682  1141 110$:    MOVAL   SCB_BASE+^X300[R7],R0   ; COMPUTE ADDRESS OF FIRST VECTOR (SBIA1)[18
          60   15 AA    DE    068A  1142 120$:    MOVAL   CRB$L_INTD+1(R10),(R0)  ; CONNECT VECTOR TO CRB CODE
       40 A0   15 AA    DE    068E  1143          MOVAL   CRB$L_INTD+1(R10),64(R0); SAME FOR
    0080 C0    15 AA    DE    0693  1144          MOVAL   CRB$L_INTD+1(R10),128(R0); ALL FOUR
    00C0 C0    15 AA    DE    0699  1145          MOVAL   CRB$L_INTD+1(R10),192(R0); VECTORS
          0A AA    05    90  069F  1146          MOVB    #DYN$C_CRB,CRB$B_TYPE(R10) ; SET CORRECT TYPE
             6A    6A    DE  06A3  1147          MOVAL   CRB$L_WQFL(R10),CRB$L_WQFL(R10) ; INITIALIZE WAIT QUEUE HEADER
          04 AA    6A    DE  06A6  1148          MOVAL   CRB$L_WQFL(R10),CRB$L_WQBL(R10) ; FLINK AND BLINK
          0C AA    08    B0  06AA  1149          MOVW    #8,CRB$W_REFC(R10)      ; SET REFERENCE COUNT
                                06AE  1150
          0A A9    09    90  06AE  1151          MOVB    #DYN$C_IDB,IDB$B_TYPE(R9); AND TYPE CODE
          0C A9    01    9B  06B2  1152          MOVZBW  #1,IDB$W_UNITS(R9)      ; Set count of units
             69    54    D0  06B6  1153          MOVL    R4,IDB$L_CSR(R9)        ; SET CSR ADDRESS TO CONFIG REG 0
          1C AA    59    D0  06B9  1154          MOVL    R9,CRB$L_INTD+VEC$L_IDB(R10)    ; SET ADDRESS OF IDB INTO CRB
    20 AA  00000000'9F    9E  06BD  1155          MOVAB   @#DR$INITIAL,CRB$L_INTD+VEC$L_INITIAL(R10) ; SET ADDRESS OF CONTROLL
                                06C5  1156
          0A A6    01    90  06C5  1157          MOVB    #DYN$C_ADP,ADP$B_TYPE(R6); TYPE CODE
             66    54    D0  06C9  1158          MOVL    R4,ADP$L_CSR(R6)        ; SET ADDRESS OF CONFIGURATION REGISTER
          0C A6    57    B0  06CC  1159          MOVW    R7,ADP$W_TR(R6)         ; SET TR NUMBER OF ADAPTER
          0E A6    02    B0  06D0  1160          MOVW    #AT$_DR,ADP$W_ADPTYPE(R6); SET ADAPTER TYPE TO DRA
          10 A6    5A    D0  06D4  1161          MOVL    R10,ADP$L_CRB(R6)       ; POINT ADP TO CRB
          28 AA    56    D0  06D8  1162          MOVL    R6,CRB$L_INTD+VEC$L_ADP(R10)    ; SET CRB POINTER TO ADP
          10 A9    56    D0  06DC  1163          MOVL    R6,IDB$L_ADP(R9)        ; AND INTO IDB
             55    59    D0  06E0  1164          MOVL    R9,R5                   ; ADDRESS OF IDB
                0414    30  06E3  1165          BSBW    ADPLINK                 ; LINK ADP TO END OF CHAIN
    00000000'EF         16  06E6  1166          JSB     DR$INITIAL              ; INITIALIZE MASSBUS ADAPTER
                                06EC  1167          ENBINT                          ; Re-enable interrupts
             12   8E   DA    06EC                        MTPR    (SP)+,S^#PR$_IPL
             50   00'  D0    06EF  1168          MOVL    S^#SS$_NORMAL,R0        ; SUCCESSFUL
                                06F2  1169
          07BC 8F      BA    06F2  1170 999$:    POPR    #^M<R2,R3,R4,R5,R7,R8,R9,R10>; RESTORE ALL REGISTERS
                   05   06F6  1171          RSB                             ; RETURN
                                06F7  1172
                                06F7  1173 DRACRB:                                 ; SKELETON DRA CRB
                     3C   BB    06F7  1174          PUSHR   #^M<R2,R3,R4,R5>        ; SAVE REGISTERS
    00000000'9F         16  06F9  1175          JSB     @#DR$INT                ; CALL INTERRUPT DISPATCHER
                00000000  06FF  1176          .LONG   0                       ; CRB$L_INTD+VEC$L_INTD
                00000000' 0703  1177          .LONG   DR$INITIAL              ; CRB$L_INTD+VEC$L_INITIAL
                00000010  0707  1178 DRACRBLEN=.-DRACRB                        ;
```

```
                                0707          .SBTTL  MAXIMIZE ACCESS MODE
                                0707  ;+
                                0707  ; EXE$MAXACMODE - MAXIMIZE ACCESS MODE
                                0707  ;
                                0707  ; THIS ROUTINE IS CALLED TO MAXIMIZE A SPECIFIED ACCESS MODE WITH THE PREVIOUS
                                0707  ; MODE FIELD OF THE CURRENT PSL.
                                0707  ;
                                0707  ; INPUTS:
                                0707  ;
                                0707  ;       R0 = ACCESS MODE TO MAXIMIZE WITH PREVIOUS MODE FIELD OF PSL.
                                0707  ;
                                0707  ; OUTPUTS:
                                0707  ;
                                0707  ;       THE SPECIFIED ACCESS MODE IS MAXIMIZED WITH THE PREVIOUS MODE FIELD
                                0707  ;       OF THE CURRENT PSL AND RETURNED IN REGISTER R0.
                                0707  ;
                                0707  ;       REGISTERS R2 AND R3 ARE PRESERVED ACROSS CALL.
                                0707  ;-
                                0707
                                0707  EXE$MAXACMODE::                                   ;MAXIMIZE ACCESS MODE
                     51   DC    0707          MOVPSL  R1                                ;READ CURRENT PSL
50   51   02   16   ED    0709          CMPZV   #PSL$V_PRVMOD,#PSL$S_PRVMOD,R1,R0 ;COMPARE WITH PREVIOUS MODE
                     05   15    070E          BLEQ    10$                               ;IF LEQ SPECIFIED ACCESS MODE LESS PRIVILEGE
50   51   02   16   EF    0710          EXTZV   #PSL$V_PRVMOD,#PSL$S_PRVMOD,R1,R0 ;EXTRACT PREVIOUS MODE FIELD
                     05    0715  10$:    RSB                                       ;
```

```
                        0716  1206          .SBTTL  BUG$CHECK       Bugcheck notification routine
                        0716  1207 ;++
                        0716  1208 ;
                        0716  1209 ; Functional Description:
                        0716  1210 ;
                        0716  1211 ;       This routine types the text of the VMS bugcheck and is equivalent
                        0716  1212 ;       to a supervisor ERRSUP
                        0716  1213 ;
                        0716  1214 ; Calling Sequence:
                        0716  1215 ;       BSBW    BUG$CHECK
                        0716  1216 ;       .ASCIC  "error text"
                        0716  1217 ;
                        0716  1218 ; Input Parameters:
                        0716  1219 ;       a(SP)   -> ASCIC explaination
                        0716  1220 ;
                        0716  1221 ; Implicit Inputs:
                        0716  1222 ;       NONE
                        0716  1223 ;
                        0716  1224 ; Output Parameters:
                        0716  1225 ;       NONE
                        0716  1226 ;
                        0716  1227 ; Implicit Outputs:
                        0716  1228 ;       NONE
                        0716  1229 ;
                        0716  1230 ; Side Effects:
                        0716  1231 ;       NONE
                        0716  1232 ;
                        0716  1233 ;--
                        0716  1234
                        0716  1235 BUG$CHECK::
        50   6E   D0   0716  1236          MOVL    (SP),R0                         ; GET ADDRESS OF TEXT
0000FE00 9F   01   C8   0719  1237          BISL    #DSA$M_HALT,a#DSA$GL_FLAGS ; Force Halt on error                [12]
                        0720  1238          ERRSUP_S ,(R0)
    00000000'EF   DF   0720                         PUSHAL  $MODULE
                60   DF   0726                         PUSHAL  (R0)
                05   DD   0728                         PUSHL   #$ER
00000000'EF     03   FB   072A                         CALLS   #3, DS_ERRSUP
                E3   11   0731  1239          BRB     BUG$CHECK                       ; CAN'T CONTINUE
```

```
0733  1241          .SBTTL  QIO$LOAD_DB     Insert unit into data base
0733  1242 ;++
0733  1243 ; FUNCTIONAL DESCRIPTION:
0733  1244 ;
0733  1245 ;       This routine will load a single unit into an already existing
0733  1246 ;       database.
0733  1247 ;
0733  1248 ; CALLING SEQUENCE:
0733  1249 ;
0733  1250 ;       CALL QIO$LOAD_DB(ACF_LIST)
0733  1251 ;
0733  1252 ; INPUT PARAMETERS:
0733  1253 ;
0733  1254 ;       ACF_LIST -
0733  1255 ;
0733  1256 ;       ACF$L_ADAPTER(AP) = ADDRESS OF ADAPTER CONTROL BLOCK
0733  1257 ;       ACF$L_CONFIGREG(AP) = ADDRESS OF CONFIGURATION STATUS REGISTER
0733  1258 ;       ACF$W_AVECTOR(AP) = OFFSET TO ADAPTER INTERRUPT VECTOR (SCB)
0733  1259 ;       ACF$B_AUNIT(AP) = ADAPTER UNIT NUMBER
0733  1260 ;       ACF$B_AFLAG(AP) = ADAPTER GENERATION CONTROL FLAGS
0733  1261 ;       ACF$L_CONTRLREG(AP) = ADDRESS OF CONTROL REGISTER
0733  1262 ;       ACF$W_CVECTOR(AP) = OFFSET TO CONTROLLER INTERRUPT VECTOR (TABLE)
0733  1263 ;       ACF$B_CUNIT(AP) = CONTROLLER UNIT NUMBER
0733  1264 ;       ACF$B_CNUMVEC(AP) = NUMBER OF CONTROLLER VECTORS
0733  1265 ;       ACF$L_DEVNAME(AP) = ADDRESS OF DEVICE NAME COUNTED STRING
0733  1266 ;       ACF$L_DRVNAME(AP) = ADDRESS OF DRIVER NAME COUNTED STRING
0733  1267 ;
0733  1268 ; IMPLICIT INPUTS:
0733  1269 ;
0733  1270 ;       NONE
0733  1271 ;
0733  1272 ; OUTPUT PARAMETERS:
0733  1273 ;
0733  1274 ;       NONE
0733  1275 ;
0733  1276 ; IMPLICIT OUTPUTS:
0733  1277 ;
0733  1278 ;       DATABASE LOADED
0733  1279 ;
0733  1280 ; COMPLETION CODES:
0733  1281 ;
0733  1282 ;       R0 = STATUS OF OPERATION
0733  1283 ;
0733  1284 ; SIDE EFFECTS:
0733  1285 ;
0733  1286 ;       NONE
0733  1287 ;
0733  1288 ;--
```

```
                          0733  1290 QIO$LOAD_DB:
                    0FFC  0733  1291         .WORD   ^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>
                          0735  1292
          00000005'EF   94  0735  1293         CLRB    L^LOAD_FLAGS            ;CLEAR LOADER FLAGS                    [11]
                 030D   30  073B  1294         BSBW    IOGEN$LOCK_IODB         ;LOCK THE I/O DATABASE
                          073E  1295 ;
                          073E  1296 ; LOCATE THE DPT FOR THIS DRIVER
                          073E  1297 ;
           53   18 AC   D0  073E  1298         MOVL    ACF$L_DRVNAME(AP),R3    ; Address of driver name
              52   83   9A  0742  1299         MOVZBL  (R3)+,R2                ; Get length of driver
                 FA19   30  0745  1300         BSBW    LOC$DPT                 ; Locate driver dispatch table
                21 50   E8  0748  1301         BLBS    R0,15$                  ; Branch if found
                          074B  1302
           51   14 AC   9E  074B  1303         MOVAB   ACF$L_DEVNAME(AP),R1    ; ADDRESS OF ASCIC DEVICE NAME
              50   81   9A  074F  1304         MOVZBL  (R1)+,R0                ; GET LENGTH
                   03   BB  0752  1305         PUSHR   #^M<R0,R1>              ; STACK LENGTH,ADDRESS
          00000046'EF   9F  0754  1306         PUSHAB  L^T_NODRIVER            ; ADDRESS OF ASCIC EDT TEXT            [11]
              7E   01   9A  075A  1307         movzbl  #ds$k_printf,-(sp)      ; Use PRINTF                           [13]
              7E   22   98  075D  1308         cvtbl   #ds$k_type_qio_nodriver,-(sp)   ; code                         [13]
    00000000'GF   05   FB  0760  1309         CALLS   #5, G^DSX$PRINT         ; DRIVER FOR DEVICE NOT FOUND          [13]
                   50   D4  0767  1310         CLRL    R0                      ; ERROR
                 026D   31  0769  1311         BRW     DB_ERROR
                          076C  1312 ;
                          076C  1313 ; CHECK IF DEVICE DATABASE ALREADY LOADED
                          076C  1314 ;
           55   14 AC   D0  076C  1315 15$:    MOVL    ACF$L_DEVNAME(AP),R5    ;GET ADDR OF DEVICE NAME
              54   85   9A  0770  1316         MOVZBL  (R5)+,R4                ;GET SIZE OF DEVICE NAME
      5A   00000000'GF   DE  0773  1317         MOVAL   G^IOC$GL_DEVLIST,R10    ;GET ADDR OF DEVICE LISTHEAD
                   6A   D5  077A  1318 20$:    TSTL    DDB$L_LINK(R10)         ;IS THERE A NEXT DDB?
                   31   13  077C  1319         BEQL    CREATE_DDB              ;BR IF NOT - CREATE A NEW DDB
              5A   6A   D0  077E  1320         MOVL    DDB$L_LINK(R10),R10     ;GET ADDR OF NEXT DDB
           51   14 AA   9E  0781  1321         MOVAB   DDB$T_NAME(R10),R1      ;GET ADDR OF DEVICE NAME
              50   81   9A  0785  1322         MOVZBL  (R1)+,R0                ;GET SIZE OF DEVICE NAME
65    54   00   61   50   2D  0788  1323         CMPC5   R0,(R1),#0,R4,(R5)      ;COMPARE DEVICE NAMES
                   EA   12  078E  1324         BNEQ    20$                     ;BR IF NOT EQUAL
                          0790  1325
           50   04 AA   D0  0790  1326         MOVL    DDB$L_UCB(R10),R0       ;GET ADDR OF FIRST UCB
           59   20 A0   D0  0794  1327         MOVL    UCB$L_CRB(R0),R9        ;GET ADDR OF CRB
           58   1C A9   D0  0798  1328         MOVL    CRB$L_INTD+VEC$L_IDB(R9),R8 ;GET ADDR OF IDB
        48 A0   12 AC   91  079C  1329 30$:    CMPB    ACF$B_CUNIT(AP),UCB$W_UNIT(R0) ;IS UCB ALREADY LOADED?
                   03   12  07A1  1330         BNEQ    40$                     ;BR IF NOT
                 022C   31  07A3  1331         BRW     DB_EXIT                 ;ELSE NOTHING TO DO - EXIT
           50   2C A0   D0  07A6  1332 40$:    MOVL    UCB$L_LINK(R0),R0       ;GET ADDR OF NEXT UCB
                   F0   12  07AA  1333         BNEQ    30$                     ;BR IF THERE IS ONE
                  0129  31  07AC  1334         BRW     CREATE_UCB              ;CREATE THE NEW UCB
                          07AF  1335 ;
                          07AF  1336 ; CREATE THE DDB
                          07AF  1337 ;
                          07AF  1338 CREATE_DDB:
              51   34   9A  07AF  1339         MOVZBL  #DDB$K_LENGTH,R1        ;GET SIZE OF DDB
                 030C   30  07B2  1340         BSBW    QIO$ALLOCATE            ;CREATE THE DDB
                03 50   E8  07B5  1341         BLBS    R0,10$                  ;BR IF SUCCESS
                 021E   31  07B8  1342         BRW     DB_ERROR                ;ELSE - ERROR
    00000005'EF   01   88  07BB  1343 10$:    BISB    #LOAD_M_DDB,L^LOAD_FLAGS ;SET DDB LOADED FLAG                  [11]
    00000006'EF   6A   DE  07C2  1344         MOVAL   DDB$L_LINK(R10),L^DDB_BLINK ;SAVE DDB BACKWARD LINK            [11]
              6A   52   D0  07C9  1345         MOVL    R2,DDB$L_LINK(R10)      ;SET LINK TO THIS DDB
              5A   52   D0  07CC  1346         MOVL    R2,R10                  ;GET ADDR OF DDB
```

```
                08 AA    51    B0   07CF  1347          MOVW    R1,DDB$W_SIZE(R10)          ;SET SIZE
                0A AA    06    90   07D3  1348          MOVB    #DYN$C_DDB,DDB$B_TYPE(R10) ;SET TYPE
                     0B AB    96   07D7  1349          INCB    DPT$B_REFC(R11)             ;INCREMENT DPT REFERENCE COUNT
                50   14 BC    9A   07DA  1350          MOVZBL  @ACF$L_DEVNAME(AP),R0       ;GET SIZE OF DEVICE NAME
                         50   D6   07DE  1351          INCL    R0                          ;ADD 1 BYTE FOR COUNT
          14 AA 14 BC    50   28   07E0  1352          MOVC    R0,@ACF$L_DEVNAME(AP),DDB$T_NAME(R10) ;SET DEVICE NAME
                50   18 BC    9A   07E6  1353          MOVZBL  @ACF$L_DRVNAME(AP),R0       ;GET SIZE OF DRIVER NAME
                         50   D6   07EA  1354          INCL    R0                          ;ADD 1 BYTE FOR COUNT
          24 AA 18 BC    50   28   07EC  1355          MOVC    R0,@ACF$L_DRVNAME(AP),DDB$T_DRVNAME(R10) ;SET DRIVER NAME
                               07F2  1356 ;
                               07F2  1357 ; CHECK IF CRB/IDB NEED TO BE CREATED
                               07F2  1358 ;
             14 0D AB    00    E0   07F2  1359          BBS     #DPT$V_SUBCNTRL,DPT$B_FLAGS(R11),CREATE_CRB ;BR IF SUBCONTROLLER
                0C AB    01    91   07F7  1360          CMPB    #AT$_UBA,DPT$B_ADPTYPE(R11) ;UBA DEVICE?
                         0E    13   07FB  1361          BEQL    CREATE_CRB                  ;BR IF YES
                50   6C    D0   07FD  1362          MOVL    ACF$L_ADAPTER(AP),R0        ;GET ADDR OF ADP
                59   10 A0    D0   0800  1363          MOVL    ADP$L_CRB(R0),R9            ;GET ADDR OF EXISTING CRB
                58   1C A9    D0   0804  1364          MOVL    CRB$L_INTD+VEC$L_IDB(R9),R8 ;GET ADDR OF IDB
                     00CD    31   0808  1365          BRW     CREATE_UCB                  ;CREATE A NEW UCB
                               080B  1366 ;
                               080B  1367 ; CREATE CRB
                               080B  1368 ;
                               080B  1369 CREATE_CRB:
                51   13 AC    9A   080B  1370          MOVZBL  ACF$B_CNUMVEC(AP),R1        ;GET NUMBER OF INT VECTORS
                         51    D7   080F  1371          DECL    R1                          ;ONE IS ALWAYS ASSUMED
                     51   24    A4   0811  1372          MULW    #VEC$K_LENGTH,R1            ;COMPUTE SIZE OF EXTRA DISPATCHERS
                     51   38    A0   0814  1373          ADDW    #CRB$K_LENGTH,R1            ;COMPUTE TOTAL SIZE OF CRB
                        02A7    30   0817  1374          BSBW    QIO$ALLOCATE                ;ALLOCATE THE CRB
                      03 50     E8   081A  1375          BLBS    R0,10$                      ;BR IF SUCCESS
                       01B9    31   081D  1376          BRW     DB_ERROR                    ;ELSE - ERROR
00000005'EF           02    88   0820  1377 10$:     BISB    #LOAD_M_CRB,L^LOAD_FLAGS ;SET CRB LOADED FLAG                    [11]
                59   52    D0   0827  1378          MOVL    R2,R9                       ;GET ADDR OF CRB
             08 A9   51    B0   082A  1379          MOVW    R1,CRB$W_SIZE(R9)           ;SET SIZE
             0A A9   05    90   082E  1380          MOVB    #DYN$C_CRB,CRB$B_TYPE(R9) ;SET TYPE
             69   69    DE   0832  1381          MOVAL   CRB$L_WQFL(R9),CRB$L_WQFL(R9) ;SET WAIT QUEUE LISTHEAD
             04 A9   69    DE   0835  1382          MOVAL   CRB$L_WQFL(R9),CRB$L_WQBL(R9) ;..
          19 0D AB   00    E1   0839  1383          BBC     #DPT$V_SUBCNTRL,DPT$B_FLAGS(R11),CREATE_IDB ;BR IF NOT SUBCONTROLLER
                50   6C    D0   083E  1384          MOVL    ACF$L_ADAPTER(AP),R0        ;GET ADDR OF ADAPTER CONTROL BLOCK
             51   10 A0    D0   0841  1385          MOVL    ADP$L_CRB(R0),R1            ;GET ADDR OF SECONDARY CRB
             10 A9   51    D0   0845  1386          MOVL    R1,CRB$L_LINK(R9)           ;SET ADDR OF SECONDARY CRB
             52   1C A1    D0   0849  1387          MOVL    CRB$L_INTD+VEC$L_IDB(R1),R2 ;GET ADDR OF SECONDARY IDB
             53   0A AC    9A   084D  1388          MOVZBL  ACF$B_AUNIT(AP),R3          ;GET ADAPTER UNIT NUMBER
          14 A243 15 A9    9E   0851  1389          MOVAB   CRB$L_INTD+1(R9),IDB$L_UCBLST(R2)[R3] ;SET ADDR OF DISPATCHER
                               0857  1390 ;
                               0857  1391 ; CREATE IDB
                               0857  1392 ;
                               0857  1393 CREATE_IDB:
                51   34    9A   0857  1394          MOVZBL  #IDB$K_LENGTH,R1            ;SET LENGTH OF IDB
                     0264    30   085A  1395          BSBW    QIO$ALLOCATE                ;ALLOCATE THE IDB
                      03 50     E8   085D  1396          BLBS    R0,10$                      ;BR IF SUCCESS
                       C176    31   0860  1397          BRW     DB_ERROR                    ;ELSE - ERROR
00000005'EF           04    88   0863  1398 10$:     BISB    #LOAD_M_IDB,L^LOAD_FLAGS ;SET IDB LOADED FLAG                    [11]
                58   52    D0   086A  1399          MOVL    R2,R8                       ;GET ADDR OF IDB
             08 A8   51    B0   086D  1400          MOVW    R1,IDB$W_SIZE(R8)           ;SET SIZE
             0A A8   09    90   0871  1401          MOVB    #DYN$C_IDB,IDB$B_TYPE(R8) ;SET TYPE
             10 A8   6C    D0   0875  1402          MOVL    ACF$L_ADAPTER(AP),IDB$L_ADP(R8) ;SET ADDR OF ADP
             68   0C AC    D0   0879  1403          MOVL    ACF$L_CONTRLREG(AP),IDB$L_CSR(R8) ;SET ADDR OF CSR
```

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                0C A8   08   9B  087D  1404          MOVZBW  #8,IDB$W_UNITS(R8)      ; Always set up for 8 units
                                  0881  1405 ;
                                  0881  1406 ; CREATE INTERRUPT VECTOR DISPATCHER(S)
                                  0881  1407 ;
                                  0881  1408 CREATE_VEC:
                56   10 AC   32   0881  1409          CVTWL   ACF$W_CVECTOR(AP),R6    ;GET VECTOR TABLE OFFSET
                        0A   14   0885  1410          BGTR    5$                      ;BR IF VECTOR SPECIFIED
             50   007C802A 8F   D0   0887  1411          MOVL    #SYSG$_INVVEC,R0        ;SET INVALID VECTOR ERROR
                      0148   31   088E  1412          BRW     DB_ERROR                ;...EXIT
                55   13 AC   9A   0891  1413 5$:      MOVZBL  ACF$B_CNUMVEC(AP),R5    ;GET NUMBER OF INTERRUPT VECTORS
                54   14 A9   DE   0895  1414          MOVAL   CRB$L_INTD(R9),R4       ;GET ADDR OF FIRST DISPATCHER
             64   0000003C'EF   D0   0899  1415 10$:     MOVL    L^MBINT_DISP,VEC$Q_DISPATCH(R4) ;SET "PUSHR #^M<R2,R3,R4,R5>"   [11]
                                  08A0  1416                                          ; AND "JSB @#"
                14 A4   6C   D0   08A0  1417          MOVL    ACF$L_ADAPTER(AP),VEC$L_ADP(R4) ;SET ADDR OF ADP
                08 A4   58   D0   08A4  1418          MOVL    R8,VEC$L_IDB(R4)        ;SET ADDR OF IDB
                0C AB   01   91   08A8  1419          CMPB    #AT$_UBA,DPT$B_ADPTYPE(R11) ;UBA DEVICE?
                        21   12   08AC  1420          BNEQ    30$                     ;BR IF NOT
                   50   6C   D0   08AE  1421          MOVL    ACF$L_ADAPTER(AP),R0    ;GET ADDR OF ADP
                50   56   10 A0   C1   08B1  1422          ADDL3   ADP$L_VECTOR(R0),R6,R0  ;GET ADDR OF VECTOR TABLE ENTRY
             60   00000000'8F   D1   08B6  1423          CMPL    #UBA$UNEXINT,(R0)       ;IS VECTOR IN USE?
                        0A   13   08BD  1424          BEQL    20$                     ;BR IF NOT
             50   007C801A 8F   D0   08BF  1425          MOVL    #SYSG$_VECINUSE,R0      ;SET ERROR STATUS
                      0110   31   08C6  1426          BRW     DB_ERROR                ;...EXIT
                                  08C9  1427 20$:
                00000000'EF   16   08C9  1428          JSB     IOGEN$CONN_VEC          ; CONNECT UB DEVICE VECTOR      ; 19
                   56   04   C0   08CF  1429 30$:     ADDL    #4,R6                   ;INCREMENT VECTOR OFFSET
                   54   24   C0   08D2  1430          ADDL    #VEC$K_LENGTH,R4        ;INCREMENT DISPATCH ADDR
                     C1 55   F5   08D5  1431          SOBGTR  R5,10$                  ;DECREMENT VECTOR COUNT - BR IF MORE
                                  08D8  1432 ;
                                  08D8  1433 ; CREATE A UCB
                                  08D8  1434 ;
                                  08D8  1435 CREATE_UCB:
                51   0E AB   3C   08D8  1436          MOVZWL  DPT$W_UCBSIZE(R11),R1   ;GET SIZE OF UCB
                      01E2   30   08DC  1437          BSBW    QIO$ALLOCATE            ;ALLOCATE THE UCB
                     03 50   E8   08DF  1438          BLBS    R0,5$                   ;BR IF SUCCESS
                      00F4   31   08E2  1439          BRW     DB_ERROR                ;ELSE - ERROR
          00000005'EF   08   88   08E5  1440 5$:      BISB    #LOAD_M_UCB,L^LOAD_FLAGS ;SET UCB LOADED FLAG                   [11]
                57   52   D0   08EC  1441          MOVL    R2,R7                   ;GET ADDR OF UCB
                08 A7   51   B0   08EF  1442          MOVW    R1,UCB$W_SIZE(R7)       ;SET SIZE
                0A A7   10   90   08F3  1443          MOVB    #DYN$C_UCB,UCB$B_TYPE(R7) ;SET TYPE
             0C A7   0C A7   DE   08F7  1444          MOVAL   UCB$L_ASTQFL(R7),UCB$L_ASTQFL(R7) ;SET AST QUEUE LISTHEAD
             10 A7   0C A7   DE   08FC  1445          MOVAL   UCB$L_ASTQFL(R7),UCB$L_ASTQBL(R7) ;...
                20 A7   59   D0   0901  1446          MOVL    R9,UCB$L_CRB(R7)        ;SET ADDR OF CRB
                   0C A9   B6   0905  1447          INCW    CRB$W_REFC(R9)          ;INCREMENT CRB REFERENCE COUNT
                50   12 AC   9A   0908  1448          MOVZBL  ACF$B_CUNIT(AP),R0      ;GET CONTROLLER UNIT NUMBER
                 14 A840   57   D0   090C  1449          MOVL    R7,IDB$L_UCBLST(R8)[R0] ;SET ADDR OF UCB IN IDB
                24 A7   5A   D0   0911  1450          MOVL    R10,UCB$L_DDB(R7)       ;SET ADDR OF DDB
             40 A7   40 A7   DE   0915  1451          MOVAL   UCB$L_IOQFL(R7),UCB$L_IOQFL(R7) ;SET I/O QUEUE LISTHEAD
             44 A7   40 A7   DE   091A  1452          MOVAL   UCB$L_IOQFL(R7),UCB$L_IOQBL(R7) ;...
             48 A7   12 AC   9B   091F  1453          MOVZBW  ACF$B_CUNIT(AP),UCB$W_UNIT(R7) ;SET UNIT NUMBER
             74 A7   0A AC   90   0924  1454          MOVB    ACF$B_AUNIT(AP),UCB$B_SLAVE(R7) ;SET SLAVE CNTRLER NUMBER
                                  0929  1455
                51   04 AA   DE   0929  1456          MOVAL   DDB$L_UCB(R10),R1       ;GET ADDR OF ADDR OF FIRST UCB
                   50   61   D0   092D  1457          MOVL    (R1),R0                 ;GET ADDR OF FIRST UCB
                        09   13   0930  1458          BEQL    20$                     ;BR IF NONE
                51   2C A0   DE   0932  1459 10$:     MOVAL   UCB$L_LINK(R0),R1       ;GET ADDR OF ADDR OF NEXT UCB
                   50   61   D0   0936  1460          MOVL    (R1),R0                 ;GET ADDR OF NEXT UCB
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```
                F7   12  0939  1461          BNEQ    10$                             ;BR IF IT EXISTS
      0000000A'EF   51   D0  093B  1462 20$:  MOVL    R1,L^UCB_BLINK                  ;SAVE UCB BACKWARD LINK                 [11]
            61   57   D0  0942  1463          MOVL    R7,(R1)                         ;SET FORWARD LINK TO UCB
                           0945  1464
                           0945  1465 ;
                           0945  1466 ; INITIALIZE ALL THE CONTROL BLOCKS
                           0945  1467 ;
                           0945  1468 INIT_DB:
            54   5B   D0  0945  1469          MOVL    R11,R4                          ;SET ADDR OF DRIVER PROLOGUE
            55   57   D0  0948  1470          MOVL    R7,R5                           ;SET ADDR OF UCB
      00000000'EF   16  094B  1471          JSB     IOC$INITDRV                             ; Init the control blocks       [11]
   58 A5    0800 8F   A8  0951  1472          BISW    #UCB$M_VALID,UCB$W_STS(R5);FORCE SOFTWARE VOLUME VALID
         0A 50   E8  0957  1473          BLBS    R0,INIT_CNTRL                   ;BR IF SUCCESS
   50    007C800A 8F   D0  095A  1474          MOVL    #SYSG$_INVDPTINI,R0             ;SET ERROR STATUS
         0075   31   0961  1475          BRW     DB_ERROR                        ;...EXIT
                           0964  1476 ;
                           0964  1477 ; CALL THE CONTROLLER AND DRIVE INITIALIZATION ROUTINES
                           0964  1478 ;
                           0964  1479 INIT_CNTRL:
                           0964  1480          DSBINT                                  ;DISABLE INTERRUPTS
            7E   12   DB  0964                        MFPR    S^#PR$_IPL,-(SP)
            12   1F   DA  0967                        MTPR    #31,S^#PR$_IPL
   06 00000005'EF   01   E1  096A  1481          BBC     #LOAD_V_CRB,L^LOAD_FLAGS,INIT_UNIT ;BR IF CRB NOT JUST CREATED  [11]
            56   5A   D0  0972  1482          MOVL    R10,R6                          ;SET ADDR OF DDB
               00DB   30  0975  1483          BSBW    IOGEN$CNTRL_INI                 ;INITIALIZE THE CONTROLLER
                           0978  1484
                           0978  1485 INIT_UNIT:
            55   57   D0  0978  1486          MOVL    R7,R5                           ;GET ADDR OF UCB
            54   68   D0  097B  1487          MOVL    IDB$L_CSR(R8),R4                ;GET ADDR OF CSR
            53   54   D0  097E  1488          MOVL    R4,R3                           ;ASSUME ONLY ONE CSR
      50    10 A9   D0  0981  1489          MOVL    CRB$L_LINK(R9),R0               ;GET ADDR OF SECONDARY CRB
            07   13  0985  1490          BEQL    10$                             ;BR IF NONE
      50    1C A0   D0  0987  1491          MOVL    CRB$L_INTD+VEC$L_IDB(R0),R0 ;GET ADDR OF SECONDARY IDB
            54   60   D0  098B  1492          MOVL    IDB$L_CSR(R0),R4                ;GET SECONDARY CSR ADDR
      0C AB    01   91  098E  1493 10$:   CMPB    #AT$_UBA,DPT$B_ADPTYPE(R11) ;UBA DEVICE?
            18   12  0992  1494          BNEQ    20$                             ;BR IF NOT
            56   6C   D0  0994  1495          MOVL    ACF$L_ADAPTER(AP),R6            ;GET ADDR OF ADP
            56   66   D0  0997  1496          MOVL    ADP$L_CSR(R6),R6                ;GET ADDR OF adapter CSR
            50   56   D0  099A  1497          MOVL    R6,R0
      00000000'EF   16  099D  1498          JSB     IO$TESTCSR_L                    ; CHECK FOR NONEX CSR   ; 19
         06 50   E8  09A3  1499          BLBS    R0,20$                          ; BRANCH IF CSR EXISTS
      58 A7    10   AA  09A6  1500          BICW    #UCB$M_ONLINE,UCB$W_STS(R7) ;SET DEVICE OFFLINE
            23   11  09AA  1501          BRB     30$                             ;
      50    0C AA   D0  09AC  1502 20$:   MOVL    DDB$L_DDT(R10),R0               ; GET ADDRESS OF DDT
      51    18 A0   D0  09B0  1503          MOVL    DDT$L_UNITINIT(R0),R1           ; GET OFFSET OF UNIT CODE
      03 51    10   E0  09B4  1504          BBS     #16,R1,25$                      ; BRANCH IF ABSOLUTE SUPERVISOR ADDR
            51   50   C0  09B8  1505          ADDL    R0,R1                           ; ADD IN BASE ADDRESS
00000000'8F   51   D1  09BB  1506 25$:   CMPL    R1,#IOC$RTN                     ; IF EQUAL TO IOC$RETURN THEN
            06   12  09C2  1507          BNEQ    27$                             ; UNIT INIT WASN'T SPECIFIED
      51    2C A9   D0  09C4  1508          MOVL    CRB$L_INTD+VEC$L_UNITINIT(R9),R1  ; SO GET IT FROM CRB
            05   13  09C8  1509          BEQL    30$                             ; NOT SPECIFIED IN CRB EITHER
            61   16  09CA  1510 27$:   JSB     (R1)                            ; CALL UNIT INITIALIZATION
            56   5A   D0  09CC  1511          MOVL    R10,R6                          ; SET UP ADDRESS OF DDB
                           09CF  1512 30$:
                           09CF  1513          ENBINT                                  ;RE-ENABLE INTERRUPTS
            12   8E   DA  09CF                        MTPR    (SP)+,S^#PR$_IPL
                           09D2  1514 ;
```

```
                        09D2  1515 ; OPERATION COMPLETED - UNLOCK I/O DATABASE AND EXIT
                        09D2  1516 ;
                        09D2  1517 DB_EXIT:
            007A   30   09D2  1518          BSBW    IOGEN$UNLK_IODB          ;UNLOCK I/O DATABASE
                        09D5  1519                                           ; AND LOWER IPL
      50    01   D0   09D5  1520          MOVL    #1,R0                    ;SET SUCCESS
                   04   09D8  1521          RET                              ;...EXIT
```

```
                                09D9  1523          .SBTTL  DB_ERROR        ERROR LOADING DATABASE
                                09D9  1524 ;++
                                09D9  1525 ;
                                09D9  1526 ; DB_ERROR - LOCAL ROUTINE TO UNLOAD A PARTIALLY LOADED DATABASE
                                09D9  1527 ;
                                09D9  1528 ;       This routine checks the loading flags (LOAD_FLAGS) and
                                09D9  1529 ;       unload and unlinks any control blocks that were just created.
                                09D9  1530 ;
                                09D9  1531 ; INPUTS:
                                09D9  1532 ;
                                09D9  1533 ;       LOAD_FLAGS = FLAGS INDICATING CONTROL BLOCKS THAT HAVE JUST
                                09D9  1534 ;                    BEEN CREATED
                                09D9  1535 ;
                                09D9  1536 ; OUTPUTS:
                                09D9  1537 ;
                                09D9  1538 ;       R0 = ERROR STATUS THAT CAUSED UNLOADING
                                09D9  1539 ;
                                09D9  1540 ;--
                                09D9  1541 DB_ERROR:
                     50   DD    09D9  1542          PUSHL   R0                      ;SAVE ERROR STATUS
                                09DB  1543 ;
                                09DB  1544 ; UCB UNLOADING
                                09DB  1545 ;
      1C 00000005'EF    03   E1  09DB  1546          BBC     #LOAD_V_UCB,L^LOAD_FLAGS,20$ ;BR IF UCB NOT CREATED          [11]
              0000000A'FF   D4  09E3  1547          CLRL    @L^UCB_BLINK            ;CLEAR POINTER TO UCB                [11]
                   0C A9    B7  09E9  1548          DECW    CRB$W_REFC(R9)          ;DECREMENT CRB REFERENCE COUNT
                50   12 AC   9A  09EC  1549          MOVZBL  ACF$B_CUNIT(AP),R0      ;GET CONTROLLER UNIT NUMBER
                   14 A840   D4  09F0  1550          CLRL    IDB$L_UCBLST(R8)[R0]    ;CLEAR IDB POINTER TO UCB
                50   57    D0  09F4  1551          MOVL    R7,R0                   ;SET ADDR OF UCB
                     02    10  09F7  1552          BSBB    10$                     ;DEALLOCATE THE UCB
                     04    11  09F9  1553          BRB     20$                     ;
                                09FB  1554 ;
                                09FB  1555 ; LOCAL SUBROUTINE TO DEALLOCATE A CONTROL BLOCK
                                09FB  1556 ;
                                09FB  1557 ;       INPUT - R0 = ADDRESS OF BLOCK TO DEALLOCATE
                                09FB  1558 ;
                   00E6   30    09FB  1559 10$:     BSBW    QIO$DEALLOCATE          ;DEALLOCATE TO NON-PAGED POOL
                          05    09FE  1560          RSB
                                09FF  1561
                                09FF  1562 ;
                                09FF  1563 ; IDB UNLOADING
                                09FF  1564 ;
      05 00000005'EF    02   E1  09FF  1565 20$:     BBC     #LOAD_V_IDB,L^LOAD_FLAGS,30$ ;BR IF IDB NOT CREATED          [11]
                50   58    D0  0A07  1566          MOVL    R8,R0                   ;SET ADDR OF IDB
                     EF    10  0A0A  1567          BSBB    10$                     ;DEALLOCATE THE IDB
                                0A0C  1568 ;
                                0A0C  1569 ; CRB UNLOADING
                                0A0C  1570 ;
      1A 00000005'EF    01   E1  0A0C  1571 30$:     BBC     #LOAD_V_CRB,L^LOAD_FLAGS,50$ ;BR IF CRB NOT CREATED          [11]
            10 0D AB    00   E1  0A14  1572          BBC     #DPT$V_SUBCNTRL,DPT$B_FLAGS(R11),40$ ;BR IF NOT SUBCONTROLLER
               51    10 A9    D0  0A19  1573          MOVL    CRB$L_LINK(R9),R1       ;GET ADDR OF SECONDARY CRB
               51    1C A1    D0  0A1D  1574          MOVL    CRB$L_INTD+VEC$L_IDB(R1),R1 ;GET ADDR OF SECONDARY IDB
               50    0A AC    9A  0A21  1575          MOVZBL  ACF$B_AUNIT(AP),R0      ;GET ADAPTER UNIT NUMBER
                  14 A140    D4  0A25  1576          CLRL    IDB$L_UCBLST(R1)[R0]    ;CLEAR DISPATCHER POINTER
               50    59    D0  0A29  1577 40$:     MOVL    R9,R0                   ;SET ADDR OF CRB
                     CD    10  0A2C  1578          BSBB    10$                     ;DEALLOCATE THE CRB
                                0A2E  1579 ;
```

```
                                0A2E  1580 ; DDB UNLOADING
                                0A2E  1581 ;
      0E 00000005'EF    00    E1  0A2E  1582 50$:    BBC     #LOAD_V_DDB,L^LOAD_FLAGS,60$ ;BR IF DDB NOT CREATED          [11]
                     0B AB    97  0A36  1583         DECB    DPT$B_REFC(R11)          ;DECREMENT DPT REFERENCE COUNT
                00000006'FF   D4  0A39  1584         CLRL    @L^DDB_BLINK             ;CLEAR LINK TO THE DDB               [11]
                        50    5A  0A3F  1585         MOVL    R10,R0                   ;SET ADDR OF DDB
                              B7  10  0A42  1586         BSBB    10$                      ;DEALLOCATE THE DDB
                                0A44  1587 60$:
                          0008  30  0A44  1588         BSBW    IOGEN$UNLK_IODB          ;UNLOCK THE I/O DATABASE
                                0A47  1589                                            ; AND LOWER IPL
                              50 8ED0 0A47  1590         POPL    R0                       ;RESTORE STATUS
                                 04 0A4A  1591         RET                              ;...EXIT
                                0A4B  1592
                                0A4B  1593
                                0A4B  1594
                                0A4B  1595         .SBTTL                  I/O DATABASE INTERLOCKS
                                0A4B  1596 IOGEN$LOCK_IODB:
                                0A4B  1597         SETIPL  #31
                        12    1F  DA  0A4B                 MTPR    #31,S^#PR$_IPL
                                 05 0A4E  1598         RSB
                                0A4F  1599 IOGEN$UNLK_IODB:
                                0A4F  1600         SETIPL  #0
                        12    00  DA  0A4F                 MTPR    #0,S^#PR$_IPL
                                 05 0A52  1601         RSB
```

```
                                0A53  1603          .SBTTL  IOGEN$CNTRL_INI Initialize a controller
                                0A53  1604 ;++
                                0A53  1605 ;
                                0A53  1606 ; IOGEN$CNTRL_INI - INITIALIZE THE DEVICE CONTROLLER
                                0A53  1607 ;
                                0A53  1608 ; INPUTS - R6 = ADDR OF DDB
                                0A53  1609 ;          R11 = ADDR OF DRIVER PROLOGUE TABLE
                                0A53  1610 ;
                                0A53  1611 ;--
                                0A53  1612 IOGEN$CNTRL_INI::
 0C AB    01    91    0A53  1613          CMPB    #AT$_UBA,DPT$B_ADPTYPE(R11) ;UBA DEVICE?
             42    12    0A57  1614          BNEQ    20$                         ;BR IF NOT
    0FFC  8F    BB    0A59  1615          PUSHR   #^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ;SAVE REGISTERS
 50   04  A6    D0    0A5D  1616          MOVL    DDB$L_UCB(R6),R0            ;GET ADDR OF FIRST UCB
 58   20  A0    D0    0A61  1617          MOVL    UCB$L_CRB(R0),R8            ;GET ADDR OF CRB
 55   1C  A8    D0    0A65  1618          MOVL    CRB$L_INTD+VEC$L_IDB(R8),R5 ;SET ADDR OF IDB
    54    65    D0    0A69  1619          MOVL    IDB$L_CSR(R5),R4            ;SET ADDR OF CSR
 50   10  A5    D0    0A6C  1620          MOVL    IDB$L_ADP(R5),R0            ;GET ADDR OF ADP
    50    60    D0    0A70  1621          MOVL    ADP$L_CSR(R0),R0            ;GET ADDR OF UBA CSR
    0040  8F    BB    0A73  1622          PUSHR   #^M<R6>                     ;SAVE DDB ADDRESS
 56   10  A5    D0    0A77  1623          MOVL    IDB$L_ADP(R5),R6            ;GET ADDRESS OF ADP
    56    66    D0    0A7B  1624          MOVL    ADP$L_CSR(R6),R6            ;GET ADDRESS OF CSR
    50    54    D0    0A7E  1625          MOVL    R4,R0                       ;Copy address of Controller CSR
00000000'EF     16    0A81  1626          JSB     IO$TESTCSR_W                ;TEST IF CONTROLLER EXISTS      ; 19
    0040  8F    BA    0A87  1627          POPR    #^M<R6>                     ;RESTORE DDB ADDRESS
      08  50    E9    0A8B  1628          BLBC    R0,10$                      ;BRANCH IF NON-EXISTENT CSR
 50   20  A8    D0    0A8E  1629          MOVL    CRB$L_INTD+VEC$L_INITIAL(R8),R0 ;GET ADDR OF INIT ROUTINE
             02    13    0A92  1630          BEQL    10$                         ;BR IF NONE
                         0A94  1631                                  ;R4 = ADDR OF CSR
                         0A94  1632                                  ;R5 = ADDR OF IDB
                         0A94  1633                                  ;R8 = ADDR OF CRB
          60    16    0A94  1634          JSB     (R0)                        ;INIT CONTROLLER
                         0A96  1635 10$:
    0FFC  8F    BA    0A96  1636          POPR    #^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ;RESTORE REGISTERS
                05    0A9A  1637          RSB
                         0A9B  1638 20$:
 0C AB    00    91    0A9B  1639          CMPB    #AT$_MBA,DPT$B_ADPTYPE(R11) ;UBA DEVICE?
             1F    12    0A9F  1640          BNEQ    40$                         ; Branch if not MBA
    0FFC  8F    BB    0AA1  1641          PUSHR   #^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ;SAVE REGISTERS
 50   04  A6    D0    0AA5  1642          MOVL    DDB$L_UCB(R6),R0            ;GET ADDR OF FIRST UCB
 58   20  A0    D0    0AA9  1643          MOVL    UCB$L_CRB(R0),R8            ;GET ADDR OF CRB
 55   1C  A8    D0    0AAD  1644          MOVL    CRB$L_INTD+VEC$L_IDB(R8),R5 ;SET ADDR OF IDB
    54    65    D0    0AB1  1645          MOVL    IDB$L_CSR(R5),R4            ;SET ADDR OF CSR
 50   20  A8    D0    0AB4  1646          MOVL    CRB$L_INTD+VEC$L_INITIAL(R8),R0 ;GET ADDR OF INIT ROUTINE
             02    13    0AB8  1647          BEQL    30$                         ;BR IF NONE
                         0ABA  1648                                  ;R4 = ADDR OF CSR
                         0ABA  1649                                  ;R5 = ADDR OF IDB
                         0ABA  1650                                  ;R8 = ADDR OF CRB
          60    16    0ABA  1651          JSB     (R0)                        ;INIT CONTROLLER
                         0ABC  1652 30$:
    0FFC  8F    BA    0ABC  1653          POPR    #^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ;RESTORE REGISTERS
                         0AC0  1654 40$:
                05    0AC0  1655          RSB
```

```
                        0AC1  1657          .SBTTL                  MEMORY ALLOCATION SUBROUTINES
                        0AC1  1658 ;+
                        0AC1  1659 ; ALONONPAGED CALLS EXE$ALONONPAGED TO ALLOCATE NON-PAGED POOL.
                        0AC1  1660 ; ZERO'S THE BLOCK WHEN ALLOCATED
                        0AC1  1661 ; ALSO THE LENGTH OF THE ALLOCATED BLOCK IS ADDED TO QIO$L_ALLOCATED.
                        0AC1  1662 ;
                        0AC1  1663 ; INPUT:
                        0AC1  1664 ;       R1 - SIZE OF REQUESTED BLOCK IN BYTES
                        0AC1  1665 ;
                        0AC1  1666 ; OUTPUTS:
                        0AC1  1667 ;       R0 - SUCCESS/FAILURE INDICATION
                        0AC1  1668 ;       R1 - ALLOCATED SIZE OF BLOCK
                        0AC1  1669 ;       R2 - ADDRESS OF BLOCK
                        0AC1  1670 ;-
                        0AC1  1671 QIO$ALLOCATE:
              08   BB   0AC1  1672          PUSHR   #^M<R3>                 ; SAVE R3
   00000000'EF   16   0AC3  1673          JSB     EXE$ALONONPAGED         ; ATTEMPT TO ALLOCATE
              08   BA   0AC9  1674          POPR    #^M<R3>                 ; RESTORE R3
           15 50   E9   0ACB  1675          BLBC    R0,20$                  ; RETURN W/ ERROR
              06   BB   0ACE  1676          PUSHR   #^M<R1,R2>              ; SAVE REGS
51   51    FD 8F   78   0AD0  1677          ASHL    #-3,R1,R1               ; DIVIDE BY 8
              82   7C   0AD5  1678 10$:     CLRQ    (R2)+                   ; CLEAR
           FB 51   F5   0AD7  1679          SOBGTR  R1,10$                  ; COUNT QUADWORD AND CONTINUE
              06   BA   0ADA  1680          POPR    #^M<R1,R2>              ; RESTORE
00000000'EF   51   C0   0ADC  1681          ADDL    R1,L^QIO$L_ALLOCATE     ; REMEMBER IT WAS ALLOCATE              [11]
              05   0AE3  1682 20$:     RSB                             ; RETURN
                   0AE4  1683
                   0AE4  1684
                   0AE4  1685
                   0AE4  1686 ;+
                   0AE4  1687 ; QIO$DEALLOCATE CALLS EXE$DEANONPAGED TO RELEASE THE MEMORY
                   0AE4  1688 ; THE SIZE OF THE BLOCK IS SUBTRACTED FROM QIO$L_ALLOCATE
                   0AE4  1689 ; INPUT:        R0 Address of block
                   0AE4  1690 ;-
                   0AE4  1691 QIO$DEALLOCATE::
           0E   BB   0AE4  1692          PUSHR   #^M<R1,R2,R3>           ; SAVE REGS
      51   08 A0   3C   0AE6  1693          MOVZWL  8(R0),R1                ; GET LENGH OF BLOCK
00000000'EF   51   C2   0AEA  1694          SUBL    R1,L^QIO$L_ALLOCATE     ; SUBTRACT FROM SPACE ALLOCATE          [11]
   00000000'EF   16   0AF1  1695          JSB     EXE$DEANONPAGED         ; RELEASE IT
           0E   BA   0AF7  1696          POPR    #^M<R1,R2,R3>           ; RESTORE
                05   0AF9  1697          RSB                             ; RETURN
```

```
                                0AFA          .SBTTL  ADPLINK         Link adapter to end of ADP list
                                0AFA  ;+
                                0AFA  ; ADPLINK LINKS THE ADAPTER CONTROL BLOCK  TO THE END OF THE ADP LIST
                                0AFA  ;
                                0AFA  ; INPUT:
                                0AFA  ;       R6 - ADDRESS OF NEW ADP
                                0AFA  ; OUTPUTS:
                                0AFA  ;       ADP IS LINK TO THE END OF THE ADPLIST LOCATED BY IOC$GL_ADPLIST.
                                0AFA  ;-
                                0AFA  ADPLINK:                                  ;
50   FFFFFFFC'EF     9E         0AFA          MOVAB   <IOC$GL_ADPLIST-ADP$L_LINK>,R0  ; START OF LIST
      51    04 A0    D0         0B01  10$:    MOVL    ADP$L_LINK(R0),R1       ; FLINK TO FIRST ENTRY
                05   13         0B05          BEQL    20$                     ; AT END
         50     51   D0         0B07          MOVL    R1,R0                   ; TRY AGAIN
                F5   11         0B0A          BRB     10$                     ;
      04 A0     56   D0         0B0C  20$:    MOVL    R6,ADP$L_LINK(R0)       ; CHAIN NEW ADP TO END OF LIST
                     05         0B10          RSB
                                0B11
                                0B11
                                0B11  ;+
                                0B11  ; FIND_ADP LOCATES THE ADAPTER CONTROL BLOCK WITH THE MATCHING TR NUMBER
                                0B11  ; INPUT:        R4=CSR                                                    [18]
                                0B11  ; OUTPUT:       R6=ADP
                                0B11  ;-
                                0B11  FIND_ADP:
                50   D4         0B11          CLRL    R0                      ; INITIALLY A FAILURE
56   FFFFFFFC'EF     9E         0B13          MOVAB   L^IOC$GL_ADPLIST-ADP$L_LINK,R6  ; HEAD OF ADAPTER LIST    [11]
      56    04 A6    D0         0B1A  10$:    MOVL    ADP$L_LINK(R6),R6       ; ADVANCE TO NEXT IN LIST
                08   13         0B1E          BEQL    20$                     ; BRANCH IF END OF LIST
         54     66   D1         0B20          CMPL    ADP$L_CSR(R6),R4        ; CSR NUMBER MATCH?                [18]
                F5   12         0B23          BNEQ    10$                     ; BRANCH IF NO MATCH
         50     00'  D0         0B25          MOVL    S^#SS$_NORMAL,R0        ; SUCCESS
                     05         0B28  20$:    RSB
```

```
                     0B29  1733          .Sbttl  Exe$PwrTimChk - Check reasonable interval since power recovery ;[14]
                     0B29  1734 ;++                                                                               [14]
                     0B29  1735 ; Functional Description:                                                         [14]
                     0B29  1736 ;       EXE$PWRTIMCHK is called by driver initialization code to check for        [14]
                     0B29  1737 ;       a sufficient interval since power recovery to expect devices to be        [14]
                     0B29  1738 ;       ready again.  If the return from EXE$PWRTIMCHK indicates that the         [14]
                     0B29  1739 ;       reasonable interval has not yet elapsed, the device driver may elect      [14]
                     0B29  1740 ;       to wait for a while using EXE$PWRTIMCHK check the time.                   [14]
                     0B29  1741 ;                                                                                 [14]
                     0B29  1742 ; Calling Sequence:                                                               [14]
                     0B29  1743 ;       BSB/JSB EXE$PWRTIMCHK                                                     [14]
                     0B29  1744 ;                                                                                 [14]
                     0B29  1745 ; Output Parameters:                                                              [14]
                     0B29  1746 ;       R0 - Low bit clear if interval expired.                                   [14]
                     0B29  1747 ;--                                                                               [14]
```

```
                                0B29  1749 Exe$PwrTimChk::                                                                [14]
                          50    D4  0B29  1750          CLRL    R0                      ; Assume interval expired          [14]
                    06    0000FE17'EF   91  0B2B  1751          CMPB    DSA$GL_SID+3,#PR$_SID_TYP8NN ; is this the nautilus cpu? [24]
                          09    13  0B32  1752          BEQL    3999$                   ; yes                              [28]
                    11    0000FE17'EF   91  0B34  1753          CMPB    DSA$GL_SID+3,#pr$_sid_typ8rr ; is this the RRR cpu?  [28] ;G:8
                          52    12  0B3B  1754          BNEQ    4020$                   ; if not then continue             [24]
                                0B3D  1755 ;+
                                0B3D  1756 ;  TODR is console resident for nautilus and RRR [28]                          ;G:7
                                0B3D  1757 ;-
                                0B3D  1758 3999$:                                       ;                                  [28]
                          07    BB  0B3D  1759          PUSHR   #^M<R0,R1,R2>           ; register save mask               [24]
                          52    D4  0B3F  1760          CLRL    R2                      ; init R2                          [24]
                00000000'EF     D4  0B41  1761          CLRL    TODR_BYTE_CNT           ; init byte/loop count             [24]
                      00'8F     88  0B47  1762          BISB2   #DS$M_TODR_ACTIVE,-     ; set TODR read processing flag    [24]
                00000000'EF         0B4A  1763                  CONSOLEAAA_FLAGS
                                0B4F  1764 4000$:
                      50    22  DB  0B4F  1765          MFPR    #PR$_TXCS,R0            ; store tx status                  [24]
              F5 50   00000000'8F   E1  0B52  1766          BBC     #TXCS$V_RDY,R0,4000$    ; branch if not ready to transmit  [24]
                 23   00000F08 8F   DA  0B5A  1767          MTPR    #^X00000F08,#PR$_TXDB   ; TOY read request                 [24]
                                0B61  1768 4005$:
                                0B61  1769          $DS_BREAK                       ; get binary data                  [24]
                00000000'9F   6E    FA  0B61                CALLG   (SP), a#DS$BREAK
                   04   00000000'EF   D1  0B68  1770          CMPL    TODR_BYTE_CNT,#4        ; do we have all four bytes of toy data [24]
                          08    13  0B6F  1771          BEQL    4010$                   ; yes then continue                [24]
              E8 52   00002710 8F   F2  0B71  1772          AOBLSS  #10000,R2,4005$         ; else keep looping                [24]
                                0B79  1773 4010$:
                00000000'8F   CA    0B79  1774          BICL2   #DS$M_TODR_ACTIVE,-       ; clear todr read processing flag  [24]
                00000000'EF         0B7F  1775                  CONSOLEAAA_FLAGS
                          07    BA  0B84  1776          POPR    #^M<R0,R1,R2>           ; register restore                 [24]
                   7E   00000000'EF   D0  0B86  1777          MOVL    TODR_STORE,-(SP)        ; get toy data                     [24]
                          03    11  0B8D  1778          BRB     4030$
                                0B8F  1779 4020$:
                      7E    1B  DB  0B8F  1780          MFPR    #PR$_TODR,-(SP)         ; Get current time of day          [14]
                                0B92  1781 4030$:
                8E    00000004'EF   D1  0B92  1782          CMPL    L^EXE$GL_PWRDONE,(SP)+  ; Check for time expired          [14]
                          02    1B  0B99  1783          BLEQU   10$                     ; Exit with low bit clear if expired [14]
                          50    D6  0B9B  1784          INCL    R0                      ; Else set low bit of R0           [14]
                          05    0B9D  1785 10$:         RSB                             ;                                  [14]
                                0B9E  1786              .END
```

```
$$ARGS                          = 00000007    D
$$T1                            = 00000020    D
$ER                             = 00000006    D
$MODULE                           00000000 R  D  02
$_KNOWN                         = 00000007    D
ACF                               FFFFFFC0    D
ACF$B_AFLAG                       0000000B    D
ACF$B_AUNIT                       0000000A    D
ACF$B_CNUMVEC                     00000013    D
ACF$B_CUNIT                       00000012    D
ACF$C_LENGTH                      00000020    D
ACF$K_LENGTH                      00000020    D
ACF$L_ADAPTER                     00000000    D
ACF$L_CONFIGREG                   00000004    D
ACF$L_CONTRLREG                   0000000C    D
ACF$L_DEVNAME                     00000014    D
ACF$L_DRVNAME                     00000018    D
ACF$W_AVECTOR                     00000008    D
ACF$W_CVECTOR                     00000010    D
ACF$W_MAXUNITS                    0000001C    D
ADP$B_NUMBER                      0000000B    D
ADP$B_PORT                        00000020    D
ADP$B_TYPE                        0000000A    D
ADP$C_DRADPLEN                    00000014    D
ADP$C_MBAADPLEN                   00000014    D
ADP$C_MPMADPLEN                   00000070    D
ADP$C_UBAADPLEN                   00000070    D
ADP$K_DRADPLEN                    00000014    D
ADP$K_MBAADPLEN                   00000014    D
ADP$K_MPMADPLEN                   00000070    D
ADP$K_UBAADPLEN                   00000070    D
ADP$L_CRB                         00000010    D
ADP$L_CSR                         00000000    D
ADP$L_DPQBL                       00000018    D
ADP$L_DPQFL                       00000014    D
ADP$L_INTD                        00000064    D
ADP$L_LINK                        00000004    D
ADP$L_MRQBL                       00000020    D
ADP$L_MRQFL                       0000001C    D
ADP$L_PRQQBL                      00000018    D
ADP$L_PRQQFL                      00000014    D
ADP$L_SHB                         0000001C    D
ADP$L_VECTOR                      00000010    D
ADP$W_ADPTYPE                     0000000E    D
ADP$W_DPBITMAP                    00000024    D
ADP$W_MRBITMAP                    00000026    D
ADP$W_SIZE                        00000008    D
ADP$W_TR                          0000000C    D
ADPLINK                           00000AFA R  D  04
ALLOC$_ACMODE                   = 00000010    D
ALLOC$_DEVNAM                   = 00000004    D
ALLOC$_NARGS                    = 00000004    D
ALLOC$_PHYBUF                   = 0000000C    D
ALLOC$_PHYLEN                   = 00000008    D
AT$_DR                          = 00000002    D
AT$_MBA                         = 00000000    D
AT$_UBA                         = 00000001    D
AUNKFUNC                          00000008 R  D  02
BIT...                          = 00000004    D
BUG$CHECK                         00000716 RG D  04
CCB$B_AMOD                        00000009    D
CCB$B_STS                         00000008    D
CCB$C_LENGTH                      00000010    D
CCB$K_LENGTH                      00000010    D
CCB$L_DIRP                        0000000C    D
CCB$L_UCB                         00000000    D
CCB$L_WIND                        00000004    D
CCB$W_IOC                         0000000A    D
CMK$_APBOOT                     = 00000004    D
CMK$_ASTEXIT                    = 00000000    D
CMK$_CANTIM                     = 0000000B    D
CMK$_HIBER                      = 00000007    D
CMK$_INITSCB                    = 00000008    D
CMK$_LAST                       = 0000000E    D
CMK$_MMENABLE                   = 00000003    D
CMK$_RCONSOLE                   = 00000001    D
CMK$_REFRESH                    = 00000005    D
CMK$_SCHDWK                     = 00000006    D
CMK$_SETIMR                     = 0000000C    D
CMK$_SETIPL                     = 00000009    D
CMK$_SETPRT                     = 0000000D    D
CMK$_SGIPR                      = 0000000A    D
CMK$_TCONSOLE                   = 00000002    D
CONSOLEAAA_FLAGS                  ********W G   00
CR                              = 0000000D    D
CRB$B_MASK                        0000000E    D
CRB$B_TYPE                        0000000A    D
CRB$C_LENGTH                      00000038    D
CRB$K_LENGTH                      00000038    D
CRB$L_INTD                        00000014    D
CRB$L_INTD2                       00000038    D
CRB$L_LINK                        00000010    D
CRB$L_WQBL                        00000004    D
CRB$L_WQFL                        00000000    D
CRB$W_REFC                        0000000C    D
CRB$W_SIZE                        00000008    D
CREATE_CRB                        0000080B R  D  04
CREATE_DDB                        000007AF R  D  04
CREATE_IDB                        00000857 R  D  04
CREATE_UCB                        000008D8 R  D  04
CREATE_VEC                        00000881 R  D  04
CRLF_LENGTH                     = 00000002    D
CTL$GW_CHINDX                     0000003A RG D  02
CTL$GW_NMIOCH                     00000038 RG D  02
DB_ERROR                          000009D9 R  D  04
DB_EXIT                           000009D2 R  D  04
DDB$B_ACPCLASS                    00000013    D
DDB$B_TYPE                        0000000A    D
DDB$C_LENGTH                      00000034    D
DDB$K_LENGTH                      00000034    D
DDB$L_ACPD                        00000010    D
DDB$L_DDT                         0000000C    D
DDB$L_LINK                        00000000    D
DDB$L_UCB                         00000004    D
```

```
DDB$T_DRVNAME                   00000024    D
DDB$T_NAME                      00000014    D
DDB$W_SIZE                      00000008    D
DDB_BLINK                       00000006 R  D  03
DDT$L_ALTSTART                  0000001C    D
DDT$L_CANCEL                    0000000C    D
DDT$L_FDT                       00000008    D
DDT$L_REGDUMP                   00000010    D
DDT$L_START                     00000000    D
DDT$L_UNITINIT                  00000018    D
DDT$L_UNSOLINT                  00000004    D
DDT$W_DIAGBUF                   00000014    D
DDT$W_ERRORBUF                  00000016    D
DIR...                        = FFFFFFFF    D
DPT$B_ADPTYPE                   0000000C    D
DPT$B_FLAGS                     0000000D    D
DPT$B_REFC                      0000000B    D
DPT$B_TYPE                      0000000A    D
DPT$C_LENGTH                    0000002A    D
DPT$K_LENGTH                    0000002A    D
DPT$L_BLINK                     00000004    D
DPT$L_FLINK                     00000000    D
DPT$T_NAME                      0000001E    D
DPT$V_SUBCNTRL                = 00000000    D
DPT$W_INITTAB                   00000010    D
DPT$W_MAXUNITS                  00000016    D
DPT$W_REINITTAB                 00000012    D
DPT$W_SIZE                      00000008    D
DPT$W_UCBSIZE                   0000000E    D
DPT$W_UNLOAD                    00000014    D
DPT$W_VERSION                   00000018    D
DR$INITIAL                      ********    X   00
DR$INT                          ********    X   00
DR780$B_BR                      00000033     D
DR780$B_CONFIG                  00000035     D
DR780$B_SELF                    00000034     D
DR780$B_TR                      00000032     D
DR780$B_UUT                     00000036     D
DR780$K_LEN                     00000037     D
DRACRB                          000006F7 R   D  04
DRACRBLEN                     = 00000010     D
DS$BREAK                        ********    X   00
DS$GK_SID                       ********    X   00
DS$GL_FLAGS                     ********    X   00
DS$GPHARD                       ********    X   00
DS$K_CCB                        ********    X   00
DS$K_ERROR                    = 00000002     D
DS$K_NORMAL                   = 00000001     D
DS$K_PRINTB                   = 00000002     D
DS$K_PRINTF                   = 00000001     D
DS$K_PRINTI                   = 00000000     D
DS$K_PRINTX                   = 00000003     D
DS$K_SEVERE                   = 00000004     D
DS$K_SUBSYS                   = 00000066     D
DS$K_TYPE_ABORT_PROGRAM       = 00000014     D
DS$K_TYPE_ABORT_TEST          = 00000013     D
DS$K_TYPE_COMMAND_ERR         = 00000015     D
DS$K_TYPE_COMMAND_OUT         = 00000016     D
DS$K_TYPE_CRD_AUTOTEST        = 0000001A     D
DS$K_TYPE_DS_PROMPT           = 00000001     D
DS$K_TYPE_DS_START            = 0000001D     D
DS$K_TYPE_ERRDEV              = 00000008     D
DS$K_TYPE_ERRHARD             = 00000006     D
DS$K_TYPE_ERROR_BODY          = 00000009     D
DS$K_TYPE_ERROR_END           = 0000000A     D
DS$K_TYPE_ERRPREP             = 0000001B     D
DS$K_TYPE_ERRSOFT             = 00000007     D
DS$K_TYPE_ERRSUP              = 00000004     D
DS$K_TYPE_ERRSYS              = 00000005     D
DS$K_TYPE_ERR_HALT            = 0000000D     D
DS$K_TYPE_EXCEPTION           = 0000000C     D
DS$K_TYPE_EXCEPTION_HEAD      = 0000000B     D
DS$K_TYPE_FIRST_PASS          = 00000011     D
DS$K_TYPE_GENERAL             = 00000000     D
DS$K_TYPE_GENERAL_ERROR       = 00000003     D
DS$K_TYPE_NO_TESTS            = 00000012     D
DS$K_TYPE_PARAM_ERROR         = 0000001C     D
DS$K_TYPE_PROGRAM_END         = 00000010     D
DS$K_TYPE_PROGRAM_INFO        = 00000017     D
DS$K_TYPE_PROGRAM_START       = 0000000F     D
DS$K_TYPE_QIO_INVADP          = 00000024     D
DS$K_TYPE_QIO_NODRIVER        = 00000022     D
DS$K_TYPE_QIO_WRONGVER        = 00000023     D
DS$K_TYPE_SCRIPT_ECHO         = 00000021     D
DS$K_TYPE_SCRIPT_PNF          = 0000001E     D
DS$K_TYPE_SCRIPT_PROMPT       = 00000020     D
DS$K_TYPE_SCRIPT_SKIP         = 0000001F     D
DS$K_TYPE_SEQUENCE_ERROR      = 00000019     D
DS$K_TYPE_START_ERR           = 00000018     D
DS$K_TYPE_START_LIST          = 00000025     D
DS$K_TYPE_SUMMARY             = 0000000E     D
DS$K_TYPE_USER_PROMPT         = 00000002     D
DS$K_WARNING                  = 00000000     D
DS$LOAD                         ********    X   00
DS$M_ABRTFLG                  = 00000040     D
DS$M_BADTIME                  = 00100000     D
DS$M_BATCH                    = 00400000     D
DS$M_BRKCLR                   = 00001000     D
DS$M_BRKPT                    = 00000800     D
DS$M_CHARFLG                  = 00000100     D
DS$M_CMDFLG                   = 00000080     D
DS$M_CTRLC                    = 00000001     D
DS$M_CTRLO                    = 00010000     D
DS$M_DEVFLG                   = 00000200     D
DS$M_DISABLCC                 = 01000000     D
DS$M_DONFLG                   = 00002000     D
DS$M_ERRFLG                   = 00000010     D
DS$M_EXCEPT                   = 00080000     D
DS$M_EXETST                   = 00040000     D
DS$M_HLTFLG                   = 00000008     D
DS$M_LODFLG                   = 00000002     D
DS$M_MEMMGT                   = 00008000     D
DS$M_NI                       = 04000000     D
DS$M_OUTPUT                   = 00800000     D
```

```
DS$M_RUBFLG                     = 00000020     D
DS$M_SCRIPT                     = 00200000     D
DS$M_SETIMR                     = 02000000     D
DS$M_STRFLG                     = 00000004     D
DS$M_SUBT                       = 00004000     D
DS$M_SYSFLG                     = 00000400     D
DS$M_TIMED                      = 02000000     D
DS$M_TIMED_OUT                  = 08000000     D
DS$M_TIMRON                     = 00020000     D
DS$M_TODR_ACTIVE                  ********W G    00
DS$V_ABRTFLG                    = 00000006     D
DS$V_BADTIME                    = 00000014     D
DS$V_BATCH                      = 00000016     D
DS$V_BRKCLR                     = 0000000C     D
DS$V_BRKPT                      = 0000000B     D
DS$V_CHARFLG                    = 00000008     D
DS$V_CMDFLG                     = 00000007     D
DS$V_CTRLC                      = 00000000     D
DS$V_CTRLO                      = 00000010     D
DS$V_DEVFLG                     = 00000009     D
DS$V_DISABLCC                   = 00000018     D
DS$V_DONFLG                     = 0000000D     D
DS$V_ERRFLG                     = 00000004     D
DS$V_EXCEPT                     = 00000013     D
DS$V_EXETST                     = 00000012     D
DS$V_HLTFLG                     = 00000003     D
DS$V_LODFLG                     = 00000001     D
DS$V_MEMMGT                     = 0000000F     D
DS$V_NI                         = 0000001A     D
DS$V_OUTPUT                     = 00000017     D
DS$V_RUBFLG                     = 00000005     D
DS$V_SCRIPT                     = 00000015     D
DS$V_SETIMR                     = 00000019     D
DS$V_STRFLG                     = 00000002     D
DS$V_SUBT                       = 0000000E     D
DS$V_SYSFLG                     = 0000000A     D
DS$V_TIMED                      = 00000019     D
DS$V_TIMED_OUT                  = 0000001B     D
DS$V_TIMRON                     = 00000011     D
DS$_AP_NORMAL_BREAK             = 00660150     D
DS$_ARITH                       = 006600D0     D
DS$_ASBE                        = 00660118     D
DS$_BADLINK                     = 006600F0     D
DS$_BADTYPE                     = 006600E8     D
DS$_BIIC                        = 00660120     D
DS$_CHME                        = 006600A8     D
DS$_CHMK                        = 006600E0     D
DS$_DEVNAME                     = 00660108     D
DS$_ERROR                       = 00660002     D
DS$_FHWE                        = 00660068     D
DS$_FRAGBUF                     = 00660080     D
DS$_ICBUSY                      = 006600C8     D
DS$_ICERR                       = 006600C0     D
DS$_IHWE                        = 00660060     D
DS$_ILLCHAR                     = 00660018     D
DS$_ILLPAGCNT                   = 00660078     D
DS$_ILLUNIT                     = 00660100     D
DS$_INIT_FAIL                   = 00660140     D
DS$_INSFMEM                     = 00660050     D
DS$_INVCPU                      = 00660130     D
DS$_IPL2HI                      = 006600B8     D
DS$_IVADDR                      = 00660040     D
DS$_IVVECT                      = 00660038     D
DS$_KRNLSTK                     = 00660090     D
DS$_LOGIC                       = 00660070     D
DS$_MCHK                        = 00660088     D
DS$_MEM_ALLOC_ERR               = 00660138     D
DS$_MMOFF                       = 00660058     D
DS$_NEEDUNIT                    = 006600F8     D
DS$_NODE                        = 00660128     D
DS$_NOPCS                       = 00660110     D
DS$_NORMAL                      = 00660001     D
DS$_NOSUPPORT                   = 006600B1     D
DS$_NOTALLOWMP                  = 00660148     D
DS$_NOTDON                      = 00660030     D
DS$_NOTIMP                      = 006600B0     D
DS$_NULLSTR                     = 00660010     D
DS$_OVERFLOW                    = 00660008     D
DS$_POWER                       = 00660098     D
DS$_PROGERR                     = 00660020     D
DS$_SEVERE                      = 00660004     D
DS$_TRANSL                      = 006600A0     D
DS$_TRUNCATE                    = 00660028     D
DS$_UNEXPINT                    = 006600D8     D
DS$_UNSUPPDEV                   = 00660158     D
DS$_VASFULL                     = 00660048     D
DS$_WARNING                     = 00660000     D
DSA$AL_APTMAIL                    0000FE00     D
DSA$AT_APTTXT                     0000FA00     D
DSA$GL_APTCOM                     0000FE04     D
DSA$GL_DEVLEN                     0000FE58     D
DSA$GL_ERRNO                      0000FE44     D
DSA$GL_EVENT                      0000FE48     D
DSA$GL_FLAGS                      0000FE00     D
DSA$GL_MSGTYP                     0000FE40     D
DSA$GL_PASSES                     0000FE08     D
DSA$GL_PASSNO                     0000FE54     D
DSA$GL_SECTNO                     0000FE10     D
DSA$GL_SID                        0000FE14     D
DSA$GL_SUBTNO                     0000FE4C     D
DSA$GL_TESTNO                     0000FE50     D
DSA$GL_UNITS                      0000FE0C     D
DSA$GQ_MSGPTR                     0000FE68     D
DSA$GT_DEVNAM                     0000FE5C     D
DSA$M_HALT                      = 00000001     D
DSR$COMPLETION                    ********     X    00
DSX$PRINT                         ********     X    00
DS_ERRSUP                         ********     X    00
DVR$B_CNUMVEC                     0000000B     D
DVR$B_TYPE                        0000000A     D
DVR$C_LEN                         00000014     D
DVR$L_IDENT                       00000010     D
DVR$W_DPT                         0000000E     D
DVR$W_GENERIC                     0000000C     D
```

```
DVR$W_SIZE                      00000008     D
DVR$_IDENT                    = FFFF0001     D
DW750$K_LEN                     00000032     D
DW780$B_BR                      00000033     D
DW780$B_TR                      00000032     D
DW780$K_LEN                     00000034     D
DYN$C_ACB                     = 00000002   G D
DYN$C_ADP                     = 00000001   G D
DYN$C_AQB                     = 00000003   G D
DYN$C_BRDCST                  = 0000001A   G D
DYN$C_BUFIO                   = 00000013   G D
DYN$C_CEB                     = 00000004   G D
DYN$C_CRB                     = 00000005   G D
DYN$C_CXB                     = 0000001B   G D
DYN$C_DDB                     = 00000006   G D
DYN$C_DPT                     = 0000001E   G D
DYN$C_EXTGSD                  = 00000028   G D
DYN$C_FCB                     = 00000007   G D
DYN$C_FRK                     = 00000008   G D
DYN$C_GSD                     = 00000015   G D
DYN$C_IDB                     = 00000009   G D
DYN$C_IRP                     = 0000000A   G D
DYN$C_IRPE                    = 0000002C   G D
DYN$C_JIB                     = 0000002F   G D
DYN$C_JPB                     = 0000001F   G D
DYN$C_KFH                     = 00000026   G D
DYN$C_KFI                     = 00000018   G D
DYN$C_LOG                     = 0000000B   G D
DYN$C_MBX                     = 0000002B   G D
DYN$C_MTL                     = 00000019   G D
DYN$C_MVL                     = 00000016   G D
DYN$C_NDB                     = 0000001C   G D
DYN$C_NET                     = 00000017   G D
DYN$C_PBH                     = 00000020   G D
DYN$C_PCB                     = 0000000C   G D
DYN$C_PDB                     = 00000021   G D
DYN$C_PFL                     = 00000023   G D
DYN$C_PIB                     = 00000022   G D
DYN$C_PQB                     = 0000000D   G D
DYN$C_PTR                     = 00000025   G D
DYN$C_RBM                     = 00000031   G D
DYN$C_RVT                     = 0000000E   G D
DYN$C_RVX                     = 00000027   G D
DYN$C_SFT                     = 00000024   G D
DYN$C_SHB                     = 0000002A   G D
DYN$C_SHMCEB                  = 0000002E   G D
DYN$C_SHMGSD                  = 00000029   G D
DYN$C_SHRBUFIO                = 00000080   G D
DYN$C_SLAVCEB                 = 0000002D   G D
DYN$C_SPECIAL                 = 00000080   G D
DYN$C_SSB                     = 0000001D   G D
DYN$C_TQE                     = 0000000F   G D
DYN$C_TWP                     = 00000030   G D
DYN$C_TYPAHD                  = 00000014   G D
DYN$C_UCB                     = 00000010   G D
DYN$C_VCA                     = 00000032   G D
DYN$C_VCB                     = 00000011   G D
DYN$C_WCB                     = 00000012   G D
EXE$ALONONPAGED                 ********     X   00
EXE$DEANONPAGED                 ********     X   00
EXE$FORKDSPTH                   ********     X   00
EXE$GL_PWRDONE                  00000004 RG  D   02
EXE$MAXACMODE                   00000707 RG  D   04
EXE$PWRTIMCHK                   00000B29 RG  D   04
EXE$QIO                         00000000 RG  D   04
FILE                            FFFFFFF4     D
FILEDEF                         FFFFFFE4     D
FILEDESC                        FFFFFFEC     D
FILL_ACF                        000003A6 R   D   04
FIND_ADP                        00000B11 R   D   04
HP$A_DEPENDENT                  00000032     D
HP$A_DEVICE                     00000018     D
HP$A_DVA                        0000001C     D
HP$A_LINK                       00000020     D
HP$B_DRIVE                      0000000B     D
HP$B_FLAGS                      0000000A     D
HP$B_RH780_BR                   00000033     D
HP$B_RH780_TR                   00000032     D
HP$K_RH780_LEN                  00000034     D
HP$Q_DEVICE                     00000000     D
HP$T_DEVICE                     0000000C     D
HP$T_TYPE                       00000026     D
HP$W_SIZE                       00000008     D
HP$W_VECTOR                     00000024     D
IDB$B_TYPE                      0000000A     D
IDB$C_LENGTH                    00000034     D
IDB$K_LENGTH                    00000034     D
IDB$L_ADP                       00000010     D
IDB$L_CSR                       00000000     D
IDB$L_OWNER                     00000004     D
IDB$L_UCBLST                    00000014     D
IDB$W_SIZE                      00000008     D
IDB$W_UNITS                     0000000C     D
INIT_CNTRL                      00000964 R   D   04
INIT_DB                         00000945 R   D   04
INIT_UNIT                       00000978 R   D   04
INI_DRADP                       00000616 R   D   04
INI_MBADP                       000004A0 R   D   04
INI_UBADP                       00000594 R   D   04
IO$S_FCODE                    = 00000006     D
IO$TESTCSR_L                    ********     X   00
IO$TESTCSR_W                    ********     X   00
IO$V_FCODE                    = 00000000     D
IO$_READPROMPT                = 00000037     D
IO$_WRITEVBLK                 = 00000030     D
IOC$GL_ADPLIST                  ********     X   00
IOC$GL_DEVLIST                  ********     X   00
IOC$GL_DPTLIST                  ********     X   00
IOC$INITDRV                     ********     X   00
IOC$IOPOST                      ********     X   00
IOC$REINITDRV                   ********     X   00
IOC$RTN                         ********     X   00
IOGEN$CNTRL_INI                 00000A53 RG  D   04
IOGEN$CONN_VEC                  ********     X   00
```

```
IOGEN$LOCK_IODB                 00000A4B R   D   04
IOGEN$UNLK_IODB                 00000A4F R   D   04
LASTCHAR                        00000004 R   D   03
LENGTH                          FFFFFFE0     D
LF                            = 0000000A     D
LOAD$_ADDRESS                 = 00000010     D
LOAD$_DEFAULT                 = 00000008     D
LOAD$_FILE                    = 00000004     D
LOAD$_LENGTH                  = 0000000C     D
LOAD$_NARGS                   = 00000007     D
LOAD$_RETLEN                  = 00000014     D
LOAD$_RETREC                  = 00000018     D
LOAD$_VBN                     = 0000001C     D
LOAD_DRIVER                     000002D8 R   D   04
LOAD_FLAGS                      00000005 R   D   03
LOAD_M_CRB                    = 00000002     D
LOAD_M_DDB                    = 00000001     D
LOAD_M_IDB                    = 00000004     D
LOAD_M_UCB                    = 00000008     D
LOAD_V_CRB                    = 00000001     D
LOAD_V_DDB                    = 00000000     D
LOAD_V_IDB                    = 00000002     D
LOAD_V_UCB                    = 00000003     D
LOC$DPT                         00000161 R   D   04
LOC$PTDESC                      ********       X   00
LOCAL                           FFFFFFC0       D
MBA$INITIAL                     ********       X   00
MBA$INT                         ********       X   00
MBACRB                          00000584 R   D   04
MBACRBLEN                     = 00000010     D
MBINT_DISP                      0000003C R   D   02
NUMUBAVEC                     = 00000080     D
PR$_IPL                       = 00000012     D
PR$_SID_TYP8NN                = 00000006     D
PR$_SID_TYP8RR                = 00000011     D
PR$_TODR                      = 0000001B     D
PR$_TXCS                      = 00000022     D
PR$_TXDB                      = 00000023     D
PREADVBLK                       ********     X   00
PSL$S_PRVMOD                  = 00000002     D
PSL$V_PRVMOD                  = 00000016     D
QIO$ADDUNIT                     00000259 RG  D   04
QIO$ALLOCATE                    00000AC1 R   D   04
QIO$CLEANUP                     00000192 RG  D   04
QIO$DEALLOCATE                  00000AE4 RG  D   04
QIO$INITIALIZE                  0000013E RG  D   04
QIO$LOAD_DB                     00000733 R   D   04
QIO$L_ALLOCATE                  00000000 R   D   03
QIO$_ASTADR                   = 00000014     D
QIO$_ASTPRM                   = 00000018     D
QIO$_CHAN                     = 00000008     D
QIO$_EFN                      = 00000004     D
QIO$_FUNC                     = 0000000C     D
QIO$_IOSB                     = 00000010     D
QIO$_NARGS                    = 0000000C     D
QIO$_P1                       = 0000001C     D
QIO$_P2                       = 00000020     D
QIO$_P3                       = 00000024     D
QIO$_P4                       = 00000028     D
QIO$_P5                       = 0000002C     D
QIO$_P6                       = 00000030     D
QIOCLEAN_CPU                    ********     X   00
READVBLK                        ********     X   00
REMOTE_NODE_CONTROL_LEVEL       ********W GX   00
RH780$B_BR                      00000033       D
RH780$B_TR                      00000032       D
RH780$K_LEN                     00000034       D
SAVABS...                     = FFFFFFC0       D
SCAN$ALPHA                      ********     X   00
SCAN$SEARCHLIST                 ********     X   00
SCB$L_ACCESS                    00000020       D
SCB$L_ARITH                     00000034       D
SCB$L_BREAK                     0000002C       D
SCB$L_CHME                      00000044       D
SCB$L_CHMK                      00000040       D
SCB$L_CHMS                      00000048       D
SCB$L_CHMU                      0000004C       D
SCB$L_COMPAT                    00000030       D
SCB$L_KNLSTK                    00000008       D
SCB$L_MACHCHK                   00000004       D
SCB$L_OPCCUS                    00000014       D
SCB$L_OPCDEC                    00000010       D
SCB$L_POWER                     0000000C       D
SCB$L_RADRMOD                   0000001C       D
SCB$L_ROPRAND                   00000018       D
SCB$L_RXDB                      000000F8       D
SCB$L_SFTLVL1                   00000084       D
SCB$L_SFTLVL10                  000000A8       D
SCB$L_SFTLVL11                  000000AC       D
SCB$L_SFTLVL12                  000000B0       D
SCB$L_SFTLVL13                  000000B4       D
SCB$L_SFTLVL14                  000000B8       D
SCB$L_SFTLVL15                  000000BC       D
SCB$L_SFTLVL2                   00000088       D
SCB$L_SFTLVL3                   0000008C       D
SCB$L_SFTLVL4                   00000090       D
SCB$L_SFTLVL5                   00000094       D
SCB$L_SFTLVL6                   00000098       D
SCB$L_SFTLVL7                   0000009C       D
SCB$L_SFTLVL8                   000000A0       D
SCB$L_SFTLVL9                   000000A4       D
SCB$L_TBIT                      00000028       D
SCB$L_TIMER                     000000C0       D
SCB$L_TRANSL                    00000024       D
SCB$L_TXDB                      000000FC       D
SCB$L_VM                        00000038       D
SCB$L_ZERO                      00000000       D
SCB_BASE                        ********       X   00
SCB_IMAGE                       ********       X   00
SEND_CONSOLE_RESPONSE           ********W GX   00
SIZ...                        = 00000001       D
SS$_INSFMEM                     ********       X   00
SS$_IVCHAN                      ********       X   00
SS$_NORMAL                      ********       X   00
```

```
SYSG$_INVDPTINI                 = 007C800A     D
SYSG$_INVVEC                    = 007C802A     D
SYSG$_VECINUSE                  = 007C801A     D
TODR_BYTE_CNT                     ********W G    00
TODR_STORE                        ********W G    00
TXCS$V_RDY                        ********W G    00
T_ADAPTER_TYPE                    000000C2 R   D  02
T_CRLF                            000000C0 R   D  02
T_INVADP                          00000095 R   D  02
T_KNOWN_DEV                       000000C9 R   D  02
T_NODRIVER                        00000046 R   D  02
T_WRONGVER                        00000068 R   D  02
UBA$INITIAL                       ********W G    00
UBA$UNEXINT                       ********     X  00
UBADP_CPU                         ********     X  00
UBINTSZ                           ********W G    00
UBINT_DISP                        00000044 RG  D  02
UCB$B_AMOD                      00000053     D
UCB$B_CEX                       00000077     D
UCB$B_CM1                       0000004A     D
UCB$B_CM2                       0000004B     D
UCB$B_DEVCLASS                  00000038     D
UCB$B_DEVTYPE                   00000039     D
UCB$B_DIPL                      00000052     D
UCB$B_DX_SCTCNT                 000000A6     D
UCB$B_ERTCNT                    00000070     D
UCB$B_ERTMAX                    00000071     D
UCB$B_FEX                       00000076     D
UCB$B_FIPL                      0000000B     D
UCB$B_LOCSRV                    0000003C     D
UCB$B_OFFNDX                    00000094     D
UCB$B_OFFRTC                    00000095     D
UCB$B_REMSRV                    0000003D     D
UCB$B_SECTORS                   0000003C     D
UCB$B_SLAVE                     00000074     D
UCB$B_SPR                       00000075     D
UCB$B_STATE                     00000052     D
UCB$B_TRACKS                    0000003D     D
UCB$B_TT_CRFILL                 0000009D     D
UCB$B_TT_DECRF                  000000A1     D
UCB$B_TT_DELFF                  000000A2     D
UCB$B_TT_DESPEE                 000000A0     D
UCB$B_TT_DETYPE                 000000A4     D
UCB$B_TT_LFFILL                 0000009E     D
UCB$B_TT_SPEED                  0000009C     D
UCB$B_TYPE                      0000000A     D
UCB$B_VERTSZ                    0000003F     D
UCB$C_LENGTH                    00000074     D
UCB$C_MB_LENGTH                 00000090     D
UCB$C_TT_LENGTH                 000000BC     D
UCB$K_LENGTH                    00000074     D
UCB$K_MB_LENGTH                 00000090     D
UCB$K_TT_LENGTH                 000000BC     D
UCB$L_AMB                       00000054     D
UCB$L_ASTQBL                    00000010     D
UCB$L_ASTQFL                    0000000C     D
UCB$L_CPID                      0000005C     D
UCB$L_CRB                       00000020     D
UCB$L_DDB                       00000024     D
UCB$L_DEVCHAR                   00000034     D
UCB$L_DEVDEPEND                 0000003C     D
UCB$L_DPC                       00000080     D
UCB$L_DUETIM                    0000005C     D
UCB$L_DX_BFPNT                  0000009C     D
UCB$L_DX_BUF                    00000098     D
UCB$L_DX_RXDB                   000000A0     D
UCB$L_EMB                       00000078     D
UCB$L_FIRST                     00000014     D
UCB$L_FPC                       0000000C     D
UCB$L_FQBL                      00000004     D
UCB$L_FQFL                      00000000     D
UCB$L_FR3                       00000010     D
UCB$L_FR4                       00000014     D
UCB$L_IOQBL                     00000044     D
UCB$L_IOQFL                     00000040     D
UCB$L_IRP                       0000004C     D
UCB$L_LINK                      0000002C     D
UCB$L_LOGADR                    00000064     D
UCB$L_MAXBLOCK                  00000084     D
UCB$L_MB_MBX                    0000007C     D
UCB$L_MB_PORT                   0000008C     D
UCB$L_MB_RAST                   00000078     D
UCB$L_MB_SHB                    00000080     D
UCB$L_MB_WAST                   00000074     D
UCB$L_MB_WIOQBL                 00000088     D
UCB$L_MB_WIOQFL                 00000084     D
UCB$L_MEDIA                     0000008C     D
UCB$L_NT_DATSSB                 00000074     D
UCB$L_NT_INTSSB                 00000078     D
UCB$L_OPCNT                     00000060     D
UCB$L_OWNUIC                    0000001C     D
UCB$L_PID                       00000028     D
UCB$L_RQBL                      00000004     D
UCB$L_RQFL                      00000000     D
UCB$L_SVAPTE                    00000068     D
UCB$L_SVPN                      00000064     D
UCB$L_TT_DECHAR                 000000A8     D
UCB$L_TT_RDUE                   0000008C     D
UCB$L_TT_RTIMOU                 000000B8     D
UCB$L_VCB                       00000030     D
UCB$M_ONLINE                  = 00000010     D
UCB$M_VALID                   = 00000800     D
UCB$T_PARTNER                   0000000C     D
UCB$W_BCNT                      0000006E     D
UCB$W_BCR                       00000096     D
UCB$W_BOFF                      0000006C     D
UCB$W_BUFQUO                    00000018     D
UCB$W_BYTESTOGO                 0000003E     D
UCB$W_CHARGE                    0000004A     D
UCB$W_CYLINDERS                 0000003E     D
UCB$W_DA                        0000008C     D
UCB$W_DC                        0000008E     D
UCB$W_DEVBUFSIZ                 0000003A     D
UCB$W_DEVSTS                    0000005A     D
```

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UCB$W_DIRSEQ                    00000088    D
UCB$W_DSTADDR                   00000018    D
UCB$W_DX_BCR                    000000A4    D
UCB$W_EC1                       00000090    D
UCB$W_EC2                       00000092    D
UCB$W_ERRCNT                    00000072    D
UCB$W_FUNC                      0000007E    D
UCB$W_MB_SEED                   00000000    D
UCB$W_MSGCNT                    00000016    D
UCB$W_MSGMAX                    00000014    D
UCB$W_NT_CHAN                   0000007C    D
UCB$W_OFFSET                    0000008A    D
UCB$W_REFC                      00000050    D
UCB$W_SIZE                      00000008    D
UCB$W_SRCADDR                   0000001A    D
UCB$W_STS                       00000058    D
UCB$W_TT_DESIZE                 000000A5    D
UCB$W_UNIT                      00000048    D
UCB$W_VPROT                     0000001A    D
UCB_BLINK                       0000000A R  D   03
VEC$B_DATAPATH                  00000013    D
VEC$B_NUMREG                    00000012    D
VEC$C_LENGTH                    00000024    D
VEC$K_LENGTH                    00000024    D
VEC$L_ADP                       00000014    D
VEC$L_IDB                       00000008    D
VEC$L_INITIAL                   0000000C    D
VEC$L_START                     0000001C    D
VEC$L_UNITDISC                  00000020    D
VEC$L_UNITINIT                  00000018    D
VEC$Q_DISPATCH                  00000000    D
VEC$W_MAPREG                    00000010    D
VMS$QIO                         ********    X   00
WRITEVBLK                       ********    X   00

                                          +-----------------+
                                          ! Psect synopsis !
                                          +-----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           FFFFFFF4  (    0.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
DATA                            00000103  (  259.)  02 (  2.)  NOPIC   USR   CON   REL   LCL   SHR NOEXE   RD  NOWRT NOVEC LONG
WORK                            0000000E  (   14.)  03 (  3.)  NOPIC   USR   CON   REL   LCL NOSHR NOEXE   RD    WRT NOVEC LONG
CODE                            00000B9E  ( 2974.)  04 (  4.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD  NOWRT NOVEC LONG
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$ARGS	=00000007	285 (1)	259 (1) 271 (1) 285 (1)
$$T1	=00000020	285 (1)	259 (1) 271 (1) 285 (1)
$ER	=00000006	1238 (13)	#-1238 (13) #-458 (1) #-666 (4) #-894 (6)
			#-925 (6)
$MODULE	00000000-R	325 (1)	1238 (13) 458 (1) 666 (4) 894 (6)
			925 (6)
$_KNOWN	=00000007	380 (1)	372 (1)
ACF	FFFFFFC0	733 (5)	738 (6)
ACF$B_AFLAG	0000000B		#-918 (6)
ACF$B_AUNIT	0000000A		#-1388 (15) #-1454 (15) #-1575 (16) #-901 (6)
ACF$B_CNUMVEC	00000013		#-1370 (15) #-1413 (15) #-915 (6) #-917 (6)
ACF$B_CUNIT	00000012		#-1329 (15) #-1448 (15) #-1453 (15) #-1549 (16)
			#-910 (6)
ACF$C_LENGTH	00000020		733 (5)
ACF$L_ADAPTER	00000000		#-1362 (15) #-1384 (15) #-1402 (15) #-1417 (15)
			#-1421 (15) #-1495 (15) #-896 (6)
ACF$L_CONFIGREG	00000004		#-897 (6)
ACF$L_CONTRLREG	0000000C		#-1403 (15) #-903 (6)
ACF$L_DEVNAME	00000014		1303 (15) #-1315 (15) #-1350 (15) 1352 (15)
			#-752 (6)
ACF$L_DRVNAME	00000018		#-1298 (15) #-1353 (15) 1355 (15) #-854 (6)
ACF$W_AVECTOR	00000008		#-899 (6)
ACF$W_CVECTOR	00000010		#-1409 (15) #-905 (6) #-908 (6)
ACF$W_MAXUNITS	0000001C		#-912 (6)
ADP$B_TYPE	0000000A		#-1003 (8) #-1056 (9) #-1157 (11)
ADP$C_DRADPLEN	00000014		#-1114 (10)
ADP$C_MBAADPLEN	00000014		#-960 (7)
ADP$C_UBAADPLEN	00000070		#-1047 (9)
ADP$L_CRB	00000010		#-1007 (8) #-1161 (11) #-1363 (15) #-1385 (15)
ADP$L_CSR	00000000		#-1004 (8) #-1058 (9) #-1158 (11) #-1496 (15)
			#-1621 (17) #-1624 (17) #-1728 (19)
ADP$L_DPQFL	00000014		1060 (9)
ADP$L_LINK	00000004		#-1069 (9) 1709 (19) #-1710 (19) #-1714 (19)
			1725 (19) #-1726 (19)
ADP$L_MRQFL	0000001C		1063 (9)
ADP$L_VECTOR	00000010		#-1073 (9) #-1422 (15)
ADP$W_ADPTYPE	0000000E		#-1006 (8) #-1057 (9) #-1160 (11)
ADP$W_MRBITMAP	00000026		#-1067 (9)
ADP$W_SIZE	00000008		#-1055 (9) #-1118 (10) #-964 (7)
ADP$W_TR	0000000C		#-1005 (8) #-1059 (9) #-1159 (11)
ADPLINK	00000AFA-R	1708 (19)	#-1011 (8) #-1071 (9) #-1165 (11)
ALLOC$_ACMODE	=00000010	259 (1)	
ALLOC$_DEVNAM	=00000004	259 (1)	
ALLOC$_NARGS	=00000004	259 (1)	
ALLOC$_PHYBUF	=0000000C	259 (1)	
ALLOC$_PHYLEN	=00000008	259 (1)	
AT$_DR	=00000002		#-1160 (11) 368 (1)
AT$_MBA	=00000000		#-1006 (8) #-1639 (17) 364 (1) 366 (1)
			#-893 (6)
AT$_UBA	=00000001		#-1057 (9) #-1360 (15) #-1419 (15) #-1493 (15)

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                                                        #-1613   (17)     363    (1)      365    (1)      367    (1)
                                                          369    (1)
AUNKFUNC                    00000008-R   330    (1)       458    (1)
BIT...                     =00000004     402    (1)       276    (1)      277    (1)      287    (1)      290    (1)
                                                          402    (1)
BUG$CHECK                   00000716-R   1235   (13)    #-1239   (13)
CMK$_APBOOT                =00000004     277    (1)
CMK$_ASTEXIT               =00000000     277    (1)
CMK$_CANTIM                =0000000B     277    (1)
CMK$_HIBER                 =00000007     277    (1)
CMK$_INITSCB               =00000008     277    (1)
CMK$_LAST                  =0000000E     277    (1)
CMK$_MMENABLE              =00000003     277    (1)
CMK$_RCONSOLE              =00000001     277    (1)
CMK$_REFRESH               =00000005     277    (1)
CMK$_SCHDWK                =00000006     277    (1)
CMK$_SETIMR                =0000000C     277    (1)
CMK$_SETIPL                =00000009     277    (1)
CMK$_SETPRT                =0000000D     277    (1)
CMK$_SGIPR                 =0000000A     277    (1)
CMK$_TCONSOLE              =00000002     277    (1)
CONSOLEAAA_FLAGS            00000000-XR                  #-1763   (19)   #-1775   (19)     318    (1)
CR                         =0000000D     252    (1)       358    (1)
CRB$B_TYPE                  0000000A                     #-1146   (11)   #-1380   (15)   #-992    (8)
CRB$C_LENGTH                00000038                     #-1102   (10)   #-948    (7)
CRB$K_LENGTH                00000038                     #-1373   (15)
CRB$L_INTD                  00000014                     #-1000   (8)    #-1001   (8)    #-1008   (8)      1133   (11)
                                                          1142   (11)     1143   (11)     1144   (11)     1145   (11)
                                                        #-1154   (11)   #-1155   (11)   #-1162   (11)   #-1328   (15)
                                                        #-1364   (15)   #-1387   (15)     1389   (15)     1414   (15)
                                                        #-1491   (15)   #-1508   (15)   #-1574   (16)   #-1618   (17)
                                                        #-1629   (17)   #-1644   (17)   #-1646   (17)   #-648    (4)
                                                          979    (8)      988    (8)      989    (8)      990    (8)
                                                          991    (8)
CRB$L_LINK                  00000010                     #-1386   (15)   #-1489   (15)   #-1573   (16)   #-631    (4)
CRB$L_WQBL                  00000004                     #-1148   (11)   #-1382   (15)   #-994    (8)
CRB$L_WQFL                  00000000                      1147   (11)     1148   (11)     1381   (15)     1382   (15)
                                                          993    (8)      994    (8)
CRB$W_REFC                  0000000C                     #-1149   (11)   #-1447   (15)   #-1548   (16)   #-995    (8)
CRB$W_SIZE                  00000008                     #-1106   (10)   #-1379   (15)   #-952    (7)
CREATE_CRB                  0000080B-R   1369   (15)    #-1359   (15)   #-1361   (15)
CREATE_DDB                  000007AF-R   1338   (15)    #-1319   (15)
CREATE_IDB                  00000857-R   1393   (15)    #-1383   (15)
CREATE_UCB                  000008D8-R   1435   (15)    #-1334   (15)   #-1365   (15)
CREATE_VEC                  00000881-R   1408   (15)
CRLF_LENGTH                =00000002     253    (1)     #-491    (1)
CTL$GW_CHINDX               0000003A-R   337    (1)
CTL$GW_NMIOCH               00000038-R   334    (1)
DB_ERROR                    000009D9-R   1541   (16)    #-1311   (15)   #-1342   (15)   #-1376   (15)   #-1397   (15)
                                                        #-1412   (15)   #-1426   (15)   #-1439   (15)   #-1475   (15)
DB_EXIT                     000009D2-R   1517   (15)    #-1331   (15)
DDB$B_TYPE                  0000000A                     #-1348   (15)
DDB$K_LENGTH                00000034                     #-1339   (15)
DDB$L_DDT                   0000000C                     #-1502   (15)
DDB$L_LINK                  00000000                     #-1318   (15)   #-1320   (15)     1344   (15)   #-1345   (15)
                                                        #-642    (4)
DDB$L_UCB                   00000004                     #-1326   (15)     1456   (15)   #-1616   (17)   #-1642   (17)
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                                                        #-620    (4)      634    (4)
DDB$T_DRVNAME                  00000024                   1355   (15)
DDB$T_NAME                     00000014                   1321   (15)     1352   (15)
DDB$W_SIZE                     00000008                  #-1347   (15)
DDB_BLINK                      00000006-R   403    (1)   #-1344   (15)   #-1584   (16)
DDT$L_UNITINIT                 00000018                  #-1503   (15)
DIR...                        =FFFFFFFF     733    (5)     733    (5)
DPT$B_ADPTYPE                  0000000C                  #-1360   (15)   #-1419   (15)   #-1493   (15)   #-1613   (17)
                                                        #-1639   (17)   #-876    (6)
DPT$B_FLAGS                    0000000D                   1359   (15)     1383   (15)     1572   (16)
DPT$B_REFC                     0000000B                  #-1349   (15)   #-1583   (16)   #-660    (4)    #-921    (6)
                                                        #-923    (6)
DPT$L_FLINK                    00000000                  #-558    (3)    #-657    (4)    #-774    (6)
DPT$T_NAME                     0000001E                   563    (3)    #-777    (6)      853    (6)
DPT$V_SUBCNTRL                =00000000                  #-1359   (15)   #-1383   (15)   #-1572   (16)
DPT$W_MAXUNITS                 00000016                  #-911    (6)
DPT$W_SIZE                     00000008                  #-846    (6)
DPT$W_UCBSIZE                  0000000E                  #-1436   (15)
DR$INITIAL                     00000000-XR                1155   (11)     1166   (11)     1177   (11)      303    (1)
DR$INT                         00000000-XR                1175   (11)     303    (1)
DRACRB                         000006F7-R   1173   (11)    1133   (11)     1178   (11)
DRACRBLEN                     =00000010     1178   (11)  #-1133   (11)
DS$BREAK                       00000000-XR                1769   (19)     296    (1)
DS$GK_SID                      00000000-XR                312    (1)    #-439    (1)    #-460    (1)
DS$GL_FLAGS                    00000000-XR                312    (1)      434    (1)      464    (1)      469    (1)
DS$GPHARD                      00000000-XR                300    (1)
DS$K_CCB                       00000000-XR                305    (1)      335    (1)      338    (1)
DS$K_ERROR                    =00000002     287    (1)
DS$K_NORMAL                   =00000001     287    (1)
DS$K_PRINTB                   =00000002     276    (1)
DS$K_PRINTF                   =00000001     276    (1)   #-1307   (15)   #-806    (6)    #-834    (6)    #-881    (6)
DS$K_PRINTI                   =00000000     276    (1)
DS$K_PRINTX                   =00000003     276    (1)
DS$K_SEVERE                   =00000004     287    (1)
DS$K_SUBSYS                   =00000066     287    (1)     287    (1)
DS$K_TYPE_ABORT_PROGRAM       =00000014     276    (1)
DS$K_TYPE_ABORT_TEST          =00000013     276    (1)
DS$K_TYPE_COMMAND_ERR         =00000015     276    (1)
DS$K_TYPE_COMMAND_OUT         =00000016     276    (1)
DS$K_TYPE_CRD_AUTOTEST        =0000001A     276    (1)
DS$K_TYPE_DS_PROMPT           =00000001     276    (1)
DS$K_TYPE_DS_START            =0000001D     276    (1)
DS$K_TYPE_ERRDEV              =00000008     276    (1)
DS$K_TYPE_ERRHARD             =00000006     276    (1)
DS$K_TYPE_ERROR_BODY          =00000009     276    (1)
DS$K_TYPE_ERROR_END           =0000000A     276    (1)
DS$K_TYPE_ERRPREP             =0000001B     276    (1)
DS$K_TYPE_ERRSOFT             =00000007     276    (1)
DS$K_TYPE_ERRSUP              =00000004     276    (1)
DS$K_TYPE_ERRSYS              =00000005     276    (1)
DS$K_TYPE_ERR_HALT            =0000000D     276    (1)
DS$K_TYPE_EXCEPTION           =0000000C     276    (1)
DS$K_TYPE_EXCEPTION_HEAD      =0000000B     276    (1)
DS$K_TYPE_FIRST_PASS          =00000011     276    (1)
DS$K_TYPE_GENERAL             =00000000     276    (1)
DS$K_TYPE_GENERAL_ERROR       =00000003     276    (1)
DS$K_TYPE_NO_TESTS            =00000012     276    (1)
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DS$K_TYPE_PARAM_ERROR           =0000001C     276     (1)
DS$K_TYPE_PROGRAM_END           =00000010     276     (1)
DS$K_TYPE_PROGRAM_INFO          =00000017     276     (1)
DS$K_TYPE_PROGRAM_START         =0000000F     276     (1)
DS$K_TYPE_QIO_INVADP            =00000024     276     (1)    #-882    (6)
DS$K_TYPE_QIO_NODRIVER          =00000022     276     (1)    #-1308   (15)   #-807    (6)
DS$K_TYPE_QIO_WRONGVER          =00000023     276     (1)    #-835    (6)
DS$K_TYPE_SCRIPT_ECHO           =00000021     276     (1)
DS$K_TYPE_SCRIPT_PNF            =0000001E     276     (1)
DS$K_TYPE_SCRIPT_PROMPT         =00000020     276     (1)
DS$K_TYPE_SCRIPT_SKIP           =0000001F     276     (1)
DS$K_TYPE_SEQUENCE_ERROR        =00000019     276     (1)
DS$K_TYPE_START_ERR             =00000018     276     (1)
DS$K_TYPE_START_LIST            =00000025     276     (1)
DS$K_TYPE_SUMMARY               =0000000E     276     (1)
DS$K_TYPE_USER_PROMPT           =00000002     276     (1)
DS$K_WARNING                    =00000000     287     (1)
DS$LOAD                          00000000-XR                  301     (1)      800     (6)      821     (6)
DS$M_ABRTFLG                    =00000040     290     (1)
DS$M_BADTIME                    =00100000     290     (1)
DS$M_BATCH                      =00400000     290     (1)
DS$M_BRKCLR                     =00001000     290     (1)
DS$M_BRKPT                      =00000800     290     (1)
DS$M_CHARFLG                    =00000100     290     (1)
DS$M_CMDFLG                     =00000080     290     (1)
DS$M_CTRLC                      =00000001     290     (1)
DS$M_CTRLO                      =00010000     290     (1)
DS$M_DEVFLG                     =00000200     290     (1)
DS$M_DISABLCC                   =01000000     290     (1)
DS$M_DONFLG                     =00002000     290     (1)
DS$M_ERRFLG                     =00000010     290     (1)
DS$M_EXCEPT                     =00080000     290     (1)
DS$M_EXETST                     =00040000     290     (1)
DS$M_HLTFLG                     =00000008     290     (1)
DS$M_LODFLG                     =00000002     290     (1)
DS$M_MEMMGT                     =00008000     290     (1)
DS$M_NI                         =04000000     290     (1)
DS$M_OUTPUT                     =00800000     290     (1)
DS$M_RUBFLG                     =00000020     290     (1)
DS$M_SCRIPT                     =00200000     290     (1)
DS$M_SETIMR                     =02000000     290     (1)
DS$M_STRFLG                     =00000004     290     (1)
DS$M_SUBT                       =00004000     290     (1)
DS$M_SYSFLG                     =00000400     290     (1)
DS$M_TIMED                      =02000000     290     (1)
DS$M_TIMED_OUT                  =08000000     290     (1)
DS$M_TIMRON                     =00020000     290     (1)
DS$M_TODR_ACTIVE                 00000000-XR                  #-1762   (19)   #-1774   (19)      318     (1)
DS$V_ABRTFLG                    =00000006     290     (1)
DS$V_BADTIME                    =00000014     290     (1)
DS$V_BATCH                      =00000016     290     (1)
DS$V_BRKCLR                     =0000000C     290     (1)
DS$V_BRKPT                      =0000000B     290     (1)
DS$V_CHARFLG                    =00000008     290     (1)
DS$V_CMDFLG                     =00000007     290     (1)
DS$V_CTRLC                      =00000000     290     (1)
DS$V_CTRLO                      =00000010     290     (1)
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DS$V_DEVFLG                     =00000009     290     (1)
DS$V_DISABLCC                   =00000018     290     (1)
DS$V_DONFLG                     =0000000D     290     (1)
DS$V_ERRFLG                     =00000004     290     (1)
DS$V_EXCEPT                     =00000013     290     (1)
DS$V_EXETST                     =00000012     290     (1)
DS$V_HLTFLG                     =00000003     290     (1)
DS$V_LODFLG                     =00000001     290     (1)
DS$V_MEMMGT                     =0000000F     290     (1)
DS$V_NI                         =0000001A     290     (1)    #-434    (1)    #-464    (1)    #-469    (1)
DS$V_OUTPUT                     =00000017     290     (1)
DS$V_RUBFLG                     =00000005     290     (1)
DS$V_SCRIPT                     =00000015     290     (1)
DS$V_SETIMR                     =00000019     290     (1)
DS$V_STRFLG                     =00000002     290     (1)
DS$V_SUBT                       =0000000E     290     (1)
DS$V_SYSFLG                     =0000000A     290     (1)
DS$V_TIMED                      =00000019     290     (1)
DS$V_TIMED_OUT                  =0000001B     290     (1)
DS$V_TIMRON                     =00000011     290     (1)
DS$_AP_NORMAL_BREAK             =00660150     287     (1)
DS$_ARITH                       =006600D0     287     (1)
DS$_ASBE                        =00660118     287     (1)
DS$_BADLINK                     =006600F0     287     (1)
DS$_BADTYPE                     =006600E8     287     (1)
DS$_BIIC                        =00660120     287     (1)
DS$_CHME                        =006600A8     287     (1)
DS$_CHMK                        =006600E0     287     (1)
DS$_DEVNAME                     =00660108     287     (1)
DS$_ERROR                       =00660002     287     (1)
DS$_FHWE                        =00660068     287     (1)
DS$_FRAGBUF                     =00660080     287     (1)
DS$_ICBUSY                      =006600C8     287     (1)
DS$_ICERR                       =006600C0     287     (1)
DS$_IHWE                        =00660060     287     (1)
DS$_ILLCHAR                     =00660018     287     (1)
DS$_ILLPAGCNT                   =00660078     287     (1)
DS$_ILLUNIT                     =00660100     287     (1)
DS$_INIT_FAIL                   =00660140     287     (1)
DS$_INSFMEM                     =00660050     287     (1)
DS$_INVCPU                      =00660130     287     (1)
DS$_IPL2HI                      =006600B8     287     (1)
DS$_IVADDR                      =00660040     287     (1)
DS$_IVVECT                      =00660038     287     (1)
DS$_KRNLSTK                     =00660090     287     (1)
DS$_LOGIC                       =00660070     287     (1)
DS$_MCHK                        =00660088     287     (1)
DS$_MEM_ALLOC_ERR               =00660138     287     (1)
DS$_MMOFF                       =00660058     287     (1)
DS$_NEEDUNIT                    =006600F8     287     (1)
DS$_NODE                        =00660128     287     (1)
DS$_NOPCS                       =00660110     287     (1)
DS$_NORMAL                      =00660001     287     (1)
DS$_NOSUPPORT                   =006600B1     287     (1)    #-766    (6)
DS$_NOTALLOWMP                  =00660148     287     (1)
DS$_NOTDON                      =00660030     287     (1)
DS$_NOTIMP                      =006600B0     287     (1)      287    (1)
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DS$_NULLSTR                     =00660010     287     (1)
DS$_OVERFLOW                    =00660008     287     (1)
DS$_POWER                       =00660098     287     (1)
DS$_PROGERR                     =00660020     287     (1)
DS$_SEVERE                      =00660004     287     (1)
DS$_TRANSL                      =006600A0     287     (1)
DS$_TRUNCATE                    =00660028     287     (1)
DS$_UNEXPINT                    =006600D8     287     (1)
DS$_UNSUPPDEV                   =00660158     287     (1)
DS$_VASFULL                     =00660048     287     (1)
DS$_WARNING                     =00660000     287     (1)       287     (1)
DSA$GL_FLAGS                     0000FE00                      #-1237    (13)
DSA$GL_SID                       0000FE14                      #-1751    (19)  #-1753    (19)
DSA$M_HALT                      =00000001                      #-1237    (13)
DSR$COMPLETION                   00000000-XR                    301     (1)     815     (6)     823     (6)
DSX$PRINT                        00000000-XR                   1309    (15)     300     (1)     808     (6)     836     (6)
                                                               883     (6)
DS_ERRSUP                        00000000-XR                   1238    (13)     300     (1)     458     (1)     666     (4)
                                                               894     (6)     925     (6)
DVR$B_CNUMVEC                    0000000B                      #-914     (6)
DVR$C_LEN                        00000014                       845     (6)     913     (6)
DVR$L_IDENT                      00000010                      #-828     (6)   #-831     (6)
DVR$W_SIZE                       00000008                      #-826     (6)
DVR$_IDENT                      =FFFF0001                      #-827     (6)   #-830     (6)
DYN$C_ADP                       =00000001                      #-1003    (8)   #-1056    (9)   #-1157    (11)
DYN$C_CRB                       =00000005                      #-1146    (11)  #-1380    (15)  #-992     (8)
DYN$C_DDB                       =00000006                      #-1348    (15)
DYN$C_IDB                       =00000009                      #-1151    (11)  #-1401    (15)  #-997     (8)
DYN$C_UCB                       =00000010                      #-1443    (15)
EXE$ALONONPAGED                  00000000-XR                   1673    (18)     298     (1)     813     (6)
EXE$DEANONPAGED                  00000000-XR                   1695    (18)     298     (1)     841     (6)
EXE$FORKDSPTH                    00000000-XR                    309     (1)
EXE$GL_PWRDONE                   00000004-R    327     (1)     #-1782    (19)
EXE$MAXACMODE                    00000707-R    1199    (12)
EXE$PWRTIMCHK                    00000B29-R    1749    (19)
EXE$QIO                          00000000-R    432     (1)
FILE                             FFFFFFF4      733     (5)     #-787     (6)   #-788     (6)   #-789     (6)     791     (6)
FILEDEF                          FFFFFFE4      733     (5)     #-792     (6)    797     (6)
FILEDESC                         FFFFFFEC      733     (5)     #-790     (6)   #-791     (6)     798     (6)     804     (6)
                                                               832     (6)
FILL_ACF                         000003A6-R    852     (6)     #-779     (6)
FIND_ADP                         00000B11-R    1723    (19)    #-889     (6)
HP$A_DEVICE                      00000018                      #-887     (6)   #-902     (6)
HP$A_LINK                        00000020                      #-764     (6)   #-857     (6)   #-860     (6)
HP$B_DRIVE                       0000000B                      #-900     (6)   #-909     (6)
HP$Q_DEVICE                      00000000                      #-743     (6)   #-744     (6)    803     (6)     878     (6)
HP$T_TYPE                        00000026                       755     (6)   #-865     (6)    870     (6)     879     (6)
HP$W_VECTOR                      00000024                      #-898     (6)   #-904     (6)   #-907     (6)
IDB$B_TYPE                       0000000A                      #-1151    (11)  #-1401    (15)  #-997     (8)
IDB$C_LENGTH                     00000034                      #-1108    (10)  #-954     (7)
IDB$K_LENGTH                     00000034                      #-1394    (15)
IDB$L_ADP                        00000010                      #-1009    (8)   #-1163    (11)  #-1402    (15)  #-1620    (17)
                                                               #-1623    (17)
IDB$L_CSR                        00000000                      #-1153    (11)  #-1403    (15)  #-1487    (15)  #-1492    (15)
                                                               #-1619    (17)  #-1645    (17)  #-999     (8)
IDB$L_UCBLST                     00000014                      #-1389    (15)  #-1449    (15)  #-1550    (16)  #-1576    (16)
IDB$W_SIZE                       00000008                      #-1112    (10)  #-1400    (15)  #-958     (7)
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IDB$W_UNITS                     0000000C                        #-1152  (11)   #-1404  (15)   #-998   (8)
INIT_CNTRL                      00000964-R  1479  (15)         #-1473  (15)
INIT_DB                         00000945-R  1468  (15)
INIT_UNIT                       00000978-R  1485  (15)         #-1481  (15)
INI_DRADP                       00000616-R  1098  (10)           893   (6)
INI_MBADP                       000004A0-R  944   (7)            893   (6)
INI_UBADP                       00000594-R  1044  (9)            893   (6)
IO$S_FCODE                      =00000006                       #-446   (1)
IO$TESTCSR_L                    00000000-XR                       1498  (15)      299   (1)
IO$TESTCSR_W                    00000000-XR                       1626  (17)      299   (1)
IO$V_FCODE                      =00000000                       #-446   (1)
IO$_READPROMPT                  =00000037                       #-485   (1)
IO$_WRITEVBLK                   =00000030                       #-456   (1)
IOC$GL_ADPLIST                  00000000-XR                       1709  (19)     1725  (19)      297   (1)   #-545   (2)
                                                                   607   (4)
IOC$GL_DEVLIST                  00000000-XR                       1317  (15)      297   (1)   #-544   (2)   #-617   (4)
                                                                #-642   (4)
IOC$GL_DPTLIST                  00000000-XR                        297  (1)       540   (2)      555   (3)      655   (4)
                                                                   772   (6)      847   (6)
IOC$INITDRV                     00000000-XR                       1471  (15)      308   (1)
IOC$IOPOST                      00000000-XR                        309  (1)
IOC$REINITDRV                   00000000-XR                        309  (1)
IOC$RTN                         00000000-XR                     #-1506  (15)      311   (1)
IOGEN$CNTRL_INI                 00000A53-R  1612  (17)         #-1483  (15)
IOGEN$CONN_VEC                  00000000-XR                       1428  (15)      305   (1)
IOGEN$LOCK_IODB                 00000A4B-R  1596  (16)         #-1294  (15)
IOGEN$UNLK_IODB                 00000A4F-R  1599  (16)         #-1518  (15)   #-1588  (16)
LASTCHAR                        00000004-R  393   (1)          #-481   (1)    #-488   (1)
LENGTH                          FFFFFFE0    733   (5)            794   (6)    #-812   (6)
LF                              =0000000A   251   (1)            358   (1)    #-488   (1)
LOAD$_ADDRESS                   =00000010   285   (1)         #-820   (6)
LOAD$_DEFAULT                   =00000008   285   (1)
LOAD$_FILE                      =00000004   285   (1)
LOAD$_LENGTH                    =0000000C   285   (1)         #-819   (6)
LOAD$_NARGS                     =00000007   285   (1)
LOAD$_RETLEN                    =00000014   285   (1)
LOAD$_RETREC                    =00000018   285   (1)
LOAD$_VBN                       =0000001C   285   (1)
LOAD_DRIVER                     000002D8-R  786   (6)         #-776   (6)
LOAD_FLAGS                      00000005-R  395   (1)         #-1293  (15)   #-1343  (15)   #-1377  (15)   #-1398  (15)
                                                              #-1440  (15)     1481  (15)     1546  (16)     1565  (16)
                                                                1571  (16)     1582  (16)
LOAD_M_CRB                      =00000002   402   (1)         #-1377  (15)
LOAD_M_DDB                      =00000001   402   (1)         #-1343  (15)
LOAD_M_IDB                      =00000004   402   (1)         #-1398  (15)
LOAD_M_UCB                      =00000008   402   (1)         #-1440  (15)
LOAD_V_CRB                      =00000001   402   (1)         #-1481  (15)   #-1571  (16)
LOAD_V_DDB                      =00000000   402   (1)         #-1582  (16)
LOAD_V_IDB                      =00000002   402   (1)         #-1565  (16)
LOAD_V_UCB                      =00000003   402   (1)         #-1546  (16)
LOC$DPT                         00000161-R  553   (3)         #-1200  (15)
LOC$PTDESC                      00000000-XR                       310   (1)      757   (6)
LOCAL                           FFFFFFC0    733   (5)            737   (6)
MBA$INITIAL                     00000000-XR                       1001  (8)      1012  (8)      1023  (8)      302   (1)
MBA$INT                         00000000-XR                       1021  (8)      302   (1)
MBACRB                          00000584-R  1019  (8)            1024  (8)      979   (8)
MBACRBLEN                       =00000010   1024  (8)         #-979   (8)
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MBINT_DISP                       0000003C-R    340   (1)     #-1415  (15)
NUMUBAVEC                       =00000080      1042  (9)     #-1047  (9)     #-1074  (9)
PR$_IPL                         =00000012                    #-1013  (8)     #-1053  (9)     #-1077  (9)     #-1131  (11)
                                                             #-1167  (11)    #-1480  (15)    #-1513  (15)    #-1597  (16)
                                                             #-1600  (16)    #-605   (4)     #-663   (4)     #-977   (8)
PR$_SID_TYP8NN                  =00000006                    #-1751  (19)
PR$_SID_TYP8RR                  =00000011                    #-1753  (19)
PR$_TODR                        =0000001B                    #-1780  (19)
PR$_TXCS                        =00000022                    #-1765  (19)
PR$_TXDB                        =00000023                    #-1767  (19)
PREADVBLK                        00000000-XR                   306   (1)
PSL$S_PRVMOD                    =00000002                    #-1201  (12)    #-1203  (12)
PSL$V_IS                        =0000001A      277   (1)
PSL$V_PRVMOD                    =00000016                    #-1201  (12)    #-1203  (12)
QIO$ADDUNIT                      00000259-R    735   (6)
QIO$ALLOCATE                     00000AC1-R    1671  (18)    #-1049  (9)     #-1103  (10)    #-1109  (10)    #-1115  (10)
                                                             #-1340  (15)    #-1374  (15)    #-1395  (15)    #-1437  (15)
                                                             #-949   (7)     #-955   (7)     #-961   (7)
QIO$CLEANUP                      00000192-R    601   (4)
QIO$DEALLOCATE                   00000AE4-R    1691  (18)    #-1123  (10)    #-1125  (10)    #-1559  (16)    #-638   (4)
                                                             #-643   (4)     #-649   (4)     #-651   (4)     #-969   (7)
                                                             #-971   (7)
QIO$INITIALIZE                   0000013E-R    538   (2)
QIO$LOAD_DB                      00000733-R    1290  (15)      920   (6)
QIO$L_ALLOCATE                   00000000-R    390   (1)     #-1681  (18)    #-1694  (18)    #-546   (2)     #-664   (4)
QIO$_ASTADR                     =00000014      271   (1)
QIO$_ASTPRM                     =00000018      271   (1)
QIO$_CHAN                       =00000008      271   (1)     #-436   (1)
QIO$_EFN                        =00000004      271   (1)
QIO$_FUNC                       =0000000C      271   (1)       447   (1)     #-486   (1)
QIO$_IOSB                       =00000010      271   (1)     #-499   (1)       504   (1)
QIO$_NARGS                      =0000000C      271   (1)
QIO$_P1                         =0000001C      271   (1)     #-476   (1)     #-480   (1)     #-502   (1)
QIO$_P2                         =00000020      271   (1)     #-475   (1)     #-479   (1)
QIO$_P3                         =00000024      271   (1)
QIO$_P4                         =00000028      271   (1)
QIO$_P5                         =0000002C      271   (1)     #-496   (1)
QIO$_P6                         =00000030      271   (1)
QIOCLEAN_CPU                     00000000-XR                   310   (1)       609   (4)
READVBLK                         00000000-XR                   306   (1)       472   (1)
REMOTE_NODE_CONTROL_LEVEL        00000000-XR                   313   (1)       319   (1)       503   (1)
SAVABS...                       =FFFFFFC0      733   (5)
SCAN$ALPHA                       00000000-XR                   308   (1)       745   (6)
SCAN$SEARCHLIST                  00000000-XR                   308   (1)       873   (6)
SCB$L_SFTLVL4                    00000090                    #-612   (4)     #-613   (4)
SCB$L_SFTLVL8                    000000A0                    #-610   (4)     #-611   (4)
SCB_BASE                         00000000-XR                  1139   (11)      1141   (11)      304   (1)       603   (4)
                                                              739   (6)       985   (8)       987   (8)
SCB_IMAGE                        00000000-XR                   304   (1)       604   (4)
SEND_CONSOLE_RESPONSE            00000000-XR                   313   (1)       319   (1)       477   (1)       493   (1)
                                                               497   (1)
SIZ...                          =00000001      402   (1)      290   (1)       402   (1)
SS$_INSFMEM                      00000000-XR                 #-1127  (10)      307   (1)     #-973   (7)
SS$_IVCHAN                       00000000-XR                   307   (1)
SS$_NORMAL                       00000000-XR                 #-1014  (8)     #-1168  (11)    #-1730  (19)      307   (1)
                                                             #-567   (3)
SYSG$_INVDPTINI                 =007C800A                    #-1474  (15)
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SYSG$_INVVEC                    =007C802A                       #-1411  (15)
SYSG$_VECINUSE                  =007C801A                       #-1425  (15)
TODR_BYTE_CNT                    00000000-XR                    #-1761  (19)  #-1770  (19)    318   (1)
TODR_STORE                       00000000-XR                    #-1777  (19)    318   (1)
TXCS$V_RDY                       00000000-XR                    #-1766  (19)    321   (1)
T_ADAPTER_TYPE                   000000C2-R   362   (1)        #-875   (6)
T_CRLF                           000000C0-R   357   (1)          492   (1)
T_INVADP                         00000095-R   353   (1)          880   (6)
T_KNOWN_DEV                      000000C9-R   371   (1)          380   (1)     872   (6)
T_NODRIVER                       00000046-R   347   (1)         1306   (15)    805   (6)
T_WRONGVER                       00000068-R   350   (1)          833   (6)
UBA$INITIAL                      00000000-XR                     1070   (9)     320   (1)
UBA$UNEXINT                      00000000-XR                     1075   (9)   #-1423  (15)    302   (1)
UBADP_CPU                        00000000-XR                     1072   (9)     304   (1)
UBINTSZ                          00000000-XR                    #-1047  (9)     320   (1)
UBINT_DISP                       00000044-R   344   (1)
UCB$B_SLAVE                      00000074                       #-1454  (15)
UCB$B_TYPE                       0000000A                       #-1443  (15)
UCB$L_ASTQBL                     00000010                       #-1445  (15)
UCB$L_ASTQFL                     0000000C                        1444   (15)    1445  (15)
UCB$L_CRB                        00000020                       #-1327  (15)  #-1446  (15)  #-1617  (17)  #-1643  (17)
                                                                #-621   (4)
UCB$L_DDB                        00000024                       #-1450  (15)
UCB$L_IOQBL                      00000044                       #-1452  (15)
UCB$L_IOQFL                      00000040                        1451   (15)    1452  (15)
UCB$L_LINK                       0000002C                       #-1332  (15)    1459  (15)    634   (4)   #-635   (4)
UCB$M_ONLINE                    =00000010                       #-1500  (15)
UCB$M_VALID                     =00000800                       #-1472  (15)
UCB$W_SIZE                       00000008                       #-1442  (15)
UCB$W_STS                        00000058                       #-1472  (15)  #-1500  (15)
UCB$W_UNIT                       00000048                       #-1329  (15)  #-1453  (15)
UCB_BLINK                        0000000A-R   406   (1)        #-1462  (15)  #-1547  (16)
VEC$K_LENGTH                     00000024                       #-1372  (15)  #-1430  (15)
VEC$L_ADP                        00000014                       #-1008  (8)   #-1162  (11)  #-1417  (15)
VEC$L_IDB                        00000008                       #-1000  (8)   #-1154  (11)  #-1328  (15)  #-1364  (15)
                                                                #-1387  (15)  #-1418  (15)  #-1491  (15)  #-1574  (16)
                                                                #-1618  (17)  #-1644  (17)  #-648   (4)
VEC$L_INITIAL                    0000000C                       #-1001  (8)   #-1155  (11)  #-1629  (17)  #-1646  (17)
VEC$L_UNITINIT                   00000018                       #-1508  (15)
VEC$Q_DISPATCH                   00000000                       #-1415  (15)
VMS$QIO                          00000000-XR                     305   (1)     438   (1)
WRITEVBLK                        00000000-XR                     306   (1)     467   (1)
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Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	26	00:00:00.00	00:00:00.17
Command processing	905	00:00:00.28	00:00:00.79
Pass 1	1274	00:00:05.60	00:00:08.68
Symbol table sort	0	00:00:00.49	00:00:00.49
Pass 2	95	00:00:01.63	00:00:03.26
Symbol table output	2	00:00:00.09	00:00:00.44
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	7	00:00:00.37	00:00:00.53

```
Assembler run totals          2313     00:00:08.47    00:00:14.37

The working set limit was 3400 pages.
348441 bytes (681 pages) of virtual memory were used to buffer the intermediate code.
There were 90 pages of symbol table space allocated to hold 1693 non-local and 119 local symbols.
1786 source lines were read in Pass 1, producing 126 object records in Pass 2.
69 pages of virtual memory were used to define 60 macros.
```

+----------------------------+
! Macro library statistics !
+----------------------------+

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	25
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	6
SYS$COMMON:[SYSLIB]LIB.MLB;2	5
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	14
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	50

```
2035 GETS were required to define 50 macros.

There were no errors, warnings or information messages.
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

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(1) 93 ONE PARAMETER FUNCTION PROCESSING
(1) 126 ZERO PARAMETER FUNCTION PROCESSING
(1) 159 READ AND WRITE FUNCTION PROCESSING
(1) 212 READ AND WRITE FUNCTION BUFFER CHECK AND LOCK ROUTINES
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(1) 356 CHECK BUFFER ACCESSIBILITY FOR READ FUNCTION
(1) 392 CHECK BUFFER ACCESSIBILITY FOR WRITE FUNCTION
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(1) 531 SET DEVICE MODE AND CHARACTERISTICS FUNCTIONS (AT FDT LEVEL)
(1) 571 SET DEVICE MODE AND CHARACTERISTICS FUNCTIONS
(1) 610 SENSE DEVICE MODE AND CHARACTERISTICS FUNCTIONS
(1) 648 CARRIAGE CONTROL INTERPRETATION

```
                     0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element QIOFDT.MAR
                     0000     2 ; *1     6-FEB-1986 15:22:10 DS ""
                     0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element QIOFDT.MAR
                     0000     4         .TITLE  QIOFDT  *** QIOFDT function dispatch routines
                     0000     5         .IDENT  /05-03/
                00000000     6         .PSECT  SEP, EXE, SHR, WRT, LONG
                     0000     7
                00000014     8 EXE$C_CMSTKSZ   = ^X14          ; Utterly unused Change mode call size
                     0000     9 ;
                     0000    10 ;*****************************************************************************
                     0000    11 ;*                                                                           *
                     0000    12 ; COPYRIGHT (C) 1977, 1980
                     0000    13 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
                     0000    14 ;*                                                                           *
                     0000    15 ;*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND  COPIED   *
                     0000    16 ;*  ONLY  IN  ACCORDANCE  WITH  THE  TERMS  OF  SUCH  LICENSE AND WITH THE  *
                     0000    17 ;*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE OR  ANY  OTHER   *
                     0000    18 ;*  COPIES  THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY   *
                     0000    19 ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE  IS  HEREBY   *
                     0000    20 ;*  TRANSFERRED.                                                            *
                     0000    21 ;*                                                                           *
                     0000    22 ;*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE   *
                     0000    23 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT  *
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                     0000    26 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS   *
                     0000    27 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
                     0000    28 ;*                                                                           *
                     0000    29 ;*****************************************************************************
                     0000    30 ;
                     0000    31 ; D. N. CUTLER 15-SEP-76
                     0000    32 ;
                     0000    33 ; MODIFIED BY:
                     0000    34 ;
                     0000    35 ;       DS5.4   John Ciukaj     5-May-1980      Version 5.4
                     0000    36 ;                 Used Vax/Vms version 2.0 SYSQIOFDT.MAR and created
                     0000    37 ;                 a UPD file with the edits necessary to reflect the
                     0000    38 ;                 changes exhibited in Supervisor version 5.3 module
                     0000    39 ;                 QIOFDT.
                     0000    40 ;
                     0000    41 ;                Dave Butenhof   30-jun-1980,    version 5.5
                     0000    42 ;       02        Alter two BSBW's to longword displacment JSB's since
                     0000    43 ;                 the supervisor's gotten fatter.
                     0000    44 ;
                     0000    45 ;       03       M. Baggett      8-Dec-1982      Version 6.10
                     0000    46 ;                Change BSBW to JSB to fixed truncation error.
                     0000    47 ;
                     0000    48 ;
                     0000    49 ;       SRB0003          Steve Beckhardt         23-Oct-1979
                     0000    50 ;       Fixed bug to deallocate diagnostic buffer if QIO is being
                     0000    51 ;       backed out to fault a page in.
                     0000    52 ;
                     0000    53 ;       MHB0029          M. H. Bramhall          28-Sep-1979
                     0000    54 ;       Added EXE$CARRIAGE for carriage control processing.
                     0000    55 ;
                     0000    56 ;       SRB0002          STEVE BECKHARDT         30-MAR-1979
                     0000    57 ;       ADDED ENTRY POINTS EXE$MODIFY, EXE$MODIFYLOCK, AND EXE$MODIFYLOCKR
```

```
                        0000     58 ;       FOR FUNCTIONS THAT READ AND WRITE MEMORY.
                        0000     59 ;
                        0000     60 ;       SRB0001          STEVE BECKHARDT         29-MAR-1979
                        0000     61 ;       ADDED ROUTINES EXE$READLOCKR, EXE$WRITELOCKR, EXE$READCHKR, AND
                        0000     62 ;       EXE$WRITECHKR
                        0000     63 ;
                        0000     64 ; SYSTEM SERVICE QUEUE I/O FUNCTION DECISION TABLE SUBROUTINES
                        0000     65 ;
                        0000     66 ; MACRO LIBRARY CALLS
                        0000     67 ;
                        0000     68
                        0000     69          $ACBDEF                             ;DEFINE ACB OFFSETS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .IIF    NB,ACB$L_ASTQFL,        ACB$L_ASTQFL:
                00000004 0000                       .BLKL   1
                        0004                .IIF    NB,ACB$L_ASTQBL,        ACB$L_ASTQBL:
                00000008 0004                       .BLKL   1
                        0008                .IIF    NB,ACB$W_SIZE,  ACB$W_SIZE:
                0000000A 0008                       .BLKW   1
                        000A                .IIF    NB,ACB$B_TYPE,  ACB$B_TYPE:
                0000000B 000A                       .BLKB   1
                        000B                .IIF    NB,ACB$B_RMOD,  ACB$B_RMOD:
                0000000C 000B                       .BLKB   1
                        000C                .IIF    NB,ACB$L_PID,   ACB$L_PID:
                00000010 000C                       .BLKL   1
                        0010                .IIF    NB,ACB$L_AST,   ACB$L_AST:
                00000014 0010                       .BLKL   1
                        0014                .IIF    NB,ACB$L_ASTPRM,        ACB$L_ASTPRM:
                00000018 0014                       .BLKL   1
                        0018                .IIF    NB,ACB$C_LENGTH,        ACB$C_LENGTH:
                        0018                .IIF    NB,ACB$K_LENGTH,        ACB$K_LENGTH:
                        0018                .IIF    NB,ACB$L_KAST,  ACB$L_KAST:
                0000001C 0018                       .BLKL   1
                00000000                    .RESTORE
                        0000     70         $CCBDEF                             ;DEFINE CCB OFFSETS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 001C               .=0
                        0000                .IIF    NB,CCB$L_UCB,   CCB$L_UCB:
                00000004 0000                       .BLKL   1
                        0004                .IIF    NB,CCB$L_WIND,  CCB$L_WIND:
                00000008 0004                       .BLKL   1
                        0008                .IIF    NB,CCB$B_STS,   CCB$B_STS:
                00000009 0008                       .BLKB   1
                        0009                .IIF    NB,CCB$B_AMOD,  CCB$B_AMOD:
                0000000A 0009                       .BLKB   1
                        000A                .IIF    NB,CCB$W_IOC,   CCB$W_IOC:
                0000000C 000A                       .BLKW   1
                        000C                .IIF    NB,CCB$L_DIRP,  CCB$L_DIRP:
                00000010 000C                       .BLKL   1
                        0010                .IIF    NB,CCB$C_LENGTH,        CCB$C_LENGTH:
                        0010                .IIF    NB,CCB$K_LENGTH,        CCB$K_LENGTH:
                00000000                    .RESTORE
                        0000     71         $DEVDEF                             ;DEFINE DEVICE CHARACTERISTICS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 001C               .=0
```

```
                    00000000                .RESTORE
                        0000    72          $IODEF                          ;DEFINE I/O FUNCTION CODES
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                    00000000    001C        .=0
                    00000000                .RESTORE
                        0000    73          $IRPDEF                         ;DEFINE IRP OFFSETS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                    00000000    001C        .=0
                        0000                .IIF    NB,IRP$L_IOQFL, IRP$L_IOQFL:
                    00000004    0000                .BLKL   1
                        0004                .IIF    NB,IRP$L_IOQBL, IRP$L_IOQBL:
                    00000008    0004                .BLKL   1
                        0008                .IIF    NB,IRP$W_SIZE,  IRP$W_SIZE:
                    0000000A    0008                .BLKW   1
                        000A                .IIF    NB,IRP$B_TYPE,  IRP$B_TYPE:
                    0000000B    000A                .BLKB   1
                        000B                .IIF    NB,IRP$B_RMOD,  IRP$B_RMOD:
                    0000000C    000B                .BLKB   1
                        000C                .IIF    NB,IRP$L_PID,   IRP$L_PID:
                    00000010    000C                .BLKL   1
                        0010                .IIF    NB,IRP$L_AST,   IRP$L_AST:
                    00000014    0010                .BLKL   1
                        0014                .IIF    NB,IRP$L_ASTPRM,        IRP$L_ASTPRM:
                    00000018    0014                .BLKL   1
                        0018                .IIF    NB,IRP$L_WIND,  IRP$L_WIND:
                    0000001C    0018                .BLKL   1
                        001C                .IIF    NB,IRP$L_UCB,   IRP$L_UCB:
                    00000020    001C                .BLKL   1
                        0020                .IIF    NB,IRP$W_FUNC,  IRP$W_FUNC:
                    00000022    0020                .BLKW   1
                        0022                .IIF    NB,IRP$B_EFN,   IRP$B_EFN:
                    00000023    0022                .BLKB   1
                        0023                .IIF    NB,IRP$B_PRI,   IRP$B_PRI:
                    00000024    0023                .BLKB   1
                        0024                .IIF    NB,IRP$L_IOSB,  IRP$L_IOSB:
                    00000028    0024                .BLKL   1
                        0028                .IIF    NB,IRP$W_CHAN,  IRP$W_CHAN:
                    0000002A    0028                .BLKW   1
                        002A                .IIF    NB,IRP$W_STS,   IRP$W_STS:
                    0000002C    002A                .BLKW   1
                        002C                .IIF    NB,IRP$L_SVAPTE,        IRP$L_SVAPTE:
                    00000030    002C                .BLKL   1
                        0030                .IIF    NB,IRP$W_BOFF,  IRP$W_BOFF:
                    00000032    0030                .BLKW   1
                        0032                .IIF    NB,IRP$W_BCNT,  IRP$W_BCNT:
                    00000034    0032                .BLKW   1
                        0034                .IIF    NB,IRP$L_IOST1, IRP$L_IOST1:
                        0034                .IIF    NB,IRP$L_MEDIA, IRP$L_MEDIA:
                    00000038    0034                .BLKL   1
                        0038                .IIF    NB,IRP$L_IOST2, IRP$L_IOST2:
                        0038                .IIF    NB,IRP$L_TT_TERM,       IRP$L_TT_TERM:
                        0038                .IIF    NB,IRP$B_CARCON,        IRP$B_CARCON:
                    00000039    0038                .BLKB   1
                    0000003C    0039                .BLKB   3
                        003C                .IIF    NB,IRP$Q_NT_PRVMSK,     IRP$Q_NT_PRVMSK:
```

```
                    003C                .IIF    NB,IRP$W_ABCNT, IRP$W_ABCNT:
                    003C                .IIF    NB,IRP$W_TT_PRMPT,      IRP$W_TT_PRMPT:
          0000003E  003C                        .BLKW   1
                    003E                .IIF    NB,IRP$W_OBCNT, IRP$W_OBCNT:
          00000040  003E                        .BLKW   1
                    0040                .IIF    NB,IRP$L_SEGVBN,        IRP$L_SEGVBN:
          00000044  0040                        .BLKL   1
                    0044                .IIF    NB,IRP$L_DIAGBUF,       IRP$L_DIAGBUF:
          00000048  0044                        .BLKL   1
                    0048                .IIF    NB,IRP$L_SEQNUM,        IRP$L_SEQNUM:
          0000004C  0048                        .BLKL   1
                    004C                .IIF    NB,IRP$L_EXTEND,        IRP$L_EXTEND:
          00000050  004C                        .BLKL   1
                    0050                .IIF    NB,IRP$L_ARB,   IRP$L_ARB:
          00000054  0050                        .BLKL   1
          00000058  0054                        .BLKL   1
          0000005C  0058                        .BLKL   1
                    005C                .IIF    NB,IRP$C_LENGTH,        IRP$C_LENGTH:
                    005C                .IIF    NB,IRP$K_LENGTH,        IRP$K_LENGTH:
                00000000                .RESTORE
                    0000     74         $PCBDEF                         ;DEFINE PCB VALUES
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
          00000000  005C                .=0
                    0000                .IIF    NB,PCB$L_SQFL,  PCB$L_SQFL:
          00000004  0000                        .BLKL   1
                    0004                .IIF    NB,PCB$L_SQBL,  PCB$L_SQBL:
          00000008  0004                        .BLKL   1
                    0008                .IIF    NB,PCB$W_SIZE,  PCB$W_SIZE:
          0000000A  0008                        .BLKW   1
                    000A                .IIF    NB,PCB$B_TYPE,  PCB$B_TYPE:
          0000000B  000A                        .BLKB   1
                    000B                .IIF    NB,PCB$B_PRI,   PCB$B_PRI:
          0000000C  000B                        .BLKB   1
                    000C                .IIF    NB,PCB$B_ASTACT,        PCB$B_ASTACT:
          0000000D  000C                        .BLKB   1
                    000D                .IIF    NB,PCB$B_ASTEN, PCB$B_ASTEN:
          0000000E  000D                        .BLKB   1
                    000E                .IIF    NB,PCB$W_MTXCNT,        PCB$W_MTXCNT:
          00000010  000E                        .BLKW   1
                    0010                .IIF    NB,PCB$L_ASTQFL,        PCB$L_ASTQFL:
          00000014  0010                        .BLKL   1
                    0014                .IIF    NB,PCB$L_ASTQBL,        PCB$L_ASTQBL:
          00000018  0014                        .BLKL   1
                    0018                .IIF    NB,PCB$L_PHYPCB,        PCB$L_PHYPCB:
          0000001C  0018                        .BLKL   1
                    001C                .IIF    NB,PCB$L_OWNER, PCB$L_OWNER:
          00000020  001C                        .BLKL   1
                    0020                .IIF    NB,PCB$L_WSSWP, PCB$L_WSSWP:
          00000024  0020                        .BLKL   1
                    0024                .IIF    NB,PCB$L_STS,   PCB$L_STS:
          00000028  0024                        .BLKL   1
                    0028                .IIF    NB,PCB$L_WTIME, PCB$L_WTIME:
          0000002C  0028                        .BLKL   1
                    002C                .IIF    NB,PCB$W_STATE, PCB$W_STATE:
          0000002E  002C                        .BLKW   1
                    002E                .IIF    NB,PCB$B_WEFC,  PCB$B_WEFC:
```

```
                    0000002F  002E                        .BLKB   1
                              002F              .IIF    NB,PCB$B_PRIB,  PCB$B_PRIB:
                    00000030  002F                        .BLKB   1
                              0030              .IIF    NB,PCB$W_APTCNT,        PCB$W_APTCNT:
                    00000032  0030                        .BLKW   1
                              0032              .IIF    NB,PCB$W_TMBU,  PCB$W_TMBU:
                    00000034  0032                        .BLKW   1
                              0034              .IIF    NB,PCB$W_GPGCNT,        PCB$W_GPGCNT:
                    00000036  0034                        .BLKW   1
                              0036              .IIF    NB,PCB$W_PPGCNT,        PCB$W_PPGCNT:
                    00000038  0036                        .BLKW   1
                              0038              .IIF    NB,PCB$W_ASTCNT,        PCB$W_ASTCNT:
                    0000003A  0038                        .BLKW   1
                              003A              .IIF    NB,PCB$W_BIOCNT,        PCB$W_BIOCNT:
                    0000003C  003A                        .BLKW   1
                              003C              .IIF    NB,PCB$W_BIOLM, PCB$W_BIOLM:
                    0000003E  003C                        .BLKW   1
                              003E              .IIF    NB,PCB$W_DIOCNT,        PCB$W_DIOCNT:
                    00000040  003E                        .BLKW   1
                              0040              .IIF    NB,PCB$W_DIOLM, PCB$W_DIOLM:
                    00000042  0040                        .BLKW   1
                              0042              .IIF    NB,PCB$W_PRCCNT,        PCB$W_PRCCNT:
                    00000044  0042                        .BLKW   1
                              0044              .IIF    NB,PCB$T_TERMINAL,      PCB$T_TERMINAL:
                    0000004C  0044                        .BLKB   8
                              004C              .IIF    NB,PCB$L_PQB,   PCB$L_PQB:
                              004C              .IIF    NB,PCB$L_EFWM,  PCB$L_EFWM:
                    00000050  004C                        .BLKL   1
                              0050              .IIF    NB,PCB$L_EFCS,  PCB$L_EFCS:
                    00000054  0050                        .BLKL   1
                              0054              .IIF    NB,PCB$L_EFCU,  PCB$L_EFCU:
                    00000058  0054                        .BLKL   1
                              0058              .IIF    NB,PCB$L_EFC2P, PCB$L_EFC2P:
                    0000005C  0058                        .BLKL   1
                              005C              .IIF    NB,PCB$L_EFC3P, PCB$L_EFC3P:
                    00000060  005C                        .BLKL   1
                              0060              .IIF    NB,PCB$L_PID,   PCB$L_PID:
                    00000064  0060                        .BLKL   1
                              0064              .IIF    NB,PCB$L_PHD,   PCB$L_PHD:
                    00000068  0064                        .BLKL   1
                              0068              .IIF    NB,PCB$T_LNAME, PCB$T_LNAME:
                    00000078  0068                        .BLKB   16
                              0078              .IIF    NB,PCB$L_JIB,   PCB$L_JIB:
                    0000007C  0078                        .BLKL   1
                              007C              .IIF    NB,PCB$Q_PRIV,  PCB$Q_PRIV:
                    00000084  007C                        .BLKQ   1
                              0084              .IIF    NB,PCB$L_ARB,   PCB$L_ARB:
                    00000088  0084                        .BLKL   1
                              0088              .IIF    NB,PCB$L_UIC,   PCB$L_UIC:
                              0088              .IIF    NB,PCB$W_MEM,   PCB$W_MEM:
                    0000008A  0088                        .BLKW   1
                              008A              .IIF    NB,PCB$W_GRP,   PCB$W_GRP:
                    0000008C  008A                        .BLKW   1
                              008C              .IIF    NB,PCB$C_LENGTH,        PCB$C_LENGTH:
                              008C              .IIF    NB,PCB$K_LENGTH,        PCB$K_LENGTH:
                          00000000              .RESTORE
                              0000    75        $SSDEF                          ;DEFINE SYSTEM STATUS VALUES
```

```
                     0000               .SAVE   LOCAL_BLOCK
                     0000               .PSECT  $ABS$,ABS
                     008C               .=0
                     00000000           .RESTORE
                     0000    76         $UCBDEF                                 ;DEFINE UCB OFFSETS
                     0000               .SAVE   LOCAL_BLOCK
                     0000               .PSECT  $ABS$,ABS
                     008C               .=0
                     0000               .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                     0000               .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
                     0000                       .BLKL   1
                     0004               .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                     0004               .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
                     0004                       .BLKL   1
                     0008               .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
                     0008                       .BLKW   1
                     000A               .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
                     000A                       .BLKB   1
                     000B               .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
                     000B                       .BLKB   1
                     000C               .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                     000C               .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                     000C               .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
                     000C                       .BLKB   1
                     000D                       .BLKB   3
                     0010               .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                     0010               .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
                     0010                       .BLKL   1
                     0014               .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                     0014               .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                     0014               .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
                     0014                       .BLKW   1
                     0016               .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
                     0016                       .BLKW   1
                     0018               .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                     0018               .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
                     0018                       .BLKW   1
                     001A               .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                     001A               .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
                     001A                       .BLKW   1
                     001C               .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
                     001C                       .BLKL   1
                     0020               .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
                     0020                       .BLKL   1
                     0024               .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
                     0024                       .BLKL   1
                     0028               .IIF    NB,UCB$L_PID,   UCB$L_PID:
                     0028                       .BLKL   1
                     002C               .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
                     002C                       .BLKL   1
                     0030               .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
                     0030                       .BLKL   1
                     0034               .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
                     0034                       .BLKL   1
                     0038               .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
                     0038                       .BLKB   1
                     0039               .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
```

```
0000003A  0039                                  .BLKB   1
          003A                  .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
0000003C  003A                                  .BLKW   1
          003C                  .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
          003C                  .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
          003C                  .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
0000003D  003C                                  .BLKB   1
          003D                  .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
          003D                  .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
0000003E  003D                                  .BLKB   1
          003E                  .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
          003E                  .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
0000003F  003E                                  .BLKB   1
          003F                  .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
00000040  003F                                  .BLKB   1
          0040                  .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
00000044  0040                                  .BLKL   1
          0044                  .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
00000048  0044                                  .BLKL   1
          0048                  .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
0000004A  0048                                  .BLKW   1
          004A                  .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
          004A                  .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
0000004B  004A                                  .BLKB   1
          004B                  .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
0000004C  004B                                  .BLKB   1
          004C                  .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
00000050  004C                                  .BLKL   1
          0050                  .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
00000052  0050                                  .BLKW   1
          0052                  .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
          0052                  .IIF    NB,UCB$B_STATE, UCB$B_STATE:
00000053  0052                                  .BLKB   1
          0053                  .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
00000054  0053                                  .BLKB   1
          0054                  .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
00000058  0054                                  .BLKL   1
          0058                  .IIF    NB,UCB$W_STS,   UCB$W_STS:
0000005A  0058                                  .BLKW   1
          005A                  .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
0000005C  005A                                  .BLKW   1
          005C                  .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
          005C                  .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
00000060  005C                                  .BLKL   1
          0060                  .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
00000064  0060                                  .BLKL   1
          0064                  .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
          0064                  .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
00000068  0064                                  .BLKL   1
          0068                  .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
0000006C  0068                                  .BLKL   1
          006C                  .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
0000006E  006C                                  .BLKW   1
          006E                  .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
00000070  006E                                  .BLKW   1
          0070                  .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
00000071  0070                                  .BLKB   1
```

```
                        0071              .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
00000072  0071                                      .BLKB   1
                        0072              .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074  0072                                      .BLKW   1
                        0074              .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
                        0074              .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000  0074                            . = 0
                        0000              .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002  0000                                      .BLKW   1
00000074  0002                            . = 116
                        0074              .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078  0074                                      .BLKL   1
                        0078              .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C  0078                                      .BLKL   1
                        007C              .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080  007C                                      .BLKL   1
                        0080              .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084  0080                                      .BLKL   1
                        0084              .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088  0084                                      .BLKL   1
                        0088              .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C  0088                                      .BLKL   1
                        008C              .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090  008C                                      .BLKL   1
                        0090              .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
                        0090              .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074  0090                            . = 116
                        0074              .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075  0074                                      .BLKB   1
                        0075              .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076  0075                                      .BLKB   1
                        0076              .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077  0076                                      .BLKB   1
                        0077              .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078  0077                                      .BLKB   1
                        0078              .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C  0078                                      .BLKL   1
0000007E  007C                                      .BLKW   1
                        007E              .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080  007E                                      .BLKW   1
                        0080              .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084  0080                                      .BLKL   1
00000080  0084                            . = 128
00000084  0080                                      .BLKL   1
                        0084              .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088  0084                                      .BLKL   1
                        0088              .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A  0088                                      .BLKW   1
                        008A              .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C  008A                                      .BLKW   1
                        008C              .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
                        008C              .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E  008C                                      .BLKW   1
                        008E              .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090  008E                                      .BLKW   1
                        0090              .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092  0090                                      .BLKW   1
```

```
                        0092                .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
                00000094  0092                        .BLKW   1
                        0094                .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
                00000095  0094                        .BLKB   1
                        0095                .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
                00000096  0095                        .BLKB   1
                        0096                .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
                00000098  0096                        .BLKW   1
                00000096  0098                . = 150
                00000098  0096                        .BLKW   1
                        0098                .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
                0000009C  0098                        .BLKL   1
                        009C                .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
                000000A0  009C                        .BLKL   1
                        00A0                .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
                000000A4  00A0                        .BLKL   1
                        00A4                .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
                000000A6  00A4                        .BLKW   1
                        00A6                .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
                000000A7  00A6                        .BLKB   1
                000000A8  00A7                        .BLKB   1
                00000074  00A8                . = 116
                00000078  0074                        .BLKL   1
                0000007C  0078                        .BLKL   1
                00000080  007C                        .BLKL   1
                00000084  0080                        .BLKL   1
                00000088  0084                        .BLKL   1
                0000008C  0088                        .BLKL   1
                        008C                .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
                00000090  008C                        .BLKL   1
                00000094  0090                        .BLKL   1
                00000098  0094                        .BLKL   1
                0000009C  0098                        .BLKL   1
                        009C            .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
                0000009D  009C                        .BLKB   1
                        009D            .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
                0000009E  009D                        .BLKB   1
                        009E            .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
                0000009F  009E                        .BLKB   1
                000000A0  009F                        .BLKB   1
                        00A0            .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
                000000A1  00A0                        .BLKB   1
                        00A1            .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
                000000A2  00A1                        .BLKB   1
                        00A2            .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
                000000A3  00A2                        .BLKB   1
                000000A4  00A3                        .BLKB   1
                        00A4            .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
                000000A5  00A4                        .BLKB   1
                        00A5            .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
                000000A7  00A5                        .BLKW   1
                000000A8  00A7                        .BLKB   1
                        00A8            .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
                000000AC  00A8                        .BLKL   1
                000000B0  00AC                        .BLKL   1
                000000B4  00B0                        .BLKL   1
                000000B8  00B4                        .BLKL   1
```

```
                          00B8                  .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
                 000000BC 00B8                                  .BLKL   1
                          00BC                  .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
                          00BC                  .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
                 00000074 00BC                  . = 116
                          0074                  .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
                 00000078 0074                                  .BLKL   1
                          0078                  .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
                 0000007C 0078                                  .BLKL   1
                          007C                  .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
                 0000007E 007C                                  .BLKW   1
                 00000080 007E                                  .BLKW   1
                       00000000                 .RESTORE
                          0000      77          $VADEF                          ;DEFINE VIRTUAL ADDRESS FIELDS
                          0000                  .SAVE   LOCAL_BLOCK
                          0000                  .PSECT  $ABS$,ABS
                 00000000 00BC                  .=0
                       00000000                 .RESTORE
                          0000      78
                          0000      79 ;
                          0000      80 ; LOCAL SYMBOLS
                          0000      81 ;
                          0000      82 ; ARGUMENT LIST OFFSET DEFINITIONS
                          0000      83 ;
                          0000      84
                 00000000 0000      85 P1=0                                   ;FIRST FUNCTION DEPENDENT PARAMETER
                 00000004 0000      86 P2=4                                   ;SECOND FUNCTION DEPENDENT PARAMETER
                 00000008 0000      87 P3=8                                   ;THIRD FUNCTION DEPENDENT PARAMETER
                 0000000C 0000      88 P4=12                                  ;FOURTH FUNCTION DEPENDENT PARAMETER
                 00000010 0000      89 P5=16                                  ;FIFTH FUNCTION DEPENDENT PARAMETER
                 00000014 0000      90 P6=20                                  ;SIXTH FUNCTION DEPENDENT PARAMETER
```

```
                     0000     93          .SBTTL  ONE PARAMETER FUNCTION PROCESSING
                     0000     94 ;+
                     0000     95 ; EXE$ONEPARM - ONE PARAMETER FUNCTION PROCESSING
                     0000     96 ;
                     0000     97 ; THIS ROUTINE IS CALLED FROM THE FUNCTION DECISION TABLE DISPATCHER TO
                     0000     98 ; PROCESS A ONE PARAMETER FUNCTION THAT REQUIRES NO SPECIAL CHECKING.
                     0000     99 ;
                     0000    100 ; INPUTS:
                     0000    101 ;
                     0000    102 ;       R0 = SCRATCH.
                     0000    103 ;       R1 = SCRATCH.
                     0000    104 ;       R2 = SCRATCH.
                     0000    105 ;       R3 = ADDRESS OF I/O REQUEST PACKET.
                     0000    106 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                     0000    107 ;       R5 = ASSIGNED DEVICE UCB ADDRESS.
                     0000    108 ;       R6 = ADDRESS OF CCB.
                     0000    109 ;       R7 = I/O FUNCTION CODE BIT NUMBER.
                     0000    110 ;       R8 = FUNCTION DECISION TABLE DISPATCH ADDRESS.
                     0000    111 ;       R9 = SCRATCH.
                     0000    112 ;       R10 = SCRATCH.
                     0000    113 ;       R11 = SCRATCH.
                     0000    114 ;       AP = ADDRESS OF FIRST FUNCTION DEPENDENT PARAMETER.
                     0000    115 ;
                     0000    116 ; OUTPUTS:
                     0000    117 ;
                     0000    118 ; ***TBS***
                     0000    119 ;-
                     0000    120
                     0000    121          .ENABL  LSB
                     0000    122 EXE$ONEPARM::                                   ;ONE PARAMETER FUNCTION PROCESSING
 34 A3   6C   D0     0000    123          MOVL    P1(AP),IRP$L_MEDIA(R3)         ;STORE PARAMETER IN MEDIA ADDRESS
         03   11     0004    124          BRB     10$                            ;
```

```
                     0006   126          .SBTTL  ZERO PARAMETER FUNCTION PROCESSING
                     0006   127 ;+
                     0006   128 ; EXE$ZEROPARAM - ZERO PARAMETER FUNCTION PROCESSING
                     0006   129 ;
                     0006   130 ; THIS ROUTINE IS CALLED FROM THE FUNCTION DECISION TABLE DISPATCHER TO
                     0006   131 ; PROCESS A ZERO PARAMETER FUNCTION THAT REQUIRES NO ADDITION CHECKING.
                     0006   132 ;
                     0006   133 ; INPUTS:
                     0006   134 ;
                     0006   135 ;       R0 = SCRATCH.
                     0006   136 ;       R1 = SCRATCH.
                     0006   137 ;       R2 = SCRATCH.
                     0006   138 ;       R3 = ADDRESS OF I/O REQUEST PACKET.
                     0006   139 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                     0006   140 ;       R5 = ASSIGNED DEVICE UCB ADDRESS.
                     0006   141 ;       R6 = ADDRESS OF CCB.
                     0006   142 ;       R7 = I/O FUNCTION CODE BIT NUMBER.
                     0006   143 ;       R8 = FUNCTION DECISION TABLE DISPATCH ADDRESS.
                     0006   144 ;       R9 = SCRATCH.
                     0006   145 ;       R10 = SCRATCH.
                     0006   146 ;       R11 = SCRATCH.
                     0006   147 ;       AP = ADDRESS OF FIRST FUNCTION DEPENDENT PARAMETER.
                     0006   148 ;
                     0006   149 ; OUTPUTS:
                     0006   150 ;
                     0006   151 ; ***TBS***
                     0006   152 ;-
                     0006   153
                     0006   154 EXE$ZEROPARM::                               ;ZERO PARAMETER FUNCTION PROCESSING
 34 A3   D4          0006   155          CLRL    IRP$L_MEDIA(R3)             ;CLEAR PARAMETER
  FFF4'  31          0009   156 10$:     BRW     EXE$QIODRVPKT               ;QUEUE I/O PACKET TO DRIVER
                     000C   157          .DSABL  LSB
```

```
                                000C   159          .SBTTL  READ AND WRITE FUNCTION PROCESSING
                                000C   160 ;+
                                000C   161 ; EXE$READ - READ FUNCTION PROCESSING
                                000C   162 ; EXE$WRITE - WRITE FUNCTION PROCESSING
                                000C   163 ; EXE$MODIFY - MODIFY FUNCTION PROCESSING
                                000C   164 ;
                                000C   165 ; THESE ROUTINES ARE CALLED FROM THE FUNCTION DECISION TABLE DISPATCHER TO
                                000C   166 ; PROCESS A READ OR WRITE PHYSICAL OR LOGICAL FUNCTION.
                                000C   167 ; EXE$MODIFY IS USED FOR FUNCTIONS THAT READ AND WRITE MEMORY.
                                000C   168 ;
                                000C   169 ; INPUTS:
                                000C   170 ;
                                000C   171 ;       R0 = SCRATCH.
                                000C   172 ;       R1 = SCRATCH.
                                000C   173 ;       R2 = SCRATCH.
                                000C   174 ;       R3 = ADDRESS OF I/O REQUEST PACKET.
                                000C   175 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                                000C   176 ;       R5 = ASSIGNED DEVICE UCB ADDRESS.
                                000C   177 ;       R6 = ADDRESS OF CCB.
                                000C   178 ;       R7 = I/O FUNCTION CODE BIT NUMBER.
                                000C   179 ;       R8 = FUNCTION DECISION TABLE DISPATCH ADDRESS.
                                000C   180 ;       R9 = SCRATCH.
                                000C   181 ;       R10 = SCRATCH.
                                000C   182 ;       R11 = SCRATCH.
                                000C   183 ;       AP = ADDRESS OF FIRST FUNCTION DEPENDENT PARAMETER.
                                000C   184 ;
                                000C   185 ; OUTPUTS:
                                000C   186 ;
                                000C   187 ; ***TBS***
                                000C   188 ;-
                                000C   189
                                000C   190          .ENABL  LSB
                                000C   191 EXE$MODIFY::                                   ;MODIFY FUNCTION PROCESSING
    52    44'AF    DE          000C   192          MOVAL   B^EXE$MODIFYLOCK,R2         ;SET ADDRESS OF BUFFER CHECK ROUTINE
          04    11              0010   193          BRB     5$
                                0012   194 EXE$READ::                                    ;READ FUNCTION PROCESSING
    52    3E'AF    DE          0012   195          MOVAL   B^EXE$READLOCK,R2           ;SET ADDRESS OF BUFFER CHECK ROUTINE
04 2A A3    01    E3          0016   196 5$:       BBCS    #IRP$V_FUNC,IRP$W_STS(R3),10$ ;SET READ FUNCTION STATUS
                                001B   197 EXE$WRITE::                                   ;WRITE FUNCTION PROCESSING
    52    41'AF    DE          001B   198          MOVAL   B^EXE$WRITELOCK,R2          ;SET ADDRESS OF BUFFER CHECK ROUTINE
38 A3     0C AC    D0          001F   199 10$:      MOVL    P4(AP),IRP$B_CARCON(R3)     ;INSERT CARRIAGE CONTROL BYTE
       06    00    ED          0024   200          CMPZV   #IRP$V_FCODE,#IRP$S_FCODE,- ;PHYSICAL I/O FUNCTION?
    1F    20 A3               0027   201                  IRP$W_FUNC(R3),#IO$_PHYSICAL ;
          04    15              002A   202          BLEQ    20$                         ;IF LEQ YES
          15    A2              002C   203          SUBW    #IO$_READLBLK-IO$_READPBLK,- ;CONVERT TO PHYSICAL FUNCTION
       20 A3                   002E   204                  IRP$W_FUNC(R3)              ;
    51    04 AC    3C          0030   205 20$:      MOVZWL  P2(AP),R1                   ;GET NUMBER OF BYTES TO TRANSFER
          05    13              0034   206          BEQL    30$                         ;IF EQL NONE
       50    6C    D0          0036   207          MOVL    P1(AP),R0                   ;GET STARTING VIRTUAL ADDRESS OF TRANSFER
          62    16              0039   208          JSB     (R2)                        ;CHECK BUFFER AND LOCK IN MEMORY
          FFC2'   31            003B   209 30$:      BRW     EXE$QIODRVPKT               ;QUEUE I/O PACKET TO DRIVER
                                003E   210          .DSABL  LSB
```

```
                        003E   212          .SBTTL  READ AND WRITE FUNCTION BUFFER CHECK AND LOCK ROUTINES
                        003E   213 ;+
                        003E   214 ; EXE$READLOCK - CHECK BUFFER FOR READ ACCESSIBILITY AND LOCK
                        003E   215 ; EXE$WRITELOCK - CHECK BUFFER FOR WRITE ACCESSIBILITY AND LOCK
                        003E   216 ; EXE$MODIFYLOCK - CHECK BUFFER FOR READ ACCESSIBILITY AND LOCK
                        003E   217 ;
                        003E   218 ; THESE ROUTINES ARE CALLED TO CHECK THE ACCESSIBILITY OF AN I/O BUFFER AND
                        003E   219 ; TO LOCK THE BUFFER IN MEMORY FOR A DIRECT MEMORY TRANSFER.
                        003E   220 ;
                        003E   221 ; INPUTS:
                        003E   222 ;
                        003E   223 ;       R0 = STARTING ADDRESS OF I/O BUFFER.
                        003E   224 ;       R1 = LENGTH OF TRANSFER IN BYTES.
                        003E   225 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                        003E   226 ;       R6 = ADDRESS OF CCB.
                        003E   227 ;
                        003E   228 ; OUTPUTS:
                        003E   229 ;
                        003E   230 ;       THE I/O BUFFER IS CHECKED FOR THE PROPER ACCESSIBILITY. IF THE
                        003E   231 ;       CHECK SUCCEEDS, THEN THE BUFFER IS LOCKED IN MEMORY AND THE STARTING
                        003E   232 ;       ADDRESS OF THE PAGE TABLE ENTRIES THAT MAP THE TRANSFER IS STORED
                        003E   233 ;       IN THE I/O PACKET. ELSE THE I/O IS COMPLETED WITH A STATUS OF
                        003E   234 ;       ACCESS VIOLATION.
                        003E   235 ;-
                        003E   236
                        003E   237 EXE$READLOCK::                           ;CHECK BUFFER FOR READ FUNCTION AND LOCK
                 11  10 003E   238          BSBB    EXE$READLOCKR          ;EXE$READLOCKR RETURNS NORMALLY ON
                        0040   239                                         ;SUCCESS, VIA COROUTINE CALL ON FAILURE
                     05 0040   240          RSB                            ;RETURNS TO CALLER ON SUCCESS, TO
                        0041   241                                         ;EXE$READLOCKR ON FAILURE
                        0041   242
                        0041   243 EXE$WRITELOCK::                          ;CHECK BUFFER FOR WRITE FUNCTION AND LOCK
                 15  10 0041   244          BSBB    EXE$WRITELOCKR         ;EXE$WRITELOCKR RETURNS NORMALLY ON
                        0043   245                                         ;SUCCESS, VIA COROUTINE CALL ON FAILURE
                     05 0043   246          RSB                            ;RETURNS TO CALLER ON SUCCESS, TO
                        0044   247                                         ;EXE$WRITELOCKR ON FAILURE
                        0044   248
                        0044   249 EXE$MODIFYLOCK::                         ;CHECK BUFFER FOR MODIFY FUNCTION AND LOCK
                 01  10 0044   250          BSBB    EXE$MODIFYLOCKR        ;EXE$MODIFYLOCKR RETURNS NORMALLY ON
                        0046   251                                         ;SUCCESS, VIA COROUTINE CALL ON FAILURE
                     05 0046   252          RSB                            ;RETURNS TO CALLER ON SUCCESS, TO
                        0047   253                                         ;EXE$MODIFYLOCKR ON FAILURE
```

```
                     0047   255          .SBTTL  READ AND WRITE BUFFER CHECK AND LOCK AND RETURN ROUTINES
                     0047   256 ;+
                     0047   257 ; EXE$READLOCKR - CHECK BUFFER FOR READ ACCESSIBILITY AND LOCK AND RETURN
                     0047   258 ;                 ON ERROR
                     0047   259 ; EXE$WRITELOCKR - CHECK BUFFER FOR WRITE ACCESSIBILITY AND LOCK AND RETURN
                     0047   260 ;                  ON ERROR
                     0047   261 ; EXE$MODIFYLOCKR - CHECK BUFFER FOR READ ACCESSIBILITY AND LOCK AND RETURN
                     0047   262 ;                   ON ERROR
                     0047   263 ;
                     0047   264 ; THESE ROUTINES ARE CALLED TO CHECK THE ACCESSIBILITY OF AN I/O BUFFER
                     0047   265 ; AND TO LOCK THE BUFFER IN MEMORY FOR A DIRECT MEMORY TRANSFER.  IN
                     0047   266 ; ADDITION, THESE ROUTINES PERFORM A COROUTINE CALL IF THERE IS AN ERROR
                     0047   267 ; OR ANY PAGES HAVE TO BE FAULTED IN.  THE PURPOSE OF THE COROUTINE
                     0047   268 ; CALL IS TO ALLOW THE CALLER TO PERFORM ANY NECESSARY CLEANUP BEFORE
                     0047   269 ; THE QIO IS BACKED UP OR ABORTED.  THESE ROUTINES ARE TYPICALLY CALLED
                     0047   270 ; BY DRIVERS THAT MUST LOCK MULTIPLE AREAS INTO MEMORY.  SINCE THESE
                     0047   271 ; ROUTINES CANNOT UNLOCK AREAS PREVIOUSLY LOCKED, THE COROUTINE CALL ALLOWS
                     0047   272 ; THE CALLER (THE DRIVER) TO UNLOCK PREVIOUSLY LOCKED AREAS (AND PERFORM
                     0047   273 ; ANY OTHER CLEANUP) AND THEN RETURN HERE TO BACK UP OR ABORT THE I/O.
                     0047   274 ;
                     0047   275 ; EXE$MODIFYLOCKR IS USED WHEN THE BUFFER WILL BE READ AND WRITTEN BY THE
                     0047   276 ; I/O DEVICE.  IT DISABLES AN OPTIMIZATION IN MMG$IOLOCK WHICH IS USED
                     0047   277 ; WHEN THE BUFFER IS ONLY WRITTEN.
                     0047   278 ;
                     0047   279 ; INPUTS:
                     0047   280 ;
                     0047   281 ;       R0 = STARTING ADDRESS OF I/O BUFFER.
                     0047   282 ;       R1 = LENGTH OF BUFFER IN BYTES.
                     0047   283 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                     0047   284 ;       R6 = ADDRESS OF CCB.
                     0047   285 ;
                     0047   286 ; OUTPUTS:
                     0047   287 ;
                     0047   288 ;       THE I/O BUFFER IS CHECKED FOR THE PROPER ACCESSIBILITY.  IF THE
                     0047   289 ;       CHECK SUCCEEDS, THEN THE BUFFER IS LOCKED IN MEMORY AND THE STARTING
                     0047   290 ;       ADDRESS OF THE PAGE TABLE ENTRIES THAT MAP THE TRANSFER IS STORED
                     0047   291 ;       IN THE I/O PACKET.
                     0047   292 ;
                     0047   293 ;       R0 = RETURN CODE
                     0047   294 ;
                     0047   295 ;       NOTE THAT IF THERE ARE NO ERRORS AND NO PAGES HAVE TO BE FAULTED
                     0047   296 ;       IN, THEN THESE ROUTINES RETURN NORMALLY.  HOWEVER, IF THERE IS AN
                     0047   297 ;       ERROR OR A PAGE HAS TO BE FAULTED IN, THEN THE CALLER IS CALLED
                     0047   298 ;       BY A COROUTINE CALL.  THE CALLER'S RSB THEN RETURNS HERE WHERE
                     0047   299 ;       THE QIO IS EITHER BACKED UP OR ABORTED.  NOTE THAT IN THIS CASE
                     0047   300 ;       THE CALLER'S ERROR HANDLING CODE MUST PRESERVE ALL REGISTERS,
                     0047   301 ;       INCLUDING R0 AND R1.
                     0047   302 ;-
                     0047   303          .ENABL  LSB
                     0047   304 EXE$MODIFYLOCKR::                          ;CHECK BUFFER FOR MODIFY FUNCTION AND LOCK
          50   DD    0047   305          PUSHL   R0                        ;SAVE STARTING ADDRESS OF BUFFER
        0096   30    0049   306          BSBW    EXE$READCHKR             ;CHECK BUFFER FOR READ FUNCTION
    52    04   C8    004C   307          BISL    #4,R2                    ;DISABLE OPTIMIZATION IN MMG$IOLOCK
          0C   11    004F   308          BRB     10$
                     0051   309
                     0051   310 EXE$READLOCKR::                           ;CHECK BUFFER FOR READ FUNCTION AND LOCK
          50   DD    0051   311          PUSHL   R0                        ;SAVE STARTING ADDRESS OF BUFFER
```

```
                     008C   30   0053   312          BSBW    EXE$READCHKR                ;CHECK BUFFER FOR READ FUNCTION
                       05   11   0056   313          BRB     10$
                            0058   314
                            0058   315 EXE$WRITELOCKR::                                 ;CHECK BUFFER FOR WRITE FUNCTION AND LOCK
                       50   DD   0058   316          PUSHL   R0                          ;SAVE STARTING ADDRESS OF BUFFER
                     00AF   30   005A   317          BSBW    EXE$WRITECHKR               ;CHECK BUFFER FOR WRITE FUNCTION
                   1D 50    E9   005D   318 10$:     BLBC    R0,15$                      ;BRANCH IF ERROR
                       50 8ED0  0060   319          POPL    R0                          ;RESTORE STARTING ADDRESS OF BUFFER
          30 A3    50   FE00 8F   AB   0063   320          BICW3   #^C<VA$M_BYTE>,R0,IRP$W_BOFF(R3) ;SET BYTE OFFSET IN PAGE
                       53   DD   006A   321          PUSHL   R3                          ;SAVE ADDRESS OF I/O PACKET
                00000000'EF   16   006C   322          JSB     MMG$IOLOCK                  ;LOCK PAGES FOR I/O                    [03]
                       53   8E   D0   0072   323          MOVL    (SP)+,R3                    ;RETRIEVE ADDRESS OF I/O PACKET
                     08 50    E9   0075   324          BLBC    R0,20$                      ;IF LBC LOCK FAILURE
                 2C A3    51   D0   0078   325          MOVL    R1,IRP$L_SVAPTE(R3)         ;INSERT ADDRESS OF FIRST PTE IN PACKET
                            05   007C   326          RSB                                 ;
                    5E   04   C0   007D   327 15$:     ADDL    #4,SP                       ;THROW AWAY OLD R0
                       9E   16   0080   328 20$:     JSB     @(SP)+                      ;COROUTINE CALL TO CLEANUP
                       50   D5   0082   329          TSTL    R0                          ;ERRORS ENCOUNTERED?
                       45   12   0084   330          BNEQ    50$                         ;IF NEQ YES
                       51   DD   0086   331          PUSHL   R1                          ;SAVE VIRTUAL ADDRESS OF PAGE TO FAULT
                  3E A4    B6   0088   332          INCW    PCB$W_DIOCNT(R4)            ;ADJUST DIRECT I/O COUNT
                  0A A6    B7   008B   333          DECW    CCB$W_IOC(R6)               ;DECREMENT CHANNEL I/O COUNT
             0F 2A A3    07   E1   008E   334          BBC     #IRP$V_DIAGBUF,IRP$W_STS(R3),25$  ;BR. IF NO DIAGNOSTIC BUFFER
                50   44 A3    D0   0093   335          MOVL    IRP$L_DIAGBUF(R3),R0        ;GET ADDRESS OF DIAGNOSTIC BUFFER
                       53   DD   0097   336          PUSHL   R3                          ;SAVE R3
                00000000'EF   16   0099   337          jsb     l^exe$deanonpaged                   ; Deallocate diagnostic buffer
                       53 8ED0  009F   338          POPL    R3                          ;RESTORE R3
                            00A2   339 25$:
          03 0B A3    06   E1   00A2   340          BBC     #ACB$V_QUOTA,IRP$B_RMOD(R3),30$ ;IF CLR, NO AST SPECIFIED
                 38 A4    B6   00A7   341          INCW    PCB$W_ASTCNT(R4)            ;ADJUST AST COUNT
                    50   53   D0   00AA   342 30$:     MOVL    R3,R0                       ;SET ADDRESS OF BLOCK TO DEALLOCATE
                00000000'EF   16   00AD   343          jsb     l^exe$deanonpaged                   ; Deallocate I/O packet
                       02   BA   00B3   344          POPR    #^M<R1>                     ;RETRIEVE VIRTUAL ADDRESS OF PAGE TO FAULT
                    5E   5D   D0   00B5   345          MOVL    FP,SP                       ;TRIM STACK BACK TO CHANGE MODE FRAME
                 5C    08 AD    7D   00B8   346          MOVQ    8(FP),AP                    ;RESTORE USER ARGUMENT AND FRAME POINTERS
                    5E   14   C0   00BC   347          ADDL    S^#EXE$C_CMSTKSZ,SP         ;REMOVE CHANGE MODE CALL FRAME FROM STACK
              50    8E   04   C3   00BF   348          SUBL3   #4,(SP)+,R0                 ;CALCULATE RESTART ADDRESS
                  C7'AF    9F   00C3   349          PUSHAB  B^40$                       ;SET NEW RETURN ADDRESS
                       02   00C6   350          REI                                 ;
                       61   95   00C7   351 40$:     TSTB    (R1)                        ;FAULT USER BUFFER AGAIN
                       60   17   00C9   352          JMP     (R0)                        ;REPEAT SYSTEM SERVICE
                     FF32'  31   00CB   353 50$:     BRW     EXE$ABORTIO                 ;ABORT I/O REQUEST
                            00CE   354          .DSABL  LSB
```

```
                        00CE   356          .SBTTL  CHECK BUFFER ACCESSIBILITY FOR READ FUNCTION
                        00CE   357 ;+
                        00CE   358 ; EXE$READCHK - CHECK BUFFER ACCESSIBILITY FOR READ FUNCTION
                        00CE   359 ;
                        00CE   360 ; THIS ROUTINE IS CALLED TO CHECK BUFFER ACCESSIBILITY FOR A READ I/O
                        00CE   361 ; FUNCTION.
                        00CE   362 ;
                        00CE   363 ; INPUTS:
                        00CE   364 ;
                        00CE   365 ;       R0 = ADDRESS OF BUFFER.
                        00CE   366 ;       R1 = SIZE OF TRANSFER IN BYTES.
                        00CE   367 ;       R3 = ADDRESS OF I/O REQUEST PACKET.
                        00CE   368 ;
                        00CE   369 ; OUTPUTS:
                        00CE   370 ;
                        00CE   371 ;       IF BUFFER IS NOT WRITE ACCESSIBLE, THEN THE I/O REQUEST IS TERM-
                        00CE   372 ;       INATED VIA EXE$IOFINISH WITH A STATUS OF SS$_ACCVIO.
                        00CE   373 ;
                        00CE   374 ;       IF BUFFER IS WRITE ACCESSIBLE, THEN THE FOLLOWING VALUES ARE RE-
                        00CE   375 ;       TURNED:
                        00CE   376 ;
                        00CE   377 ;             R0 = ADDRESS OF BUFFER.
                        00CE   378 ;             R1 = SIZE OF TRANSFER IN BYTES.
                        00CE   379 ;             R2 = READ FUNCTION INDICATOR (1).
                        00CE   380 ;             R3 = ADDRESS OF I/O REQUEST PACKET.
                        00CE   381 ;
                        00CE   382 ;             IRP$W_BCNT(R3) = SIZE OF TRANSFER IN BYTES.
                        00CE   383 ;             IRP$W_FUNC(R3) = READ.
                        00CE   384 ;-
                        00CE   385
                        00CE   386          .ENABL  LSB
                        00CE   387 EXE$READCHK::                        ;CHECK BUFFER FOR READ FUNCTION
50   DD                 00CE   388          PUSHL   R0                  ;SAVE ADDRESS OF BUFFER
10   10                 00D0   389          BSBB    EXE$READCHKR        ;CHECK BUFFER
04   11                 00D2   390          BRB     10$
```

```
                        00D4    392          .SBTTL  CHECK BUFFER ACCESSIBILITY FOR WRITE FUNCTION
                        00D4    393 ;+
                        00D4    394 ; EXE$WRITECHK - CHECK BUFFER ACCESSIBILITY FOR WRITE FUNCTION
                        00D4    395 ;
                        00D4    396 ; THIS ROUTINE IS CALLED TO CHECK BUFFER ACCESSIBILITY FOR A WRITE I/O
                        00D4    397 ; FUNCTION.
                        00D4    398 ;
                        00D4    399 ; INPUTS:
                        00D4    400 ;
                        00D4    401 ;       R0 = ADDRESS OF BUFFER.
                        00D4    402 ;       R1 = SIZE OF TRANSFER IN BYTES.
                        00D4    403 ;       R3 = ADDRESS OF I/O REQUEST PACKET.
                        00D4    404 ;
                        00D4    405 ; OUTPUTS:
                        00D4    406 ;
                        00D4    407 ;       IF BUFFER IS NOT READ ACCESSIBLE, THEN THE I/O REQUEST IS TERM-
                        00D4    408 ;       INATED VIA EXE$IOFINISH WITH A STATUS OF SS$_ACCVIO.
                        00D4    409 ;
                        00D4    410 ;       IF BUFFER IS READ ACCESSIBLE, THEN THE FOLLOWING VALUES ARE RE-
                        00D4    411 ;       TURNED:
                        00D4    412 ;
                        00D4    413 ;               R0 = ADDRESS OF BUFFER.
                        00D4    414 ;               R1 = SIZE OF TRANSFER IN BYTES.
                        00D4    415 ;               R2 = WRITE FUNCTION INDICATOR (0).
                        00D4    416 ;               R3 = ADDRESS OF I/O REQUEST PACKET.
                        00D4    417 ;
                        00D4    418 ;               IRP$W_BCNT(R3) = SIZE OF TRANSFER IN BYTES.
                        00D4    419 ;               IRP$W_FUNC(R3) = WRITE.
                        00D4    420 ;-
                        00D4    421
                        00D4    422 EXE$WRITECHK::                              ;CHECK BUFFER FOR WRITE FUNCTION
   50   DD               00D4    423          PUSHL   R0                      ;SAVE ADDRESS OF BUFFER
   34   10               00D6    424          BSBB    EXE$WRITECHKR           ;CHECK BUFFER
03 50   E8               00D8    425 10$:     BLBS    R0,20$                  ;BRANCH IF SUCCESS
 FF22'  31               00DB    426          BRW     EXE$ABORTIO             ;ABORT I/O
   50 8ED0               00DE    427 20$:     POPL    R0                      ;RESTORE ADDRESS OF BUFFER
      05                 00E1    428          RSB
                         00E2    429          .DSABL  LSB
```

```
                     00E2   431          .SBTTL  CHECK BUFFER ACCESSIBILITY FOR READ FUNCTION AND RETURN
                     00E2   432 ;+
                     00E2   433 ; EXE$READCHKR - CHECK BUFFER ACCESSIBILITY FOR READ FUNCTION AND RETURN
                     00E2   434 ;
                     00E2   435 ; THIS ROUTINE IS CALLED TO CHECK BUFFER ACCESSIBILITY FOR A READ I/O
                     00E2   436 ; FUNCTION.  STATUS IS RETURNED IN R0.
                     00E2   437 ;
                     00E2   438 ; INPUTS:
                     00E2   439 ;
                     00E2   440 ;       R0 = ADDRESS OF BUFFER.
                     00E2   441 ;       R1 = SIZE OF TRANSFER IN BYTES.
                     00E2   442 ;       R3 = ADDRESS OF I/O REQUEST PACKET.
                     00E2   443 ;
                     00E2   444 ; OUTPUTS:
                     00E2   445 ;
                     00E2   446 ;       IF THE BUFFER IS NOT WRITE ACCESSIBLE, THEN THE FOLLOWING
                     00E2   447 ;       VALUE IS RETURNED:
                     00E2   448 ;
                     00E2   449 ;       R0 = SS$_ACCVIO
                     00E2   450 ;
                     00E2   451 ;       IF BUFFER IS WRITE ACCESSIBLE, THEN THE FOLLOWING VALUES ARE RE-
                     00E2   452 ;       TURNED:
                     00E2   453 ;
                     00E2   454 ;               R0 = SS$_NORMAL
                     00E2   455 ;               R1 = SIZE OF TRANSFER IN BYTES.
                     00E2   456 ;               R2 = READ FUNCTION INDICATOR (1).
                     00E2   457 ;               R3 = ADDRESS OF I/O REQUEST PACKET.
                     00E2   458 ;
                     00E2   459 ;               IRP$W_BCNT(R3) = SIZE OF TRANSFER IN BYTES.
                     00E2   460 ;               IRP$W_FUNC(R3) = READ.
                     00E2   461 ;-
                     00E2   462
                     00E2   463          .ENABL  LSB
                     00E2   464 EXE$READCHKR::                               ;CHECK BUFFER FOR READ FUNCTION
          51   DD   00E2   465          PUSHL   R1                          ;SAVE R1
     51   50   C0   00E4   466          ADDL    R0,R1                       ;CALCULATE ENDING BUFFER ADDRESS
50   01FF 8F   AA   00E7   467          BICW    #VA$M_BYTE,R0               ;TRUNCATE TO START OF PAGE
     51   50   C2   00EC   468          SUBL    R0,R1                       ;CALCULATE LENGTH OF BUFFER TO PROBE
52   FE00 8F   32   00EF   469          CVTWL   #-^X200,R2                  ;SET ADDRESS ADJUSTMENT CONSTANT
                    00F4   470 10$:     IFNOWRT R1,(R0),ACCESS              ;CAN ENDS OF BUFFER BE WRITTEN?
60   51   00   0D   00F4               PROBEW  #0,R1,(R0)
          40   13   00F8               BEQL    ACCESS
     50   52   C2   00FA   471          SUBL    R2,R0                       ;CALCULATE VIRTUAL ADDRESS OF NEXT PAGE
   51   6142   3E   00FD   472          MOVAW   (R1)[R2],R1                 ;CALCULATE NEW LENGTH
          F1   14   0101   473          BGTR    10$                         ;IF GTR MORE TO TEST
  2A A3    02   A8   0103   474          BISW    #IRP$M_FUNC,IRP$W_STS(R3) ;SET READ FUNCTION
     52    01   D0   0107   475          MOVL    #1,R2                       ;SET READ FUNCTION INDICATOR
           23   11   010A   476          BRB     30$                         ;
```

```
                                010C    478          .SBTTL  CHECK BUFFER ACCESSIBILITY FOR WRITE FUNCTION AND RETURN
                                010C    479 ;+
                                010C    480 ; EXE$WRITECHKR - CHECK BUFFER ACCESSIBILITY FOR WRITE FUNCTION AND RETURN
                                010C    481 ;
                                010C    482 ; THIS ROUTINE IS CALLED TO CHECK BUFFER ACCESSIBILITY FOR A WRITE I/O
                                010C    483 ; FUNCTION.  STATUS IS RETURNED IN R0
                                010C    484 ;
                                010C    485 ; INPUTS:
                                010C    486 ;
                                010C    487 ;       R0 = ADDRESS OF BUFFER.
                                010C    488 ;       R1 = SIZE OF TRANSFER IN BYTES.
                                010C    489 ;       R3 = ADDRESS OF I/O REQUEST PACKET.
                                010C    490 ;
                                010C    491 ; OUTPUTS:
                                010C    492 ;
                                010C    493 ;       IF BUFFER IS NOT READ ACCESSIBLE, THEN THE FOLLOWING VALUE IS
                                010C    494 ;       RETURNED:
                                010C    495 ;
                                010C    496 ;       R0 = SS$_ACCVIO
                                010C    497 ;
                                010C    498 ;       IF BUFFER IS READ ACCESSIBLE, THEN THE FOLLOWING VALUES ARE RE-
                                010C    499 ;       TURNED:
                                010C    500 ;
                                010C    501 ;               R0 = SS$_NORMAL
                                010C    502 ;               R1 = SIZE OF TRANSFER IN BYTES.
                                010C    503 ;               R2 = WRITE FUNCTION INDICATOR (0).
                                010C    504 ;               R3 = ADDRESS OF I/O REQUEST PACKET.
                                010C    505 ;
                                010C    506 ;               IRP$W_BCNT(R3) = SIZE OF TRANSFER IN BYTES.
                                010C    507 ;               IRP$W_FUNC(R3) = WRITE.
                                010C    508 ;-
                                010C    509
                                010C    510 EXE$WRITECHKR::                             ;CHECK BUFFER FOR WRITE FUNCTION
          51    DD              010C    511          PUSHL   R1                         ;SAVE R1
     51   50    C0              010E    512          ADDL    R0,R1                      ;CALCULATE ENDING BUFFER ADDRESS
50   01FF 8F    AA              0111    513          BICW    #VA$M_BYTE,R0              ;TRUNCATE TO START OF PAGE
     51   50    C2              0116    514          SUBL    R0,R1                      ;CALCULATE LENGTH OF BUFFER TO PROBE
52   FE00 8F    32              0119    515          CVTWL   #-^X200,R2                 ;GET ADDRESS ADJUSTMENT CONSTANT
                                011E    516 20$:     IFNORD  R1,(R0),ACCESS             ;CAN ENDS OF BUFFER BE READ?
60   51   00    0C              011E                 PROBER  #0,R1,(R0)
          16    13              0122                 BEQL    ACCESS
     50   52    C2              0124    517          SUBL    R2,R0                      ;CALCULATE VIRTUAL ADDRESS OF NEXT PAGE
   51   6142    3E              0127    518          MOVAW   (R1)[R2],R1                ;CALCULATE NEW LENGTH
          F1    14              012B    519          BGTR    20$                        ;IF GTR MORE TO CHECK
          52    D4              012D    520          CLRL    R2                         ;SET WRITE FUNCTION INDICATOR
          51 8ED0               012F    521 30$:     POPL    R1                         ;RESTORE R1
  32 A3   51    B0              0132    522          MOVW    R1,IRP$W_BCNT(R3)          ;INSERT TRANSFER BYTE COUNT IN PACKET
     50   01    3C              0136    523          MOVZWL  #SS$_NORMAL,R0             ;SUCCESS RETURN
                05              0139    524          RSB                                ;
                                013A    525 ACCESS:                                     ;SET ACCESS VIOLATION
          51 8ED0               013A    526          POPL    R1                         ;RESTORE R1
     50   0C    3C              013D    527          MOVZWL  #SS$_ACCVIO,R0             ;
                05              0140    528          RSB
                                0141    529          .DSABL  LSB
```

```
                     0141   531          .SBTTL  SET DEVICE MODE AND CHARACTERISTICS FUNCTIONS (AT FDT LEVEL)
                     0141   532 ;+
                     0141   533 ; EXE$SETCHAR - SET DEVICE MODE AND CHARACTERISTICS FUNCTIONS (AT FDT LEVEL)
                     0141   534 ;
                     0141   535 ; THIS ROUTINE PLACES THE NEW CHARACTERISTICS SPECIFIED BY THE QUADWORD POINTED
                     0141   536 ; TO BY P1 INTO THE SECOND AND THIRD LONGWORDS OF THE DEVICE UCB.
                     0141   537 ;
                     0141   538 ; INPUTS:
                     0141   539 ;
                     0141   540 ;       R0 = SCRATCH.
                     0141   541 ;       R1 = SCRATCH.
                     0141   542 ;       R2 = SCRATCH.
                     0141   543 ;       R3 = ADDRESS OF I/O REQUEST PACKET.
                     0141   544 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                     0141   545 ;       R5 = ASSIGNED DEVICE UCB ADDRESS.
                     0141   546 ;       R6 = ADDRESS OF CCB.
                     0141   547 ;       R7 = I/O FUNCTION CODE BIT NUMBER.
                     0141   548 ;       R8 = FUNCTION DECISION TABLE DISPATCH ADDRESS.
                     0141   549 ;       R9 = SCRATCH.
                     0141   550 ;       R10 = SCRATCH.
                     0141   551 ;       R11 = SCRATCH.
                     0141   552 ;       AP = ADDRESS OF FIRST FUNCTION DEPENDENT PARAMETER.
                     0141   553 ;
                     0141   554 ; OUTPUTS:
                     0141   555 ;
                     0141   556 ;       THE CHARACTERISTICS SPECIFIED BY THE QUADWORD POINTER TO BY P1 ARE STORED
                     0141   557 ;       IN THE SECOND AND THIRD LONGWORDS OF THE DEVICE UCB.
                     0141   558 ;-
                     0141   559
                     0141   560          .ENABL  LSB
                     0141   561 EXE$SETCHAR::                                ;SET DEVICE MODE AND CHARACTERISTICS
     51    6C    D0  0141   562          MOVL    P1(AP),R1                   ;GET ADDRESS OF CHARACTERISTICS
                     0144   563          IFNORD  #8,(R1),ACCESS              ;CAN CHARACTERISTICS QUADWORD BE READ?
61   08    00    0C  0144                       PROBER  #0,#8,(R1)
           F0    13  0148                       BEQL    ACCESS
     57    23    D1  014A   564          CMPL    #IO$_SETMODE,R7             ;SET MODE FUNCTION?
           04    13  014D   565          BEQL    10$                         ;IF EQL YES
  38 A5    61    B0  014F   566          MOVW    (R1),UCB$B_DEVCLASS(R5)     ;SET DEVICE TYPE AND CLASS
3A A5    02    A1  B0  0153   567 10$:    MOVW    2(R1),UCB$W_DEVBUFSIZ(R5)   ;SET DEFAULT BUFFER SIZE
3C A5    04    A1  D0  0158   568          MOVL    4(R1),UCB$L_DEVDEPEND(R5)   ;SET DEVICE CHARACTERISTICS
           14    11  015D   569          BRB     20$                         ;
```

```
                     015F   571          .SBTTL  SET DEVICE MODE AND CHARACTERISTICS FUNCTIONS
                     015F   572 ;+
                     015F   573 ; EXE$SETMODE - SET DEVICE CHARACTERISTICS AND MODE
                     015F   574 ;
                     015F   575 ; FUNCTIONAL DESCRIPTION:
                     015F   576 ;
                     015F   577 ; THIS ROUTINE PLACES THE NEW CHARACTERISTICS SPECIFIED BY P1 INTO
                     015F   578 ; THE I/O PACKET FOR INSERTION INTO THE UCB WHEN THE UNIT IS IDLE.
                     015F   579 ; THE INPUT DATA IS IN THE FORM RETURNED BY $GTCHAN. THE SPECIFIED BUFFER
                     015F   580 ; IS ASSUMED TO BE 12 BYTES IN LENGTH. THE P2 LENGTH SPECIFIER IS IGNORED.
                     015F   581 ;
                     015F   582 ; THE NEW CHARACTERISTICS ARE PLACED IN IRP$L_MEDIA/MEDIA+4 AND THE
                     015F   583 ; PACKET IS QUEUED VIA EXE$QIODRVPKT.
                     015F   584 ;
                     015F   585 ; INPUTS:
                     015F   586 ;
                     015F   587 ;       R3 = I/O PACKET ADDRESS
                     015F   588 ;       R4 = CURRENT PCB
                     015F   589 ;       R5 = ACB ADDRESS
                     015F   590 ;       R6 = ASSIGNED CCB ADDRESS
                     015F   591 ;       AP = ADDRESS OF THE QIO ARGUMEMT P1
                     015F   592 ;
                     015F   593 ; OUTPUTS:
                     015F   594 ;
                     015F   595 ;       R0 = STATUS OF THE OPERATION
                     015F   596 ;       R3+ ARE PRESERVED.
                     015F   597 ;
                     015F   598 ; COMPLETION CODES:
                     015F   599 ;
                     015F   600 ;       SS$_NORMAL - SUCCESSFUL
                     015F   601 ;       SS$_ACCVIO - BUFFER ACCESS VIOLATION
                     015F   602 ;-
                     015F   603
                     015F   604 EXE$SETMODE::                                ;SET DEVICE MODE AND CHARACTERISTICS
          51   6C    D0   015F   605          MOVL    P1(AP),R1               ;ADDRESS BUFFER
                     0162   606          IFNORD  #8,(R1),ACCESS          ;BR IF NO ACCESS
    61    08   00    0C   0162                  PROBER  #0,#8,(R1)
                D2   13   0166                  BEQL    ACCESS
      34 A3   61    7D   0168   607          MOVQ    (R1),IRP$L_MEDIA(R3)    ;INSERT CHARACTERISTICS IN I/O PACKET
            FE91'   31   016C   608          BRW     EXE$QIODRVPKT           ;QUEUE THE PACKET
```

```
                        016F    610          .SBTTL  SENSE DEVICE MODE AND CHARACTERISTICS FUNCTIONS
                        016F    611 ;+
                        016F    612 ; EXE$SENSEMODE - SENSE DEVICE MODE AND CHARACTERISTICS FUNCTIONS
                        016F    613 ;
                        016F    614 ; THIS ROUTINE OBTAINS THE CURRENT DEVICE MODE/CHARACTERISTICS FROM THE DEVICE
                        016F    615 ; DEPENDENT CHARACTERISTICS LONGWORD IN THE UCB AND IMMEDIATELY COMPLETES THE
                        016F    616 ; I/O OPERATION WITH THE SECOND LONGWORD OF THE FINAL I/O STATUS EQUAL TO THE
                        016F    617 ; DEVICE DEPENDENT CHARACTERSITICS.
                        016F    618 ;
                        016F    619 ; INPUTS:
                        016F    620 ;
                        016F    621 ;       R0 = SCRATCH.
                        016F    622 ;       R1 = SCRATCH.
                        016F    623 ;       R2 = SCRATCH.
                        016F    624 ;       R3 = ADDRESS OF I/O REQUEST PACKET.
                        016F    625 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                        016F    626 ;       R5 = ASSIGNED DEVICE UCB ADDRESS.
                        016F    627 ;       R6 = ADDRESS OF CCB.
                        016F    628 ;       R7 = I/O FUNCTION CODE BIT NUMBER.
                        016F    629 ;       R8 = FUNCTION DECISION TABLE DISPATCH ADDRESS.
                        016F    630 ;       R9 = SCRATCH.
                        016F    631 ;       R10 = SCRATCH.
                        016F    632 ;       R11 = SCRATCH.
                        016F    633 ;       AP = ADDRESS OF FIRST FUNCTION DEPENDENT PARAMETER.
                        016F    634 ;
                        016F    635 ; OUTPUTS:
                        016F    636 ;
                        016F    637 ;       THE DEVICE DEPENDENT CHARACTERISTICS ARE OBTAINED FROM THE UCB AND
                        016F    638 ;       THE I/O IS COMPLETED WITH THE SECOND I/O STATUS LONGWORD EQUAL TO THE
                        016F    639 ;       DEVICE CHARACTERISTICS.
                        016F    640 ;-
                        016F    641
                        016F    642 EXE$SENSEMODE::                                 ;SENSE DEVICE MODE/CHARACTERISTICS
51   3C A5   D0        016F    643          MOVL    UCB$L_DEVDEPEND(R5),R1         ;GET DEVICE DEPENDENT CHARACTERSITICS
   50   01   3C        0173    644 20$:     MOVZWL  #SS$_NORMAL,R0                 ;SET NORMAL COMPLETION STATUS
      FE87'  31        0176    645          BRW     EXE$FINISHIO                   ;FINISH I/O OPERATION
                       0179    646          .DSABL  LSB
```

```
                     0179   648          .SBTTL  CARRIAGE CONTROL INTERPRETATION
                     0179   649 ;+
                     0179   650 ; EXE$CARRIAGE - INTERPRET CARRIAGE CONTROL SPECIFIER
                     0179   651 ;
                     0179   652 ; FUNCTIONAL DESCRIPTION:
                     0179   653 ;
                     0179   654 ; THIS ROUTINE IS USED BY THE LINE PRINTER DRIVER AND THE TERMINAL
                     0179   655 ; DRIVER TO INTERPRET THE CARRIAGE CONTROL SPECIFIER IN IRP$B_CARCON .
                     0179   656 ; NOTE THAT IRP$B_CARCON IS USED AS A LONGWORD!
                     0179   657 ;
                     0179   658 ; THE SPECIFIER IS AS FOLLOWS:
                     0179   659 ;
                     0179   660 ;       .BYTE 1 -- FORTRAN CARRIAGE CONTROL CHARACTER IF NOT 0
                     0179   661 ;       .BYTE 2 -- ***** IGNORED *****
                     0179   662 ;       .BYTE 3 -- PREFIX CARRIAGE CONTROL
                     0179   663 ;       .BYTE 4 -- SUFFIX CARRIAGE CONTROL
                     0179   664 ;
                     0179   665 ; THE PRE/SUF FIELDS ARE AS FOLLOWS
                     0179   666 ;
                     0179   667 ;       IF BIT 7=0 THEN BITS 6-0 ARE THE NUMBER OF NEWLINES TO INSERT.
                     0179   668 ;       IF BIT 7=1 AND BIT 6=0 THEN BITS 4-0 ARE THE ASCII CHARACTER TO
                     0179   669 ;                                   OUTPUT. ASCII SET C0 OR C1 IS SPECIFIED BY BIT 5.
                     0179   670 ;       IF BIT 7=1 AND BIT 6=1 THEN BITS 5-0 ARE THE PRINTER CHANNEL NUMBER
                     0179   671 ;
                     0179   672 ; ASCII SET C0 IS ASSUMED AND BIT 6 IS IGNORED IF BIT 7=0.
                     0179   673 ;
                     0179   674 ; INPUTS:
                     0179   675 ;
                     0179   676 ;       R3 = ADDRESS OF THE I/O PACKET
                     0179   677 ;       R5 = ADDRESS OF THE UCB
                     0179   678 ;
                     0179   679 ; OUTPUTS:
                     0179   680 ;
                     0179   681 ;       IRP$B_CARCON IS SET UP TO REFLECT THE PRE/SUF CHARACTERS TO SEND.
                     0179   682 ;
                     0179   683 ;       BYTE 0 = NUMBER OF CHARACTERS TO SEND
                     0179   684 ;       BYTE 1 = CHARACTER, IF 0 THEN NEWLINE
                     0179   685 ;
                     0179   686 ;       IRP$B_CARCON+2 HAS THE SUFFIX CONTROL.
                     0179   687 ;
                     0179   688 ;       R0,R1 ARE USED.
                     0179   689 ;
                     0179   690 ;-
                     0179   691 ;
                     0179   692 ; LOCAL DATA TABLE
                     0179   693 ;
                     0179   694 CCTABLE:                             ; CARRIAGE CONTROL TO FORTRAN MATCH TABLE
 0D 01 00 01         0179   695          .BYTE   1,0,1,13            ; SPACE => 1 NL, 1 CR
          20         017D   696          .ASCII  / /
 0D 01 00 02         017E   697          .BYTE   2,0,1,13            ; "0" => 2 NL, 1 CR
          30         0182   698          .ASCII  /0/
 0D 01 0C 01         0183   699          .BYTE   1,12,1,13           ; "1" => 1 FF, 1 CR
          31         0187   700          .ASCII  /1/
 0D 01 00 00         0188   701          .BYTE   0,0,1,13            ; "+" => NOTHING, 1 CR
          2B         018C   702          .ASCII  /+/
 00 00 00 01         018D   703          .BYTE   1,0,0,0             ; "$" => 1 NL, NOTHING
          24         0191   704          .ASCII  /$/
```

```
                0D 01 00 01   0192   705          .BYTE   1,0,1,13                ; DEFAULT => 1 NL, 1 CR
                      00      0196   706          .BYTE   0                       ; TABLE END
                              0197   707 ;
                              0197   708 ;
                              0197   709 ;
                              0197   710 EXE$CARRIAGE::                          ; INTERPRET CARRIAGE CONTROL
              51    38 A3     9A     0197   711          MOVZBL  IRP$B_CARCON(R3),R1     ; GET FORTRAN SPECIFIER
                    12        13     019B   712          BEQL    20$                     ; IF EQL THEN TRY PRE/SUF
              50    D9 AF     9E     019D   713          MOVAB   B^CCTABLE,R0            ; ADDRESS MATCH TABLE
              38 A3   80      D0     01A1   714 10$:      MOVL    (R0)+,IRP$B_CARCON(R3)  ; ASSUME MATCH
                      60      95     01A5   715          TSTB    (R0)                    ; END OF TABLE?
                      05      13     01A7   716          BEQL    15$                     ; IF EQL THEN YES
                 51   80      91     01A9   717          CMPB    (R0)+,R1                ; MATCH?
                      F3      12     01AC   718          BNEQ    10$                     ; NO THEN SEARCH
                              05     01AE   719 15$:      RSB                             ; ELSE RETURN
                              01AF   720 ;
                              01AF   721 ; PRE/SUF CARRIAGE CONTROL
                              01AF   722 ;
              51    3A A3     9A     01AF   723 20$:      MOVZBL  IRP$B_CARCON+2(R3),R1   ; GET PREFIX SPECIFIER
                    02        13     01B3   724          BEQL    30$                     ; IF EQL THEN NONE
                    19        10     01B5   725          BSBB    100$                    ; INTERPRET THE SPECIFIER
              38 A3 51        90     01B7   726 30$:      MOVB    R1,IRP$B_CARCON(R3)     ; INSERT NUMBER
              39 A3 50        90     01BB   727          MOVB    R0,IRP$B_CARCON+1(R3)   ; INSERT CHARACTER
              51    3B A3     9A     01BF   728          MOVZBL  IRP$B_CARCON+3(R3),R1   ; GET SUFFIX SPECIFIER
                    02        13     01C3   729          BEQL    40$                     ; IF EQL THEN NONE
                    09        10     01C5   730          BSBB    100$                    ; CONVERT THE SPECIFIER
              3A A3 51        90     01C7   731 40$:      MOVB    R1,IRP$B_CARCON+2(R3)   ; INSERT NUMBER
              3B A3 50        90     01CB   732          MOVB    R0,IRP$B_CARCON+3(R3)   ; INSERT CHARACTER
                              05     01CF   733          RSB                             ; RETURN
                              01D0   734 ;
                              01D0   735 ; SUBROUTINE TO INTERPRET PRE/SUF SPECIFIER
                              01D0   736 ;
                    50        D4     01D0   737 100$:     CLRL    R0                      ; ASSUME NEWLINE
                 08 51        07     01D2   738          BBC     #7,R1,110$              ; IF BIT 7 CLEAR THEN DONE
           50    51    E0     8F     01D6   739          BICB3   #^X0E0,R1,R0            ; REMOVE OTHER BITS
                 51    01     9A     01DB   740          MOVZBL  #1,R1                   ; SET ONE CHARACTER
                              05     01DE   741 110$:     RSB                             ; RETURN
                              01DF   742
                              01DF   743          .END
```

ACB$B_RMOD		0000000B		D		IRP$L_ARB		00000050		D	
ACB$B_TYPE		0000000A		D		IRP$L_AST		00000010		D	
ACB$C_LENGTH		00000018		D		IRP$L_ASTPRM		00000014		D	
ACB$K_LENGTH		00000018		D		IRP$L_DIAGBUF		00000044		D	
ACB$L_AST		00000010		D		IRP$L_EXTEND		0000004C		D	
ACB$L_ASTPRM		00000014		D		IRP$L_IOQBL		00000004		D	
ACB$L_ASTQBL		00000004		D		IRP$L_IOQFL		00000000		D	
ACB$L_ASTQFL		00000000		D		IRP$L_IOSB		00000024		D	
ACB$L_KAST		00000018		D		IRP$L_IOST1		00000034		D	
ACB$L_PID		0000000C		D		IRP$L_IOST2		00000038		D	
ACB$V_QUOTA	=	00000006		D		IRP$L_MEDIA		00000034		D	
ACB$W_SIZE		00000008		D		IRP$L_PID		0000000C		D	
ACCESS		0000013A	R	D	01	IRP$L_SEGVBN		00000040		D	
CCB$B_AMOD		00000009		D		IRP$L_SEQNUM		00000048		D	
CCB$B_STS		00000008		D		IRP$L_SVAPTE		0000002C		D	
CCB$C_LENGTH		00000010		D		IRP$L_TT_TERM		00000038		D	
CCB$K_LENGTH		00000010		D		IRP$L_UCB		0000001C		D	
CCB$L_DIRP		0000000C		D		IRP$L_WIND		00000018		D	
CCB$L_UCB		00000000		D		IRP$M_FUNC	=	00000002		D	
CCB$L_WIND		00000004		D		IRP$Q_NT_PRVMSK		0000003C		D	
CCB$W_IOC		0000000A		D		IRP$S_FCODE	=	00000006		D	
CCTABLE		00000179	R	D	01	IRP$V_DIAGBUF	=	00000007		D	
EXE$ABORTIO		********		X	01	IRP$V_FCODE	=	00000000		D	
EXE$CARRIAGE		00000197	RG	D	01	IRP$V_FUNC	=	00000001		D	
EXE$C_CMSTKSZ	=	00000014		D		IRP$W_ABCNT		0000003C		D	
EXE$DEANONPAGED		********		X	01	IRP$W_BCNT		00000032		D	
EXE$FINISHIO		********		X	01	IRP$W_BOFF		00000030		D	
EXE$MODIFY		0000000C	RG	D	01	IRP$W_CHAN		00000028		D	
EXE$MODIFYLOCK		00000044	RG	D	01	IRP$W_FUNC		00000020		D	
EXE$MODIFYLOCKR		00000047	RG	D	01	IRP$W_OBCNT		0000003E		D	
EXE$ONEPARM		00000000	RG	D	01	IRP$W_SIZE		00000008		D	
EXE$QIODRVPKT		********		X	01	IRP$W_STS		0000002A		D	
EXE$READ		00000012	RG	D	01	IRP$W_TT_PRMPT		0000003C		D	
EXE$READCHK		000000CE	RG	D	01	MMG$IOLOCK		********		X	01
EXE$READCHKR		000000E2	RG	D	01	P1	=	00000000		D	
EXE$READLOCK		0000003E	RG	D	01	P2	=	00000004		D	
EXE$READLOCKR		00000051	RG	D	01	P3	=	00000008		D	
EXE$SENSEMODE		0000016F	RG	D	01	P4	=	0000000C		D	
EXE$SETCHAR		00000141	RG	D	01	P5	=	00000010		D	
EXE$SETMODE		0000015F	RG	D	01	P6	=	00000014		D	
EXE$WRITE		0000001B	RG	D	01	PCB$B_ASTACT		0000000C		D	
EXE$WRITECHK		000000D4	RG	D	01	PCB$B_ASTEN		0000000D		D	
EXE$WRITECHKR		0000010C	RG	D	01	PCB$B_PRI		0000000B		D	
EXE$WRITELOCK		00000041	RG	D	01	PCB$B_PRIB		0000002F		D	
EXE$WRITELOCKR		00000058	RG	D	01	PCB$B_TYPE		0000000A		D	
EXE$ZEROPARM		00000006	RG	D	01	PCB$B_WEFC		0000002E		D	
IO$_PHYSICAL	=	0000001F		D		PCB$C_LENGTH		0000008C		D	
IO$_READLBLK	=	00000021		D		PCB$K_LENGTH		0000008C		D	
IO$_READPBLK	=	0000000C		D		PCB$L_ARB		00000084		D	
IO$_SETMODE	=	00000023		D		PCB$L_ASTQBL		00000014		D	
IRP$B_CARCON		00000038		D		PCB$L_ASTQFL		00000010		D	
IRP$B_EFN		00000022		D		PCB$L_EFC2P		00000058		D	
IRP$B_PRI		00000023		D		PCB$L_EFC3P		0000005C		D	
IRP$B_RMOD		0000000B		D		PCB$L_EFCS		00000050		D	
IRP$B_TYPE		0000000A		D		PCB$L_EFCU		00000054		D	
IRP$C_LENGTH		0000005C		D		PCB$L_EFWM		0000004C		D	
IRP$K_LENGTH		0000005C		D		PCB$L_JIB		00000078		D	

PCB$L_OWNER		0000001C	D	UCB$B_TT_DETYPE		000000A4	D
PCB$L_PHD		00000064	D	UCB$B_TT_LFFILL		0000009E	D
PCB$L_PHYPCB		00000018	D	UCB$B_TT_SPEED		0000009C	D
PCB$L_PID		00000060	D	UCB$B_TYPE		0000000A	D
PCB$L_PQB		0000004C	D	UCB$B_VERTSZ		0000003F	D
PCB$L_SQBL		00000004	D	UCB$C_LENGTH		00000074	D
PCB$L_SQFL		00000000	D	UCB$C_MB_LENGTH		00000090	D
PCB$L_STS		00000024	D	UCB$C_TT_LENGTH		000000BC	D
PCB$L_UIC		00000088	D	UCB$K_LENGTH		00000074	D
PCB$L_WSSWP		00000020	D	UCB$K_MB_LENGTH		00000090	D
PCB$L_WTIME		00000028	D	UCB$K_TT_LENGTH		000000BC	D
PCB$Q_PRIV		0000007C	D	UCB$L_AMB		00000054	D
PCB$T_LNAME		00000068	D	UCB$L_ASTQBL		00000010	D
PCB$T_TERMINAL		00000044	D	UCB$L_ASTQFL		0000000C	D
PCB$W_APTCNT		00000030	D	UCB$L_CPID		0000005C	D
PCB$W_ASTCNT		00000038	D	UCB$L_CRB		00000020	D
PCB$W_BIOCNT		0000003A	D	UCB$L_DDB		00000024	D
PCB$W_BIOLM		0000003C	D	UCB$L_DEVCHAR		00000034	D
PCB$W_DIOCNT		0000003E	D	UCB$L_DEVDEPEND		0000003C	D
PCB$W_DIOLM		00000040	D	UCB$L_DPC		00000080	D
PCB$W_GPGCNT		00000034	D	UCB$L_DUETIM		0000005C	D
PCB$W_GRP		0000008A	D	UCB$L_DX_BFPNT		0000009C	D
PCB$W_MEM		00000088	D	UCB$L_DX_BUF		00000098	D
PCB$W_MTXCNT		0000000E	D	UCB$L_DX_RXDB		000000A0	D
PCB$W_PPGCNT		00000036	D	UCB$L_EMB		00000078	D
PCB$W_PRCCNT		00000042	D	UCB$L_FIRST		00000014	D
PCB$W_SIZE		00000008	D	UCB$L_FPC		0000000C	D
PCB$W_STATE		0000002C	D	UCB$L_FQBL		00000004	D
PCB$W_TMBU		00000032	D	UCB$L_FQFL		00000000	D
SIZ...	=	00000002	D	UCB$L_FR3		00000010	D
SS$_ACCVIO	=	0000000C	D	UCB$L_FR4		00000014	D
SS$_NORMAL	=	00000001	D	UCB$L_IOQBL		00000044	D
UCB$B_AMOD		00000053	D	UCB$L_IOQFL		00000040	D
UCB$B_CEX		00000077	D	UCB$L_IRP		0000004C	D
UCB$B_CM1		0000004A	D	UCB$L_LINK		0000002C	D
UCB$B_CM2		0000004B	D	UCB$L_LOGADR		00000064	D
UCB$B_DEVCLASS		00000038	D	UCB$L_MAXBLOCK		00000084	D
UCB$B_DEVTYPE		00000039	D	UCB$L_MB_MBX		0000007C	D
UCB$B_DIPL		00000052	D	UCB$L_MB_PORT		0000008C	D
UCB$B_DX_SCTCNT		000000A6	D	UCB$L_MB_RAST		00000078	D
UCB$B_ERTCNT		00000070	D	UCB$L_MB_SHB		00000080	D
UCB$B_ERTMAX		00000071	D	UCB$L_MB_WAST		00000074	D
UCB$B_FEX		00000076	D	UCB$L_MB_WIOQBL		00000088	D
UCB$B_FIPL		0000000B	D	UCB$L_MB_WIOQFL		00000084	D
UCB$B_LOCSRV		0000003C	D	UCB$L_MEDIA		0000008C	D
UCB$B_OFFNDX		00000094	D	UCB$L_NT_DATSSB		00000074	D
UCB$B_OFFRTC		00000095	D	UCB$L_NT_INTSSB		00000078	D
UCB$B_REMSRV		0000003D	D	UCB$L_OPCNT		00000060	D
UCB$B_SECTORS		0000003C	D	UCB$L_OWNUIC		0000001C	D
UCB$B_SLAVE		00000074	D	UCB$L_PID		00000028	D
UCB$B_SPR		00000075	D	UCB$L_RQBL		00000004	D
UCB$B_STATE		00000052	D	UCB$L_RQFL		00000000	D
UCB$B_TRACKS		0000003D	D	UCB$L_SVAPTE		00000068	D
UCB$B_TT_CRFILL		0000009D	D	UCB$L_SVPN		00000064	D
UCB$B_TT_DECRF		000000A1	D	UCB$L_TT_DECHAR		000000A8	D
UCB$B_TT_DELFF		000000A2	D	UCB$L_TT_RDUE		0000008C	D
UCB$B_TT_DESPEE		000000A0	D	UCB$L_TT_RTIMOU		000000B8	D

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UCB$L_VCB                       00000030    D
UCB$T_PARTNER                   0000000C    D
UCB$W_BCNT                      0000006E    D
UCB$W_BCR                       00000096    D
UCB$W_BOFF                      0000006C    D
UCB$W_BUFQUO                    00000018    D
UCB$W_BYTESTOGO                 0000003E    D
UCB$W_CHARGE                    0000004A    D
UCB$W_CYLINDERS                 0000003E    D
UCB$W_DA                        0000008C    D
UCB$W_DC                        0000008E    D
UCB$W_DEVBUFSIZ                 0000003A    D
UCB$W_DEVSTS                    0000005A    D
UCB$W_DIRSEQ                    00000088    D
UCB$W_DSTADDR                   00000018    D
UCB$W_DX_BCR                    000000A4    D
UCB$W_EC1                       00000090    D
UCB$W_EC2                       00000092    D
UCB$W_ERRCNT                    00000072    D
UCB$W_FUNC                      0000007E    D
UCB$W_MB_SEED                   00000000    D
UCB$W_MSGCNT                    00000016    D
UCB$W_MSGMAX                    00000014    D
UCB$W_NT_CHAN                   0000007C    D
UCB$W_OFFSET                    0000008A    D
UCB$W_REFC                      00000050    D
UCB$W_SIZE                      00000008    D
UCB$W_SRCADDR                   0000001A    D
UCB$W_STS                       00000058    D
UCB$W_TT_DESIZE                 000000A5    D
UCB$W_UNIT                      00000048    D
UCB$W_VPROT                     0000001A    D
VA$M_BYTE                     = 000001FF    D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
SEP	000001DF (479.)	01 (1.)	NOPIC USR CON REL LCL SHR EXE RD WRT NOVEC LONG
ABS	000000BC (188.)	02 (2.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
ACB$V_QUOTA	=00000006		#-340 (1)
ACCESS	0000013A-R	525 (1)	#-470 (1) #-516 (1) #-563 (1) #-606 (1)
CCB$W_IOC	0000000A		#-333 (1)
CCTABLE	00000179-R	694 (1)	713 (1)
EXE$ABORTIO	00000000-XR		#-353 (1) #-426 (1)
EXE$CARRIAGE	00000197-R	710 (1)	
EXE$C_CMSTKSZ	=00000014	8 (1)	#-347 (1)
EXE$DEANONPAGED	00000000-XR		337 (1) 343 (1)
EXE$FINISHIO	00000000-XR		#-645 (1)
EXE$MODIFY	0000000C-R	191 (1)	
EXE$MODIFYLOCK	00000044-R	249 (1)	192 (1)
EXE$MODIFYLOCKR	00000047-R	304 (1)	#-250 (1)
EXE$ONEPARM	00000000-R	122 (1)	
EXE$QIODRVPKT	00000000-XR		#-156 (1) #-209 (1) #-608 (1)
EXE$READ	00000012-R	194 (1)	
EXE$READCHK	000000CE-R	387 (1)	
EXE$READCHKR	000000E2-R	464 (1)	#-306 (1) #-312 (1) #-389 (1)
EXE$READLOCK	0000003E-R	237 (1)	195 (1)
EXE$READLOCKR	00000051-R	310 (1)	#-238 (1)
EXE$SENSEMODE	0000016F-R	642 (1)	
EXE$SETCHAR	00000141-R	561 (1)	
EXE$SETMODE	0000015F-R	604 (1)	
EXE$WRITE	0000001B-R	197 (1)	
EXE$WRITECHK	000000D4-R	422 (1)	
EXE$WRITECHKR	0000010C-R	510 (1)	#-317 (1) #-424 (1)
EXE$WRITELOCK	00000041-R	243 (1)	198 (1)
EXE$WRITELOCKR	00000058-R	315 (1)	#-244 (1)
EXE$ZEROPARM	00000006-R	154 (1)	
IO$_PHYSICAL	=0000001F		#-201 (1)
IO$_READLBLK	=00000021		#-203 (1)
IO$_READPBLK	=0000000C		#-203 (1)
IO$_SETMODE	=00000023		#-564 (1)
IRP$B_CARCON	00000038		#-199 (1) #-711 (1) #-714 (1) #-723 (1)
			#-726 (1) #-727 (1) #-728 (1) #-731 (1)
			#-732 (1)
IRP$B_RMOD	0000000B		340 (1)
IRP$L_DIAGBUF	00000044		#-335 (1)
IRP$L_MEDIA	00000034		#-123 (1) #-155 (1) #-607 (1)
IRP$L_SVAPTE	0000002C		#-325 (1)
IRP$M_FUNC	=00000002		#-474 (1)
IRP$S_FCODE	=00000006		#-200 (1)
IRP$V_DIAGBUF	=00000007		#-334 (1)
IRP$V_FCODE	=00000000		#-200 (1)
IRP$V_FUNC	=00000001		#-196 (1)
IRP$W_BCNT	00000032		#-522 (1)
IRP$W_BOFF	00000030		#-320 (1)
IRP$W_FUNC	00000020		201 (1) #-204 (1)
IRP$W_STS	0000002A		196 (1) 334 (1) #-474 (1)
MMG$IOLOCK	00000000-XR		322 (1)
P1	=00000000	85 (1)	#-123 (1) #-207 (1) #-562 (1) #-605 (1)

```
P2                              =00000004      86      (1)     #-205     (1)
P3                              =00000008      87      (1)
P4                              =0000000C      88      (1)     #-199     (1)
P5                              =00000010      89      (1)
P6                              =00000014      90      (1)
PCB$W_ASTCNT                     00000038                       #-341     (1)
PCB$W_DIOCNT                     0000003E                       #-332     (1)
SS$_ACCVIO                      =0000000C                       #-527     (1)
SS$_NORMAL                      =00000001                       #-523     (1)     #-644     (1)
UCB$B_DEVCLASS                   00000038                       #-566     (1)
UCB$L_DEVDEPEND                  0000003C                       #-568     (1)     #-643     (1)
UCB$W_DEVBUFSIZ                  0000003A                       #-567     (1)
VA$M_BYTE                       =000001FF                       #-320     (1)     #-467     (1)     #-513     (1)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.01	00:00:00.19
Command processing	927	00:00:00.24	00:00:00.94
Pass 1	725	00:00:02.99	00:00:04.18
Symbol table sort	0	00:00:00.33	00:00:00.33
Pass 2	65	00:00:00.86	00:00:01.59
Symbol table output	2	00:00:00.03	00:00:00.10
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	4	00:00:00.04	00:00:00.03
Assembler run totals	1752	00:00:04.51	00:00:07.37

```
The working set limit was 2400 pages.
166703 bytes (326 pages) of virtual memory were used to buffer the intermediate code.
There were 70 pages of symbol table space allocated to hold 1171 non-local and 26 local symbols.
743 source lines were read in Pass 1, producing 76 object records in Pass 2.
21 pages of virtual memory were used to define 20 macros.
```

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	6
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	3
SYS$COMMON:[SYSLIB]STARLET.MLB;2	7
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	16

```
1437 GETS were required to define 16 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

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(1) 81 DECLARATIONS
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(1) 558 INSERT I/O PACKET IN QUEUE BY PRIORITY

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element QIOREQ.MAR
0000     2 ; *1     6-FEB-1986 15:22:13 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element QIOREQ.MAR
0000     4         .TITLE  QIOREQ  *** QIOREQ handle QIO request
0000     5         .IDENT  /01-02/
0000     6         .NLIST  CND
0000     7
0000     8 ;
0000     9 ;*****************************************************************************
0000    10 ;*                                                                           *
0000    11 ; COPYRIGHT (C) 1977, 1980
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0000    26 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    27 ;*                                                                           *
0000    28 ;*****************************************************************************
0000    29 ;
0000    30 ;++
0000    31 ;
0000    32 ; AUTHOR:
0000    33 ;
0000    34 ;       D. N. CUTLER,   14-JUN-76
0000    35 ;
0000    36 ; FACILITY:
0000    37 ;
0000    38 ;       SYSTEM SERVICE QUEUE I/O REQUEST
0000    39 ;
0000    40 ; MODIFIED BY:
0000    41 ;
0000    42 ;       DS5.4   John Ciukaj     5-May-1980      Version 5.4
0000    43 ;                 Used Vax/Vms version 2.0 SYSQIOREQ.MAR and created
0000    44 ;                 a UPD file with the edits necessary to reflect the
0000    45 ;                 changes exhibited in Supervisor version 5.3 module
0000    46 ;                 QIOREQ.
0000    47 ;                Dave Butenhof   30-jun-1980,    version 5.5
0000    48 ;       02          Alter some word displacement BSB's to longword displacement
0000    49 ;                   JSB's, since supervisor has expanded.
0000    50 ;
0000    51 ;
0000    52 ;       V0208   LMK0001         LEN KAWELL              03-OCT-1979
0000    53 ;                DISALLOW LOGICAL/PHYSICAL I/O TO A SPOOLED DEVICE UNLESS
0000    54 ;                THE PROCESS HAS LOG_IO PRIVILEGE.
0000    55 ;
0000    56 ;       V0207   KDM0053         Kathleen D. Morse       31-Aug-1979
0000    57 ;                ADD TWO NEW ENTRY POINTS FOR SHARED MEMORY GLOBAL SECTION
```

```
                                0000     58 ;                  I/O, EXE$BLDPKTGSR AND EXE$BLDPKTGSW.
                                0000     59 ;
                                0000     60 ;          V0006   CHP0002          CAROL PETERS            14-AUG-1979
                                0000     61 ;                  IN EXE$ALTQUEPKT, IF NO ALTERNATE START I/O ADDRESS
                                0000     62 ;                  IS SPECIFIED IN THE DDR, JUST RETURN TO CALLER.
                                0000     63 ;
                                0000     64 ;          V0005   ACG0047          ANDREW C. GOLDSTEIN     09-AUG-1979
                                0000     65 ;                  ADD ACCESS RIGHTS BLOCK, PROTECTION INTERFACE CHANGES.
                                0000     66 ;
                                0000     67 ;          V04     CHP0001          CAROL PETERS            03-AUG-1979
                                0000     68 ;                  ADDED NEW ENTRY POINT FOR QUEUING A PACKET TO A DRIVER.
                                0000     69 ;                  ENTRY POINT IS STORED IN DDT AND CALLED ALTSTART.  ADDED
                                0000     70 ;                  SYSQIOREQ ENTRY POINT, EXE$ALTQUEPKT, WHICH JSBS TO
                                0000     71 ;                  THE ALTSTART ENTRY POIN, AND THEN RSBS TO ITS CALLER.
                                0000     72 ;
                                0000     73 ;          V03     RIH23909         R. I. HUSTVEDT          14-MAY-1979
                                0000     74 ;                  REMOVE SUPERFLUOUS BRANCH FOLLOWING CALL TO SCH$CLREF.
                                0000     75 ;
                                0000     76 ;          V02     PHL0002          P. H. LIPMAN            01-MAY-1978
                                0000     77 ;                  REWROTE BUILDPKT FOR SEGMENTED VIRTUAL I/O.
                                0000     78 ;
                                0000     79 ;--
```

```
                        0000     81          .SBTTL  DECLARATIONS
                        0000     82
                        0000     83 ;
                        0000     84 ; MACRO LIBRARY CALLS
                        0000     85 ;
                        0000     86
                        0000     87          $ACBDEF                             ;DEFINE ACB OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .IIF    NB,ACB$L_ASTQFL,        ACB$L_ASTQFL:
                00000004 0000                        .BLKL   1
                        0004                 .IIF    NB,ACB$L_ASTQBL,        ACB$L_ASTQBL:
                00000008 0004                        .BLKL   1
                        0008                 .IIF    NB,ACB$W_SIZE,  ACB$W_SIZE:
                0000000A 0008                        .BLKW   1
                        000A                 .IIF    NB,ACB$B_TYPE,  ACB$B_TYPE:
                0000000B 000A                        .BLKB   1
                        000B                 .IIF    NB,ACB$B_RMOD,  ACB$B_RMOD:
                0000000C 000B                        .BLKB   1
                        000C                 .IIF    NB,ACB$L_PID,   ACB$L_PID:
                00000010 000C                        .BLKL   1
                        0010                 .IIF    NB,ACB$L_AST,   ACB$L_AST:
                00000014 0010                        .BLKL   1
                        0014                 .IIF    NB,ACB$L_ASTPRM,        ACB$L_ASTPRM:
                00000018 0014                        .BLKL   1
                        0018                 .IIF    NB,ACB$C_LENGTH,        ACB$C_LENGTH:
                        0018                 .IIF    NB,ACB$K_LENGTH,        ACB$K_LENGTH:
                        0018                 .IIF    NB,ACB$L_KAST,  ACB$L_KAST:
                0000001C 0018                        .BLKL   1
                        0000                 .RESTORE
                        0000     88          $AQBDEF                             ;DEFINE AQB OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 001C                .=0
                        0000                 .RESTORE
                        0000     89          $CADEF                              ;DEFINE CONDITIONAL ASSEMBLY PARAMETERS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 001C                .=0
                        0000                 .RESTORE
                        0000     90          $CCBDEF                             ;DEFINE CCB OFFSETS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 001C                .=0
                        0000                 .IIF    NB,CCB$L_UCB,   CCB$L_UCB:
                00000004 0000                        .BLKL   1
                        0004                 .IIF    NB,CCB$L_WIND,  CCB$L_WIND:
                00000008 0004                        .BLKL   1
                        0008                 .IIF    NB,CCB$B_STS,   CCB$B_STS:
                00000009 0008                        .BLKB   1
                        0009                 .IIF    NB,CCB$B_AMOD,  CCB$B_AMOD:
                0000000A 0009                        .BLKB   1
                        000A                 .IIF    NB,CCB$W_IOC,   CCB$W_IOC:
                0000000C 000A                        .BLKW   1
                        000C                 .IIF    NB,CCB$L_DIRP,  CCB$L_DIRP:
                00000010 000C                        .BLKL   1
                        0010                 .IIF    NB,CCB$C_LENGTH,        CCB$C_LENGTH:
                        0010                 .IIF    NB,CCB$K_LENGTH,        CCB$K_LENGTH:
```

```
                 0000                .RESTORE
                 0000     91         $DDBDEF                          ;DEFINE DDB OFFSETS
                 0000                .SAVE   LOCAL_BLOCK
                 0000                .PSECT  $ABS$,ABS
        00000000 001C                .=0
                 0000                .IIF    NB,DDB$L_LINK,  DDB$L_LINK:
        00000004 0000                                .BLKL   1
                 0004                .IIF    NB,DDB$L_UCB,   DDB$L_UCB:
        00000008 0004                                .BLKL   1
                 0008                .IIF    NB,DDB$W_SIZE,  DDB$W_SIZE:
        0000000A 0008                                .BLKW   1
                 000A                .IIF    NB,DDB$B_TYPE,  DDB$B_TYPE:
        0000000B 000A                                .BLKB   1
        0000000C 000B                                .BLKB   1
                 000C                .IIF    NB,DDB$L_DDT,   DDB$L_DDT:
        00000010 000C                                .BLKL   1
                 0010                .IIF    NB,DDB$L_ACPD,  DDB$L_ACPD:
        00000013 0010                                .BLKB   3
                 0013                .IIF    NB,DDB$B_ACPCLASS,      DDB$B_ACPCLASS:
        00000014 0013                                .BLKB   1
                 0014                .IIF    NB,DDB$T_NAME,  DDB$T_NAME:
        00000015 0014                                .BLKB   1
        00000024 0015                                .BLKB   15
                 0024                .IIF    NB,DDB$T_DRVNAME,       DDB$T_DRVNAME:
        00000025 0024                                .BLKB   1
        00000034 0025                                .BLKB   15
                 0034                .IIF    NB,DDB$C_LENGTH,        DDB$C_LENGTH:
                 0034                .IIF    NB,DDB$K_LENGTH,        DDB$K_LENGTH:
                 0000                .RESTORE
                 0000     92         $DDTDEF                          ;DEFINE DDT OFFSETS
                 0000                .SAVE   LOCAL_BLOCK
                 0000                .PSECT  $ABS$,ABS
        00000000 0034                .=0
                 0000                .IIF    NB,DDT$L_START, DDT$L_START:
        00000004 0000                                .BLKL   1
                 0004                .IIF    NB,DDT$L_UNSOLINT,      DDT$L_UNSOLINT:
        00000008 0004                                .BLKL   1
                 0008                .IIF    NB,DDT$L_FDT,   DDT$L_FDT:
        0000000C 0008                                .BLKL   1
                 000C                .IIF    NB,DDT$L_CANCEL,        DDT$L_CANCEL:
        00000010 000C                                .BLKL   1
                 0010                .IIF    NB,DDT$L_REGDUMP,       DDT$L_REGDUMP:
        00000014 0010                                .BLKL   1
                 0014                .IIF    NB,DDT$W_DIAGBUF,       DDT$W_DIAGBUF:
        00000016 0014                                .BLKW   1
                 0016                .IIF    NB,DDT$W_ERRORBUF,      DDT$W_ERRORBUF:
        00000018 0016                                .BLKW   1
                 0018                .IIF    NB,DDT$L_UNITINIT,      DDT$L_UNITINIT:
        0000001C 0018                                .BLKL   1
                 001C                .IIF    NB,DDT$L_ALTSTART,      DDT$L_ALTSTART:
        00000020 001C                                .BLKL   1
                 0000                .RESTORE
                 0000     93         $DYNDEF                          ;DEFINE DATA STRUCTURE TYPE CODES
                 0000                .SAVE   LOCAL_BLOCK
                 0000                .PSECT  $ABS$,ABS
        00000000 0034                .=0
                 0000                .RESTORE
```

```
                    0000     94          $IPLDEF                         ;DEFINE INTERRUPT PRIORITY LEVELS
                    0000                 .SAVE   LOCAL_BLOCK
                    0000                 .PSECT  $ABS$,ABS
                    0034                 .=0
                    0000                 .RESTORE
                    0000     95          $IRPDEF                         ;DEFINE IRP OFFSETS
                    0000                 .SAVE   LOCAL_BLOCK
                    0000                 .PSECT  $ABS$,ABS
                    0034                 .=0
                    0000                 .IIF    NB,IRP$L_IOQFL, IRP$L_IOQFL:
                    0000                         .BLKL   1
                    0004                 .IIF    NB,IRP$L_IOQBL, IRP$L_IOQBL:
                    0004                         .BLKL   1
                    0008                 .IIF    NB,IRP$W_SIZE,  IRP$W_SIZE:
                    0008                         .BLKW   1
                    000A                 .IIF    NB,IRP$B_TYPE,  IRP$B_TYPE:
                    000A                         .BLKB   1
                    000B                 .IIF    NB,IRP$B_RMOD,  IRP$B_RMOD:
                    000B                         .BLKB   1
                    000C                 .IIF    NB,IRP$L_PID,   IRP$L_PID:
                    000C                         .BLKL   1
                    0010                 .IIF    NB,IRP$L_AST,   IRP$L_AST:
                    0010                         .BLKL   1
                    0014                 .IIF    NB,IRP$L_ASTPRM,        IRP$L_ASTPRM:
                    0014                         .BLKL   1
                    0018                 .IIF    NB,IRP$L_WIND,  IRP$L_WIND:
                    0018                         .BLKL   1
                    001C                 .IIF    NB,IRP$L_UCB,   IRP$L_UCB:
                    001C                         .BLKL   1
                    0020                 .IIF    NB,IRP$W_FUNC,  IRP$W_FUNC:
                    0020                         .BLKW   1
                    0022                 .IIF    NB,IRP$B_EFN,   IRP$B_EFN:
                    0022                         .BLKB   1
                    0023                 .IIF    NB,IRP$B_PRI,   IRP$B_PRI:
                    0023                         .BLKB   1
                    0024                 .IIF    NB,IRP$L_IOSB,  IRP$L_IOSB:
                    0024                         .BLKL   1
                    0028                 .IIF    NB,IRP$W_CHAN,  IRP$W_CHAN:
                    0028                         .BLKW   1
                    002A                 .IIF    NB,IRP$W_STS,   IRP$W_STS:
                    002A                         .BLKW   1
                    002C                 .IIF    NB,IRP$L_SVAPTE,        IRP$L_SVAPTE:
                    002C                         .BLKL   1
                    0030                 .IIF    NB,IRP$W_BOFF,  IRP$W_BOFF:
                    0030                         .BLKW   1
                    0032                 .IIF    NB,IRP$W_BCNT,  IRP$W_BCNT:
                    0032                         .BLKW   1
                    0034                 .IIF    NB,IRP$L_IOST1, IRP$L_IOST1:
                    0034                 .IIF    NB,IRP$L_MEDIA, IRP$L_MEDIA:
                    0034                         .BLKL   1
                    0038                 .IIF    NB,IRP$L_IOST2, IRP$L_IOST2:
                    0038                 .IIF    NB,IRP$L_TT_TERM,       IRP$L_TT_TERM:
                    0038                 .IIF    NB,IRP$B_CARCON,        IRP$B_CARCON:
                    0038                         .BLKB   1
                    0039                         .BLKB   3
                    003C                 .IIF    NB,IRP$Q_NT_PRVMSK,     IRP$Q_NT_PRVMSK:
                    003C                 .IIF    NB,IRP$W_ABCNT, IRP$W_ABCNT:
```

```
                    003C                .IIF    NB,IRP$W_TT_PRMPT,      IRP$W_TT_PRMPT:
0000003E  003C                                  .BLKW   1
                    003E                .IIF    NB,IRP$W_OBCNT, IRP$W_OBCNT:
00000040  003E                                  .BLKW   1
                    0040                .IIF    NB,IRP$L_SEGVBN,        IRP$L_SEGVBN:
00000044  0040                                  .BLKL   1
                    0044                .IIF    NB,IRP$L_DIAGBUF,       IRP$L_DIAGBUF:
00000048  0044                                  .BLKL   1
                    0048                .IIF    NB,IRP$L_SEQNUM,        IRP$L_SEQNUM:
0000004C  0048                                  .BLKL   1
                    004C                .IIF    NB,IRP$L_EXTEND,        IRP$L_EXTEND:
00000050  004C                                  .BLKL   1
                    0050                .IIF    NB,IRP$L_ARB,   IRP$L_ARB:
00000054  0050                                  .BLKL   1
00000058  0054                                  .BLKL   1
0000005C  0058                                  .BLKL   1
                    005C                .IIF    NB,IRP$C_LENGTH,        IRP$C_LENGTH:
                    005C                .IIF    NB,IRP$K_LENGTH,        IRP$K_LENGTH:
                    0000                .RESTORE
                    0000    96          $PCBDEF                         ;DEFINE PCB OFFSETS
                    0000                .SAVE   LOCAL_BLOCK
                    0000                .PSECT  $ABS$,ABS
00000000  005C                          .=0
                    0000                .IIF    NB,PCB$L_SQFL,  PCB$L_SQFL:
00000004  0000                                  .BLKL   1
                    0004                .IIF    NB,PCB$L_SQBL,  PCB$L_SQBL:
00000008  0004                                  .BLKL   1
                    0008                .IIF    NB,PCB$W_SIZE,  PCB$W_SIZE:
0000000A  0008                                  .BLKW   1
                    000A                .IIF    NB,PCB$B_TYPE,  PCB$B_TYPE:
0000000B  000A                                  .BLKB   1
                    000B                .IIF    NB,PCB$B_PRI,   PCB$B_PRI:
0000000C  000B                                  .BLKB   1
                    000C                .IIF    NB,PCB$B_ASTACT,        PCB$B_ASTACT:
0000000D  000C                                  .BLKB   1
                    000D                .IIF    NB,PCB$B_ASTEN, PCB$B_ASTEN:
0000000E  000D                                  .BLKB   1
                    000E                .IIF    NB,PCB$W_MTXCNT,        PCB$W_MTXCNT:
00000010  000E                                  .BLKW   1
                    0010                .IIF    NB,PCB$L_ASTQFL,        PCB$L_ASTQFL:
00000014  0010                                  .BLKL   1
                    0014                .IIF    NB,PCB$L_ASTQBL,        PCB$L_ASTQBL:
00000018  0014                                  .BLKL   1
                    0018                .IIF    NB,PCB$L_PHYPCB,        PCB$L_PHYPCB:
0000001C  0018                                  .BLKL   1
                    001C                .IIF    NB,PCB$L_OWNER, PCB$L_OWNER:
00000020  001C                                  .BLKL   1
                    0020                .IIF    NB,PCB$L_WSSWP, PCB$L_WSSWP:
00000024  0020                                  .BLKL   1
                    0024                .IIF    NB,PCB$L_STS,   PCB$L_STS:
00000028  0024                                  .BLKL   1
                    0028                .IIF    NB,PCB$L_WTIME, PCB$L_WTIME:
0000002C  0028                                  .BLKL   1
                    002C                .IIF    NB,PCB$W_STATE, PCB$W_STATE:
0000002E  002C                                  .BLKW   1
                    002E                .IIF    NB,PCB$B_WEFC,  PCB$B_WEFC:
0000002F  002E                                  .BLKB   1
```

```
                    002F                .IIF    NB,PCB$B_PRIB,  PCB$B_PRIB:
00000030  002F                                  .BLKB   1
                    0030                .IIF    NB,PCB$W_APTCNT,        PCB$W_APTCNT:
00000032  0030                                  .BLKW   1
                    0032                .IIF    NB,PCB$W_TMBU,  PCB$W_TMBU:
00000034  0032                                  .BLKW   1
                    0034                .IIF    NB,PCB$W_GPGCNT,        PCB$W_GPGCNT:
00000036  0034                                  .BLKW   1
                    0036                .IIF    NB,PCB$W_PPGCNT,        PCB$W_PPGCNT:
00000038  0036                                  .BLKW   1
                    0038                .IIF    NB,PCB$W_ASTCNT,        PCB$W_ASTCNT:
0000003A  0038                                  .BLKW   1
                    003A                .IIF    NB,PCB$W_BIOCNT,        PCB$W_BIOCNT:
0000003C  003A                                  .BLKW   1
                    003C                .IIF    NB,PCB$W_BIOLM, PCB$W_BIOLM:
0000003E  003C                                  .BLKW   1
                    003E                .IIF    NB,PCB$W_DIOCNT,        PCB$W_DIOCNT:
00000040  003E                                  .BLKW   1
                    0040                .IIF    NB,PCB$W_DIOLM, PCB$W_DIOLM:
00000042  0040                                  .BLKW   1
                    0042                .IIF    NB,PCB$W_PRCCNT,        PCB$W_PRCCNT:
00000044  0042                                  .BLKW   1
                    0044                .IIF    NB,PCB$T_TERMINAL,      PCB$T_TERMINAL:
0000004C  0044                                  .BLKB   8
                    004C                .IIF    NB,PCB$L_PQB,   PCB$L_PQB:
                    004C                .IIF    NB,PCB$L_EFWM,  PCB$L_EFWM:
00000050  004C                                  .BLKL   1
                    0050                .IIF    NB,PCB$L_EFCS,  PCB$L_EFCS:
00000054  0050                                  .BLKL   1
                    0054                .IIF    NB,PCB$L_EFCU,  PCB$L_EFCU:
00000058  0054                                  .BLKL   1
                    0058                .IIF    NB,PCB$L_EFC2P, PCB$L_EFC2P:
0000005C  0058                                  .BLKL   1
                    005C                .IIF    NB,PCB$L_EFC3P, PCB$L_EFC3P:
00000060  005C                                  .BLKL   1
                    0060                .IIF    NB,PCB$L_PID,   PCB$L_PID:
00000064  0060                                  .BLKL   1
                    0064                .IIF    NB,PCB$L_PHD,   PCB$L_PHD:
00000068  0064                                  .BLKL   1
                    0068                .IIF    NB,PCB$T_LNAME, PCB$T_LNAME:
00000078  0068                                  .BLKB   16
                    0078                .IIF    NB,PCB$L_JIB,   PCB$L_JIB:
0000007C  0078                                  .BLKL   1
                    007C                .IIF    NB,PCB$Q_PRIV,  PCB$Q_PRIV:
00000084  007C                                  .BLKQ   1
                    0084                .IIF    NB,PCB$L_ARB,   PCB$L_ARB:
00000088  0084                                  .BLKL   1
                    0088                .IIF    NB,PCB$L_UIC,   PCB$L_UIC:
                    0088                .IIF    NB,PCB$W_MEM,   PCB$W_MEM:
0000008A  0088                                  .BLKW   1
                    008A                .IIF    NB,PCB$W_GRP,   PCB$W_GRP:
0000008C  008A                                  .BLKW   1
                    008C                .IIF    NB,PCB$C_LENGTH,        PCB$C_LENGTH:
                    008C                .IIF    NB,PCB$K_LENGTH,        PCB$K_LENGTH:
                    0000                .RESTORE
                    0000        97      $PHDDEF                         ;DEFINE PHD OFFSETS
                    0000                .SAVE   LOCAL_BLOCK
```

```
                        0000              .PSECT  $ABS$,ABS
                00000000  008C              .=0
                        0000              .RESTORE
                        0000    98        $PRDEF                          ;DEFINE PROCESSOR REGISTERS
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
                00000000  008C              .=0
                        0000              .RESTORE
                        0000    99        $PRIDEF                         ;DEFINE PRIORITY CLASS INCREMENTS
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
                00000000  008C              .=0
                        0000              .RESTORE
                        0000    100       $PRVDEF                         ;DEFINE PRIVILEGE BITS
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
                00000000  008C              .=0
                        0000              .RESTORE
                        0000    101       $PSLDEF                         ;DEFINE PROCESSOR STATUS FIELDS
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
                00000000  008C              .=0
                        0000              .RESTORE
                        0000    102       $RSNDEF                         ;DEFINE RESOURCE WAIT NUMBERS
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
                00000000  008C              .=0
                        0000              .RESTORE
                        0000    103       $SECDEF                         ;DEFINE SEC OFFSETS
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
                00000000  008C              .=0
                        0000              .RESTORE
                        0000    104       $UCBDEF                         ;DEFINE UCB OFFSETS
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
                00000000  008C              .=0
                        0000              .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                        0000              .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
                00000004  0000                      .BLKL   1
                        0004              .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                        0004              .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
                00000008  0004                      .BLKL   1
                        0008              .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
                0000000A  0008                      .BLKW   1
                        000A              .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
                0000000B  000A                      .BLKB   1
                        000B              .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
                0000000C  000B                      .BLKB   1
                        000C              .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                        000C              .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                        000C              .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
                0000000D  000C                      .BLKB   1
                00000010  000D                      .BLKB   3
                        0010              .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                        0010              .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
                00000014  0010                      .BLKL   1
```

```
                        0014                .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                        0014                .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                        0014                .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
                00000016 0014                               .BLKW   1
                        0016                .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
                00000018 0016                               .BLKW   1
                        0018                .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                        0018                .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
                0000001A 0018                               .BLKW   1
                        001A                .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                        001A                .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
                0000001C 001A                               .BLKW   1
                        001C                .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
                00000020 001C                               .BLKL   1
                        0020                .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
                00000024 0020                               .BLKL   1
                        0024                .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
                00000028 0024                               .BLKL   1
                        0028                .IIF    NB,UCB$L_PID,   UCB$L_PID:
                0000002C 0028                               .BLKL   1
                        002C                .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
                00000030 002C                               .BLKL   1
                        0030                .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
                00000034 0030                               .BLKL   1
                        0034                .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
                00000038 0034                               .BLKL   1
                        0038                .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
                00000039 0038                               .BLKB   1
                        0039                .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
                0000003A 0039                               .BLKB   1
                        003A                .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
                0000003C 003A                               .BLKW   1
                        003C                .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
                        003C                .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
                        003C                .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
                0000003D 003C                               .BLKB   1
                        003D                .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
                        003D                .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
                0000003E 003D                               .BLKB   1
                        003E                .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
                        003E                .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
                0000003F 003E                               .BLKB   1
                        003F                .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
                00000040 003F                               .BLKB   1
                        0040                .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
                00000044 0040                               .BLKL   1
                        0044                .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
                00000048 0044                               .BLKL   1
                        0048                .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
                0000004A 0048                               .BLKW   1
                        004A                .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
                        004A                .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
                0000004B 004A                               .BLKB   1
                        004B                .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
                0000004C 004B                               .BLKB   1
                        004C                .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
                00000050 004C                               .BLKL   1
```

```
                        0050              .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
00000052                0050                      .BLKW   1
                        0052              .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
                        0052              .IIF    NB,UCB$B_STATE, UCB$B_STATE:
00000053                0052                      .BLKB   1
                        0053              .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
00000054                0053                      .BLKB   1
                        0054              .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
00000058                0054                      .BLKL   1
                        0058              .IIF    NB,UCB$W_STS,   UCB$W_STS:
0000005A                0058                      .BLKW   1
                        005A              .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
0000005C                005A                      .BLKW   1
                        005C              .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
                        005C              .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
00000060                005C                      .BLKL   1
                        0060              .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
00000064                0060                      .BLKL   1
                        0064              .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
                        0064              .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
00000068                0064                      .BLKL   1
                        0068              .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
0000006C                0068                      .BLKL   1
                        006C              .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
0000006E                006C                      .BLKW   1
                        006E              .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
00000070                006E                      .BLKW   1
                        0070              .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
00000071                0070                      .BLKB   1
                        0071              .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
00000072                0071                      .BLKB   1
                        0072              .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074                0072                      .BLKW   1
                        0074              .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
                        0074              .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000                0074              . = 0
                        0000              .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002                0000                      .BLKW   1
00000074                0002              . = 116
                        0074              .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078                0074                      .BLKL   1
                        0078              .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C                0078                      .BLKL   1
                        007C              .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080                007C                      .BLKL   1
                        0080              .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084                0080                      .BLKL   1
                        0084              .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088                0084                      .BLKL   1
                        0088              .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C                0088                      .BLKL   1
                        008C              .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090                008C                      .BLKL   1
                        0090              .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
                        0090              .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074                0090              . = 116
                        0074              .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
```

```
00000075  0074                                  .BLKB   1
          0075                  .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076  0075                                  .BLKB   1
          0076                  .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077  0076                                  .BLKB   1
          0077                  .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078  0077                                  .BLKB   1
          0078                  .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C  0078                                  .BLKL   1
0000007E  007C                                  .BLKW   1
          007E                  .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080  007E                                  .BLKW   1
          0080                  .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084  0080                                  .BLKL   1
00000080  0084                  . = 128
00000084  0080                                  .BLKL   1
          0084                  .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088  0084                                  .BLKL   1
          0088                  .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A  0088                                  .BLKW   1
          008A                  .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C  008A                                  .BLKW   1
          008C                  .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
          008C                  .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E  008C                                  .BLKW   1
          008E                  .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090  008E                                  .BLKW   1
          0090                  .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092  0090                                  .BLKW   1
          0092                  .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
00000094  0092                                  .BLKW   1
          0094                  .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095  0094                                  .BLKB   1
          0095                  .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096  0095                                  .BLKB   1
          0096                  .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098  0096                                  .BLKW   1
00000096  0098                  . = 150
00000098  0096                                  .BLKW   1
          0098                  .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C  0098                                  .BLKL   1
          009C                  .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0  009C                                  .BLKL   1
          00A0                  .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
000000A4  00A0                                  .BLKL   1
          00A4                  .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
000000A6  00A4                                  .BLKW   1
          00A6                  .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
000000A7  00A6                                  .BLKB   1
000000A8  00A7                                  .BLKB   1
00000074  00A8                  . = 116
00000078  0074                                  .BLKL   1
0000007C  0078                                  .BLKL   1
00000080  007C                                  .BLKL   1
00000084  0080                                  .BLKL   1
00000088  0084                                  .BLKL   1
0000008C  0088                                  .BLKL   1
```

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                        008C                .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
00000090  008C                                        .BLKL   1
00000094  0090                                        .BLKL   1
00000098  0094                                        .BLKL   1
0000009C  0098                                        .BLKL   1
                        009C                .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
0000009D  009C                                        .BLKB   1
                        009D                .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
0000009E  009D                                        .BLKB   1
                        009E                .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
0000009F  009E                                        .BLKB   1
000000A0  009F                                        .BLKB   1
                        00A0                .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
000000A1  00A0                                        .BLKB   1
                        00A1                .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
000000A2  00A1                                        .BLKB   1
                        00A2                .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
000000A3  00A2                                        .BLKB   1
000000A4  00A3                                        .BLKB   1
                        00A4                .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
000000A5  00A4                                        .BLKB   1
                        00A5                .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
000000A7  00A5                                        .BLKW   1
000000A8  00A7                                        .BLKB   1
                        00A8                .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
000000AC  00A8                                        .BLKL   1
000000B0  00AC                                        .BLKL   1
000000B4  00B0                                        .BLKL   1
000000B8  00B4                                        .BLKL   1
                        00B8                .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
000000BC  00B8                                        .BLKL   1
                        00BC                .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
                        00BC                .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
00000074  00BC                              . = 116
                        0074                .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
00000078  0074                                        .BLKL   1
                        0078                .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
0000007C  0078                                        .BLKL   1
                        007C                .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
0000007E  007C                                        .BLKW   1
00000080  007E                                        .BLKW   1
                        0000                .RESTORE
                        0000    105         $VCBDEF                                 ;DEFINE VCB OFFSETS
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
00000000  00BC                              .=0
                        0000                .IIF    NB,VCB$L_FCBFL, VCB$L_FCBFL:
00000004  0000                                        .BLKL   1
                        0004                .IIF    NB,VCB$L_FCBBL, VCB$L_FCBBL:
00000008  0004                                        .BLKL   1
                        0008                .IIF    NB,VCB$W_SIZE,  VCB$W_SIZE:
0000000A  0008                                        .BLKW   1
                        000A                .IIF    NB,VCB$B_TYPE,  VCB$B_TYPE:
0000000B  000A                                        .BLKB   1
                        000B                .IIF    NB,VCB$C_MRKLEN,        VCB$C_MRKLEN:
                        000B                .IIF    NB,VCB$K_MRKLEN,        VCB$K_MRKLEN:
                        000B                .IIF    NB,VCB$B_STATUS,        VCB$B_STATUS:
```

```
0000000C  000B                          .BLKB   1
          000C          .IIF    NB,VCB$W_TRANS, VCB$W_TRANS:
0000000E  000C                          .BLKW   1
          000E          .IIF    NB,VCB$W_RVN,   VCB$W_RVN:
00000010  000E                          .BLKW   1
          0010          .IIF    NB,VCB$L_AQB,   VCB$L_AQB:
00000014  0010                          .BLKL   1
          0014          .IIF    NB,VCB$T_VOLNAME,       VCB$T_VOLNAME:
00000020  0014                          .BLKB   12
          0020          .IIF    NB,VCB$L_RVT,   VCB$L_RVT:
00000024  0020                          .BLKL   1
          0024          .IIF    NB,VCB$C_COMLEN,        VCB$C_COMLEN:
          0024          .IIF    NB,VCB$K_COMLEN,        VCB$K_COMLEN:
          0024          .IIF    NB,VCB$L_HOMELBN,       VCB$L_HOMELBN:
00000028  0024                          .BLKL   1
          0028          .IIF    NB,VCB$L_HOME2LBN,      VCB$L_HOME2LBN:
0000002C  0028                          .BLKL   1
          002C          .IIF    NB,VCB$L_IXHDR2LBN,     VCB$L_IXHDR2LBN:
00000030  002C                          .BLKL   1
          0030          .IIF    NB,VCB$L_IBMAPLBN,      VCB$L_IBMAPLBN:
00000034  0030                          .BLKL   1
          0034          .IIF    NB,VCB$L_SBMAPLBN,      VCB$L_SBMAPLBN:
00000038  0034                          .BLKL   1
          0038          .IIF    NB,VCB$B_IBMAPSIZE,     VCB$B_IBMAPSIZE:
00000039  0038                          .BLKB   1
          0039          .IIF    NB,VCB$B_SBMAPSIZE,     VCB$B_SBMAPSIZE:
0000003A  0039                          .BLKB   1
          003A          .IIF    NB,VCB$B_IBMAPVBN,      VCB$B_IBMAPVBN:
0000003B  003A                          .BLKB   1
          003B          .IIF    NB,VCB$B_SBMAPVBN,      VCB$B_SBMAPVBN:
0000003C  003B                          .BLKB   1
          003C          .IIF    NB,VCB$W_CLUSTER,       VCB$W_CLUSTER:
0000003E  003C                          .BLKW   1
          003E          .IIF    NB,VCB$W_EXTEND,        VCB$W_EXTEND:
00000040  003E                          .BLKW   1
          0040          .IIF    NB,VCB$L_FREE,  VCB$L_FREE:
00000044  0040                          .BLKL   1
          0044          .IIF    NB,VCB$L_MAXFILES,      VCB$L_MAXFILES:
00000048  0044                          .BLKL   1
          0048          .IIF    NB,VCB$B_WINDOW,        VCB$B_WINDOW:
00000049  0048                          .BLKB   1
          0049          .IIF    NB,VCB$B_LRU_LIM,       VCB$B_LRU_LIM:
0000004A  0049                          .BLKB   1
          004A          .IIF    NB,VCB$W_FILEPROT,      VCB$W_FILEPROT:
0000004C  004A                          .BLKW   1
          004C          .IIF    NB,VCB$W_MCOUNT,        VCB$W_MCOUNT:
0000004E  004C                          .BLKW   1
          004E          .IIF    NB,VCB$B_EOFDELTA,      VCB$B_EOFDELTA:
0000004F  004E                          .BLKB   1
          004F          .IIF    NB,VCB$B_RESFILES,      VCB$B_RESFILES:
00000050  004F                          .BLKB   1
          0050          .IIF    NB,VCB$W_RECORDSZ,      VCB$W_RECORDSZ:
00000052  0050                          .BLKW   1
          0052          .IIF    NB,VCB$B_BLOCKFACT,     VCB$B_BLOCKFACT:
00000053  0052                          .BLKB   1
          0053          .IIF    NB,VCB$B_STATUS2,       VCB$B_STATUS2:
00000054  0053                          .BLKB   1
```

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                        0054          .IIF    NB,VCB$L_QUOTAFCB,      VCB$L_QUOTAFCB:
00000058  0054                                .BLKL   1
                        0058          .IIF    NB,VCB$L_CACHE, VCB$L_CACHE:
0000005C  0058                                .BLKL   1
                        005C          .IIF    NB,VCB$L_QUOCACHE,      VCB$L_QUOCACHE:
00000060  005C                                .BLKL   1
                        0060          .IIF    NB,VCB$W_QUOSIZE,       VCB$W_QUOSIZE:
00000062  0060                                .BLKW   1
                        0062          .IIF    NB,VCB$W_PENDERR,       VCB$W_PENDERR:
00000064  0062                                .BLKW   1
                        0064          .IIF    NB,VCB$C_LENGTH,        VCB$C_LENGTH:
                        0064          .IIF    NB,VCB$K_LENGTH,        VCB$K_LENGTH:
00000000  0064                        . = 0
                        0000          .IIF    NB,VCB$L_BLOCKFL,       VCB$L_BLOCKFL:
00000004  0000                                .BLKL   1
                        0004          .IIF    NB,VCB$L_BLOCKBL,       VCB$L_BLOCKBL:
00000008  0004                                .BLKL   1
0000000B  0008                        . = 11
00000024  000B                        . = 36
                        0024          .IIF    NB,VCB$L_CUR_FID,       VCB$L_CUR_FID:
                        0024          .IIF    NB,VCB$W_CUR_NUM,       VCB$W_CUR_NUM:
00000026  0024                                .BLKW   1
                        0026          .IIF    NB,VCB$W_CUR_SEQ,       VCB$W_CUR_SEQ:
00000028  0026                                .BLKW   1
                        0028          .IIF    NB,VCB$L_START_FID,     VCB$L_START_FID:
                        0028          .IIF    NB,VCB$W_START_NUM,     VCB$W_START_NUM:
0000002A  0028                                .BLKW   1
                        002A          .IIF    NB,VCB$W_START_SEQ,     VCB$W_START_SEQ:
0000002C  002A                                .BLKW   1
                        002C          .IIF    NB,VCB$W_MODE,  VCB$W_MODE:
0000002E  002C                                .BLKW   1
                        002E          .IIF    NB,VCB$B_TM,    VCB$B_TM:
0000002F  002E                                .BLKB   1
                        002F          .IIF    NB,VCB$B_CUR_RVN,       VCB$B_CUR_RVN:
00000030  002F                                .BLKB   1
                        0030          .IIF    NB,VCB$L_ST_RECORD,     VCB$L_ST_RECORD:
00000034  0030                                .BLKL   1
                        0034          .IIF    NB,VCB$L_MVL,   VCB$L_MVL:
0000003B  0034                                .BLKL   1
                        0038          .IIF    NB,VCB$L_WCB,   VCB$L_WCB:
0000003C  0038                                .BLKL   1
                        003C          .IIF    NB,VCB$L_VPFL,  VCB$L_VPFL:
00000040  003C                                .BLKL   1
                        0040          .IIF    NB,VCB$L_VPBL,  VCB$L_VPBL:
00000044  0040                                .BLKL   1
                        0044          .IIF    NB,VCB$L_USRLBLAST,     VCB$L_USRLBLAST:
00000048  0044                                .BLKL   1
0000000B  0048                        . = 11
                        000B          .IIF    NB,VCB$B_QNAMECNT,      VCB$B_QNAMECNT:
0000000C  000B                                .BLKB   1
                        000C          .IIF    NB,VCB$T_QNAME, VCB$T_QNAME:
00000020  000C                                .BLKB   20
                        0000          .RESTORE
                        0000    106   $WCBDEF                                ;DEFINE WINDOW CONTROL BLOCK OFFSETS
                        0000          .SAVE   LOCAL_BLOCK
                        0000          .PSECT  $ABS$,ABS
00000000  00BC                        .=0
```

```
                    0000                .IIF    NB,WCB$L_WLFL,  WCB$L_WLFL:
00000004            0000                        .BLKL   1
                    0004                .IIF    NB,WCB$L_WLBL,  WCB$L_WLBL:
00000008            0004                        .BLKL   1
                    0008                .IIF    NB,WCB$W_SIZE,  WCB$W_SIZE:
0000000A            0008                        .BLKW   1
                    000A                .IIF    NB,WCB$B_TYPE,  WCB$B_TYPE:
0000000B            000A                        .BLKB   1
                    000B                .IIF    NB,WCB$B_ACCESS,        WCB$B_ACCESS:
0000000C            000B                        .BLKB   1
                    000C                .IIF    NB,WCB$L_PID,   WCB$L_PID:
0000000E            000C                        .BLKB   2
                    000E                .IIF    NB,WCB$W_REFCNT,        WCB$W_REFCNT:
00000010            000E                        .BLKW   1
                    0010                .IIF    NB,WCB$L_ORGUCB,        WCB$L_ORGUCB:
00000014            0010                        .BLKL   1
                    0014                .IIF    NB,WCB$W_ACON,  WCB$W_ACON:
00000016            0014                        .BLKW   1
                    0016                .IIF    NB,WCB$W_NMAP,  WCB$W_NMAP:
00000018            0016                        .BLKW   1
                    0018                .IIF    NB,WCB$L_FCB,   WCB$L_FCB:
0000001C            0018                        .BLKL   1
                    001C                .IIF    NB,WCB$L_RVT,   WCB$L_RVT:
00000020            001C                        .BLKL   1
                    0020                .IIF    NB,WCB$L_STVBN, WCB$L_STVBN:
00000024            0020                        .BLKL   1
                    0024                .IIF    NB,WCB$C_MAP,   WCB$C_MAP:
                    0024                .IIF    NB,WCB$K_MAP,   WCB$K_MAP:
                    0024                .IIF    NB,WCB$C_LENGTH,        WCB$C_LENGTH:
                    0024                .IIF    NB,WCB$K_LENGTH,        WCB$K_LENGTH:
                    0024                .IIF    NB,WCB$W_P1_COUNT,      WCB$W_P1_COUNT:
00000026            0024                        .BLKW   1
                    0026                .IIF    NB,WCB$L_P1_LBN,        WCB$L_P1_LBN:
0000002A            0026                        .BLKL   1
                    002A                .IIF    NB,WCB$W_P2_COUNT,      WCB$W_P2_COUNT:
0000002C            002A                        .BLKW   1
                    002C                .IIF    NB,WCB$L_P2_LBN,        WCB$L_P2_LBN:
00000030            002C                        .BLKL   1
00000000            0030                . = 0
                    0000                .IIF    NB,WCB$W_COUNT, WCB$W_COUNT:
00000002            0000                        .BLKW   1
                    0002                .IIF    NB,WCB$L_LBN,   WCB$L_LBN:
00000006            0002                        .BLKL   1
00000000            0006                . = 0
FFFFFFFA            0000                        .BLKB   -6
                    FFFA                .IIF    NB,WCB$W_PREVCOUNT,     WCB$W_PREVCOUNT:
FFFFFFFC            FFFA                        .BLKW   1
                    FFFC                .IIF    NB,WCB$L_PREVLBN,       WCB$L_PREVLBN:
00000000            FFFC                        .BLKL   1
                    0000                .RESTORE
                    0000    107
                    0000    108 ;
                    0000    109 ; LOCAL SYMBOLS
                    0000    110 ;
                    0000    111 ; ARGUMENT LIST OFFSET DEFINITIONS
                    0000    112 ;
                    0000    113
```

```
                    00000004  0000    114 EFN=4                                   ;EVENT FLAG NUMBER
                    00000008  0000    115 CHAN=8                                  ;I/O CHANNEL NUMBER
                    0000000C  0000    116 FUNC=12                                 ;I/O FUNCTION CODE
                    00000010  0000    117 IOSB=16                                 ;ADDRESS OF I/O STATUS BLOCK
                    00000014  0000    118 ASTADR=20                               ;ADDRESS OF AST SERVICE ROUTINE
                    00000018  0000    119 ASTPRM=24                               ;AST SERVICE ROUTINE PARAMETER
                    0000001C  0000    120 P1=28                                   ;FIRST FUNCTION DEPENDENT PARAMETER
                    00000020  0000    121 P2=32                                   ;SECOND FUNCTION DEPENDENT PARAMETER
                    00000024  0000    122 P3=36                                   ;THIRD FUNCTION DEPENDENT PARAMETER
                    00000028  0000    123 P4=40                                   ;FOURTH FUNCTION DEPENDENT PARAMETER
                    0000002C  0000    124 P5=44                                   ;FIFTH FUNCTION DEPENDENT PARAMETER
                    00000030  0000    125 P6=48                                   ;SIXTH FUNCTION DEPENDENT PARAMETER
                              0000    126
                              0000    127 ;
                              0000    128 ; FUNCTION DECISION TABLE OFFSET DEFINITIONS
                              0000    129 ;
                              0000    130
                    00000000  0000    131 LEGAL=0                                 ;LEGAL FUNCTION MASK
                    00000008  0000    132 IOTYPE=8                                ;I/O FUNCTION TYPE MASK
                    00000010  0000    133 FDTACT=16                               ;ACTION ROUTINE MASKS
                         00000000     134         .PSECT  SEP, SHR, EXE, WRT, LONG
                              0000    135         MODNAM  QIOREQ
 51 45 52 4F 49 51 00'        0000        $MODULE:        .ASCIC  \QIOREQ\
                              06  0000
```

```
0007   137          .SBTTL  QUEUE I/O REQUEST
0007   138 ;+
0007   139 ; EXE$QIOREQ - QUEUE I/O REQUEST
0007   140 ;
0007   141 ; THIS SERVICE PROVIDES THE CAPABILITY TO INITIATE AN I/O OPERATION
0007   142 ; BY QUEUEING A REQUEST TO A DEVICE'S ASSOCIATED DRIVER.  ONCE THE
0007   143 ; OPERATION HAS BEEN INITIATED, CONTROL WILL RETURN TO THE CALLER
0007   144 ; WHO CAN SYNCHRONIZE I/O COMPLETION IN ONE OF THREE WAYS:
0007   145 ;
0007   146 ;       1) SPECIFY THE ADDRESS OF AN AST ROUTINE THAT WILL BE
0007   147 ;          EXECUTED WHEN THE I/O COMPLETES.
0007   148 ;
0007   149 ;       2) WAIT FOR THE SPECIFIED EVENT FLAG TO BE SET.
0007   150 ;
0007   151 ;       3) POLL THE SPECIFIED I/O STATUS BLOCK FOR A COMPLETION
0007   152 ;          STATUS.
0007   153 ;
0007   154 ; THIS ROUTINE VERIFYS THE FUNCTION INDEPENDENT PARAMETERS, ALLOCATES
0007   155 ; AN I/O REQUEST PACKET, COPIES THE FUNCTION INDEPENDENT PARAMETERS AND
0007   156 ; PROCESS INFORMATION TO THE I/O PACKET, CHECKS ACCESS TO THE DEVICE,
0007   157 ; AND CALLS THE DRIVER'S FUNCTION DECISION TABLE ROUTINE(S) THAT CORRESPOND
0007   158 ; TO THE SPECIFIED FUNCTION.  IT IS THEN UP TO THE FDT ROUTINE TO EITHER
0007   159 ; COMPLETE THE REQUEST IMMEDIATELY (EXE$ABORTIO OR EXE$FINISHIO) OR TO
0007   160 ; QUEUE THE I/O REQUEST FOR FURTHER PROCESSING BY THE DRIVER'S STARTIO
0007   161 ; ROUTINE (EXE$QIODRVPKT).
0007   162 ;
0007   163 ; INPUTS:
0007   164 ;
0007   165 ;       EFN(AP) = EVENT FLAG NUMBER.
0007   166 ;       CHAN(AP) = I/O CHANNEL NUMBER.
0007   167 ;       FUNC(AP) = I/O FUNCTION CODE.
0007   168 ;       IOSB(AP) = ADDRESS OF I/O STATUS BLOCK.
0007   169 ;       ASTADR(AP) = ADDRESS OF AST SERVICE ROUTINE.
0007   170 ;       ASTPRM(AP) = AST SERVICE ROUTINE PARAMETER.
0007   171 ;       P1(AP) TO P6(AP) = FUNCTION DEPENDENT PARAMETERS.
0007   172 ;
0007   173 ;       R4 = CURRENT PROCESS PCB ADDRESS.
0007   174 ;
0007   175 ; OUTPUTS:
0007   176 ;
0007   177 ;       R0 LOW BIT CLEAR INDICATES FAILURE TO INITIATE THE I/O REQUEST.
0007   178 ;
0007   179 ;               R0 = SS$_ABORT - A NETWORK LOGICAL LINK WAS BROKEN.
0007   180 ;
0007   181 ;               R0 = SS$_ACCVIO - THE I/O STATUS BLOCK CANNOT BE WRITTEN BY
0007   182 ;                    THE CALLER.
0007   183 ;
0007   184 ;               R0 = SS$_DEVOFFLINE - THE SPECIFIED DEVICE IS OFFLINE.
0007   185 ;
0007   186 ;               R0 = SS$_EXQUOTA - THE PROCESS HAS EXCEEDED ITS BUFFERED I/O
0007   187 ;                    QUOTA, DIRECT I/O QUOTA, OR BUFFERED I/O BYTE COUNT
0007   188 ;                    QUOTA AND HAS DISABLED RESOURCE WAIT MODE.  OR, THE
0007   189 ;                    PROCESS HAS EXCEEDED ITS AST LIMIT QUOTA.
0007   190 ;
0007   191 ;               R0 = SS$_ILLEFC - AN ILLEGAL EVENT FLAG NUMBER WAS SPECIFIED.
0007   192 ;
0007   193 ;               R0 = SS$_INSFMEM - INSUFFICIENT DYNAMIC MEMORY IS AVAILABLE
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                                0007   194 ;                   TO ALLOCATE AN I/O REQUEST PACKET AND THE PROCESS HAS
                                0007   195 ;                   DISABLED RESOURCE WAIT MODE.
                                0007   196 ;
                                0007   197 ;           R0 = SS$_IVCHAN - AN INVALID CHANNEL NUMBER WAS SPECIFIED.
                                0007   198 ;
                                0007   199 ;           R0 = SS$_NOPRIV - THE SPECIFIED CHANNEL DOES NOT EXIST OR WAS
                                0007   200 ;                   ASSIGNED FROM A MORE PRIVILEGED ACCESS MODE.  OR, THE
                                0007   201 ;                   PROCESS DOES NOT HAVE THE PRIVILEGE TO PERFORM THE
                                0007   202 ;                   SPECIFIED TYPE OF I/O FUNCTION ON THE DEVICE.
                                0007   203 ;
                                0007   204 ;           R0 = SS$_UNASEFC - UNASSOCIATED EVENT FLAG CLUSTER SPECIFIED.
                                0007   205 ;
                                0007   206 ;       R0 LOW BIT SET INDICATES SUCCESSFUL COMPLETION.
                                0007   207 ;
                                0007   208 ;           R0 = SS$_NORMAL - NORMAL COMPLETION.
                                0007   209 ;-
                                0007   210
                                0007   211          .ENABL  LSB
                           0FFC 0007   212          .ENTRY  VMS$QIO,^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11>
    54  00000000'EF     DE     0009   213          MOVAL   DS$AX_SOFTPCB, R4       ; Get PCB address into R4
      7E    04 AC     9A     0010   214 10$:     MOVZBL  EFN(AP),-(SP)           ;GET EVENT FLAG #
00000000'9F    01     FB     0014   215          CALLS   #1,a#SYS$CLREF          ;CLEAR SPECIFIED EVENT FLAG
          03 50     E8     001B   216          BLBS    R0, 15$                 ; Event flag cleared OK
           0080     31     001E   217          BRW     ERROR                   ; Didn't work
                    0021   218 15$:
    50    08 AC     3C     0021   219          MOVZWL  CHAN(AP),R0             ;GET CHANNEL NUMBER
        FFD8'       30     0025   220          BSBW    IOC$VERIFYCHAN          ;VERIFY CHANNEL NUMBER
        56   51     D0     0028   221          MOVL    R1,R6                   ;SAVE ADDRESS OF CCB
          73 50     E9     002B   222          BLBC    R0,ERROR                ;IF LBC INVALID CHANNEL
        55   66     D0     002E   223          MOVL    CCB$L_UCB(R6),R5        ;GET ASSIGNED DEVICE UCB ADDRESS
        59   52     D0     0031   224          MOVL    R2,R9                   ;SAVE CHANNEL INDEX
    5A    0C AC     3C     0034   225          MOVZWL  FUNC(AP),R10            ;GET I/O FUNCTION CODE AND MODIFIERS
57  5A  FFFFFFFF'8F     CB     0038   226          BICL3   #^C<IO$M_FCODE>,R10,R7  ;CLEAR ALL BUT I/O FUNCTION CODE
  09 34 A5    00'     E1     0040   227          BBC     S^#DEV$V_SPL,UCB$L_DEVCHAR(R5),17$ ;IF CLR, DEVICE NOT SPOOLED
        57    00'     D1     0045   228          CMPL    S^#IO$_LOGICAL,R7       ;VIRTUAL I/O FUNCTION?
              04     18     0048   229          BGEQ    17$                     ;IF GEQ NO
        55    54 A5   D0     004A   230          MOVL    UCB$L_AMB(R5),R5        ;GET INTERMEDIATE DEVICE UCB ADDRESS
        50    24 A5   D0     004E   231 17$:     MOVL    UCB$L_DDB(R5),R0        ;GET ADDRESS OF DDB
        50    0C A0   D0     0052   232          MOVL    DDB$L_DDT(R0),R0        ;GET ADDRESS OF DDT
        58    08 A0   D0     0056   233          MOVL    DDT$L_FDT(R0),R8        ;GET ADDRESS OF FDT
        03 58   10     E0     005A   234          BBS     #16,R8,20$              ;BRANCH IF SUPERVISOR ADDRESS
        58    50     C0     005E   235          ADDL    R0,R8                   ;CHANGE OFFSET TO ABSOLUTE
      2B 68   57     E1     0061   236 20$:     BBC     R7,LEGAL(R8),50$        ;IF CLR, ILLEGAL I/O FUNCTION
    2D 58 A5  04     E1     0065   237          BBC     #UCB$V_ONLINE,UCB$W_STS(R5),60$ ;IF CLR, DEVICE OFFLINE
        51    10 AC   D0     006A   238          MOVL    IOSB(AP),R1             ;GET ADDRESS OF I/O STATUS BLOCK
              08     13     006E   239          BEQL    30$                     ;IF EQL NONE SPECIFIED
                     0070   240          IFNOWRT #8,(R1),70$             ;CAN I/O STATUS BLOCK BE WRITTEN?
     61   08   00     0D     0070                   PROBEW  #0,#8,(R1)
                28     13     0074                   BEQL    70$
                61     7C     0076   241          CLRQ    (R1)                    ;CLEAR I/O STATUS BLOCK
                7E     DC     0078   242 30$:     MOVPSL  -(SP)                   ;READ CURRENT PSL
        5B    3A A4   DE     007A   243          MOVAL   PCB$W_BIOCNT(R4),R11    ;SET FOR BUFFERED I/O FUNCTION
    04 08 A8    57     E0     007E   244          BBS     R7,IOTYPE(R8),40$       ;IF SET, BUFFERED I/O FUNCTION
        5B    3E A4   DE     0083   245          MOVAL   PCB$W_DIOCNT(R4),R11    ;SET FOR DIRECT I/O FUNCTION
          52    5B     D0     0087   246 40$:     MOVL    R11,R2                  ;SET ADDRESS OF USAGE COUNT WORD
       31 04 A6   E9     008A   247          BLBC    CCB$L_WIND(R6),GTPKT    ;IF LBC ACCESS/DEACCESS NOT PENDING
              80     11     008E   248          BRB     10$                     ;
```

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                50    0000'8F   3C   0090    249 50$:    MOVZWL  #SS$_ILLIOFUNC,R0       ;SET ILLEGAL I/O FUNCTION STATUS
                            0A   11   0095    250         BRB     ERROR                 ;
                50    0000'8F   3C   0097    251 60$:    MOVZWL  #SS$_DEVOFFLINE,R0    ;SET DEVICE OFFLINE STATUS
                            03   11   009C    252         BRB     ERROR                 ;
                      50    00'  3C   009E    253 70$:    MOVZWL  S^#SS$_ACCVIO,R0      ;SET ACCESS VIOLATION STATUS
                                   00A1    254 ERROR:  SETIPL  #0                    ;ALLOW INTERRUPTS
                      12    00   DA   00A1                MTPR    #0,S^#PR$_IPL
                            50   DD   00A4    255         PUSHL   R0                    ;SAVE FINAL STATUS
                   7E    04 AC   9A   00A6    256         MOVZBL  EFN(AP),-(SP)         ;GET SPECIFIED EVENT FLAG #
         00000000'9F      01   FB   00AA    257         CALLS   #1,a#SYS$SETEF        ;SET SPECIFIED EVENT FLAG
                            01   BA   00B1    258         POPR    #^M<R0>               ;RESTORE FINAL STATUS
                            04   00B3    259         RET                           ;
                                 00B4    260
                                 00B4    261 ;
                                 00B4    262 ; ALLOCATE REQUEST I/O PACKET
                                 00B4    263 ;
                                 00B4    264
            00000000'EF      16   00B4    265 ALLOC:  JSB     L^EXE$ALLOCIRP            ; Allocate I/O request packet
                     0B 50   E8   00BA    266         BLBS    R0,SUCCES             ;IF LBS SUCCESSFUL ALLOCATION
                            E2   11   00BD    267         BRB     ERROR                 ;
         52         00000000'FF   0F   00BF    268 GTPKT:  REMQUE  aL^IOC$GL_IRPFL, R2   ; Get I/O packet from lookaside list
                            EC   1D   00C6    269         BVS     ALLOC                 ;IF VS EMPTY LIST
                                 00C8    270         .DSABL  LSB
                                 00C8    271
                                 00C8    272 ;
                                 00C8    273 ; BUILD DEVICE INDEPENDENT PART OF I/O PACKET
                                 00C8    274 ;
                                 00C8    275
                            6B   B7   00C8    276 SUCCES: DECW    (R11)                 ;UPDATE I/O COUNT FOR FUNCTION TYPE
                      0A    A6   B6   00CA    277         INCW    CCB$W_IOC(R6)         ;INCREMENT OUTSTANDING I/O ON CHANNEL
                   53       52   D0   00CD    278         MOVL    R2,R3                 ;COPY ADDRESS OF ALLOCATED I/O PACKET
                   52       08   C0   00D0    279         ADDL    #IRP$W_SIZE,R2        ;POINT TO SIZE FIELD
               82    005C    8F   B0   00D3    280         MOVW    #IRP$C_LENGTH,(R2)+   ;INSERT LENGTH OF I/O PACKET
                   82       0A   90   00D8    281         MOVB    #DYN$C_IRP,(R2)+      ;INSERT DATA STRUCTURE TYPE
         62    6E    02       16   EF   00DB    282         EXTZV   #PSL$V_PRVMOD,#PSL$S_PRVMOD,(SP),(R2) ;INSERT ACCESS MODE
                            52   D6   00E0    283         INCL    R2                    ;ADJUST PAST ACCESS MODE FIELD
                  82    60    A4   D0   00E2    284         MOVL    PCB$L_PID(R4),(R2)+   ;INSERT PROCESS ID OF CURRENT PROCESS
                  82    14    AC   7D   00E6    285         MOVQ    ASTADR(AP),(R2)+      ;INSERT AST ADDRESS AND PARAMETER
                  82    04    A6   D0   00EA    286         MOVL    CCB$L_WIND(R6),(R2)+  ;Insert Window address
                      82       55   D0   00EE    287         MOVL    R5,(R2)+              ;INSERT DEVICE UCB ADDRESS
                      82       5A   B0   00F1    288         MOVW    R10,(R2)+             ;INSERT I/O FUNCTION CODE
                  82    04    AC   90   00F4    289         MOVB    EFN(AP),(R2)+         ;INSERT EVENT FLAG NUMBER
                            82   94   00F8    290         CLRB    (R2)+                 ;INSERT PROCESS BASE PRIORITY
                  82    10    AC   D0   00FA    291         MOVL    IOSB(AP),(R2)+        ;INSERT I/O STATUS BLOCK ADDRESS
                      82       59   3C   00FE    292         MOVZWL  R9,(R2)+              ;INSERT CHANNEL INDEX AND ZERO STATUS
               04 08  A8       57   E1   0101    293         BBC     R7,IOTYPE(R8),20$     ;IF CLR, DIRECT I/O FUNCTION
                  FE  A2       01   A8   0106    294         BISW    #IRP$M_BUFIO,-2(R2)   ;SET TO BUFFERED I/O FUNCTION
                            62   7C   010A    295 20$:    CLRQ    (R2)                  ;CLEAR PTE ADDRESS, BYTE OFFSET, AND BYTE CO
                                 010C    296
                                 010C    297 ;
                                 010C    298 ; CHECK IF REQUESTING PROCESS HAS PRIVILEGE TO ACCESS DEVICE
                                 010C    299 ;
                                 010C    300
                      57    00'  D1   010C    301 ACCESS: CMPL    S^#IO$_WRITEVBLK,R7   ;POSSIBLY VIRTUAL READ OR WRITE?
                            20   1A   010F    302         BGTRU   15$                   ;IF GTRU NO
                      57    00'  D1   0111    303         CMPL    S^#IO$_READVBLK,R7    ;VIRTUAL READ OR WRITE?
                            1B   1F   0114    304         BLSSU   15$                   ;IF LSSU NO
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                0F 34 A5    00'  E1  0116   305          BBC     S^#DEV$V_FOD,UCB$L_DEVCHAR(R5),5$ ;IF CLR, NOT FILE DEVICE
                                     011B   306
                                     011B   307 ;
                                     011B   308 ; THE FOLLOWING TEST IS NECESSITATED BY THE SYSTEM INITIALIZATION SEQUENCE
                                     011B   309 ;
                                     011B   310
                      18 A3    D5    011B   311          TSTL    IRP$L_WIND(R3)          ;WINDOW ADDRESS SPECIFIED?
                         11    12    011E   312          BNEQ    15$                     ;IF NEQ YES
                0E 34 A5    00'  E1  0120   313          BBC     S^#DEV$V_MNT,UCB$L_DEVCHAR(R5),60$ ;IF CLR, DEVICE NOT MOUNTED
                0C 34 A5    00'  E1  0125   314          BBC     S^#DEV$V_FOR,UCB$L_DEVCHAR(R5),80$ ;IF CLR, MOUNTED STRUCTURED
                                     012A   315
                                     012A   316 ;
                                     012A   317 ; CONVERT VIRTUAL READ/WRITE FUNCTION TO ITS LOGICAL COUNTERPART
                                     012A   318 ;
                                     012A   319
                   57    00'  C2    012A   320 5$:      SUBL    S^#IO$_READVBLK-IO$_READLBLK,R7 ;CONVERT TO LOGICAL FUNCTION
                20 A3    03'  A2    012D   321          SUBW    S^#IO$_READVBLK-IO$_READLBLK,IRP$W_FUNC(R3) ;
                         03   11    0131   322 15$:     BRB     80$                     ; Don't care about VIRTUAL/LOG/PHYS rights
                                     0133   323 60$:
                      0064   31    0133   324 70$:     BRW     EXE$ABORTIO             ;
                                     0136   325
                                     0136   326 ;
                                     0136   327 ; PROCESS HAS ACCESS TO DEVICE
                                     0136   328 ;
                                     0136   329
                   57    00'  D1    0136   330 80$:     CMPL    S^#IO$_PHYSICAL,R7      ;LOGICAL OR VIRTUAL I/O FUNCTION?
                         39   19    0139   331          BLSS    90$                     ;IF LSS YES
             2A A3    0100 8F    A8    013B   332          BISW    #IRP$M_PHYSIO,IRP$W_STS(R3) ;SET PHYSICAL I/O FLAG
                59    30 AC    D0    0141   333          MOVL    P6(AP),R9               ;GET ADDRESS OF DIAGNOSTIC BUFFER
                         2D   13    0145   334          BEQL    90$                     ;IF EQL NONE SPECIFIED
                51    24 A5    D0    0147   335          MOVL    UCB$L_DDB(R5),R1        ;GET ADDRESS OF DDB
                51    0C A1    D0    014B   336          MOVL    DDB$L_DDT(R1),R1        ;GET ADDRESS OF DDT
                51    14 A1    3C    014F   337          MOVZWL  DDT$W_DIAGBUF(R1),R1    ;GET SIZE OF DIAGNOSTIC BUFFER
                         1F   13    0153   338          BEQL    90$                     ;IF EQL NO DIAGNOSTIC FUNCTIONS
                         53   DD    0155   339          PUSHL   R3                      ;SAVE I/O PACKET ADDRESS
                00000000'EF   16    0157   340          JSB     L^EXE$ALLOCBUF          ; Allocate diagnostic buffer
                         53 8ED0    015D   341          POPL    R3                      ;RETRIEVE I/O PACKET ADDRESS
                      D0 50    E9    0160   342          BLBC    R0,70$                  ;IF LBC ALLOCATION FAILURE
                44 A3    52    D0    0163   343          MOVL    R2,IRP$L_DIAGBUF(R3)    ;SAVE ADDRESS OF DIAGNOSTIC BUFFER
                82    0C A2    9E    0167   344          MOVAB   12(R2),(R2)+            ;SET POINTER TO DATA AREA
                   62    59    D0    016B   345          MOVL    R9,(R2)                 ;SAVE USER ADDRESS OF DIAGNOSTIC BUFFER
             2A A3    0080 8F    A8    016E   346          BISW    #IRP$M_DIAGBUF,IRP$W_STS(R3) ;SET DIAGNOSTIC BUFFER PRESENT
                                     0174   347
                                     0174   348 ;
                                     0174   349 ; CHECK IF AST IS SPECIFIED
                                     0174   350 ;
                                     0174   351
                      10 A3    D5    0174   352 90$:     TSTL    IRP$L_AST(R3)           ;AST ADDRESS SPECIFIED?
                         05   13    0177   353          BEQL    100$                    ;IF EQL NO
                0B A3    40 8F    88    0179   354          BISB    #ACB$M_QUOTA,IRP$B_RMOD(R3) ;SET AST QUOTA UPDATE FLAG
                                     017E   355
                                     017E   356 ;
                                     017E   357 ; SCAN FUNCTION DECISION TABLE CALLING EACH SELECTED ACTION ROUTINE WITH:
                                     017E   358 ;
                                     017E   359 ;       R0 = SCRATCH.
                                     017E   360 ;       R1 = SCRATCH.
                                     017E   361 ;       R2 = SCRATCH.
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                        017E   362 ;       R3 = ADDRESS OF I/O REQUEST PACKET.
                        017E   363 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                        017E   364 ;       R5 = ASSIGNED DEVICE UCB ADDRESS.
                        017E   365 ;       R6 = ADDRESS OF CCB.
                        017E   366 ;       R7 = I/O FUNCTION CODE BIT NUMBER.
                        017E   367 ;       R8 = FUNCTION DECISION TABLE DISPATCH ADDRESS.
                        017E   368 ;       R9 = SCRATCH.
                        017E   369 ;       R10 = SCRATCH.
                        017E   370 ;       R11 = SCRATCH.
                        017E   371 ;       AP = ADDRESS OF FIRST FUNCTION DEPENDENT PARAMETER.
                        017E   372 ;
                        017E   373
    58    04    C0    017E   374 100$:    ADDL    #FDTACT-12,R8           ;POINT TO ACTION ROUTINE MASKS
    5C    1C    C0    0181   375          ADDL    #P1,AP                  ;POINT TO FIRST FUNCTION DEPENDENT PARAMETER
    58    0C    C0    0184   376 110$:    ADDL    #12,R8                  ;POINT TO NEXT FUNCTION MASK
F9  68    57    E1    0187   377          BBC     R7,(R8),110$            ;IF CLR, THEN ACTION NOT SELECTED
50    08  A8    D0    018B   378          MOVL    8(R8),R0                ;GET ADDRESS OF ACTION ROUTINE
03  50    10    E0    018F   379          BBS     #16,R0,120$             ;BRANCH IF ABSOLUTE SUPERVISOR ADDR
    50    58    C0    0193   380          ADDL    R8,R0                   ;CHANGE OFFSET TO ABSOLUTE
          60    16    0196   381 120$:    JSB     (R0)                    ;CALL ACTION ROUTINE
          EA    11    0198   382          BRB     110$                    ;
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                                019A   385          .SBTTL  COMPLETE I/O OPERATION
                                019A   386 ;+
                                019A   387 ; EXE$ABORTIO - ABORT I/O OPERATION
                                019A   388 ;
                                019A   389 ; THIS ROUTINE IS JUMPED TO FROM A FUNCTION DECISION TABLE ACTION ROUTINE
                                019A   390 ; TO FINISH AN I/O OPERATION WITHOUT RETURNING THE FINAL I/O STATUS.
                                019A   391 ;
                                019A   392 ; EXE$FINISHIO - FINISH I/O OPERATION
                                019A   393 ;
                                019A   394 ; THIS ROUTINE IS JUMPED TO FROM A FUNCTION DECISION TABLE ACTION ROUTINE
                                019A   395 ; TO FINISH AN I/O OPERATION AND RETURN THE FINAL I/O STATUS.
                                019A   396 ;
                                019A   397 ; EXE$FINISHIOC - FINISH I/O OPERATION WITH SECOND I/O STATUS LONGWORD CLEARED
                                019A   398 ;
                                019A   399 ; THIS ROUTINE IS JUMPED TO FROM A FUNCTION DESCISION TABLE ACTION ROUTINE
                                019A   400 ; TO FINISH AN I/O OPERATION AND RETURN THE FINAL I/O STATUS WITH THE
                                019A   401 ; SECOND I/O STATUS LONGWORD CLEARED.
                                019A   402 ;
                                019A   403 ; INPUTS:
                                019A   404 ;
                                019A   405 ;       R0 = FIRST LONGWORD OF FINAL I/O STATUS.
                                019A   406 ;       R1 = SECOND LONGWORD OF FINAL I/O STATUS.
                                019A   407 ;       R3 = ADDRESS OF I/O REQUEST PACKET.
                                019A   408 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                                019A   409 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                                019A   410 ;
                                019A   411 ; OUTPUTS:
                                019A   412 ;
                                019A   413 ;       THE FINAL I/O STATUS IS STORED IN THE I/O PACKET AND THE PACKET IS
                                019A   414 ;       INSERTED IN THE I/O POST PROCESSING QUEUE. A SOFTWARE INTERRUPT
                                019A   415 ;       IS GENERATED TO INITIATE I/O POST PROCESSING AND THE FIRST WORD
                                019A   416 ;       OF THE FINAL I/O STATUS IS RETURNED AS THE SERVICE STATUS.
                                019A   417 ;-
                                019A   418
                                019A   419          .ENABL  LSB
                                019A   420 EXE$ABORTIO::                                ;ABORT I/O OPERATION
          24 A3    D4           019A   421          CLRL    IRP$L_IOSB(R3)             ;CLEAR ADDRESS OF I/O STATUS BLOCK
    11 0B A3    06    E5        019D   422          BBCC    #ACB$V_QUOTA,IRP$B_RMOD(R3),10$ ;IF CLR, NO AST SPECIFIED
          38 A4    B6           01A2   423          INCW    PCB$W_ASTCNT(R4)           ;UPDATE AVAILABLE AST QUEUE ENTRIES
             0C    11           01A5   424          BRB     10$                        ;
                                01A7   425 EXE$FINISHIOC::                             ;FINISH I/O OPERATION CLEAR SECOND LONGWORD
             51    D4           01A7   426          CLRL    R1                         ;CLEAR SECOND I/O STATUS LONGWORD
                                01A9   427 EXE$FINISHIO::                              ;FINISH I/O OPERATION
          60 A5    D6           01A9   428          INCL    UCB$L_OPCNT(R5)            ;INCREMENT OPERATIONS COMPLETED
       34 A3    50    7D        01AC   429          MOVQ    R0,IRP$L_MEDIA(R3)         ;STORE FINAL I/O STATUS
          50    00'   3C        01B0   430          MOVZWL  S^#SS$_NORMAL,R0           ;SET NORMAL COMPLETION STATUS
00000000'FF     63    0E        01B3   431 10$:     INSQUE  (R3),@IOC$GL_PSBL          ;INSERT I/O PACKET IN POST PROCESS QUEUE
             42    12           01BA   432          BNEQ    QIORETURN                  ;IF NEQ NOT FIRST ENTRY IN QUEUE
                                01BC   433          SOFTINT #IPL$_IOPOST               ;INITIATE SOFTWARE INTERRUPT
                                01BC                MTPR    #IPL$_IOPOST,S^#PR$_SIRR
          14    04    DA        01BC
             3D    11           01BF   434          BRB     QIORETURN                  ;
                                01C1   435          .DSABL  LSB
```

```
                     01C1    437          .SBTTL  QUEUE I/O PACKET TO DRIVER
                     01C1    438 ;+
                     01C1    439 ; EXE$QIODRVPKT - QUEUE I/O PACKET TO DRIVER
                     01C1    440 ;
                     01C1    441 ; THIS ROUTINE IS JUMPED TO FROM A FUNCTION DECISION TABLE ACTION ROUTINE
                     01C1    442 ; TO QUEUE AN I/O PACKET TO THE APPROPRIATE DRIVER.
                     01C1    443 ;
                     01C1    444 ; INPUTS:
                     01C1    445 ;
                     01C1    446 ;       R3 = ADDRESS OF I/O REQUEST PACKET.
                     01C1    447 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                     01C1    448 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                     01C1    449 ;
                     01C1    450 ; OUTPUTS:
                     01C1    451 ;
                     01C1    452 ;       THE I/O PACKET IS QUEUED BY PRIORITY IN THE APPROPRIATE DEVICE
                     01C1    453 ;       QUEUE AND A NORMAL COMPLETION STATUS IS RETURNED.
                     01C1    454 ;-
                     01C1    455
                     01C1    456 EXE$QIODRVPKT::                             ;QUEUE I/O PACKET
3F   10              01C1    457          BSBB    EXE$INSIOQ                 ;INSERT I/O PACKET IN DEVICE QUEUE
34   11              01C3    458          BRB     EXE$QIORETURN              ;
```

```
                     01C5    460          .SBTTL  EXE$ALTQUEPKT - Call driver ALTSTART entry point
                     01C5    461
                     01C5    462 ;
                     01C5    463 ; EXE$ALTQUEPKT - activates a driver at its ALTSTART entry point
                     01C5    464 ;
                     01C5    465 ; Routine description:
                     01C5    466 ;
                     01C5    467 ;       Locates and calls a driver entry point supplied as an alternate
                     01C5    468 ;       START I/O entry point. Does not test for unit busy before the
                     01C5    469 ;       call. Exits by returning to caller.
                     01C5    470 ;
                     01C5    471 ;       The routine expects to gain control at or below driver fork
                     01C5    472 ;       level. The routine raises to driver fork IPL before the call,
                     01C5    473 ;       and restores the previous IPL before returning to its caller.
                     01C5    474 ;
                     01C5    475 ; Inputs:
                     01C5    476 ;
                     01C5    477 ;       R3      - address of packet or buffer
                     01C5    478 ;       R5      - address of UCB
                     01C5    479 ;
                     01C5    480 ; Outputs:
                     01C5    481 ;
                     01C5    482 ;       Control returns to the requesting process.
                     01C5    483 ;
                     01C5    484 ;       The routine destroys R0-R1.
                     01C5    485 ;
                     01C5    486 ;--
                     01C5    487
                     01C5    488 EXE$ALTQUEPKT::                             ; Start I/O in driver.
                     01C5    489          DSBINT  UCB$B_FIPL(R5)             ; Raise to fork IPL.
   7E    12    DB    01C5                       MFPR    S^#PR$_IPL,-(SP)
12    0B A5    DA    01C8                       MTPR    UCB$B_FIPL(R5),S^#PR$_IPL
50    24 A5    D0    01CC    490          MOVL    UCB$L_DDB(R5),R0           ; Get address of unit's DDB.
50    0C A0    D0    01D0    491          MOVL    DDB$L_DDT(R0),R0           ; Get address of unit's DDT.
51    1C A0    D0    01D4    492          MOVL    DDT$L_ALTSTART(R0),R1      ; Get start offset
         09    13    01D8    493          BEQL    20$                        ; Branch if no alternate entry point
03 51    10    E0    01DA    494          BBS     #16,R1,10$                 ; Branch if supervisor absolute
   51    50    C0    01DE    495          ADDL    R0,R1                      ; Make relative to DDT
                     01E1    496                                             ; address.
                     01E1    497
                     01E1    498 10$:
         61    16    01E1    499          JSB     (R1)                       ; Go to the driver entry point.
                     01E3    500
                     01E3    501 20$:
                     01E3    502          ENBINT                             ; Reenable interrupts.
   12    BE    DA    01E3                       MTPR    (SP)+,S^#PR$_IPL
               05    01E6    503          RSB                                ; Return to caller.
```

```
                                01E7   505          .SBTTL  QUEUE I/O PACKET TO ACP
                                01E7   506 ;+
                                01E7   507 ; EXE$QIOACPPKT - QUEUE I/O PACKET TO ACP
                                01E7   508 ;
                                01E7   509 ; THIS ROUTINE IS JUMPED TO FROM A FUNCTION DECISION TABLE ACTION ROUTINE
                                01E7   510 ; TO QUEUE AN I/O PACKET TO THE APPROPRIATE ACP.
                                01E7   511 ;
                                01E7   512 ; INPUTS:
                                01E7   513 ;
                                01E7   514 ;       R3 = ADDRESS OF I/O REQUEST PACKET.
                                01E7   515 ;       R4 = CURRENT PROCESS PCB ADDRESS.
                                01E7   516 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                                01E7   517 ;
                                01E7   518 ;       CURRENT IPL MUST BE AT SYNCH OR HIGHER LEVEL.
                                01E7   519 ;
                                01E7   520 ; OUTPUTS:
                                01E7   521 ;
                                01E7   522 ;       R4 ALTERED
                                01E7   523 ;       THE I/O PACKET IS QUEUED AT THE END OF THE APPROPRIATE ACP QUEUE
                                01E7   524 ;       AND A NORMAL COMPLETION STATUS IS RETURNED.
                                01E7   525 ;-
                                01E7   526
                                01E7   527 EXE$QIOACPPKT::                          ;QUEUE I/O PACKET TO ACP
                                01E7   528          BUG_CHECK NONEXSTACP            ;NONEXISTENT ACP PROCESS
                  00000000'9F   16  01E7            JSB     @#BUG$CHECK
2C 50 43 41 54 53 58 45 4E 4F 4E 00' 01ED           .ASCIC  "NONEXSTACP,"
                              0B  01ED
                                01F9   529 EXE$QIORETURN::                          ;QUEUE I/O REQUEST COMPLETION STATUS RETURN
              50    0000'8F   3C  01F9   530          MOVZWL  #SS$_NORMAL,R0        ;SET NORMAL COMPLETION STATUS
                                01FE   531 QIORETURN:                               ;RETURN SPECIFIED STATUS
                                01FE   532          SETIPL  #0                    ;ALLOW ALL INTERRUPTS
                    12    00    DA  01FE                  MTPR    #0,S^#PR$_IPL
                                04  0201   533          RET                           ;
```

```
                     0202   535          .SBTTL  INSERT I/O PACKET IN UNIT QUEUE
                     0202   536 ;+
                     0202   537 ; EXE$INSIOQ - INSERT I/O PACKET IN UNIT QUEUE
                     0202   538 ;
                     0202   539 ; THIS ROUTINE IS CALLED TO INSERT AN I/O PACKET IN A UNIT QUEUE AND CALL
                     0202   540 ; THE APPROPRIATE I/O DRIVER IF THE UNIT IS NOT BUSY.
                     0202   541 ;
                     0202   542 ; INPUTS:
                     0202   543 ;
                     0202   544 ;       R3 = ADDRESS OF I/O REQUEST PACKET.
                     0202   545 ;       R5 = UCB ADDRESS OF DEVICE UNIT.
                     0202   546 ;-
                     0202   547
                     0202   548 EXE$INSIOQ::                                ;INSERT IN I/O QUEUE
                     0202   549          DSBINT  UCB$B_FIPL(R5)             ;RAISE IPL TO FORK LEVEL
          7E   12    DB   0202                   MFPR    S^#PR$_IPL,-(SP)
     12    0B A5    DA   0205                   MTPR    UCB$B_FIPL(R5),S^#PR$_IPL
05 58 A5    08    E2   0209   550          BBSS    #UCB$V_BSY,UCB$W_STS(R5),10$ ;IF SET, THEN DEVICE IS BUSY
        FDEF'     30   020E   551          BSBW    IOC$INITIATE               ;INITIATE I/O FUNCTION
          06      11   0211   552          BRB     20$                        ;
     52   40 A5    DE   0213   553 10$:     MOVAL   UCB$L_IOQFL(R5),R2         ;GET ADDRESS OF I/O QUEUE LISTHEAD
          04      10   0217   554          BSBB    EXE$INSERTIRP              ;INSERT I/O PACKET IN DEVICE QUEUE
                     0219   555 20$:     ENBINT                             ;ENABLE INTERRUPTS
     12   8E    DA   0219                   MTPR    (SP)+,S^#PR$_IPL
                05   021C   556          RSB                                ;
```

```
                        021D   558          .SBTTL  INSERT I/O PACKET IN QUEUE BY PRIORITY
                        021D   559 ;+
                        021D   560 ; EXE$INSERTIRP - INSERT I/O PACKET IN QUEUE BY PRIORITY
                        021D   561 ;
                        021D   562 ; THIS ROUTINE IS CALLED TO INSERT AN I/O PACKET IN A SPECIFIED QUEUE BY
                        021D   563 ; PRIORITY.
                        021D   564 ;
                        021D   565 ; INPUTS:
                        021D   566 ;
                        021D   567 ;       R2 = ADDRESS OF QUEUE LISTHEAD.
                        021D   568 ;       R3 = ADDRESS OF I/O PACKET.
                        021D   569 ;
                        021D   570 ;       CURRENT IPL MUST BE THE FORK LEVEL OF THE RESPECTIVE DRIVER PROCESS
                        021D   571 ;       OR HIGHER.
                        021D   572 ;
                        021D   573 ; OUTPUTS:
                        021D   574 ;
                        021D   575 ;       THE I/O PACKET IS INSERTED IN THE SPECIFIED QUEUE BY PRIORITY AND
                        021D   576 ;       THE 'Z' CONDITION CODE IS RETURNED TO THE CALLER.
                        021D   577 ;
                        021D   578 ;               'Z' = 1 = ENTRY WAS FIRST ENTRY IN THE QUEUE.
                        021D   579 ;
                        021D   580 ;               'Z' = 0 = ENTRIES WERE ALREADY IN THE QUEUE.
                        021D   581 ;
                        021D   582 ;       R2 AND R3 ARE PRESERVED ACROSS THE CALL.
                        021D   583 ;-
                        021D   584
                        021D   585 EXE$INSERTIRP::                              ;INSERT I/O PACKET IN QUEUE BY PRIORITY
     51    52    D0     021D   586          MOVL    R2,R1                       ;COPY LISTHEAD ADDRESS
  51   04 A1    D0     0220   587 10$:      MOVL    IRP$L_IOQBL(R1),R1          ;GET ADDRESS OF NEXT ENTRY
     51    52    D1     0224   588          CMPL    R2,R1                       ;END OF QUEUE?
           07    13     0227   589          BEQL    20$                         ;IF EQL YES
23 A1   23 A3    91     0229   590          CMPB    IRP$B_PRI(R3),IRP$B_PRI(R1) ;NEW ENTRY PRIORITY GREATER?
           F0    1F     022E   591          BLSSU   10$                         ;IF LSS YES
     61    63    0E     0230   592 20$:      INSQUE  IRP$L_IOQFL(R3),IRP$L_IOQFL(R1) ;INSERT PACKET IN I/O QUEUE
           05    0233   593          RSB                                 ;
                        0234   594
                        0234   595          .END
```

```
$ER                             = 00000001     D
$MODULE                           00000000 R   D   02
ACB$B_RMOD                        0000000B     D
ACB$B_TYPE                        0000000A     D
ACB$C_LENGTH                      00000018     D
ACB$K_LENGTH                      00000018     D
ACB$L_AST                         00000010     D
ACB$L_ASTPRM                      00000014     D
ACB$L_ASTQBL                      00000004     D
ACB$L_ASTQFL                      00000000     D
ACB$L_KAST                        00000018     D
ACB$L_PID                         0000000C     D
ACB$M_QUOTA                     = 00000040     D
ACB$V_QUOTA                     = 00000006     D
ACB$W_SIZE                        00000008     D
ACCESS                            0000010C R   D   02
ALLOC                             000000B4 R   D   02
ASTADR                          = 00000014     D
ASTPRM                          = 00000018     D
BUG$CHECK                         ********   X   02
CCB$B_AMOD                        00000009     D
CCB$B_STS                         00000008     D
CCB$C_LENGTH                      00000010     D
CCB$K_LENGTH                      00000010     D
CCB$L_DIRP                        0000000C     D
CCB$L_UCB                         00000000     D
CCB$L_WIND                        00000004     D
CCB$W_IOC                         0000000A     D
CHAN                            = 00000008     D
DDB$B_ACPCLASS                    00000013     D
DDB$B_TYPE                        0000000A     D
DDB$C_LENGTH                      00000034     D
DDB$K_LENGTH                      00000034     D
DDB$L_ACPD                        00000010     D
DDB$L_DDT                         0000000C     D
DDB$L_LINK                        00000000     D
DDB$L_UCB                         00000004     D
DDB$T_DRVNAME                     00000024     D
DDB$T_NAME                        00000014     D
DDB$W_SIZE                        00000008     D
DDT$L_ALTSTART                    0000001C     D
DDT$L_CANCEL                      0000000C     D
DDT$L_FDT                         00000008     D
DDT$L_REGDUMP                     00000010     D
DDT$L_START                       00000000     D
DDT$L_UNITINIT                    00000018     D
DDT$L_UNSOLINT                    00000004     D
DDT$W_DIAGBUF                     00000014     D
DDT$W_ERRORBUF                    00000016     D
DEV$V_FOD                         ********   X   02
DEV$V_FOR                         ********   X   02
DEV$V_MNT                         ********   X   02
DEV$V_SPL                         ********   X   02
DS$AX_SOFTPCB                     ********   X   02
DYN$C_IRP                       = 0000000A     D
EFN                             = 00000004     D
ERROR                             000000A1 R   D   02
EXE$ABORTIO                       0000019A RG  D   02
EXE$ALLOCBUF                      ********     X   02
EXE$ALLOCIRP                      ********     X   02
EXE$ALTQUEPKT                     000001C5 RG  D   02
EXE$FINISHIO                      000001A9 RG  D   02
EXE$FINISHIOC                     000001A7 RG  D   02
EXE$INSERTIRP                     0000021D RG  D   02
EXE$INSIOQ                        00000202 RG  D   02
EXE$QIOACPPKT                     000001E7 RG  D   02
EXE$QIODRVPKT                     000001C1 RG  D   02
EXE$QIORETURN                     000001F9 RG  D   02
FDTACT                          = 00000010     D
FUNC                            = 0000000C     D
GTPKT                             000000BF R   D   02
IO$M_FCODE                        ********     X   02
IO$_LOGICAL                       ********     X   02
IO$_PHYSICAL                      ********     X   02
IO$_READLBLK                      ********     X   02
IO$_READVBLK                      ********     X   02
IO$_WRITEVBLK                     ********     X   02
IOC$GL_IRPFL                      ********     X   02
IOC$GL_PSBL                       ********     X   02
IOC$INITIATE                      ********     X   02
IOC$VERIFYCHAN                    ********     X   02
IOSB                            = 00000010     D
IOTYPE                          = 00000008     D
IPL$_IOPOST                     = 00000004     D
IRP$B_CARCON                      00000038     D
IRP$B_EFN                         00000022     D
IRP$B_PRI                         00000023     D
IRP$B_RMOD                        0000000B     D
IRP$B_TYPE                        0000000A     D
IRP$C_LENGTH                      0000005C     D
IRP$K_LENGTH                      0000005C     D
IRP$L_ARB                         00000050     D
IRP$L_AST                         00000010     D
IRP$L_ASTPRM                      00000014     D
IRP$L_DIAGBUF                     00000044     D
IRP$L_EXTEND                      0000004C     D
IRP$L_IOQBL                       00000004     D
IRP$L_IOQFL                       00000000     D
IRP$L_IOSB                        00000024     D
IRP$L_IOST1                       00000034     D
IRP$L_IOST2                       00000038     D
IRP$L_MEDIA                       00000034     D
IRP$L_PID                         0000000C     D
IRP$L_SEGVBN                      00000040     D
IRP$L_SEQNUM                      00000048     D
IRP$L_SVAPTE                      0000002C     D
IRP$L_TT_TERM                     00000038     D
IRP$L_UCB                         0000001C     D
IRP$L_WIND                        00000018     D
IRP$M_BUFIO                     = 00000001     D
IRP$M_DIAGBUF                   = 00000080     D
IRP$M_PHYSIO                    = 00000100     D
IRP$Q_NT_PRVMSK                   0000003C     D
IRP$W_ABCNT                       0000003C     D
```

```
IRP$W_BCNT                00000032    D     PCB$W_PRCCNT              00000042    D
IRP$W_BOFF                00000030    D     PCB$W_SIZE                00000008    D
IRP$W_CHAN                00000028    D     PCB$W_STATE               0000002C    D
IRP$W_FUNC                00000020    D     PCB$W_TMBU                00000032    D
IRP$W_OBCNT               0000003E    D     PR$_IPL                 = 00000012    D
IRP$W_SIZE                00000008    D     PR$_SIRR                = 00000014    D
IRP$W_STS                 0000002A    D     PSL$S_PRVMOD            = 00000002    D
IRP$W_TT_PRMPT            0000003C    D     PSL$V_PRVMOD            = 00000016    D
LEGAL                   = 00000000    D     QIORETURN                 000001FE R  D  02
P1                      = 0000001C    D     SIZ...                  = 00000001    D
P2                      = 00000020    D     SS$_ACCVIO                ********    X  02
P3                      = 00000024    D     SS$_DEVOFFLINE            ********    X  02
P4                      = 00000028    D     SS$_ILLIOFUNC             ********    X  02
P5                      = 0000002C    D     SS$_NORMAL                ********    X  02
P6                      = 00000030    D     SUCCES                    000000C8 R  D  02
PCB$B_ASTACT              0000000C    D     SYS$CLREF                 ********    X  02
PCB$B_ASTEN               0000000D    D     SYS$SETEF                 ********    X  02
PCB$B_PRI                 0000000B    D     UCB$B_AMOD                00000053    D
PCB$B_PRIB                0000002F    D     UCB$B_CEX                 00000077    D
PCB$B_TYPE                0000000A    D     UCB$B_CM1                 0000004A    D
PCB$B_WEFC                0000002E    D     UCB$B_CM2                 0000004B    D
PCB$C_LENGTH              0000008C    D     UCB$B_DEVCLASS            00000038    D
PCB$K_LENGTH              0000008C    D     UCB$B_DEVTYPE             00000039    D
PCB$L_ARB                 00000084    D     UCB$B_DIPL                00000052    D
PCB$L_ASTQBL              00000014    D     UCB$B_DX_SCTCNT           000000A6    D
PCB$L_ASTQFL              00000010    D     UCB$B_ERTCNT              00000070    D
PCB$L_EFC2P               00000058    D     UCB$B_ERTMAX              00000071    D
PCB$L_EFC3P               0000005C    D     UCB$B_FEX                 00000076    D
PCB$L_EFCS                00000050    D     UCB$B_FIPL                0000000B    D
PCB$L_EFCU                00000054    D     UCB$B_LOCSRV              0000003C    D
PCB$L_EFWM                0000004C    D     UCB$B_OFFNDX              00000094    D
PCB$L_JIB                 00000078    D     UCB$B_OFFRTC              00000095    D
PCB$L_OWNER               0000001C    D     UCB$B_REMSRV              0000003D    D
PCB$L_PHD                 00000064    D     UCB$B_SECTORS             0000003C    D
PCB$L_PHYPCB              00000018    D     UCB$B_SLAVE               00000074    D
PCB$L_PID                 00000060    D     UCB$B_SPR                 00000075    D
PCB$L_PQB                 0000004C    D     UCB$B_STATE               00000052    D
PCB$L_SQBL                00000004    D     UCB$B_TRACKS              0000003D    D
PCB$L_SQFL                00000000    D     UCB$B_TT_CRFILL           0000009D    D
PCB$L_STS                 00000024    D     UCB$B_TT_DECRF            000000A1    D
PCB$L_UIC                 00000088    D     UCB$B_TT_DELFF            000000A2    D
PCB$L_WSSWP               00000020    D     UCB$B_TT_DESPEE           000000A0    D
PCB$L_WTIME               00000028    D     UCB$B_TT_DETYPE           000000A4    D
PCB$Q_PRIV                0000007C    D     UCB$B_TT_LFFILL           0000009E    D
PCB$T_LNAME               00000068    D     UCB$B_TT_SPEED            0000009C    D
PCB$T_TERMINAL            00000044    D     UCB$B_TYPE                0000000A    D
PCB$W_APTCNT              00000030    D     UCB$B_VERTSZ              0000003F    D
PCB$W_ASTCNT              00000038    D     UCB$C_LENGTH              00000074    D
PCB$W_BIOCNT              0000003A    D     UCB$C_MB_LENGTH           00000090    D
PCB$W_BIOLM               0000003C    D     UCB$C_TT_LENGTH           000000BC    D
PCB$W_DIOCNT              0000003E    D     UCB$K_LENGTH              00000074    D
PCB$W_DIOLM               00000040    D     UCB$K_MB_LENGTH           00000090    D
PCB$W_GPGCNT              00000034    D     UCB$K_TT_LENGTH           000000BC    D
PCB$W_GRP                 0000008A    D     UCB$L_AMB                 00000054    D
PCB$W_MEM                 00000088    D     UCB$L_ASTQBL              00000010    D
PCB$W_MTXCNT              0000000E    D     UCB$L_ASTQFL              0000000C    D
PCB$W_PPGCNT              00000036    D     UCB$L_CPID                0000005C    D
```

UCB$L_CRB		00000020	D	UCB$W_DIRSEQ		00000088	D
UCB$L_DDB		00000024	D	UCB$W_DSTADDR		00000018	D
UCB$L_DEVCHAR		00000034	D	UCB$W_DX_BCR		000000A4	D
UCB$L_DEVDEPEND		0000003C	D	UCB$W_EC1		00000090	D
UCB$L_DPC		00000080	D	UCB$W_EC2		00000092	D
UCB$L_DUETIM		0000005C	D	UCB$W_ERRCNT		00000072	D
UCB$L_DX_BFPNT		0000009C	D	UCB$W_FUNC		0000007E	D
UCB$L_DX_BUF		00000098	D	UCB$W_MB_SEED		00000000	D
UCB$L_DX_RXDB		000000A0	D	UCB$W_MSGCNT		00000016	D
UCB$L_EMB		00000078	D	UCB$W_MSGMAX		00000014	D
UCB$L_FIRST		00000014	D	UCB$W_NT_CHAN		0000007C	D
UCB$L_FPC		0000000C	D	UCB$W_OFFSET		0000008A	D
UCB$L_FQBL		00000004	D	UCB$W_REFC		00000050	D
UCB$L_FQFL		00000000	D	UCB$W_SIZE		00000008	D
UCB$L_FR3		00000010	D	UCB$W_SRCADDR		0000001A	D
UCB$L_FR4		00000014	D	UCB$W_STS		00000058	D
UCB$L_IOQBL		00000044	D	UCB$W_TT_DESIZE		000000A5	D
UCB$L_IOQFL		00000040	D	UCB$W_UNIT		00000048	D
UCB$L_IRP		0000004C	D	UCB$W_VPROT		0000001A	D
UCB$L_LINK		0000002C	D	VCB$B_BLOCKFACT		00000052	D
UCB$L_LOGADR		00000064	D	VCB$B_CUR_RVN		0000002F	D
UCB$L_MAXBLOCK		00000084	D	VCB$B_EOFDELTA		0000004E	D
UCB$L_MB_MBX		0000007C	D	VCB$B_IBMAPSIZE		00000038	D
UCB$L_MB_PORT		0000008C	D	VCB$B_IBMAPVBN		0000003A	D
UCB$L_MB_RAST		00000078	D	VCB$B_LRU_LIM		00000049	D
UCB$L_MB_SHB		00000080	D	VCB$B_QNAMECNT		0000000B	D
UCB$L_MB_WAST		00000074	D	VCB$B_RESFILES		0000004F	D
UCB$L_MB_WIOQBL		00000088	D	VCB$B_SBMAPSIZE		00000039	D
UCB$L_MB_WIOQFL		00000084	D	VCB$B_SBMAPVBN		0000003B	D
UCB$L_MEDIA		0000008C	D	VCB$B_STATUS		0000000B	D
UCB$L_NT_DATSSB		00000074	D	VCB$B_STATUS2		00000053	D
UCB$L_NT_INTSSB		00000078	D	VCB$B_TM		0000002E	D
UCB$L_OPCNT		00000060	D	VCB$B_TYPE		0000000A	D
UCB$L_OWNUIC		0000001C	D	VCB$B_WINDOW		00000048	D
UCB$L_PID		00000028	D	VCB$C_COMLEN		00000024	D
UCB$L_RQBL		00000004	D	VCB$C_LENGTH		00000064	D
UCB$L_RQFL		00000000	D	VCB$C_MRKLEN		0000000B	D
UCB$L_SVAPTE		00000068	D	VCB$K_COMLEN		00000024	D
UCB$L_SVPN		00000064	D	VCB$K_LENGTH		00000064	D
UCB$L_TT_DECHAR		000000A8	D	VCB$K_MRKLEN		0000000B	D
UCB$L_TT_RDUE		0000008C	D	VCB$L_AQB		00000010	D
UCB$L_TT_RTIMOU		000000B8	D	VCB$L_BLOCKBL		00000004	D
UCB$L_VCB		00000030	D	VCB$L_BLOCKFL		00000000	D
UCB$T_PARTNER		0000000C	D	VCB$L_CACHE		00000058	D
UCB$V_BSY	=	00000008	D	VCB$L_CUR_FID		00000024	D
UCB$V_ONLINE	=	00000004	D	VCB$L_FCBBL		00000004	D
UCB$W_BCNT		0000006E	D	VCB$L_FCBFL		00000000	D
UCB$W_BCR		00000096	D	VCB$L_FREE		00000040	D
UCB$W_BOFF		0000006C	D	VCB$L_HOME2LBN		00000028	D
UCB$W_BUFQUO		00000018	D	VCB$L_HOMELBN		00000024	D
UCB$W_BYTESTOGO		0000003E	D	VCB$L_IBMAPLBN		00000030	D
UCB$W_CHARGE		0000004A	D	VCB$L_IXHDR2LBN		0000002C	D
UCB$W_CYLINDERS		0000003E	D	VCB$L_MAXFILES		00000044	D
UCB$W_DA		0000008C	D	VCB$L_MVL		00000034	D
UCB$W_DC		0000008E	D	VCB$L_QUOCACHE		0000005C	D
UCB$W_DEVBUFSIZ		0000003A	D	VCB$L_QUOTAFCB		00000054	D
UCB$W_DEVSTS		0000005A	D	VCB$L_RVT		00000020	D

```
VCB$L_SBMAPLBN                  00000034    D
VCB$L_START_FID                 00000028    D
VCB$L_ST_RECORD                 00000030    D
VCB$L_USRLBLAST                 00000044    D
VCB$L_VPBL                      00000040    D
VCB$L_VPFL                      0000003C    D
VCB$L_WCB                       00000038    D
VCB$T_QNAME                     0000000C    D
VCB$T_VOLNAME                   00000014    D
VCB$W_CLUSTER                   0000003C    D
VCB$W_CUR_NUM                   00000024    D
VCB$W_CUR_SEQ                   00000026    D
VCB$W_EXTEND                    0000003E    D
VCB$W_FILEPROT                  0000004A    D
VCB$W_MCOUNT                    0000004C    D
VCB$W_MODE                      0000002C    D
VCB$W_PENDERR                   00000062    D
VCB$W_QUOSIZE                   00000060    D
VCB$W_RECORDSZ                  00000050    D
VCB$W_RVN                       0000000E    D
VCB$W_SIZE                      00000008    D
VCB$W_START_NUM                 00000028    D
VCB$W_START_SEQ                 0000002A    D
VCB$W_TRANS                     0000000C    D
VMS$QIO                         00000007 RG D   02
WCB$B_ACCESS                    0000000B    D
WCB$B_TYPE                      0000000A    D
WCB$C_LENGTH                    00000024    D
WCB$C_MAP                       00000024    D
WCB$K_LENGTH                    00000024    D
WCB$K_MAP                       00000024    D
WCB$L_FCB                       00000018    D
WCB$L_LBN                       00000002    D
WCB$L_ORGUCB                    00000010    D
WCB$L_P1_LBN                    00000026    D
WCB$L_P2_LBN                    0000002C    D
WCB$L_PID                       0000000C    D
WCB$L_PREVLBN                   FFFFFFFC    D
WCB$L_RVT                       0000001C    D
WCB$L_STVBN                     00000020    D
WCB$L_WLBL                      00000004    D
WCB$L_WLFL                      00000000    D
WCB$W_ACON                      00000014    D
WCB$W_COUNT                     00000000    D
WCB$W_NMAP                      00000016    D
WCB$W_P1_COUNT                  00000024    D
WCB$W_P2_COUNT                  0000002A    D
WCB$W_PREVCOUNT                 FFFFFFFA    D
WCB$W_REFCNT                    0000000E    D
WCB$W_SIZE                      00000008    D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	FFFFFFFC (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
SEP	00000234 (564.)	02 (2.)	NOPIC USR CON REL LCL SHR EXE RD WRT NOVEC LONG

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$ER	=00000001	135 (1)	
$MODULE	00000000-R	135 (1)	
ACB$M_QUOTA	=00000040		#-354 (1)
ACB$V_QUOTA	=00000006		#-422 (1)
ACCESS	0000010C-R	301 (1)	
ALLOC	000000B4-R	265 (1)	#-269 (1)
ASTADR	=00000014	118 (1)	#-285 (1)
ASTPRM	=00000018	119 (1)	
BUG$CHECK	00000000-XR		528 (1)
CCB$L_UCB	00000000		#-223 (1)
CCB$L_WIND	00000004		#-247 (1) #-286 (1)
CCB$W_IOC	0000000A		#-277 (1)
CHAN	=00000008	115 (1)	#-219 (1)
DDB$L_DDT	0000000C		#-232 (1) #-336 (1) #-491 (1)
DDT$L_ALTSTART	0000001C		#-492 (1)
DDT$L_FDT	00000008		#-233 (1)
DDT$W_DIAGBUF	00000014		#-337 (1)
DEV$V_FOD	00000000-XR		#-305 (1)
DEV$V_FOR	00000000-XR		#-314 (1)
DEV$V_MNT	00000000-XR		#-313 (1)
DEV$V_SPL	00000000-XR		#-227 (1)
DS$AX_SOFTPCB	00000000-XR		213 (1)
DYN$C_IRP	=0000000A		#-281 (1)
EFN	=00000004	114 (1)	#-214 (1) #-256 (1) #-289 (1)
ERROR	000000A1-R	254 (1)	#-217 (1) #-222 (1) #-250 (1) #-252 (1)
			#-267 (1)
EXE$ABORTIO	0000019A-R	420 (1)	#-324 (1)
EXE$ALLOCBUF	00000000-XR		340 (1)
EXE$ALLOCIRP	00000000-XR		265 (1)
EXE$ALTQUEPKT	000001C5-R	488 (1)	
EXE$FINISHIO	000001A9-R	427 (1)	
EXE$FINISHIOC	000001A7-R	425 (1)	
EXE$INSERTIRP	0000021D-R	585 (1)	#-554 (1)
EXE$INSIOQ	00000202-R	548 (1)	#-457 (1)
EXE$QIOACPPKT	000001E7-R	527 (1)	
EXE$QIODRVPKT	000001C1-R	456 (1)	
EXE$QIORETURN	000001F9-R	529 (1)	#-458 (1)
FDTACT	=00000010	133 (1)	#-374 (1)
FUNC	=0000000C	116 (1)	#-225 (1)
GTPKT	000000BF-R	268 (1)	#-247 (1)
IO$M_FCODE	00000000-XR		#-226 (1)
IO$_LOGICAL	00000000-XR		#-228 (1)
IO$_PHYSICAL	00000000-XR		#-330 (1)
IO$_READLBLK	00000000-XR		#-320 (1) #-321 (1)
IO$_READVBLK	00000000-XR		#-303 (1) #-320 (1) #-321 (1)
IO$_WRITEVBLK	00000000-XR		#-301 (1)
IOC$GL_IRPFL	00000000-XR		268 (1)
IOC$GL_PSBL	00000000-XR		431 (1)
IOC$INITIATE	00000000-XR		#-551 (1)
IOC$VERIFYCHAN	00000000-XR		#-220 (1)

```
IOSB                    =00000010     117    (1)    #-238    (1)    #-291    (1)
IOTYPE                  =00000008     132    (1)      244    (1)      293    (1)
IPL$_IOPOST             =00000004                   #-433    (1)
IRP$B_PRI                00000023                   #-590    (1)
IRP$B_RMOD               0000000B                   #-354    (1)      422    (1)
IRP$C_LENGTH             0000005C                   #-280    (1)
IRP$L_AST                00000010                   #-352    (1)
IRP$L_DIAGBUF            00000044                   #-343    (1)
IRP$L_IOQBL              00000004                   #-587    (1)
IRP$L_IOQFL              00000000                     592    (1)
IRP$L_IOSB               00000024                   #-421    (1)
IRP$L_MEDIA              00000034                   #-429    (1)
IRP$L_WIND               00000018                   #-311    (1)
IRP$M_BUFIO             =00000001                   #-294    (1)
IRP$M_DIAGBUF           =00000080                   #-346    (1)
IRP$M_PHYSIO            =00000100                   #-332    (1)
IRP$W_FUNC               00000020                   #-321    (1)
IRP$W_SIZE               00000008                   #-279    (1)
IRP$W_STS                0000002A                   #-332    (1)    #-346    (1)
LEGAL                   =00000000     131    (1)      236    (1)
P1                      =0000001C     120    (1)    #-375    (1)
P2                      =00000020     121    (1)
P3                      =00000024     122    (1)
P4                      =00000028     123    (1)
P5                      =0000002C     124    (1)
P6                      =00000030     125    (1)    #-333    (1)
PCB$L_PID                00000060                   #-284    (1)
PCB$W_ASTCNT             00000038                   #-423    (1)
PCB$W_BIOCNT             0000003A                     243    (1)
PCB$W_DIOCNT             0000003E                     245    (1)
PR$_IPL                 =00000012                   #-254    (1)    #-489    (1)    #-502    (1)    #-532    (1)
                                                    #-549    (1)    #-555    (1)
PR$_SIRR                =00000014                   #-433    (1)
PSL$S_PRVMOD            =00000002                   #-282    (1)
PSL$V_PRVMOD            =00000016                   #-282    (1)
QIORETURN                000001FE-R    531    (1)    #-432    (1)    #-434    (1)
SS$_ACCVIO               00000000-XR                #-253    (1)
SS$_DEVOFFLINE           00000000-XR                #-251    (1)
SS$_ILLIOFUNC            00000000-XR                #-249    (1)
SS$_NORMAL               00000000-XR                #-430    (1)    #-530    (1)
SUCCES                   000000C8-R    276    (1)    #-266    (1)
SYS$CLREF                00000000-XR                  215    (1)
SYS$SETEF                00000000-XR                  257    (1)
UCB$B_FIPL               0000000B                   #-489    (1)    #-549    (1)
UCB$L_AMB                00000054                   #-230    (1)
UCB$L_DDB                00000024                   #-231    (1)    #-335    (1)    #-490    (1)
UCB$L_DEVCHAR            00000034                     227    (1)      305    (1)      313    (1)      314    (1)
UCB$L_IOQFL              00000040                     553    (1)
UCB$L_OPCNT              00000060                   #-428    (1)
UCB$V_BSY               =00000008                   #-550    (1)
UCB$V_ONLINE            =00000004                   #-237    (1)
UCB$W_STS                00000058                     237    (1)      550    (1)
VMS$QIO                  00000007-R    212    (1)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.02	00:00:00.19
Command processing	929	00:00:00.29	00:00:01.03
Pass 1	834	00:00:03.23	00:00:04.82
Symbol table sort	0	00:00:00.29	00:00:00.28
Pass 2	58	00:00:00.95	00:00:01.70
Symbol table output	2	00:00:00.05	00:00:00.29
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	4	00:00:00.06	00:00:00.13
Assembler run totals	1856	00:00:04.89	00:00:08.44

The working set limit was 2900 pages.
220656 bytes (431 pages) of virtual memory were used to buffer the intermediate code.
There were 60 pages of symbol table space allocated to hold 1072 non-local and 26 local symbols.
595 source lines were read in Pass 1, producing 72 object records in Pass 2.
37 pages of virtual memory were used to define 36 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	2
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	11
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	10
SYS$COMMON:[SYSLIB]STARLET.MLB;2	9
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	32

1549 GETS were required to define 32 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
  _
```

Table of contents

(1) 61 INITIALIZE DRIVER DATA BASE
(1) 90 REINITIALIZE DRIVER DATA BASE
(1) 125 LOCAL SUBROUTINE TO EXECUTE OPERATION CODE
(1) 213 LOCAL SUBROUTINE TO LOCATE DATA STRUCTURE TYPE

```
                     0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element RELOCDRV.MAR
                     0000     2 ; *1     6-FEB-1986 15:22:15 DS ""
                     0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element RELOCDRV.MAR
                     0000     4         .TITLE  RELOCDRV        *** RELOCDRV relocate I/O driver
                     0000     5         .IDENT  /01/
                 00000000     6         .PSECT  SEP,SHR,EXE,WRT,LONG
                     0000     7
                     0000     8
                     0000     9 ;
                     0000    10 ;*****************************************************************************
                     0000    11 ;*                                                                           *
                     0000    12 ; COPYRIGHT (C) 1978, 1980
                     0000    13 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
                     0000    14 ;*                                                                           *
                     0000    15 ;*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND  COPIED   *
                     0000    16 ;*  ONLY  IN  ACCORDANCE  WITH  THE  TERMS  OF  SUCH  LICENSE AND WITH THE  *
                     0000    17 ;*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE OR  ANY  OTHER   *
                     0000    18 ;*  COPIES  THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY   *
                     0000    19 ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE  IS  HEREBY   *
                     0000    20 ;*  TRANSFERRED.                                                            *
                     0000    21 ;*                                                                           *
                     0000    22 ;*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE   *
                     0000    23 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT   *
                     0000    24 ;*  CORPORATION.                                                            *
                     0000    25 ;*                                                                           *
                     0000    26 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS   *
                     0000    27 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
                     0000    28 ;*                                                                           *
                     0000    29 ;*****************************************************************************
                     0000    30 ;
                     0000    31 ; D. N. CUTLER 16-JUN-78
                     0000    32 ;
                     0000    33 ;       DS5.4   John Ciukaj     5-May-1980      Version 5.4
                     0000    34 ;                 Used Vax/Vms version 2.0 RELOCDRV.MAR and created
                     0000    35 ;                 a UPD file with the edits necessary to reflect the
                     0000    36 ;                 changes exhibited in Supervisor version 5.3 module
                     0000    37 ;                 RELOCDRV.
                     0000    38 ;
                     0000    39 ;
                     0000    40 ; RELOCATE DRIVER DATABASE
                     0000    41 ;
                     0000    42 ; MACRO LIBRARY CALLS
                     0000    43 ;
                     0000    44
                     0000    45         $CRBDEF                             ;DEFINE CRB OFFSETS
                     0000               .SAVE   LOCAL_BLOCK
                     0000               .IIF    NB,CRB$L_WQFL,  CRB$L_WQFL:
           00000004  0000                       .BLKL   1
                     0004               .IIF    NB,CRB$L_WQBL,  CRB$L_WQBL:
           00000008  0004                       .BLKL   1
                     0008               .IIF    NB,CRB$W_SIZE,  CRB$W_SIZE:
           0000000A  0008                       .BLKW   1
                     000A               .IIF    NB,CRB$B_TYPE,  CRB$B_TYPE:
           0000000B  000A                       .BLKB   1
           0000000C  000B                       .BLKB   1
                     000C               .IIF    NB,CRB$W_REFC,  CRB$W_REFC:
           0000000E  000C                       .BLKW   1
```

```
                     000E                .IIF    NB,CRB$B_MASK,  CRB$B_MASK:
                     000E                        .BLKB   1
                     000F                        .BLKB   1
                     0010                .IIF    NB,CRB$L_LINK,  CRB$L_LINK:
                     0010                        .BLKL   1
                     0014                .IIF    NB,CRB$L_INTD,  CRB$L_INTD:
                     0014                        .BLKL   9
                     0038                .IIF    NB,CRB$C_LENGTH,        CRB$C_LENGTH:
                     0038                .IIF    NB,CRB$K_LENGTH,        CRB$K_LENGTH:
                     0038                .IIF    NB,CRB$L_INTD2, CRB$L_INTD2:
                     0038                        .BLKL   9
                 00000000                .RESTORE
                     0000    46          $DDBDEF                         ;DEFINE DDB OFFSETS
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
                     005C                .=0
                     0000                .IIF    NB,DDB$L_LINK,  DDB$L_LINK:
                     0000                        .BLKL   1
                     0004                .IIF    NB,DDB$L_UCB,   DDB$L_UCB:
                     0004                        .BLKL   1
                     0008                .IIF    NB,DDB$W_SIZE,  DDB$W_SIZE:
                     0008                        .BLKW   1
                     000A                .IIF    NB,DDB$B_TYPE,  DDB$B_TYPE:
                     000A                        .BLKB   1
                     000B                        .BLKB   1
                     000C                .IIF    NB,DDB$L_DDT,   DDB$L_DDT:
                     000C                        .BLKL   1
                     0010                .IIF    NB,DDB$L_ACPD,  DDB$L_ACPD:
                     0010                        .BLKB   3
                     0013                .IIF    NB,DDB$B_ACPCLASS,      DDB$B_ACPCLASS:
                     0013                        .BLKB   1
                     0014                .IIF    NB,DDB$T_NAME,  DDB$T_NAME:
                     0014                        .BLKB   1
                     0015                        .BLKB   15
                     0024                .IIF    NB,DDB$T_DRVNAME,       DDB$T_DRVNAME:
                     0024                        .BLKB   1
                     0025                        .BLKB   15
                     0034                .IIF    NB,DDB$C_LENGTH,        DDB$C_LENGTH:
                     0034                .IIF    NB,DDB$K_LENGTH,        DDB$K_LENGTH:
                 00000000                .RESTORE
                     0000    47          $DPTDEF                         ;DEFINE DPT OFFSETS
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
                     005C                .=0
                     0000                .IIF    NB,DPT$L_FLINK, DPT$L_FLINK:
                     0000                        .BLKL   1
                     0004                .IIF    NB,DPT$L_BLINK, DPT$L_BLINK:
                     0004                        .BLKL   1
                     0008                .IIF    NB,DPT$W_SIZE,  DPT$W_SIZE:
                     0008                        .BLKW   1
                     000A                .IIF    NB,DPT$B_TYPE,  DPT$B_TYPE:
                     000A                        .BLKB   1
                     000B                .IIF    NB,DPT$B_REFC,  DPT$B_REFC:
                     000B                        .BLKB   1
                     000C                .IIF    NB,DPT$B_ADPTYPE,       DPT$B_ADPTYPE:
                     000C                        .BLKB   1
                     000D                .IIF    NB,DPT$B_FLAGS, DPT$B_FLAGS:
```

```
                    0000000E  000D                        .BLKB   1
                              000E              .IIF    NB,DPT$W_UCBSIZE,       DPT$W_UCBSIZE:
                    00000010  000E                        .BLKW   1
                              0010              .IIF    NB,DPT$W_INITTAB,       DPT$W_INITTAB:
                    00000012  0010                        .BLKW   1
                              0012              .IIF    NB,DPT$W_REINITTAB,     DPT$W_REINITTAB:
                    00000014  0012                        .BLKW   1
                              0014              .IIF    NB,DPT$W_UNLOAD,        DPT$W_UNLOAD:
                    00000016  0014                        .BLKW   1
                              0016              .IIF    NB,DPT$W_MAXUNITS,      DPT$W_MAXUNITS:
                    00000018  0016                        .BLKW   1
                              0018              .IIF    NB,DPT$W_VERSION,       DPT$W_VERSION:
                    0000001A  0018                        .BLKW   1
                    0000001E  001A                        .BLKL   1
                              001E              .IIF    NB,DPT$T_NAME,  DPT$T_NAME:
                    0000002A  001E                        .BLKB   12
                              002A              .IIF    NB,DPT$C_LENGTH,        DPT$C_LENGTH:
                              002A              .IIF    NB,DPT$K_LENGTH,        DPT$K_LENGTH:
                          00000000              .RESTORE
                              0000      48      $DYNDEF                         ;DEFINE DATA STRUCTURE TYPES
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  005C              .=0
                          00000000              .RESTORE
                              0000      49      $IDBDEF                         ;DEFINE IDB OFFSETS
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  005C              .=0
                              0000              .IIF    NB,IDB$L_CSR,   IDB$L_CSR:
                    00000004  0000                        .BLKL   1
                              0004              .IIF    NB,IDB$L_OWNER, IDB$L_OWNER:
                    00000008  0004                        .BLKL   1
                              0008              .IIF    NB,IDB$W_SIZE,  IDB$W_SIZE:
                    0000000A  0008                        .BLKW   1
                              000A              .IIF    NB,IDB$B_TYPE,  IDB$B_TYPE:
                    0000000B  000A                        .BLKB   1
                    0000000C  000B                        .BLKB   1
                              000C              .IIF    NB,IDB$W_UNITS, IDB$W_UNITS:
                    0000000E  000C                        .BLKW   1
                    00000010  000E                        .BLKW   1
                              0010              .IIF    NB,IDB$L_ADP,   IDB$L_ADP:
                    00000014  0010                        .BLKL   1
                              0014              .IIF    NB,IDB$L_UCBLST,        IDB$L_UCBLST:
                    00000034  0014                        .BLKL   8
                              0034              .IIF    NB,IDB$C_LENGTH,        IDB$C_LENGTH:
                              0034              .IIF    NB,IDB$K_LENGTH,        IDB$K_LENGTH:
                          00000000              .RESTORE
                              0000      50      $UCBDEF                         ;DEFINE UCB OFFSETS
                              0000              .SAVE   LOCAL_BLOCK
                              0000              .PSECT  $ABS$,ABS
                    00000000  005C              .=0
                              0000              .IIF    NB,UCB$L_FQFL,  UCB$L_FQFL:
                              0000              .IIF    NB,UCB$L_RQFL,  UCB$L_RQFL:
                    00000004  0000                        .BLKL   1
                              0004              .IIF    NB,UCB$L_FQBL,  UCB$L_FQBL:
                              0004              .IIF    NB,UCB$L_RQBL,  UCB$L_RQBL:
                    00000008  0004                        .BLKL   1
```

```
                     0008          .IIF    NB,UCB$W_SIZE,  UCB$W_SIZE:
                     0008                  .BLKW   1
                     000A          .IIF    NB,UCB$B_TYPE,  UCB$B_TYPE:
                     000A                  .BLKB   1
                     000B          .IIF    NB,UCB$B_FIPL,  UCB$B_FIPL:
                     000B                  .BLKB   1
                     000C          .IIF    NB,UCB$L_ASTQFL,        UCB$L_ASTQFL:
                     000C          .IIF    NB,UCB$L_FPC,   UCB$L_FPC:
                     000C          .IIF    NB,UCB$T_PARTNER,       UCB$T_PARTNER:
                     000C                  .BLKB   1
                     000D                  .BLKB   3
                     0010          .IIF    NB,UCB$L_ASTQBL,        UCB$L_ASTQBL:
                     0010          .IIF    NB,UCB$L_FR3,   UCB$L_FR3:
                     0010                  .BLKL   1
                     0014          .IIF    NB,UCB$L_FR4,   UCB$L_FR4:
                     0014          .IIF    NB,UCB$L_FIRST, UCB$L_FIRST:
                     0014          .IIF    NB,UCB$W_MSGMAX,        UCB$W_MSGMAX:
                     0014                  .BLKW   1
                     0016          .IIF    NB,UCB$W_MSGCNT,        UCB$W_MSGCNT:
                     0016                  .BLKW   1
                     0018          .IIF    NB,UCB$W_BUFQUO,        UCB$W_BUFQUO:
                     0018          .IIF    NB,UCB$W_DSTADDR,       UCB$W_DSTADDR:
                     0018                  .BLKW   1
                     001A          .IIF    NB,UCB$W_VPROT, UCB$W_VPROT:
                     001A          .IIF    NB,UCB$W_SRCADDR,       UCB$W_SRCADDR:
                     001A                  .BLKW   1
                     001C          .IIF    NB,UCB$L_OWNUIC,        UCB$L_OWNUIC:
                     001C                  .BLKL   1
                     0020          .IIF    NB,UCB$L_CRB,   UCB$L_CRB:
                     0020                  .BLKL   1
                     0024          .IIF    NB,UCB$L_DDB,   UCB$L_DDB:
                     0024                  .BLKL   1
                     0028          .IIF    NB,UCB$L_PID,   UCB$L_PID:
                     0028                  .BLKL   1
                     002C          .IIF    NB,UCB$L_LINK,  UCB$L_LINK:
                     002C                  .BLKL   1
                     0030          .IIF    NB,UCB$L_VCB,   UCB$L_VCB:
                     0030                  .BLKL   1
                     0034          .IIF    NB,UCB$L_DEVCHAR,       UCB$L_DEVCHAR:
                     0034                  .BLKL   1
                     0038          .IIF    NB,UCB$B_DEVCLASS,      UCB$B_DEVCLASS:
                     0038                  .BLKB   1
                     0039          .IIF    NB,UCB$B_DEVTYPE,       UCB$B_DEVTYPE:
                     0039                  .BLKB   1
                     003A          .IIF    NB,UCB$W_DEVBUFSIZ,     UCB$W_DEVBUFSIZ:
                     003A                  .BLKW   1
                     003C          .IIF    NB,UCB$L_DEVDEPEND,     UCB$L_DEVDEPEND:
                     003C          .IIF    NB,UCB$B_SECTORS,       UCB$B_SECTORS:
                     003C          .IIF    NB,UCB$B_LOCSRV,        UCB$B_LOCSRV:
                     003C                  .BLKB   1
                     003D          .IIF    NB,UCB$B_REMSRV,        UCB$B_REMSRV:
                     003D          .IIF    NB,UCB$B_TRACKS,        UCB$B_TRACKS:
                     003D                  .BLKB   1
                     003E          .IIF    NB,UCB$W_CYLINDERS,     UCB$W_CYLINDERS:
                     003E          .IIF    NB,UCB$W_BYTESTOGO,     UCB$W_BYTESTOGO:
                     003E                  .BLKB   1
                     003F          .IIF    NB,UCB$B_VERTSZ,        UCB$B_VERTSZ:
```

```
00000040  003F                                  .BLKB   1
          0040                  .IIF    NB,UCB$L_IOQFL, UCB$L_IOQFL:
00000044  0040                                  .BLKL   1
          0044                  .IIF    NB,UCB$L_IOQBL, UCB$L_IOQBL:
00000048  0044                                  .BLKL   1
          0048                  .IIF    NB,UCB$W_UNIT,  UCB$W_UNIT:
0000004A  0048                                  .BLKW   1
          004A                  .IIF    NB,UCB$W_CHARGE,        UCB$W_CHARGE:
          004A                  .IIF    NB,UCB$B_CM1,   UCB$B_CM1:
0000004B  004A                                  .BLKB   1
          004B                  .IIF    NB,UCB$B_CM2,   UCB$B_CM2:
0000004C  004B                                  .BLKB   1
          004C                  .IIF    NB,UCB$L_IRP,   UCB$L_IRP:
00000050  004C                                  .BLKL   1
          0050                  .IIF    NB,UCB$W_REFC,  UCB$W_REFC:
00000052  0050                                  .BLKW   1
          0052                  .IIF    NB,UCB$B_DIPL,  UCB$B_DIPL:
          0052                  .IIF    NB,UCB$B_STATE, UCB$B_STATE:
00000053  0052                                  .BLKB   1
          0053                  .IIF    NB,UCB$B_AMOD,  UCB$B_AMOD:
00000054  0053                                  .BLKB   1
          0054                  .IIF    NB,UCB$L_AMB,   UCB$L_AMB:
00000058  0054                                  .BLKL   1
          0058                  .IIF    NB,UCB$W_STS,   UCB$W_STS:
0000005A  0058                                  .BLKW   1
          005A                  .IIF    NB,UCB$W_DEVSTS,        UCB$W_DEVSTS:
0000005C  005A                                  .BLKW   1
          005C                  .IIF    NB,UCB$L_CPID,  UCB$L_CPID:
          005C                  .IIF    NB,UCB$L_DUETIM,        UCB$L_DUETIM:
00000060  005C                                  .BLKL   1
          0060                  .IIF    NB,UCB$L_OPCNT, UCB$L_OPCNT:
00000064  0060                                  .BLKL   1
          0064                  .IIF    NB,UCB$L_LOGADR,        UCB$L_LOGADR:
          0064                  .IIF    NB,UCB$L_SVPN,  UCB$L_SVPN:
00000068  0064                                  .BLKL   1
          0068                  .IIF    NB,UCB$L_SVAPTE,        UCB$L_SVAPTE:
0000006C  0068                                  .BLKL   1
          006C                  .IIF    NB,UCB$W_BOFF,  UCB$W_BOFF:
0000006E  006C                                  .BLKW   1
          006E                  .IIF    NB,UCB$W_BCNT,  UCB$W_BCNT:
00000070  006E                                  .BLKW   1
          0070                  .IIF    NB,UCB$B_ERTCNT,        UCB$B_ERTCNT:
00000071  0070                                  .BLKB   1
          0071                  .IIF    NB,UCB$B_ERTMAX,        UCB$B_ERTMAX:
00000072  0071                                  .BLKB   1
          0072                  .IIF    NB,UCB$W_ERRCNT,        UCB$W_ERRCNT:
00000074  0072                                  .BLKW   1
          0074                  .IIF    NB,UCB$C_LENGTH,        UCB$C_LENGTH:
          0074                  .IIF    NB,UCB$K_LENGTH,        UCB$K_LENGTH:
00000000  0074                  . = 0
          0000                  .IIF    NB,UCB$W_MB_SEED,       UCB$W_MB_SEED:
00000002  0000                                  .BLKW   1
00000074  0002                  . = 116
          0074                  .IIF    NB,UCB$L_MB_WAST,       UCB$L_MB_WAST:
00000078  0074                                  .BLKL   1
          0078                  .IIF    NB,UCB$L_MB_RAST,       UCB$L_MB_RAST:
0000007C  0078                                  .BLKL   1
```

```
                        007C            .IIF    NB,UCB$L_MB_MBX,        UCB$L_MB_MBX:
00000080  007C                                  .BLKL   1
                        0080            .IIF    NB,UCB$L_MB_SHB,        UCB$L_MB_SHB:
00000084  0080                                  .BLKL   1
                        0084            .IIF    NB,UCB$L_MB_WIOQFL,     UCB$L_MB_WIOQFL:
00000088  0084                                  .BLKL   1
                        0088            .IIF    NB,UCB$L_MB_WIOQBL,     UCB$L_MB_WIOQBL:
0000008C  0088                                  .BLKL   1
                        008C            .IIF    NB,UCB$L_MB_PORT,       UCB$L_MB_PORT:
00000090  008C                                  .BLKL   1
                        0090            .IIF    NB,UCB$C_MB_LENGTH,     UCB$C_MB_LENGTH:
                        0090            .IIF    NB,UCB$K_MB_LENGTH,     UCB$K_MB_LENGTH:
00000074  0090          . = 116
                        0074            .IIF    NB,UCB$B_SLAVE, UCB$B_SLAVE:
00000075  0074                                  .BLKB   1
                        0075            .IIF    NB,UCB$B_SPR,   UCB$B_SPR:
00000076  0075                                  .BLKB   1
                        0076            .IIF    NB,UCB$B_FEX,   UCB$B_FEX:
00000077  0076                                  .BLKB   1
                        0077            .IIF    NB,UCB$B_CEX,   UCB$B_CEX:
00000078  0077                                  .BLKB   1
                        0078            .IIF    NB,UCB$L_EMB,   UCB$L_EMB:
0000007C  0078                                  .BLKL   1
0000007E  007C                                  .BLKW   1
                        007E            .IIF    NB,UCB$W_FUNC,  UCB$W_FUNC:
00000080  007E                                  .BLKW   1
                        0080            .IIF    NB,UCB$L_DPC,   UCB$L_DPC:
00000084  0080                                  .BLKL   1
00000080  0084          . = 128
00000084  0080                                  .BLKL   1
                        0084            .IIF    NB,UCB$L_MAXBLOCK,      UCB$L_MAXBLOCK:
00000088  0084                                  .BLKL   1
                        0088            .IIF    NB,UCB$W_DIRSEQ,        UCB$W_DIRSEQ:
0000008A  0088                                  .BLKW   1
                        008A            .IIF    NB,UCB$W_OFFSET,        UCB$W_OFFSET:
0000008C  008A                                  .BLKW   1
                        008C            .IIF    NB,UCB$L_MEDIA, UCB$L_MEDIA:
                        008C            .IIF    NB,UCB$W_DA,    UCB$W_DA:
0000008E  008C                                  .BLKW   1
                        008E            .IIF    NB,UCB$W_DC,    UCB$W_DC:
00000090  008E                                  .BLKW   1
                        0090            .IIF    NB,UCB$W_EC1,   UCB$W_EC1:
00000092  0090                                  .BLKW   1
                        0092            .IIF    NB,UCB$W_EC2,   UCB$W_EC2:
00000094  0092                                  .BLKW   1
                        0094            .IIF    NB,UCB$B_OFFNDX,        UCB$B_OFFNDX:
00000095  0094                                  .BLKB   1
                        0095            .IIF    NB,UCB$B_OFFRTC,        UCB$B_OFFRTC:
00000096  0095                                  .BLKB   1
                        0096            .IIF    NB,UCB$W_BCR,   UCB$W_BCR:
00000098  0096                                  .BLKW   1
00000096  0098          . = 150
00000098  0096                                  .BLKW   1
                        0098            .IIF    NB,UCB$L_DX_BUF,        UCB$L_DX_BUF:
0000009C  0098                                  .BLKL   1
                        009C            .IIF    NB,UCB$L_DX_BFPNT,      UCB$L_DX_BFPNT:
000000A0  009C                                  .BLKL   1
```

```
                     00A0          .IIF    NB,UCB$L_DX_RXDB,       UCB$L_DX_RXDB:
000000A4             00A0                  .BLKL   1
                     00A4          .IIF    NB,UCB$W_DX_BCR,        UCB$W_DX_BCR:
000000A6             00A4                  .BLKW   1
                     00A6          .IIF    NB,UCB$B_DX_SCTCNT,     UCB$B_DX_SCTCNT:
000000A7             00A6                  .BLKB   1
000000A8             00A7                  .BLKB   1
00000074             00A8          . = 116
00000078             0074                  .BLKL   1
0000007C             0078                  .BLKL   1
00000080             007C                  .BLKL   1
00000084             0080                  .BLKL   1
00000088             0084                  .BLKL   1
0000008C             0088                  .BLKL   1
                     008C          .IIF    NB,UCB$L_TT_RDUE,       UCB$L_TT_RDUE:
00000090             008C                  .BLKL   1
00000094             0090                  .BLKL   1
00000098             0094                  .BLKL   1
0000009C             0098                  .BLKL   1
                     009C          .IIF    NB,UCB$B_TT_SPEED,      UCB$B_TT_SPEED:
0000009D             009C                  .BLKB   1
                     009D          .IIF    NB,UCB$B_TT_CRFILL,     UCB$B_TT_CRFILL:
0000009E             009D                  .BLKB   1
                     009E          .IIF    NB,UCB$B_TT_LFFILL,     UCB$B_TT_LFFILL:
0000009F             009E                  .BLKB   1
000000A0             009F                  .BLKB   1
                     00A0          .IIF    NB,UCB$B_TT_DESPEE,     UCB$B_TT_DESPEE:
000000A1             00A0                  .BLKB   1
                     00A1          .IIF    NB,UCB$B_TT_DECRF,      UCB$B_TT_DECRF:
000000A2             00A1                  .BLKB   1
                     00A2          .IIF    NB,UCB$B_TT_DELFF,      UCB$B_TT_DELFF:
000000A3             00A2                  .BLKB   1
000000A4             00A3                  .BLKB   1
                     00A4          .IIF    NB,UCB$B_TT_DETYPE,     UCB$B_TT_DETYPE:
000000A5             00A4                  .BLKB   1
                     00A5          .IIF    NB,UCB$W_TT_DESIZE,     UCB$W_TT_DESIZE:
000000A7             00A5                  .BLKW   1
000000A8             00A7                  .BLKB   1
                     00A8          .IIF    NB,UCB$L_TT_DECHAR,     UCB$L_TT_DECHAR:
000000AC             00A8                  .BLKL   1
000000B0             00AC                  .BLKL   1
000000B4             00B0                  .BLKL   1
000000B8             00B4                  .BLKL   1
                     00B8          .IIF    NB,UCB$L_TT_RTIMOU,     UCB$L_TT_RTIMOU:
000000BC             00B8                  .BLKL   1
                     00BC          .IIF    NB,UCB$C_TT_LENGTH,     UCB$C_TT_LENGTH:
                     00BC          .IIF    NB,UCB$K_TT_LENGTH,     UCB$K_TT_LENGTH:
00000074             00BC          . = 116
                     0074          .IIF    NB,UCB$L_NT_DATSSB,     UCB$L_NT_DATSSB:
00000078             0074                  .BLKL   1
                     0078          .IIF    NB,UCB$L_NT_INTSSB,     UCB$L_NT_INTSSB:
0000007C             0078                  .BLKL   1
                     007C          .IIF    NB,UCB$W_NT_CHAN,       UCB$W_NT_CHAN:
0000007E             007C                  .BLKW   1
00000080             007E                  .BLKW   1
        00000000                   .RESTORE
                0000    51         $VECDEF                         ;DEFINE VEC OFFSETS
```

```
                        0000              .SAVE   LOCAL_BLOCK
                        0000              .PSECT  $ABS$,ABS
                00000000  00BC              .=0
                        0000              .IIF    NB,VEC$Q_DISPATCH,      VEC$Q_DISPATCH:
                00000008  0000                      .BLKQ   1
                        0008              .IIF    NB,VEC$L_IDB,   VEC$L_IDB:
                0000000C  0008                      .BLKL   1
                        000C              .IIF    NB,VEC$L_INITIAL,       VEC$L_INITIAL:
                00000010  000C                      .BLKL   1
                        0010              .IIF    NB,VEC$W_MAPREG,        VEC$W_MAPREG:
                00000012  0010                      .BLKW   1
                        0012              .IIF    NB,VEC$B_NUMREG,        VEC$B_NUMREG:
                00000013  0012                      .BLKB   1
                        0013              .IIF    NB,VEC$B_DATAPATH,      VEC$B_DATAPATH:
                00000014  0013                      .BLKB   1
                        0014              .IIF    NB,VEC$L_ADP,   VEC$L_ADP:
                00000018  0014                      .BLKL   1
                        0018              .IIF    NB,VEC$L_UNITINIT,      VEC$L_UNITINIT:
                0000001C  0018                      .BLKL   1
                        001C              .IIF    NB,VEC$L_START, VEC$L_START:
                00000020  001C                      .BLKL   1
                        0020              .IIF    NB,VEC$L_UNITDISC,      VEC$L_UNITDISC:
                00000024  0020                      .BLKL   1
                        0024              .IIF    NB,VEC$C_LENGTH,        VEC$C_LENGTH:
                        0024              .IIF    NB,VEC$K_LENGTH,        VEC$K_LENGTH:
                00000000                  .RESTORE
                        0000     52
                        0000     53 ;
                        0000     54 ; LOCAL DATA
                        0000     55 ;
                        0000     56 ; STRUCTURE TYPE BYTE ARRAY
                        0000     57 ;
                        0000     58
            10 09 06 05 0000     59 STYPE:   .BYTE   DYN$C_CRB,DYN$C_DDB,DYN$C_IDB,DYN$C_UCB ;
```

```
                     0004     61          .SBTTL  INITIALIZE DRIVER DATA BASE
                     0004     62 ;+
                     0004     63 ; IOC$INITDRV - INITIALIZE DRIVER DATA BASE
                     0004     64 ;
                     0004     65 ; THIS ROUTINE IS CALLED AFTER HAVING LOADED ALL OR PART OF A DEVICE DATA BASE.
                     0004     66 ; IT MUST BE CALLED FOR EACH UNIT THAT IS DEFINED. ITS FUNCTION IS TO USE THE
                     0004     67 ; INITIALIZATION TABLE IN THE DRIVER PROLOGUE TO INITIALIZE STATIC INFORMATION
                     0004     68 ; IN THE DRIVER DATA BASE.
                     0004     69 ;
                     0004     70 ; INPUTS:
                     0004     71 ;
                     0004     72 ;       R4 = ADDRESS OF DRIVER PROLOGUE TABLE.
                     0004     73 ;       R5 = ADDRESS OF DEVICE UCB.
                     0004     74 ;
                     0004     75 ; OUTPUTS:
                     0004     76 ;
                     0004     77 ;       THE DRIVER PROLOGUE TABLE IS INTERPRETED AND THE RESPECTIVE DATA BASE
                     0004     78 ;       IS INITIALIZED.
                     0004     79 ;
                     0004     80 ;       R0 LOW BIT CLEAR INDICATES A BAD DATA STRUCTURE.
                     0004     81 ;
                     0004     82 ;       R0 LOW BIT SET INDICATES SUCCESSFUL COMPLETION.
                     0004     83 ;-
                     0004     84
                     0004     85          .ENABL  LSB
                     0004     86 IOC$INITDRV::                                ;INITIALIZE DRIVER DATA BASE
 53   10 A4   3C     0004     87          MOVZWL  DPT$W_INITTAB(R4),R3        ;GET OFFSET TO INITIALIZATION TABLE
        04   11     0008     88          BRB     10$                         ;BR TO COMMON CODE
```

```
                     000A     90          .SBTTL  REINITIALIZE DRIVER DATA BASE
                     000A     91 ;+
                     000A     92 ; IOC$REINITDRV - REINITIALIZE DRIVER DATA BASE
                     000A     93 ;
                     000A     94 ; THIS ROUTINE IS CALLED AFTER HAVING LOADED A DRIVER WHOSE DEVICE DATA BASE IS
                     000A     95 ; ALREADY RESIDENT IN MEMORY. IT MUST BE CALLED FOR EACH UNIT THAT IS DEFINED.
                     000A     96 ; ITS FUNCTION IS TO INITIALIZE ONLY THOSE FIELDS IN THE DATA BASE THAT ARE NOT
                     000A     97 ; DYNAMIC.
                     000A     98 ;
                     000A     99 ; INPUTS:
                     000A    100 ;
                     000A    101 ;       R4 = ADDRESS OF DRIVER PROLOGUE TABLE.
                     000A    102 ;       R5 = ADDRESS OF DEVICE UCB.
                     000A    103 ;
                     000A    104 ; OUTPUTS:
                     000A    105 ;
                     000A    106 ;       THE DRIVER PROLOGUE TABLE IS INTERPRETED AND THE RESPECTIVE DATA BASE
                     000A    107 ;       IS REINITIALIZED.
                     000A    108 ;
                     000A    109 ;       R0 LOW BIT CLEAR INDICATES A BAD DATA STRUCTURE.
                     000A    110 ;
                     000A    111 ;       R0 LOW BIT SET INDICATES SUCCESSFUL COMPLETION.
                     000A    112 ;-
                     000A    113
                     000A    114 IOC$REINITDRV::                             ;REINITIALIZE DRIVER DATA BASE
 53   12 A4   3C    000A    115          MOVZWL  DPT$W_REINITTAB(R4),R3        ;GET OFFSET TO REINITIALIZATION TABLE
    53   54   C0    000E    116 10$:     ADDL    R4,R3                         ;CALCULATE ADDRESS OF INITIALIZE TABLE
         5F   10    0011    117 20$:     BSBB    LOCATE                        ;LOCATE STRUCTURE TYPE
    51   83   9A    0013    118          MOVZBL  (R3)+,R1                      ;GET OFFSET IN STRUCTURE
    52   51   C0    0016    119          ADDL    R1,R2                         ;CALCULATE BASE ADDRESS OF FIELD
    51   83   9A    0019    120          MOVZBL  (R3)+,R1                      ;GET OPERATION CODE
         02   10    001C    121          BSBB    EXECUTE                       ;EXECUTE OPERATION CODE
         F1   11    001E    122          BRB     20$                           ;
                     0020    123          .DSABL  LSB
```

```
                                0020   125          .SBTTL  LOCAL SUBROUTINE TO EXECUTE OPERATION CODE
                                0020   126 ;
                                0020   127 ; EXECUTE - EXECUTE OPERATION CODE
                                0020   128 ;
                                0020   129 ; THIS ROUTINE IS CALLED TO EXECUTE A SINGLE RELOCATION OPERATION CODE.
                                0020   130 ;
                                0020   131 ; INPUTS:
                                0020   132 ;
                                0020   133 ;       R1 = OPERATION CODE.
                                0020   134 ;       R2 = STRUCTURE FIELD BASE ADDRESS.
                                0020   135 ;       R3 = ADDRESS OF NEXT RELOCATION BYTE.
                                0020   136 ;       R4 = BASE ADDRESS OF DRIVER PROLOGUE TABLE.
                                0020   137 ;       R5 = ADDRESS OF DEVICE UCB.
                                0020   138 ;
                                0020   139 ; OUTPUTS:
                                0020   140 ;
                                0020   141 ;       IF AN INVALID OPERATION CODE IS SPECIFIED, A FAILURE IS RETURNED TO THE
                                0020   142 ;       CALLERS CALLER. ELSE THE OPERAND VALUE IS STORE IN THE SPECIFIED FIELD
                                0020   143 ;       IN THE SPECIFIED STRUCTURE.
                                0020   144 ;
                                0020   145
                                0020   146 EXECUTE:                                       ;EXECUTE RELOCATION OPERATION
                                0020   147          CASE    R1,<-                       ;DISPATCH TO FETCH ROUTINE
                                0020   148                  10$,-                       ;BYTE IMMEDIATE
                                0020   149                  30$,-                       ;WORD IMMEDIATE
                                0020   150                  50$,-                       ;WORD DISPLACED
                                0020   151                  70$,-                       ;LONGWORD IMMEDIATE
                                0020   152                  90$,-                       ;FIELD IMMEDIATE
                                0020   153                  >
04'  00   51   AF               0020                CASEW   R1,#0,S^#<<30001$-30000$>/2>-1
                                0024        30000$:
                           0022' 0024                .SIGNED_WORD    10$-30000$
                           0029' 0026                .SIGNED_WORD    30$-30000$
                           0030' 0028                .SIGNED_WORD    50$-30000$
                           0038' 002A                .SIGNED_WORD    70$-30000$
                           003F' 002C                .SIGNED_WORD    90$-30000$
                                 002E        30001$:
                                 002E   154
                                 002E   155 ;
                                 002E   156 ; INDIRECT OPERAND
                                 002E   157 ;
                                 002E   158
      50   93   D0               002E   159          MOVL    @(R3)+,R0                   ;GET DATA LONGWORD
                                 0031   160          CASE    R1,<-                       ;DISPATCH TO STORE ROUTINE
                                 0031   161                  20$,-                       ;STORE BYTE
                                 0031   162                  40$,-                       ;STORE WORD
                                 0031   163                  60$,-                       ;STORE WORD DISPLACED
                                 0031   164                  80$,-                       ;STORE LONGWORD
                                 0031   165                  100$,-                      ;STORE FILED
                                 0031   166                  >,LIMIT=#^X80               ;
04'  0080 8F   51   AF           0031                CASEW   R1,#^X80,S^#<<30003$-30002$>/2>-1
                                 0037        30002$:
                           0012' 0037                .SIGNED_WORD    20$-30002$
                           0019' 0039                .SIGNED_WORD    40$-30002$
                           0020' 003B                .SIGNED_WORD    60$-30002$
                           0028' 003D                .SIGNED_WORD    80$-30002$
                           002F' 003F                .SIGNED_WORD    100$-30002$
```

```
                                0041        30003$:
                    8E    D5    0041                TSTL    (SP)+                   ;REMOVE RETURN FROM STACK
                    50    D4    0043                CLRL    R0                      ;SET FAILURE INDICATION
                          05    0045                RSB                             ;
                                0046
                                0046        ;
                                0046        ; BYTE IMMEDIATE
                                0046        ;
                                0046
              50    83    9A    0046        10$:    MOVZBL  (R3)+,R0                ;GET DATA BYTE
              62    50    90    0049        20$:    MOVB    R0,(R2)                 ;STORE BYTE
                          05    004C                RSB                             ;
                                004D
                                004D        ;
                                004D        ; WORD IMMEDIATE
                                004D        ;
                                004D
              50    83    3C    004D        30$:    MOVZWL  (R3)+,R0                ;GET DATA WORD
              62    50    B0    0050        40$:    MOVW    R0,(R2)                 ;STORE WORD
                          05    0053                RSB                             ;
                                0054
                                0054        ;
                                0054        ; WORD DISPLACED
                                0054        ;
                                0054
              50    83    32    0054        50$:    CVTWL   (R3)+,R0                ;GET WORD DISPLACEMENT
              50    54    C0    0057        60$:    ADDL    R4,R0                   ;CALCULATE ACTUAL ADDRESS
                    03    11    005A                BRB     80$                     ;
                                005C
                                005C        ;
                                005C        ; LONGWORD IMMEDIATE
                                005C        ;
                                005C
              50    83    D0    005C        70$:    MOVL    (R3)+,R0                ;GET DATA LONGWORD
              62    50    D0    005F        80$:    MOVL    R0,(R2)                 ;STORE DATA LONGWORD
                          05    0062                RSB                             ;
                                0063
                                0063        ;
                                0063        ; FIELD STRUCTURE
                                0063        ;
                                0063
              50    83    D0    0063        90$:    MOVL    (R3)+,R0                ;GET DATA LONGWORD
              7E    83    9A    0066        100$:   MOVZBL  (R3)+,-(SP)             ;GET STARTING BIT NUMBER
              51    83    9A    0069                MOVZBL  (R3)+,R1                ;GET SIZE OF FIELD
    62    51    8E    50    F0    006C                INSV    R0,(SP)+,R1,(R2)        ;STORE FIELD
                          05    0071                RSB                             ;
```

```
                                0072          .SBTTL  LOCAL SUBROUTINE TO LOCATE DATA STRUCTURE TYPE
                                0072  ;
                                0072  ; LOCATE - LOCATE DATA STRUCTURE TYPE
                                0072  ;
                                0072  ; INPUTS:
                                0072  ;
                                0072  ;       R5 = ADDRESS OF DEVICE UCB.
                                0072  ;
                                0072  ; OUTPUTS:
                                0072  ;
                                0072  ;       IF THE STRUCTURE TYPE CODE IS ZERO, THEN SUCCESS IS RETURNED TO THE CALLERS
                                0072  ;       CALLER. IF THE STRUCTURE TYPE CODE IS INVALID, THEN AN ERROR IS RETURNED
                                0072  ;       TO THE CALLERS CALLER. ELSE THE APPROPRIATE STRUCTURE BASE ADDRESS IS
                                0072  ;       RETURNED IN R2.
                                0072  ;
                                0072
                                0072  LOCATE:                                         ;LOCATE DATA STRUCTURE TYPE
          50    01    88        0072          BISB    #1,R0                           ;ASSUME END OF RELOCATION TABLE
                63    95        0075          TSTB    (R3)                            ;END OF TABLE?
                11    13        0077          BEQL    10$                             ;IF EQL YES
   82 AF  04    83    3A        0079          LOCC    (R3)+,#4,STYPE                  ;LOCATE STRUCTURE CODE
                                007E          CASE    R0,<-                           ;DISPATCH TO STRUCTURE ROUTINE
                                007E                  20$,-                           ;UCB
                                007E                  30$,-                           ;IDB
                                007E                  40$,-                           ;DDB
                                007E                  50$,-                           ;CRB
                                007E                  >,LIMIT=#1                      ;
      03'  01    50    AF        007E          CASEW   R0,#1,S^#<<30005$-30004$>/2>-1
                                0082  30004$:
                     000B'      0082          .SIGNED_WORD    20$-30004$
                     000F'      0084          .SIGNED_WORD    30$-30004$
                     0018'      0086          .SIGNED_WORD    40$-30004$
                     001D'      0088          .SIGNED_WORD    50$-30004$
                                008A  30005$:
                8E    D5        008A  10$:    TSTL    (SP)+                           ;REMOVE RETURN FROM STACK
                      05        008C          RSB                                     ;
                                008D
                                008D  ;
                                008D  ; UCB STRUCTURE
                                008D  ;
                                008D
          52    55    D0        008D  20$:    MOVL    R5,R2                           ;SET UCB ADDRESS
                      05        0090          RSB                                     ;
                                0091
                                0091  ;
                                0091  ; IDB STRUCTURE
                                0091  ;
                                0091
      52   20 A5    D0        0091  30$:    MOVL    UCB$L_CRB(R5),R2                ;GET ADDRESS OF CRB
      52   1C A2    D0        0095          MOVL    CRB$L_INTD+VEC$L_IDB(R2),R2 ;GET ADDRESS OF IDB
                      05        0099          RSB                                     ;
                                009A
                                009A  ;
                                009A  ; DDB STRUCTURE
                                009A  ;
                                009A
      52   24 A5    D0        009A  40$:    MOVL    UCB$L_DDB(R5),R2                ;GET ADDRESS OF DDB
```

```
                     05  009E    263          RSB                                ;
                         009F    264
                         009F    265 ;
                         009F    266 ; CRB STRUCTURE
                         009F    267 ;
                         009F    268
          52   20 A5    D0  009F    269 50$:     MOVL    UCB$L_CRB(R5),R2           ;GET ADDRESS OF CRB
                     05  00A3    270          RSB                                ;
                         00A4    271
                         00A4    272          .END
```

CRB$B_MASK	0000000E	D		UCB$B_AMOD	00000053	D		UCB$L_IOQFL	00000040	D					
CRB$B_TYPE	0000000A	D		UCB$B_CEX	00000077	D		UCB$L_IRP	0000004C	D					
CRB$C_LENGTH	00000038	D		UCB$B_CM1	0000004A	D		UCB$L_LINK	0000002C	D					
CRB$K_LENGTH	00000038	D		UCB$B_CM2	0000004B	D		UCB$L_LOGADR	00000064	D					
CRB$L_INTD	00000014	D		UCB$B_DEVCLASS	00000038	D		UCB$L_MAXBLOCK	00000084	D					
CRB$L_INTD2	00000038	D		UCB$B_DEVTYPE	00000039	D		UCB$L_MB_MBX	0000007C	D					
CRB$L_LINK	00000010	D		UCB$B_DIPL	00000052	D		UCB$L_MB_PORT	0000008C	D					
CRB$L_WQBL	00000004	D		UCB$B_DX_SCTCNT	000000A6	D		UCB$L_MB_RAST	00000078	D					
CRB$L_WQFL	00000000	D		UCB$B_ERTCNT	00000070	D		UCB$L_MB_SMB	00000080	D					
CRB$W_REFC	0000000C	D		UCB$B_ERTMAX	00000071	D		UCB$L_MB_WAST	00000074	D					
CRB$W_SIZE	00000008	D		UCB$B_FEX	00000076	D		UCB$L_MB_WIOQBL	00000088	D					
DDB$B_ACPCLASS	00000013	D		UCB$B_FIPL	0000000B	D		UCB$L_MB_WIOQFL	00000084	D					
DDB$B_TYPE	0000000A	D		UCB$B_LOCSRV	0000003C	D		UCB$L_MEDIA	0000008C	D					
DDB$C_LENGTH	00000034	D		UCB$B_OFFNDX	00000094	D		UCB$L_NT_DATSSB	00000074	D					
DDB$K_LENGTH	00000034	D		UCB$B_OFFRTC	00000095	D		UCB$L_NT_INTSSB	00000078	D					
DDB$L_ACPD	00000010	D		UCB$B_REMSRV	0000003D	D		UCB$L_OPCNT	00000060	D					
DDB$L_DDT	0000000C	D		UCB$B_SECTORS	0000003C	D		UCB$L_OWNUIC	0000001C	D					
DDB$L_LINK	00000000	D		UCB$B_SLAVE	00000074	D		UCB$L_PID	00000028	D					
DDB$L_UCB	00000004	D		UCB$B_SPR	00000075	D		UCB$L_RQBL	00000004	D					
DDB$T_DRVNAME	00000024	D		UCB$B_STATE	00000052	D		UCB$L_RQFL	00000000	D					
DDB$T_NAME	00000014	D		UCB$B_TRACKS	0000003D	D		UCB$L_SVAPTE	00000068	D					
DDB$W_SIZE	00000008	D		UCB$B_TT_CRFILL	0000009D	D		UCB$L_SVPN	00000064	D					
DPT$B_ADPTYPE	0000000C	D		UCB$B_TT_DECRF	000000A1	D		UCB$L_TT_DECHAR	000000A8	D					
DPT$B_FLAGS	0000000D	D		UCB$B_TT_DELFF	000000A2	D		UCB$L_TT_RDUE	0000008C	D					
DPT$B_REFC	0000000B	D		UCB$B_TT_DESPEE	000000A0	D		UCB$L_TT_RTIMOU	000000B8	D					
DPT$B_TYPE	0000000A	D		UCB$B_TT_DETYPE	000000A4	D		UCB$L_VCB	00000030	D					
DPT$C_LENGTH	0000002A	D		UCB$B_TT_LFFILL	0000009E	D		UCB$T_PARTNER	0000000C	D					
DPT$K_LENGTH	0000002A	D		UCB$B_TT_SPEED	0000009C	D		UCB$W_BCNT	0000006E	D					
DPT$L_BLINK	00000004	D		UCB$B_TYPE	0000000A	D		UCB$W_BCR	00000096	D					
DPT$L_FLINK	00000000	D		UCB$B_VERTSZ	0000003F	D		UCB$W_BOFF	0000006C	D					
DPT$T_NAME	0000001E	D		UCB$C_LENGTH	00000074	D		UCB$W_BUFQUO	00000018	D					
DPT$W_INITTAB	00000010	D		UCB$C_MB_LENGTH	00000090	D		UCB$W_BYTESTOGO	0000003E	D					
DPT$W_MAXUNITS	00000016	D		UCB$C_TT_LENGTH	000000BC	D		UCB$W_CHARGE	0000004A	D					
DPT$W_REINITTAB	00000012	D		UCB$K_LENGTH	00000074	D		UCB$W_CYLINDERS	0000003E	D					
DPT$W_SIZE	00000008	D		UCB$K_MB_LENGTH	00000090	D		UCB$W_DA	0000008C	D					
DPT$W_UCBSIZE	0000000E	D		UCB$K_TT_LENGTH	000000BC	D		UCB$W_DC	0000008E	D					
DPT$W_UNLOAD	00000014	D		UCB$L_AMB	00000054	D		UCB$W_DEVBUFSIZ	0000003A	D					
DPT$W_VERSION	00000018	D		UCB$L_ASTQBL	00000010	D		UCB$W_DEVSTS	0000005A	D					
DYN$C_CRB =	00000005	D		UCB$L_ASTQFL	0000000C	D		UCB$W_DIRSEQ	00000088	D					
DYN$C_DDB =	00000006	D		UCB$L_CPID	0000005C	D		UCB$W_DSTADDR	00000018	D					
DYN$C_IDB =	00000009	D		UCB$L_CRB	00000020	D		UCB$W_DX_BCR	000000A4	D					
DYN$C_UCB =	00000010	D		UCB$L_DDB	00000024	D		UCB$W_EC1	00000090	D					
EXECUTE	00000020	R	D	01 UCB$L_DEVCHAR	00000034	D		UCB$W_EC2	00000092	D					
IDB$B_TYPE	0000000A		D	UCB$L_DEVDEPEND	0000003C	D		UCB$W_ERRCNT	00000072	D					
IDB$C_LENGTH	00000034		D	UCB$L_DPC	00000080	D		UCB$W_FUNC	0000007E	D					
IDB$K_LENGTH	00000034		D	UCB$L_DUETIM	0000005C	D		UCB$W_MB_SEED	00000000	D					
IDB$L_ADP	00000010		D	UCB$L_DX_BFPNT	0000009C	D		UCB$W_MSGCNT	00000016	D					
IDB$L_CSR	00000000		D	UCB$L_DX_BUF	00000098	D		UCB$W_MSGMAX	00000014	D					
IDB$L_OWNER	00000004		D	UCB$L_DX_RXDB	000000A0	D		UCB$W_NT_CHAN	0000007C	D					
IDB$L_UCBLST	00000014		D	UCB$L_EMB	00000078	D		UCB$W_OFFSET	0000008A	D					
IDB$W_SIZE	00000008		D	UCB$L_FIRST	00000014	D		UCB$W_REFC	00000050	D					
IDB$W_UNITS	0000000C		D	UCB$L_FPC	0000000C	D		UCB$W_SIZE	00000008	D					
IOC$INITDRV	00000004	RG	D	01 UCB$L_FQBL	00000004	D		UCB$W_SRCADDR	0000001A	D					
IOC$REINITDRV	0000000A	RG	D	01 UCB$L_FQFL	00000000	D		UCB$W_STS	00000058	D					
LOCATE	00000072	R	D	01 UCB$L_FR3	00000010	D		UCB$W_TT_DESIZE	000000A5	D					
SIZ... =	00000001		D	UCB$L_FR4	00000014	D		UCB$W_UNIT	00000048	D					
STYPE	00000000	R	D	01 UCB$L_IOQBL	00000044	D		UCB$W_VPROT	0000001A	D					

```
VEC$B_DATAPATH    00000013    D
VEC$B_NUMREG      00000012    D
VEC$C_LENGTH      00000024    D
VEC$K_LENGTH      00000024    D
VEC$L_ADP         00000014    D
VEC$L_IDB         00000008    D
VEC$L_INITIAL     0000000C    D
VEC$L_START       0000001C    D
VEC$L_UNITDISC    00000020    D
VEC$L_UNITINIT    00000018    D
VEC$Q_DISPATCH    00000000    D
VEC$W_MAPREG      00000010    D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
SEP	000000A4 (164.)	01 (1.)	NOPIC USR CON REL LCL SHR EXE RD WRT NOVEC LONG
ABS	000000BC (188.)	02 (2.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
CRB$L_INTD	00000014		#-255 (1)
DPT$W_INITTAB	00000010		#-87 (1)
DPT$W_REINITTAB	00000012		#-115 (1)
DYN$C_CRB	=00000005		59 (1)
DYN$C_DDB	=00000006		59 (1)
DYN$C_IDB	=00000009		59 (1)
DYN$C_UCB	=00000010		59 (1)
EXECUTE	00000020-R	146 (1)	#-121 (1)
IOC$INITDRV	00000004-R	86 (1)	
IOC$REINITDRV	0000000A-R	114 (1)	
LOCATE	00000072-R	229 (1)	#-117 (1)
STYPE	00000000-R	59 (1)	233 (1)
UCB$L_CRB	00000020		#-254 (1) #-269 (1)
UCB$L_DDB	00000024		#-262 (1)
VEC$L_IDB	00000008		#-255 (1)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.02	00:00:00.23
Command processing	929	00:00:00.32	00:00:01.20
Pass 1	495	00:00:01.42	00:00:02.84
Symbol table sort	0	00:00:00.08	00:00:00.08
Pass 2	25	00:00:00.39	00:00:00.84
Symbol table output	2	00:00:00.02	00:00:00.06
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	2	00:00:00.01	00:00:00.01
Assembler run totals	1482	00:00:02.26	00:00:05.26

The working set limit was 1900 pages.
82358 bytes (161 pages) of virtual memory were used to buffer the intermediate code.
There were 20 pages of symbol table space allocated to hold 317 non-local and 23 local symbols.
272 source lines were read in Pass 1, producing 30 object records in Pass 2.
18 pages of virtual memory were used to define 17 macros.

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                  0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1                8
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1               0
SYS$COMMON:[SYSLIB]LIB.MLB;2                             0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                         5
SYS$COMMON:[SYSLIB]STARLET.MLB;2                         0
TOTALS (all libraries)                                  13

618 GETS were required to define 13 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element RMS.B32
;    0002  0      ! *23    17-FEB-1988 15:27:19 MEIER "Changed XBI to DWMBA"
;    0003  0      ! *22    15-FEB-1988 11:33:22 BAGGETT "TKB50 changed to TBK50"
;    0004  0      ! *21    12-FEB-1988 09:16:11 BAGGETT "DEBNT changed to DEBNK and TKB50 is a controller"
;    0005  0      ! *20    11-NOV-1987 08:53:35 GEARIN "ADDED SUPPORT FOR EXTENDED P-TABLES"
;    0006  0      ! *19    22-MAY-1987 14:12:32 BAGGETT "FINISHED"
;    0007  0      ! *18    14-APR-1987 14:54:38 MARTIN "FIXED RMS"
;    0008  0      ! *17    14-APR-1987 14:34:06 BAGGETT "FINISHED"
;    0009  0      ! *16    30-MAR-1987 15:58:10 MARTIN "UPDATES FOR RRR; TESTED SOMEWHAT ONLINE, STEPPING VIA DEBUGGER"
;    0010  0      ! *15    26-MAR-1987 11:48:25 BARANSKI "RESTORING POST RELEASE CHANGES"
;    0011  0      ! *14    26-MAR-1987 11:26:23 BARANSKI "FREEZING RELEASE CHANGE"
;    0012  0      ! *13    25-MAR-1987 09:49:41 MEIER "EXTEND EXIT 47 TO ONE MORE OCCURANCE"
;    0013  0      ! *12    16-MAR-1987 10:27:17 BERGAZZI "RECOMPILE"
;    0014  0      ! *11    16-MAR-1987 10:20:29 BERGAZZI "ADD RA70 SUPPORT"
;    0015  0      ! *10     4-MAR-1987 15:28:07 BAGGETT "TK50 ADDED AS BOOT/LOAD DEVICE"
;    0016  0      ! *9     19-JAN-1987 13:48:32 MEIER "ADDED CALYPSO CASE TO THE ADAPTER-FINDING ALGORITHM IN DSX$CHECK_SUPPORT"
;    0017  0      ! *8      4-DEC-1986 16:28:35 SILVER "VOLUME SHADOWING"
;    0018  0      ! *7     29-OCT-1986 15:56:14 BARANSKI "Change Addressing Mode."
;    0019  0      ! *6     22-JUL-1986 09:33:32 MUSE "RMS TEST."
;    0020  0      ! *5     27-MAY-1986 15:14:15 SALEM "ALL DONE"
;    0021  0      ! *4      2-APR-1986 14:29:29 SALEM "<no reason given>"
;    0022  0      ! *3     19-FEB-1986 20:23:41 BARANSKI "Fix CMS error."
;    0023  0      ! *2     14-FEB-1986 10:25:40 BAGGETT "<no reason given>"
;    0024  0      ! *1      6-FEB-1986 15:22:17 DS ""
;    0025  0      ! DEC/CMS REPLACEMENT HISTORY, Element RMS.B32
;    0026  0      %title '*** RMS Master RMS routines'
;    0027  0      module rms (                                    ! Emulate RMS for VAX Supervisor
;    0028  0                  ident = '10.11-23'                                                  !G:23
;    0029  0                  ) =
;    0030  0      !
;    0031  0      ! Copyright (c) 1980, 1982, 1983, 1984, 1985, 1986, 1987, 1988                  !G:21
;    0032  0      ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
;    0033  0      !
;    0034  0      ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
;    0035  0      ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
;    0036  0      ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
;    0037  0      ! MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
;    0038  0      ! EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
;    0039  0      ! TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
;    0040  0      ! REMAIN IN DEC.
;    0041  0      !
;    0042  0      ! THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
;    0043  0      ! AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
;    0044  0      ! CORPORATION.
;    0045  0      !
;    0046  0      ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
;    0047  0      ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
;    0048  0      !
;    0049  0      !++
;    0050  0      ! FACILITY: Diagnostic Supervisor
;    0051  0      !
;    0052  0      ! ABSTRACT:
;    0053  0      !
;    0054  0      !       This module emulates RMS (read-only functions) for the
;    0055  0      !       Supervisor.  It additionally supports RT-11 format files
;    0056  0      !       on console floppy.
;    0057  0      !
```

```
;    0058  0      ! AUTHOR:
;    0059  0      !       Dave Butenhof,          4-aug-1980
;    0060  0      !
;    0061  0      ! MODIFIED BY:
;    0062  0      !
;    0063  0      !               Dave Butenhof, 02-oct-1980, Version 6.1
;    0064  0      !       1       Eliminate possiblility of accessing console storage device
;    0065  0      !               as "CS:" by explicitly checking for controller and unit.
;    0066  0      !       2       Make "last-chance" backup filespec global as "DEF$Q_BACKSTOP"
;    0067  0      !       3       <DEBUG> to make user mode debug easier, conditionalize MFPR
;    0068  0      !               to execute only in standalone.
;    0069  0      !       4       Add TS11 rpb setup to RMS$OPEN.
;    0070  0      !               Dave Butenhof, 9-apr-1981, Version 6.3
;    0071  0      !       05      Fix up some context problems in RMS base routines.  Namely,
;    0072  0      !               Return EOF if VBN = eofvbn and ffb = 0 ($READ).  Also,
;    0073  0      !               start RSZ and RBF as 0!!!
;    0074  0      !               - Dave butenhof, 02-Jun-1981, version 6.4
;    0075  0      !       06      Alter directory spec on libraries, use logical names $DS,
;    0076  0      !               $DIAG for flexibility.
;    0077  0      !               - Dave Butenhof, 24-Jun-1981, version 6.4                                [07]
;    0078  0      !       07      Setup RPB for console device, to allow using the console                 [07]
;    0079  0      !               BOOTDRIVR routines.  Also, start cleaning up some of the                 [07]
;    0080  0      !               Macro JSB routine linkages to use Bliss V2.1's register output           [07]
;    0081  0      !               parameter capability, instead of global registers.
;    0082  0      !       08      - Dave Butenhof, 31-aug-1981, version 6.5
;    0083  0      !               Support DQ device (IDC) for Nebula, as ODS disk
;    0084  0      !
;    0085  0      !       09      - Dave Butenhof, 26-Oct-1981, version 6.-
;    0086  0      !               Alter call to LOC$PTABLE to use now argument, link address
;    0087  0      !
;    0088  0      !       10      - Dave Butenhof, 25-Jan-1982, version 6.6
;    0089  0      !               Fix calls to Exe$AloNonPaged to use output arguments instead
;    0090  0      !               of global registers.  Also, add new routines to allocate and
;    0091  0      !               init pseudo RPB, and to deallocate same.  Generally clean up
;    0092  0      !               RMS$OPEN somewhat.
;    0093  0      !
;    0094  0      !       11      - Dave Butenhof, 05-Mar-1982, version 6.6
;    0095  0      !               Fix edit 10...can't have size field of data structure be
;    0096  0      !               direct output parameter of AloNonPaged, since pointer hasn't
;    0097  0      !               been set yet!
;    0098  0      !
;    0099  0      !       [12]    Dave Butenhof, 15-Apr-1982, version 6.7                                  !G:20
;    0100  0      !               Add support for UDA-50 disks (DUan)                                      !G:20
;    0101  0      !       [13]    Dave Butenhof, 24-May-1982, version 6.8                                  !G:20
;    0102  0      !               Generalize checking for device support with DS$GA_SUPPORT_TABLE          !G:20
;    0103  0      !               data structure and DSX$CHECK_SUPPORT routine.  This is only for          !G:20
;    0104  0      !               VDS file services, and does not/should not reflect all devices.          !G:20
;    0105  0      !
;    0106  0      !       14      Bob Bergazzi    7-Aug-1982      version 6.9
;    0107  0      !               Edit 13 had a typo - RL211 in device support table would not
;    0108  0      !               allow file services for an RL02 connected to an RL11.
;    0109  0      !
;    0110  0      !       15      M. Baggett      1-Dec-1982      version 6.10
;    0111  0      !               Added support for TU80 magtape as load device.
;    0112  0      !
;    0113  0      !       16      M. Baggett      7-Dec-1982      version 6.10
;    0114  0      !               Added support for TU81 magtape as load device.
```

```
;   0115  0     !
;   0116  0     !       17      M. Baggett      23-Feb-1983     Version 6.11
;   0117  0     !               Added support for RC25 booting and file operations.
;   0118  0     !
;   0119  0     !       18      M. Baggett      1-March-1983    Version 6.11
;   0120  0     !               Added LESI,RCF25 and support for booting CI-HSC50.
;   0121  0     !
;   0122  0     !       19      M. Baggett      17-May-1983     Version 6.11
;   0123  0     !               Added changes to support CI-HSC50 port station #.
;   0124  0     !       20      M. Baggett      22-Sep-1983     Version 6.13
;   0125  0     !               Changed name LESI to RC11
;   0126  0     !
;   0127  0     !       21      M. Baggett      11-Oct-1983     Version 6.13
;   0128  0     !               Added support for CI-HSC50 tape and TS05
;   0129  0     !
;   0130  0     !       22      Domenic Andella 1-Mar-1984      Version 6.13
;   0131  0     !               Added code in routines DSX$CHECK_SUPPORT and
;   0132  0     !               RMS$OPEN for 8600 CPU. Each routine uses code
;   0133  0     !               to 'backtrack' through ptables till _LINK field
;   0134  0     !               equals zero, when this occurs the present Ptable
;   0135  0     !               is linked to HUB. Not so for a VENUS, when ptable
;   0136  0     !               _LINK field equals zero it means were linked to
;   0137  0     !               to an SBIA since the HUB is ABUS.  Therfore the
;   0138  0     !               modifications have to do with saving and reloading
;   0139  0     !               the previous adapter and controller address if running on a VENUS.
;   0140  0     !
;   0141  0     !       23      Bob Bergazzi    April 13, 1984  Version 7.0
;   0142  0     !               Changed DSX$Check_support to support ODS format on
;   0143  0     !               the console storage device for the ZZZ cpu.
;   0144  0     !
;   0145  0     !       24      M. Baggett      28-aug-1984     Version 7.1
;   0146  0     !               Changed controller for RC25/RCF25 from RC11 to LESI
;   0147  0     !               so devices could be accessed.
;   0148  0     !
;   0149  0     !       25      M. Baggett      5-Oct-1984      Version 7.1
;   0150  0     !               Change TAPE in support_table to allow operaton on HSC50 tape.
;   0151  0     !
;   0152  0     !       26      Bob Bergazzi    Oct. 18,1984    Version 7.1
;   0153  0     !               Added recognition of DWBUA in the DSX$CHECK_SUPPORT routine.
;   0154  0     !
;   0155  0     !       27      M. Baggett      18-Oct-1984     Version 7.1
;   0156  0     !               Add changes for HSC50 port for magtape operation.
;   0157  0     !
;   0158  0     !       28      M. BAGGETT      2-NOV-1984      VERSION 7.1
;   0159  0     !               Support TK50.  Change TU81 to have init flag.
;   0160  0     !               Change order of clearing init flag for all applicable
;   0161  0     !               devices so a CLI command will only clear it once per command.
;   0162  0     !
;   0163  0     !       29      M. BAGGETT      26-NOV-1984     Version 7.1
;   0164  0     !               Allow file operations from RUX50.
;   0165  0     !
;   0166  0     !       30      M. Baggett      22-FEB-1985     Version 8.1
;   0167  0     !               Start support for ULTRIX file structure.
;   0168  0     !
;   0169  0     !       31      Bob Bergazzi    7-May-1985      Version 8.2
;   0170  0     !               Add support to DSX$CHECK_SUPPORT for BCI750.
;   0171  0     !
```

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;  0172  0     !       32      M. Baggett      21-May-1985     Version 8.2
;  0173  0     !               Added support for ULTRIX files.
;  0174  0     !
;  0175  0     !       33      R.E. MUSE       28-MAY-1985     Version 8.2
;  0176  0     !               Changed DSX$Check_support to support ODS format on
;  0177  0     !               the console storage device for the AAA cpu.
;  0178  0     !
;  0179  0     !       34      Bob Bergazzi    5-Jun-1985      Version 8.2
;  0180  0     !               Added support for KDB50.
;  0181  0     !
;  0182  0     !       35      Bob Bergazzi    11-June-1985    Version 8.3
;  0183  0     !               Changed BCI750 to CIBCI.
;  0184  0     !
;  0185  0     !       36      M. Baggett      12-Jun-1985     Version 8.3
;  0186  0     !               No default name in Ultrix.
;  0187  0     !
;  0188  0     !       37      M. Baggett      14-Aug-1985     Version 8.3
;  0189  0     !               Added KFBTA.
;  0190  0     !
;  0191  0     !       38      Bob Bergazzi    20-Aug-1985     Version 8.3
;  0192  0     !               Fix edit 33.
;  0193  0     !
;  0194  0     !       39      M. Baggett      22-Aug-1985     Version 9.0
;  0195  0     !               Ultrix updates.
;  0196  0     !
;  0197  0     !       40      Richard E. Muse  2-Oct-1985     Version 9.0
;  0198  0     !               Added code in routines DSX$CHECK_SUPPORT and
;  0199  0     !               RMS$OPEN for the NAUTILUS CPU. Each routine uses code
;  0200  0     !               to 'backtrack' through ptables till the _LINK field
;  0201  0     !               equals zero, when this occurs the present Ptable
;  0202  0     !               is linked to HUB and thus the adapter/controller's
;  0203  0     !               address is available.  Not so for a NAUTILUS,when
;  0204  0     !               the ptable _LINK field equals zero it means were linked to
;  0205  0     !               to an NBIA which in turn has an NBIB linked to it. Therfore
;  0206  0     !               the modifications have to do with saving and reloading
;  0207  0     !               adapter/controller address back two levels
;  0208  0     !               if running on a NAUTILUS.
;  0209  0     !
;  0210  0     !       41      J. Baranski     3-Feb-1986      Version 9.1
;  0211  0     !               Add RA82 to KBD50 and UDA50 Device Support Tables.
;  0212  0     !
;  0213  0     !       42      M. Baggett      11-Feb-1986     Version 10.0                    !G:4
;  0214  0     !               Change device type code for KFTBA to BTD$K_BVPSSP.              !G:2
;  0215  0     !                                                                               !G:4
;  0216  0     !       43      Ted Salem       4-March-1986    Version 10.0                    !G:4
;  0217  0     !               Modified $OPEN $CLOSE $READ $GET and DSX$CHECK_SUPPORT          !G:4
;  0218  0     !               to support the ANDROMEDA console using the PPA console          !G:4
;  0219  0     !               interface (PPIFACE.MAR) instead of a device driver.             !G:4
;  0220  0     !                                                                               !G:4
;  0221  0     !       44      J. Baranski     7-Mar-1986      Version 10.0                    !G:4
;  0222  0     !               Fix RA82 Device Support Entry.                                  !G:4
;  0223  0     !                                                                               !G:7
;  0224  0     !                                                                               !G:7
;  0225  0     !       45      J. Baranski     7-Oct-1986      Version 10.3                    !G:7
;  0226  0     !               Make DS$GB_SYSTYPE Addressing Mode Long Relative.               !G:7
;  0227  0     !                                                                               !G:8
;  0228  0     !       46      Ted Salem                                                       !G:19
```

```
;  0229  0     !               Changed the value of the device unit number from a                              !G:8
;  0230  0     !               byte of xx, to a word of 80xx, IF the device is a shadowed set.                 !G:8
;  0231  0     !                                                                                               !G:9
;  0232  0     !       47      Steve Meier     27-Aug-1986     Version 10.3                                    !G:9
;  0233  0     !               The same edit as 22 except for the XBI on the Calypso                           !G:9
;  0234  0     !               machine. Since the BI is not directly linked to the XMI                         !G:9
;  0235  0     !               (the DWMBA adapter is stuck in the middle) To find the P-table                  !G:23
;  0236  0     !               of the BI we must follow the links back to zero (hub) and                       !G:9
;  0237  0     !               then take one step forward.                                                     !G:9
;  0238  0     !                                                                                               !G:10
;  0239  0     !       48      M. Baggett      25-Feb-1987     Version 10.5                                    !G:10
;  0240  0     !               Modification for TK50 booting.                                                  !G:10
;  0241  0     !                                                                                               !G:11
;  0242  0     !       49      Bob Bergazzi    4-Mar-1987      Version 10.7                                    !G:11
;  0243  0     !               Added load support for RA70.                                                    !G:11
;  0244  0     !                                                                                               !G:16
;  0245  0     !       50      Ingrid Martin   25-Mar-1987     Version 10.7                                    !G:16
;  0246  0     !               Updates for RRR - similar to edits 22, 47                                       !G:16
;  0247  0     !                                                                                               !G:16
;  0248  0     !       51      M. Baggett      7-Apr-1987      Version 10.7                                    !G:17
;  0249  0     !               No intialization flag for TK50. Add TK70                                        !G:17
;  0250  0     !                                                                                               !G:19
;  0251  0     !       52      M. Baggett      22-May-1987     Version 10.9                                    !G:19
;  0252  0     !               Add I/O support for RD54                                                        !G:19
;  0253  0     !                                                                                               !G:20
;  0254  0     !               David Gearin    26-Oct-1987     Version 10.10                                   !G:20
;  0255  0     !               Added code for the extended p-table format.  Drive                              !G:20
;  0256  0     !               unit #'s will now be extracted from HPE$W_EXT_DRIVE                             !G:20
;  0257  0     !               instead of HP$B_DRIVE.                                                          !G:20
;  0258  0     !                                                                                               !G:21
;  0259  0     !       [G:21]  M. Baggett      12-Feb-1988     Ver 10.11                                       !G:21
;  0260  0     !               Added TKB50 and changed DEBNT to DEBNK and controllers.                         !G:21
;  0261  0     !                                                                                               !G:22
;  0262  0     !       [G:22]  M. Baggett      15-Feb-1988     Ver 10.12                                       !G:22
;  0263  0     !               Change TKB50 to TBK50.                                                          !G:22
;  0264  0     !                                                                                               !G:23
;  0265  0     !       [G:23]  Stephen Meier   17-Feb-1988     Ver 10.12                                       !G:23
;  0266  0     !               Change XBI to DWMBA.                                                            !G:23
;  0267  0     !--                                                                                             !G:19
;  0268  0                                                                                                     !G:19
;  0269  1     begin                                                                                           !G:19
;  0270  1     !
;  0271  1     ! include files:
;  0272  1     !                                                                                               !G:19
;  0273  1
;  0274  1     library '$diag';                !
;  0275  1
;  0276  1     library '$ds';                  !
;  0277  1
;  0278  1     library 'sys$library:lib.l32';
;  0279  1
;  0280  1     !
;  0281  1     ! table of contents:
;  0282  1     !
;  0283  1
;  0284  1     forward routine
;  0285  1         rms$error : jsb_rms,                        ! Load error status
```

```
;   0286  1         rms$load_xab : call_rms novalue,                ! Load XAB data
;   0287  1         rms$alloc_cache : jsb_cblock,                   ! Allocate cache
;   0288  1         rms$init : jsb_none novalue,                    ! Initialize
;   0289  1         rms$cleanup : jsb_none novalue,                 ! Clean up RMS allocations
;   0290  1         rab$error : jsb_rms,                            ! Store error code in RAB
;   0291  1         fab$error : jsb_rms,                            ! Store error code in FAB
;   0292  1         verify_cblock : jsb_rms,                        ! Be sure IFI and cblock pointer are OK
;   0293  1         verify_rab : jsb_rms,                           ! Verify rab
;   0294  1         verify_fab : jsb_rms,                           ! Verify fab
;   0295  1         rms$open,                                       ! RMS$OPEN emulator--open file
;   0296  1         rms$connect,                                    ! RMS$CONNECT emulator
;   0297  1         rms$get,                                        ! RMS$GET emulator--record de-block
;   0298  1         rms$disconnect,                                 ! RMS$DISCONNECT emulator
;   0299  1         rms$close;                                      ! RMS$CLOSE emulator--close file
;   0300  1
;   0301  1     !
;   0302  1     ! Local values
;   0303  1     !
;   0304  1
;   0305  1     literal
;   0306  1         True = 1,                                               ! Literal TRUE
;   0307  1         False = 0,                                              ! literal FALSE
;   0308  1         rms$c_maxfiles = 3,                             ! Maximum files open at once
;   0309  1         device$_ansi = dev$m_sqd or dev$m_fod,          ! Describe magtape
;   0310  1         device$_ods = dev$m_fod or dev$m_dir or dev$m_rnd,  ! Describe disk
;   0311  1         device$_rt11 = dev$m_dir or dev$m_rnd or dev$m_sdi or dev$m_fod,    ! Describe floppy
;   0312  1         ! Re-define Restart parameter block length as 16-byte multiple,
;   0313  1         ! to make allocation easier w/out requiring assumptions or
;   0314  1         ! explicitly storing the actual length.
;   0315  1         rpb$_length = (rpb$c_length + 15) and not 15,                                                   !G:16
;   0316  1         pr$_sid_typ8RR = 17;                            ! until this appears in a macro [50]            !G:16
;   0317  1
;   0318  1     !
;   0319  1     ! external references:
;   0320  1     !
;   0321  1     $ds_dsadef;
;   0322  1
;   0323  1     external
;   0324  1         Ultrix_flags     : Byte addressing_mode (long_relative),    ! Flag for ULTRIX disk structure. [30]
;   0325  1         Ds$Gb_Uda50_Init : Byte weak,                          ! Global init flag in PUBTDRIVR
;   0326  1         Ds$Gb_CI_Init : Byte Weak,                             ! Global init flag in PABTDRIVR
;   0327  1         Ds$Gb_KDB50_Init : Byte Weak,                          ! Global init flag in BDABTDRIVR        [34]
;   0328  1         Ds$Gb_PB_Init : Byte Weak,                             ! Global init flag in PBBTDRIVR         [37]
;   0329  1         DS$GB_SYSTYPE : BYTE addressing_mode(long_relative),! Global byte of system type            [43]    !G:7
;   0330  1         def$q_dir : bblock addressing_mode (long_relative),
;   0331  1         def$q_dev : bblock addressing_mode (long_relative),
;   0332  1         boo$select,                             ! Non-interrupt "QIO" package stuff                     !G:8
;   0333  1         boo$al_vector : addressing_mode (long_relative);
;   0334  1                                                                                                         !G:4
;   0335  1     external literal PR$_SYS_TYP900 ;                   ! System type for Andromeda     [43]            !G:5
;   0336  1                                                                                                         !G:5
;   0337  1     literal
;   0338  1     ultrix_v_mode = 0;      !  ultrix flag                                         [32]                !G:5
;   0339  1                                                                                                         !G:19
;   0340  1     MAP                                                 !                                                   [23] !G:4
;   0341  1             DSA$GL_SID : BLOCK;                         !                                                   [23] !G:4
;   0342  1                                                                                                         !G:4
```

```
;    0343  1      external routine
;    0344  1          exe$deanonpaged : jsb_deall addressing_mode (long_relative),        ! Deallocate dyn. pool space
;    0345  1          exe$alononpaged : jsb_alloc addressing_mode (long_relative),        ! Allocate from dynamic pool
;    0346  1          fil$cvtfilnam,                                  ! Convert ascii to RAD50
;    0347  1          BreakUP_File,
;    0348  1          loc$ptable : jsb_loc$ptable novalue addressing_mode (long_relative),
;    0349  1          rt11$open : call_rms,                           ! Access console RT-11 file
;    0350  1          ods$open : call_rms,                            ! Access disk file
;    0351  1          ultrix$open : call_rms addressing_mode (long_relative),         ! Access ultrix disk file[30]
;    0352  1          ansi$open : call_rms addressing_mode (long_relative),       ! Access magtape file                          !G:4
;    0353  1          ppa$lookup : call_rms addressing_mode (long_relative) weak, ! Open an Andromeda console file [43]   !G:4
;    0354  1          ppa$read   : call_rms addressing_mode (long_relative) weak, ! Read a data block for Andromeda[43]   !G:4
;    0355  1          ppa$close  : call_rms addressing_mode (long_relative) weak; ! Close a Andromeda console file [43]   !G:4
;    0356  1      !
;    0357  1      ! psect definitions:
;    0358  1      !
;    0359  1
;    0360  1      psect
;    0361  1          plit = data ( share, addressing_mode (long_relative));
;    0362  1
;    0363  1      psect
;    0364  1          own = work ( read, write, addressing_mode (long_relative));
;    0365  1
;    0366  1      psect
;    0367  1      global = work ( read, write, addressing_mode (long_relative));                                          !G:20
;    0368  1
;    0369  1      psect
;    0370  1          code = code ( read, execute, share);
;    0371  1
;    0372  1      !
;    0373  1      ! Own storage
;    0374  1      !
;    0375  1
;    0376  1      global
;    0377  1          rms$file_table : vector [4];                 ! ifi-indexed pointers
;    0378  1      !
;    0379  1      ! Global data definitions:
;    0380  1      !
;    0381  1
;    0382  1      global bind
;    0383  1          def$c_bkstp_len = %charcount (%ascii'CSA0:[SYSMAINT];0'),
;    0384  1          def$q_backstop = uplit byte(%ascii'CSA0:[SYSMAINT];0'),
;    0385  1          def$c_ultrix_len = %charcount (%ascii'CSA0:(0,6)field'),!                                       [32]
;    0386  1          def$q_ultrix = uplit byte(%ascii'CSA0:(0,6)field'); !                                           [32]
;    0387  1
```

```
;    0389  1      %Sbttl 'Device support table'
;    0390  1
;    0391  1      Compiletime                                                                                                    [13]
;    0392  1          $$_Rows_$$ = 0;                                                                                            [13]
;    0393  1
;    0394  1      Global Bind                                 ! Device support table                                             [13]
;    0395  1          Ds$GA_Support_Table = Uplit (           !                                                                  [13]
;    0396  1              Support_Entry ('console', HUB, Btd$K_Console, RT11, <>, 0, <>),                    ! Console          [13]
;    0397  1              Support_Entry ('console', HUB, Btd$K_Console, ODS, <>, 0, <>),                     ! ZZZ,AAA console
;    0398  1              Support_Entry ('RP04', MBA, Btd$K_Mb, ODS, <A>, 0, <>),                            ! RP04             [13]
;    0399  1              Support_Entry ('RP05', MBA, Btd$K_Mb, ODS, <A>, 0, <>),                            ! RP05             [13]
;    0400  1              Support_Entry ('RP06', MBA, Btd$K_Mb, ODS, <A>, 0, <>),                            ! RP06             [13]
;    0401  1              Support_Entry ('RP07', MBA, Btd$K_Mb, ODS, <A>, 0, <>),                            ! RP07             [13]
;    0402  1              Support_Entry ('RM03', MBA, Btd$K_Mb, ODS, <A>, 0, <>),                            ! RM03             [13]
;    0403  1              Support_Entry ('RM05', MBA, Btd$K_Mb, ODS, <A>, 0, <>),                            ! RM05             [13]
;    0404  1              Support_Entry ('RM80', MBA, Btd$K_Mb, ODS, <A>, 0, <>),                            ! RM80             [13]
;    0405  1              Support_Entry ('TM03', MBA, Btd$K_Tm, ANSI, <A, C>, 0, <'TE16', 'TU45', 'TU77'>),  ! TM03             [13]
;    0406  1              Support_Entry ('TM78', MBA, Btd$K_Tf, ANSI, <A, C>, 0, <'TU78'>),                  ! TM78             [13]
;    0407  1              Support_Entry ('RB730',UBA, Btd$K_Dg, ODS, <A, C>, 0, <'RL02', 'R80'>),            ! IDC              [13]
;    0408  1              Support_Entry ('UDA50',UBA, Btd$K_UDA,ODS, <A, C>,Ds$GB_Uda50_Init,<'RA70','RA80','RA81','RA82','RA90','RA60
;    0409  1              Support_Entry ('RK611',UBA, Btd$K_Dm, ODS, <A, C>, 0, <'RK06', 'RK07'>),           ! RK06/07          [13]
;    0410  1              Support_Entry ('RL11' ,UBA, Btd$K_Dl, ODS, <A, C>, 0, <'RL02'>),                   ! RL02             [14]
;    0411  1              Support_Entry ('TS11', UBA, Btd$K_Ts, ANSI,<A>, 0, <>),                            ! TS04             [13]
;    0412  1              Support_Entry ('TS04', UBA, Btd$K_Ts, ANSI,<A>, 0, <>),                            ! TS04             [13]
;    0413  1              Support_Entry ('TS05', UBA, Btd$K_Ts, ANSI,<A>, 0, <>),                            ! TS05             [21]
;    0414  1              Support_Entry ('TU80', UBA, Btd$K_Ts, ANSI,<A>, 0, <>),                            ! TU80             [15]
;    0415  1              Support_Entry ('TU81', UBA, Btd$K_Mu, ANSI,<A>, 0, <>),                            ! TU81             [28]
;    0416  1              Support_Entry ('CI_NODE',CIA, Btd$K_HSCCI,ODS, <A, C>, DS$GB_CI_INIT, <'DISK'>),   ! HSC50            [20]
;    0417  1              Support_Entry ('CI_NODE',CIA, Btd$K_HSCMU,ANSI, <A, C>, DS$GB_CI_INIT, <'TAPE'>),  ! HSC50 TAPE       [25]
;    0418  1              Support_Entry ('LESI',UBA, Btd$K_UDA,ODS, <A, C>, Ds$GB_Uda50_Init, <'RC25','RCF25'>),  ! LESI         [12]
;    0419  1              Support_Entry ('RUX50',UBA, Btd$K_UDA,ODS, <A, C>, Ds$GB_Uda50_Init, <'RX31','RX32','RX50','RX100'>),!  [29]
;    0420  1              Support_Entry ('TK50', DEBNK,Btd$K_HSCCI, ANSI,<A>,0, <>),                         ! TK50             [28]
;    0421  1              Support_Entry ('TK50', TBK50,Btd$K_HSCCI, ANSI,<A>,0, <>),                         ! TK50             [G:2
;    0422  1              Support_Entry ('TK70', DEBNK,Btd$K_HSCCI, ANSI,<A>,0, <>),                         ! TK70             [51]
;    0423  1              SUPPORT_ENTRY ('RA60',KDB50,BTD$K_BDA,ODS,<A>,DS$GB_KDB50_INIT,<>),                ! KDB50 (BDA)      [34]
;    0424  1              SUPPORT_ENTRY ('RA70',KDB50,BTD$K_BDA,ODS,<A>,DS$GB_KDB50_INIT,<>),                ! KDB50 (BDA)      [49]
;    0425  1              SUPPORT_ENTRY ('RA80',KDB50,BTD$K_BDA,ODS,<A>,DS$GB_KDB50_INIT,<>),                ! KDB50 (BDA)      [34]
;    0426  1              SUPPORT_ENTRY ('RA81',KDB50,BTD$K_BDA,ODS,<A>,DS$GB_KDB50_INIT,<>),                ! KDB50 (BDA)      [34]
;    0427  1              SUPPORT_ENTRY ('RA82',KDB50,BTD$K_BDA,ODS,<A>,DS$GB_KDB50_INIT,<>),                ! KDB50 (BDA)      [41]
;    0428  1              SUPPORT_ENTRY ('RA90',KDB50,BTD$K_BDA,ODS,<A>,DS$GB_KDB50_INIT,<>),                ! KDB50 (BDA)      [41]
;    0429  1              SUPPORT_ENTRY ('RX50',KFBTA,BTD$K_BVPSSP,ODS,<A>,DS$GB_PB_INIT,<>),                ! KFBTA (BVP)      [37]
;    0430  1              SUPPORT_ENTRY ('RD52',KFBTA,BTD$K_BVPSSP,ODS,<A>,DS$GB_PB_INIT,<>),                ! KFBTA (BVP)      [37]
;    0431  1              SUPPORT_ENTRY ('RD53',KFBTA,BTD$K_BVPSSP,ODS,<A>,DS$GB_PB_INIT,<>),                ! KFBTA (BVP)      [37]
;    0432  1              SUPPORT_ENTRY ('RD54',KFBTA,BTD$K_BVPSSP,ODS,<A>,DS$GB_PB_INIT,<>)                 ! KFBTA (BVP)      [52]
;    0433  1              );                                      !                                                                  [13]
;    0434  1
;    0435  1      Global Literal                                  !                                                                  [13]
;    0436  1          Ds$GK_Support_Table_Rows = $$_Rows_$$;      !                                                                  [13]
```

```
;    0438  1      %Sbttl 'Allocate pseudo RPB'
;    0439  1
;    0440  1      !++
;    0441  1      ! Functional description:
;    0442  1      !       Allocate a block of nonpaged pool and initialize it to resemble an
;    0443  1      !       RPB data structure.  Note that it is NOT an RPB for a number of
;    0444  1      !       reasons, including the fact that it may not be page-aligned.  It is
;    0445  1      !       close enough to an RPB to make the VMS standalone BOOTDRIVR I/O
;    0446  1      !       mechanism function correctly.
;    0447  1      !                                                                          !G:19
;    0448  1      ! Input Parameters:
;    0449  1      !       04(Ap)          DeviceType (type code for device [DM, DL, MB,...])
;    0450  1      !       08(Ap)          ADPType (type code for adapter [MBA, UBA])
;    0451  1      !       12(Ap)          ADPPhy (physical/virtual address of adapter)
;    0452  1      !       16(Ap)          CSRPhy (physical/virtual address of controller)
;    0453  1      !       20(Ap)          Drive (Unit number of drive)
;    0454  1      !       24(AP)          Slave unit number
;    0455  1      !       28(AP)          Port number on CI network for HSC50.                [19]
;    0456  1      !       32(AP)          BI node number                                      [37]
;    0457  1      !
;    0458  1      ! Outputs:
;    0459  1      !       R0              0 if couldn't allocate RPB; else address of RPB
;    0460  1      !--
;    0461  1
;    0462  1      Global Routine Dsr$Allocate_Pseudo_RPB (        !                          [10]
;    0463  1              DeviceType, ADPType, CSRPhy, ADPPhy, Drive, Slave, Ciport, binode) =    !  [10]
;    0464  2          Begin                       !                                          [10]
;    0465  2
;    0466  2          Builtin                     !                                          [10]
;    0467  2              Mfpr;                   !                                          [10]
;    0468  2                                                                                 !G:19
;    0469  2          Local                       !                                          [10]
;    0470  2              RPB : Ref Block [, Byte];       !                                  [10]
;    0471  2                                                                                 !G:19
;    0472  2          If Not Exe$AloNonPaged (RPB$_Length;, RPB)  !                          [10]
;    0473  2          Then                        !                                          [10]
;    0474  2              Return 0;               !                                          [10]
;    0475  2
;    0476  2          Ch$Fill (0, RPB$_Length, .RPB);     ! Zero it for good measure         [10]
;    0477  2          .RPB = .RPB;                ! First longword is own address        [10]
;    0478  2          RPB [RPB$B_DevTyp] = .DeviceType;   !                                  [10]
;    0479  2          RPB [RPB$L_BootR1] = .binode;       !                                  [37]
;    0480  2          RPB [RPB$L_IOVec] = Boo$AL_Vector;  !                                  [10]
;    0481  2          (RPB [RPB$B_ConfReg])<0, 8> = .ADPType;     !                          [10]
;    0482  2          RPB [RPB$L_CSRPhy] = RPB [RPB$L_CSRVir] = .CSRPhy;  !                  [10]
;    0483  2          RPB [RPB$L_ADPPhy] = RPB [RPB$L_ADPVir] = .ADPPhy;  !                  [10]
;    0484  2          RPB [RPB$W_Unit] = .Drive;  !                                          [10]
;    0485  2          RPB [RPB$B_Slave] = .Slave; !                                          [10]
;    0486  2          RPB [RPB$L_BOOTR2] = .Ciport; ! HSC50 CI port number.                  [19]
;    0487  2          Boo$AL_Vector + 8 = Boo$Select - Boo$AL_Vector;     ! Initialize the entry.  [10]
;    0488  2
;    0489  2          If Not .Dse$V_User Then Mfpr (Pr$_Sbr, RPB [RPB$L_Svaspt]); ! Get sys page table addr.  [10]
;    0490  2
;    0491  2          .RPB                        !                                          [10]
;    0492  1          End;                        !                                          [10]
```

```
                                                                                .TITLE  RMS *** RMS Master RMS routines
                                                                                .IDENT  \10.11-23\

                                                                                .PSECT  WORK,NOEXE,2

                                                                  00000 RMS$FILE_TABLE::
                                                                                .BLKB   16

                                                                                .PSECT  DATA,NOWRT,NOEXE,  SHR,2

5D  54  4E  49  41  4D  53  59  53  5B  3A  30  41  53  43  00000 P.AAA:  .ASCII  \CSA0:[SYSMAINT];0\                        ;
                                                    30  3B  0000F                                                          ;
64  6C  65  69  66  29  36  2C  30  28  3A  30  41  53  43  00011 P.AAB:  .ASCII  \CSA0:(0,6)field\                          ;
                            65  6C  6F  73  6E  6F  63  07  00020 P.AAD:  .ASCII  <7>\console\                                ;
                            65  6C  6F  73  6E  6F  63  07  00028 P.AAE:  .ASCII  <7>\console\                                ;
                                        34  30  50  52  04  00030 P.AAF:  .ASCII  <4>\RP04\                                   ;
                                        35  30  50  52  04  00035 P.AAG:  .ASCII  <4>\RP05\                                   ;
                                        36  30  50  52  04  0003A P.AAH:  .ASCII  <4>\RP06\                                   ;
                                        37  30  50  52  04  0003F P.AAI:  .ASCII  <4>\RP07\                                   ;
                                        33  30  4D  52  04  00044 P.AAJ:  .ASCII  <4>\RM03\                                   ;
                                        35  30  4D  52  04  00049 P.AAK:  .ASCII  <4>\RM05\                                   ;
                                        30  38  4D  52  04  0004E P.AAL:  .ASCII  <4>\RM80\                                   ;
                                        33  30  4D  54  04  00053 P.AAM:  .ASCII  <4>\TM03\                                   ;
                                        36  31  45  54  04  00058 P.AAO:  .ASCII  <4>\TE16\                                   ;
                                        35  34  55  54  04  0005D P.AAP:  .ASCII  <4>\TU45\                                   ;
                                        37  37  55  54  04  00062 P.AAQ:  .ASCII  <4>\TU77\                                   ;
                                                            00067         .BLKB   1
                        00000000' 00000000' 00000000'  00068 P.AAN:  .ADDRESS P.AAO, P.AAP, P.AAQ                        ;
                                            00000000   00074         .LONG   0                                             ;
                                        38  37  4D  54  04  00078 P.AAR:  .ASCII  <4>\TM78\                                   ;
                                        38  37  55  54  04  0007D P.AAT:  .ASCII  <4>\TU78\                                   ;
                                                            00082         .BLKB   2
                                            00000000'  00084 P.AAS:  .ADDRESS P.AAT                                      ;
                                            00000000   00088         .LONG   0                                             ;
                                    30  33  37  42  52  05  0008C P.AAU:  .ASCII  <5>\RB730\                                  ;
                                        32  30  4C  52  04  00092 P.AAW:  .ASCII  <4>\RL02\                                   ;
                                            30  38  52  03  00097 P.AAX:  .ASCII  <3>\R80\                                    ;
                                                            0009B         .BLKB   1
                                        00000000' 00000000'  0009C P.AAV:  .ADDRESS P.AAW, P.AAX                              ;
                                            00000000   000A4         .LONG   0                                             ;
                                    30  35  41  44  55  05  000A8 P.AAY:  .ASCII  <5>\UDA50\                                  ;
                                        30  37  41  52  04  000AE P.ABA:  .ASCII  <4>\RA70\                                   ;
                                        30  38  41  52  04  000B3 P.ABB:  .ASCII  <4>\RA80\                                   ;
                                        31  38  41  52  04  000B8 P.ABC:  .ASCII  <4>\RA81\                                   ;
                                        32  38  41  52  04  000BD P.ABD:  .ASCII  <4>\RA82\                                   ;
                                        30  39  41  52  04  000C2 P.ABE:  .ASCII  <4>\RA90\                                   ;
                                        30  36  41  52  04  000C7 P.ABF:  .ASCII  <4>\RA60\                                   ;
00000000' 00000000' 00000000' 00000000' 00000000' 00000000'  000CC P.AAZ:  .ADDRESS P.ABA, P.ABB, P.ABC, P.ABD, P.ABE, P.ABF  ;
                                            00000000   000E4         .LONG   0                                             ;
                                    31  31  36  4B  52  05  000E8 P.ABG:  .ASCII  <5>\RK611\                                  ;
                                        36  30  4B  52  04  000EE P.ABI:  .ASCII  <4>\RK06\                                   ;
                                        37  30  4B  52  04  000F3 P.ABJ:  .ASCII  <4>\RK07\                                   ;
                                        00000000' 00000000'  000F8 P.ABH:  .ADDRESS P.ABI, P.ABJ                              ;
                                            00000000   00100         .LONG   0                                             ;
                                        31  31  4C  52  04  00104 P.ABK:  .ASCII  <4>\RL11\                                   ;
                                        32  30  4C  52  04  00109 P.ABM:  .ASCII  <4>\RL02\                                   ;
                                                            0010E         .BLKB   2
```

```
                                  00000000' 00110 P.ABL:  .ADDRESS P.ABM                                  ;
                                  00000000  00114         .LONG   0                                       ;
                        31  31  53  54  04  00118 P.ABN:  .ASCII  <4>\TS11\                               ;
                        34  30  53  54  04  0011D P.ABO:  .ASCII  <4>\TS04\                               ;
                        35  30  53  54  04  00122 P.ABP:  .ASCII  <4>\TS05\                               ;
                        30  38  55  54  04  00127 P.ABQ:  .ASCII  <4>\TU80\                               ;
                        31  38  55  54  04  0012C P.ABR:  .ASCII  <4>\TU81\                               ;
                45  44  4F  4E  5F  49  43  07  00131 P.ABS:  .ASCII  <7>\CI_NODE\                            ;
                        4B  53  49  44  04  00139 P.ABU:  .ASCII  <4>\DISK\                               ;
                                            0013E         .BLKB   2
                                  00000000' 00140 P.ABT:  .ADDRESS P.ABU                                  ;
                                  00000000  00144         .LONG   0                                       ;
                45  44  4F  4E  5F  49  43  07  00148 P.ABV:  .ASCII  <7>\CI_NODE\                            ;
                        45  50  41  54  04  00150 P.ABX:  .ASCII  <4>\TAPE\                               ;
                                            00155         .BLKB   3
                                  00000000' 00158 P.ABW:  .ADDRESS P.ABX                                  ;
                                  00000000  0015C         .LONG   0                                       ;
                        49  53  45  4C  04  00160 P.ABY:  .ASCII  <4>\LESI\                               ;
                        35  32  43  52  04  00165 P.ACA:  .ASCII  <4>\RC25\                               ;
                    35  32  46  43  52  05  0016A P.ACB:  .ASCII  <5>\RCF25\                              ;
                        00000000' 00000000' 00170 P.ABZ:  .ADDRESS P.ACA, P.ACB                          ;
                                  00000000  00178         .LONG   0                                       ;
                    30  35  58  55  52  05  0017C P.ACC:  .ASCII  <5>\RUX50\                              ;
                        31  33  58  52  04  00182 P.ACE:  .ASCII  <4>\RX31\                               ;
                        32  33  58  52  04  00187 P.ACF:  .ASCII  <4>\RX32\                               ;
                        30  35  58  52  04  0018C P.ACG:  .ASCII  <4>\RX50\                               ;
                    30  38  31  58  52  05  00191 P.ACH:  .ASCII  <5>\RX180\                              ;
                                            00197         .BLKB   1
        00000000' 00000000' 00000000' 00000000' 00198 P.ACD:  .ADDRESS P.ACE, P.ACF, P.ACG, P.ACH          ;
                                  00000000  001A8         .LONG   0                                       ;
                        30  35  4B  54  04  001AC P.ACI:  .ASCII  <4>\TK50\                               ;
                        30  35  4B  54  04  001B1 P.ACJ:  .ASCII  <4>\TK50\                               ;
                        30  37  4B  54  04  001B6 P.ACK:  .ASCII  <4>\TK70\                               ;
                        30  36  41  52  04  001BB P.ACL:  .ASCII  <4>\RA60\                               ;
                        30  37  41  52  04  001C0 P.ACM:  .ASCII  <4>\RA70\                               ;
                        30  38  41  52  04  001C5 P.ACN:  .ASCII  <4>\RA80\                               ;
                        31  38  41  52  04  001CA P.ACO:  .ASCII  <4>\RA81\                               ;
                        32  38  41  52  04  001CF P.ACP:  .ASCII  <4>\RA82\                               ;
                        30  39  41  52  04  001D4 P.ACQ:  .ASCII  <4>\RA90\                               ;
                        30  35  58  52  04  001D9 P.ACR:  .ASCII  <4>\RX50\                               ;
                        32  35  44  52  04  001DE P.ACS:  .ASCII  <4>\RD52\                               ;
                        33  35  44  52  04  001E3 P.ACT:  .ASCII  <4>\RD53\                               ;
                        34  35  44  52  04  001E8 P.ACU:  .ASCII  <4>\RD54\                               ;
                                            001ED         .BLKB   3
                                  00000000' 001F0 P.AAC:  .ADDRESS P.AAD                                  ;
                                        00  001F4         .BYTE   0                                       ;
                                        40  001F5         .BYTE   64                                      ;
                                        03  001F6         .BYTE   3                                       ;
                                        00  001F7         .BYTE   0                                       ;
                                  00000000  001F8         .LONG   0                                       ;
                                  00000000  001FC         .LONG   0                                       ;
                                  00000000' 00200         .ADDRESS P.AAE                                  ;
                                        00  00204         .BYTE   0                                       ;
                                        40  00205         .BYTE   64                                      ;
                                        02  00206         .BYTE   2                                       ;
                                        00  00207         .BYTE   0                                       ;
                                  00000000  00208         .LONG   0                                       ;
```

```
00000000  0020C        .LONG   0                                    ;
00000000' 00210        .ADDRESS P.AAF                               ;
      20  00214        .BYTE   32                                   ;
      00  00215        .BYTE   0                                    ;
      02  00216        .BYTE   2                                    ;
      01  00217        .BYTE   1                                    ;
00000000  00218        .LONG   0                                    ;
00000000  0021C        .LONG   0                                    ;
00000000' 00220        .ADDRESS P.AAG                               ;
      20  00224        .BYTE   32                                   ;
      00  00225        .BYTE   0                                    ;
      02  00226        .BYTE   2                                    ;
      01  00227        .BYTE   1                                    ;
00000000  00228        .LONG   0                                    ;
00000000  0022C        .LONG   0                                    ;
00000000' 00230        .ADDRESS P.AAH                               ;
      20  00234        .BYTE   32                                   ;
      00  00235        .BYTE   0                                    ;
      02  00236        .BYTE   2                                    ;
      01  00237        .BYTE   1                                    ;
00000000  00238        .LONG   0                                    ;
00000000  0023C        .LONG   0                                    ;
00000000' 00240        .ADDRESS P.AAI                               ;
      20  00244        .BYTE   32                                   ;
      00  00245        .BYTE   0                                    ;
      02  00246        .BYTE   2                                    ;
      01  00247        .BYTE   1                                    ;
00000000  00248        .LONG   0                                    ;
00000000  0024C        .LONG   0                                    ;
00000000' 00250        .ADDRESS P.AAJ                               ;
      20  00254        .BYTE   32                                   ;
      00  00255        .BYTE   0                                    ;
      02  00256        .BYTE   2                                    ;
      01  00257        .BYTE   1                                    ;
00000000  00258        .LONG   0                                    ;
00000000  0025C        .LONG   0                                    ;
00000000' 00260        .ADDRESS P.AAK                               ;
      20  00264        .BYTE   32                                   ;
      00  00265        .BYTE   0                                    ;
      02  00266        .BYTE   2                                    ;
      01  00267        .BYTE   1                                    ;
00000000  00268        .LONG   0                                    ;
00000000  0026C        .LONG   0                                    ;
00000000' 00270        .ADDRESS P.AAL                               ;
      20  00274        .BYTE   32                                   ;
      00  00275        .BYTE   0                                    ;
      02  00276        .BYTE   2                                    ;
      01  00277        .BYTE   1                                    ;
00000000  00278        .LONG   0                                    ;
00000000  0027C        .LONG   0                                    ;
00000000' 00280        .ADDRESS P.AAM                               ;
      20  00284        .BYTE   32                                   ;
      B1  00285        .BYTE   -79                                  ;
      01  00286        .BYTE   1                                    ;
      03  00287        .BYTE   3                                    ;
00000000  00288        .LONG   0                                    ;
00000000' 0028C        .ADDRESS P.AAN                               ;
```

```
00000000' 00290          .ADDRESS P.AAR                                  ;
       20  00294          .BYTE   32                                      ;
       B3  00295          .BYTE   -77                                     ;
       01  00296          .BYTE   1                                       ;
       03  00297          .BYTE   3                                       ;
00000000  00298          .LONG   0                                       ;
00000000' 0029C          .ADDRESS P.AAS                                  ;
00000000' 002A0          .ADDRESS P.AAU                                  ;
       00  002A4          .BYTE   0                                       ;
       03  002A5          .BYTE   3                                       ;
       02  002A6          .BYTE   2                                       ;
       03  002A7          .BYTE   3                                       ;
00000000  002A8          .LONG   0                                       ;
00000000' 002AC          .ADDRESS P.AAV                                  ;
00000000' 002B0          .ADDRESS P.AAY                                  ;
       00  002B4          .BYTE   0                                       ;
       11  002B5          .BYTE   17                                      ;
       02  002B6          .BYTE   2                                       ;
       03  002B7          .BYTE   3                                       ;
00000000G 002B8          .ADDRESS DS$GB_UDA50_INIT                       ;
00000000' 002BC          .ADDRESS P.AAZ                                  ;
00000000' 002C0          .ADDRESS P.ABG                                  ;
       00  002C4          .BYTE   0                                       ;
       01  002C5          .BYTE   1                                       ;
       02  002C6          .BYTE   2                                       ;
       03  002C7          .BYTE   3                                       ;
00000000  002C8          .LONG   0                                       ;
00000000' 002CC          .ADDRESS P.ABH                                  ;
00000000' 002D0          .ADDRESS P.ABK                                  ;
       00  002D4          .BYTE   0                                       ;
       02  002D5          .BYTE   2                                       ;
       02  002D6          .BYTE   2                                       ;
       03  002D7          .BYTE   3                                       ;
00000000  002D8          .LONG   0                                       ;
00000000' 002DC          .ADDRESS P.ABL                                  ;
00000000' 002E0          .ADDRESS P.ABN                                  ;
       00  002E4          .BYTE   0                                       ;
       B2  002E5          .BYTE   -78                                     ;
       01  002E6          .BYTE   1                                       ;
       01  002E7          .BYTE   1                                       ;
00000000  002E8          .LONG   0                                       ;
00000000  002EC          .LONG   0                                       ;
00000000' 002F0          .ADDRESS P.ABO                                  ;
       00  002F4          .BYTE   0                                       ;
       B2  002F5          .BYTE   -78                                     ;
       01  002F6          .BYTE   1                                       ;
       01  002F7          .BYTE   1                                       ;
00000000  002F8          .LONG   0                                       ;
00000000  002FC          .LONG   0                                       ;
00000000' 00300          .ADDRESS P.ABP                                  ;
       00  00304          .BYTE   0                                       ;
       B2  00305          .BYTE   -78                                     ;
       01  00306          .BYTE   1                                       ;
       01  00307          .BYTE   1                                       ;
00000000  00308          .LONG   0                                       ;
00000000  0030C          .LONG   0                                       ;
00000000' 00310          .ADDRESS P.ABQ                                  ;
```

```
        00  00314        .BYTE   0                                   ;
        B2  00315        .BYTE   -78                                 ;
        01  00316        .BYTE   1                                   ;
        01  00317        .BYTE   1                                   ;
  00000000  00318        .LONG   0                                   ;
  00000000  0031C        .LONG   0                                   ;
  00000000' 00320        .ADDRESS P.ABR                              ;
        00  00324        .BYTE   0                                   ;
        B4  00325        .BYTE   -76                                 ;
        01  00326        .BYTE   1                                   ;
        01  00327        .BYTE   1                                   ;
  00000000  00328        .LONG   0                                   ;
  00000000  0032C        .LONG   0                                   ;
  00000000' 00330        .ADDRESS P.ABS                              ;
        00  00334        .BYTE   0                                   ;
        20  00335        .BYTE   32                                  ;
        02  00336        .BYTE   2                                   ;
        03  00337        .BYTE   3                                   ;
  00000000G 00338        .ADDRESS DS$GB_CI_INIT                      ;
  00000000' 0033C        .ADDRESS P.ABT                              ;
  00000000' 00340        .ADDRESS P.ABV                              ;
        00  00344        .BYTE   0                                   ;
        B5  00345        .BYTE   -75                                 ;
        01  00346        .BYTE   1                                   ;
        03  00347        .BYTE   3                                   ;
  00000000G 00348        .ADDRESS DS$GB_CI_INIT                      ;
  00000000' 0034C        .ADDRESS P.ABW                              ;
  00000000' 00350        .ADDRESS P.ABY                              ;
        00  00354        .BYTE   0                                   ;
        11  00355        .BYTE   17                                  ;
        02  00356        .BYTE   2                                   ;
        03  00357        .BYTE   3                                   ;
  00000000G 00358        .ADDRESS DS$GB_UDA50_INIT                   ;
  00000000' 0035C        .ADDRESS P.ABZ                              ;
  00000000' 00360        .ADDRESS P.ACC                              ;
        00  00364        .BYTE   0                                   ;
        11  00365        .BYTE   17                                  ;
        02  00366        .BYTE   2                                   ;
        03  00367        .BYTE   3                                   ;
  00000000G 00368        .ADDRESS DS$GB_UDA50_INIT                   ;
  00000000' 0036C        .ADDRESS P.ACD                              ;
  00000000' 00370        .ADDRESS P.ACI                              ;
        00  00374        .BYTE   0                                   ;
        20  00375        .BYTE   32                                  ;
        01  00376        .BYTE   1                                   ;
        01  00377        .BYTE   1                                   ;
  00000000  00378        .LONG   0                                   ;
  00000000  0037C        .LONG   0                                   ;
  00000000' 00380        .ADDRESS P.ACJ                              ;
        00  00384        .BYTE   0                                   ;
        20  00385        .BYTE   32                                  ;
        01  00386        .BYTE   1                                   ;
        01  00387        .BYTE   1                                   ;
  00000000  00388        .LONG   0                                   ;
  00000000  0038C        .LONG   0                                   ;
  00000000' 00390        .ADDRESS P.ACK                              ;
        00  00394        .BYTE   0                                   ;
```

```
        20  00395        .BYTE   32                                  ;
        01  00396        .BYTE   1                                   ;
        01  00397        .BYTE   1                                   ;
  00000000  00398        .LONG   0                                   ;
  00000000  0039C        .LONG   0                                   ;
  00000000' 003A0        .ADDRESS P.ACL                              ;
        00  003A4        .BYTE   0                                   ;
        21  003A5        .BYTE   33                                  ;
        02  003A6        .BYTE   2                                   ;
        01  003A7        .BYTE   1                                   ;
  00000000G 003A8        .ADDRESS DS$GB_KDB50_INIT                   ;
  00000000  003AC        .LONG   0                                   ;
  00000000' 003B0        .ADDRESS P.ACM                              ;
        00  003B4        .BYTE   0                                   ;
        21  003B5        .BYTE   33                                  ;
        02  003B6        .BYTE   2                                   ;
        01  003B7        .BYTE   1                                   ;
  00000000G 003B8        .ADDRESS DS$GB_KDB50_INIT                   ;
  00000000  003BC        .LONG   0                                   ;
  00000000' 003C0        .ADDRESS P.ACN                              ;
        00  003C4        .BYTE   0                                   ;
        21  003C5        .BYTE   33                                  ;
        02  003C6        .BYTE   2                                   ;
        01  003C7        .BYTE   1                                   ;
  00000000G 003C8        .ADDRESS DS$GB_KDB50_INIT                   ;
  00000000  003CC        .LONG   0                                   ;
  00000000' 003D0        .ADDRESS P.ACO                              ;
        00  003D4        .BYTE   0                                   ;
        21  003D5        .BYTE   33                                  ;
        02  003D6        .BYTE   2                                   ;
        01  003D7        .BYTE   1                                   ;
  00000000G 003D8        .ADDRESS DS$GB_KDB50_INIT                   ;
  00000000  003DC        .LONG   0                                   ;
  00000000' 003E0        .ADDRESS P.ACP                              ;
        00  003E4        .BYTE   0                                   ;
        21  003E5        .BYTE   33                                  ;
        02  003E6        .BYTE   2                                   ;
        01  003E7        .BYTE   1                                   ;
  00000000G 003E8        .ADDRESS DS$GB_KDB50_INIT                   ;
  00000000  003EC        .LONG   0                                   ;
  00000000' 003F0        .ADDRESS P.ACQ                              ;
        00  003F4        .BYTE   0                                   ;
        21  003F5        .BYTE   33                                  ;
        02  003F6        .BYTE   2                                   ;
        01  003F7        .BYTE   1                                   ;
  00000000G 003F8        .ADDRESS DS$GB_KDB50_INIT                   ;
  00000000  003FC        .LONG   0                                   ;
  00000000' 00400        .ADDRESS P.ACR                              ;
        00  00404        .BYTE   0                                   ;
        22  00405        .BYTE   34                                  ;
        02  00406        .BYTE   2                                   ;
        01  00407        .BYTE   1                                   ;
  00000000G 00408        .ADDRESS DS$GB_PB_INIT                      ;
  00000000  0040C        .LONG   0                                   ;
  00000000' 00410        .ADDRESS P.ACS                              ;
        00  00414        .BYTE   0                                   ;
        22  00415        .BYTE   34                                  ;
```

```
                02  00416          .BYTE   2                                       ;
                01  00417          .BYTE   1                                       ;
00000000G       00418          .ADDRESS DS$GB_PB_INIT                             ;
00000000        0041C          .LONG   0                                          ;
00000000'       00420          .ADDRESS P.ACT                                     ;
                00  00424          .BYTE   0                                      ;
                22  00425          .BYTE   34                                     ;
                02  00426          .BYTE   2                                      ;
                01  00427          .BYTE   1                                      ;
00000000G       00428          .ADDRESS DS$GB_PB_INIT                             ;
00000000        0042C          .LONG   0                                          ;
00000000'       00430          .ADDRESS P.ACU                                     ;
                00  00434          .BYTE   0                                      ;
                22  00435          .BYTE   34                                     ;
                02  00436          .BYTE   2                                      ;
                01  00437          .BYTE   1                                      ;
00000000G       00438          .ADDRESS DS$GB_PB_INIT                             ;
00000000        0043C          .LONG   0                                          ;

DSA$AL_APTMAIL=     65024
DSA$GL_FLAGS=       65024
DSA$GL_APTCOM=      65028
DSA$GL_PASSES=      65032
DSA$GL_UNITS=       65036
DSA$GL_SECTNO=      65040
DSA$GL_SID=         65044
DSA$GL_MSGTYP=      65088
DSA$GL_ERRNO=       65092
DSA$GL_EVENT=       65096
DSA$GL_SUBTNO=      65100
DSA$GL_TESTNO=      65104
DSA$GL_PASSNO=      65108
DSA$GL_DEVLEN=      65112
DSA$GL_DEVNAM=      65116
DSA$GL_MSGPTR=      65128
DEF$C_BKSTP_LEN==   17
DEF$Q_BACKSTOP==    P.AAA
DEF$C_ULTRIX_LEN==  15
DEF$Q_ULTRIX==      P.AAB
DS$GA_SUPPORT_TABLE==
                    P.AAC
DS$GK_SUPPORT_TABLE_ROWS==
                    37
        .EXTRN  ULTRIX_FLAGS, DS$GB_SYSTYPE
        .EXTRN  DEF$Q_DIR, DEF$Q_DEV
        .EXTRN  BOO$SELECT, BOO$AL_VECTOR
        .EXTRN  PR$_SYS_TYP900, EXE$DEANONPAGED
        .EXTRN  EXE$ALONONPAGED
        .EXTRN  FIL$CVTFILNAM, BREAKUP_FILE
        .EXTRN  LOC$PTABLE, RT11$OPEN
        .EXTRN  ODS$OPEN, ULTRIX$OPEN
        .EXTRN  ANSI$OPEN
        .WEAK   DS$GB_UDA50_INIT
        .WEAK   DS$GB_CI_INIT, DS$GB_KDB50_INIT
        .WEAK   DS$GB_PB_INIT, PPA$LOOKUP
        .WEAK   PPA$READ, PPA$CLOSE
```

```
                                                                  .PSECT  CODE,NOWRT,  SHR,2

                                                  0FFC 00000      .ENTRY  DSR$ALLOCATE_PSEUDO_RPB, Save R2,R3,R4,R5,-  ; 0462
                                                                          R6,R7,R8,R9,R10,R11                          ;
                                 51      0110   8F  3C 00002      MOVZWL  #272, R1                                     ; 0472
                                    00000000G   EF  16 00007      JSB     EXE$ALONONPAGED                              ;
                                 56             52  D0 0000D      MOVL    R2, R6                                       ;
                                 03             50  E8 00010      BLBS    R0, 1$                                       ;
                                                50  D4 00013      CLRL    R0                                           ; 0474
                                                    04 00015      RET                                                  ;
   0110   8F          00         6E             00  2C 00016 1$:  MOVC5   #0, (SP), #0, #272, (RPB)                    ; 0476
                                                66     0001D                                                            ;
                                 66             56  D0 0001E      MOVL    RPB, (RPB)                                   ; 0477
                           66    A6        04   AC  90 00021      MOVB    DEVICETYPE, 102(RPB)                         ; 0478
                           20    A6        20   AC  D0 00026      MOVL    BINODE, 32(RPB)                              ; 0479
                           34    A6 00000000G   EF  9E 0002B      MOVAB   BOO$AL_VECTOR, 52(RPB)                       ; 0480
                         0090    C6        08   AC  90 00033      MOVB    ADPTYPE, 144(RPB)                            ; 0481
                                 50        0C   AC  D0 00039      MOVL    CSRPHY, R0                                   ; 0482
                           58    A6             50  D0 0003D      MOVL    R0, 88(RPB)                                  ;
                           54    A6             50  D0 00041      MOVL    R0, 84(RPB)                                  ;
                                 50        10   AC  D0 00045      MOVL    ADPPHY, R0                                   ; 0483
                           60    A6             50  D0 00049      MOVL    R0, 96(RPB)                                  ;
                           5C    A6             50  D0 0004D      MOVL    R0, 92(RPB)                                  ;
                           64    A6        14   AC  B0 00051      MOVW    DRIVE, 100(RPB)                              ; 0484
                           67    A6        18   AC  90 00056      MOVB    SLAVE, 103(RPB)                              ; 0485
                           24    A6        1C   AC  D0 0005B      MOVL    CIPORT, 36(RPB)                              ; 0486
                      00000000G  EF 00000000*   8F  D0 00060      MOVL    #<BOO$SELECT-BOO$AL_VECTOR>, -               ; 0487
                                                                          BOO$AL_VECTOR+8                              ;
                   04 0000FE03   9F             04  E0 0006B      BBS     #4, @#^X0000FE03, 2$                         ; 0489
                           50    A6             0C  DB 00073      MFPR    #12, 80(RPB)                                 ;
                                 50             56  D0 00077 2$:  MOVL    RPB, R0                                      ; 0492
                                                    04 0007A      RET                                                  ;

; Routine Size:  123 bytes,    Routine Base:  CODE + 0000
```

```
;   0494  1     %Sbttl 'Deallocate RPB'
;   0495  1
;   0496  1     Global Routine Dsr$Deallocate_Pseudo_RPB (RPB) =        !                                    [10]
;   0497  2         Begin                          !                                                        [10]
;   0498  2         (.RPB + 8)<0, 16> = RPB$_Length;    !                                                   [10]
;   0499  2         Exe$DeaNonPaged (.RPB)         !                                                        [10]
;   0500  1         End;                           !                                                        [10]


                                          0FFC 00000        .ENTRY  DSR$DEALLOCATE_PSEUDO_RPB, Save R2,R3,R4,-  ; 0496
                                                                    R5,R6,R7,R8,R9,R10,R11                      ;
                        50        04   AC  D0 00002        MOVL    RPB, R0                                     ; 0498
                  08    A0      0110   8F  B0 00006        MOVW    #272, 8(R0)                                 ;
                           00000000G   EF  16 0000C        JSB     EXE$DEANONPAGED                             ; 0499
                                           04 00012        RET                                                 ; 0500

; Routine Size:  19 bytes,    Routine Base:  CODE + 007B
```

```
;    0502  1     %Sbttl 'Check device support tables'
;    0503  1
;    0504  1     !+
;    0505  1     ! Function:
;    0506  1     !       Search device support tables for the controller/device specified: return various
;    0507  1     !       information on the pair.
;    0508  1     !
;    0509  1     ! Calling sequence:
;    0510  1     !       status = DSX$CHECK_SUPPORT (Device, Adapter, Btd, File, Init)
;    0511  1     !
;    0512  1     ! Inputs:
;    0513  1     !       Device          => Address of device Ptable
;    0514  1     !
;    0515  1     ! Outputs:
;    0516  1     !       Adc             => Address to receive adapter code (BOOTDRIVR)
;    0517  1     !       Btd             => Address to receive boot device type code
;    0518  1     !       File            => Address to receive file structure type code
;    0519  1     !       Init            => Address to recieve address of driver init flag byte
;    0520  1     !
;    0521  1     ! Status:
;    0522  1     !       SS$_Normal      => OK
;    0523  1     !       DS$_Error       => Device is not supported by file services
;    0524  1     !       DS$_ProgErr     => Error in support table (SPT$V_CONTROLLER set but no drive name list, or bad file structur
;    0525  1     !-
;    0526  1
;    0527  1     Global Routine DSX$Check_Support (Device, Adc, Btd, File, Init) =       !                                          [13]
;    0528  2         Begin                                                               !                                          [13]
;    0529  2
;    0530  2         Builtin                                                             !                                          [13]
;    0531  2             NullParameter;                                                  ! Determine if parameter was specified     [13]
;    0532  2
;    0533  2         Map                                                                 !                                          [13]
;    0534  2             Device : Ref $Ds_Hpo_Decl ();                                                          !G:20
;    0535  2
;    0536  2         Local                                                                                      !G:20
;    0537  2             Adapter_epb: Ref $Ds_Hpeo_decl (),                                                     !G:20
;    0538  2             Controller_Epb: Ref $Ds_Hpeo_decl (),                                      !
;    0539  2             Device_epb : Ref $Ds_Hpeo_decl (),                                 !
;    0540  2             Controller : Ref $Ds_Hpo_Decl (),                               ! Pointer to controller Ptable         [13]
;    0541  2             Adapter : Ref $DS_Hpo_Decl (),                                  ! Pointer to adapter Ptable            [13]
;    0542  2             Check_Device : Ref Vector [, Byte],                             ! Pointer for controller device name   [13]
;    0543  2             Support_Row : Ref Support_Entry_Def,                            ! Pointer to support list vector       [13]
;    0544  2             Found_Device : Byte Initial (0),                                ! flag for search
;    0545  2             PREV_ADAPTER : REF $DS_HPO_DECL (),                             ! Storage for saved copy of adapter ptable - venus     [22]
;    0546  2             PREV_CONTROLLER : REF $DS_HPO_DECL (),                          ! Storage for saved copy of controller ptable - venus  [22]
;    0547  2             PREV_PREV_CONTROLLER : REF $DS_HPO_DECL (),                     ! Storage for saved copy of controller ptable - nautilus [40
;    0548  2             PREV_PREV_ADAPTER : REF $DS_HPO_DECL ();                        ! Storage for saved copy of adapter ptable - nautilus  [40]
;    0549  2             Adapter = Controller = PREV_ADAPTER = PREV_CONTROLLER = PREV_PREV_ADAPTER = PREV_PREV_CONTROLLER =  .Device;
;    0550  2                                                                             ! Copy Ptable address                  [22] [40]
;    0551  2
;    0552  2         While .Adapter [Hp$A_Link] NeqA 0 Do                                ! Locate link Ptables                      [13]
;    0553  3             Begin                                                           !                                          [13]
;    0554  3             PREV_PREV_CONTROLLER = .PREV_CONTROLLER;                        ! save copy                                [40]
;    0555  3             PREV_CONTROLLER = .CONTROLLER;                                  ! Save copy                                [22]
;    0556  3             Controller = .Adapter;                                          ! Shift links down                         [13]
;    0557  3             PREV_PREV_ADAPTER = .PREV_ADAPTER;                              ! save copy                                [40]
;    0558  3             PREV_ADAPTER =.ADAPTER;                                         ! Save copy                                [22]
```

```
;   0559 3              Adapter = .Adapter [Hp$A_Link]                  !                                                   [13]
;   0560 2              End;                                            !                                                   [13]
;   0561 3        BEGIN                                                 !                                                   [22]
;   0562 3          BIND
;   0563 3              DEV_TYPE = ADAPTER [HP$T_TYPE] : VECTOR [, BYTE];       ! Points to ptable _LINK field                [22]
;   0564 3
;   0565 3      ! The following IF statement checks if the ptable _TYPE field is an SBIA, if so the previously saved adapter    [22]
;   0566 3      ! address is loaded into ADAPTER. This is necessary for a VENUS CPU since HUB is equal to ABUS , and a _LINK    [22]
;   0567 3      ! field of zero would indicate that the present ptable is for an SBIA.                                        [22]
;   0568 3
;   0569 4              IF (.DEV_TYPE [0] EQL 4                         ! Check for length                                    [47]
;   0570 4                 AND (.(DEV_TYPE [1]) <0,32> EQL %ASCII 'SBIA'))! Check for _TYPE filed of SBIA
;   0571 4                OR (.DEV_TYPE [0] EQL 5                       ! Check length                                        [47]
;   0572 4                 AND (.(DEV_TYPE [1]) <0,32> EQL %ASCII 'DWMB'))! Check for _type filed of DWMBA
;   0573 3              THEN                                            !                                                   [22]
;   0574 4                BEGIN                                         !                                                   [22]
;   0575 4                      CONTROLLER = .PREV_CONTROLLER;          ! Load 'previous' controller ptable address           [22]
;   0576 4                      ADAPTER = .PREV_ADAPTER;                ! Load 'prevous' adapter ptable address               [22]
;   0577 4                END                                           !                                                   [22]
;   0578 2        END;                                                  !                                                   [22]
;   0579 3        BEGIN                                                 !                                                   [40]
;   0580 3          BIND
;   0581 3              DEV_TYPE = ADAPTER [HP$T_TYPE] : VECTOR [, BYTE];       ! Points to ptable _LINK field                [40]
;   0582 3
;   0583 3      ! The following IF statement checks if the ptable _TYPE field is an NBIA, if so the PREV_PREV saved adapter    [40]
;   0584 3      ! address is loaded into ADAPTER. This is necessary for NAUTILUS and RRR CPU since the _LINK                  [40]
;   0585 3      ! field of zero would indicate that the present ptable is for an NBIA.                                        [40]
;   0586 3
;   0587 3              IF .DEV_TYPE [0] EQL 4                          ! Check for correct ASCII count of 4.                 [40]
;   0588 4              AND (.(DEV_TYPE [1]) <0,32> EQL %ASCII 'NBIA')  ! Check for _TYPE filed of NBIA                       [40]
;   0589 3              THEN                                            !                                                   [40]
;   0590 4                BEGIN                                         !                                                   [40]
;   0591 4                      CONTROLLER = .PREV_PREV_CONTROLLER;     ! Load  controller ptable address                     [40]
;   0592 4                      ADAPTER = .PREV_PREV_ADAPTER;           ! Load adapter ptable address                         [40]
;   0593 4                END                                           !                                                   [40]
;   0594 2        END;                                                  !                                                   [40]
;   0595 2          Check_Device = Controller [Hp$T_Type];              ! Point to device type of controller                  [13]
;   0596 2          Support_Row = Ds$GA_Support_Table;                  ! Point to beginning of table                         [13]
;   0597 2
;   0598 2          Incr I From 0 to Ds$GK_Support_Table_Rows - 1 Do    ! Loop through the table                              [13]
;   0599 3              Begin                                           !                                                   [13]
;   0600 3
;   0601 3              Bind                                            !                                                   [13]
;   0602 3                  Device_Type = .Support_Row [Spt$L_Type] : Vector [, Byte];          !                           [13]
;   0603 3
;   0604 3              If .Device_Type [0] Eql .Check_Device [0]       ! If device type lengths are same                     [13]
;   0605 3               And Ch$Eql (                                   ! .. and names match                                  [13]
;   0606 3                  .Device_Type [0],                           !                                                   [13]
;   0607 3                  Device_Type [1],                            !                                                   [13]
;   0608 3                  .Device_Type [0],                           !                                                   [13]
;   0609 3                  Check_Device [1]                            !                                                   [13]
;   0610 3                  )                                           !                                                   [13]
;   0611 3              Then                                            !                                                   [13]
;   0612 4                  Begin                                       ! Tentative match...verify it                         [13]
;   0613 4
;   0614 4                  Local                                       !                                                   [13]
;   0615 4                      Found_Adapter : Byte Initial (0),       ! Flag for matching adapter                           [13]
```

```
;   0616  4                 Found_Unit : Byte Initial (0);          ! Flag for matching unit                                [13]
;   0617  4
;   0618  4             If .Support_Row [Spt$V_Adapter]             ! If there should be an adapter                         [13]
;   0619  4             Then                                        !                                                       [13]
;   0620  5                 Begin                                   !                                                       [13]
;   0621  5
;   0622  5                 Bind                                    ! Bind to the adapter device type                       [13]
;   0623  5                     Adapter_Type = Adapter [Hp$T_Type] : Vector [, Byte];       !                               [13]
;   0624  5
;   0625  5                 If .Support_Row [Spt$B_Adc] Eql 0       ! If it should be a UNIBUS                              [13]
;   0626  5                  And .Adapter_Type [0] Eql 5            ! .. and string has the right length for 'DW%%%'        [26]
;   0627  5                  And .(Adapter_Type [1])<0, 16> Eql %Ascii'DW'  ! .. and it starts out right                   [26]
;   0628  5                 Then                                    !                                                       [13]
;   0629  5                     Found_Adapter = True                ! .. then mark that it's OK                             [13]
;   0630  5                 Else If .Support_Row [Spt$B_Adc] Eql 32 ! .. if it should be MASSbus                            [13]
;   0631  5                  And .Adapter_Type [0] Eql 5            ! .. and it has right length for 'RH7%0'                [13]
;   0632  5                  And .(Adapter_Type [1])<0, 24> Eql %Ascii'RH7' ! .. and it starts out right                   [13]
;   0633  5                  And .Adapter_Type [5] Eql %C'0'        ! .. and it ends right                                  [13]
;   0634  5                 Then                                    !                                                       [13]
;   0635  5                     Found_Adapter = True                ! .. then mark it as OK                                 [13]
;   0636  5
;   0637  5                 ELSE If .Support_Row [Spt$B_Adc] Eql 0  ! .. if it should be CIbus                              [18]
;   0638  5                  And .Adapter_Type [0] Eql 5            ! .. and it has right length for 'CI7%0'                [18]
;   0639  5                  And .(Adapter_Type [1])<0, 24> Eql %Ascii'CI7' ! .. and it starts out right                   [18]
;   0640  5                  And .Adapter_Type [5] Eql %C'0'        ! .. and it ends right                                  [18]
;   0641  5                 Then                                    !                                                       [18]
;   0642  5                     Found_Adapter = True                ! .. then mark it as OK                                 [18]
;   0643  5
;   0644  5                 ELSE If .Support_Row [Spt$B_Adc] Eql 0  ! .. if it should be CIbus                              [31]
;   0645  5                  And .Adapter_Type [0] Eql 5            ! .. and it has right length for 'CIBCI'                [35]
;   0646  5                  And .(Adapter_Type [1])<0, 32> Eql %Ascii'CIBC'        ! .. and it starts out right            [35]
;   0647  5                 Then                                    !                                                       [31]
;   0648  5                     Found_Adapter = True                ! .. then mark it as OK                                 [31]
;   0649  5
;   0650  5                 ELSE If .Support_Row [Spt$B_Adc] Eql 0  ! .. if it should be KDB50                              [34]
;   0651  5                  And .Adapter_Type [0] Eql 5            ! .. and it has right length for 'KDB50'                [34]
;   0652  5                  And .(Adapter_Type [1])<0, 32> Eql %Ascii'KDB5'        ! .. and it starts out right            [34]
;   0653  5                 Then                                    !                                                       [34]
;   0654  5                     Found_Adapter = True                ! .. then mark it as OK                                 [34]
;   0655  5
;   0656  5                 ELSE If .Support_Row [Spt$B_Adc] Eql 0  ! .. if it should be KFBTA                              [37]
;   0657  5                  And .Adapter_Type [0] Eql 5            ! .. and it has right length for 'KFBTA'                [37]
;   0658  5                  And .(Adapter_Type [1])<0, 32> Eql %Ascii'KFBT'        ! .. and it starts out right            [37]
;   0659  5                 Then                                    !                                                       [37]
;   0660  5                     Found_Adapter = True                ! .. then mark it as OK                                 [37]
;   0661  5
;   0662  5                 ELSE If .Support_Row [Spt$B_Adc] Eql 0  ! .. if it should be DEBNK                              [48]
;   0663  5                  And .Adapter_Type [0] Eql 5            ! .. and it has right length for 'DEBNK'                [48]
;   0664  5                  And .(Adapter_Type [1])<0, 32> Eql %Ascii'DEBN'        ! .. and it starts out right            [48]
;   0665  5                 Then                                    !                                                       [48]
;   0666  5                     Found_Adapter = True                ! .. then mark it as OK                                 [48]
;   0667  5                                                                                                        !G:10
;   0668  5                 ELSE If .Support_Row [Spt$B_Adc] Eql 0  ! .. if it should be TBK50                              [G:2
;   0669  5                  And .Adapter_Type [0] Eql 5            ! .. and it has right length for 'TBK50'                [G:2
;   0670  5                  And .(Adapter_Type [1])<0, 32> Eql %Ascii'TBK5'        ! .. and it starts out right            [G:2
;   0671  5                 Then                                    !                                                       [G:2
;   0672  5                     Found_Adapter = True                ! .. then mark it as OK                                 [G:2
```

```
;  0673  5                                                                                                  !G:21
;  0674  5                End                                          !                                                  [13]
;  0675  4            Else                                             !                                                  [13]
;  0676  4                Found_Adapter = True;                        ! Pretend we found it, if there shouldn't be any   [13]
;  0677  4
;  0678  4            If .Support_Row [Spt$V_Controller]               ! If there should be a controller, check drives    [13]
;  0679  4            Then                                             !                                                  [13]
;  0680  5                Begin                                        !                                                  [13]
;  0681  5
;  0682  5                Local                                        !                                                  [13]
;  0683  5                    Index : Initial (0);                     ! Index in list of drive names                     [13]
;  0684  5
;  0685  5                Bind                                         ! Bind to vector of names                          [13]
;  0686  5                    Drive_Vector = .Support_Row [Spt$L_Drives] : Vector;        !                          [13]
;  0687  5
;  0688  5                If Drive_Vector Eql 0                        ! If no support list                               [13]
;  0689  5                Then                                         !                                                  [13]
;  0690  5                    Return DS$_ProgErr;                      ! Return with an error                             [13]
;  0691  5
;  0692  5                While Not .Found_Unit And .Drive_Vector [.Index] Neq 0 Do       ! Loop through drive list  [13]
;  0693  6                    Begin                                    !                                                  [13]
;  0694  6
;  0695  6                    Bind                                     ! Map to ASCIC string                              [13]
;  0696  6                        Unit_Name = .Drive_Vector [.Index] : Vector [, Byte],   ! Map string to check      [13]
;  0697  6                        Device_Name = Device [Hp$T_Type] : Vector [, Byte];     ! Map device Ptable type   [13]
;  0698  6
;  0699  6                    If .Unit_Name [0] Eql .Device_Name [0]      ! If sizes are equal                       [13]
;  0700  6                     And Ch$Eql (                            ! .. and names themselves match OK                 [13]
;  0701  6                        .Unit_Name [0],                      !                                                  [13]
;  0702  6                        Unit_Name [1],                       !                                                  [13]
;  0703  6                        .Unit_Name [0],                      !                                                  [13]
;  0704  6                        Device_Name [1]                      !                                                  [13]
;  0705  6                        )                                    !                                                  [13]
;  0706  6                    Then                                     !                                                  [13]
;  0707  7                        Begin                                !                                                  [13]
;  0708  7                        Found_Unit = True;                   ! OK, this drive is supported                      [13]
;  0709  7                        ExitLoop                             ! Don't check the others                           [13]
;  0710  6                        End;                                 !                                                  [13]
;  0711  6
;  0712  6                    Index = .Index + 1                       ! Increment table index                            [13]
;  0713  6                    End                                      ! End of WHILE loop                                [13]
;  0714  6
;  0715  5                End                                          !                                                  [13]
;  0716  4            Else                                             !                                                  [13]
;  0717  4                Found_Unit = True;                           ! Mark as OK if shouldn't be a drive               [13]
;  0718  4
;  0719  4            Found_Device = (.Found_Adapter And .Found_Unit);    ! Check both search bits                   [13]
;  0720  4
;  0721  4            If .Found_Device
;  0722  5                THEN IF ((.SUPPORT_ROW [SPT$B_BTD] NEQ BTD$K_CONSOLE) OR                ! Not console or   [23]
;  0723  5
;  0724  6                        ((.SUPPORT_ROW [SPT$B_BTD] EQL BTD$K_CONSOLE) AND               ! (console and     [23]
;  0725  6                         (.DSA$GL_SID [PR$V_SID_TYPE] NEQ PR$_SID_TYP8SS) AND           !  not ZZZ cpu and [23]
;  0726  6                         (.DSA$GL_SID [PR$V_SID_TYPE] NEQ PR$_SID_TYP8NN) AND           !  not AAA cpu and [38]
;  0727  6                         (.DSA$GL_SID [PR$V_SID_TYPE] NEQ PR$_SID_TYP8RR) AND           !  not RRR cpu and [50]
;  0728  5                         (.SUPPORT_ROW [SPT$B_FILE] EQL 3))          OR                !  RT11)           [23]
;  0729  5
```

```
;    0730  6                        ((.SUPPORT_ROW [SPT$B_BTD] EQL BTD$K_CONSOLE) AND              ! ((console and          [23]
;    0731  7                         ((.DSA$GL_SID [PR$V_SID_TYPE] EQL PR$_SID_TYP8SS) OR          ! ( ZZZ cpu or           [23]
;    0732  7                         (.DSA$GL_SID [PR$V_SID_TYPE] EQL PR$_SID_TYP8NN) OR           !  AAA cpu) and          [38]
;    0733  6                         (.DSA$GL_SID [PR$V_SID_TYPE] EQL PR$_SID_TYP8RR)) AND         !  RRR cpu) and          [50]
;    0734  5                         (.SUPPORT_ROW [SPT$B_FILE] EQL 2)))                           !  ODS)                  [23]
;    0735  5
;    0736  4                       THEN EXITLOOP
;    0737  4
;    0738  3                    End;                                                               !                        [13]
;    0739  3
;    0740  3                Support_Row = .Support_Row + Spt$K_Row_Size    ! Advance to next row                        [13]
;    0741  2                End;                                           !                        [13]
;    0742  2
;    0743  2            If Not .Found_Device Then Return Ds$_Error;        ! Return with error, if not found            [13]
;    0744  2
;    0745  3                    IF      ((.SUPPORT_ROW [SPT$B_BTD] NEQ BTD$K_CONSOLE) AND          ! (not console and       [43]
;    0746  3                             (.DS$GB_SYSTYPE EQL PR$_SYS_TYP900))                      !  ANRROMEDA)            [43]
;    0747  2                            then Return DS$_ERROR ;                                                          !G:4
;    0748  2                                                                                                             !G:4
;    0749  2            If Not NullParameter (2)                           ! If output params specified, copy values    [13]
;    0750  2            Then                                               !                        [13]
;    0751  2                .Adc = .Support_Row [Spt$B_Adc];               ! .. copy adapter code                       [13]
;    0752  2
;    0753  2            If Not NullParameter (3)                           !                        [13]
;    0754  2            Then                                               !                        [13]
;    0755  2                .Btd = .Support_Row [Spt$B_Btd];               ! .. copy device code                        [13]
;    0756  2
;    0757  2            If Not NullParameter (4)                           !                        [13]
;    0758  2            Then                                               !                        [13]
;    0759  2                .File = .Support_Row [Spt$B_File];             ! .. copy file code                          [13]
;    0760  2
;    0761  2            If Not NullParameter (5)                           !                        [13]
;    0762  2            Then                                               !                        [13]
;    0763  2                .Init = .Support_Row [Spt$L_Init];             ! .. copy init address                       [13]
;    0764  2
;    0765  2            SS$_Normal                                         ! Success                [13]
;    0766  1            End;                                               ! End of routine         [13]


                                0FFC 00000          .ENTRY  DSX$CHECK_SUPPORT, Save R2,R3,R4,R5,R6,R7,- ; 0527
                                                            R8,R9,R10,R11                               ;
                     5E      08  C2 00002          SUBL2   #8, SP                                      ;
                             6E  94 00005          CLRB    FOUND_DEVICE                                ; 0544
                     52  04  AC  D0 00007          MOVL    DEVICE, PREV_PREV_CONTROLLER                ; 0549
                     55      52  D0 0000B          MOVL    PREV_PREV_CONTROLLER, PREV_PREV_ADAPTER     ;
                     53      52  D0 0000E          MOVL    PREV_PREV_CONTROLLER, PREV_CONTROLLER       ;
                     54      52  D0 00011          MOVL    PREV_PREV_CONTROLLER, PREV_ADAPTER          ;
                     50      52  D0 00014          MOVL    PREV_PREV_CONTROLLER, CONTROLLER            ;
                     57      52  D0 00017          MOVL    PREV_PREV_CONTROLLER, ADAPTER               ;
                         20  A7  D5 0001A 1$:       TSTL    32(ADAPTER)                                 ; 0552
                             15  13 0001D          BEQL    2$                                          ;
                     52      53  D0 0001F          MOVL    PREV_CONTROLLER, PREV_PREV_CONTROLLER       ; 0554
                     53      50  D0 00022          MOVL    CONTROLLER, PREV_CONTROLLER                 ; 0555
                     50      57  D0 00025          MOVL    ADAPTER, CONTROLLER                         ; 0556
```

```
                                 55          54  D0 00028        MOVL    PREV_ADAPTER, PREV_PREV_ADAPTER                 ; 0557
                                 54          57  D0 0002B        MOVL    ADAPTER, PREV_ADAPTER                           ; 0558
                                 57      20  A7  D0 0002E        MOVL    32(ADAPTER), ADAPTER                            ; 0559
                                             E6  11 00032        BRB     1$                                              ;
                                 51      26  A7  9E 00034 2$:    MOVAB   38(ADAPTER), R1                                 ; 0563
                                 04          61  91 00038        CMPB    (R1), #4                                        ; 0569
                                             0A  12 0003B        BNEQ    3$                                              ;
                        41494253 8F      01  A1  D1 0003D        CMPL    1(R1), #1095320147                              ; 0570
                                             0F  13 00045        BEQL    4$                                              ;
                                 05          61  91 00047 3$:    CMPB    (R1), #5                                        ; 0571
                                             10  12 0004A        BNEQ    5$                                              ;
                        424D5744 8F      01  A1  D1 0004C        CMPL    1(R1), #1112364868                              ; 0572
                                             06  12 00054        BNEQ    5$                                              ;
                                 50          53  D0 00056 4$:    MOVL    PREV_CONTROLLER, CONTROLLER                     ; 0575
                                 57          54  D0 00059        MOVL    PREV_ADAPTER, ADAPTER                           ; 0576
                                 51      26  A7  9E 0005C 5$:    MOVAB   38(ADAPTER), R1                                 ; 0581
                                 04          61  91 00060        CMPB    (R1), #4                                        ; 0587
                                             10  12 00063        BNEQ    6$                                              ;
                        4149424E 8F      01  A1  D1 00065        CMPL    1(R1), #1095320142                              ; 0588
                                             06  12 0006D        BNEQ    6$                                              ;
                                 50          52  D0 0006F        MOVL    PREV_PREV_CONTROLLER, CONTROLLER                ; 0591
                                 57          55  D0 00072        MOVL    PREV_PREV_ADAPTER, ADAPTER                      ; 0592
                                 54      26  A0  9E 00075 6$:    MOVAB   38(R0), CHECK_DEVICE                            ; 0595
                                 55 00000000' EF  9E 00079        MOVAB   DS$GA_SUPPORT_TABLE, SUPPORT_ROW                ; 0596
                                         04  AE  D4 00080        CLRL    I                                               ; 0598
                                 50          65  D0 00083 7$:    MOVL    (SUPPORT_ROW), R0                               ; 0602
                                 64          60  91 00086        CMPB    (R0), (CHECK_DEVICE)                            ; 0604
                                             0E  12 00089        BNEQ    8$                                              ;
                                 52          60  9A 0008B        MOVZBL  (R0), R2                                        ; 0606
                                 51          60  9A 0008E        MOVZBL  (R0), R1                                        ; 0608
        51          00      01   A0          52  2D 00091        CMPC5   R2, 1(R0), #0, R1, 1(CHECK_DEVICE)              ; 0605
                                         01  A4     00097                                                                ;
                                             03  13 00099 8$:    BEQL    9$                                              ;
                                           0153  31 0009B        BRW     28$                                             ;
                                             59  94 0009E 9$:    CLRB    FOUND_ADAPTER                                   ; 0615
                                             5B  94 000A0        CLRB    FOUND_UNIT                                      ; 0616
                                 03      07  A5  E8 000A2        BLBS    7(SUPPORT_ROW), 11$                             ; 0618
                                           00AB  31 000A6 10$:   BRW     19$                                             ;
                                 50      26  A7  9E 000A9 11$:   MOVAB   38(ADAPTER), R0                                 ; 0623
                                             51  D4 000AD        CLRL    R1                                              ; 0625
                                         04  A5  95 000AF        TSTB    4(SUPPORT_ROW)                                  ;
                                             0F  12 000B2        BNEQ    12$                                             ;
                                             51  D6 000B4        INCL    R1                                              ;
                                 05          60  91 000B6        CMPB    (R0), #5                                        ; 0626
                                             08  12 000B9        BNEQ    12$                                             ;
                            5744 8F      01  A0  B1 000BB        CMPW    1(R0), #22340                                   ; 0627
                                             E3  13 000C1        BEQL    10$                                             ;
                                 20      04  A5  91 000C3 12$:   CMPB    4(SUPPORT_ROW), #32                             ; 0630
                                             17  12 000C7        BNEQ    13$                                             ;
                                 05          60  91 000C9        CMPB    (R0), #5                                        ; 0631
                                             12  12 000CC        BNEQ    13$                                             ;
00374852  8F      01  A0         18          00  ED 000CE        CMPZV   #0, #24, 1(R0), #3622994                        ; 0632
                                             06  12 000D8        BNEQ    13$                                             ;
                                 30      05  A0  91 000DA        CMPB    5(R0), #48                                      ; 0633
                                             74  13 000DE        BEQL    19$                                             ;
                                 74          51  E9 000E0 13$:   BLBC    R1, 20$                                         ; 0637
                                 05          60  91 000E3        CMPB    (R0), #5                                        ; 0638
```

```
                                                  12  12 000E6          BNEQ    14$                                          ;
00374943   8F       01   A0          18           00  ED 000E8          CMPZV   #0, #24, 1(R0), #3623235                     ; 0639
                                                  06  12 000F2          BNEQ    14$                                          ;
                                    30       05   A0  91 000F4          CMPB    5(R0), #48                                   ; 0640
                                                  5A  13 000F8          BEQL    19$                                          ;
                                    5A           51  E9 000FA 14$:     BLBC    R1, 20$                                      ; 0644
                                    05           60  91 000FD          CMPB    (R0), #5                                     ; 0645
                                                  0A  12 00100          BNEQ    15$                                          ;
                          43424943  8F       01   A0  D1 00102          CMPL    1(R0), #1128417603                           ; 0646
                                                  48  13 0010A          BEQL    19$                                          ;
                                    48           51  E9 0010C 15$:     BLBC    R1, 20$                                      ; 0650
                                    05           60  91 0010F          CMPB    (R0), #5                                     ; 0651
                                                  0A  12 00112          BNEQ    16$                                          ;
                          3542444B  8F       01   A0  D1 00114          CMPL    1(R0), #893535307                            ; 0652
                                                  36  13 0011C          BEQL    19$                                          ;
                                    36           51  E9 0011E 16$:     BLBC    R1, 20$                                      ; 0656
                                    05           60  91 00121          CMPB    (R0), #5                                     ; 0657
                                                  0A  12 00124          BNEQ    17$                                          ;
                          5442464B  8F       01   A0  D1 00126          CMPL    1(R0), #1413629515                           ; 0658
                                                  24  13 0012E          BEQL    19$                                          ;
                                    24           51  E9 00130 17$:     BLBC    R1, 20$                                      ; 0662
                                    05           60  91 00133          CMPB    (R0), #5                                     ; 0663
                                                  0A  12 00136          BNEQ    18$                                          ;
                          4E424544  8F       01   A0  D1 00138          CMPL    1(R0), #1312965956                           ; 0664
                                                  12  13 00140          BEQL    19$                                          ;
                                    12           51  E9 00142 18$:     BLBC    R1, 20$                                      ; 0668
                                    05           60  91 00145          CMPB    (R0), #5                                     ; 0669
                                                  0D  12 00148          BNEQ    20$                                          ;
                          354B4254  8F       01   A0  D1 0014A          CMPL    1(R0), #894124628                            ; 0670
                                                  03  12 00152          BNEQ    20$                                          ;
                                    59           01  90 00154 19$:     MOVB    #1, FOUND_ADAPTER                            ; 0676
                      3D       07   A5           01  E1 00157 20$:     BBC     #1, 7(SUPPORT_ROW), 24$                      ; 0678
                                                  56  D4 0015C          CLRL    INDEX                                        ; 0683
                                    5A       0C   A5  D0 0015E          MOVL    12(SUPPORT_ROW), R10                         ; 0686
                                                  08  12 00162          BNEQ    21$                                          ; 0688
                                    50 00660020   8F  D0 00164          MOVL    #6684704, R0                                 ; 0690
                                                      04 0016B          RET                                                  ;
                                    50       04   AC  D0 0016C 21$:     MOVL    DEVICE, R0                                   ; 0697
                                    58       26   A0  9E 00170          MOVAB   38(R0), R8                                   ;
                                    25           5B  E8 00174 22$:     BLBS    FOUND_UNIT, 25$                              ; 0692
                                                6A46  D5 00177          TSTL    (R10)[INDEX]                                 ;
                                                  20  13 0017A          BEQL    25$                                          ;
                                    50          6A46  D0 0017C          MOVL    (R10)[INDEX], R0                             ; 0696
                                    68           60  91 00180          CMPB    (R0), (R8)                                   ; 0699
                                                  10  12 00183          BNEQ    23$                                          ;
                                    52           60  9A 00185          MOVZBL  (R0), R2                                     ; 0701
                                    51           60  9A 00188          MOVZBL  (R0), R1                                     ; 0703
      51          00       01   A0           52  2D 0018B          CMPC5   R2, 1(R0), #0, R1, 1(R8)                     ; 0700
                                          01   A8     00191                                                                ;
                                                  04  13 00193          BEQL    24$                                          ;
                                                  56  D6 00195 23$:     INCL    INDEX                                        ; 0712
                                                  DB  11 00197          BRB     22$                                          ;
                                    5B           01  90 00199 24$:     MOVB    #1, FOUND_UNIT                               ; 0717
                                    50           5B  92 0019C 25$:     MCOMB   FOUND_UNIT, R0                               ; 0719
                      6E           59           50  8B 0019F          BICB3   R0, FOUND_ADAPTER, FOUND_DEVICE              ;
                                    4B           6E  E9 001A3          BLBC    FOUND_DEVICE, 28$                            ; 0721
                              40   8F       05   A5  91 001A6          CMPB    5(SUPPORT_ROW), #64                          ; 0722
```

```
                                                 4E  12 001AB          BNEQ    29$                                                     ;
                                05 0000FE17      9F  91 001AD          CMPB    @#^X0000FE17, #5                                        ; 0725
                                                 18  13 001B4          BEQL    26$                                                     ;
                                06 0000FE17      9F  91 001B6          CMPB    @#^X0000FE17, #6                                        ; 0726
                                                 0F  13 001BD          BEQL    26$                                                     ;
                                11 0000FE17      9F  91 001BF          CMPB    @#^X0000FE17, #17                                       ; 0727
                                                 06  13 001C6          BEQL    26$                                                     ;
                                03       06      A5  91 001C8          CMPB    6(SUPPORT_ROW), #3                                      ; 0728
                                                 2D  13 001CC          BEQL    29$                                                     ;
                            40  8F       05      A5  91 001CE 26$:     CMPB    5(SUPPORT_ROW), #64                                     ; 0730
                                                 1C  12 001D3          BNEQ    28$                                                     ;
                                50 0000FE17      9F  9A 001D5          MOVZBL  @#^X0000FE17, R0                                        ; 0731
                                05                   50  91 001DC          CMPB    R0, #5                                                  ;
                                                     0A  13 001DF          BEQL    27$                                                     ;
                                06                   50  91 001E1          CMPB    R0, #6                                                  ; 0732
                                                     05  13 001E4          BEQL    27$                                                     ;
                                11                   50  91 001E6          CMPB    R0, #17                                                 ; 0733
                                                     06  12 001E9          BNEQ    28$                                                     ;
                                02       06          A5  91 001EB 27$:     CMPB    6(SUPPORT_ROW), #2                                      ; 0734
                                                     0A  13 001EF          BEQL    29$                                                     ;
                                55                   10  C0 001F1 28$:     ADDL2   #16, SUPPORT_ROW                                        ; 0740
        FE88        04  AE      .01                  24  F1 001F4          ACBL    #36, #1, I, 7$                                          ;
                                16                   6E  E9 001FB 29$:     BLBC    FOUND_DEVICE, 30$                                       ; 0743
                            40  8F       05          A5  91 001FE          CMPB    5(SUPPORT_ROW), #64                                     ; 0745
                                                     17  13 00203          BEQL    31$                                                     ;
00000000G  8F 00000000G  EF      08                  00  ED 00205          CMPZV   #0, #8, DS$GB_SYSTYPE, #PR$_SYS_TYP900                  ; 0746
                                                     08  12 00212          BNEQ    31$                                                     ;
                                50 00660002      8F  D0 00214 30$:     MOVL    #6684674, R0                                            ; 0747
                                                     04  0021B          RET                                                             ;
                                02                   6C  91 0021C 31$:     CMPB    (AP), #2                                                ; 0749
                                                     0A  1F 0021F          BLSSU   32$                                                     ;
                                         08      AC  D5 00221          TSTL    8(AP)                                                   ;
                                                 05  13 00224          BEQL    32$                                                     ;
                            08  BC       04      A5  9A 00226          MOVZBL  4(SUPPORT_ROW), aADC                                    ; 0751
                                03               6C  91 0022B 32$:     CMPB    (AP), #3                                                ; 0753
                                                 0A  1F 0022E          BLSSU   33$                                                     ;
                                         0C      AC  D5 00230          TSTL    12(AP)                                                  ;
                                                 05  13 00233          BEQL    33$                                                     ;
                            0C  BC       05      A5  9A 00235          MOVZBL  5(SUPPORT_ROW), aBTD                                    ; 0755
                                04               6C  91 0023A 33$:     CMPB    (AP), #4                                                ; 0757
                                                 0A  1F 0023D          BLSSU   34$                                                     ;
                                         10      AC  D5 0023F          TSTL    16(AP)                                                  ;
                                                 05  13 00242          BEQL    34$                                                     ;
                            10  BC       06      A5  9A 00244          MOVZBL  6(SUPPORT_ROW), aFILE                                   ; 0759
                                05               6C  91 00249 34$:     CMPB    (AP), #5                                                ; 0761
                                                 0A  1F 0024C          BLSSU   35$                                                     ;
                                         14      AC  D5 0024E          TSTL    20(AP)                                                  ;
                                                 05  13 00251          BEQL    35$                                                     ;
                            14  BC       08      A5  D0 00253          MOVL    8(SUPPORT_ROW), aINIT                                   ; 0763
                                50               01  D0 00258 35$:     MOVL    #1, R0                                                  ; 0766
                                                     04  0025B          RET                                                             ;

; Routine Size:  604 bytes,    Routine Base:  CODE + 008E
```

```
;    0768  1      %sbttl 'load error status'
;    0769  1
;    0770  1      !++
;    0771  1      ! Functional description:
;    0772  1      !       Set status in FAB field STS and clean up static storage for
;    0773  1      !       return.
;    0774  1      !
;    0775  1      ! Inputs:
;    0776  1      !       R0      error code
;    0777  1      ! Implicit inputs:
;    0778  1      !       R11     Pointer to FAB
;    0779  1      !       also some CBLOCK fields if the CBLOCK has been allocated
;    0780  1      ! Outputs:
;    0781  1      !       none
;    0782  1      ! Implicit outputs:
;    0783  1      !       loads error code into FAB [fab$l_sts]
;    0784  1      ! Side effects:
;    0785  1      !       It will deallocate all nonpaged pool space allocated and
;    0786  1      !       clear the RMS$FILE_TABLE entry used to point to it, as well
;    0787  1      !       as the FAB's IFI which is an index into this table.
;    0788  1      ! Return codes: R0 unaffected
;    0789  1      !--
;    0790  1
;    0791  1      global routine rms$error (code) : jsb_rms =
;    0792  2          begin
;    0793  2
;    0794  2          external register
;    0795  2              cblock = 9 : ref bblock,
;    0796  2              fab = 11 : ref bblock;
;    0797  2
;    0798  2          bind
;    0799  2              cache = cblock [ctl$l_cache1] : vector; ! Make it easy to look at
;    0800  2
;    0801  2          fab [fab$l_sts] = .code;                    ! Load the return code
;    0802  2
;    0803  2          if .cblock eql 0 then return .code;         ! Can't go further if no cblock
;    0804  2
;    0805  2          if not .code                                ! If it was an error
;    0806  2              or .cblock [ctl$b_op] eql ctl$c_close   !   or this is a close
;    0807  2          then
;    0808  3              begin                                   ! Deallocate the world!!!!!
;    0809  3
;    0810  3              if .cblock [ctl$b_op] eql ctl$c_open or .cblock [ctl$b_op] eql ctl$c_close
;    0811  3                                                      ! If we should deallocate
;    0812  3              then
;    0813  4                  begin
;    0814  4
;    0815  4                  if .cblock [ctl$l_filhdr] neq 0     ! If file header space was allocated
;    0816  4                  then
;    0817  5                      begin
;    0818  5                      (.cblock [ctl$l_filhdr] + 8)<0, 16> = ctl$c_filhdr_siz; ! Set length of filhdr
;    0819  5                      exe$deanonpaged (.cblock [ctl$l_filhdr])        ! Deallocate it
;    0820  4                      end;
;    0821  4
;    0822  4                  if .cblock [ctl$l_rpb] neq 0        ! If we allocated an RPB
;    0823  4                  then
;    0824  4                      Dsr$Deallocate_Pseudo_RPB (.cblock [ctl$l_rpb]);        ! Deallocate it                [10]
```

```
;   0825  4
;   0826  4                 if .cblock [ctl$w_file_len] neq 0   ! If we allocated a string
;   0827  4                 then
;   0828  5                     begin                           ! De-allocate it
;   0829  5                     (.cblock [ctl$l_file_ptr] + 8)<0, 16> = .cblock [ctl$w_file_alloc];
;   0830  5                                                     ! Load IRP$W_SIZE field
;   0831  5                     exe$deanonpaged (.cblock [ctl$l_file_ptr])      ! De-allocate the string
;   0832  4                     end;
;   0833  4
;   0834  4     !
;   0835  4     ! Now deallocate cache buffers if any were allocated
;   0836  4     !
;   0837  4
;   0838  4                 incr i from 0 to 2 do
;   0839  4
;   0840  4                     if .cache [.i] neq 0            ! If this buffer was allocated
;   0841  4                     then
;   0842  5                         begin
;   0843  5                         (.cache [.i] + 8)<0, 16> = .cblock [ctl$w_cache_size]*512;  ! Set size of buffer
;   0844  5                         exe$deanonpaged (.cache [.i])       ! Deallocate it
;   0845  4                         end;
;   0846  4
;   0847  4                 exe$deanonpaged (.cblock);          ! De-allocate the block
;   0848  4                 rms$file_table [.fab [fab$w_ifi]] = 0;      ! Clear table entry
;   0849  4                 cblock = 0;                         ! Clear cblock pointer
;   0850  4                 fab [fab$w_ifi] = 0                 ! Clear IFI
;   0851  4                 end
;   0852  4
;   0853  2             end;
;   0854  2
;   0855  2         if .cblock neq 0 then cblock [ctl$b_op] = 0;        ! Clear operation code
;   0856  2
;   0857  2         .code                                       ! Return what we came with
;   0858  1         end;                                        ! of rms$error



                                        3E  BB 00000 RMS$ERROR::
                                                                PUSHR   #^M<R1,R2,R3,R4,R5>                     ; 0791
                        55              50  D0 00002            MOVL    R0, R5                                  ;
                    08  AB              55  D0 00005            MOVL    CODE, 8(FAB)                            ; 0801
                                        59  D5 00009            TSTL    CBLOCK                                  ; 0803
                                        7F  13 0000B            BEQL    9$                                      ;
                        05              55  E9 0000D            BLBC    CODE, 1$                                ; 0805
                        04              69  91 00010            CMPB    (CBLOCK), #4                            ; 0806
                                        71  12 00013            BNEQ    8$                                      ;
                        01              69  91 00015 1$:        CMPB    (CBLOCK), #1                            ; 0810
                                        05  13 00018            BEQL    2$                                      ;
                        04              69  91 0001A            CMPB    (CBLOCK), #4                            ;
                                        67  12 0001D            BNEQ    8$                                      ;
                        50        54    A9  D0 0001F 2$:        MOVL    84(CBLOCK), R0                          ; 0815
                                        0C  13 00023            BEQL    3$                                      ;
                    08  A0      0200    8F  B0 00025            MOVW    #512, 8(R0)                             ; 0818
                           00000000G    EF  16 0002B            JSB     EXE$DEANONPAGED                         ; 0819
                                  38    A9  D5 00031 3$:        TSTL    56(CBLOCK)                              ; 0822
```

```
                                        08  13 00034          BEQL    4$                                          ;
                                  38    A9  DD 00036          PUSHL   56(CBLOCK)                                  ; 0824
                     FD53   CF          01  FB 00039          CALLS   #1, DSR$DEALLOCATE_PSEUDO_RPB               ;
                                  48    A9  B5 0003E 4$:      TSTW    72(CBLOCK)                                  ; 0826
                                        0F  13 00041          BEQL    5$                                          ;
                          50      4C    A9  D0 00043          MOVL    76(CBLOCK), R0                              ; 0829
                       08   A0      4A    A9  B0 00047          MOVW    74(CBLOCK), 8(R0)                           ;
                             00000000G   EF  16 0004C          JSB     EXE$DEANONPAGED                             ; 0831
                                        54  D4 00052 5$:      CLRL    I                                           ; 0838
                          50      2C A944  D0 00054 6$:      MOVL    44(CBLOCK)[I], R0                           ; 0840
                                        0E  13 00059          BEQL    7$                                          ;
          08   A0      0A   A9    0200   8F  A5 0005B          MULW3   #512, 10(CBLOCK), 8(R0)                     ; 0843
                             00000000G   EF  16 00063          JSB     EXE$DEANONPAGED                             ; 0844
               E7         54            02  F3 00069 7$:      AOBLEQ  #2, I, 6$                                   ; 0838
                          50            59  D0 0006D          MOVL    CBLOCK, R0                                  ; 0847
                             00000000G   EF  16 00070          JSB     EXE$DEANONPAGED                             ;
                          50      02    AB  3C 00076          MOVZWL  2(FAB), R0                                  ; 0848
                             00000000'EF40  D4 0007A          CLRL    RMS$FILE_TABLE[R0]                          ;
                                        59  D4 00081          CLRL    CBLOCK                                      ; 0849
                                  02    AB  B4 00083          CLRW    2(FAB)                                      ; 0850
                                        59  D5 00086 8$:      TSTL    CBLOCK                                      ; 0855
                                        02  13 00088          BEQL    9$                                          ;
                                        69  94 0008A          CLRB    (CBLOCK)                                    ;
                          50            55  D0 0008C 9$:      MOVL    CODE, R0                                    ; 0858
                                        3E  BA 0008F          POPR    #^M<R1,R2,R3,R4,R5>                         ;
                                            05 00091          RSB                                                 ;

; Routine Size:  146 bytes,    Routine Base:  CODE + 02EA

;   0859  1
```

```
;    0861  1     %sbttl 'load XAB'
;    0862  1
;    0863  1     global routine rms$load_xab : call_rms novalue =
;    0864  1
;    0865  1     !++
;    0866  1     ! Functional description:
;    0867  1     !       set the fields of the FHC XAB.
;    0868  1     !
;    0869  1     ! Inputs:
;    0870  1     !       none
;    0871  1     !
;    0872  1     ! Implicit inputs:
;    0873  1     !       R9              Pointer to the RMS control block
;    0874  1     !       R11             Pointer to the FAB block
;    0875  1     !
;    0876  1     !       all other fields are taken from the FAB or the RMS internal
;    0877  1     !       control block.
;    0878  1     !
;    0879  1     ! Outputs:
;    0880  1     !       none
;    0881  1     !
;    0882  1     ! Implicit Outputs:
;    0883  1     !       If the XAB pointer of the FAB is not zero, the XAB block is
;    0884  1     !       filled in.
;    0885  1     !
;    0886  1     ! Side Effects:
;    0887  1     !       none
;    0888  1     !
;    0889  1     ! Return codes:
;    0890  1     !       none
;    0891  1     !--
;    0892  1
;    0893  2         begin
;    0894  2
;    0895  2         external register
;    0896  2             cblock = 9 : ref bblock,                ! Pointer to control block
;    0897  2             fab = 11 : ref bblock;                  ! Pointer to FAB
;    0898  2
;    0899  2         local
;    0900  2             xab : ref bblock;
;    0901  2
;    0902  2         xab = .fab [fab$l_xab];                     ! Get first XAB address
;    0903  2
;    0904  2         while .xab neq 0                            ! while there are more XABs
;    0905  2             and .xab [xab$b_cod] neq xab$c_fhc do   !  and it's not a FHCXAB
;    0906  2             xab = .xab [xab$l_nxt];                 ! link to next XAB in chain
;    0907  2
;    0908  2         if .xab eql 0                               ! If we ran out of XABs
;    0909  2             or .xab [xab$b_bln] neq xab$c_fhclen    !  or this isn't really an FHC
;    0910  2         then
;    0911  2             return;                                 ! return to caller
;    0912  2
;    0913  2         xab [xab$b_atr] = .fab [fab$b_rat];         ! Copy attributes
;    0914  2         xab [xab$l_ebk] = .cblock [ctl$l_eofvbn];   ! Copy end-of-file VBN
;    0915  2         xab [xab$w_ffb] = .cblock [ctl$w_offbyte];  ! Copy end-of-file byte number
;    0916  2         xab [xab$b_hsz] = .fab [fab$b_fsz];         ! Copy fixed header size
;    0917  2         xab [xab$w_lrl] =                           ! Longest is maximum
```

```
;   0918  2         xab [xab$w_mrz] = .fab [fab$w_mrs];          ! Copy max record length
;   0919  2         (xab [xab$b_rfo])<0, 4> = .fab [fab$b_rfm];  ! Copy record format
;   0920  2         (xab [xab$b_rfo])<4, 4> = fab$c_seq;         ! Always sequential
;   0921  2         xab [xab$l_sbn] = .cblock [ctl$l_startlbn]   ! Copy starting block number
;   0922  1         end;                                         ! of rms$load_xab


                                                  0000 00000          .ENTRY  RMS$LOAD_XAB, Save nothing                  ; 0863
                                  50       24   AB  D0 00002          MOVL    36(FAB), XAB                                ; 0902
                                                0B  13 00006 1$:      BEQL    2$                                          ; 0904
                                  1D           60  91 00008          CMPB    (XAB), #29                                  ; 0905
                                                06  13 0000B          BEQL    2$                                          ;
                                  50       04   A0  D0 0000D          MOVL    4(XAB), XAB                                 ; 0906
                                                F3  11 00011          BRB     1$                                          ;
                                                50  D5 00013 2$:      TSTL    XAB                                         ; 0908
                                                37  13 00015          BEQL    3$                                          ;
                                  2C       01   A0  91 00017          CMPB    1(XAB), #44                                 ; 0909
                                                31  12 0001B          BNEQ    3$                                          ;
                            09    A0       1E   AB  90 0001D          MOVB    30(FAB), 9(XAB)                             ; 0913
                            10    A0       44   A9  D0 00022          MOVL    68(CBLOCK), 16(XAB)                         ; 0914
                            14    A0       42   A9  B0 00027          MOVW    66(CBLOCK), 20(XAB)                         ; 0915
                            17    A0       3F   AB  90 0002C          MOVB    63(FAB), 23(XAB)                            ; 0916
                                  51       36   AB  3C 00031          MOVZWL  54(FAB), R1                                 ; 0918
                            18    A0           51  B0 00035          MOVW    R1, 24(XAB)                                 ;
                            0A    A0           51  B0 00039          MOVW    R1, 10(XAB)                                 ;
     08   A0          04          00       1F   AB  F0 0003D          INSV    31(FAB), #0, #4, 8(XAB)                     ; 0919
                            08    A0       F0   8F  8A 00044          BICB2   #240, 8(XAB)                                ; 0920
                            28    A0       50   A9  D0 00049          MOVL    80(CBLOCK), 40(XAB)                         ; 0921
                                                    04 0004E 3$:      RET                                                 ; 0922

; Routine Size:  79 bytes,    Routine Base:  CODE + 037C


;   0923  1
```

```
;    0925  1      %sbttl 'allocate cache blocks'
;    0926  1
;    0927  1      global routine rms$alloc_cache (bufsiz) : jsb_cblock =
;    0928  1
;    0929  1      !++
;    0930  1      ! Functional description:
;    0931  1      !       Allocate cache blocks.  Since Magtape requires larger cache
;    0932  1      !       buffers than other devices, this routine allows each format-
;    0933  1      !       specific OPEN routine to allocate whatever buffer size is
;    0934  1      !       necessary.
;    0935  1      !
;    0936  1      ! Inputs:
;    0937  1      !       bufsiz          size of cache buffer needed in pages
;    0938  1      !
;    0939  1      ! Implicit inputs:
;    0940  1      !       R9              pointer to control block
;    0941  1      !
;    0942  1      ! Outputs:
;    0943  1      !       none
;    0944  1      !
;    0945  1      ! Implicit outputs:
;    0946  1      !       none
;    0947  1      !
;    0948  1      ! Side effects:
;    0949  1      !       'non-paged' pool space is allocated for each cache buffer (3).
;    0950  1      !       The cache buffer pointers in the control block are set to point
;    0951  1      !       to them, and the CACHE_SIZE word is set to the buffer length
;    0952  1      !       in pages
;    0953  1      !
;    0954  1      ! Return codes
;    0955  1      !       RMS$_NORMAL             if everything was OK
;    0956  1      !       RMS$_DME                if couldn't allocate memory
;    0957  1      !-
;    0958  2          begin
;    0959  2
;    0960  2          external register
;    0961  2              cblock = 9 : ref bblock;                ! Map to control block
;    0962  2
;    0963  2          Local                           !                                       [10]
;    0964  2              Size;                       !                                       [10]
;    0965  2
;    0966  2          cblock [ctl$w_cache_size] = size = .bufsiz; ! Set buffer size to alloc.
;    0967  2          size = .size*512;                           ! Convert to bytes
;    0968  2
;    0969  2          If Not Exe$Alononpaged (.Size;, CBlock [Ctl$L_Cache1])      !          [10]
;    0970  2          Then                            !                                       [10]
;    0971  2              Return Rms$_Dme;            ! Allocate A Buffer                     [10]
;    0972  2
;    0973  2          If Not Exe$Alononpaged (.Size;, CBlock [Ctl$L_Cache2])      !          [10]
;    0974  2          Then                            !                                       [10]
;    0975  2              Return Rms$_Dme;            !                                       [10]
;    0976  2
;    0977  2          If Not Exe$Alononpaged (.Size;, CBlock [Ctl$L_Cache3])      !          [10]
;    0978  2          Then                            !                                       [10]
;    0979  2              Return Rms$_Dme;            !                                       [10]
;    0980  2
;    0981  2          rms$_normal
```

```
;   0982  1          end;                                    ! of rms$alloc_cache



                                        1C  BB 00000 RMS$ALLOC_CACHE::
                                                          PUSHR   #^M<R2,R3,R4>                          ; 0927
                          54            50  D0 00002        MOVL    BUFSIZ, SIZE                           ; 0966
                     0A   A9            50  B0 00005        MOVW    BUFSIZ, 10(CBLOCK)                     ;
                54        54            09  78 00009        ASHL    #9, SIZE, SIZE                         ; 0967
                          51            54  D0 0000D        MOVL    SIZE, R1                               ; 0969
                             00000000G  EF  16 00010        JSB     EXE$ALONONPAGED                        ;
                     2C   A9            52  D0 00016        MOVL    R2, 44(CBLOCK)                         ;
                          20            50  E9 0001A        BLBC    R0, 1$                                 ;
                          51            54  D0 0001D        MOVL    SIZE, R1                               ; 0973
                             00000000G  EF  16 00020        JSB     EXE$ALONONPAGED                        ;
                     30   A9            52  D0 00026        MOVL    R2, 48(CBLOCK)                         ;
                          10            50  E9 0002A        BLBC    R0, 1$                                 ;
                          51            54  D0 0002D        MOVL    SIZE, R1                               ; 0977
                             00000000G  EF  16 00030        JSB     EXE$ALONONPAGED                        ;
                     34   A9            52  D0 00036        MOVL    R2, 52(CBLOCK)                         ;
                          09            50  E8 0003A        BLBS    R0, 2$                                 ;
                          50 000184D4   8F  D0 0003D 1$:    MOVL    #99540, R0                             ; 0979
                                        07  11 00044        BRB     3$                                     ;
                          50 00010001   8F  D0 00046 2$:    MOVL    #65537, R0                             ; 0982
                                        1C  BA 0004D 3$:    POPR    #^M<R2,R3,R4>                          ;
                                            05 0004F        RSB                                            ;

; Routine Size:  80 bytes,    Routine Base:  CODE + 03CB

;   0983  1
```

```
;   0985  1     %sbttl 'initialize static table'
;   0986  1
;   0987  1     !++
;   0988  1     ! Functional description:
;   0989  1     !       Set the file table pointer locations to 0.
;   0990  1     !
;   0991  1     ! Inputs: none
;   0992  1     ! Implicit inputs: none
;   0993  1     ! Outputs: none
;   0994  1     ! Implicit outputs: none
;   0995  1     ! Side effects: none
;   0996  1     ! Status return: none
;   0997  1     !--
;   0998  1
;   0999  1     global routine rms$init : jsb_none novalue =
;   1000  1
;   1001  1         incr i from 1 to 3 do
;   1002  1             rms$file_table [.i] = 0;



                                50            01  D0 00000 RMS$INIT::
                                                                  MOVL    #1, I                                   ; 1001
                                   00000000'EF40  D4 00003 1$:    CLRL    RMS$FILE_TABLE[I]                       ; 1002
                    F5          50            03  F3 0000A        AOBLEQ  #3, I, 1$                               ;
                                                  05 0000E        RSB                                             ;

; Routine Size:  15 bytes,    Routine Base:  CODE + 041B

;   1003  1
```

```
;    1005  1     %sbttl 'clean up code'
;    1006  1
;    1007  1     global routine rms$cleanup : jsb_none novalue =
;    1008  1
;    1009  1     !++
;    1010  1     ! Functional description:
;    1011  1     !       Called from CLEANUP to de-allocate any RMS static storage from
;    1012  1     !       files not properly closed due to some error.
;    1013  1     !
;    1014  1     ! Inputs : none
;    1015  1     ! Implicit inputs:
;    1016  1     !       rms$file_table  pointers to control blocks
;    1017  1     ! Outputs: None
;    1018  1     ! Implicit outputs: none
;    1019  1     ! Side effects:
;    1020  1     !       deallocates any RMS static storage
;    1021  1     !--
;    1022  1
;    1023  1         incr i from 1 to rms$c_maxfiles do
;    1024  1
;    1025  1             if .rms$file_table [.i] neq 0
;    1026  1             then
;    1027  2                 begin
;    1028  2
;    1029  2                 local
;    1030  2                     x : $fab_decl;                  ! Allocate fake FAB
;    1031  2
;    1032  2                 global register
;    1033  2                     cblock = 9 : ref bblock ,
;    1034  2                     rab = 10,
;    1035  2                     fab = 11 : ref bblock;
;    1036  2
;    1037  2                 cblock = .rms$file_table [.i];      ! Map the control block
;    1038  2                 fab = x;                            ! Map the fake FAB
;    1039  2                 rab = 0;                            ! No RAB
;    1040  2                 fab [fab$w_ifi] = .i;               ! Set the file_table index
;    1041  2                 cblock [ctl$b_op] = ctl$c_close;    ! Force de-allocate
;    1042  2                 rms$error (0)                       ! De-allocate it all
;    1043  1                 end;


                        0E00    8F   BB 00000 RMS$CLEANUP::
                                             PUSHR   #^M<R9,R10,R11>                 ; 1007
                     5E     B0    AE   9E 00004         MOVAB   -B0(SP), SP             ;
                     51           01   D0 00008         MOVL    #1, I                   ; 1023
                     50 00000000'EF41   D0 0000B 1$:     MOVL    RMS$FILE_TABLE[I], R0   ; 1025
                                  14   13 00013         BEQL    2$                      ;
                     59           50   D0 00015         MOVL    R0, CBLOCK              ; 1037
                     5B           6E   9E 00018         MOVAB   X, FAB                  ; 1038
                                  5A   D4 0001B         CLRL    RAB                     ; 1039
                  02 AB           51   B0 0001D         MOVW    I, 2(FAB)               ; 1040
                     69           04   90 00021         MOVB    #4, (CBLOCK)            ; 1041
                                  50   D4 00024         CLRL    R0                      ; 1042
                                FE97   30 00026         BSBW    RMS$ERROR               ;
```

```
                     DE          51          03  F3 00029 2$:     AOBLEQ  #3, I, 1$                          ; 1023
                                 5E       50 AE  9E 0002D         MOVAB   80(SP), SP                          ; 1043
                                       0E00 8F  BA 00031         POPR    #^M<R9,R10,R11>                     ;
                                            05  00035           RSB                                         ;

; Routine Size:  54 bytes,    Routine Base:  CODE + 042A

;   1044  1
```

```
;   1046  1     %sbttl 'load error code in RAB'
;   1047  1     routine rab$error (code) : jsb_rms =
;   1048  1
;   1049  1     !++
;   1050  1     ! Functional description:
;   1051  1     !       Sets error code into RAB
;   1052  1     ! Inputs:
;   1053  1     !       code            the error code
;   1054  1     ! Implicit inputs:
;   1055  1     !       R10             pointer to RAB
;   1056  1     ! Outputs: none
;   1057  1     ! Implicit outputs: none
;   1058  1     ! Side effects: none
;   1059  1     ! Return status:
;   1060  1     !       same as code input
;   1061  1     !--
;   1062  1
;   1063  2         begin
;   1064  2
;   1065  2         external register
;   1066  2             rab = 10 : ref bblock;
;   1067  2
;   1068  3         (rab [rab$l_sts] = .code)
;   1069  1         end;                                    ! of rab$error


                    08   AA          50  D0 00000 RAB$ERROR:
                                                 MOVL    CODE, 8(RAB)                    ; 1068
                                         05 00004 RSB                                    ; 1069

; Routine Size:  5 bytes,    Routine Base:  CODE + 0460
```

```
;    1071  1     %sbttl 'load FAB error code'
;    1072  1     routine fab$error (code) : jsb_rms =
;    1073  1
;    1074  1     !++
;    1075  1     ! Functional description:
;    1076  1     !       Sets error code into FAB
;    1077  1     ! Inputs:
;    1078  1     !       code            the error code
;    1079  1     ! Implicit inputs:
;    1080  1     !       R11             pointer to FAB
;    1081  1     ! Outputs: none
;    1082  1     ! Implicit outputs: none
;    1083  1     ! Side effects: none
;    1084  1     ! Return status:
;    1085  1     !       same as code input
;    1086  1     !--
;    1087  1
;    1088  2         begin
;    1089  2
;    1090  2         external register
;    1091  2             fab = 11 : ref bblock;
;    1092  2
;    1093  3         (fab [fab$l_sts] = .code)
;    1094  1         end;                                        ! of fab$error


                        08   AB          50  D0 00000 FAB$ERROR:
                                                     MOVL    CODE, 8(FAB)                    ; 1093
                                             05 00004        RSB                             ; 1094

; Routine Size:  5 bytes,    Routine Base:  CODE + 0465
```

```
;   1096  1     %sbttl 'verify validity of FAB'
;   1097  1     routine verify_fab : jsb_rms =
;   1098  1
;   1099  1     !++
;   1100  1     ! Functional description:
;   1101  1     !       Check the ID fields of the FAB to be sure it's really a FAB
;   1102  1     ! Inputs: none
;   1103  1     ! Implicit inputs:
;   1104  1     !       R11             pointer to the FAB to verify
;   1105  1     ! Outputs: none
;   1106  1     ! Implicit outputs: none
;   1107  1     ! Side effects: none
;   1108  1     ! Return codes:
;   1109  1     !       0               not a FAB
;   1110  1     !       1               A good FAB
;   1111  1     !--
;   1112  1
;   1113  2         begin
;   1114  2
;   1115  2         external register
;   1116  2             fab = 11 : ref bblock;
;   1117  2
;   1118  2         if .fab [fab$b_bid] neq fab$c_bid           ! If the ID byte is wrong,
;   1119  2             or .fab [fab$b_bln] neq fab$c_bln       !  or the length is wrong
;   1120  2         then
;   1121  2             return 0;                               ! it's no good
;   1122  2
;   1123  2         1
;   1124  1         end;                                        ! of verify_fab



                        03          6B  91 00000 VERIFY_FAB:
                                                     CMPB    (FAB), #3                       ; 1118
                                    07  12 00003     BNEQ    1$                              ;
                    50  8F      01  AB  91 00005     CMPB    1(FAB), #80                     ; 1119
                                    03  13 0000A     BEQL    2$                              ;
                                    50  D4 0000C 1$: CLRL    R0                              ; 1121
                                        05 0000E     RSB                                     ;
                        50          01  D0 0000F 2$: MOVL    #1, R0                          ; 1124
                                        05 00012     RSB                                     ;

; Routine Size:  19 bytes,    Routine Base:  CODE + 046A
```

```
;    1126  1     %sbttl 'verify cblock'
;    1127  1     routine verify_cblock : jsb_rms =
;    1128  1
;    1129  1     !++
;    1130  1     ! Functional description:
;    1131  1     !       Initialize the global CBLOCK pointer (R9) by using a FAB's
;    1132  1     !       IFI field as index into the RMS$FILE_TABLE array of cblock
;    1133  1     !       pointers.
;    1134  1     ! Inputs: none
;    1135  1     ! Implicit inputs:
;    1136  1     !       R11             pointer to FAB
;    1137  1     ! Outputs: none
;    1138  1     ! Implicit outputs:
;    1139  1     !       R9              pointer to CBLOCK
;    1140  1     ! Side Effects: none
;    1141  1     ! Return codes:
;    1142  1     !       0               IFI or RMS$FILE_TABLE entry is invalid
;    1143  1     !       1               Alright
;    1144  1     !--
;    1145  1
;    1146  2         begin
;    1147  2
;    1148  2         external register
;    1149  2             cblock = 9,                             ! Global pointer to Cblock
;    1150  2             fab = 11 : ref bblock;                  ! Global pointer to FAB
;    1151  2
;    1152  2         local
;    1153  2             ifi;
;    1154  2
;    1155  2         ifi = .fab [fab$w_ifi];                     ! Get the IFI index
;    1156  2
;    1157  2         if .ifi leq 0 or .ifi gtr rms$c_maxfiles    ! If the ifi is bad
;    1158  2             or (cblock = .rms$file_table [.ifi]) eql 0      ! or the entry is bad
;    1159  2         then
;    1160  2             return (cblock = 0);                    ! Clear cblock and return
;    1161  2
;    1162  2         1
;    1163  1         end;                                        ! of verify_cblock



                                50       02    AB  3C 00000 VERIFY_CBLOCK:
                                                            MOVZWL  2(FAB), IFI                     ; 1155
                                               0F  15 00004         BLEQ    1$                      ; 1157
                                03             50  D1 00006         CMPL    IFI, #3                 ;
                                               0A  14 00009         BGTR    1$                      ;
                                59 00000000'EF40  D0 0000B         MOVL    RMS$FILE_TABLE[IFI], CBLOCK     ; 1158
                                               05  12 00013         BNEQ    2$                      ;
                                               59  D4 00015 1$:     CLRL    CBLOCK                  ; 1160
                                               50  D4 00017         CLRL    R0                      ;
                                                   05 00019         RSB                             ;
                                50             01  D0 0001A 2$:     MOVL    #1, R0                  ; 1163
                                                   05 0001D         RSB                             ;

; Routine Size:  30 bytes,    Routine Base:  CODE + 047D
```

```
;    1165  1     %sbttl 'verify validity of RAB'
;    1166  1     routine verify_rab : jsb_rms =
;    1167  1
;    1168  1     !++
;    1169  1     ! Functional description:
;    1170  1     !       Check the ID fields of the RAB to be sure it's really a RAB
;    1171  1     ! Inputs: none
;    1172  1     ! Implicit inputs:
;    1173  1     !       R10             pointer to the RAB to verify
;    1174  1     ! Outputs: none
;    1175  1     ! Implicit outputs: none
;    1176  1     ! Side effects: none
;    1177  1     ! Return codes:
;    1178  1     !       0               not a RAB
;    1179  1     !       1               A good RAB
;    1180  1     !--
;    1181  1
;    1182  2         begin
;    1183  2
;    1184  2         external register
;    1185  2             rab = 10 : ref bblock;
;    1186  2
;    1187  2         if .rab [rab$b_bid] neq rab$c_bid           ! If the ID byte is wrong,
;    1188  2             or .rab [rab$b_bln] neq rab$c_bln       !  or the length is wrong
;    1189  2         then
;    1190  2             return 0;                               ! it's no good
;    1191  2
;    1192  2         1
;    1193  1         end;                                        ! of verify_rab



                                    01          6A  91 00000 VERIFY_RAB:
                                                             CMPB    (RAB), #1                       ; 1187
                                                07  12 00003         BNEQ    1$                      ;
                                44  8F      01  AA  91 00005         CMPB    1(RAB), #68             ; 1188
                                                03  13 0000A         BEQL    2$                      ;
                                                50  D4 0000C 1$:     CLRL    R0                      ; 1190
                                                    05 0000E         RSB                             ;
                                    50          01  D0 0000F 2$:     MOVL    #1, R0                  ; 1193
                                                    05 00012         RSB                             ;

; Routine Size:  19 bytes,    Routine Base:  CODE + 049B
```

```
;    1195  1      %sbttl 'RMS$OPEN routine'
;    1196  1
;    1197  1      global routine rms$open (fabptr) =
;    1198  1
;    1199  1      !++
;    1200  1      ! Functional Description:
;    1201  1      !       Search for the file designated by the FAB filename field (with
;    1202  1      !       appropriate defaults added).  If file is found, set fields in
;    1203  1      !       FAB, NAM and XAB blocks to values retrieved from the file header
;    1204  1      !       or other media areas.
;    1205  1      !
;    1206  1      ! Inputs:
;    1207  1      !       fabptr          Address of the FAB block to control access to
;    1208  1      !                       this file.
;    1209  1      !
;    1210  1      ! Implicit inputs:
;    1211  1      !       fab$l_nam       points to the NAM block associated with this FAB.
;    1212  1      !       fab$l_xab       points to the XAB chain associated with this FAB.
;    1213  1      !       several other pointers with the FAB, NAM and XAB blocks which
;    1214  1      !       determine the type of file manipulations, what values are to be
;    1215  1      !       returned, etc.
;    1216  1      !
;    1217  1      ! Outputs:
;    1218  1      !       R0              status code
;    1219  1      !
;    1220  1      ! Implicit Outputs:
;    1221  1      !       many fields in the FAB, NAM and XAB are set to describe the file
;    1222  1      !       just opened.
;    1223  1      !
;    1224  1      ! Side Effects:
;    1225  1      !       Dynamic pool space is allocated and initialized.  This includes
;    1226  1      !       a copy of the file header, and several blocks for file caching.
;    1227  1      !
;    1228  1      ! Return codes:
;    1229  1      !       RMS$_NORMAL                     Everything's cool
;    1230  1      !       RMS$_ACC                        Error accessing file
;    1231  1      !       RMS$_FAB                        Bad FAB
;    1232  1      !       RMS$_DME                        insufficient memory for internal
;    1233  1      !                                       data structures
;    1234  1      !       RMS$_ORG                        Invalid file organization (only
;    1235  1      !                                       Sequential supported)
;    1236  1      !--
;    1237  1
;    1238  2          begin
;    1239  2
;    1240  2          global register
;    1241  2              cblock = 9 : ref bblock ,               ! Pointer to control block
;    1242  2              rab = 10 : ref bblock ,                 ! RMS package globals
;    1243  2              fab = 11 : ref bblock;
;    1244  2
;    1245  2          local
;    1246  2              CBlockSize : Word,                      ! Return from AloNonPaged
;    1247  2              file_index,                             ! Potential IFI
;    1248  2              filedesc : bblock [dsc$c_s_bln*5],      ! Descriptors for filename parts
;    1249  2              filename : bblock [nam$c_maxrss],       ! Final filename buffer
;    1250  2              filenamedesc : bblock [dsc$c_s_bln];    ! Descriptor for filename
;    1251  2
```

```
;   1252  2     !
;   1253  2     ! first, check consistency.  Specifically, be sure that the
;   1254  2     ! 'FAB' passed really IS a FAB block.  Accept no substitutes
;   1255  2     !
;   1256  2         rab = 0;                                    ! No RAB for OPEN service
;   1257  2         cblock = 0;                                 ! No cblock yet
;   1258  2         fab = .fabptr;                              ! Set FAB pointer
;   1259  2
;   1260  2         if not verify_fab () then return (rms$_fab);        ! Invalid FAB
;   1261  2
;   1262  2         if .fab [fab$b_org] neq fab$c_seq then return rms$error (rms$_org); ! DS only supports sequential
;   1263  2
;   1264  2         fab [fab$w_ifi] = 0;                        ! Pre-clear ifi
;   1265  3         file_index = (incr i from 1 to 3 do         ! Find un-used IFI
;   1266  2             if .rms$file_table [.i] eql 0 then exitloop .i);
;   1267  2
;   1268  2         if .file_index eql -1                       ! If no open slot,
;   1269  2         then
;   1270  2             return (fab [fab$l_sts] = rms$_dme);    ! Error
;   1271  2
;   1272  2         If Not Exe$Alononpaged (Ctl$C_Length; CblockSize, CBlock)   !                                   [11]
;   1273  2         Then                                        !                                                   [10]
;   1274  2             Return (Fab [Fab$L_Sts] = Rms$_Dme);    ! Error If Can'T Allocate                           [10]
;   1275  2
;   1276  2         Rms$File_Table [.File_Index] = .CBlock;     ! Set file pointer
;   1277  2         ch$fill (0, ctl$c_length, .cblock);         ! Clear the table
;   1278  2         CBlock [Ctl$W_Size] = .CblockSize;          ! set structure size                                [11]
;   1279  2         cblock [ctl$b_op] = ctl$c_open;             ! Set operation code
;   1280  2         fab [fab$w_ifi] = .file_index;              ! Store pointer to it
;   1281  2
;   1282  2     !
;   1283  2     ! Initialize FAB fields
;   1284  2     !
;   1285  2         fab [fab$w_mrs] = fab [fab$b_bks] =         ! Clear a few fields
;   1286  2         fab [fab$l_stv] = fab [fab$l_mrn] = fab [fab$l_sdc] = 0;
;   1287  2         fab [fab$l_sts] = rms$_suc;                 ! Pre-set success code
;   1288  2         ch$fill (0, dsc$c_s_bln*5, filedesc);       ! Initialize filespec parts
;   1289  2     !
;   1290  2     ! Set file name for proper disk structure
;   1291  2     !
;   1292  2          If (.ultrix_flags)<ultrix_v_mode,1>        !                                   [32]
;   1293  2         Then                                        !                                   [32]
;   1294  3        begin                                        !                                   [32]
;   1295  3       breakup_file (def$c_ultrix_len, def$q_ultrix, filedesc);      ! Ultimate system default[32]
;   1296  3       breakup_file (.def$q_dev [dsc$w_length],      ! Load DS default device            [32]
;   1297  3             .def$q_dev [dsc$a_pointer], filedesc);  !                                   [32]
;   1298  3         breakup_file (.def$q_dir [dsc$w_length],    ! Load DS default filespec          [32]
;   1299  3             .def$q_dir [dsc$a_pointer], filedesc);  !                                   [32]
;   1300  3         End                                         !                                   [32]
;   1301  2         Else                                        !                                   [32]
;   1302  3         begin                                       !                                   [32]
;   1303  3         breakup_file (def$c_bkstp_len, def$q_backstop, filedesc);   ! Ultimate system default
;   1304  3         breakup_file (.def$q_dev [dsc$w_length],    ! Load DS default device
;   1305  3             .def$q_dev [dsc$a_pointer], filedesc);
;   1306  3         breakup_file (.def$q_dir [dsc$w_length],    ! Load DS default filespec
;   1307  3             .def$q_dir [dsc$a_pointer], filedesc);
;   1308  3         breakup_file (.fab [fab$b_dns],             ! Load user's default filespec
```

```
;    1309  3            .fab [fab$l_dna], filedesc);
;    1310  2        End;                                        !                                   [32]
;    1311  2        breakup_file (.fab [fab$b_fns],             ! Load filespec
;    1312  2            .fab [fab$l_fna], filedesc);
;    1313  3        begin
;    1314  4        begin
;    1315  4
;    1316  4        local
;    1317  4            pointer,
;    1318  4            length;
;    1319  4
;    1320  4        pointer = filename;                         ! Point to filename buffer
;    1321  4        length = nam$c_maxrss;
;    1322  4        filenamedesc [dsc$a_pointer] = .pointer;    ! And set final descriptor
;    1323  4
;    1324  4        incr i from 0 to 4 do                       ! For each field
;    1325  5            begin
;    1326  5
;    1327  5            bind
;    1328  5                d = filedesc + .i*dsc$c_s_bln : bblock;     ! Isolate field to load
;    1329  5
;    1330  5            local
;    1331  5                len,
;    1332  5                ptr;
;    1333  5
;    1334  5            len = .d [dsc$w_length];
;    1335  5            ptr = .d [dsc$a_pointer];
;    1336  5
;    1337  5            while (len = .len - 1) geq 0 and (length = .length - 1) geq 0 do
;    1338  5                ch$wchar_a (ch$rchar_a (ptr), pointer)
;    1339  5
;    1340  4            end;
;    1341  4
;    1342  4        filenamedesc [dsc$w_length] = .pointer - filename;  ! Get final length
;    1343  3        end;
;    1344  3    !
;    1345  3    ! Now, copy filename into system pool space, and set up file control
;    1346  3    ! block descriptor to it.
;    1347  3    !
;    1348  3
;    1349  3        If Not Exe$Alononpaged (    !                                                   [10]
;    1350  3            Cblock [Ctl$W_File_Len] = .Filenamedesc [Dsc$W_Length]; !                   [10]
;    1351  3            CBlock [Ctl$W_File_Alloc],      !                                           [10]
;    1352  3            CBlock [Ctl$L_File_Ptr])        !                                           [10]
;    1353  3        Then                                !                                           [10]
;    1354  3            Return Rms$Error (Rms$_Dme);    ! Fatal If Can'T Allocate                   [10]
;    1355  3
;    1356  3        ch$move (.filenamedesc [dsc$w_length], .filenamedesc [dsc$a_pointer], .cblock [ctl$l_file_ptr]);
;    1357  3                                            ! Copy the string itself
;    1358  2        end;                                ! of file merge
;    1359  2    !
;    1360  2    ! Now, access the file and set up static pointers, FAB fields, etc.
;    1361  2    !
;    1362  3        begin
;    1363  3
;    1364  3        local
;    1365  3            devlen,
```

```
;  1366 3            devptr : ref vector [, word],          ! Map to check fst 2 chars
;  1367 3            stat;
;  1368 3
;  1369 3        linkage
;  1370 3            jsb_device = jsb (register = 4, register = 5;   !                                    [07]
;  1371 3                register = 0, register  = 1);       !                                            [07]
;  1372 3
;  1373 3        external routine
;  1374 3            scan$device : jsb_device novalue addressing_mode (long_relative);
;  1375 3
;  1376 3        scan$device (.filenamedesc [dsc$w_length],  !                                            [07]
;  1377 3                .filenamedesc [dsc$a_pointer];      !                                            [07]
;  1378 3                devlen, devptr);    ! Check for device name                                      [07]
;  1379 3        cblock [ctl$w_unit] = .devlen<16, 16, 1>;   ! Store unit number returned
;  1380 3        stat =                      ! Do the device dependent part                               [07]
;  1381 4            begin                   !                                                            [07]
;  1382 4
;  1383 4            local
;  1384 4                adapter_epb: ref $ds_hpeo_decl (),   ! Extended ptable for adapter                !G:20
;  1385 4                controller_epb: ref $ds_hpeo_decl (),! Extended ptable for controllel             !G:20
;  1386 4                device_epb: ref $ds_hpeo_decl(),     ! Extended ptable for device                 !G:20
;  1387 4                adapter_addr_ext: long,              ! temp address of end of EPB                 !G:20
;  1388 4                controller_addr_ext: long,           ! temp address of end of EPB                 !G:20
;  1389 4                device_addr_ext: long,               ! temp address of end of EPB                 !G:20
;  1390 4                                                                                                    !G:20
;  1391 4                AdapterType,        !                                                            [10]
;  1392 4                DeviceType,         !                                                            [10]
;  1393 4                DeviceUnit,         !                                                            [10]
;  1394 4                SlaveNumber,        !                                                            [10]
;  1395 4                Cinumber,           !                                                            [19]
;  1396 4                binode,             !                                                            [37]
;  1397 4                OpenRoutine,        !                                                            [10]
;  1398 4                FileFormat,         ! Fileformat code                                            [13]
;  1399 4                InitByte,           ! Address of byte to clear to cause driver init on file open [28]
;  1400 4                Status,             ! Status return                                              [13]
;  1401 4                device : ref $ds_hpo_decl (),       ! Pointer to device PTABLE
;  1402 4                controller : ref $ds_hpo_decl (),   ! Pointer to controller PTABLE
;  1403 4                adapter : ref $ds_hpo_decl (),      ! Pointer to adapter PTABLE
;  1404 4                PREV_CONTROLLER : REF $DS_HPO_DECL (),!Storage for previous controller ptable address [22]
;  1405 4                PREV_ADAPTER : REF $DS_HPO_DECL (), ! Storage for previous adapter ptable address [22]
;  1406 4            PREV_PREV_CONTROLLER : REF $DS_HPO_DECL (),     ! Storage for saved copy of controller ptable - nautilus [40
;  1407 4            PREV_PREV_ADAPTER : REF $DS_HPO_DECL ();        ! Storage for saved copy of adapter ptable - nautilus   [40]
;  1408 4
;  1409 4            SlaveNumber = 0;        !                                                            [10]
;  1410 4            OpenRoutine = 0;        !                                                            [10]
;  1411 4            Cinumber    = 0;        !                                                            [19]
;  1412 4            binode      = 0;        !                                                            [37]
;  1413 4            Loc$Ptable (.DevLen<0, 16>, .DevPtr, -1; Device);       ! Find the ptable            [09]
;  1414 4
;  1415 4            If .Device Eql 0 Then Return Rms$Error (Rms$_Dev);      ! If none, error
;  1416 4            Controller = Adapter = CBlock [Ctl$L_Ptable] = PREV_ADAPTER = PREV_CONTROLLER = PREV_PREV_ADAPTER
;  1417 4                       = PREV_PREV_CONTROLLER =  .Device;! Output R1 = ptable pointer            [22] [40]
;  1418 4
;  1419 4        While .Adapter [Hp$A_Link] NeqA 0 Do                ! Locate link Ptables
;  1420 5            Begin                                           !                                            [13]
;  1421 5            PREV_PREV_CONTROLLER = .PREV_CONTROLLER;        ! save copy                                  [40]
;  1422 5            PREV_CONTROLLER = .CONTROLLER;                  ! Save copy                                  [22]
```

```
;  1423  5            Controller = .Adapter;                          ! Shift links down                                  [13]
;  1424  5            PREV_PREV_ADAPTER = .PREV_ADAPTER;              ! save copy                                         [40]
;  1425  5            PREV_ADAPTER =.ADAPTER;                         ! Save copy                                         [22]
;  1426  5            Adapter = .Adapter [Hp$A_Link]                  !                                                   [13]
;  1427  4            End;                                            !                                                   [13]
;  1428  5        BEGIN                                               !                                                   [22]
;  1429  5          BIND
;  1430  5            DEV_TYPE = ADAPTER [HP$T_TYPE] : VECTOR [, BYTE];       ! Points to ptable _LINK field                [22]
;  1431  5
;  1432  5      ! The following IF statement checks if the ptable _TYPE field is an SBIA, if so the previously saved adapter   [22]
;  1433  5      ! address is loaded into ADAPTER. This is necessary for a VENUS CPU since HUB is equal to ABUS , and a _LINK   [22]
;  1434  5      ! filed of zero would indicate that the present ptable is for an SBIA.                                      [22]
;  1435  5
;  1436  6            IF (.DEV_TYPE [0] EQL 4                         ! Check for length                                  [47]
;  1437  6               AND (.(DEV_TYPE [1]) <0,32> EQL %ASCII 'SBIA'))! Check for _TYPE filed of SBIA
;  1438  6              OR (.DEV_TYPE [0] EQL 5                       ! Check length                                      [47]
;  1439  6               AND (.(DEV_TYPE [1]) <0,32> EQL %ASCII 'DWMB'))! Check for _type filed of DWMBA
;  1440  5            THEN                                            !                                                   [22]
;  1441  6              BEGIN                                         !                                                   [22]
;  1442  6                    CONTROLLER = .PREV_CONTROLLER;          ! Load 'previous' controller ptable address          [22]
;  1443  6                    ADAPTER = .PREV_ADAPTER;                ! Load 'prevous' adapter ptable address              [22]
;  1444  6              END                                           !                                                   [22]
;  1445  4          END;                                              !                                                   [22]
;  1446  5        BEGIN                                               !                                                   [40]
;  1447  5          BIND
;  1448  5            DEV_TYPE = ADAPTER [HP$T_TYPE] : VECTOR [, BYTE];       ! Points to ptable _LINK field                [40]
;  1449  5                                                                                                        !G:21
;  1450  5      ! The following IF statement checks if the ptable _TYPE field is an NBIA, if so the PREV_PREV saved adapter    [40]
;  1451  5      ! address is loaded into ADAPTER. This is necessary for NAUTILUS and RRR CPU since the _LINK                  [40]
;  1452  5      ! field of zero would indicate that the present ptable is for an NBIA.                                      [40]
;  1453  5
;  1454  5            IF .DEV_TYPE [0] EQL 4                          ! Check for correct ASCII count of 4.                [40]
;  1455  5            AND .(DEV_TYPE [1]) <0,32> EQL %ASCII 'NBIA'    ! Check for _TYPE filed of NBIA                      [40]
;  1456  5            THEN                                            !                                                   [40]
;  1457  6              BEGIN                                         !                                                   [40]
;  1458  6                    CONTROLLER = .PREV_PREV_CONTROLLER;     ! Load  controller ptable address                    [40]
;  1459  6                    ADAPTER = .PREV_PREV_ADAPTER;           ! Load adapter ptable address                        [40]
;  1460  6              END                                           !                                                   [40]
;  1461  4        END;                                                !                                                   [40]
;  1462  4            device_addr_ext =  (.device + .device[Hp$w_size]) - 4;                                        !G:20
;  1463  4            Device_Epb      =  ..device_addr_ext;                                                         !G:20
;  1464  4            If .(Device [Hp$T_device] ) <0,32> EQL %ASCII '_DUS'   ! Check if device is a shadow member          [46]
;  1465  4            Then                                            !                                                   [46]
;  1466  4              deviceUnit      =  (.device_epb [Hpe$w_ext_drive]) or 32768                                 !G:20
;  1467  4            Else                                                                                          !G:21
;  1468  4              deviceUnit      =  .device_epb [Hpe$w_ext_drive];                                           !G:20
;  1469  4                                                                                                          !G:19
;  1470  4            Status = DSX$Check_Support (.Device, AdapterType, DeviceType, FileFormat, InitByte);    !      [13]
;  1471  4
;  1472  4            If Not .Status                                  ! If device not supported                      [13]
;  1473  4            Then                                            !                                              [13]
;  1474  5                Begin                                       !                                              [13]
;  1475  5                Fab [Fab$L_Stv] = .Status;                  ! set secondary status                         [13]
;  1476  5                Return RMS$Error (RMS$_Dev)                 ! Device error                                 [13]
;  1477  4                End;                                        !                                              [13]
;  1478  4                                                                                                          !G:4
;  1479  5            If  (.DS$GB_SYSTYPE EQL PR$_SYS_TYP900)         !  if Andromeda cpu                            [43] !G:5
```

```
;   4          Then                                          ! then call the PPA interface to                [43] !G:4
;   5              Begin                                     ! open the file                                 [43] !G:4
;   5              Status = PPA$LOOKUP(FILENAMEDESC);        !                                              [43] !G:4
;   5              Return  .Status                           !                                              [43] !G:4
;   4              End;                                      !                                              [43] !G:4
;   4                                                                                                        !G:4
;   4          If .InitByte NeqA 0                           ! If init byte was specified in table           [13]
;   4          Then                                          !                                              [13]
;   4              (.InitByte)<0, 8> = 0;                    ! ... clear the byte                            [13]
;   4
;   4          Case .FileFormat From 1 To 3 Of               ! Case on file format                           [13]
;   4              Set                                       !                                              [13]
;   4              [RMS$K_Ansi] :                            ! .. ANSI file (magtape)                        [13]
;   5                  Begin                                 !                                              [13]
;   5                    adapter_addr_ext =  (.adapter + .adapter[Hp$w_size]) - 4;                            !G:20
;   5                    Adapter_Epb      =  ..adapter_addr_ext;                                              !G:20
;   5                    binode           =   .adapter_epb [Hpe$w_ext_drive];                                 !G:20
;   5                    Cinumber = .Controller [Hp$B_Ci_tem] ;        ! Set CI port number for HSC50                [25]
;   5                                                                                                        !G:20
;   5                    controller_addr_ext =  (.controller + .controller[Hp$w_size]) - 4;                   !G:20
;   5                    Controller_Epb          =  ..controller_addr_ext;                                    !G:20
;   5                    deviceUnit       =  .controller_epb [Hpe$w_ext_drive];                               !G:20
;   5                    binode           =   .controller_epb [Hpe$w_ext_drive];                              !G:20
;   5                                                                                                        !G:20
;   5                                                                                                        !G:20
;   5                    device_addr_ext =  (.device + .device[Hp$w_size]) - 4;                               !G:20
;   5                    Device_Epb       =  ..device_addr_ext;                                               !G:20
;   5                    SlaveNumber      =  .device_epb [Hpe$w_ext_drive];                                   !G:20
;   5                                                                                                        !G:20
;   5                  Fab [Fab$L_Dev] = Device$_Ansi;         ! Set device characteristics                   [13]
;   5                  CBlock [Ctl$V_Ansi] = True;             ! Set ANSI bit                                 [13]
;   5                  OpenRoutine = Ansi$Open                 ! Set OPEN routine address                     [13]
;   4                  End;                                    !                                              [13]
;   4              [RMS$K_Ods] :                               ! .. ODS file (normal disk)                    [13]
;   5                  Begin                                   !                                              [13]
;   5                    adapter_addr_ext =  (.adapter + .adapter[Hp$w_size]) - 4;                            !G:20
;   5                    Adapter_Epb      =  ..adapter_addr_ext;                                              !G:20
;   5                    binode           =  .adapter_epb[hpe$w_ext_drive];                                   !G:20
;   5                                                                                                        !G:20
;   5                    Cinumber = .Controller [Hp$B_Ci_tem] ;        ! Set CI port number for HSC50                [20]
;   5                    Fab [Fab$L_Dev] = Device$_Ods;                ! Set device characteristics                  [13]
;   5                    Cblock [Ctl$V_Ods] = True;            ! Set ODS bit                                  [13] !G:20
;   5              If (.ultrix_flags)<ultrix_v_mode,1>         !                                              [32]
;   5              Then                                        !                                              [32] !G:20
;   5                  OpenRoutine = Ultrix$Open               ! Set Open routine address                     [32]
;   5              Else                                        !                                              [32]
;   5                  OpenRoutine = Ods$Open;                 ! Set OPEN routine address                     [13]
;   4                  End;                                    !                                              [13]
;   4              [RMS$K_Rt11] :                              ! .. RT11 console media                        [13]
;   5                  Begin                                   !                                              [13]
;   5                  Fab [Fab$L_Dev] = Device$_Rt11;         ! .. set device characteristics                [13]
;   5                  CBlock [Ctl$V_Rt11] = True;             ! .. set RT-11 bit                             [13]
;   5                  OpenRoutine = Rt11$Open                 ! .. set OPEN routine address                  [13]
;   4                  End;                                    !                                              [13]
;   4              [OutRange] :                                ! Bad support table file code                  [13]
;   5                  Begin                                   !                                              [13]
;   5                  Fab [Fab$L_Stv] = DS$_ProgErr;          ! set secondary return status                  [13]
```

```
;   1537  5                 Return RMS$Error (RMS$_Dev)          ! error code                                  [13]
;   1538  5                 End                                  !                                             [13]
;   1539  4             Tes;                                     !                                             [13]
;   1540  4
;   1541  5         (If .OpenRoutine Neq 0                       ! Open file if good device                    [10]
;   1542  5         Then                                         !                                             [10]
;   1543  6             Begin                                    !                                             [10]
;   1544  6             CBlock [Ctl$L_RPB] = Dsr$Allocate_Pseudo_RPB (      !                                  [10]
;   1545  6                 .DeviceType,                         !                                             [10]
;   1546  6                 .AdapterType,                        !                                             [10]
;   1547  6                 .Controller [HP$A_Device],           !                                             [10]
;   1548  6                 .Adapter [HP$A_Device],              !                                             [10]
;   1549  6                 .DeviceUnit,                         !                                             [10]
;   1550  6                 .SlaveNumber,                        !                                             [10]
;   1551  6                 .Cinumber,                           !
;   1552  6                 .binode);                            !                                             [37]
;   1553  6             (.OpenRoutine) ()                        ! Call the open routine                       [10]
;   1554  6             End                                      !                                             [10]
;   1555  5         Else                                         !                                             [10]
;   1556  5             Rms$_Dev)                                !                                             [10] !G:20
;   1557  3         End;                                         !                                             [07]
;   1558  3     rms$load_xab ();                          ! Load the FHCXAB if any
;   1559  3     rms$error (.stat)                         ! Return status in FAB & R0
;   1560  3     end                                       ! of file access block
;   1561  1     end;                                      ! Of RMS$OPEN


                                                                .EXTRN  SCAN$DEVICE

                                    0FFC 00000                  .ENTRY  RMS$OPEN, Save R2,R3,R4,R5,R6,R7,R8,R9,R10,-; 1197
                                                                        R11                                          ;
                    5E      FEB4    CE   9E 00002               MOVAB   -332(SP), SP                                 ;
                                    59   7C 00007               CLRQ    CBLOCK                                       ; 1257
                    5B        04    AC   D0 00009               MOVL    FABPTR, FAB                                  ; 1258
                                    AD   10 0000D               BSBB    VERIFY_FAB                                   ; 1260
                    08              50   E8 0000F               BLBS    R0, 1$                                       ;
                    50 0001850C     8F   D0 00012               MOVL    #99596, R0                                   ;
                                         04 00019               RET                                                  ;
                              1D    AB   95 0001A 1$:           TSTB    29(FAB)                                      ; 1262
                                    0A   13 0001D               BEQL    2$                                           ;
                    50 0001860C     8F   D0 0001F               MOVL    #99852, R0                                   ;
                                  036E   31 00026               BRW     35$                                          ;
                              02    AB   B4 00029 2$:           CLRW    2(FAB)                                       ; 1264
                    50              01   D0 0002C               MOVL    #1, I                                        ; 1265
                       00000000'EF40     D5 0002F 3$:           TSTL    RMS$FILE_TABLE[I]                            ; 1266
                                    05   12 00036               BNEQ    4$                                           ;
                    56              50   D0 00038               MOVL    I, FILE_INDEX                                ;
                                    07   11 0003B               BRB     5$                                           ;
          EE        50              03   F3 0003D 4$:           AOBLEQ  #3, I, 3$                                    ; 1265
                    56              01   CE 00041               MNEGL   #1, FILE_INDEX                               ;
             FFFFFFFF 8F            56   D1 00044 5$:           CMPL    FILE_INDEX, #-1                              ; 1268
                                    13   13 0004B               BEQL    6$                                           ;
                    51        5C    8F   9A 0004D               MOVZBL  #92, R1                                      ; 1272
                       00000000G    EF   16 00051               JSB     EXE$ALONONPAGED                              ;
                    57              51   D0 00057               MOVL    R1, CBLOCKSIZE                               ;
                    59              52   D0 0005A               MOVL    R2, CBLOCK                                   ;
```

```
                                10                  50  E8 0005D            BLBS    R0, 7$                                          ;
                             08 AB 000184D4         8F  D0 00060 6$:        MOVL    #99540, 8(FAB)                                  ; 1274
                                50 000184D4         8F  D0 00068            MOVL    #99540, R0                                      ;
                                                        04 0006F            RET                                                     ;
                   00000000'EF46                    59  D0 00070 7$:        MOVL    CBLOCK, RMS$FILE_TABLE[FILE_INDEX]              ; 1276
    005C   8F          00          6E                00  2C 00078            MOVC5   #0, (SP), #0, #92, (CBLOCK)                     ; 1277
                                                    69      0007F                                                                   ;
                             08 A9                  57  B0 00080            MOVW    CBLOCKSIZE, 8(CBLOCK)                           ; 1278
                                69                  01  90 00084            MOVB    #1, (CBLOCK)                                    ; 1279
                             02 AB                  56  B0 00087            MOVW    FILE_INDEX, 2(FAB)                              ; 1280
                                   44               AB  D4 0008B            CLRL    68(FAB)                                         ; 1286
                                   38               AB  D4 0008E            CLRL    56(FAB)                                         ;
                                   0C               AB  D4 00091            CLRL    12(FAB)                                         ;
                                   3E               AB  94 00094            CLRB    62(FAB)                                         ;
                                   36               AB  B4 00097            CLRW    54(FAB)                                         ;
                             08 AB 00010001         8F  D0 0009A            MOVL    #65537, 8(FAB)                                  ; 1287
            28          00          6E                00  2C 000A2            MOVC5   #0, (SP), #0, #40, FILEDESC                     ; 1288
                                      D8            AD      000A7                                                                   ;
                                37 00000000G        EF  E9 000A9            BLBC    ULTRIX_FLAGS, 8$                                ; 1292
                                      D8            AD  9F 000B0            PUSHAB  FILEDESC                                        ; 1295
                                   00000000'        EF  9F 000B3            PUSHAB  DEF$Q_ULTRIX                                    ;
                                                    0F  DD 000B9            PUSHL   #15                                             ;
                          0000G CF                  03  FB 000BB            CALLS   #3, BREAKUP_FILE                                ;
                                      D8            AD  9F 000C0            PUSHAB  FILEDESC                                        ; 1297
                                00000000G           EF  DD 000C3            PUSHL   DEF$Q_DEV+4                                     ;
                             7E 00000000G           EF  3C 000C9            MOVZWL  DEF$Q_DEV, -(SP)                                ; 1296
                          0000G CF                  03  FB 000D0            CALLS   #3, BREAKUP_FILE                                ;
                                      D8            AD  9F 000D5            PUSHAB  FILEDESC                                        ; 1299
                                00000000G           EF  DD 000D8            PUSHL   DEF$Q_DIR+4                                     ;
                             7E 00000000G           EF  3C 000DE            MOVZWL  DEF$Q_DIR, -(SP)                                ; 1298
                                                    44  11 000E5            BRB     9$                                              ;
                                      D8            AD  9F 000E7 8$:        PUSHAB  FILEDESC                                        ; 1303
                                   00000000'        EF  9F 000EA            PUSHAB  DEF$Q_BACKSTOP                                  ;
                                                    11  DD 000F0            PUSHL   #17                                             ;
                          0000G CF                  03  FB 000F2            CALLS   #3, BREAKUP_FILE                                ;
                                      D8            AD  9F 000F7            PUSHAB  FILEDESC                                        ; 1305
                                00000000G           EF  DD 000FA            PUSHL   DEF$Q_DEV+4                                     ;
                             7E 00000000G           EF  3C 00100            MOVZWL  DEF$Q_DEV, -(SP)                                ; 1304
                          0000G CF                  03  FB 00107            CALLS   #3, BREAKUP_FILE                                ;
                                      D8            AD  9F 0010C            PUSHAB  FILEDESC                                        ; 1307
                                00000000G           EF  DD 0010F            PUSHL   DEF$Q_DIR+4                                     ;
                             7E 00000000G           EF  3C 00115            MOVZWL  DEF$Q_DIR, -(SP)                                ; 1306
                          0000G CF                  03  FB 0011C            CALLS   #3, BREAKUP_FILE                                ;
                                      D8            AD  9F 00121            PUSHAB  FILEDESC                                        ; 1309
                                      30            AB  DD 00124            PUSHL   48(FAB)                                         ;
                                   7E 35            AB  9A 00127            MOVZBL  53(FAB), -(SP)                                  ; 1308
                          0000G CF                  03  FB 0012B 9$:        CALLS   #3, BREAKUP_FILE                                ;
                                      D8            AD  9F 00130            PUSHAB  FILEDESC                                        ; 1312
                                      2C            AB  DD 00133            PUSHL   44(FAB)                                         ;
                                   7E 34            AB  9A 00136            MOVZBL  52(FAB), -(SP)                                  ; 1311
                          0000G CF                  03  FB 0013A            CALLS   #3, BREAKUP_FILE                                ;
                                52 24               AE  9E 0013F            MOVAB   FILENAME, POINTER                               ; 1320
                                54 FF               8F  9A 00143            MOVZBL  #255, LENGTH                                    ; 1321
                                20 AE               52  D0 00147            MOVL    POINTER, FILENAMEDESC+4                         ; 1322
                                                    51  D4 0014B            CLRL    I                                               ; 1324
                                50 D8 AD41          7E  9E 0014D 10$:        MOVAQ   FILEDESC[I], R0                                 ; 1328
                                53                  60  3C 00152            MOVZWL  (R0), LEN                                       ; 1334
```

```
                        50        04   A0  D0 00155          MOVL    4(R0), PTR                                  ; 1335
                                       53  D7 00159 11$:     DECL    LEN                                         ; 1337
                                       09  19 0015B          BLSS    12$                                         ;
                                       54  D7 0015D          DECL    LENGTH                                      ;
                                       05  19 0015F          BLSS    12$                                         ;
                        82             80  90 00161          MOVB    (PTR)+, (POINTER)+                          ; 1338
                                       F3  11 00164          BRB     11$                                         ;
            E3          51             04  F3 00166 12$:     AOBLEQ  #4, I, 10$                                  ; 1324
                        50        24   AE  9E 0016A          MOVAB   FILENAME, R0                                ; 1342
      1C    AE          52             50  A3 0016E          SUBW3   R0, POINTER, FILENAMEDESC                   ;
                        51        1C   AE  3C 00173          MOVZWL  FILENAMEDESC, R1                            ; 1350
                  48    A9             51  B0 00177          MOVW    R1, 72(CBLOCK)                              ;
                           00000000G   EF  16 0017B          JSB     EXE$ALONONPAGED                             ;
                  4A    A9             51  B0 00181          MOVW    R1, 74(CBLOCK)                              ; 1351
                  4C    A9             52  D0 00185          MOVL    R2, 76(CBLOCK)                              ; 1352
                        0A             50  E8 00189          BLBS    R0, 13$                                     ;
                        50 000184D4    8F  D0 0018C          MOVL    #99540, R0                                  ; 1354
                                     0201  31 00193          BRW     35$                                         ;
      4C    B9    20    BE        1C   AE  28 00196 13$:     MOVC3   FILENAMEDESC, @FILENAMEDESC+4, @76(CBLOCK)  ; 1356
                        55        20   AE  D0 0019D          MOVL    FILENAMEDESC+4, R5                          ; 1376
                        54        1C   AE  3C 001A1          MOVZWL  FILENAMEDESC, R4                            ;
                           00000000G   EF  16 001A5          JSB     SCAN$DEVICE                                 ;
                        53             50  D0 001AB          MOVL    R0, R3                                      ;
            50          53        F0   8F  78 001AE          ASHL    #-16, DEVLEN, R0                            ; 1379
                  02    A9             50  B0 001B3          MOVW    R0, 2(CBLOCK)                               ;
                                       58  D4 001B7          CLRL    OPENROUTINE                                 ; 1410
                                  04   AE  7C 001B9          CLRQ    CINUMBER                                    ; 1411
                                       6E  D4 001BC          CLRL    BINODE                                      ; 1412
                        52             01  CE 001BE          MNEGL   #1, R2                                      ; 1413
                        50             53  3C 001C1          MOVZWL  DEVLEN, R0                                  ;
                           00000000G   EF  16 001C4          JSB     LOC$PTABLE                                  ;
                        53             51  D0 001CA          MOVL    R1, R3                                      ;
                                       03  12 001CD          BNEQ    14$                                         ; 1415
                                     00ED  31 001CF          BRW     27$                                         ;
                        57             53  D0 001D2 14$:     MOVL    DEVICE, PREV_PREV_CONTROLLER                ; 1417
                        56             53  D0 001D5          MOVL    DEVICE, PREV_PREV_ADAPTER                   ;
                        55             53  D0 001D8          MOVL    DEVICE, PREV_CONTROLLER                     ;
                        51             53  D0 001DB          MOVL    DEVICE, PREV_ADAPTER                        ;
                  3C    A9             53  D0 001DE          MOVL    DEVICE, 60(CBLOCK)                          ;
                        52             53  D0 001E2          MOVL    DEVICE, ADAPTER                             ;
                        54             53  D0 001E5          MOVL    DEVICE, CONTROLLER                          ;
                                  20   A2  D5 001E8 15$:     TSTL    32(ADAPTER)                                 ; 1419
                                       15  13 001EB          BEQL    16$                                         ;
                        57             55  D0 001ED          MOVL    PREV_CONTROLLER, PREV_PREV_CONTROLLER       ; 1421
                        55             54  D0 001F0          MOVL    CONTROLLER, PREV_CONTROLLER                 ; 1422
                        54             52  D0 001F3          MOVL    ADAPTER, CONTROLLER                         ; 1423
                        56             51  D0 001F6          MOVL    PREV_ADAPTER, PREV_PREV_ADAPTER             ; 1424
                        51             52  D0 001F9          MOVL    ADAPTER, PREV_ADAPTER                       ; 1425
                        52        20   A2  D0 001FC          MOVL    32(ADAPTER), ADAPTER                        ; 1426
                                       E6  11 00200          BRB     15$                                         ;
                        50        26   A2  9E 00202 16$:     MOVAB   38(ADAPTER), R0                             ; 1430
                        04             60  91 00206          CMPB    (R0), #4                                    ; 1436
                                       0A  12 00209          BNEQ    17$                                         ;
            41494253    8F        01   A0  D1 0020B          CMPL    1(R0), #1095320147                          ; 1437
                                       0F  13 00213          BEQL    18$                                         ;
                        05             60  91 00215 17$:     CMPB    (R0), #5                                    ; 1438
                                       10  12 00218          BNEQ    19$                                         ;
```

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                        424D5744    8F      01    A0  D1 0021A          CMPL    1(R0), #1112364868                                  ; 1439
                                                  06  12 00222          BNEQ    19$                                                 ;
                                    54              55  D0 00224 18$:    MOVL    PREV_CONTROLLER, CONTROLLER                         ; 1442
                                    52              51  D0 00227          MOVL    PREV_ADAPTER, ADAPTER                               ; 1443
                                    51      26      A2  9E 0022A 19$:    MOVAB   38(ADAPTER), R1                                     ; 1448
                                    04              61  91 0022E          CMPB    (R1), #4                                            ; 1454
                                                    10  12 00231          BNEQ    20$                                                 ;
                        4149424E    8F      01      A1  D1 00233          CMPL    1(R1), #1095320142                                  ; 1455
                                                    06  12 0023B          BNEQ    20$                                                 ;
                                    54              57  D0 0023D          MOVL    PREV_PREV_CONTROLLER, CONTROLLER                    ; 1458
                                    52              56  D0 00240          MOVL    PREV_PREV_ADAPTER, ADAPTER                          ; 1459
                                    50      08      A3  3C 00243 20$:    MOVZWL  8(DEVICE), R0                                       ; 1462
                                    57      FC A043 9E  00247            MOVAB   -4(R0)[DEVICE], DEVICE_ADDR_EXT                     ;
                                    55              67  D0 0024C          MOVL    (DEVICE_ADDR_EXT), DEVICE_EPB                       ; 1463
                        5355445F    8F      0C      A3  D1 0024F          CMPL    12(DEVICE), #1398096991                             ; 1464
                                                    0B  12 00257          BNEQ    21$                                                 ;
                                    56      14      A5  3C 00259          MOVZWL  20(DEVICE_EPB), DEVICEUNIT                          ; 1466
            56          01          0F              01  F0 0025D          INSV    #1, #15, #1, DEVICEUNIT                             ;
                                                    04  11 00262          BRB     22$                                                 ;
                                    56      14      A5  3C 00264 21$:    MOVZWL  20(DEVICE_EPB), DEVICEUNIT                          ; 1468
                                            0C      AE  9F 00268 22$:    PUSHAB  INITBYTE                                            ; 1470
                                            14      AE  9F 0026B         PUSHAB  FILEFORMAT                                          ;
                                            1C      AE  9F 0026E         PUSHAB  DEVICETYPE                                          ;
                                            24      AE  9F 00271         PUSHAB  ADAPTERTYPE                                         ;
                                                    53  DD 00274         PUSHL   DEVICE                                              ;
                            F965    CF              05  FB 00276         CALLS   #5, DSX$CHECK_SUPPORT                               ;
                                    51              50  D0 0027B         MOVL    R0, STATUS                                          ;
                                    06              51  E8 0027E         BLBS    STATUS, 23$                                         ; 1472
                              0C    AB              51  D0 00281         MOVL    STATUS, 12(FAB)                                     ; 1475
                                                    38  11 00285         BRB     27$                                                 ; 1476
00000000G   8F 00000000G    EF              08          00  ED 00287 23$:    CMPZV   #0, #8, DS$GB_SYSTYPE, #PR$_SYS_TYP900      ; 1479
                                                        0E  12 00294         BNEQ    24$                                                 ;
                                            1C      AE  9F 00296         PUSHAB  FILENAMEDESC                                        ; 1482
                                00000000G   EF          01  FB 00299         CALLS   #1, PPA$LOOKUP                                      ;
                                    51              50  D0 002A0         MOVL    R0, STATUS                                          ;
                                                    04  002A3           RET                                                         ; 1483
                                            0C      AE  D5 002A4 24$:    TSTL    INITBYTE                                            ; 1486
                                                    03  13 002A7         BEQL    25$                                                 ;
                                            0C      BE  94 002A9         CLRB    @INITBYTE                                           ; 1488
                                02              01      10  AE  CF 002AC 25$:    CASEL   FILEFORMAT, #1, #2                          ; 1490
                            009D            0065        0018      002B1 26$:    .WORD   28$-26$,-                                   ;
                                                                                      29$-26$,-                                     ;
                                                                                      31$-26$                                       ;
                              0C    AB  00660020    8F  D0 002B7         MOVL    #6684704, 12(FAB)                                   ; 1536
                                    50  000184C4    8F  D0 002BF 27$:    MOVL    #99524, R0                                          ; 1537
                                                00CE    31 002C6         BRW     35$                                                 ;
                                    50      08      A2  3C 002C9 28$:    MOVZWL  8(ADAPTER), R0                                      ; 1494
                                    50      FC A042 9E  002CD            MOVAB   -4(R0)[ADAPTER], ADAPTER_ADDR_EXT                   ;
                                    50              60  D0 002D2         MOVL    (ADAPTER_ADDR_EXT), ADAPTER_EPB                     ; 1495
                                    6E      14      A0  3C 002D5         MOVZWL  20(ADAPTER_EPB), BINODE                             ; 1496
                              04    AE      34      A4  9A 002D9         MOVZBL  52(CONTROLLER), CINUMBER                            ; 1497
                                    50      08      A4  3C 002DE         MOVZWL  8(CONTROLLER), R0                                   ; 1499
                                    50      FC A044 9E  002E2            MOVAB   -4(R0)[CONTROLLER], CONTROLLER_ADDR_EXT             ;
                                    50              60  D0 002E7         MOVL    (CONTROLLER_ADDR_EXT), CONTROLLER_EPB               ; 1500
                                    56      14      A0  3C 002EA         MOVZWL  20(CONTROLLER_EPB), DEVICEUNIT                      ; 1501
                                    6E      14      A0  3C 002EE         MOVZWL  20(CONTROLLER_EPB), BINODE                          ; 1502
                                    50      08      A3  3C 002F2         MOVZWL  8(DEVICE), R0                                       ; 1505
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                     57        FC A043  9E 002F6          MOVAB   -4(R0)[DEVICE], DEVICE_ADDR_EXT                 ;
                     55              67  D0 002FB          MOVL    (DEVICE_ADDR_EXT), DEVICE_EPB                   ; 1506
                 08  AE        14   A5  3C 002FE          MOVZWL  20(DEVICE_EPB), SLAVENUMBER                     ; 1507
                 40  AB      4020   8F  3C 00303          MOVZWL  #16416, 64(FAB)                                 ; 1509
                 01  A9              08  88 00309          BISB2   #8, 1(CBLOCK)                                   ; 1510
                     58 00000000G     EF  9E 0030D          MOVAB   ANSI$OPEN, OPENROUTINE                          ; 1511
                                      49  11 00314          BRB     32$                                             ;
                     50        08     A2  3C 00316 29$:     MOVZWL  8(ADAPTER), R0                                  ; 1515
                     50        FC A042  9E 0031A          MOVAB   -4(R0)[ADAPTER], ADAPTER_ADDR_EXT               ;
                     50              60  D0 0031F          MOVL    (ADAPTER_ADDR_EXT), ADAPTER_EPB                 ; 1516
                     6E        14    A0  3C 00322          MOVZWL  20(ADAPTER_EPB), BINODE                         ; 1517
                 04  AE        34   A4  9A 00326          MOVZBL  52(CONTROLLER), CINUMBER                        ; 1519
                 40  AB 10004008   8F  D0 0032B          MOVL    #268451848, 64(FAB)                             ; 1520
                 01  A9              02  88 00333          BISB2   #2, 1(CBLOCK)                                   ; 1521
                     09 00000000G     EF  E9 00337          BLBC    ULTRIX_FLAGS, 30$                               ; 1522
                     58 00000000G     EF  9E 0033E          MOVAB   ULTRIX$OPEN, OPENROUTINE                        ; 1524
                                      18  11 00345          BRB     32$                                             ;
                     58      0000G    CF  9E 00347 30$:     MOVAB   ODS$OPEN, OPENROUTINE                           ; 1526
                                      11  11 0034C          BRB     32$                                             ; 1490
                 40  AB 10004018   8F  D0 0034E 31$:     MOVL    #268451864, 64(FAB)                             ; 1530
                 01  A9              01  88 00356          BISB2   #1, 1(CBLOCK)                                   ; 1531
                     58      0000G    CF  9E 0035A          MOVAB   RT11$OPEN, OPENROUTINE                          ; 1532
                                      27  13 0035F 32$:     BEQL    33$                                             ; 1541
                                      6E  DD 00361          PUSHL   BINODE                                          ; 1552
                                  08  AE  DD 00363          PUSHL   CINUMBER                                        ; 1551
                                  10  AE  DD 00366          PUSHL   SLAVENUMBER                                     ; 1550
                                      56  DD 00369          PUSHL   DEVICEUNIT                                      ; 1549
                                  18  A2  DD 0036B          PUSHL   24(ADAPTER)                                     ; 1548
                                  18  A4  DD 0036E          PUSHL   24(CONTROLLER)                                  ; 1547
                                  30  AE  DD 00371          PUSHL   ADAPTERTYPE                                     ; 1546
                                  30  AE  DD 00374          PUSHL   DEVICETYPE                                      ; 1545
                 F7D6    CF           08  FB 00377          CALLS   #8, DSR$ALLOCATE_PSEUDO_RPB                     ;
                   38    A9           50  D0 0037C          MOVL    R0, 56(CBLOCK)                                  ;
                         68           00  FB 00380          CALLS   #0, (OPENROUTINE)                               ; 1553
                         52           50  D0 00383          MOVL    R0, STAT                                        ; 1541
                                      07  11 00386          BRB     34$                                             ;
                         52 000184C4  8F  D0 00388 33$:     MOVL    #99524, STAT                                    ; 1556
                 FB3A    CF           00  FB 0038F 34$:     CALLS   #0, RMS$LOAD_XAB                                ; 1558
                         50           52  D0 00394          MOVL    STAT, R0                                        ; 1559
                                  FAA2    30 00397 35$:     BSBW    RMS$ERROR                                       ;
                                          04 0039A          RET                                                     ; 1561

; Routine Size:  923 bytes,    Routine Base:  CODE + 04AE

;   1562  1
;   1563  1                                                                                                  !G:20
;   1564  1                                                                                                  !G:20
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```
;    1566  1      %sbttl 'RMS$CONNECT routine'
;    1567  1
;    1568  1      global routine rms$connect (rabptr) =
;    1569  1
;    1570  1      !++
;    1571  1      ! Functional description:
;    1572  1      !       Connect a RAB to a FAB.  This is relatively trivial; the validity
;    1573  1      !       of both RAB and FAB are verified, checks are made to be sure the
;    1574  1      !       file is open and no other RAB has been connected previously.
;    1575  1      !
;    1576  1      ! Inputs:
;    1577  1      !       rabptr          pointer to the RAB to connect
;    1578  1      !
;    1579  1      ! Implicit inputs:
;    1580  1      !       RAB [rab$l_fab] points to the FAB to connect this RAB to
;    1581  1      !       FAB [fab$w_ifi] indexes the rms$file_table to find the CBLOCK
;    1582  1      !
;    1583  1      ! Outputs:
;    1584  1      !       none
;    1585  1      !
;    1586  1      ! Implicit outputs:
;    1587  1      !       RAB [rab$l_sts] return status
;    1588  1      !       RAB [rab$l_stv] secondary status
;    1589  1      !
;    1590  1      ! Side Effects:
;    1591  1      !       some fields in the RAB and CBLOCK are modified
;    1592  1      !
;    1593  1      ! Return codes:
;    1594  1      !       RMS$_NORMAL     all OK
;    1595  1      !       RMS$_CCR        a RAB is already connected to this FAB
;    1596  1      !       RMS$_RAB        the RAB block is invalid
;    1597  1      !       RMS$_FAB        the FAB block is invalid
;    1598  1      !       RMS$_IFI        the FAB's IFI field is invalid.
;    1599  1      !       RMS$_RAC        Invalid record access mode--only SEQuential and
;    1600  1      !                       RFA access modes are supported.
;    1601  1      !--
;    1602  1
;    1603  2          begin
;    1604  2
;    1605  2          global register
;    1606  2              rab = 10 : ref bblock ,                 ! Pointer to RAB
;    1607  2              fab = 11 : ref bblock ,                 ! Pointer to FAB
;    1608  2              cblock = 9 : ref bblock;                ! Pointer to CBLOCK
;    1609  2
;    1610  2          cblock = 0;
;    1611  2          fab = 0;
;    1612  2          rab = .rabptr;                              ! Map to RAB
;    1613  2
;    1614  2          if not verify_rab ()                        ! If the RAB is bad
;    1615  2          then
;    1616  2              return (rms$_rab);                      !  return error
;    1617  2
;    1618  2          rab [rab$l_stv] = 0;
;    1619  2
;    1620  2          if .rab [rab$b_rac] neq rab$c_seq           ! If not sequential access
;    1621  2              and .rab [rab$b_rac] neq rab$c_rfa      !  and not RFA random
;    1622  2          then
```

```
;    1623  2          return rab$error (rms$_rac);          ! then bad access mode
;    1624  2
;    1625  2      fab = .rab [rab$l_fab];                   ! Map to FAB
;    1626  2
;    1627  2      if not verify_fab ()                      ! If the FAB is bad
;    1628  2      then
;    1629  2          return rab$error (rms$_fab);          !  return error
;    1630  2
;    1631  2      if not verify_cblock ()                   ! If the IFI is bad
;    1632  2      then
;    1633  2          return rab$error (rms$_ifi);          !  return with error
;    1634  2
;    1635  2      if .cblock [ctl$l_rab] neq 0              ! If there's already a RAB
;    1636  2      then
;    1637  2          return rab$error (rms$_ccr);          !  it's no good--only one allowed
;    1638  2
;    1639  2      cblock [ctl$l_rab] = .rab;                ! Now set point to RAB
;    1640  2      cblock [ctl$l_vbn] = 1;                   ! Set internal RFA
;    1641  2      cblock [ctl$w_byte] = 0;
;    1642  2      cblock [ctl$w_rec_size] = 0;              ! Clear last-record size
;    1643  2      ch$fill (0, 6, rab [rab$w_rfa]);          ! Set RFA to 0
;    1644  2      rab [rab$l_rbf] = 0;
;    1645  2      rab [rab$w_rsz] = 0;
;    1646  2      cblock [ctl$l_nbp] = 0;
;    1647  2      rab$error (rms$_normal)                   ! Set good return
;    1648  1      end;


                     0FFC 00000          .ENTRY  RMS$CONNECT, Save R2,R3,R4,R5,R6,R7,R8,R9,- ; 1568
                                                  R10,R11                                    ;
                       59  D4 00002              CLRL    CBLOCK                             ; 1610
                       5B  D4 00004              CLRL    FAB                                ; 1611
5A          04         AC  D0 00006              MOVL    RABPTR, RAB                        ; 1612
                     FC45  30 0000A              BSBW    VERIFY_RAB                         ; 1614
08                     50  E8 0000D              BLBS    R0, 1$                             ;
50  0001863C           8F  D0 00010              MOVL    #99900, R0                         ; 1616
                           04 00017              RET                                        ;
            0C         AA  D4 00018 1$:          CLRL    12(RAB)                            ; 1618
            1E         AA  95 0001B              TSTB    30(RAB)                            ; 1620
                       0F  13 0001E              BEQL    2$                                 ;
02          1E         AA  91 00020              CMPB    30(RAB), #2                        ; 1621
                       09  13 00024              BEQL    2$                                 ;
50  00018644           8F  D0 00026              MOVL    #99908, R0                         ; 1623
                       4F  11 0002D              BRB     6$                                 ;
5B          3C         AA  D0 0002F 2$:          MOVL    60(RAB), FAB                       ; 1625
                     FBEB  30 00033              BSBW    VERIFY_FAB                         ; 1627
09                     50  E8 00036              BLBS    R0, 3$                             ;
50  0001850C           8F  D0 00039              MOVL    #99596, R0                         ; 1629
                       3C  11 00040              BRB     6$                                 ;
                     FBEF  30 00042 3$:          BSBW    VERIFY_CBLOCK                      ; 1631
09                     50  E8 00045              BLBS    R0, 4$                             ;
50  00018564           8F  D0 00048              MOVL    #99684, R0                         ; 1633
                       2D  11 0004F              BRB     6$                                 ;
            20         A9  D5 00051 4$:          TSTL    32(CBLOCK)                         ; 1635
```

```
                                        09  13 00054          BEQL    5$                                      ;
                          50 00018494   8F  D0 00056          MOVL    #99476, R0                              ; 1637
                                        1F  11 0005D          BRB     6$                                      ;
                     20   A9            5A  D0 0005F 5$:      MOVL    RAB, 32(CBLOCK)                         ; 1639
                     18   A9            01  7D 00063          MOVQ    #1, 24(CBLOCK)                          ; 1640
     06          00      6E            00  2C 00067          MOVC5   #0, (SP), #0, #6, 16(RAB)               ; 1643
                                 10     AA     0006C                                                          ;
                                 28     AA  D4 0006E          CLRL    40(RAB)                                 ; 1644
                                 22     AA  B4 00071          CLRW    34(RAB)                                 ; 1645
                                 04     A9  D4 00074          CLRL    4(CBLOCK)                               ; 1646
                          50 00010001   8F  D0 00077          MOVL    #65537, R0                              ; 1647
                                      FB96  30 0007E 6$:      BSBW    RAB$ERROR                               ;
                                            04 00081          RET                                             ; 1648

; Routine Size:  130 bytes,    Routine Base:  CODE + 0849


;   1649  1
```

```
;    1651  1      %sbttl 'RMS routine'
;    1652  1
;    1653  1      global routine rms$get (rabptr) =
;    1654  1
;    1655  1      !++
;    1656  1      ! Functional description:
;    1657  1      !       Read the next record into a user-specified buffer, from the
;    1658  1      !       file currently open on the FAB to which the input RAB is
;    1659  1      !       connected.
;    1660  1      !
;    1661  1      ! Inputs:
;    1662  1      !       rabptr                  pointer to the RAB to use
;    1663  1      !
;    1664  1      ! Implicit inputs:
;    1665  1      !       RAB [rab$l_fab]         The FAB which controls the file
;    1666  1      !       RAB [rab$w_rfa]         Desired record's file address
;    1667  1      !       FAB [fab$w_ifi]         Index in RMS$FILE_TABLE for this file
;    1668  1      !       CBLOCK                  Internal control block
;    1669  1      !
;    1670  1      ! Outputs:
;    1671  1      !       none
;    1672  1      !
;    1673  1      ! Implicit outputs:
;    1674  1      !       The RBF and RSZ fields of the RAB are set to describe the
;    1675  1      !       record read.
;    1676  1      !
;    1677  1      !       RAB [rab$l_sts]         contains the status code
;    1678  1      !       RAB [rab$l_stv]         may contain a secondary status
;    1679  1      !       RAB [rab$w_rfa]         in sequential access mode ONLY, this
;    1680  1      !                               3-word field is updated prior to the actual
;    1681  1      !                               access.  Not updated for Andromeda.                    !G:4
;    1682  1      !
;    1683  1      ! Side effects:
;    1684  1      !       CBLOCK                  The next RFA, the cache control data, and
;    1685  1      !                               the tape position control are all subject
;    1686  1      !                               to change.
;    1687  1      !
;    1688  1      ! Return codes:
;    1689  1      !       RMS$_NORMAL             Everything's nice
;    1690  1      !       RMS$_RER                Some read error (RAB [rab$l_stv] contains
;    1691  1      !                               the actual SS$_* error code)
;    1692  1      !       RMS$_RFA                Invalid RFA was specified in random-by-RFA
;    1693  1      !                               mode.
;    1694  1      !       RMS$_EOF                Attempt to read record past end of file
;    1695  1      !       RMS$_RAB                bad RAB
;    1696  1      !       RMS$_FAB                bad FAB
;    1697  1      !       RMS$_IFI                bad IFI (or CBLOCK)
;    1698  1      !       RMS$_ISI                FAB and RAB not connected
;    1699  1      !       RMS$_RTB                Record too big for buffer (truncated)
;    1700  1      !--
;    1701  1
;    1702  2          begin
;    1703  2
;    1704  2          global register
;    1705  2              cblock = 9 : ref bblock ,           ! Map to CBLOCK
;    1706  2              rab = 10 : ref bblock ,             ! Map to RAB
;    1707  2              fab = 11 : ref bblock;              ! Map to FAB
```

```
;    1708  2
;    1709  2          local
;    1710  2              stat;
;    1711  2
;    1712  2          fab = cblock = 0;
;    1713  2          rab = .rabptr;                          ! Get pointer to RAB
;    1714  2
;    1715  2          if not verify_rab ()                    ! If it isn't a RAB
;    1716  2          then
;    1717  2              return (rms$_rab);                  !  no good at all
;    1718  2
;    1719  2          rab [rab$l_stv] = 0;                    ! Clear out STV field
;    1720  2          fab = .rab [rab$l_fab];                 ! Point to RAB's FAB
;    1721  2
;    1722  2          if not verify_fab ()                    ! If it isn't a FAB
;    1723  2          then
;    1724  2              return rab$error (rms$_fab);        !  then quit nicely
;    1725  2
;    1726  2          if not verify_cblock ()                 ! Load CBLOCK pointer,
;    1727  2          then
;    1728  2              return rab$error (rms$_ifi);        !  and quit if IFI's bad
;    1729  2
;    1730  2          if .cblock [ctl$l_rab] neq .rab         ! If this isn't the right RAB
;    1731  2          then
;    1732  2              return rab$error (rms$_isi);        !  say 'bad stream id'
;    1733  2
;    1734  2      !
;    1735  2      ! Now, all the control stuff is OK.  We can go to work
;    1736  2      !
;    1737  2                                                                                  !G:4
;    1738  3          If  (.DS$GB_SYSTYPE EQL PR$_SYS_TYP900)     !  if Andromeda cpu      [43]  !G:5
;    1739  2          then                                                                    !G:4
;    1740  3              Begin                                                               !G:4
;    1741  3              stat = PPA$READ                         ! Read block (into UBF) using interface [43]  !G:4
;    1742  3                   ( RAB[RAB$L_UBF], RAB[RAB$W_RSZ] );  ! and return record size read (RSZ)     [43]  !G:4
;    1743  3              RAB [rab$l_sts] = .stat ;               ! Fill the status in the RAB            [43]  !G:4
;    1744  3              end                                                                 !G:4
;    1745  2           else                                                                   !G:4
;    1746  2                                                                                  !G:19
;    1747  3              Begin                                                               !G:4
;    1748  3              cblock [ctl$b_op] = ctl$c_get;          ! We're on GET operation    !G:4
;    1749  3                                                                                  !G:4
;    1750  3              if .rab [rab$b_rac] eql rab$c_rfa       ! If random, copy user's    !G:4
;    1751  3              then                                                                !G:4
;    1752  3                  ch$move (6, rab [rab$w_rfa], cblock [ctl$w_rfa]);   ! RFA        !G:4
;    1753  3                                                                                  !G:4
;    1754  3              rab [rab$w_rsz] = rab [rab$l_rbf] = 0;  ! Init context              [05] !G:4
;    1755  3                                                                                  !G:4
;    1756  3              if .cblock [ctl$l_vbn] gtr .cblock [ctl$l_eofvbn]       ! If RFA is past EOF  !G:4
;    1757  3                  or .cblock [ctl$l_vbn] eql .cblock [ctl$l_eofvbn]   !          !G:4
;    1758  3                  and .cblock [ctl$w_byte] geq .cblock [ctl$w_offbyte]            !G:4
;    1759  3              then                                                                !G:4
;    1760  3                  return rab$error (                                              !G:4
;    1761  3                                                                                  !G:4
;    1762  3                          if .rab [rab$b_rac] eql rab$c_rfa then rms$_rfa else rms$_eof);     !  don't bother  !G:4
;    1763  3                                                                                  !G:4
;    1764  3              stat = (.cblock [ctl$l_get]) ();        ! Call actual GET routine   !G:4
```

```
;   1765  3          ch$move (6, cblock [ctl$w_rfa], rab [rab$w_rfa])        ! Set user RFA                          !G:4
;   1766  2          END ;                                                                                           !G:4
;   1767  2                                                                                                          !G:4
;   1768  2      rab$error (.stat)                                  ! Return whatever status
;   1769  1      end;                                               ! Of RMS$GET



                                                  0FFC 00000          .ENTRY  RMS$GET, Save R2,R3,R4,R5,R6,R7,R8,R9,R10,-  ; 1653
                                                                              R11                                          ;
                                                 59  D4 00002          CLRL    CBLOCK                                       ; 1712
                                                 5B  D4 00004          CLRL    FAB                                          ;
                                 5A       04   AC  D0 00006          MOVL    RABPTR, RAB                                  ; 1713
                                             FBC3  30 0000A          BSBW    VERIFY_RAB                                   ; 1715
                                 08           50  E8 0000D          BLBS    R0, 1$                                       ;
                                 50 0001863C  8F  D0 00010          MOVL    #99900, R0                                   ; 1717
                                                  04 00017          RET                                                  ;
                                          0C   AA  D4 00018 1$:     CLRL    12(RAB)                                      ; 1719
                                 5B       3C   AA  D0 0001B          MOVL    60(RAB), FAB                                 ; 1720
                                             FB7D  30 0001F          BSBW    VERIFY_FAB                                   ; 1722
                                 09           50  E8 00022          BLBS    R0, 2$                                       ;
                                 50 0001850C  8F  D0 00025          MOVL    #99596, R0                                   ; 1724
                                              7E  11 0002C          BRB     9$                                           ;
                                             FB81  30 0002E 2$:     BSBW    VERIFY_CBLOCK                                ; 1726
                                 09           50  E8 00031          BLBS    R0, 3$                                       ;
                                 50 00018564  8F  D0 00034          MOVL    #99684, R0                                   ; 1728
                                              6F  11 0003B          BRB     9$                                           ;
                                 5A       20   A9  D1 0003D 3$:     CMPL    32(CBLOCK), RAB                              ; 1730
                                              09  13 00041          BEQL    4$                                           ;
                                 50 00018584  8F  D0 00043          MOVL    #99716, R0                                   ; 1732
                                              72  11 0004A          BRB     12$                                          ;
00000000G  8F 00000000G  EF      08           00  ED 0004C 4$:     CMPZV   #0, #8, DS$GB_SYSTYPE, #PR$_SYS_TYP900       ; 1738
                                              16  12 00059          BNEQ    5$                                           ;
                                          22   AA  9F 0005B          PUSHAB  34(RAB)                                      ; 1742
                                          24   AA  9F 0005E          PUSHAB  36(RAB)                                      ;
                         00000000G  EF         02  FB 00061          CALLS   #2, PPA$READ                                 ;
                                    56         50  D0 00068          MOVL    R0, STAT                                     ;
                              08   AA         56  D0 0006B          MOVL    STAT, 8(RAB)                                 ; 1743
                                              4A  11 0006F          BRB     11$                                          ;
                                    69         02  90 00071 5$:     MOVB    #2, (CBLOCK)                                 ; 1748
                                    02       1E   AA  91 00074          CMPB    30(RAB), #2                                  ; 1750
                                              06  12 00078          BNEQ    6$                                           ;
                  18   A9       10   AA         06  28 0007A          MOVC3   #6, 16(RAB), 24(CBLOCK)                      ; 1752
                                          28   AA  D4 00080 6$:     CLRL    40(RAB)                                      ; 1754
                                          22   AA  B4 00083          CLRW    34(RAB)                                      ;
                              44   A9       18   A9  D1 00086          CMPL    24(CBLOCK), 68(CBLOCK)                       ; 1756
                                              09  14 0008B          BGTR    7$                                           ;
                                              1F  12 0008D          BNEQ    10$                                          ; 1757
                              42   A9       1C   A9  B1 0008F          CMPW    28(CBLOCK), 66(CBLOCK)                       ; 1758
                                              18  1F 00094          BLSSU   10$                                          ;
                                    02       1E   AA  91 00096 7$:     CMPB    30(RAB), #2                                  ; 1762
                                              09  12 0009A          BNEQ    8$                                           ;
                                 50 0001865C  8F  D0 0009C          MOVL    #99932, R0                                   ;
                                              19  11 000A3          BRB     12$                                          ;
                                 50 0001827A  8F  D0 000A5 8$:     MOVL    #98938, R0                                   ;
```

```
                                        10  11 000AC 9$:     BRB     12$                                  ; 1760
                        0C   B9         00  FB 000AE 10$:    CALLS   #0, @12(CBLOCK)                      ; 1764
                             56         50  D0 000B2         MOVL    R0, STAT                             ;
            10   AA     18   A9         06  28 000B5         MOVC3   #6, 24(CBLOCK), 16(RAB)              ; 1765
                             50         56  D0 000BB 11$:    MOVL    STAT, R0                             ; 1768
                                      FAD4  30 000BE 12$:    BSBW    RAB$ERROR                            ;
                                            04 000C1         RET                                          ; 1769

; Routine Size:  194 bytes,    Routine Base:  CODE + 08CB


;   1770  1
```

```
;    1772  1      %sbttl 'RMS$READ routine'
;    1773  1
;    1774  1      global routine rms$read (rabptr) =
;    1775  1
;    1776  1      !++
;    1777  1      ! Functional description:
;    1778  1      !       Read from a file, beginning with either the next or some specified
;    1779  1      !       VBN.  As many blocks are read as will fit in the user buffer
;    1780  1      !
;    1781  1      ! Inputs:
;    1782  1      !       rabptr                  pointer to the RAB to use
;    1783  1      !
;    1784  1      ! Implicit inputs:
;    1785  1      !       RAB [rab$l_fab]         The FAB which controls the file
;    1786  1      !       RAB [rab$l_bkt]         VBN to read from
;    1787  1      !       FAB [fab$w_ifi]         Index in RMS$FILE_TABLE for this file
;    1788  1      !       CBLOCK                  Internal control block
;    1789  1      !
;    1790  1      ! Outputs:
;    1791  1      !       none
;    1792  1      !
;    1793  1      ! Implicit outputs:
;    1794  1      !       The RBF and RSZ fields of the RAB are set to describe the
;    1795  1      !       record read.
;    1796  1      !
;    1797  1      !       RAB [rab$l_sts]         contains the status code
;    1798  1      !       RAB [rab$l_stv]         may contain a secondary status
;    1799  1      !
;    1800  1      ! Side effects:
;    1801  1      !       CBLOCK                  The next block, the cache control data, and
;    1802  1      !                               the tape position control are all subject
;    1803  1      !                               to change.
;    1804  1      !
;    1805  1      ! Return codes:
;    1806  1      !       RMS$_NORMAL             Everything's nice
;    1807  1      !       RMS$_RER                Some read error (RAB [rab$l_stv] contains
;    1808  1      !                               the actual SS$_* error code)
;    1809  1      !       RMS$_RAB                bad RAB
;    1810  1      !       RMS$_FAB                bad FAB
;    1811  1      !       RMS$_IFI                bad IFI (or CBLOCK)
;    1812  1      !       RMS$_ISI                FAB and RAB not connected
;    1813  1      !       RMS$_EOF                VBN specified is past EOF
;    1814  1      !       RMS$_SEQ                VBN was specified for access to Andromeda console       [43]            !G:4
;    1815  1      !--
;    1816  1
;    1817  2          begin
;    1818  2
;    1819  2          global register
;    1820  2              cblock = 9 : ref bblock ,           ! Map to CBLOCK
;    1821  2              rab = 10 : ref bblock ,             ! Map to RAB
;    1822  2              fab = 11 : ref bblock;              ! Map to FAB
;    1823  2
;    1824  2          local
;    1825  2              stat;
;    1826  2
;    1827  2          fab = cblock = 0;
;    1828  2          rab = .rabptr;                          ! Get pointer to RAB
```

```
;    1829  2
;    1830  2          if not verify_rab ()                    ! If it isn't a RAB
;    1831  2          then
;    1832  2              return (rms$_rab);                  !  no good at all
;    1833  2
;    1834  2          rab [rab$l_stv] = 0;                    ! Clear out STV field
;    1835  2          fab = .rab [rab$l_fab];                 ! Point to RAB's FAB
;    1836  2
;    1837  2          if not verify_fab ()                    ! If it isn't a FAB
;    1838  2          then
;    1839  2              return rab$error (rms$_fab);        !  then quit nicely
;    1840  2
;    1841  2          if not verify_cblock ()                 ! Load CBLOCK pointer,
;    1842  2          then
;    1843  2              return rab$error (rms$_ifi);        !  and quit if IFI's bad
;    1844  2
;    1845  2          if .cblock [ctl$l_rab] neq .rab         ! If this isn't the right RAB
;    1846  2          then
;    1847  2              return rab$error (rms$_isi);        !  say 'bad stream id'
;    1848  2
;    1849  2      !
;    1850  2      ! Now, all the control stuff is OK.  We can go to work
;    1851  2      !
;    1852  2                                                                                  !G:4
;    1853  3       If  (.DS$GB_SYSTYPE EQL PR$_SYS_TYP900)          !  if Andromeda cpu  [43]  !G:5
;    1854  2            then                                                                  !G:5
;    1855  3              Begin                                                               !G:4
;    1856  3              if .rab [rab$l_bkt] gtr 0                ! If user specified VBN  [43]  !G:4
;    1857  3              then return rab$error (rms$_seq);        !  return error          [43]  !G:4
;    1858  3                                                                                  !G:4
;    1859  3              stat = PPA$READ                          ! Read block (into UBF) using interface [43]  !G:4
;    1860  3                   ( RAB[RAB$L_UBF], RAB[RAB$W_RSZ] );  ! and return record size read (RSZ)  [43]  !G:4
;    1861  3              end                                                                 !G:4
;    1862  2          else                                                                    !G:4
;    1863  3              Begin                                                               !G:4
;    1864  3              cblock [ctl$b_op] = ctl$c_read;         ! We're on READ operation   !G:4
;    1865  3                                                                                  !G:4
;    1866  3              if .cblock [ctl$l_nbp] eql 0            ! If this is first          !G:4
;    1867  3              then                                                                !G:4
;    1868  3              cblock [ctl$l_nbp] = 1;                 ! Set to block 1            !G:4
;    1869  3                                                                                  !G:4
;    1870  3              if .rab [rab$l_bkt] gtr 0                    ! If user specified VBN  !G:4
;    1871  3              then                                                                !G:4
;    1872  3                  cblock [ctl$l_nbp] = .rab [rab$l_bkt];   ! Copy to next block pointer  !G:4
;    1873  3                                                                                  !G:4
;    1874  3              rab [rab$l_rfa0] = .cblock [ctl$l_nbp]; ! Set RFA to beginning of block  !G:4
;    1875  3              rab [rab$w_rfa4] = 0;                                               !G:4
;    1876  3              rab [rab$w_rsz] = rab [rab$l_rbf] = 0;  ! Init context stuff  [05] !G:4
;    1877  3                                                                                  !G:4
;    1878  3              if .cblock [ctl$l_nbp] gtr .cblock [ctl$l_eofvbn]       ! If past end of file  !G:4
;    1879  4                  or (.cblock [ctl$l_nbp] eql .cblock [ctl$l_eofvbn]  !  [05] !G:4
;    1880  4                   and .cblock [ctl$w_offbyte] eql 0) !  (check if on null block)  [05] !G:4
;    1881  3              then                                                                !G:4
;    1882  3                  return rab$error (rms$_eof);        !  don't bother             !G:4
;    1883  3                                                                                  !G:4
;    1884  3              stat = (.cblock [ctl$l_read]) ();       ! Call actual READ routine  !G:4
;    1885  2              END;                                                                !G:4
```

```
;   1886  2                                                                                                    !G:4
;   1887  2                                                                                                    !G:4
;   1888  2         rab$error (.stat)                          ! Return whatever status
;   1889  1         end;                                       ! Of RMS$READ



                                                  0FFC 00000          .ENTRY  RMS$READ, Save R2,R3,R4,R5,R6,R7,R8,R9,R10,-; 1774
                                                                              R11                                         ;
                                                 59  D4 00002          CLRL    CBLOCK                                      ; 1827
                                                 5B  D4 00004          CLRL    FAB                                         ;
                                 5A       04     AC  D0 00006          MOVL    RABPTR, RAB                                 ; 1828
                                               FB01  30 0000A          BSBW    VERIFY_RAB                                  ; 1830
                                 08             50  E8 0000D          BLBS    R0, 1$                                      ;
                                 50 0001863C    8F  D0 00010          MOVL    #99900, R0                                  ; 1832
                                                    04 00017          RET                                                 ;
                                          0C     AA  D4 00018 1$:      CLRL    12(RAB)                                     ; 1834
                                 5B       3C     AA  D0 0001B          MOVL    60(RAB), FAB                                ; 1835
                                               FABB  30 0001F          BSBW    VERIFY_FAB                                  ; 1837
                                 09             50  E8 00022          BLBS    R0, 2$                                      ;
                                 50 0001850C    8F  D0 00025          MOVL    #99596, R0                                  ; 1839
                                                 39  11 0002C          BRB     5$                                          ;
                                               FABF  30 0002E 2$:      BSBW    VERIFY_CBLOCK                               ; 1841
                                 09             50  E8 00031          BLBS    R0, 3$                                      ;
                                 50 00018564    8F  D0 00034          MOVL    #99684, R0                                  ; 1843
                                                 7D  11 0003B          BRB     13$                                         ;
                                 5A       20     A9  D1 0003D 3$:      CMPL    32(CBLOCK), RAB                             ; 1845
                                                 09  13 00041          BEQL    4$                                          ;
                                 50 00018584    8F  D0 00043          MOVL    #99716, R0                                  ; 1847
                                                 6E  11 0004A          BRB     13$                                         ;
00000000G  8F 00000000G  EF      08             00  ED 0004C 4$:      CMPZV   #0, #8, DS$GB_SYSTYPE, #PR$_SYS_TYP900      ; 1853
                                                 1D  12 00059          BNEQ    7$                                          ;
                                          38     AA  D5 0005B          TSTL    56(RAB)                                     ; 1856
                                                 09  15 0005E          BLEQ    6$                                          ;
                                 50 000186AC    8F  D0 00060          MOVL    #100012, R0                                 ; 1857
                                                 51  11 00067 5$:      BRB     13$                                         ;
                                          22     AA  9F 00069 6$:      PUSHAB  34(RAB)                                     ; 1860
                                          24     AA  9F 0006C          PUSHAB  36(RAB)                                     ;
                         00000000G  EF           02  FB 0006F          CALLS   #2, PPA$READ                                ;
                                                 3F  11 00076          BRB     12$                                         ;
                                 69             03  90 00078 7$:      MOVB    #3, (CBLOCK)                                ; 1864
                                          04     A9  D5 0007B          TSTL    4(CBLOCK)                                   ; 1866
                                                 04  12 0007E          BNEQ    8$                                          ;
                             04   A9             01  D0 00080          MOVL    #1, 4(CBLOCK)                               ; 1868
                                          38     AA  D5 00084 8$:      TSTL    56(RAB)                                     ; 1870
                                                 05  15 00087          BLEQ    9$                                          ;
                             04   A9      38     AA  D0 00089          MOVL    56(RAB), 4(CBLOCK)                          ; 1872
                             10   AA      04     A9  D0 0008E 9$:      MOVL    4(CBLOCK), 16(RAB)                          ; 1874
                                          14     AA  B4 00093          CLRW    20(RAB)                                     ; 1875
                                          28     AA  D4 00096          CLRL    40(RAB)                                     ; 1876
                                          22     AA  B4 00099          CLRW    34(RAB)                                     ;
                             44   A9      04     A9  D1 0009C          CMPL    4(CBLOCK), 68(CBLOCK)                       ; 1878
                                                 07  14 000A1          BGTR    10$                                         ;
                                                 0E  12 000A3          BNEQ    11$                                         ; 1879
                                          42     A9  B5 000A5          TSTW    66(CBLOCK)                                  ; 1880
```

```
                                  09  12 000A8          BNEQ    11$                                  ;
                     50 0001827A  8F  D0 000AA 10$:     MOVL    #98938, R0                           ; 1882
                                  07  11 000B1          BRB     13$                                  ;
                 10  B9           00  FB 000B3 11$:     CALLS   #0, @16(CBLOCK)                      ; 1884
                     51           50  D0 000B7 12$:     MOVL    R0, STAT                             ;
                                FA16  30 000BA 13$:     BSBW    RAB$ERROR                            ; 1888
                                      04 000BD          RET                                          ; 1889

; Routine Size:  190 bytes,    Routine Base:  CODE + 098D


;   1890  1
```

```
;    1892  1      %sbttl 'RMS$DISCONNECT routine'
;    1893  1
;    1894  1      global routine rms$disconnect (rabptr) =
;    1895  1
;    1896  1      !++
;    1897  1      ! Functional description:
;    1898  1      !       Disconnect a RAB from a FAB.  This is relatively trivial; the validity
;    1899  1      !       of both RAB and FAB are verified, checks are made to be sure the
;    1900  1      !       file is open and the RAB was connected to that FAB
;    1901  1      !
;    1902  1      ! Inputs:
;    1903  1      !       rabptr          pointer to the RAB to disconnect
;    1904  1      !
;    1905  1      ! Implicit inputs:
;    1906  1      !       RAB [rab$l_fab] points to the FAB to disconnect this RAB from
;    1907  1      !       FAB [fab$w_ifi] indexes the rms$file_table to find the CBLOCK
;    1908  1      !
;    1909  1      ! Outputs:
;    1910  1      !       none
;    1911  1      !
;    1912  1      ! Implicit outputs:
;    1913  1      !       RAB [rab$l_sts] return status
;    1914  1      !       RAB [rab$l_stv] secondary status
;    1915  1      !
;    1916  1      ! Side Effects:
;    1917  1      !       some fields in the RAB and CBLOCK are modified
;    1918  1      !
;    1919  1      ! Return codes:
;    1920  1      !       RMS$_NORMAL     all OK
;    1921  1      !       RMS$_RAB        the RAB block is invalid
;    1922  1      !       RMS$_FAB        the FAB block is invalid
;    1923  1      !       RMS$_IFI        the FAB's IFI field is invalid.
;    1924  1      !       RMS$_ISI        RAB and FAB weren't connected
;    1925  1      !--
;    1926  1
;    1927  2          begin
;    1928  2
;    1929  2          global register
;    1930  2              rab = 10 : ref bblock ,                 ! Pointer to RAB
;    1931  2              fab = 11 : ref bblock ,                 ! Pointer to FAB
;    1932  2              cblock = 9 : ref bblock;                ! Pointer to CBLOCK
;    1933  2
;    1934  2          fab = cblock = 0;
;    1935  2          rab = .rabptr;                              ! Map to RAB
;    1936  2
;    1937  2          if not verify_rab ()                        ! If the RAB is bad
;    1938  2          then
;    1939  2              return (rms$_rab);                      !  return error
;    1940  2
;    1941  2          rab [rab$l_stv] = 0;
;    1942  2          fab = .rab [rab$l_fab];                     ! Map to FAB
;    1943  2
;    1944  2          if not verify_fab ()                        ! If the FAB is bad
;    1945  2          then
;    1946  2              return rab$error (rms$_fab);            !  return error
;    1947  2
;    1948  2          if not verify_cblock ()                     ! If bad IFI
```

```
;    1949  2          then
;    1950  2              return rab$error (rms$_ifi);                ! return with error
;    1951  2
;    1952  2          if .cblock [ctl$l_rab] neq .rab                 ! If this isn't the right RAB
;    1953  2          then
;    1954  2              return rab$error (rms$_isi);                ! say 'bad stream id'
;    1955  2
;    1956  2          cblock [ctl$l_rab] = 0;                         ! Clear RAB pointer.
;    1957  2          rab$error (rms$_normal)                         ! Set good return
;    1958  1          end;



                                    0FFC 00000          .ENTRY  RMS$DISCONNECT, Save R2,R3,R4,R5,R6,R7,R8,- ; 1894
                                                                R9,R10,R11                                      ;
                                      59  D4 00002          CLRL    CBLOCK                                    ; 1934
                                      5B  D4 00004          CLRL    FAB                                       ;
                              5A      04  AC  D0 00006          MOVL    RABPTR, RAB                               ; 1935
                                        FA43  30 0000A          BSBW    VERIFY_RAB                                ; 1937
                              08          50  E8 0000D          BLBS    R0, 1$                                    ;
                              50 0001863C   8F  D0 00010          MOVL    #99900, R0                                ; 1939
                                          04  00017          RET                                               ;
                                      0C  AA  D4 00018 1$:    CLRL    12(RAB)                                   ; 1941
                              5B      3C  AA  D0 0001B          MOVL    60(RAB), FAB                              ; 1942
                                        F9FD  30 0001F          BSBW    VERIFY_FAB                                ; 1944
                              09          50  E8 00022          BLBS    R0, 2$                                    ;
                              50 0001850C   8F  D0 00025          MOVL    #99596, R0                                ; 1946
                                          28  11 0002C          BRB     5$                                        ;
                                        FA01  30 0002E 2$:      BSBW    VERIFY_CBLOCK                             ; 1948
                              09          50  E8 00031          BLBS    R0, 3$                                    ;
                              50 00018564   8F  D0 00034          MOVL    #99684, R0                                ; 1950
                                          19  11 0003B          BRB     5$                                        ;
                              5A      20  A9  D1 0003D 3$:      CMPL    32(CBLOCK), RAB                           ; 1952
                                          09  13 00041          BEQL    4$                                        ;
                              50 00018584   8F  D0 00043          MOVL    #99716, R0                                ; 1954
                                          0A  11 0004A          BRB     5$                                        ;
                                      20  A9  D4 0004C 4$:      CLRL    32(CBLOCK)                                ; 1956
                              50 00010001   8F  D0 0004F          MOVL    #65537, R0                                ; 1957
                                        F9BC  30 00056 5$:      BSBW    RAB$ERROR                                 ;
                                          04  00059          RET                                               ; 1958

; Routine Size:  90 bytes,    Routine Base:  CODE + 0A4B

;    1959  1
```

```
;    1961  1      %sbttl 'RMS$CLOSE routine'
;    1962  1
;    1963  1      global routine rms$close (fabptr) =
;    1964  1
;    1965  1      !++
;    1966  1      ! Functional description
;    1967  1      !       Perform operations necessary to sever a file's connection to
;    1968  1      !       RMS.  This includes de-allocating all internal data blocks,
;    1969  1      !       re-positioning a magtape (if the file is on magtape), and
;    1970  1      !       clearing the file's slot in the RMS$FILE_TABLE.
;    1971  1      !
;    1972  1      ! Inputs:
;    1973  1      !       fabptr          Pointer to the FAB describing the file to be closed
;    1974  1      !
;    1975  1      ! Implicit inputs:
;    1976  1      !       The control block (CBLOCK) associated with the file.
;    1977  1      !
;    1978  1      ! Outputs:
;    1979  1      !       none
;    1980  1      !
;    1981  1      ! Implicit outputs:
;    1982  1      !       FAB [fab$l_sts]         contains return code
;    1983  1      !
;    1984  1      ! Side Effects:
;    1985  1      !       Deallocate file's CBLOCK and clear the file's slot in the file
;    1986  1      !       pointer table, and the FAB's IFI.
;    1987  1      !
;    1988  1      ! Return codes:
;    1989  1      !       RMS$_NORMAL             All OK
;    1990  1      !       possible magtape positioning error code
;    1991  1      !--
;    1992  1
;    1993  2          begin
;    1994  2
;    1995  2          global register
;    1996  2              cblock = 9 : ref bblock ,                  ! map control block
;    1997  2              rab = 10,                                  ! register for rab (not used)
;    1998  2              fab = 11 : ref bblock;                     ! To map FAB
;    1999  2                                                                                          !G:21
;    2000  2          local
;    2001  2              stat;
;    2002  2
;    2003  3       If  (.DS$GB_SYSTYPE EQL PR$_SYS_TYP900)               !  if Andromeda cpu          [43]    !G:5
;    2004  2          Then                                              ! then call the PPA interface to [43]    !G:5
;    2005  3              Begin                                         ! open the file             [43]    !G:4
;    2006  3              Stat = PPA$CLOSE();                           !                           [43]    !G:4
;    2007  3              Return  .Stat                                 !                           [43]    !G:4
;    2008  2              End;                                          !                           [43]    !G:4
;    2009  2                                                                                              !G:4
;    2010  2                                                                                              !G:4
;    2011  2          cblock = rab = 0;                                 ! None
;    2012  2          fab = .fabptr;                                    ! Set up FAB pointer
;    2013  2
;    2014  2          if not verify_fab () then return (rms$_fab);          ! Error if not rea FAB
;    2015  2
;    2016  2          fab [fab$l_sts] = 0;                              ! Init some fields
;    2017  2          fab [fab$l_stv] = 0;
```

```
;    2018  2
;    2019  2          if not verify_cblock ()                        ! If bad IFI
;    2020  2          then
;    2021  2              return rms$error (rms$_ifi);               !  return error
;    2022  2
;    2023  2          cblock [ctl$b_op] = ctl$c_close;               ! Specify operation
;    2024  2
;    2025  2          if .cblock [ctl$l_rab] neq 0                   ! If RAB wasn't disconnected
;    2026  2          then
;    2027  3              begin
;    2028  3
;    2029  3              local
;    2030  3                  stat;
;    2031  3
;    2032  3              stat = rms$disconnect (.cblock [ctl$l_rab]);    ! Disconnect it
;    2033  3
;    2034  3              if not .stat
;    2035  3              then
;    2036  3                  return rms$error (.stat)               ! Error?
;    2037  2              end;
;    2038  2
;    2039  3          stat = (if .cblock [ctl$l_close] neq 0         ! If there's a close routine
;    2040  3          then (.cblock [ctl$l_close]) ()                !  call it
;    2041  2          else rms$_normal);                             !  otherwise, set good status
;    2042  2          rms$error (.stat)                              ! De-allocate, return
;    2043  1          end;


                                        0FFC 00000          .ENTRY  RMS$CLOSE, Save R2,R3,R4,R5,R6,R7,R8,R9,-    ; 1963
                                                                    R10,R11                                      ;
00000000G  8F 00000000G  EF       08        00  ED 00002          CMPZV   #0, #8, DS$GB_SYSTYPE, #PR$_SYS_TYP900   ; 2003
                                            0B  12 0000F          BNEQ    1$                                   ;
                          00000000G  EF       00  FB 00011          CALLS   #0, PPA$CLOSE                        ; 2006
                                    52        50  D0 00018          MOVL    R0, STAT                             ;
                                              04  0001B          RET                                          ; 2007
                                        59    7C  0001C 1$:       CLRQ    CBLOCK                               ; 2011
                                    5B    04  AC  D0 0001E          MOVL    FABPTR, FAB                          ; 2012
                                        F9A0  30  00022          BSBW    VERIFY_FAB                           ; 2014
                                    08        50  E8 00025          BLBS    R0, 2$                               ;
                                    50 0001850C 8F  D0 00028          MOVL    #99596, R0                           ;
                                              04  0002F          RET                                          ;
                                        08  AB  7C  00030 2$:       CLRQ    8(FAB)                               ; 2016
                                        F9A2  30  00033          BSBW    VERIFY_CBLOCK                        ; 2019
                                    09        50  E8 00036          BLBS    R0, 3$                               ;
                                    50 00018564 8F  D0 00039          MOVL    #99684, R0                           ; 2021
                                              2B  11 00040          BRB     7$                                   ;
                                    69        04  90 00042 3$:       MOVB    #4, (CBLOCK)                         ; 2023
                                        20  A9  D5 00045          TSTL    32(CBLOCK)                           ; 2025
                                              0B  13 00048          BEQL    4$                                   ;
                                        20  A9  DD 0004A          PUSHL   32(CBLOCK)                           ; 2032
                                FF54  CF        01  FB 0004D          CALLS   #1, RMS$DISCONNECT                   ;
                                    18        50  E9 00052          BLBC    STAT, 7$                             ; 2034
                                        14  A9  D5 00055 4$:       TSTL    20(CBLOCK)                           ; 2039
                                              09  13 00058          BEQL    5$                                   ;
```

```
                                14   B9            00  FB 0005A        CALLS   #0, a20(CBLOCK)                          ; 2040
                                     52            50  D0 0005E        MOVL    R0, STAT                                 ;
                                                   07  11 00061        BRB     6$                                       ;
                                     52 00010001   8F  D0 00063 5$:    MOVL    #65537, STAT                             ; 2041
                                     50            52  D0 0006A 6$:    MOVL    STAT, R0                                 ; 2042
                                                F7D5  30 0006D 7$:    BSBW    RMS$ERROR                                ;
                                                      04 00070        RET                                              ; 2043

; Routine Size:  113 bytes,    Routine Base:  CODE + 0AA5


;   2044  1
;   2045  1     end
;   2046  1
;   2047  0     eludom




;                                   PSECT SUMMARY
;
;       Name                    Bytes                          Attributes
;
;  WORK                            16  NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  DATA                          1088  NOVEC,NOWRT,  RD ,NOEXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  CODE                          2838  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  .  ABS  .                        0  NOVEC,NOWRT,NORD ,NOEXE,NOSHR,  LCL,  ABS,  CON,NOPIC,ALIGN(0)



Symbol                      Type  Defined  Referenced ...
------------------------ -------- ----- ----------------
$$_ROWS_$$                Comptime   392   396     397     398     399     400     401     402     403     404     405     406
                                          407     408     409     410     411     412     413     414     415     416     417
                                          418     419     420     421     422     423     424     425     426     427     428
                                          429     430     431     432     436
$ASCIC                    Macro    Lib01   396     397     398     399     400     401     402     403     404     405     406
                                          407     408     409     410     411     412     413     414     415     416     417
                                          418     419     420     421     422     423     424     425     426     427     428
                                          429     430     431     432
$DS_DSADEF                Macro    Lib01   321
$DS_HPEO_DECL             Macro    Lib01   537     538     539    1384    1385    1386
$DS_HPEO_F                Fieldset Lib01   537     538     539    1384    1385    1386
$DS_HPO_DECL              Macro    Lib01   534     540     541     545     546     547     548    1401    1402    1403    1404
                                         1405    1406    1407
$DS_HPO_F                 Fieldset Lib01   534     540     541     545     546     547     548    1401    1402    1403    1404
                                         1405    1406    1407
$FAB_DECL                 Macro    Lib03  1030
A                         Unbound          405     406     407     408     409     410     416     417     418     419
ADAPTER                   Local      541   549=    552a.   556.    558.    559=    559a.   563aa   576=    581aa   592=    623aa
                          Local     1403  1416=   1419a.  1423.   1425.   1426=   1426a.  1430aa  1443=   1448aa  1459=   1494.
                                         1494a.  1515.   1515a.  1548a.
ADAPTERTYPE               Local     1391  1470a   1546.
```

Symbol	Type	Defined	Referenced ...
ADAPTER_ADDR_EXT	Local	1387	1494= 1495a. 1515= 1516a.
ADAPTER_EPB	Local	537	
	Local	1384	1495= 1496a. 1516= 1517a.
ADAPTER_TYPE	Bind	623	626. 627. 631. 632. 633. 638. 639. 640. 645. 646. 651.
			652. 657. 658. 663. 664. 669. 670.
ADC	RoutForm	527	751a=
ADPPHY	RoutForm	463	483.
ADPTYPE	RoutForm	463	481.
ANSI$OPEN	ExtRout	352	1511a
AP	Builtin	749	749a. 749.
	Builtin	753	753a. 753.
	Builtin	757	757a. 757.
	Builtin	761	761a. 761.
BBLOCK	Structur	Lib02 330	331 795 796 896 897 900 961 1033 1035 1066
		1091	1116 1150 1185 1241 1242 1243 1248 1249 1250 1328
		1606	1607 1608 1705 1706 1707 1820 1821 1822 1930 1931
		1932	1996 1998
BINODE	RoutForm	463	479.
	Local	1396	1412= 1496= 1502= 1517= 1552.
BOO$AL_VECTOR	External	333	480a 487= 487a
BOO$SELECT	External	332	487a
BREAKUP_FILE	ExtRout	347	1295c 1296c 1298c 1303c 1304c 1306c 1308c 1311c
BTD	RoutForm	527	755a=
BTD$K_BDA	Literal	Lib03 423	424 425 426 427 428
BTD$K_BVPSSP	Literal	Lib03 429	430 431 432
BTD$K_CONSOLE	Literal	Lib03 396	397 722 724 730 745
BTD$K_DL	Literal	Lib03 410	
BTD$K_DM	Literal	Lib03 409	
BTD$K_DQ	Literal	Lib03 407	
BTD$K_HSCCI	Literal	Lib03 416	420 421 422
BTD$K_HSCMU	Literal	Lib02 417	
BTD$K_MB	Literal	Lib03 398	399 400 401 402 403 404
BTD$K_MU	Literal	Lib02 415	
BTD$K_TF	Literal	Lib02 406	
BTD$K_TM	Literal	Lib02 405	
BTD$K_TS	Literal	Lib02 411	412 413 414
BTD$K_UDA	Literal	Lib03 408	418 419
BUFSIZ	RoutForm	927	966.
CACHE	Bind	799	840. 843. 844.
CALL_RMS	Linkage	Lib02 286	349 350 351 352 353 354 355 863
CBLOCK	ExtReg	795	799aa 803. 806a. 810a. 815a. 818a. 819a. 822a. 824a. 826a. 829a.
			831a. 843a. 847. 849= 855. 855a=
	ExtReg	896	914a. 915a. 921a.
	ExtReg	961	966a= 969a= 973a= 977a=
	GlobReg	1033	1037= 1041a=
	ExtReg	1149	1158= 1160=
	GlobReg	1241	1257= 1272= 1276. 1277a= 1278a= 1279a= 1350a= 1351a= 1352a= 1356a= 1379a=
			1416a= 1510a= 1521a= 1531a= 1544a=
	GlobReg	1608	1610= 1635a. 1639a= 1640a= 1641a= 1642a= 1646a=
	GlobReg	1705	1712= 1730a. 1748a= 1752a= 1756a. 1757a. 1758a. 1764ac 1765a.
	GlobReg	1820	1827= 1845a. 1864a= 1866a. 1868a= 1872a= 1874a. 1878a. 1879a. 1880a. 1884ac
	GlobReg	1932	1934= 1952a. 1956a=
	GlobReg	1996	2011= 2023a= 2025a. 2032a. 2039a. 2040ac
CBLOCKSIZE	Local	1246	1272= 1278.
CHECK_DEVICE	Local	542	595= 604a. 609a.

Symbol	Type	Defined	Referenced ...							
CIA	Unbound		398	399	400	401	402	403	404	405	406
CINUMBER	Local	1395	1411=	1497=	1519=	1551.					
CIPORT	RoutForm	463	486.								
CODE	RoutForm	791	801.	803.	805.	857.					
	RoutForm	1047	1068.								
	RoutForm	1072	1093.								
CONTROLLER	Local	540	549=	555.	556=	575=	591=	595aa			
	Local	1402	1416=	1422.	1423=	1442=	1458=	1497a.	1499.	1499a.	1519a.	1547a.
CONTROLLER_ADDR_EXT	Local	1388	1499=	1500a.							
CONTROLLER_EPB	Local	538									
	Local	1385	1500=	1501a.	1502a.						
CSRPHY	RoutForm	463	482.								
CTL$B_OP	Macro	Lib02	806	810	855	1041	1279	1748	1864	2023	
CTL$C_CLOSE	Literal	Lib02	806	810	1041	2023					
CTL$C_FILHDR_SIZ	Literal	Lib02	818								
CTL$C_GET	Literal	Lib02	1748								
CTL$C_LENGTH	Literal	Lib02	1272	1277							
CTL$C_OPEN	Literal	Lib02	810	1279							
CTL$C_READ	Literal	Lib02	1864								
CTL$L_CACHE1	Macro	Lib02	799	969							
CTL$L_CACHE2	Macro	Lib02	973								
CTL$L_CACHE3	Macro	Lib02	977								
CTL$L_CLOSE	Macro	Lib02	2039	2040							
CTL$L_EOFVBN	Macro	Lib02	914	1756	1757	1878	1879				
CTL$L_FILE_PTR	Macro	Lib02	829	831	1352	1356					
CTL$L_FILHDR	Macro	Lib02	815	818	819						
CTL$L_GET	Macro	Lib02	1764								
CTL$L_NBP	Macro	Lib02	1646	1866	1868	1872	1874	1878	1879		
CTL$L_PTABLE	Macro	Lib02	1416								
CTL$L_RAB	Macro	Lib02	1635	1639	1730	1845	1952	1956	2025	2032	
CTL$L_READ	Macro	Lib02	1884								
CTL$L_RPB	Macro	Lib02	822	824	1544						
CTL$L_STARTLBN	Macro	Lib02	921								
CTL$L_VBN	Macro	Lib02	1640	1756	1757						
CTL$V_ANSI	Macro	Lib02	1510								
CTL$V_ODS	Macro	Lib02	1521								
CTL$V_RT11	Macro	Lib02	1531								
CTL$W_BYTE	Macro	Lib02	1641	1758							
CTL$W_CACHE_SIZE	Macro	Lib02	843	966							
CTL$W_FILE_ALLOC	Macro	Lib02	829	1351							
CTL$W_FILE_LEN	Macro	Lib02	826	1350							
CTL$W_OFFBYTE	Macro	Lib02	915	1758	1880						
CTL$W_REC_SIZE	Macro	Lib02	1642								
CTL$W_RFA	Macro	Lib02	1752	1765							
CTL$W_SIZE	Macro	Lib02	1278								
CTL$W_UNIT	Macro	Lib02	1379								
D	Bind	1328	1334.	1335.							
DEBNK	Unbound		398	399	400	401	402	403	404	405	406
DEBNT	Unbound		398	399	400	401	402	403	404	405	406
DEF$C_BKSTP_LEN	GlobBind	383	1303								
DEF$C_ULTRIX_LEN	GlobBind	385	1295								
DEF$Q_BACKSTOP	GlobBind	384	1303a								
DEF$Q_DEV	External	331	1296.	1297.	1304.	1305.					
DEF$Q_DIR	External	330	1298.	1299.	1306.	1307.					
DEF$Q_ULTRIX	GlobBind	386	1295a								

Symbol	Type	Defined	Referenced ...									
DEV$M_DIR	Literal	Lib03	310	311								
DEV$M_FOD	Literal	Lib03	309	310	311							
DEV$M_RND	Literal	Lib03	310	311								
DEV$M_SDI	Literal	Lib03	311									
DEV$M_SQD	Literal	Lib03	309									
DEVICE	RoutForm	527	534m	549.	697aa							
	Local	1401	1413=	1415.	1417.	1462.	1462a.	1464a.	1470.	1505.	1505a.	
DEVICE$_ANSI	Literal	309	1509									
DEVICE$_ODS	Literal	310	1520									
DEVICE$_RT11	Literal	311	1530									
DEVICETYPE	RoutForm	463	478.									
	Local	1392	1470a	1545.								
DEVICEUNIT	Local	1393	1466=	1468=	1501=	1549.						
DEVICE_ADDR_EXT	Local	1389	1462=	1463a.	1505=	1506a.						
DEVICE_EPB	Local	539										
	Local	1386	1463=	1466a.	1468a.	1506=	1507a.					
DEVICE_NAME	Bind	697	699.	704.								
DEVICE_TYPE	Bind	602	604.	606.	607.	608.						
DEVLEN	Local	1365	1378=	1379.	1413.							
DEVPTR	Local	1366	1378=	1413.								
DEV_TYPE	Bind	563	569.	570.	571.	572.						
	Bind	581	587.	588.								
	Bind	1430	1436.	1437.	1438.	1439.						
	Bind	1448	1454.	1455.								
DRIVE	RoutForm	463	484.									
DRIVELIST	Unbound		396	397	398	399	400	401	402	403	404	411	412
			413	414	415	420	421	422	423	424	425	426	427
			428	429	430	431	432						
	Macro	Lib02	405	406	407	408	409	410	416	417	418	419	
DRIVE_VECTOR	Bind	686	688	692.	696.							
DS$GA_SUPPORT_TABLE	GlobBind	395	596a									
DS$GB_CI_INIT	External	326	416a	417a								
DS$GB_KDB50_INIT	External	327	423a	424a	425a	426a	427a	428a				
DS$GB_PB_INIT	External	328	429a	430a	431a	432a						
DS$GB_SYSTYPE	External	329	746.	1479.	1738.	1853.	2003.					
DS$GB_UDA50_INIT	External	325	408a	418a	419a							
DS$GK_SUPPORT_TABLE_ROWS	GlobLit	436	598									
DS$_ERROR	Literal	Lib01	743	747								
DS$_PROGERR	Literal	Lib01	690	1536								
DSA$AL_APTMAIL	Bind	321	321									
DSA$GL_APTCOM	Bind	321										
DSA$GL_DEVLEN	Bind	321										
DSA$GL_DEVNAM	Bind	321										
DSA$GL_ERRNO	Bind	321										
DSA$GL_EVENT	Bind	321										
DSA$GL_FLAGS	Bind	321	489									
DSA$GL_MSGPTR	Bind	321										
DSA$GL_MSGTYP	Bind	321										
DSA$GL_PASSES	Bind	321										
DSA$GL_PASSNO	Bind	321										
DSA$GL_SECTNO	Bind	321										
DSA$GL_SID	Bind	321	341m	725	726	727	731	732	733			
DSA$GL_SUBTNO	Bind	321										
DSA$GL_TESTNO	Bind	321										
DSA$GL_UNITS	Bind	321										

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Symbol                          Type  Defined  Referenced ...
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DSA$V_USER                      Macro    Lib01   489
DSC$A_POINTER                   Macro    Lib03  1297    1299    1305    1307    1322    1335    1356    1377
DSC$C_S_BLN                     Literal  Lib03  1248    1250    1288    1328
DSC$W_LENGTH                    Macro    Lib03  1296    1298    1304    1306    1334    1342    1350    1356    1376
DSR$ALLOCATE_PSEUDO_RPB         GlobRout  462   1544c
DSR$DEALLOCATE_PSEUDO_RPB       GlobRout  496    824c
DSX$CHECK_SUPPORT               GlobRout  527   1470c
EXE$ALONONPAGED                 ExtRout   345    472c    969c    973c    977c   1272c   1349c
EXE$DEANONPAGED                 ExtRout   344    499c    819c    831c    844c    847c
FAB                             ExtReg    796    801a=   848a.   850a=
                                ExtReg    897    902a.   913a.   916a.   918a.   919a.
                                GlobReg  1035   1038=   1040a=
                                ExtReg   1091   1093a=
                                ExtReg   1116   1118a.  1119a.
                                ExtReg   1150   1155a.
                                GlobReg  1243   1258=   1262a.  1264a=  1270a=  1274a=  1280a=  1285a=  1286a=  1287a=  1308a.  1309a.
                                                1311a.  1312a.  1475a=  1509a=  1520a=  1530a=  1536a=
                                GlobReg  1607   1611=   1625=
                                GlobReg  1707   1712=   1720=
                                GlobReg  1822   1827=   1835=
                                GlobReg  1931   1934=   1942=
                                GlobReg  1998   2012=   2016a=  2017a=
FAB$B_BID                       Macro    Lib03  1118
FAB$B_BKS                       Macro    Lib03  1285
FAB$B_BLN                       Macro    Lib03  1119
FAB$B_DNS                       Macro    Lib03  1308
FAB$B_FNS                       Macro    Lib03  1311
FAB$B_FSZ                       Macro    Lib03   916
FAB$B_ORG                       Macro    Lib03  1262
FAB$B_RAT                       Macro    Lib03   913
FAB$B_RFM                       Macro    Lib03   919
FAB$C_BID                       Literal  Lib03  1118
FAB$C_BLN                       Literal  Lib03  1030    1119
FAB$C_SEQ                       Literal  Lib03   920    1262
FAB$ERROR                       Routine  1072   291f
FAB$L_DEV                       Macro    Lib03  1509    1520    1530
FAB$L_DNA                       Macro    Lib03  1309
FAB$L_FNA                       Macro    Lib03  1312
FAB$L_MRN                       Macro    Lib03  1286
FAB$L_SDC                       Macro    Lib03  1286
FAB$L_STS                       Macro    Lib03   801    1093    1270    1274    1287    2016
FAB$L_STV                       Macro    Lib03  1286    1475    1536    2017
FAB$L_XAB                       Macro    Lib03   902
FAB$W_IFI                       Macro    Lib03   848     850    1040    1155    1264    1280
FAB$W_MRS                       Macro    Lib03   918    1285
FABPTR                          RoutForm 1197   1258.
                                RoutForm 1963   2012.
FALSE                           Literal   307
FIL$CVTFILNAM                   ExtRout   346
FILE                            RoutForm  527    759a=
FILEDESC                        Local    1248   1288=   1295a   1297a   1299a   1303a   1305a   1307a   1309a   1312a   1328a
FILEFORMAT                      Local    1398   1470a   1490.
FILENAME                        Local    1249   1320a   1342a
FILENAMEDESC                    Local    1250   1322=   1342=   1350.   1356.   1356a.  1376.   1377.   1482a
FILE_INDEX                      Local    1247   1265=   1268.   1276.   1280.
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Symbol	Type	Defined	Referenced ...									
FOUND_ADAPTER	Local	615	615=	629=	635=	642=	648=	654=	660=	666=	672=	676=	719.
FOUND_DEVICE	Local	544	544=	719=	721.	743.							
FOUND_UNIT	Local	616	616=	692.	708=	717=	719.						
HP$A_DEVICE	Field	Lib01	1547.	1548.									
HP$A_LINK	Field	Lib01	552.	559.	1419.	1426.							
HP$B_CI_TEM	Field	Lib01	1497.	1519.									
HP$K_LENGTH	Literal	Lib01	534	540	541	545	546	547	548	1401	1402	1403	1404
			1405	1406	1407								
HP$T_DEVICE	Field	Lib01	1464.										
HP$T_TYPE	Field	Lib01	563a	581a	595a	623a	697a	1430a	1448a				
HP$W_SIZE	Field	Lib01	1462.	1494.	1499.	1505.	1515.						
HPE$K_LENGTH	Literal	Lib01	537	538	539	1384	1385	1386					
HPE$W_EXT_DRIVE	Field	Lib01	1466.	1468.	1496.	1501.	1502.	1507.	1517.				
HUB	Unbound		398	399	400	401	402	403	404	405	406		
I	Local	598											
	Local	838	840.	843.	844.								
	Local	1001	1002.										
	Local	1023	1025.	1037.	1040.								
	Local	1265	1266.										
	Local	1324	1328.										
IFI	Local	1153	1155=	1157.	1158.								
INDEX	Local	683	683=	692.	696.	712=	712.						
INIT	RoutForm	527	763a=										
INITBYTE	Local	1399	1470a	1486.	1488a=								
JSB_ALLOC	Linkage	Lib02	345										
JSB_CBLOCK	Linkage	Lib02	287	927									
JSB_DEALL	Linkage	Lib02	344										
JSB_DEVICE	Linkage	1370	1374										
JSB_LOC$PTABLE	Linkage	Lib02	348										
JSB_NONE	Linkage	Lib02	288	289	999	1007							
JSB_RMS	Linkage	Lib02	285	290	291	292	293	294	791	1047	1072	1097	1127
			1166										
KDB50	Unbound		398	399	400	401	402	403	404	405	406		
KFBTA	Unbound		398	399	400	401	402	403	404	405	406		
LEN	Local	1331	1334=	1337=	1337.								
LENGTH	Local	1318	1321=	1337=	1337.								
LOC$PTABLE	ExtRout	348	1413c										
MFPR	Builtin	467	489										
NAM$C_MAXRSS	Literal	Lib03	1249	1321									
NULLPARAMETER	Builtin	531	749	753	757	761							
ODS	Unbound		405	406	411	412	413	414	415	417	420	421	422
ODS$OPEN	ExtRout	350	1526a										
OPENROUTINE	Local	1397	1410=	1511=	1524=	1526=	1532=	1541.	1553ac				
POINTER	Local	1317	1320=	1322.	1338a=	1338=	1338.	1342.					
PPA$CLOSE	ExtRout	355	2006c										
PPA$LOOKUP	ExtRout	353	1482c										
PPA$READ	ExtRout	354	1741c	1859c									
PR$V_SID_TYPE	Macro	Lib03	725	726	727	731	732	733					
PR$_SBR	Literal	Lib03	489										
PR$_SID_TYP8NN	Literal	Lib03	726	732									
PR$_SID_TYP8RR	Literal	316	727	733									
PR$_SID_TYP8SS	Literal	Lib03	725	731									
PR$_SYS_TYP900	ExtLit	335	746	1479	1738	1853	2003						
PREV_ADAPTER	Local	545	549=	557.	558=	576.							
	Local	1405	1416=	1424.	1425=	1443.							

Symbol	Type	Defined	Referenced ...									
PREV_CONTROLLER	Local	546	549=	554.	555=	575.						
	Local	1404	1416=	1421.	1422=	1442.						
PREV_PREV_ADAPTER	Local	548	549=	557=	592.							
	Local	1407	1416=	1424=	1459.							
PREV_PREV_CONTROLLER	Local	547	549=	554=	591.							
	Local	1406	1417=	1421=	1458.							
PTR	Local	1332	1335=	1338.	1338=							
RAB	GlobReg	1034	1039=									
	ExtReg	1066	1068a=									
	ExtReg	1185	1187a.	1188a.								
	GlobReg	1242	1256=									
	GlobReg	1606	1612=	1618a=	1620a.	1621a.	1625a.	1639.	1643a=	1644a=	1645a=	
	GlobReg	1706	1713=	1719a=	1720a.	1730.	1742aa	1743a=	1750a.	1752a.	1754a=	1762a.	1765a=
	GlobReg	1821	1828=	1834a=	1835a.	1845.	1856a.	1860aa	1870a.	1872a.	1874a=	1875a=	1876a=
	GlobReg	1930	1935=	1941a=	1942a.	1952.						
	GlobReg	1997	2011=									
RAB$B_BID	Macro	Lib03	1187									
RAB$B_BLN	Macro	Lib03	1188									
RAB$B_RAC	Macro	Lib03	1620	1621	1750	1762						
RAB$C_BID	Literal	Lib03	1187									
RAB$C_BLN	Literal	Lib03	1188									
RAB$C_RFA	Literal	Lib03	1621	1750	1762							
RAB$C_SEQ	Literal	Lib03	1620									
RAB$ERROR	Routine	1047	290f	1623c	1629c	1633c	1637c	1647c	1724c	1728c	1732c	1760c	1768c
			1839c	1843c	1847c	1857c	1882c	1888c	1946c	1950c	1954c	1957c	
RAB$L_BKT	Macro	Lib03	1856	1870	1872								
RAB$L_FAB	Macro	Lib03	1625	1720	1835	1942							
RAB$L_RBF	Macro	Lib03	1644	1754	1876								
RAB$L_RFA0	Macro	Lib03	1874										
RAB$L_STS	Macro	Lib03	1068	1743									
RAB$L_STV	Macro	Lib03	1618	1719	1834	1941							
RAB$L_UBF	Macro	Lib03	1742	1860									
RAB$W_RFA	Macro	Lib03	1643	1752	1765								
RAB$W_RFA4	Macro	Lib03	1875										
RAB$W_RSZ	Macro	Lib03	1645	1742	1754	1860	1876						
RABPTR	RoutForm	1568	1612.										
	RoutForm	1653	1713.										
	RoutForm	1774	1828.										
	RoutForm	1894	1935.										
RMS$ALLOC_CACHE	GlobRout	927	287f										
RMS$CLEANUP	GlobRout	1007	289f										
RMS$CLOSE	GlobRout	1963	299f										
RMS$CONNECT	GlobRout	1568	296f										
RMS$C_MAXFILES	Literal	308	1023	1157									
RMS$DISCONNECT	GlobRout	1894	298f	2032c									
RMS$ERROR	GlobRout	791	285f	1042c	1262c	1354c	1415c	1476c	1537c	1559c	2021c	2036c	2042c
RMS$FILE_TABLE	Global	377	848=	1002=	1025.	1037.	1158.	1266.	1276=				
RMS$GET	GlobRout	1653	297f										
RMS$INIT	GlobRout	999	288f										
RMS$K_ANSI	Unbound		396	397	398	399	400	401	402	403	404	407	408
			409	410	416	418	419	423	424	425	426	427	428
			429	430	431	432							
	Literal	Lib02	405	406	411	412	413	414	415	417	420	421	422
			1492										
RMS$K_ODS	Unbound		396	405	406	411	412	413	414	415	417	420	421

Symbol	Type	Defined	Referenced ...									
			422									
	Literal	Lib02	397	398	399	400	401	402	403	404	407	408	409
			410	416	418	419	423	424	425	426	427	428	429
			430	431	432	1513							
RMS$K_RT11	Unbound		397	398	399	400	401	402	403	404	405	406	407
			408	409	410	411	412	413	414	415	416	417	418
			419	420	421	422	423	424	425	426	427	428	429
			430	431	432								
	Literal	Lib02	396	1528									
RMS$LOAD_XAB	GlobRout	863	286f	1558c									
RMS$OPEN	GlobRout	1197	295f										
RMS$READ	GlobRout	1774											
RMS$_CCR	Literal	Lib03	1637										
RMS$_DEV	Literal	Lib03	1415	1476	1537	1556							
RMS$_DME	Literal	Lib03	971	975	979	1270	1274	1354					
RMS$_EOF	Literal	Lib03	1762	1882									
RMS$_FAB	Literal	Lib03	1260	1629	1724	1839	1946	2014					
RMS$_IFI	Literal	Lib03	1633	1728	1843	1950	2021						
RMS$_ISI	Literal	Lib03	1732	1847	1954								
RMS$_NORMAL	Literal	Lib03	981	1647	1957	2041							
RMS$_ORG	Literal	Lib03	1262										
RMS$_RAB	Literal	Lib03	1616	1717	1832	1939							
RMS$_RAC	Literal	Lib03	1623										
RMS$_RFA	Literal	Lib03	1762										
RMS$_SEQ	Literal	Lib03	1857										
RMS$_SUC	Literal	Lib03	1287										
RPB	Local	470	472=	476a=	477a=	477.	478a=	479a=	480a=	481a=	482a=	483a=	484a=
			485a=	486a=	489a=	491.							
	RoutForm	496	498.	499.									
RPB$B_CONFREG	Macro	Lib03	481										
RPB$B_DEVTYP	Macro	Lib03	478										
RPB$B_SLAVE	Macro	Lib03	485										
RPB$C_LENGTH	Literal	Lib03	315										
RPB$L_ADPPHY	Macro	Lib03	483										
RPB$L_ADPVIR	Macro	Lib03	483										
RPB$L_BOOTR1	Macro	Lib03	479										
RPB$L_BOOTR2	Macro	Lib03	486										
RPB$L_CSRPHY	Macro	Lib03	482										
RPB$L_CSRVIR	Macro	Lib03	482										
RPB$L_IOVEC	Macro	Lib03	480										
RPB$L_SVASPT	Macro	Lib03	489										
RPB$W_UNIT	Macro	Lib03	484										
RPB$_LENGTH	Literal	315	472	476	498								
RT11	Unbound		397	398	399	400	401	402	403	404	405	406	407
			408	409	410	411	412	413	414	415	416	417	418
			419	420	421	422	423	424	425	426	427	428	429
			430	431	432								
RT11$OPEN	ExtRout	349	1532a										
SCAN$DEVICE	ExtRout	1374	1376c										
SIZE	Local	964	966=	967=	967.	969.	973.	977.					
SLAVE	RoutForm	463	485.										
SLAVENUMBER	Local	1394	1409=	1507=	1550.								
SPT$B_ADC	Field	Lib02	625.	630.	637.	644.	650.	656.	662.	668.	751.		
SPT$B_BTD	Field	Lib02	722.	724.	730.	745.	755.						
SPT$B_FILE	Field	Lib02	728.	734.	759.								

Symbol	Type	Defined	Referenced ...
SPT$K_ROW_SIZE	Literal	Lib02	543 740
SPT$L_DRIVES	Field	Lib02	686.
SPT$L_INIT	Field	Lib02	763.
SPT$L_TYPE	Field	Lib02	602.
SPT$V_ADAPTER	Unbound		405 406 407 408 409 410 416 417 418 419
	Field	Lib02	398 399 400 401 402 403 404 405 406 407 408
			409 410 411 412 413 414 415 416 417 418 419
			420 421 422 423 424 425 426 427 428 429 430
			431 432 618.
SPT$V_CONTROLLER	Unbound		398 399 400 401 402 403 404 405 406 407 408
			409 410 411 412 413 414 415 416 417 418 419
			420 421 422 423 424 425 426 427 428 429 430
			431 432
	Field	Lib02	405 406 407 408 409 410 416 417 418 419 678.
SS$_NORMAL	Literal	Lib03	765
STAT	Local	1367	1380= 1559.
	Local	1710	1741= 1743. 1764= 1768.
	Local	1825	1859= 1884= 1888.
	Local	2001	2006= 2007. 2039= 2042.
	Local	2030	2032= 2034. 2036.
STATUS	Local	1400	1470= 1472. 1475. 1482= 1483.
SUPPORTFLAGS	Macro	Lib02	396 397 398 399 400 401 402 403 404 405 406
			407 408 409 410 411 412 413 414 415 416 417
			418 419 420 421 422 423 424 425 426 427 428
			429 430 431 432
SUPPORT_ENTRY	Macro	Lib02	396 397 398 399 400 401 402 403 404 405 406
			407 408 409 410 411 412 413 414 415 416 417
			418 419 420 421 422 423 424 425 426 427 428
SUPPORT_ENTRY_DEF	Macro	Lib02	543
SUPPORT_ENTRY_FIELD	Fieldset	Lib02	543
SUPPORT_ROW	Local	543	596= 602a. 618a. 625a. 630a. 637a. 644a. 650a. 656a. 662a. 668a.
			678a. 686a. 722a. 724a. 728a. 730a. 734a. 740= 740. 745a. 751a.
			755a. 759a. 763a.
TBK50	Unbound		398 399 400 401 402 403 404 405 406
TRUE	Literal	306	629 635 642 648 654 660 666 672 676 708 717
			1510 1521 1531
UBA	Unbound		398 399 400 401 402 403 404 405 406
ULTRIX$OPEN	ExtRout	351	1524a
ULTRIX_FLAGS	External	324	1292. 1522.
ULTRIX_V_MODE	Literal	338	1292 1522
UNIT_NAME	Bind	696	699. 701. 702. 703.
VERIFY_CBLOCK	Routine	1127	292f 1631c 1726c 1841c 1948c 2019c
VERIFY_FAB	Routine	1097	294f 1260c 1627c 1722c 1837c 1944c 2014c
VERIFY_RAB	Routine	1166	293f 1614c 1715c 1830c 1937c
X	Local	1030	1038a
XAB	Local	900	902= 904. 905a. 906= 906a. 908. 909a. 913a= 914a= 915a= 916a=
			917a= 918a= 919a= 920a= 921a=
XAB$B_ATR	Macro	Lib03	913
XAB$B_BLN	Macro	Lib03	909
XAB$B_COD	Macro	Lib03	905
XAB$B_HSZ	Macro	Lib03	916
XAB$B_RFO	Macro	Lib03	919 920
XAB$C_FHC	Literal	Lib03	905
XAB$C_FHCLEN	Literal	Lib03	909

```
Symbol                        Type  Defined  Referenced ...
------------------------- -------- ----- ----------------
XAB$L_EBK                  Macro    Lib03   914
XAB$L_NXT                  Macro    Lib03   906
XAB$L_SBN                  Macro    Lib03   921
XAB$W_FFB                  Macro    Lib03   915
XAB$W_LRL                  Macro    Lib03   917
XAB$W_MRZ                  Macro    Lib03   918


                CROSS REFERENCE MAP

Line #      Event          File ...
-----  ---------------  ---------
    1  Source (start)   DISK$DS:[DS.LOCAL.RELEASE.WORK]RMS.B32;1
   27  Module RMS
  274  Library #1       DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
  276  Library #2       DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
  278  Library #3       SYS$COMMON:[SYSLIB]LIB.L32;3
 2047  Eludom RMS


        KEY TO REFERENCE TYPE FLAGS

            .   Fetch
            =   Store
            c   Routine call
            a   Address use
            @   Indirect use
            e   External, external routine, or external literal declaration
            f   Forward or forward routine declaration
            h   Condition handler enabling
            m   Map declaration
            u   Undeclare declaration


;                              Library Statistics
;
;                                          -------- Symbols --------      Pages       Processing
;       File                               Total    Loaded   Percent      Mapped      Time
;
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
;                                            942        27         2        96          00:00.0
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
;                                            675        66         9        47          00:00.0
;  SYS$COMMON:[SYSLIB]LIB.L32;3             21522       103         0      1156          00:00.9




;                                   COMMAND QUALIFIERS

;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:RMS.B32
```

```
; Size:          2838 code + 1104 data bytes
; Run Time:        00:14.1
; Elapsed Time:    00:18.2
; Lines/CPU Min:    8685
; Lexemes/CPU-Min:133586
; Memory Used:  423 pages
; Compilation Complete
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element RT11.B32
;    0002  0      ! *1     6-FEB-1986 15:22:22 DS ""
;    0003  0      ! DEC/CMS REPLACEMENT HISTORY, Element RT11.B32
;    0004  0      %title '*** RT11 Console media RMS routines'
;    0005  0      module RT11 (                                   ! RMS$OPEN, RMS$GET, RMS$READ, RMS$CLOSE services
;    0006  0                   ident = '01-04'
;    0007  0                   ) =
;    0008  0      !
;    0009  0      ! Copyright (c) 1980, 1981
;    0010  0      ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
;    0011  0      !
;    0012  0      ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
;    0013  0      ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
;    0014  0      ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
;    0015  0      ! MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
;    0016  0      ! EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
;    0017  0      ! TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
;    0018  0      ! REMAIN IN DEC.
;    0019  0      !
;    0020  0      ! THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
;    0021  0      ! AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
;    0022  0      ! CORPORATION.
;    0023  0      !
;    0024  0      ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
;    0025  0      ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
;    0026  0
;    0027  0      !++
;    0028  0      ! FACILITY: Diagnostic Supervisor
;    0029  0      !
;    0030  0      ! ABSTRACT:
;    0031  0      !
;    0032  0      !       This module supports RMS operations on the VAX console media
;    0033  0      !       (RT-11 formatted RX-01/02 or TU-58).
;    0034  0      !
;    0035  0      ! AUTHOR:
;    0036  0      !       Dave Butenhof,          15-aug-1980
;    0037  0      !
;    0038  0      ! MODIFIED BY:
;    0039  0      !
;    0040  0      !               Dave Butenhof, 6-feb-1981, version 6.3
;    0041  0      !       01      Make $GET return full record size in RAB$L_STV on
;    0042  0      !               RMS$_RTB error.
;    0043  0      !               - Dave butenhof, 02-Jun-1981, version 6.4
;    0044  0      !       02      Fix spec. of libraries for flexibility
;    0045  0      !               - Dave Butenhof, 26-Jun-1981, version 6.4
;    0046  0      !       03      Delete useage of DSP$XX_READ routine; use bootdrivers
;    0047  0      !               (boo$qio) for console storage read.
;    0048  0      !
;    0049  0      !       04      Jack Stansbury, 1-June-1982, Version 6.8
;    0050  0      !               Fixed a truncation error.
;    0051  0      !--
;    0052  0
```

```
;    0054  0      %sbttl 'declarations'
;    0055  1      begin
;    0056  1      !
;    0057  1      ! include files:
;    0058  1      !
;    0059  1
;    0060  1      library '$diag';                !
;    0061  1
;    0062  1      library '$ds';                  !
;    0063  1
;    0064  1      library 'sys$library:lib.l32';
;    0065  1
;    0066  1      !
;    0067  1      ! Internal definitions
;    0068  1      !
;    0069  1
;    0070  1      linkage
;    0071  1          jsb_acc = jsb : global (block = 6, vbn = 7, cblock = 9, rab = 10),
;    0072  1          jsb_adv = jsb (register = 0) : global (vbn = 7, offset = 8);
;    0073  1
;    0074  1      !
;    0075  1      ! table of contents:
;    0076  1      !
;    0077  1
;    0078  1      forward routine
;    0079  1          advance     : Addressing_Mode (Long_Relative) jsb_adv novalue,      ! Advance internal 'RFA' pointers       [04]
;    0080  1          access      : Addressing_Mode (Long_Relative) jsb_acc,              ! Access block of file                  [04]
;    0081  1          rt11$open   : Addressing_Mode (Long_Relative) call_rms,             ! RMS$OPEN emulator--open file          [04]
;    0082  1          rt11$get    : Addressing_Mode (Long_Relative) call_rms,             ! RMS$GET emulator--read/de-block       [04]
;    0083  1          rt11$read   : Addressing_Mode (Long_Relative) call_rms;             ! RMS$READ emulator--read block-mode    [04]
;    0084  1
;    0085  1
;    0086  1      !
;    0087  1      ! External references
;    0088  1      !
;    0089  1
;    0090  1      external routine
;    0091  1          fil$cvtfilnam       : Addressing_Mode (Long_Relative),                  ! Convert ascii filename to RAD50
;    0092  1          rms$alloc_cache     : Addressing_Mode (Long_Relative) Jsb_cblock,       ! Allocate cache blocks
;    0093  1          boo$qio             : Addressing_Mode (Long_Relative);                  ! Logical block I/O
;    0094  1      !
;    0095  1      ! psect definitions:
;    0096  1      !
;    0097  1
;    0098  1      psect
;    0099  1          plit = data ( share, addressing_mode (long_relative));
;    0100  1
;    0101  1      psect
;    0102  1          own = work ( read, write);
;    0103  1
;    0104  1      psect
;    0105  1          global = work ( read, write);
;    0106  1
;    0107  1      psect
;    0108  1          code = code (share, addressing_mode (long_relative));       !                                               [04]
;    0109  1
```

```
;   0111  1     %sbttl 'advance record pointers'
;   0112  1     routine advance (length) : jsb_adv novalue =
;   0113  2         begin
;   0114  2
;   0115  2         external register
;   0116  2             vbn = 7,
;   0117  2             offset = 8;
;   0118  2
;   0119  2         offset = .offset + .length;                 ! Advance pointer
;   0120  2
;   0121  2         if .offset gtr 511                          ! If we overlapped block
;   0122  2         then
;   0123  3             begin
;   0124  3             vbn = .vbn + (.offset/512);             ! Increment VBN
;   0125  3             offset = .offset and 511                ! Slice down offset
;   0126  3             end
;   0127  3
;   0128  1         end;


                                                                    .TITLE  RT11 *** RT11 Console media RMS routines
                                                                    .IDENT  \01-04\

                                                                    .EXTRN  FIL$CVTFILNAM, RMS$ALLOC_CACHE
                                                                    .EXTRN  BOO$QIO

                                                                    .PSECT  CODE,NOWRT,  SHR,2

                                58            50  C0 00000 ADVANCE:ADDL2   LENGTH, OFFSET                          ; 0119
                        000001FF  8F            58  D1 00003         CMPL    OFFSET, #511                            ; 0121
                                                10  15 0000A         BLEQ    1$                                      ;
                    50          58 00000200     8F  C7 0000C         DIVL3   #512, OFFSET, R0                        ; 0124
                                57            50  C0 00014         ADDL2   R0, VBN                                 ;
        58          58          09            00  EF 00017         EXTZV   #0, #9, OFFSET, OFFSET                  ; 0125
                                                  05 0001C 1$:     RSB                                             ; 0128

; Routine Size:  29 bytes,    Routine Base:  CODE + 0000
```

```
;    0130  1      %sbttl 'Access file block via cache'
;    0131  1      routine access : jsb_acc =
;    0132  1
;    0133  1      !++
;    0134  1      ! Functional description:
;    0135  1      !       If the desired VBN is not in cache, refresh cache.  Return
;    0136  1      !       pointer to appropriate cache buffer
;    0137  1      !
;    0138  1      ! Implicit inputs:
;    0139  1      !       R7              desired VBN
;    0140  1      !       R9              RMS control block
;    0141  1      !       R10             RAB
;    0142  1      !
;    0143  1      ! Implicit outputs:
;    0144  1      !       R6              pointer to buffer
;    0145  1      !
;    0146  1      ! Side effects:
;    0147  1      !       may alter cache and perform I/O to floppy.
;    0148  1      !--
;    0149  1
;    0150  2          begin
;    0151  2
;    0152  2          external register
;    0153  2              block = 6,
;    0154  2              vbn = 7,
;    0155  2              cblock = 9 : ref bblock,
;    0156  2              rab = 10 : ref bblock;
;    0157  2
;    0158  2          bind
;    0159  2              cache = cblock [ctl$l_cachel] : vector;
;    0160  2
;    0161  2          if .vbn geq .cblock [ctl$l_eofvbn]          ! If past end of file,
;    0162  2          then
;    0163  2              return (if .rab [rab$b_rac] eql rab$c_rfa then rms$_rfa else rms$_eof); !  that's it.
;    0164  2
;    0165  2          if .vbn lss .cblock [ctl$l_lvbn]            ! If block's not in
;    0166  2              or .vbn geq .cblock [ctl$l_hvbn]        !  cache now, get it
;    0167  2          then
;    0168  3              begin
;    0169  3
;    0170  3              if .cblock [ctl$w_cache_size] eql 0     ! If no cache buffers
;    0171  3              then
;    0172  4                  begin                               ! make them happen
;    0173  4
;    0174  4                  local
;    0175  4                      stat;
;    0176  4
;    0177  4                  stat = rms$alloc_cache (1);         ! Allocate
;    0178  4
;    0179  4                  if not .stat                        ! If failure
;    0180  4                  then
;    0181  5                      begin
;    0182  5                      rab [rab$l_stv] = .stat;
;    0183  5                      return rms$_dme
;    0184  5                      end
;    0185  5
;    0186  3                  end;
```

```
;   0187  3
;   0188  3             block = .vbn + .cblock [ctl$l_startlbn] - 1;    ! First block to read
;   0189  3
;   0190  3             incr i from 0 to 2 do                          ! Read the blocks
;   0191  4                 begin
;   0192  4
;   0193  4                 local
;   0194  4                     stat;
;   0195  4
;   0196  5                 if (.block - .cblock [ctl$l_startlbn] - 1)  ! If the 3-block window
;   0197  4                     geq .cblock [ctl$l_eofvbn]             !  overlaps EOF, don't
;   0198  4                 then
;   0199  4                     exitloop;                              !  try to read any more
;   0200  4
;   0201  4                 stat = boo$qio (.cache [.i],               ! Read to cache buffer i                    [03]
;   0202  4                     512,            ! one block                                                        [03]
;   0203  4                     .block,         ! logical block number                                             [03]
;   0204  4                     io$_readlblk,   ! read it                                                          [03]
;   0205  4                     0,              ! physical address                                                 [03]
;   0206  4                     .cblock [ctl$l_rpb]);   ! address of RPB                                           [03]
;   0207  4
;   0208  4                 if not .stat
;   0209  4                 then
;   0210  5                     begin
;   0211  5                     rab [rab$l_stv] = .stat;               ! Set read code
;   0212  5                     return rms$_rer
;   0213  4                     end;
;   0214  4
;   0215  4                 block = .block + 1                         ! Advance block #
;   0216  3                 end;
;   0217  3
;   0218  3             cblock [ctl$l_lvbn] = .vbn;                    ! Window begins here
;   0219  3             cblock [ctl$l_hvbn] = min (.vbn + 3,           ! Ends at VBN +3 or
;   0220  3                 .cblock [ctl$l_eofvbn])                    !  at EOF
;   0221  2             end;
;   0222  2
;   0223  2         block = .cache [.vbn - .cblock [ctl$l_lvbn]];       ! Get pointer
;   0224  2         1
;   0225  1         end;                                               ! of access


                                        0C  BB 00000 ACCESS: PUSHR   #^M<R2,R3>                          ; 0131
                        53       2C     A9  9E 00002         MOVAB   44(CBLOCK), R3                      ; 0159
                   44   A9             57  D1 00006         CMPL    VBN, 68(CBLOCK)                     ; 0161
                                        18  19 0000A         BLSS    2$                                  ;
                        02       1E     AA  91 0000C         CMPB    30(RAB), #2                         ; 0163
                                        09  12 00010         BNEQ    1$                                  ;
                        50 0001865C     8F  D0 00012         MOVL    #99932, R0                          ;
                                        70  11 00019         BRB     6$                                  ;
                        50 0001827A     8F  D0 0001B 1$:     MOVL    #98938, R0                          ;
                                        67  11 00022         BRB     6$                                  ;
                   28   A9             57  D1 00024 2$:     CMPL    VBN, 40(CBLOCK)                     ; 0165
                                        06  19 00028         BLSS    3$                                  ;
                   24   A9             57  D1 0002A         CMPL    VBN, 36(CBLOCK)                     ; 0166
```

```
                                    79  19 0002E          BLSS    10$                                  ;
                              0A    A9  B5 00030 3$:      TSTW    10(CBLOCK)                           ; 0170
                                    19  12 00033          BNEQ    4$                                   ;
                        50          01  D0 00035          MOVL    #1, R0                               ; 0177
                           00000000G EF  16 00038          JSB     RMS$ALLOC_CACHE                      ;
                        0D          50  E8 0003E          BLBS    STAT, 4$                             ; 0179
                  0C    AA          50  D0 00041          MOVL    STAT, 12(RAB)                        ; 0182
                        50 000184D4 8F  D0 00045          MOVL    #99540, R0                           ; 0183
                                    67  11 0004C          BRB     11$                                  ;
        50              57    50    A9  C1 0004E 4$:      ADDL3   80(CBLOCK), VBN, R0                  ; 0188
                        56    FF    A0  9E 00053          MOVAB   -1(R0), BLOCK                        ;
                                    52  D4 00057          CLRL    I                                    ; 0190
        50              56    50    A9  C3 00059 5$:      SUBL3   80(CBLOCK), BLOCK, R0                ; 0196
                                    50  D7 0005E          DECL    R0                                   ;
                  44    A9          50  D1 00060          CMPL    R0, 68(CBLOCK)                       ; 0197
                                    2D  18 00064          BGEQ    8$                                   ;
                              38    A9  DD 00066          PUSHL   56(CBLOCK)                           ; 0201
                        7E          21  7D 00069          MOVQ    #33, -(SP)                           ; 0204
                                    56  DD 0006C          PUSHL   BLOCK                                ;
                        7E    0200  8F  3C 0006E          MOVZWL  #512, -(SP)                          ; 0202
                                  6342  DD 00073          PUSHL   (R3)[I]                              ; 0201
           00000000G    EF          06  FB 00076          CALLS   #6, BOO$QIO                          ;
                        0D          50  E8 0007D          BLBS    STAT, 7$                             ; 0208
                  0C    AA          50  D0 00080          MOVL    STAT, 12(RAB)                        ; 0211
                        50 0001C0F4 8F  D0 00084          MOVL    #114932, R0                          ; 0212
                                    28  11 0008B 6$:      BRB     11$                                  ;
                                    56  D6 0008D 7$:      INCL    BLOCK                                ; 0215
        C6              52          02  F3 0008F          AOBLEQ  #2, I, 5$                            ;
                  28    A9          57  D0 00093 8$:      MOVL    VBN, 40(CBLOCK)                      ; 0218
                        50    03    A7  9E 00097          MOVAB   3(R7), R0                            ; 0219
                  44    A9          50  D1 0009B          CMPL    R0, 68(CBLOCK)                       ;
                                    04  15 0009F          BLEQ    9$                                   ;
                        50    44    A9  D0 000A1          MOVL    68(CBLOCK), R0                       ;
                  24    A9          50  D0 000A5 9$:      MOVL    R0, 36(CBLOCK)                       ;
        50              57    28    A9  C3 000A9 10$:     SUBL3   40(CBLOCK), VBN, R0                  ; 0223
                        56        6340  D0 000AE          MOVL    (R3)[R0], BLOCK                      ;
                        50          01  D0 000B2          MOVL    #1, R0                               ; 0225
                                    0C  BA 000B5 11$:     POPR    #^M<R2,R3>                           ;
                                        05 000B7          RSB                                          ;

; Routine Size:  184 bytes,    Routine Base:  CODE + 001D
```

```
%sbttl 'RT-11 OPEN service'

global routine rt11$open : call_rms =

!++
! Functional description:
!       Access a file on the console media (floppy or TU-58) to be
!       sure it exists and to ascertain it's properties (such as
!       size).  Return this information in the FAB block and in
!       the RMS file control block, which is pointed to by the
!       entry in RMS$FILE_TABLE indexed by the FAB's IFI field.
!
! Inputs:
!       none
!
! Implicit inputs:
!       R11     points to the FAB
!       R9      points to the CBLOCK (RMS internal file control block)
!
! Outputs:
!       none
!
! Implicit outputs:
!       Several fields in the FAB and in the static file control block
!       are altered to describe the file.  Also, if an XAB (XABFHC is
!       the only XAB currently supported) exists, it will be filled in.
!
! Return status
!       RMS$_DME        insufficient memory for allocation of buffers
!       RMS$_NEF        non existant file
!       RMS$_ACC        can't access media's directory segment
!--

    begin

    local
        ptr,
        len,
        segment,                                    ! Directory segment number
        rad50nam : vector [3],                      ! Hold RAD50 name
        rad50desc : bblock [dsc$c_s_bln],           ! Descriptor for RAD50 cvt.
        segblk : bblock [1024],                     ! Buffer to read in segment
        address_first,                              ! First entry of segment
        extra_length,                               ! Extra len of entries in seg
        start_block,                                ! Starting block of file
        file_length;                                ! Length of file (blocks)

    external register
        cblock = 9 : ref bblock,                    ! Pointer to control block
        rab = 10,
        fab = 11 : ref bblock;                      ! Define the FAB

    bind
        unit = cblock [ctl$w_unit] : word;

    cblock [ctl$l_get] = rt11$get;                  ! Store GET routine address
    cblock [ctl$l_read] = rt11$read;                ! Store READ routine address
```

```
;    0284  2          ptr = .cblock [ctl$l_file_ptr];                ! Get filename descriptor
;    0285  2          len = .cblock [ctl$w_file_len];
;    0286  2
;    0287  2          while 1 do                                     ! Skip to end of directory
;    0288  3              begin
;    0289  3
;    0290  3              local
;    0291  3                  char : byte;
;    0292  3
;    0293  3              if (len = .len - 1) lss 0                  ! If no more string
;    0294  3              then
;    0295  3                  return (rms$_fnm);                     !  invalid file name
;    0296  3
;    0297  3              char = ch$rchar_a (ptr);                   ! Get next character
;    0298  3
;    0299  3              if .char eql %ascii']'                     ! If it's a directory
;    0300  3                  or .char eql %ascii'>'                 !  terminator
;    0301  3              then
;    0302  3                  exitloop                               ! then leave scan loop
;    0303  2              end;
;    0304  2
;    0305  2          rad50desc [dsc$w_length] = .len;               ! Load filename descr.
;    0306  2          rad50desc [dsc$a_pointer] = .ptr;
;    0307  2
;    0308  2          if not fil$cvtfilnam (rad50desc, rad50nam)     ! Try to RAD50 the name
;    0309  2          then
;    0310  2              return (rms$_fnm);                         ! Bad filename if can't
;    0311  2
;    0312  2          segment = 1;                                   ! Start with first segment
;    0313  2
;    0314  2          while 1 do                                     ! Find directory entry
;    0315  3              begin
;    0316  3
;    0317  3              local
;    0318  3                  stat;
;    0319  3
;    0320  3              if .segment eql 0 then return (rms$_fnf);       ! If no more, file not found
;    0321  3
;    0322  4              if not (stat = boo$qio (segblk, ! Read to buffer segblk                                  [03]
;    0323  4                          1024,       !  read two blocks (a segment)                                 [03]
;    0324  4                          4 * .segment*2,     !  logical block number                               [03]
;    0325  4                          io$_readlblk,       !  read operation                                     [03]
;    0326  4                          0,          !  physical address                                           [03]
;    0327  4                          .cblock [ctl$l_rpb]))       !                                             [03]
;    0328  3              then
;    0329  4                  (fab [fab$l_stv] = .stat;              ! If can't read, file access
;    0330  3                  return (rms$_acc));                    !  error.
;    0331  3
;    0332  3              segment = .segblk [rt$w_segment];          ! Link to next segment
;    0333  3              start_block = .segblk [rt$w_startblock];        ! Where segment starts
;    0334  3              extra_length = .segblk [rt$w_extralen]; ! Variable part of entries
;    0335  3              address_first = segblk [rt$w_first] - rt$_fixed - .extra_length;        ! First entry address
;    0336  3
;    0337  3              if
;    0338  3
;    0339  3                  while 1 do                             ! Find file name in segment
;    0340  4                      begin
```

```
;   0341  4
;   0342  4                     bind
;   0343  4                         entry = (address_first = .address_first + rt$_fixed + .extra_length) : bblock;
;   0344  4
;   0345  4                     if .entry [rt$v_endseg] then exitloop 0;        ! End of segment
;   0346  4
;   0347  4                     file_length = .entry [rt$w_filelength]; ! Get length of file
;   0348  4                     start_block = .file_length + .start_block;      ! Start of next file
;   0349  4
;   0350  4                     if .entry [rt$v_perm]           ! If file is permanent
;   0351  4                         and .entry [rt$l_filename] eql .rad50nam [0]        ! and filename matches
;   0352  4                         and .entry [rt$w_filetype] eql .(rad50nam + 6)<0, 16, 0>
;   0353  4                     then
;   0354  4                         exitloop 1
;   0355  4
;   0356  4                     end                             ! ( value 1 if found, 0 if end of segment )
;   0357  3             then
;   0358  3
;   0359  3                 exitloop                            ! Access file if found
;   0360  2             end;                                    ! of segment loop
;   0361  2
;   0362  2         start_block = .start_block - .file_length;  ! Back up pointer
;   0363  2     !
;   0364  2     ! Initialize control block fields
;   0365  2     !
;   0366  2         cblock [ctl$w_offbyte] = 0;                 ! Set fst RFA past EOF
;   0367  2         cblock [ctl$l_eofvbn] = .file_length + 1;   !  VBN of said RFA
;   0368  2         cblock [ctl$l_startlbn] = .start_block;     ! First block of file
;   0369  2         fab [fab$l_alq] = .file_length;             ! Set # blocks in file
;   0370  2         fab [fab$l_fop] = fab$m_ctg;                ! RT-11 files are contiguous
;   0371  2         fab [fab$b_fsz] = 0;                        ! Clear fixed record size
;   0372  2         fab [fab$b_rat] = fab$m_cr;                 ! Treat as CR format
;   0373  2         fab [fab$b_rfm] = fab$c_rt11;               ! RT-11 format
;   0374  2         fab [fab$w_mrs] = 512;                      ! Max rec size of 1 block
;   0375  2         rms$_normal                                 ! Return OK
;   0376  1         end;                                        ! of RT11$OPEN


                                        007C 00000          .ENTRY  RT11$OPEN, Save R2,R3,R4,R5,R6          ; 0229
                    5E      FBEC    CE   9E 00002          MOVAB   -1044(SP), SP                           ;
                0C  A9 00000000V    EF   9E 00007          MOVAB   RT11$GET, 12(CBLOCK)                    ; 0282
                10  A9 00000000V    EF   9E 0000F          MOVAB   RT11$READ, 16(CBLOCK)                   ; 0283
                    51        4C    A9   D0 00017          MOVL    76(CBLOCK), PTR                         ; 0284
                    50        48    A9   3C 0001B          MOVZWL  72(CBLOCK), LEN                         ; 0285
                                    50   D7 0001F 1$:      DECL    LEN                                     ; 0293
                                    26   19 00021          BLSS    3$                                      ;
                    52              81   90 00023          MOVB    (PTR)+, CHAR                            ; 0297
                5D  8F              52   91 00026          CMPB    CHAR, #93                               ; 0299
                                    05   13 0002A          BEQL    2$                                      ;
                    3E              52   91 0002C          CMPB    CHAR, #62                               ; 0300
                                    EE   12 0002F          BNEQ    1$                                      ;
                EC  AD              50   B0 00031 2$:      MOVW    LEN, RAD50DESC                          ; 0305
                F0  AD              51   D0 00035          MOVL    PTR, RAD50DESC+4                        ; 0306
                            F4      AD   9F 00039          PUSHAB  RAD50NAM                                ; 0308
```

```
                                EC   AD  9F 0003C          PUSHAB  RAD50DESC                                  ;
          00000000G  EF             02  FB 0003F          CALLS   #2, FIL$CVTFILNAM                          ;
                     08             50  E8 00046          BLBS    R0, 4$                                     ;
                     50 0001852C    8F  D0 00049 3$:      MOVL    #99628, R0                                 ; 0310
                                        04 00050          RET                                                ;
                     53             01  D0 00051 4$:      MOVL    #1, SEGMENT                                ; 0312
                                    53  D5 00054 5$:      TSTL    SEGMENT                                    ; 0320
                                    08  12 00056          BNEQ    6$                                         ;
                     50 00018292    8F  D0 00058          MOVL    #98962, R0                                 ;
                                        04 0005F          RET                                                ;
                                38   A9  DD 00060 6$:      PUSHL   56(CBLOCK)                                 ; 0327
                     7E             21  7D 00063          MOVQ    #33, -(SP)                                 ; 0325
        7E           53             01  78 00066          ASHL    #1, SEGMENT, -(SP)                         ; 0324
                     6E             04  C0 0006A          ADDL2   #4, (SP)                                   ;
                     7E      0400   8F  3C 0006D          MOVZWL  #1024, -(SP)                               ; 0323
                                14   AE  9F 00072          PUSHAB  SEGBLK                                     ; 0322
          00000000G  EF             06  FB 00075          CALLS   #6, BOO$QIO                                ;
                     0C             50  E8 0007C          BLBS    STAT, 7$                                   ;
                0C   AB             50  D0 0007F          MOVL    STAT, 12(FAB)                              ; 0329
                     50 0001C002    8F  D0 00083          MOVL    #114690, R0                                ; 0330
                                        04 0008A          RET                                                ;
                     53        02   AE  3C 0008B 7$:      MOVZWL  SEGBLK+2, SEGMENT                          ; 0332
                     56        08   AE  3C 0008F          MOVZWL  SEGBLK+8, START_BLOCK                      ; 0333
                     54        06   AE  3C 00093          MOVZWL  SEGBLK+6, EXTRA_LENGTH                     ; 0334
                     50        FC   AE  9E 00097          MOVAB   SEGBLK-4, R0                               ; 0335
        52           50             54  C3 0009B          SUBL3   EXTRA_LENGTH, R0, ADDRESS_FIRST            ;
                     52        0E A442  9E 0009F 8$:      MOVAB   14(EXTRA_LENGTH)[ADDRESS_FIRST], -         ; 0343
                                                                   ADDRESS_FIRST                              ;
                     50             52  D0 000A4          MOVL    ADDRESS_FIRST, R0                          ;
        A9           60             0B  E0 000A7          BBS     #11, (R0), 5$                              ; 0345
                     55        08   A0  3C 000AB          MOVZWL  8(R0), FILE_LENGTH                         ; 0347
                     56             55  C0 000AF          ADDL2   FILE_LENGTH, START_BLOCK                   ; 0348
        E9           60             0A  E1 000B2          BBC     #10, (R0), 8$                              ; 0350
                F4   AD        02   A0  D1 000B6          CMPL    2(R0), RAD50NAM                            ; 0351
                                    E2  12 000BB          BNEQ    8$                                         ;
                FA   AD        06   A0  B1 000BD          CMPW    6(R0), RAD50NAM+6                          ; 0352
                                    DB  12 000C2          BNEQ    8$                                         ;
                     56             55  C2 000C4          SUBL2   FILE_LENGTH, START_BLOCK                   ; 0362
                                42   A9  B4 000C7          CLRW    66(CBLOCK)                                 ; 0366
                44   A9        01   A5  9E 000CA          MOVAB   1(R5), 68(CBLOCK)                          ; 0367
                50   A9             56  D0 000CF          MOVL    START_BLOCK, 80(CBLOCK)                    ; 0368
                10   AB             55  D0 000D3          MOVL    FILE_LENGTH, 16(FAB)                       ; 0369
                04   AB 00100000    8F  D0 000D7          MOVL    #1048576, 4(FAB)                           ; 0370
                                3F   AB  94 000DF          CLRB    63(FAB)                                    ; 0371
                1E   AB      0402   8F  B0 000E2          MOVW    #1026, 30(FAB)                             ; 0372
                36   AB      0200   8F  B0 000E8          MOVW    #512, 54(FAB)                              ; 0374
                     50 00010001    8F  D0 000EE          MOVL    #65537, R0                                 ; 0376
                                        04 000F5          RET                                                ;

; Routine Size:  246 bytes,    Routine Base:  CODE + 00D5

;   0377  1
```

```
;    0379  1      %sbttl 'RT11$GET routine'
;    0380  1
;    0381  1      global routine rt11$get : call_rms =
;    0382  1
;    0383  1      !++
;    0384  1      ! Functional description:
;    0385  1      !       Access a single record from the record stream, copying it to
;    0386  1      !       the user's buffer.
;    0387  1      !
;    0388  1      ! Inputs:
;    0389  1      !       none
;    0390  1      !
;    0391  1      ! Implicit inputs:
;    0392  1      !       R9              pointer to internal control CBLOCK
;    0393  1      !       R10             pointer to RAB
;    0394  1      !       various fields within all three control structures
;    0395  1      !
;    0396  1      ! Outputs:
;    0397  1      !       none
;    0398  1      !
;    0399  1      ! Implicit outputs:
;    0400  1      !       RAB [rab$l_rbf] Address where record is stored
;    0401  1      !       RAB [rab$w_rsz] Size of record
;    0402  1      !       RAB [rab$l_sts] Status return code
;    0403  1      !
;    0404  1      ! Side effects:
;    0405  1      !       CBLOCK          current RFA will be updated if access is sequential.
;    0406  1      !                       record size is set if read is successful.
;    0407  1      !                       Cache contents and control data may be affected
;    0408  1      ! Status codes:
;    0409  1      !       RMS$_NORMAL     good return
;    0410  1      !       RMS$_RTB        record too big (truncated)
;    0411  1      !       RMS$_EOF        RFA is beyond last record of file
;    0412  1      !       RMS$_RER        Read error on media
;    0413  1      !--
;    0414  1
;    0415  2          begin
;    0416  2
;    0417  2          external register
;    0418  2              cblock = 9 : ref bblock,                ! Map CBLOCK
;    0419  2              rab = 10 : ref bblock;                  ! Map RAB
;    0420  2
;    0421  2          global register
;    0422  2              block = 6 : ref vector [, byte],        ! Access block
;    0423  2              vbn = 7,                                ! Current file 'VBN'
;    0424  2              offset = 8;                             ! Current block offset
;    0425  2
;    0426  2          local
;    0427  2              outlim,                                 ! Remaining length of buffer
;    0428  2              outptr,                                 ! Address to copy to
;    0429  2              rtb;                                    ! Flag for record truncated
;    0430  2
;    0431  2          vbn = .cblock [ctl$l_vbn];                  ! Grab the intended RFA
;    0432  2          offset = .cblock [ctl$w_byte];
;    0433  2
;    0434  2          if .rab [rab$b_rac] neq rab$c_rfa           ! If not random access
;    0435  2          then
```

```
;    0436  2              advance (.cblock [ctl$w_rec_size]);     ! advance RFA to next record
;    0437  2
;    0438  2          cblock [ctl$l_vbn] = .vbn;                  ! Save new RFA
;    0439  2          cblock [ctl$w_byte] = .offset;
;    0440  2          cblock [ctl$w_rec_size] = 0;                ! If bad error, repeat record
;    0441  2          rtb = 0;                                    ! Record's not too big yet
;    0442  2          rab [rab$w_rsz] = 0;                        ! Clear record size
;    0443  2          outlim = .rab [rab$w_usz];                  ! Limiting size for transfer
;    0444  2          rab [rab$l_rbf] = outptr = .rab [rab$l_ubf];        ! Set output pointer
;    0445  2
;    0446  2          while 1 do                                  ! Read record
;    0447  3              begin
;    0448  3
;    0449  3              while 1 do                              ! Read up to CR or EOF
;    0450  4                  begin
;    0451  4
;    0452  4                  local
;    0453  4                      cr,                             ! Flag
;    0454  4                      string_size,                    ! Size of partial string
;    0455  4                      bite,                           ! Current offset in block
;    0456  4                      len;                            ! Length to copy
;    0457  4
;    0458  4                  cr = 0;                             ! Clear CR flag
;    0459  4                  bite = .offset;                     ! Where to start in block
;    0460  5                  begin
;    0461  5
;    0462  5                  local
;    0463  5                      stat;
;    0464  5
;    0465  5                  stat = access ();                   ! Access the block
;    0466  5
;    0467  5                  if not .stat then return .stat
;    0468  5
;    0469  4                  end;
;    0470  4
;    0471  4                  if .block [.offset] eql 0           ! If reached EOF
;    0472  4                  then
;    0473  4                      return (if .rab [rab$b_rac] eql rab$c_rfa then rms$_rfa else rms$_eof); !  get out
;    0474  4
;    0475  5                  while not (cr = .block [.bite] eql %x'd')   ! Find end of block or CR
;    0476  4                      and .bite leq 511 do
;    0477  4                      bite = .bite + 1;               ! Advance
;    0478  4
;    0479  4                  string_size = .bite - .offset;      ! Get length of this string
;    0480  4                  len = min (.string_size, .outlim);  ! Get length to transfer
;    0481  4
;    0482  4                  if .outlim lss .string_size         ! If not enough space,
;    0483  4                  then
;    0484  4                      rtb = 1;                        !  set flag for overflow
;    0485  4
;    0486  4                  outptr = ch$move (.len, block [.offset], .outptr);  ! Copy as much as we can
;    0487  4                  outlim = .outlim - .len;            ! Count size of copy
;    0488  4                  rab [rab$w_rsz] = .rab [rab$w_rsz] + .len;
;    0489  4                  advance (.string_size);             ! Advance past this block
;    0490  4
;    0491  4                  if .cr
;    0492  4                  then
```

```
;    0493  4                    exitloop                        ! Keep looping until end
;    0494  3                end;
;    0495  3
;    0496  3            advance (1);                            ! Skip the CR
;    0497  4            begin
;    0498  4
;    0499  4            local
;    0500  4                stat;
;    0501  4
;    0502  4            stat = access ();                       ! Access new RFA
;    0503  4
;    0504  4            if not .stat then return .stat
;    0505  4
;    0506  3            end;
;    0507  3
;    0508  3            if .block [.offset] eql %x'a'           ! If CR is followed by LF
;    0509  3            then
;    0510  4                begin
;    0511  4                cblock [ctl$w_rec_size] =           ! Set whole record size
;    0512  4                (.vbn - .cblock [ctl$l_vbn])*512 + .offset - .cblock [ctl$w_byte] + 1;
;    0513  4                return
;    0514  5                    (if .rtb
;    0515  5                    then
;    0516  6                        begin
;    0517  6                        rab [rab$l_stv] = .cblock [ctl$w_rec_size];
;    0518  6                        rms$_rtb
;    0519  6                        end
;    0520  5                    else rms$_normal)
;    0521  4                end
;    0522  3            else                                    ! Not end of record yet
;    0523  3
;    0524  3                if .outlim lss 1                    ! If there's no room
;    0525  3                then
;    0526  3                    rtb = 1
;    0527  3                else
;    0528  4                    begin
;    0529  4                    outlim = .outlim - 1;           ! Insert the CR we found
;    0530  4                    rab [rab$w_rsz] = .rab [rab$w_rsz] + 1;
;    0531  4                    ch$wchar_a (%x'd', outptr)
;    0532  4                    end
;    0533  4
;    0534  3                end
;    0535  3
;    0536  1        end;                                        ! of RT11$GET



                                    09FC 00000          .ENTRY  RT11$GET, Save R2,R3,R4,R5,R6,R7,R8,R11     ; 0381
                              5E        10  C2 00002      SUBL2   #16, SP                                     ;
                              57    18  A9  D0 00005      MOVL    24(CBLOCK), VBN                             ; 0431
                              58    1C  A9  3C 00009      MOVZWL  28(CBLOCK), OFFSET                          ; 0432
                              02    1E  AA  91 0000D      CMPB    30(RAB), #2                                 ; 0434
                                        08  13 00011      BEQL    1$                                          ;
                              50    1E  A9  3C 00013      MOVZWL  30(CBLOCK), R0                              ; 0436
                                  FE1A  CF  16 00017      JSB     ADVANCE                                     ;
```

```
                18   A9          57  D0 0001B 1$:    MOVL    VBN, 24(CBLOCK)                          ; 0438
                1C   A9          58  3C 0001F        MOVZWL  OFFSET, 28(CBLOCK)                       ; 0439
                          08     AE  D4 00023        CLRL    RTB                                      ; 0441
                          22     AA  B4 00026        CLRW    34(RAB)                                  ; 0442
                04   AE   20     AA  3C 00029        MOVZWL  32(RAB), OUTLIM                          ; 0443
                     53   24     AA  D0 0002E        MOVL    36(RAB), OUTPTR                          ; 0444
                28   AA          53  D0 00032        MOVL    OUTPTR, 40(RAB)                          ;
                          0C     AE  D4 00036 2$:    CLRL    CR                                       ; 0458
                     52          58  D0 00039        MOVL    OFFSET, BITE                             ; 0459
                          FE12   CF  16 0003C        JSB     ACCESS                                   ; 0465
                     01          50  E8 00040        BLBS    STAT, 3$                                 ; 0467
                                     04 00043        RET                                              ;
                               6846  95 00044 3$:    TSTB    (OFFSET)[BLOCK]                          ; 0471
                                 16  12 00047        BNEQ    5$                                       ;
                     02   1E     AA  91 00049        CMPB    30(RAB), #2                              ; 0473
                                 08  12 0004D        BNEQ    4$                                       ;
                     50 0001865C 8F  D0 0004F        MOVL    #99932, R0                               ;
                                     04 00056        RET                                              ;
                     50 0001827A 8F  D0 00057 4$:    MOVL    #98938, R0                               ;
                                     04 0005E        RET                                              ;
                                 50  D4 0005F 5$:    CLRL    R0                                       ; 0475
                     0D        6246  91 00061        CMPB    (BITE)[BLOCK], #13                       ;
                                 02  12 00065        BNEQ    6$                                       ;
                                 50  D6 00067        INCL    R0                                       ;
                0C   AE          50  D0 00069 6$:    MOVL    R0, CR                                   ;
                     0D          50  E8 0006D        BLBS    R0, 7$                                   ;
           000001FF  8F          52  D1 00070        CMPL    BITE, #511                               ; 0476
                                 04  14 00077        BGTR    7$                                       ;
                                 52  D6 00079        INCL    BITE                                     ; 0477
                                 E2  11 0007B        BRB     5$                                       ;
        6E           52          58  C3 0007D 7$:    SUBL3   OFFSET, BITE, STRING_SIZE                ; 0479
                     50          6E  D0 00081        MOVL    STRING_SIZE, R0                          ; 0480
                04   AE          50  D1 00084        CMPL    R0, OUTLIM                               ;
                                 04  15 00088        BLEQ    8$                                       ;
                     50   04     AE  D0 0008A        MOVL    OUTLIM, R0                               ;
                     5B          50  D0 0008E 8$:    MOVL    R0, LEN                                  ;
                     6E   04     AE  D1 00091        CMPL    OUTLIM, STRING_SIZE                      ; 0482
                                 04  18 00095        BGEQ    9$                                       ;
                08   AE          01  D0 00097        MOVL    #1, RTB                                  ; 0484
        63        6846           5B  28 0009B 9$:    MOVC3   LEN, (OFFSET)[BLOCK], (OUTPTR)           ; 0486
                04   AE          5B  C2 000A0        SUBL2   LEN, OUTLIM                              ; 0487
                22   AA          5B  A0 000A4        ADDW2   LEN, 34(RAB)                             ; 0488
                     50          6E  D0 000A8        MOVL    STRING_SIZE, R0                          ; 0489
                          FD86   CF  16 000AB        JSB     ADVANCE                                  ;
                     59   0C     AE  E9 000AF        BLBC    CR, 13$                                  ; 0491
                     50          01  D0 000B3        MOVL    #1, R0                                   ; 0496
                          FD7B   CF  16 000B6        JSB     ADVANCE                                  ;
                          FD94   CF  16 000BA        JSB     ACCESS                                   ; 0502
                     4E          50  E9 000BE        BLBC    STAT, 14$                                ; 0504
                     0A        6846  91 000C1        CMPB    (OFFSET)[BLOCK], #10                     ; 0508
                                 31  12 000C5        BNEQ    11$                                      ;
        50           57   18     A9  C3 000C7        SUBL3   24(CBLOCK), VBN, R0                      ; 0512
        50           50          09  78 000CC        ASHL    #9, R0, R0                               ;
                     50          58  C0 000D0        ADDL2   OFFSET, R0                               ;
                     51   1C     A9  3C 000D3        MOVZWL  28(CBLOCK), R1                           ;
                     50          51  C2 000D7        SUBL2   R1, R0                                   ;
     1E  A9          50          01  A1 000DA        ADDW3   #1, R0, 30(CBLOCK)                       ;
```

```
                    0D        08   AE  E9 000DF          BLBC    RTB, 10$                                ; 0514
                0C  AA        1E   A9  3C 000E3          MOVZWL  30(CBLOCK), 12(RAB)                     ; 0517
                    50 000181A8    8F  D0 000E8          MOVL    #98728, R0                              ; 0518
                                       04 000EF          RET                                             ;
                    50 00010001    8F  D0 000F0 10$:     MOVL    #65537, R0                              ; 0520
                                       04 000F7          RET                                             ; 0513
                              04   AE  D5 000F8 11$:     TSTL    OUTLIM                                  ; 0524
                                   06  14 000FB          BGTR    12$                                     ;
                08  AE            01  D0 000FD          MOVL    #1, RTB                                 ; 0526
                                   09  11 00101          BRB     13$                                     ;
                              04   AE  D7 00103 12$:     DECL    OUTLIM                                  ; 0529
                              22   AA  B6 00106          INCW    34(RAB)                                 ; 0530
                    83            0D  90 00109          MOVB    #13, (OUTPTR)+                          ; 0531
                                 FF27  31 0010C 13$:     BRW     2$                                      ; 0446
                                       04 0010F 14$:     RET                                             ; 0536

; Routine Size:  272 bytes,    Routine Base:  CODE + 01CB


;   0537  1
```

```
;    0539  1      %sbttl 'RT11$READ routine'
;    0540  1
;    0541  1      global routine rt11$read : call_rms =
;    0542  1
;    0543  1      !++
;    0544  1      ! Functional description:
;    0545  1      !       Read virtual blocks of file
;    0546  1      !
;    0547  1      ! Inputs:
;    0548  1      !       none
;    0549  1      !
;    0550  1      ! Implicit inputs:
;    0551  1      !       R9                      CBLOCK pointer
;    0552  1      !       R10                     RAB pointer
;    0553  1      !       various fields in the above-listed data structures
;    0554  1      !
;    0555  1      ! Outputs:
;    0556  1      !       none
;    0557  1      !
;    0558  1      ! Implicit outputs:
;    0559  1      !       RAB [rab$l_rbf]         points to buffer
;    0560  1      !       RAB [rab$w_rsz]         size of buffer
;    0561  1      !
;    0562  1      ! Side Effects:
;    0563  1      !       CBLOCK [ctl$l_nbp]      points to next VBN for sequential READ.
;    0564  1      !
;    0565  1      ! Return codes:
;    0566  1      !       RMS$_NORMAL             OK
;    0567  1      !       RMS$_RER                Read error
;    0568  1      !--
;    0569  1
;    0570  2          begin
;    0571  2
;    0572  2          external register
;    0573  2              cblock = 9 : ref bblock,                ! Map to control block
;    0574  2              rab = 10 : ref bblock;                  ! Map to RAB
;    0575  2
;    0576  2          local
;    0577  2              size,
;    0578  2              stat,
;    0579  2              next;
;    0580  2
;    0581  2          next = .cblock [ctl$l_nbp];                 ! VBN to read
;    0582  2          rab [rab$w_rsz] = size = min (.rab [rab$w_usz],     ! smaller of given size
;    0583  2              (.cblock [ctl$l_eofvbn] - .next)*512);  ! and rest of file size
;    0584  2          cblock [ctl$l_nbp] = .next + (.size + 511)/512;     ! Set next block pointer
;    0585  2          stat = boo$qio (                ! Read the virtual block                    [03]
;    0586  2                          rab [rab$l_rbf] = .rab [rab$l_ubf], !  to specified place    [03]
;    0587  2                          .size,          !  with specified size                      [03]
;    0588  2                          .cblock [ctl$l_startlbn] + .next - 1,       ! logical       [03]
;    0589  2                                                                      ! block         [03]
;    0590  2                          io$_readlblk,           !  logical read                     [03]
;    0591  2                          0,              !  physical addresses                       [03]
;    0592  2                          .cblock [ctl$l_rpb]);       !                               [03]
;    0593  2
;    0594  2          if not .stat
;    0595  2          then
```

```
;   0596  3             begin
;   0597  3             rab [rab$l_stv] = .stat;                    ! Save 'system' return
;   0598  3             return rms$_rer                             ! Return read error
;   0599  2             end;
;   0600  2
;   0601  2         rms$_normal
;   0602  1         end;



                                                  0004 00000          .ENTRY  RT11$READ, Save R2                          ; 0541
                                  52        04   A9  D0 00002          MOVL    4(CBLOCK), NEXT                             ; 0581
                      50        44   A9             52  C3 00006          SUBL3   NEXT, 68(CBLOCK), R0                        ; 0583
                      50             50             09  78 0000B          ASHL    #9, R0, R0                                  ;
                                  51        20   AA  3C 0000F          MOVZWL  32(RAB), R1                                 ;
                                  50             51  D1 00013          CMPL    R1, R0                                      ;
                                                 03  15 00016          BLEQ    1$                                          ;
                                  51             50  D0 00018          MOVL    R0, R1                                      ;
                                  50             51  D0 0001B 1$:      MOVL    R1, SIZE                                    ;
                            22   AA             51  B0 0001E          MOVW    R1, 34(RAB)                                 ;
                                  51      01FF   C0  9E 00022          MOVAB   511(R0), R1                                 ; 0584
                                  51 00000200    8F  C6 00027          DIVL2   #512, R1                                    ;
                  04   A9         51             52  C1 0002E          ADDL3   NEXT, R1, 4(CBLOCK)                         ;
                                          38   A9  DD 00033          PUSHL   56(CBLOCK)                                  ; 0592
                                  7E             21  7D 00036          MOVQ    #33, -(SP)                                  ; 0590
                      51         52        50   A9  C1 00039          ADDL3   80(CBLOCK), NEXT, R1                        ; 0588
                                          FF   A1  9F 0003E          PUSHAB  -1(R1)                                      ;
                                                 50  DD 00041          PUSHL   SIZE                                        ;
                                          24   AA  DD 00043          PUSHL   36(RAB)                                     ; 0586
                            28   AA             6E  D0 00046          MOVL    (SP), 40(RAB)                               ;
                     00000000G   EF             06  FB 0004A          CALLS   #6, BOO$QIO                                 ;
                                  0C             50  E8 00051          BLBS    STAT, 2$                                    ; 0594
                            0C   AA             50  D0 00054          MOVL    STAT, 12(RAB)                               ; 0597
                                  50 0001C0F4    8F  D0 00058          MOVL    #114932, R0                                 ; 0598
                                                     04 0005F          RET                                                 ;
                                  50 00010001    8F  D0 00060 2$:      MOVL    #65537, R0                                  ; 0602
                                                     04 00067          RET                                                 ;

; Routine Size:  104 bytes,    Routine Base:  CODE + 02DB


;   0603  1
;   0604  1     end
;   0605  1
;   0606  0     eludom




;                                  PSECT SUMMARY
;
;       Name                    Bytes                        Attributes
;
```

; CODE 835 NOVEC,NOWRT, RD , EXE, SHR, LCL, REL, CON,NOPIC,ALIGN(2)

Symbol	Type	Defined	Referenced ...
ACCESS	Routine	131	80f 465c 502c
ADDRESS_FIRST	Local	269	335= 343= 343.
ADVANCE	Routine	112	79f 436c 489c 496c
BBLOCK	Structur	Lib02	155 156 267 268 275 277 343 418 419 573 574
BITE	Local	455	459= 475. 476. 477= 477. 479.
BLOCK	ExtReg	153	188= 196. 203. 215= 215. 223=
	GlobReg	422	471a. 475a. 486a. 508a.
BOO$QIO	ExtRout	93	201c 322c 585c
CACHE	Bind	159	201. 223.
CALL_RMS	Linkage	Lib02	81 82 83 229 381 541
CBLOCK	ExtReg	155	159aa 161a. 165a. 166a. 170a. 188a. 196a. 197a. 206a. 218a= 219a= 220a. 223a.
	ExtReg	275	280aa 282a= 283a= 284a. 285a. 327a. 366a= 367a= 368a=
	ExtReg	418	431a. 432a. 436a. 438a= 439a= 440a= 511a= 512a. 517a.
	ExtReg	573	581a. 583a. 584a= 588a. 592a.
CHAR	Local	291	297= 299. 300.
CR	Local	453	458= 475= 491.
CTL$L_CACHE1	Macro	Lib02	159
CTL$L_EOFVBN	Macro	Lib02	161 197 220 367 583
CTL$L_FILE_PTR	Macro	Lib02	284
CTL$L_GET	Macro	Lib02	282
CTL$L_HVBN	Macro	Lib02	166 219
CTL$L_LVBN	Macro	Lib02	165 218 223
CTL$L_NBP	Macro	Lib02	581 584
CTL$L_READ	Macro	Lib02	283
CTL$L_RPB	Macro	Lib02	206 327 592
CTL$L_STARTLBN	Macro	Lib02	188 196 368 588
CTL$L_VBN	Macro	Lib02	431 438 512
CTL$W_BYTE	Macro	Lib02	432 439 512
CTL$W_CACHE_SIZE	Macro	Lib02	170
CTL$W_FILE_LEN	Macro	Lib02	285
CTL$W_OFFBYTE	Macro	Lib02	366
CTL$W_REC_SIZE	Macro	Lib02	436 440 511 517
CTL$W_UNIT	Macro	Lib02	280
DSC$A_POINTER	Macro	Lib03	306
DSC$C_S_BLN	Literal	Lib03	267
DSC$W_LENGTH	Macro	Lib03	305
ENTRY	Bind	343	345. 347. 350. 351. 352.
EXTRA_LENGTH	Local	270	334= 335. 343.
FAB	ExtReg	277	329a= 369a= 370a= 371a= 372a= 373a= 374a=
FAB$B_FSZ	Macro	Lib03	371
FAB$B_RAT	Macro	Lib03	372
FAB$B_RFM	Macro	Lib03	373
FAB$C_RT11	Literal	Lib02	373
FAB$L_ALQ	Macro	Lib03	369
FAB$L_FOP	Macro	Lib03	370
FAB$L_STV	Macro	Lib03	329
FAB$M_CR	Literal	Lib03	372
FAB$M_CTG	Literal	Lib03	370

Symbol	Type	Defined	Referenced ...									
FAB$W_MRS	Macro	Lib03	374									
FIL$CVTFILNAM	ExtRout	91	308c									
FILE_LENGTH	Local	272	347=	348.	362.	367.	369.					
I	Local	190	201.									
IO$_READLBLK	Literal	Lib03	204	325	590							
JSB_ACC	Linkage	71	80	131								
JSB_ADV	Linkage	72	79	112								
JSB_CBLOCK	Linkage	Lib02	92									
LEN	Local	264	285=	293=	293.	305.						
	Local	456	480=	486.	487.	488.						
LENGTH	RoutForm	112	119.									
NEXT	Local	579	581=	583.	584.	588.						
OFFSET	ExtReg	117	119=	119.	121.	124.	125=	125.				
	GlobReg	424	432=	439.	459.	471.	479.	486.	508.	512.		
OUTLIM	Local	427	443=	480.	482.	487=	487.	524.	529=	529.		
OUTPTR	Local	428	444=	486=	486a=	531a=	531=	531.				
PTR	Local	263	284=	297.	297=	306.						
RAB	ExtReg	156	163a.	182a=	211a=							
	ExtReg	276										
	ExtReg	419	434a.	442a=	443a.	444a=	444a.	473a.	488a=	488a.	517a=	530a=	530a.
	ExtReg	574	582a=	582a.	586a=	586a.	597a=					
RAB$B_RAC	Macro	Lib03	163	434	473							
RAB$C_RFA	Literal	Lib03	163	434	473							
RAB$L_RBF	Macro	Lib03	444	586								
RAB$L_STV	Macro	Lib03	182	211	517	597						
RAB$L_UBF	Macro	Lib03	444	586								
RAB$W_RSZ	Macro	Lib03	442	488	530	582						
RAB$W_USZ	Macro	Lib03	443	582								
RAD50DESC	Local	267	305=	306=	308a							
RAD50NAM	Local	266	308a	351.	352.							
RMS$ALLOC_CACHE	ExtRout	92	177c									
RMS$_ACC	Literal	Lib03	330									
RMS$_DME	Literal	Lib03	183									
RMS$_EOF	Literal	Lib03	163	473								
RMS$_FNF	Literal	Lib03	320									
RMS$_FNM	Literal	Lib03	295	310								
RMS$_NORMAL	Literal	Lib03	375	520	601							
RMS$_RER	Literal	Lib03	212	598								
RMS$_RFA	Literal	Lib03	163	473								
RMS$_RTB	Literal	Lib03	518									
RT$L_FILENAME	Macro	Lib02	351									
RT$V_ENDSEG	Macro	Lib02	345									
RT$V_PERM	Macro	Lib02	350									
RT$W_EXTRALEN	Macro	Lib02	334									
RT$W_FILELENGTH	Macro	Lib02	347									
RT$W_FILETYPE	Macro	Lib02	352									
RT$W_FIRST	Macro	Lib02	335									
RT$W_SEGMENT	Macro	Lib02	332									
RT$W_STARTBLOCK	Macro	Lib02	333									
RT$_FIXED	Literal	Lib02	335	343								
RT11$GET	GlobRout	381	82f	282a								
RT11$OPEN	GlobRout	229	81f									
RT11$READ	GlobRout	541	83f	283a								
RTB	Local	429	441=	484=	514.	526=						
SEGBLK	Local	268	322a	332.	333.	334.	335a					

Symbol	Type	Defined	Referenced ...						
SEGMENT	Local	265	312=	320.	324.	332=			
SIZE	Local	577	582=	584.	587.				
START_BLOCK	Local	271	333=	348=	348.	362=	362.	368.	
STAT	Local	175	177=	179.	182.				
	Local	194	201=	208.	211.				
	Local	318	322=	329.					
	Local	463	465=	467.					
	Local	500	502=	504.					
	Local	578	585=	594.	597.				
STRING_SIZE	Local	454	479=	480.	482.	489.			
UNIT	Bind	280							
VBN	ExtReg	116	124=	124.					
	ExtReg	154	161.	165.	166.	188.	218.	219.	223.
	GlobReg	423	431=	438.	512.				

CROSS REFERENCE MAP

Line #	Event	File ...
1	Source (start)	DISK$DS:[DS.LOCAL.RELEASE.WORK]RT11.B32;1
5	Module RT11	
60	Library #1	DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
62	Library #2	DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
64	Library #3	SYS$COMMON:[SYSLIB]LIB.L32;3
606	Eludom RT11	

KEY TO REFERENCE TYPE FLAGS

.	Fetch
=	Store
c	Routine call
a	Address use
a	Indirect use
e	External, external routine, or external literal declaration
f	Forward or forward routine declaration
h	Condition handler enabling
m	Map declaration
u	Undeclare declaration

Library Statistics

File	Symbols Total	Symbols Loaded	Symbols Percent	Pages Mapped	Processing Time
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1	942	0	0	96	00:00.0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1	675	31	4	47	00:00.0
SYS$COMMON:[SYSLIB]LIB.L32;3	21522	29	0	1156	00:00.9

```
;                                       COMMAND QUALIFIERS

;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:RT11.B32

; Size:          835 code + 0 data bytes
; Run Time:        00:04.0
; Elapsed Time:    00:06.3
; Lines/CPU Min:    9000
; Lexemes/CPU-Min: 64915
; Memory Used:  153 pages
; Compilation Complete
```

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(1) 157 DECLARATIONS
(1) 219 INITIAL SYSTEM CONTROL BLOCK IMAGE.
(1) 292 DSX$INITSCB INITIALIZE SYSTEM CONTROL BLOCK ROUTINE
(1) 389 DSX$SETVEC SET VECTOR ROUTINE
(1) 522 DSX$CLRVEC RESTORE VECTOR ROUTINE
(1) 600 CHECK_VECTOR Verify vector range
(1) 644 DSX$SETIPL SET INTERRUPT PRIORITY LEVEL SERVICE PROCEDURE.
(1) 677 SOFT$INT Software interrupt vectors

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element SCB.MAR
0000     2 ; *4    26-MAR-1987 10:09:04 MEIER "REMOVED REFERENCES TO calypso & polarstar"
0000     3 ; *3    19-JAN-1987 13:46:32 MEIER "CALYPSO INTERVAL TIMER CHANGE IMPLEMENTED"
0000     4 ; *2     5-MAY-1986 11:35:52 SALEM "DONE"
0000     5 ; *1     6-FEB-1986 15:22:24 DS ""
0000     6 ; DEC/CMS REPLACEMENT HISTORY, Element SCB.MAR
0000     7         .TITLE  SCB     SYSTEM CONTROL BLOCK
0000     8         .IDENT  /07-34/                                                 ;G:2
0000     9         .NoShow Conditionals
0000    10
0000    11 ;
0000    12 ; COPYRIGHT (C) 1977, 1981, 1983, 1984, 1985, 1986                      ;G:3
0000    13 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    14 ;
0000    15 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
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0000    27 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0000    28 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    29
0000    30 ;++
0000    31 ; FACILITY:
0000    32 ;
0000    33 ; ABSTRACT:
0000    34 ;
0000    35 ; ENVIRONMENT:
0000    36 ;
0000    37 ; AUTHOR:       KEN CHAPMAN     20-SEP-77       VERSION 01.
0000    38 ;
0000    39 ; MODIFIED BY:
0000    40 ;                NICK HOWGATE    05-DEC-77       VERSION 02
0000    41 ;       01       ADDED EXCEPTION HANDLER ENHANCEMENT.
0000    42 ;
0000    43 ;                KEN CHAPMAN     01-DEC-77       VERSION 03
0000    44 ;       02       ADD TIMRON FLAG SET AND CLEAR TO $DS_SETVEC_L AND $DS_CLRVEC_L,
0000    45 ;                RESPECTIVELY, FOR INTERVAL TIMER VECTOR.
0000    46 ;
0000    47 ;                KEN CHAPMAN     16-FEB-78       VERSION 04 (ESSAA-3.07).
0000    48 ;       03       GENERAL CODE ENHANCEMENTS.
0000    49 ;       04       ADDED GENERALIZED EXCEPTION HANDLER FROM DEBUG.
0000    50 ;       05       "REI" INSTEAD OF "HALT" ON UNEXPECTED INTERRUPT.
0000    51 ;
0000    52 ;                N. HOWGATE      21-FEB-78       VERSION 05 (ESSAA-4.00).
0000    53 ;       06       ADD QIO SUPPORT - SOFTWARE LEVEL 8 VECTOR, AND MBA0 VECTOR
0000    54 ;                TOM SOUTTER     27-FEB-78
0000    55 ;       07       FIX TO UNEXPECTED VECTOR HANDLER TO CALL CLI
0000    56 ;                TOM SOUTTER     28-FEB-78
0000    57 ;       08       TURNED ON AST DELIVERY VECTOR (SOFTWARE LEVEL 2 INTERRUPT)
```

```
0000   ;
0000   ;                TOM SOUTTER     28-MAR-78       VERSION 06 (ESSAA-4.01).
0000   ;        09      INSTALLED HOOK TO INITIALIZE SYSTEM TIME IN $DS_CLRVEC_L (TIMER)
0000   ;        10      SET TIMER VECTOR TO DSI$TIMSRV & TR9/BR5 TO MBA$INTDIS
0000   ;                ROGER RIGGS     20-APR-78
0000   ;        11      CORRECTLY REMOVE UPPER 2 BITS OF SBA ADDRESS ON DISPLAY
0000   ;        12      Get PC correct and do DMP_SBI and DMP_SILO on SBI errors
0000   ;                ROGER RIGGS     15-FEB-79
0000   ;        13      MODIFIED SETVEC SO LOW 2 BITS OF SCB REFLECT SETVEC BITS
0000   ;                EVEN FOR 'SOFT' VECTORS.
0000   ;                REMOVED 'IS' BIT FROM MOST EXCEPTIONS
0000   ;                Roger Riggs     12-Jun-1979
0000   ;        14      Made software interrupt vectors soft, like BPT, T-bit...
0000   ;                Roger Riggs     1-OCT-1979
0000   ;        15      Changes to have only 1 SCB instead of 1 per machine
0000   ;                Space for SCB is allocated in kernel, initialization
0000   ;                is done here.  SCB_IMAGE is reduced to only 1 page.
0000   ;                Roger Riggs     6-NOV-1979
0000   ;        16      Made SETIPL change mode to KERNEL before setting the IPL
0000   ;                Roger Riggs, 26-Jan-1980, Version 5.2
0000   ;        17      Set supervisor vector for software IPL interrupts on
0000   ;                levels 6,9,10,11, to dispatch to EXE$FORKDSPTH
0000   ;                John Ciukaj, 5-feb-80.    Version 5.2
0000   ;        18      Delete 'MOVAB   IS(R3),(R2)' causing exception while
0000   ;                running diagnostic ECKAX, Exception depended on value
0000   ;                of R2 on entry to DS$INITSCB
0000   ;                Roger Riggs, 21-Mar-1980
0000   ;        19      Added EXE$GL_SCB to hold address of current SCB.
0000   ;                Roger Riggs, 18-SEP-1980, Version 6.0
0000   ;        20      Added code to DS$INITSCB to restart the clock
0000   ;                Dave Butenhof, 18-feb-1981, version 6.3
0000   ;        21      Also allow SETVEC w/out changing address
0000   ;        22      Fix several truncation errors
0000   ;
0000   ;        23      - Jack Stansbury, 22-Oct-1981, Version 6.5
0000   ;                Fixed several truncation errors. Changed SEP Psects to
0000   ;                what they should be. Added .LIBRARY statements for
0000   ;                $DS and $DIAG.
0000   ;
0000   ;        24      Jack Stansbury, 15-September-1982, Version 6.9
0000   ;                Added code in the SetVec routine that will take care of a race
0000   ;                condition with the interval clock interrupts and an MTPR
0000   ;                instruction that turns off the clock. Also changed the ICCS$M_ERR
0000   ;                to be bit 15, instead of bit 31.
0000   ;
0000   ;        25      Jack Stansbury, 16-September-1982, Version 6.9
0000   ;                Changed the ICCS$M_Err bit back to 31. The VAX Hardware Handbook
0000   ;                has a picture of the ICCS longword in the back of the book. This
0000   ;                picture states that the ERR bit is bit 15. However, in other
0000   ;                sections of the book (and in the SRM), the ERR bit is 15. The
0000   ;                NEBULA hardware thinks it is 15 also.
0000   ;
0000   ;        26      Bob Bergazzi    21-Oct-1982     version 6.9
0000   ;                Changed comments in DSX$SETVEC routine. Also see CLOCK.MAR [25]
0000   ;
0000   ;        27      Bob Bergazzi    April 26, 1983  Version 6.11
0000   ;                Added call to ONLY_SCB in DSX$INITSCB which fixes the SCB for VENUS.
```

```
                                0000    115 ;
                                0000    116 ;       28      Bob Bergazzi    June 7, 1983    Version 6.12
                                0000    117 ;               Changed the CLRVEC routine to reset the clock vector before
                                0000    118 ;               resetting the clock. This compensates for the TOK hardware bug
                                0000    119 ;               on 11/750s, which caused interrupts once in a blue moon when
                                0000    120 ;               resetting the clock.
                                0000    121 ;
                                0000    122 ;       29      Domenic Andella 1-May-1984      Version 7.0
                                0000    123 ;               Included FAULT_CLEAR selection code macro, and added
                                0000    124 ;               push/pop of selection code around call to DSR$FAULT_CLEAR
                                0000    125 ;               in routine DSX$INITSCB. Specific action relating to
                                0000    126 ;               CPU type and calling routine can then be taken in
                                0000    127 ;               MCHK___ module.
                                0000    128 ;
                                0000    129 ;       30      M. Baggett      27-Aug-1984     Version 7.1
                                0000    130 ;               Do not access the interval timer registers for AURORA.
                                0000    131 ;
                                0000    132 ;       31      Bob Bergazzi    Oct. 15, 1984   Version 7.1
                                0000    133 ;               Change SETVEC so that vector 0 is legal.
                                0000    134 ;
                                0000    135 ;       32      Bob Bergazzi    Nov. 8, 1984    Version 7.1
                                0000    136 ;               Put UNKNOWN_INT into psect SEP, in order to make it closer
                                0000    137 ;               to the SCB. The word displacement of the BSBW in SCB_UNKINT
                                0000    138 ;               had grown larger than a word, since it is a negative displacement.
                                0000    139 ;
                                0000    140 ;       33      Bob Bergazzi    Sep. 18, 1985   Version 9.0
                                0000    141 ;               Changed success return for $DS_CLRVEC from SS$_NORMAL to DS$_NORMAL
                                0000    142 ;               which is what SETVEC does, and what the documentation says. Symptom
                                0000    143 ;               was that the channel service for DSINT was returning SS$_NORMAL from
                                0000    144 ;               the $DS_CLRVEC call when DSINT is also documented as returning
                                0000    145 ;               DS$_NORMAL.
                                0000    146 ;                                                                       ;G:2
                                0000    147 ;       34      Ted Salem       May 4, 1986     Version 10.0            ;G:2
                                0000    148 ;               Changes fix #30 to check for MicroVax based systems     ;G:2
                                0000    149 ;                                                                       ;G:2
                                0000    150 ;       35      Stephen Meier   Sept 22, 1986   Version 10.2            ;G:3
                                0000    151 ;               Updated reference to the interval clock for LLL;        ;G:4
                                0000    152 ;               LLL's interval clock is implemented in I/O space rather ;G:4
                                0000    153 ;               than as IPR's.                                          ;G:3
                                0000    154 ;                                                                       ;G:3
                                0000    155 ;--
```

```
                     0000   157          .SBTTL  DECLARATIONS
                     0000   158 ;
                     0000   159 ; INCLUDE FILES:
                     0000   160 ;
                     0000   161          .LIBRARY        /SYS$LIBRARY:LIB/       ;                       [23]
                     0000   162          .LIBRARY        /$DS/           ;                               [23]
                     0000   163          .LIBRARY        /$DIAG/         ;                               [23]
                     0000   164
                     0000   165 ;
                     0000   166 ; MACROS:
                     0000   167 ;
                     0000   168
                     0000   169 ;
                     0000   170 ; EQUATED SYMBOLS:
                     0000   171 ;
                     0000   172
                     0000   173          $DS_CVTREG_DEF
                     0000   174          $DS_DSDEF
                     0000   175          $PRDEF
                     0000               .SAVE   LOCAL_BLOCK
                     0000               .RESTORE
                     0000   176          $PSLDEF
                     0000               .SAVE   LOCAL_BLOCK
                     0000               .RESTORE
                     0000   177          $DS_SCBDEF
                     0000   178          $DS_SETVEC_DEF
                     0000   179          CMKDEF
                     0000   180          DSFDEF
                     0000   181          FLTCLR_SEL                                                      ;[29
00000001             0000   182 IS        = 1
                     0000   183
80000000             0000   184 ICCS$M_ERR        = 1 @ 31        ; ERROR INDICATOR IN PR$_ICCS           [25]
00000080             0000   185 ICCS$M_INT        = 1 @ 7         ; INTERRUPT PENDING IN $PR$_ICCS        ;G:3
                     0000   186                                                                         ;G:3
                     0000   187 .WEAK    CLK$K_TCR0              ; Location of LLL clock register        ;G:4
                     0000   188                                  ; defined in CLOCKLLL [35]              ;G:3
```

```
                        00000000   190          .PSECT  Work, NoExe, NoShr, Wrt, Long   ;                                  [23]
                             0000  191
                             0000  192 ;
                             0000  193 ; OWN STORAGE:
                             0000  194 ;
                             0000  195
                             0000  196 DS$GB_Stopping_The_Timer::      ; If = 1, we are doing an MTPR to stop the      [24]
                          00 0000  197          .Byte   0               ; . . . interval clock.                         [24]
                             0001  198
                             0001  199 DS$GA_CHMKVEC::
                    00000005 0001  200          .BLKL   1               ; USER CHANGE MODE TO KERNEL VECTOR.
                             0005  201
                             0005  202 DS$GA_BREAKVEC::
                    00000009 0005  203          .BLKL   1               ; USER BREAK INSTRUCTION FAULT VECTOR.      ;G:3
                             0009  204
                             0009  205 DS$GA_TBITVEC::
                    0000000D 0009  206          .BLKL   1               ; USER T-BIT TRAP VECTOR.
                             000D  207
                             000D  208 EXE$GL_SCB::
                    00000000' 000D 209          .LONG   SCB_IMAGE       ; Virtual address of SCB
                             0011  210
                             0011  211 DS$GA_SOFTINT::
                    00000000 0011  212          .LONG   0               ; 1 Bit per level 1-15(D)
00000000'00000000'00000000'00000000' 0015  213          .LONG   0[15]           ; Soft interrupt vectors, 0=not assigned
00000000'00000000'00000000'00000000' 0025
00000000'00000000'00000000'00000000' 0035
         00000000'00000000'00000000' 0045
```

```
                        00000000   215          .PSECT  Data, NoExe, Shr, NoWrt, Long   ;                    [23]
                            0000   216
                            0000   217          MODNAM  SCB
                  42 43 53 00' 0000       $MODULE:        .ASCIC  \SCB\
                               03 0000
```

```
                     0004   219          .SBTTL  INITIAL SYSTEM CONTROL BLOCK IMAGE.
                     0004   220 ;+
                     0004   221 ; IMAGE OF THE SYSTEM CONTROL BLOCK USED TO REINITIALIZE THE ACTUAL EXE.
                     0004   222 ;-
                     0004   223
                 00000000   224          .PSECT  $SCB, SHR, EXE, WRT, PAGE
                     0000   225
                     0000   226 SCB_IMAGE::
00000000'            0000   227                  .LONG   SCBVECTOR_000   ; UNSPECIFIED. RESERVED TO DEC.
00000001'            0004   228 SCB_MCHK:       .LONG   EXE_MCHK+IS     ; MACHINE CHECK ABORT.
00000001'            0008   229 SCB_KRNLSTK:    .LONG   EXE_KRNLSTK+IS  ; KERNEL STACK NOT VALID ABORT.
00000001'            000C   230 SCB_POWER:      .LONG   EXE_POWER+IS    ; POWER FAIL INTERRUPT.
00000000'            0010   231 SCB_OPCDEC:     .LONG   EXE_OPCDEC      ; RESERVED/PRIVILEGED INSTRUCTIONS FAULT.
00000000'            0014   232 SCB_OPCCUS:     .LONG   EXE_OPCCUS      ; CUSTOMER RESERVED INSTRUCTION FAULT.
00000000'            0018   233 SCB_ROPRAND:    .LONG   EXE_ROPRAND     ; RESERVED OPERAND FAULT/ABORT.
00000000'            001C   234 SCB_RADRMOD:    .LONG   EXE_RADRMOD     ; RESERVED ADDRESSING MODE FAULT.
00000000'            0020   235 SCB_ACCVIO:     .LONG   EXE_ACCVIO      ; ACCESS CONTROL VIOLATION FAULT.
00000000'            0024   236 SCB_TRANSL:     .LONG   EXE_TRANSL      ; TRANSLATION NOT VALID FAULT.
00000000'            0028   237 SCB_TBIT:       .LONG   EXE_TBIT        ; TRACE TRAP.
00000000'            002C   238 SCB_BREAK:      .LONG   EXE_BREAK       ; BREAKPOINT FAULT.
00000000'            0030   239 SCB_COMPAT:     .LONG   EXE_COMPAT      ; COMPATIBILITY TRAP.
00000000'            0034   240 SCB_ARITH:      .LONG   EXE_ARITH       ; ARITHMETIC TRAP.
00000000'            0038   241                  .LONG   SCBVECTOR_038   ; UNSPECIFIED.
00000000'            003C   242                  .LONG   SCBVECTOR_03C   ; UNSPECIFIED.
00000000'            0040   243 SCB_CHMK:       .LONG   EXE_CMODKRNL    ; CHMK TRAP.
00000000'            0044   244 SCB_CHME:       .LONG   EXE_CHME        ; CHME TRAP.
00000000'            0048   245 SCB_CHMS:       .LONG   EXE_CHMS        ; CHMS TRAP.
00000000'            004C   246 SCB_CHMU:       .LONG   EXE_CHMU        ; CHMU TRAP.
00000000'            0050   247                  .LONG   SCBVECTOR_050   ; UNSPECIFIED.
00000000'            0054   248                  .LONG   SCBVECTOR_054   ; UNSPECIFIED.
00000000'            0058   249                  .LONG   SCBVECTOR_058   ; UNSPECIFIED.
00000000'            005C   250                  .LONG   SCBVECTOR_05C   ; UNSPECIFIED.
00000000'            0060   251                  .LONG   SCBVECTOR_060   ; UNSPECIFIED.
00000000'            0064   252                  .LONG   SCBVECTOR_064   ; UNSPECIFIED.
00000000'            0068   253                  .LONG   SCBVECTOR_068   ; UNSPECIFIED.
00000000'            006C   254                  .LONG   SCBVECTOR_06C   ; UNSPECIFIED.
00000000'            0070   255                  .LONG   SCBVECTOR_070   ; UNSPECIFIED.
00000000'            0074   256                  .LONG   SCBVECTOR_074   ; UNSPECIFIED.
00000000'            0078   257                  .LONG   SCBVECTOR_078   ; UNSPECIFIED.
00000000'            007C   258                  .LONG   SCBVECTOR_07C   ; UNSPECIFIED.
00000000'            0080   259                  .LONG   SCBVECTOR_080   ; UNSPECIFIED.
000002B4'            0084   260 SCB_SFTLVL1:    .LONG   SOFT$INT        ; SOFTWARE LEVEL 1 INTERRUPT.
000002B4'            0088   261 SCB_SFTLVL2:    .LONG   SOFT$INT        ; SOFTWARE LEVEL 2 INTERRUPT.
000002B4'            008C   262 SCB_SFTLVL3:    .LONG   SOFT$INT        ; SOFTWARE LEVEL 3 INTERRUPT.
000002B4'            0090   263 SCB_SFTLVL4:    .LONG   SOFT$INT        ; SOFTWARE LEVEL 4 INTERRUPT.
000002B4'            0094   264 SCB_SFTLVL5:    .LONG   SOFT$INT        ; SOFTWARE LEVEL 5 INTERRUPT.
000002B4'            0098   265 SCB_SFTLVL6:    .LONG   SOFT$INT        ; SOFTWARE LEVEL 6 INTERRUPT.
000002B4'            009C   266 SCB_SFTLVL7:    .LONG   SOFT$INT        ; SOFTWARE LEVEL 7 INTERRUPT.
000002B4'            00A0   267 SCB_SFTLVL8:    .LONG   SOFT$INT        ; SOFTWARE LEVEL 8 INTERRUPT.
000002B4'            00A4   268 SCB_SFTLVL9:    .LONG   SOFT$INT        ; SOFTWARE LEVEL 9 INTERRUPT.
000002B4'            00A8   269 SCB_SFTLVL10:   .LONG   SOFT$INT        ; SOFTWARE LEVEL 10 INTERRUPT.
000002B4'            00AC   270 SCB_SFTLVL11:   .LONG   SOFT$INT        ; SOFTWARE LEVEL 11 INTERRUPT.
000002B4'            00B0   271 SCB_SFTLVL12:   .LONG   SOFT$INT        ; SOFTWARE LEVEL 12 INTERRUPT.
000002B4'            00B4   272 SCB_SFTLVL13:   .LONG   SOFT$INT        ; SOFTWARE LEVEL 13 INTERRUPT.
000002B4'            00B8   273 SCB_SFTLVL14:   .LONG   SOFT$INT        ; SOFTWARE LEVEL 14 INTERRUPT.
000002B4'            00BC   274 SCB_SFTLVL15:   .LONG   SOFT$INT        ; SOFTWARE LEVEL 15 INTERRUPT.
00000001'            00C0   275 SCB_TIMER:      .LONG   DSI$TIMSRV+IS   ; INTERVAL TIMER INTERRUPT.
```

```
00000000' 00C4   276                .LONG   SCBVECTOR_0C4   ; UNSPECIFIED.
00000000' 00C8   277                .LONG   SCBVECTOR_0C8   ; UNSPECIFIED.
00000000' 00CC   278                .LONG   SCBVECTOR_0CC   ; UNSPECIFIED.
00000000' 00D0   279                .LONG   SCBVECTOR_0D0   ; UNSPECIFIED.
00000000' 00D4   280                .LONG   SCBVECTOR_0D4   ; UNSPECIFIED.
00000000' 00D8   281                .LONG   SCBVECTOR_0D8   ; UNSPECIFIED.
00000000' 00DC   282                .LONG   SCBVECTOR_0DC   ; UNSPECIFIED.
00000000' 00E0   283                .LONG   SCBVECTOR_0E0   ; UNSPECIFIED.
00000000' 00E4   284                .LONG   SCBVECTOR_0E4   ; UNSPECIFIED.
00000000' 00E8   285                .LONG   SCBVECTOR_0E8   ; UNSPECIFIED.
00000000' 00EC   286                .LONG   SCBVECTOR_0EC   ; UNSPECIFIED.
00000000' 00F0   287                .LONG   SCBVECTOR_0F0   ; UNSPECIFIED.
00000000' 00F4   288                .LONG   SCBVECTOR_0F4   ; UNSPECIFIED.
00000000' 00F8   289                .LONG   SCBVECTOR_0F8   ; UNSPECIFIED.
00000000' 00FC   290                .LONG   SCBVECTOR_0FC   ; UNSPECIFIED.
```

```
                     0100   292          .SBTTL  DSX$INITSCB     INITIALIZE SYSTEM CONTROL BLOCK ROUTINE
                00000000   293          .PSECT  Code, Exe, Shr, NoWrt, Long     ;                          [23]
                     0000   294
                     0000   295 ;++
                     0000   296 ; FUNCTIONAL DESCRIPTION:
                     0000   297 ;
                     0000   298 ;       This routine generates the necessary SCB.
                     0000   299 ;       The 1st half page contains vectors for exceptions and traps
                     0000   300 ;       The rest of the 4 pages is filled with trap catchers.
                     0000   301 ;       Interrupts are disabled while the SCB is being updated.
                     0000   302 ;       Calls the ONLY_SCB routine to do CPU specific SCB setup.
                     0000   303 ;
                     0000   304 ; CALLING SEQUENCE:
                     0000   305 ;
                     0000   306 ;       DS$INITSCB()
                     0000   307 ;
                     0000   308 ; INPUT PARAMETERS:     NONE
                     0000   309 ;
                     0000   310 ; IMPLICIT INPUTS:      NONE
                     0000   311 ;
                     0000   312 ; OUTPUT PARAMETERS:    NONE
                     0000   313 ;
                     0000   314 ; IMPLICIT OUTPUTS:     NONE
                     0000   315 ;
                     0000   316 ; COMPLETION CODES:     NONE
                     0000   317 ;
                     0000   318 ; SIDE EFFECTS:         NONE
                     0000   319 ;--
```

```
                     000C  0000    321 .ENTRY  DSX$INITSCB,^M<R2,R3>
                           0002    322
                           0002    323         CMK     INITSCB                 ; CHANGE MODE TO KERNEL.
                 7E   DC   0002            MOVPSL  -(SP)
              06 6E   1A   E0   0004            BBS     #PSL$V_IS, (SP), 30000$
                      8E   D4   0008            CLRL    (SP)+
                      08   BC   000A            CHMK    #CMK$_INITSCB
                      06   11   000C            BRB     30001$
        00000026'EF   16   000E      30000$: JSB     CMK$INITSCB
                           0014      30001$:
                           0014    324
              50   00'  D0   0014    325         MOVL    S^#SS$_NORMAL,R0        ; Set success
  00000000'EF   11   E5   0017    326         BBCC    #DS$V_TIMRON,DS$GL_FLAGS,- ; Clear interval timer in use
                      00   001E    327                 10$
        00000000'EF   16   001F    328 10$:    JSB     KB_CHECK                ; CHECK KEYBOARD STATUS.
                      04   0025    329         RET                             ; RETURN TO CALLING ROUTINE
                           0026    330
                           0026    331 ;
                           0026    332 ; Reset the whole SCB and reset the SCBB
                           0026    333 ;
                           0026    334
                           0026    335 CMK$INITSCB::
                      0F   BB   0026    336         PUSHR   #^M<R0,R1,R2,R3>        ; Save registers
                           0028    337         DSBINT                          ; Disable interrupts
              7E   12   DB   0028                 MFPR    S^#PR$_IPL,-(SP)
              12   1F   DA   002B                 MTPR    #31,S^#PR$_IPL
                      51   D4   002E    338         CLRL    R1                      ; Clear count of quads to be copied
        52    00000000'EF   9E   0030    339         MOVAB   L^SCB_BASE,R2           ; Point to where to build SCB
        53    00000000'EF   9E   0037    340         MOVAB   SCB_IMAGE,R3            ; 1/2 page of SCB image
                           003E    341
              82   83   7D   003E    342 10$:    MOVQ    (R3)+,(R2)+             ; Copy quadword of SCB
           F9 51   1F   F3   0041    343         AOBLEQ  #31,R1,10$              ; Copy 1/2 page
                           0045    344
        53    00000100'EF   9E   0045    345         MOVAB   SCB_UNKINT+^X100,R3     ; Point to unknown interrupt field
        51    00000000'EF   9E   004C    346         MOVAB   L^UNKNOWN_INT,R1        ; Address of intermediate handler       [23]
                           0053    347
              50   03 A3   9E   0053    348 20$:    MOVAB   3(R3),R0                ; Address after BSBW inst
           50   51   50   C3   0057    349         SUBL3   R0,R1,R0                ; make offset to handler
           50   50   08   78   005B    350         ASHL    #8,R0,R0                ; Position offset
                50   30   90   005F    351         MOVB    #^X30,R0                ; Insert opcode for BSBW
                83   50   D0   0062    352         MOVL    R0,(R3)+                ; Insert BSBW UNKNOWN_INT
              62   FD A3   9E   0065    353         MOVAB   IS-4(R3),(R2)           ; Point SCB vector to BSBW+IS
FFE0 52   04   FFFFFFFC'8F   F1   0069    354         ACBL    #SCB_UNKINT-4,#0,R2,20$ ; For every vector in the SCB
                           0073    355
        00000000'EF   16   0073    356         JSB     ONLY_SCB                ; Do CPU specific SCB setup             [27]
                           0079    357
                           0079    358 ;+
                           0079    359 ; Re-init clock and flag
                           0079    360 ;-
                           0079    361
        00000000'EF   16   0079    362         JSB     L^CLK$RE_INIT           ; Initialize the system timer
  00000000'EF   11   E5   007F    363         BBCC    #DS$V_TIMRON, -         ; RELEASE THE INTERVAL CLOCK.
                      00   0086    364                   DS$GL_FLAGS, 25$
                           0087    365
        00000001'EF   D4   0087    366 25$:    CLRL    DS$GA_CHMKVEC           ; CLEAR USER CHMK VECTOR.
        00000005'EF   D4   008D    367         CLRL    DS$GA_BREAKVEC          ; CLEAR USER BREAK VECTOR.
        00000009'EF   D4   0093    368         CLRL    DS$GA_TBITVEC           ; CLEAR USER TBIT VECTOR.
```

```
                50   07   D0  0099   369          MOVL    #7,R0                      ; Max software interrupt level
                                009C   370
        00000011'EF40    7C  009C   371 30$:     CLRQ    DS$GA_SOFTINT[R0]          ; Clear soft vector
                  F6 50   F5  00A3   372          SOBGTR  R0,30$                     ; Clear all vectors including 0 (mask)
   50   00000000'EF      DE  00A6   373          MOVAL   SCB_BASE,R0                ; Point to SCB
                11   50   DA  00AD   374          MTPR    R0,#PR$_SCBB               ; Set SCBB
   0000000D'EF      50   D0  00B0   375          MOVL    R0,EXE$GL_SCB              ; Set Virtual address of SCB
                    02   DD  00B7   376          PUSHL   #DS$_GK_INITSCB            ; Pass fault clear selection code        ;[29
        00000000'EF      16  00B9   377          JSB     L^DSR$FAULT_CLEAR          ; Reset fault regs and enables
                    8E   D5  00BF   378          TSTL    (SP)+                      ; Reset the stack
                                00C1   379          ENBINT                             ; Re-enable interrupts
                12   8E   DA  00C1                       MTPR    (SP)+,S^#PR$_IPL
                    0F   BA  00C4   380          POPR    #^M<R0,R1,R2,R3>           ; Restore registers
                         02  00C6   381          REI
                                00C7   382
                         00000000   383 .PSECT   SEP,    SHR,    EXE,    WRT,    LONG                                ;        [32]
                                0000   384 UNKNOWN_INT:
   6E   00000003'8F      C2  0000   385          SUBL    #SCB_UNKINT+3,(SP)         ; BSBW addr-base is SCB offset
        00000000'EF      16  0007   386          JSB     DSI$CHANNEL_VEC            ; Enter channel services w/ vector       [23]
        00000000'EF      17  000D   387          JMP     EXE_UNEXPINT               ; With offset on stack flag unexpected   [23]
```

```
                     0013   389          .SBTTL  DSX$SETVEC      SET VECTOR ROUTINE
                     0013   390 ;++
                     0013   391 ; FUNCTIONAL DESCRIPTION:
                     0013   392 ;
                     0013   393 ;       ROUTINE TO LOAD THE ADDRESS OF AN EXCEPTION OR INTERRUPT SERVICE ROUTINE
                     0013   394 ;       INTO THE SYSTEM CONTROL BLOCK (SCB).
                     0013   395 ;
                     0013   396 ; CALLING SEQUENCE:
                     0013   397 ;
                     0013   398 ;       STANDARD CALL PROCEDURE.
                     0013   399 ;
                     0013   400 ; INPUT PARAMETERS:
                     0013   401 ;
                     0013   402 ;       SETVEC$_VECTOR(AP)      = OFFSET INTO SCB.
                     0013   403 ;       SETVEC$_SRVADR(AP)      = ADDRESS OF INTERRUPT SERVICE ROUTINE
                     0013   404 ;       SETVEC$_CODE(AP)        = VECTOR CODE IN BITS 1:0.
                     0013   405 ;
                     0013   406 ; IMPLICIT INPUTS:      NONE
                     0013   407 ;
                     0013   408 ; OUTPUT PARAMETERS:
                     0013   409 ;
                     0013   410 ;       R0      = COMPLETION CODE.
                     0013   411 ;       R1      = PREVIOUS SERVICE ADDRESS.
                     0013   412 ;
                     0013   413 ; IMPLICIT OUTPUTS:     NONE
                     0013   414 ;
                     0013   415 ; COMPLETION CODES:
                     0013   416 ;
                     0013   417 ;       DS$_NORMAL      = VECTOR MODIFIED.
                     0013   418 ;       DS$_IVADDR      = SERVICE ADDRESS <1:0> NOT ZERO.
                     0013   419 ;       DS$_IVVECT      = INVALID VECTOR NUMBER.
                     0013   420 ;       DS$_ICBUSY      = INTERVAL CLOCK BUSY.
                     0013   421 ;
                     0013   422 ; SIDE EFFECTS:         NONE
                     0013   423 ;--
```

```
                          000000C7          .PSECT  Code, Exe, Shr, NoWrt, Long     ;                                  [23]
                        000C  00C7  .ENTRY  DSX$SETVEC,^M<R2,R3>            ; Save R2 and R3                          [24]
                              00C9
                  0163   30   00C9          BSBW    CHECK_VECTOR            ; Check vector for validity
                              00CC
      50   00660040 8F   D0   00CC          MOVL    #DS$_IVADDR, R0         ; SET ERROR RETURN CODE.
            08 AC    03   D3   00D3          BITL    #3,8(AP)                ; CHECK FOR LONGWORD ALIGNED ADR.
                     4A   12   00D7          BNEQ    53$                     ; Exit if not longword aligned
                              00D9
      51   00000000'E2   DE   00D9          MOVAL   L^SCB_BASE(R2), R1      ; GET ADR OF VECTOR AS I KNOW IT.
                              00E0                                                                                  ;G:3
          0040 8F    52   B1   00E0          CMPW    R2, #SCB$L_CHMK         ; CHECK FOR CHMK VECTOR.
                     0A   12   00E5          BNEQ    30$
      51   00000001'EF   DE   00E7          MOVAL   DS$GA_CHMKVEC, R1       ; SET SOFT VECTOR INSTEAD.
                  008D   31   00EE          BRW     100$                                                          ;G:3
                              00F1
                2C   52   B1   00F1  30$:   CMPW    R2, #SCB$L_BREAK        ; CHECK FOR BREAK VECTOR.
                     09   12   00F4          BNEQ    40$
      51   00000005'EF   DE   00F6          MOVAL   DS$GA_BREAKVEC, R1      ; SET SOFT VECTOR INSTEAD.
                     7F   11   00FD          BRB     100$
                              00FF
                28   52   B1   00FF  40$:   CMPW    R2, #SCB$L_TBIT         ; CHECK FOR TBIT VECTOR.
                     09   12   0102          BNEQ    50$
      51   00000009'EF   DE   0104          MOVAL   DS$GA_TBITVEC, R1       ; SET SOFT VECTOR INSTEAD.
                     71   11   010B          BRB     100$
                              010D
          00C0 8F    52   B1   010D  50$:   CMPW    R2, #SCB$L_TIMER        ; CHECK FOR TIMER VECTOR.
                     4D   12   0112          BNEQ    60$
      00000000'EF    11   E3   0114          BBCS    #DS$V_TIMRON, -         ; SET TIMER FLAG.
                     09        011B                    DS$GL_FLAGS, 55$
      50   006600C8 8F   D0   011C          MOVL    #DS$_ICBUSY, R0         ; INTERVAL CLOCK BUSY.
                              0123
                     7A   11   0123  53$:   BRB     DSX$SETVEC_X
                              0125
      00000000'EF    08   91   0125  55$:   CMPB    #PR$_SID_TYPUV2, EXE$GB_CPUTYPE ; Is it A MicroVax chip?[30][xx] ;G:
                     50   13   012C          BEQL    100$                            ; If yes do not access registers[30]
      00000000'EF    01   90   012E          MovB    #1, L^DS$GB_Stopping_The_Timer  ; Set flag to signal stopping   [24]
                              0135          ;+                                                                    ;G:3
                              0135          ; If this is an LLL machine, the interval clock is mapped into I/O    ;G:4
                              0135          ; space, hence, the clock must be disabled there.                     ;G:3
                              0135          ;-                                                                    ;G:3
                50   3E   DB   0135          MFPR    #PR$_SID,R0                     ; get system ID         [35]  ;G:3
      50    50    E8 8F   78   0138          ASHL    #-24,R0,R0                      ; get upper byte        [35]  ;G:3
                50   0A   91   013D          CMPB    #10,R0                          ; Is this an LLL??      [35]  ;G:4
                     0D   12   0140          BNEQ    57$                             ; not LLL               [35]  ;G:4
00000000'EF   80000080 8F   D0   0142          MOVL    #ICCS$M_ERR + -                 ; CLEAR ERROR &                ;G:3
                              014D                    ICCS$M_INT , -                  ; INTERRUPT & STOP THE CLOCK  ;G:3
                              014D                    CLK$K_TCR0                      ; IN THE INTERVAL TIMER [35]  ;G:3
                     0A   11   014D          BRB     58$                             ; continue              [35]  ;G:3
                              014F          ;+
                              014F          ; Do an Mtpr and then an Mfpr because the interval clock may interrupt in
                              014F          ; between the time the MTPR console code starts executing and when the MTPR
                              014F          ; console code is actually finished. That is, the Mtpr console code may
                              014F          ; actually be executing at the same time as the MFPR macro code starts.
                              014F          ;-
                              014F
      18   80000080 8F   DA   014F  57$:   MTPR    #ICCS$M_ERR + -         ; CLEAR ERROR &                       ;G:3
```

```
                                0156   482                  ICCS$M_INT , -          ; INTERRUPT & STOP THE CLOCK
                                0156   483                #PR$_ICCS                 ; IN THE INTERVAL TIMER
                                0156   484
                    53   18   DB 0156   485          Mfpr    #PR$_ICCS, R3           ; This ensures that the preceding       [25]
                                0159   486                                          ; MTPR is really finished (at the       [25]
                                0159   487                                          ; console level)                        [25]
                                0159   488
          00000000'EF   94      0159   489 58$:      ClrB    L^DS$GB_Stopping_The_Timer      ; Clear flag to signal done     [24]
                        1D   11 015F   490           BRB     100$
                                0161   491
          0084 8F       52   B1 0161   492 60$:      CMPW    R2,#SCB$L_SFTLVL1       ; Possible software interrupt vector
                        16   19 0166   493           BLSS    70$                     ; No, desired vector is too low
          00BC 8F       52   B1 0168   494           CMPW    R2,#SCB$L_SFTLVL15      ; Possible software interrupt vector
                        0F   14 016D   495           BGTR    70$                     ; No, desired vector is too high
     51   52   04   02   EF   016F   496           EXTZV   #2,#4,R2,R1             ; Isolate software interrupt level
     51   00000011'EF41   DE   0174   497           MOVAL   DS$GA_SOFTINT[R1],R1    ; Point to true vector
                        00   11 017C   498           BRB     100$
                                017E   499
                                017E   500 70$:
                                017E   501
                                017E   502 ;+
                                017E   503 ; Vector offset in R2
                                017E   504 ; Address of vector in R1
                                017E   505 ;-
                                017E   506
                        61   DD 017E   507 100$:     PUSHL   (R1)                    ; SAVE OLD SERVICE ADDRESS.
                     08 AC   D5 0180   508           TSTL    8(AP)                   ; See if address is 0                   [21]
                        04   13 0183   509           BEQL    110$                    ; If so, don't change                   [21]
                61   08 AC   D0 0185   510           MOVL    8(AP), (R1)             ; LOAD THE VECTOR REQUESTED
                                0189   511
                                0189   512 110$:                                    ;                                       [21]
     51   00000000'E2   DE   0189   513           MOVAL   L^SCB_BASE(R2), R1      ; Set back to SCB vec (soft vector)     [21]
61   02   00   0C AC   F0   0190   514           INSV    12(AP), #0, #2, (R1)    ; SET VECTOR CODE BITS 1:0.
                        02   BA 0196   515           POPR    #^M<R1>                 ; PUT OLD SERVICE ADDRESS INTO R1.
     50   00660001 8F   D0   0198   516           MOVL    #DS$_NORMAL, R0         ; SET SUCCESSFUL RETURN
                                019F   517
                                019F   518 DSX$SETVEC_X:
          00000000'EF   16   019F   519           JSB     KB_CHECK                ; CHECK KEYBOARD STATUS.
                        04   01A5   520           RET                             ; RETURN TO THE DIAGNOSTIC
```

```
01A6    522          .SBTTL  DSX$CLRVEC      RESTORE VECTOR ROUTINE
01A6    523 ;++
01A6    524 ; FUNCTIONAL DESCRIPTION:
01A6    525 ;
01A6    526 ; THIS ROUTINE LOADS THE VECTOR IN THE 'SCB' WITH THE CONTENTS
01A6    527 ; OF THE CORRESPONDING VECTOR IN 'SCB_IMAGE' (A PAGE WHICH HOLDS THE
01A6    528 ; INITIAL CONTENTS OF EACH VECTOR).
01A6    529 ; Interrupts are disabled while the SCB is being changed.
01A6    530 ;
01A6    531 ; CALLING SEQUENCE:
01A6    532 ;
01A6    533 ;       DS$CLRVEC(VECTOR OFFSET)
01A6    534 ;
01A6    535 ; INPUT PARAMETERS:
01A6    536 ;
01A6    537 ;       4(AP) OFFSET INTO S.C.B.
01A6    538 ;
01A6    539 ; IMPLICIT INPUTS:
01A6    540 ;
01A6    541 ;       SCB_IMAGE - INITIAL SYSTEM CONTROL BLOCK
01A6    542 ;
01A6    543 ; OUTPUT PARAMETERS:
01A6    544 ;
01A6    545 ;       R0 = 1 > SUCCESSFUL
01A6    546 ;       R0 = 0 > FAILURE
01A6    547 ;
01A6    548 ; IMPLICIT OUTPUTS:     NONE
01A6    549 ;
01A6    550 ; COMPLETION CODES:     NONE
01A6    551 ;
01A6    552 ; SIDE EFFECTS:        NONE
01A6    553 ;--
```

```
                     0004  01A6   555 .ENTRY  DSX$CLRVEC,^M<R2>
                           01A8   556
                     0084   30    01A8   557          BSBW    CHECK_VECTOR            ; Verify vector
                           01AB   558
           0040 8F    52   B1    01AB   559 10$:     CMPW    R2, #SCB$L_CHMK         ; CHECK FOR CHMK VECTOR.
                      08   12    01B0   560          BNEQ    20$
            00000001'EF    D4    01B2   561          CLRL    DS$GA_CHMKVEC           ; CLEAR SOFT VECTOR.
                      36   11    01B8   562          BRB     100$
                           01BA   563
                2C    52   B1    01BA   564 20$:     CMPW    R2, #SCB$L_BREAK        ; CHECK FOR BREAK VECTOR.
                      08   12    01BD   565          BNEQ    30$
            00000005'EF    D4    01BF   566          CLRL    DS$GA_BREAKVEC          ; CLEAR SOFT VECTOR.
                      29   11    01C5   567          BRB     100$
                           01C7   568
                28    52   B1    01C7   569 30$:     CMPW    R2, #SCB$L_TBIT         ; CHECK FOR TBIT VECTOR.
                      08   12    01CA   570          BNEQ    50$
            00000009'EF    D4    01CC   571          CLRL    DS$GA_TBITVEC           ; CLEAR SOFT VECTOR.
                      1C   11    01D2   572          BRB     100$
                           01D4   573
           0084 8F    52   B1    01D4   574 50$:     CMPW    R2,#SCB$L_SFTLVL1       ; Possible software interrupt vector
                      15   19    01D9   575          BLSS    60$                     ; No, desired vector is too low
           00BC 8F    52   B1    01DB   576          CMPW    R2,#SCB$L_SFTLVL15      ; Possible software interrupt vector
                      0E   14    01E0   577          BGTR    60$                     ; No, desired vector is too high
      50   52    04   02    EF    01E2   578          EXTZV   #2,#4,R2,R0             ; Isolate software interrupt level
          00000011'EF40   D4    01E7   579          CLRL    DS$GA_SOFTINT[R0]       ; Clear vector
                      00   11    01EE   580          BRB     100$
                           01F0   581
                           01F0   582 60$:
      50    00000001'E2   9E    01F0   583 100$:    MOVAB   L^SCB_UNKINT+IS(R2),R0  ; Restore unexpected handler
          0100 8F    52   B1    01F7   584          CMPW    R2,#^X100               ; 1st 1/2 page?
                      07   18    01FC   585          BGEQ    120$                    ; Branch if not
      50    00000000'E2   D0    01FE   586          MOVL    L^SCB_IMAGE(R2),R0      ; Get static vector
                           0205   587
00000000'E2    50   D0    0205   588 120$:    MOVL    R0,L^SCB_BASE(R2)       ; RESTORE THE VECTOR.
          00C0 8F    52   B1    020C   589          CMPW    R2, #SCB$L_TIMER        ; TIMER VECTOR?                 [28]
                      0E   12    0211   590          BNEQ    150$                    ; No                            [28]
            00000000'EF    16    0213   591          JSB     L^CLK$RE_INIT           ; Yes, initialize the system timer [28]
00000000'EF    11   E5    0219   592          BBCC    #DS$V_TIMRON, -         ; RELEASE THE INTERVAL CLOCK.   [28]
                      00   0220   593                    DS$GL_FLAGS, 150$       ;                               [28]
      50    00660001 8F   D0    0221   594 150$:    MOVL    #DS$_NORMAL, R0         ; SET SUCCESSFUL RETURN         [33]
                           0228   595
                           0228   596 DSX$CLRVEC_X:
            00000000'EF    16    0228   597          JSB     KB_CHECK                ; CHECK KEYBOARD.
                      04   022E   598          RET                             ; RETURN TO DIAGNOSTIC PROGRAM
```

```
                     600          .SBTTL  CHECK_VECTOR    Verify vector range
022F    601 ;++
022F    602 ; FUNCTIONAL DESCRIPTION:
022F    603 ;
022F    604 ;       This routine is used to verify that the vector specified
022F    605 ;       falls within the SCB and is aligned properly
022F    606 ;
022F    607 ; CALLING SEQUENCE:
022F    608 ;
022F    609 ;       BSBW    CHECK_VECTOR
022F    610 ;
022F    611 ; INPUT PARAMETERS:
022F    612 ;
022F    613 ;       4(AP)   Vector
022F    614 ;
022F    615 ; IMPLICIT INPUTS:      NONE
022F    616 ;
022F    617 ; IMPLICIT INPUTS:      NONE
022F    618 ;
022F    619 ; OUTPUT PARAMETERS:    NONE
022F    620 ;
022F    621 ; IMPLICIT OUTPUTS:
022F    622 ;
022F    623 ;       R2      correct vector
022F    624 ;
022F    625 ; SIDE EFFECTS:
022F    626 ;
022F    627 ;       Returns to caller if vector bad
022F    628 ;
022F    629 ; COMPLETION CODES:
022F    630 ;
022F    631 ;--
```

```
                                022F   633 CHECK_VECTOR:
          52    04 AC    D0     022F   634          MOVL    4(AP),R2                  ; Get vector
   52   00000000'8F     D1     0233   635          CMPL    #SCB_UNKINT-SCB_BASE,R2   ; Within SCB?
                  06    15     023A   636          BLEQ    10$                       ; Branch if not
             52   03    D3     023C   637          BITL    #3,R2                     ; Longword aligned?
                  01    12     023F   638          BNEQ    10$                       ; Branch if not
                        05     0241   639          RSB                               ; Return since vector ok
                                0242   640
   50   00660038 8F     D0     0242   641 10$:     MOVL    #DS$_IVVECT,R0            ; Sorry bad vector, return
                        04     0249   642          RET
```

```
                     024A   644          .SBTTL  DSX$SETIPL      SET INTERRUPT PRIORITY LEVEL SERVICE PROCEDURE.
                     024A   645 ;++
                     024A   646 ; FUNCTIONAL DESCRIPTION:
                     024A   647 ;
                     024A   648 ;       THIS ROUTINE SETS THE CURRENT IPL
                     024A   649 ;
                     024A   650 ; CALLING SEQUENCE:     NONE
                     024A   651 ;
                     024A   652 ; INPUT PARAMETERS:     NONE
                     024A   653 ;
                     024A   654 ; IMPLICIT INPUTS:      NONE
                     024A   655 ;
                     024A   656 ; OUTPUT PARAMETERS:    NONE
                     024A   657 ;
                     024A   658 ; IMPLICIT OUTPUTS:     NONE
                     024A   659 ;
                     024A   660 ; COMPLETION CODES:     NONE
                     024A   661 ;
                     024A   662 ; SIDE EFFECTS:         NONE
                     024A   663 ;--
```

```
                          0000  024A   665 .ENTRY  DSX$SETIPL,^M<>
                                024C   666
                                024C   667         CMK     SETIPL                  ; Change mode to kernel
                             7E   DC   024C         MOVPSL  -(SP)
                       06 6E     1A   E0   024E         BBS     #PSL$V_IS, (SP), 30002$
                             8E   D4   0252         CLRL    (SP)+
                             09   BC   0254         CHMK    #CMK$_SETIPL
                             06   11   0256         BRB     30003$
                   00000266'EF    16   0258     30002$: JSB     CMK$SETIPL
                                025E   30003$:
                50   00000000'8F    D0   025E   668         MOVL    #SS$_NORMAL,R0          ; INDICATE SUCCESS
                                04   0265   669         RET
                                0266   670
                                0266   671 CMK$SETIPL::
                          12    04 AC   DA   0266   672         MTPR    4(AP), #PR$_IPL
             04 AE    05    10    04 AC   F0   026A   673         INSV    4(AP),#PSL$V_IPL, -
                                0271   674                         #PSL$S_IPL,4(SP)        ; Set IPL also in PSL about to be.
                                02   0271   675         REI                             ; Exit CHMK
```

```
                        0272   677          .SBTTL  SOFT$INT        Software interrupt vectors
                        0272   678 ;++
                        0272   679 ; FUNCTIONAL DESCRIPTION:
                        0272   680 ;
                        0272   681 ;       These vectors are the software interrupt vector.
                        0272   682 ;
                        0272   683 ;--
                        0272   684          .ALIGN  LONG
                        0274   685 SOFT$INT_A:
                00000000' 0274   686          .ADDRESS        0                ; IPL 0 impossible / filler
                00000000' 0278   687          .ADDRESS        0                ; IPL 1 usused
                00000000' 027C   688          .ADDRESS        SCH$ASTDEL       ; IPL 2 is AST delivery
                00000000' 0280   689          .ADDRESS        0                ; IPL 3 unused
                00000000' 0284   690          .ADDRESS        IOC$IOPOST       ; IPL 4 QIO post processing
                00000000' 0288   691          .ADDRESS        DS$SOFTIPL5      ; IPL 5 Enter special handler
                00000000' 028C   692          .ADDRESS        EXE$FORKDSPTH    ; IPL 6 Fork dispatch
                00000000' 0290   693          .ADDRESS        DSI$TIMER        ; IPL 7 Timer interrupt service
                00000000' 0294   694          .ADDRESS        EXE$FORKDSPTH    ; IPL 8 Fork dispatch
                00000000' 0298   695          .ADDRESS        EXE$FORKDSPTH    ; IPL 9 Fork dispatch
                00000000' 029C   696          .ADDRESS        EXE$FORKDSPTH    ; IPL 10 Fork dispatch
                00000000' 02A0   697          .ADDRESS        EXE$FORKDSPTH    ; IPL 11 Fork dispatch
                00000000' 02A4   698          .ADDRESS        0                ; IPL 12 unused
                00000000' 02A8   699          .ADDRESS        0                ; IPL 13 unused
                00000000' 02AC   700          .ADDRESS        0                ; IPL 14 unused
                00000000' 02B0   701          .ADDRESS        0                ; IPL 15 unused
                          02B4   702
                          02B4   703
                          02B4   704          .ALIGN  LONG                     ; Software interrupt vector (all IPL's)
                          02B4   705 SOFT$INT:
                       03   BB   02B4   706          PUSHR   #^M<R0,R1>       ; Save register
                     50   12   DB   02B6   707          MFPR    #PR$_IPL,R0      ; Get IPL
          0A 00000011'EF   50   E4   02B9   708          BBSC    R0,DS$GA_SOFTINT,10$     ; Branch if supervisor expected this
           51   00000011'EF40   D0   02C1   709          MOVL    DS$GA_SOFTINT[R0],R1     ; User handler address?
                       1B   12   02C9   710          BNEQ    20$              ; Branch if user handler
                            02CB   711
                51   A5 AF40   D0   02CB   712 10$:    MOVL    SOFT$INT_A[R0],R1        ; Get handler address
                       25   12   02D0   713          BNEQ    30$              ; Branch if handler specified
                  51   04 AE   D0   02D2   714          MOVL    4(SP),R1         ; Restore R1
                     50   20   C0   02D6   715          ADDL    #^X20,R0         ; Generate SCB offset
              04 AE   50   02   78   02D9   716          ASHL    #2,R0,4(SP)      ; SCB vector of unexpected interrupt
                       01   BA   02DE   717          POPR    #^M<R0>          ; Restore register
                00000000'EF   17   02E0   718          JMP     EXE_UNEXPINT     ; Process unexpected interrupt          [23]
                            02E6   719
                   7E   6E   7D   02E6   720 20$:    MOVQ    (SP),-(SP)       ; Make space for PC/PSL
                08 AE   51   D0   02E9   721          MOVL    R1,8(SP)         ; Set PC
                     0C AE   DC   02ED   722          MOVPSL  12(SP)           ; Current PSL for interrupt routine
                51   80 AF40   D0   02F0   723          MOVL    SOFT$INT_A[R0],R1        ; Get supervisor handler
                       0A   13   02F5   724          BEQL    40$              ; Branch if none
                            02F7   725
                   7E   6E   7D   02F7   726 30$:    MOVQ    (SP),-(SP)       ; make space for PC/PSL
                08 AE   51   D0   02FA   727          MOVL    R1,8(SP)         ; Set PC
                     0C AE   DC   02FE   728          MOVPSL  12(SP)           ; Current PSL for interrupt routine
                            0301   729
                       03   BA   0301   730 40$:    POPR    #^M<R0,R1>       ; Restore
                            02   0303   731          REI                      ; Enter interrupt handler
                                 0304   732
                                 0304   733          .END
```

```
$$ARGS                          = 00000003     D
$$T1                            = 00000010     D
$ER                             = 00000001     D
$MODULE                           00000000 R   D   03
BIT...                          = 00000004     D
CHECK_VECTOR                      0000022F R   D   05
CLK$K_TCR0                        ********W GX     00
CLK$RE_INIT                       ********    X    05
CMK$INITSCB                       00000026 RG  D   05
CMK$SETIPL                        00000266 RG  D   05
CMK$_APBOOT                     = 00000004     D
CMK$_ASTEXIT                    = 00000000     D
CMK$_CANTIM                     = 0000000B     D
CMK$_HIBER                      = 00000007     D
CMK$_INITSCB                    = 00000008     D
CMK$_LAST                       = 0000000E     D
CMK$_MMENABLE                   = 00000003     D
CMK$_RCONSOLE                   = 00000001     D
CMK$_REFRESH                    = 00000005     D
CMK$_SCHDWK                     = 00000006     D
CMK$_SETIMR                     = 0000000C     D
CMK$_SETIPL                     = 00000009     D
CMK$_SETPRT                     = 0000000D     D
CMK$_SGIPR                      = 0000000A     D
CMK$_TCONSOLE                   = 00000002     D
CVTREG$_DATA                    = 00000008     D
CVTREG$_MAXLEN                  = 00000014     D
CVTREG$_MNEADR                  = 0000000C     D
CVTREG$_MSB                     = 00000004     D
CVTREG$_NARGS                   = 0000000B     D
CVTREG$_STRBUF                  = 00000010     D
CVTREG$_V1                      = 00000018     D
CVTREG$_V2                      = 0000001C     D
CVTREG$_V3                      = 00000020     D
CVTREG$_V4                      = 00000024     D
CVTREG$_V5                      = 00000028     D
CVTREG$_V6                      = 0000002C     D
DS$GA_BREAKVEC                    00000005 RG  D   02
DS$GA_CHMKVEC                     00000001 RG  D   02
DS$GA_SOFTINT                     00000011 RG  D   02
DS$GA_TBITVEC                     00000009 RG  D   02
DS$GB_STOPPING_THE_TIMER          00000000 RG  D   02
DS$GL_FLAGS                       ********    X    05
DS$K_ERROR                      = 00000002     D
DS$K_NORMAL                     = 00000001     D
DS$K_SEVERE                     = 00000004     D
DS$K_SUBSYS                     = 00000066     D
DS$K_WARNING                    = 00000000     D
DS$M_ABRTFLG                    = 00000040     D
DS$M_BADTIME                    = 00100000     D
DS$M_BATCH                      = 00400000     D
DS$M_BRKCLR                     = 00001000     D
DS$M_BRKPT                      = 00000800     D
DS$M_CHARFLG                    = 00000100     D
DS$M_CMDFLG                     = 00000080     D
DS$M_CTRLC                      = 00000001     D
DS$M_CTRLO                      = 00010000     D
DS$M_DEVFLG                     = 00000200     D
DS$M_DISABLCC                   = 01000000     D
DS$M_DONFLG                     = 00002000     D
DS$M_ERRFLG                     = 00000010     D
DS$M_EXCEPT                     = 00080000     D
DS$M_EXETST                     = 00040000     D
DS$M_HLTFLG                     = 00000008     D
DS$M_LODFLG                     = 00000002     D
DS$M_MEMMGT                     = 00008000     D
DS$M_NI                         = 04000000     D
DS$M_OUTPUT                     = 00800000     D
DS$M_RUBFLG                     = 00000020     D
DS$M_SCRIPT                     = 00200000     D
DS$M_SETIMR                     = 02000000     D
DS$M_STRFLG                     = 00000004     D
DS$M_SUBT                       = 00004000     D
DS$M_SYSFLG                     = 00000400     D
DS$M_TIMED                      = 02000000     D
DS$M_TIMED_OUT                  = 08000000     D
DS$M_TIMRON                     = 00020000     D
DS$SOFTIPL5                       ********    X    05
DS$V_ABRTFLG                    = 00000006     D
DS$V_BADTIME                    = 00000014     D
DS$V_BATCH                      = 00000016     D
DS$V_BRKCLR                     = 0000000C     D
DS$V_BRKPT                      = 0000000B     D
DS$V_CHARFLG                    = 00000008     D
DS$V_CMDFLG                     = 00000007     D
DS$V_CTRLC                      = 00000000     D
DS$V_CTRLO                      = 00000010     D
DS$V_DEVFLG                     = 00000009     D
DS$V_DISABLCC                   = 00000018     D
DS$V_DONFLG                     = 0000000D     D
DS$V_ERRFLG                     = 00000004     D
DS$V_EXCEPT                     = 00000013     D
DS$V_EXETST                     = 00000012     D
DS$V_HLTFLG                     = 00000003     D
DS$V_LODFLG                     = 00000001     D
DS$V_MEMMGT                     = 0000000F     D
DS$V_NI                         = 0000001A     D
DS$V_OUTPUT                     = 00000017     D
DS$V_RUBFLG                     = 00000005     D
DS$V_SCRIPT                     = 00000015     D
DS$V_SETIMR                     = 00000019     D
DS$V_STRFLG                     = 00000002     D
DS$V_SUBT                       = 0000000E     D
DS$V_SYSFLG                     = 0000000A     D
DS$V_TIMED                      = 00000019     D
DS$V_TIMED_OUT                  = 0000001B     D
DS$V_TIMRON                     = 00000011     D
DS$_AP_NORMAL_BREAK             = 00660150     D
DS$_ARITH                       = 006600D0     D
DS$_ASBE                        = 00660118     D
DS$_BADLINK                     = 006600F0     D
DS$_BADTYPE                     = 006600E8     D
DS$_BIIC                        = 00660120     D
DS$_CHME                        = 006600A8     D
```

```
DS$_CHMK                    = 006600E0    D        EXE$GL_SCB                  0000000D RG D  02
DS$_DEVNAME                 = 00660108    D        EXE_ACCVIO                  ********   X   04
DS$_ERROR                   = 00660002    D        EXE_ARITH                   ********   X   04
DS$_FHWE                    = 00660068    D        EXE_BREAK                   ********   X   04
DS$_FRAGBUF                 = 00660080    D        EXE_CHME                    ********   X   04
DS$_GK_EXE_MCHK             = 00000000    D        EXE_CHMS                    ********   X   04
DS$_GK_INITSCB              = 00000002    D        EXE_CHMU                    ********   X   04
DS$_GK_INT_WORK             = 00000003    D        EXE_CMODKRNL                ********   X   04
DS$_GK_TST$MCHK             = 00000001    D        EXE_COMPAT                  ********   X   04
DS$_ICBUSY                  = 006600C8    D        EXE_KRNLSTK                 ********   X   04
DS$_ICERR                   = 006600C0    D        EXE_MCHK                    ********   X   04
DS$_IHWE                    = 00660060    D        EXE_OPCCUS                  ********   X   04
DS$_ILLCHAR                 = 00660018    D        EXE_OPCDEC                  ********   X   04
DS$_ILLPAGCNT               = 00660078    D        EXE_POWER                   ********   X   04
DS$_ILLUNIT                 = 00660100    D        EXE_RADRMOD                 ********   X   04
DS$_INIT_FAIL               = 00660140    D        EXE_ROPRAND                 ********   X   04
DS$_INSFMEM                 = 00660050    D        EXE_TBIT                    ********   X   04
DS$_INVCPU                  = 00660130    D        EXE_TRANSL                  ********   X   04
DS$_IPL2HI                  = 006600B8    D        EXE_UNEXPINT                ********   X   06
DS$_IVADDR                  = 00660040    D        ICCS$M_ERR                = 80000000    D
DS$_IVVECT                  = 00660038    D        ICCS$M_INT                = 00000080    D
DS$_KRNLSTK                 = 00660090    D        IOC$IOPOST                  ********   X   05
DS$_LOGIC                   = 00660070    D        IS                        = 00000001    D
DS$_MCHK                    = 00660088    D        KB_CHECK                    ********   X   05
DS$_MEM_ALLOC_ERR           = 00660138    D        ONLY_SCB                    ********   X   05
DS$_MMOFF                   = 00660058    D        PR$_ICCS                  = 00000018    D
DS$_NEEDUNIT                = 006600F8    D        PR$_IPL                   = 00000012    D
DS$_NODE                    = 00660128    D        PR$_SCBB                  = 00000011    D
DS$_NOPCS                   = 00660110    D        PR$_SID                   = 0000003E    D
DS$_NORMAL                  = 00660001    D        PR$_SID_TYPUV2            = 00000008    D
DS$_NOSUPPORT               = 006600B1    D        PSL$S_IPL                 = 00000005    D
DS$_NOTALLOWMP              = 00660148    D        PSL$V_IPL                 = 00000010    D
DS$_NOTDON                  = 00660030    D        PSL$V_IS                  = 0000001A    D
DS$_NOTIMP                  = 006600B0    D        SCB$L_ACCESS                00000020    D
DS$_NULLSTR                 = 00660010    D        SCB$L_ARITH                 00000034    D
DS$_OVERFLOW                = 00660008    D        SCB$L_BREAK                 0000002C    D
DS$_POWER                   = 00660098    D        SCB$L_CHME                  00000044    D
DS$_PROGERR                 = 00660020    D        SCB$L_CHMK                  00000040    D
DS$_SEVERE                  = 00660004    D        SCB$L_CHMS                  00000048    D
DS$_TRANSL                  = 006600A0    D        SCB$L_CHMU                  0000004C    D
DS$_TRUNCATE                = 00660028    D        SCB$L_COMPAT                00000030    D
DS$_UNEXPINT                = 006600D8    D        SCB$L_KNLSTK                00000008    D
DS$_UNSUPPDEV               = 00660158    D        SCB$L_MACHCHK               00000004    D
DS$_VASFULL                 = 00660048    D        SCB$L_OPCCUS                00000014    D
DS$_WARNING                 = 00660000    D        SCB$L_OPCDEC                00000010    D
DSI$CHANNEL_VEC               ********   X   06     SCB$L_POWER                 0000000C    D
DSI$TIMER                     ********   X   05     SCB$L_RADRMOD               0000001C    D
DSI$TIMSRV                    ********   X   04     SCB$L_ROPRAND               00000018    D
DSR$FAULT_CLEAR               ********   X   05     SCB$L_RXDB                  000000F8    D
DSX$CLRVEC                    000001A6 RG D  05     SCB$L_SFTLVL1               00000084    D
DSX$CLRVEC_X                  00000228 R  D  05     SCB$L_SFTLVL10              000000A8    D
DSX$INITSCB                   00000000 RG D  05     SCB$L_SFTLVL11              000000AC    D
DSX$SETIPL                    0000024A RG D  05     SCB$L_SFTLVL12              000000B0    D
DSX$SETVEC                    000000C7 RG D  05     SCB$L_SFTLVL13              000000B4    D
DSX$SETVEC_X                  0000019F R  D  05     SCB$L_SFTLVL14              000000B8    D
EXE$FORKDSPTH                 ********   X   05     SCB$L_SFTLVL15              000000BC    D
EXE$GB_CPUTYPE                ********   X   05     SCB$L_SFTLVL2               00000088    D
```

```
SCB$L_SFTLVL3                   0000008C    D
SCB$L_SFTLVL4                   00000090    D
SCB$L_SFTLVL5                   00000094    D
SCB$L_SFTLVL6                   00000098    D
SCB$L_SFTLVL7                   0000009C    D
SCB$L_SFTLVL8                   000000A0    D
SCB$L_SFTLVL9                   000000A4    D
SCB$L_TBIT                      00000028    D
SCB$L_TIMER                     000000C0    D
SCB$L_TRANSL                    00000024    D
SCB$L_TXDB                      000000FC    D
SCB$L_VM                        00000038    D
SCB$L_ZERO                      00000000    D
SCBVECTOR_000                   ********    X   04
SCBVECTOR_038                   ********    X   04
SCBVECTOR_03C                   ********    X   04
SCBVECTOR_050                   ********    X   04
SCBVECTOR_054                   ********    X   04
SCBVECTOR_058                   ********    X   04
SCBVECTOR_05C                   ********    X   04
SCBVECTOR_060                   ********    X   04
SCBVECTOR_064                   ********    X   04
SCBVECTOR_068                   ********    X   04
SCBVECTOR_06C                   ********    X   04
SCBVECTOR_070                   ********    X   04
SCBVECTOR_074                   ********    X   04
SCBVECTOR_078                   ********    X   04
SCBVECTOR_07C                   ********    X   04
SCBVECTOR_080                   ********    X   04
SCBVECTOR_0C4                   ********    X   04
SCBVECTOR_0C8                   ********    X   04
SCBVECTOR_0CC                   ********    X   04
SCBVECTOR_0D0                   ********    X   04
SCBVECTOR_0D4                   ********    X   04
SCBVECTOR_0D8                   ********    X   04
SCBVECTOR_0DC                   ********    X   04
SCBVECTOR_0E0                   ********    X   04
SCBVECTOR_0E4                   ********    X   04
SCBVECTOR_0E8                   ********    X   04
SCBVECTOR_0EC                   ********    X   04
SCBVECTOR_0F0                   ********    X   04
SCBVECTOR_0F4                   ********    X   04
SCBVECTOR_0F8                   ********    X   04
SCBVECTOR_0FC                   ********    X   04
SCB_ACCVIO                      00000020 R  D   04
SCB_ARITH                       00000034 R  D   04
SCB_BASE                        ********    X   05
SCB_BREAK                       0000002C R  D   04
SCB_CHME                        00000044 R  D   04
SCB_CHMK                        00000040 R  D   04
SCB_CHMS                        00000048 R  D   04
SCB_CHMU                        0000004C R  D   04
SCB_COMPAT                      00000030 R  D   04
SCB_IMAGE                       00000000 RG D   04
SCB_KRNLSTK                     00000008 R  D   04
SCB_MCHK                        00000004 R  D   04
SCB_OPCCUS                      00000014 R  D   04
SCB_OPCDEC                      00000010 R  D   04
SCB_POWER                       0000000C R  D   04
SCB_RADRMOD                     0000001C R  D   04
SCB_ROPRAND                     00000018 R  D   04
SCB_SFTLVL1                     00000084 R  D   04
SCB_SFTLVL10                    000000A8 R  D   04
SCB_SFTLVL11                    000000AC R  D   04
SCB_SFTLVL12                    000000B0 R  D   04
SCB_SFTLVL13                    000000B4 R  D   04
SCB_SFTLVL14                    000000B8 R  D   04
SCB_SFTLVL15                    000000BC R  D   04
SCB_SFTLVL2                     00000088 R  D   04
SCB_SFTLVL3                     0000008C R  D   04
SCB_SFTLVL4                     00000090 R  D   04
SCB_SFTLVL5                     00000094 R  D   04
SCB_SFTLVL6                     00000098 R  D   04
SCB_SFTLVL7                     0000009C R  D   04
SCB_SFTLVL8                     000000A0 R  D   04
SCB_SFTLVL9                     000000A4 R  D   04
SCB_TBIT                        00000028 R  D   04
SCB_TIMER                       000000C0 R  D   04
SCB_TRANSL                      00000024 R  D   04
SCB_UNKINT                      ********    X   05
SCH$ASTDEL                      ********    X   05
SETVEC$_CODE                  = 0000000C    D
SETVEC$_NARGS                 = 00000003    D
SETVEC$_SRVADR                = 00000008    D
SETVEC$_VECTOR                = 00000004    D
SIZ...                        = 00000001    D
SOFT$INT                        000002B4 R  D   05
SOFT$INT_A                      00000274 R  D   05
SS$_NORMAL                      ********    X   05
UNKNOWN_INT                     00000000 R  D   06
```

```
                                  +----------------+
                                  ! Psect synopsis !
                                  +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           00000200  (  512.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
WORK                            00000051  (   81.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR NOEXE   RD    WRT NOVEC LONG
DATA                            00000004  (    4.)  03 (  3.)  NOPIC   USR   CON   REL   LCL   SHR NOEXE   RD  NOWRT NOVEC LONG
$SCB                            00000100  (  256.)  04 (  4.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD    WRT NOVEC PAGE
CODE                            00000304  (  772.)  05 (  5.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD  NOWRT NOVEC LONG
SEP                             00000013  (   19.)  06 (  6.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD    WRT NOVEC LONG
```

```
                                        +-------------------------+
                                        ! Symbol Cross Reference !
                                        +-------------------------+

SYMBOL                          VALUE        DEFINITION      REFERENCES...
------                          -----        ----------      -------------
$$ARGS                         =00000003     178    (1)      173    (1)      178    (1)
$$T1                           =00000010     178    (1)      173    (1)      178    (1)
$ER                            =00000001     217    (1)
$MODULE                         00000000-R   217    (1)
BIT...                         =00000004     181    (1)      174    (1)      179    (1)      180    (1)      181    (1)
CHECK_VECTOR                    0000022F-R   633    (1)    #-428    (1)    #-557    (1)
CLK$K_TCR0                      00000000-XR                 187    (1)    #-472    (1)
CLK$RE_INIT                     00000000-XR                 362    (1)      591    (1)
CMK$INITSCB                     00000026-R   335    (1)      323    (1)
CMK$SETIPL                      00000266-R   671    (1)      667    (1)
CMK$_APBOOT                    =00000004     179    (1)
CMK$_ASTEXIT                   =00000000     179    (1)
CMK$_CANTIM                    =0000000B     179    (1)
CMK$_HIBER                     =00000007     179    (1)
CMK$_INITSCB                   =00000008     179    (1)    #-323    (1)
CMK$_LAST                      =0000000E     179    (1)
CMK$_MMENABLE                  =00000003     179    (1)
CMK$_RCONSOLE                  =00000001     179    (1)
CMK$_REFRESH                   =00000005     179    (1)
CMK$_SCHDWK                    =00000006     179    (1)
CMK$_SETIMR                    =0000000C     179    (1)
CMK$_SETIPL                    =00000009     179    (1)    #-667    (1)
CMK$_SETPRT                    =0000000D     179    (1)
CMK$_SGIPR                     =0000000A     179    (1)
CMK$_TCONSOLE                  =00000002     179    (1)
CVTREG$_DATA                   =00000008     173    (1)
CVTREG$_MAXLEN                 =00000014     173    (1)
CVTREG$_MNEADR                 =0000000C     173    (1)
CVTREG$_MSB                    =00000004     173    (1)
CVTREG$_NARGS                  =0000000B     173    (1)
CVTREG$_STRBUF                 =00000010     173    (1)
CVTREG$_V1                     =00000018     173    (1)
CVTREG$_V2                     =0000001C     173    (1)
CVTREG$_V3                     =00000020     173    (1)
CVTREG$_V4                     =00000024     173    (1)
CVTREG$_V5                     =00000028     173    (1)
CVTREG$_V6                     =0000002C     173    (1)
DS$GA_BREAKVEC                  00000005-R   202    (1)    #-367    (1)      443    (1)    #-566    (1)
DS$GA_CHMKVEC                   00000001-R   199    (1)    #-366    (1)      438    (1)    #-561    (1)
DS$GA_SOFTINT                   00000011-R   211    (1)    #-371    (1)      497    (1)    #-579    (1)      708    (1)
                                                           #-709    (1)
DS$GA_TBITVEC                   00000009-R   205    (1)    #-368    (1)      448    (1)    #-571    (1)
DS$GB_STOPPING_THE_TIMER        00000000-R   196    (1)    #-461    (1)    #-489    (1)
DS$GL_FLAGS                     00000000-XR                 326    (1)      364    (1)      454    (1)      593    (1)
DS$K_ERROR                     =00000002     174    (1)
DS$K_NORMAL                    =00000001     174    (1)
DS$K_SEVERE                    =00000004     174    (1)
DS$K_SUBSYS                    =00000066     174    (1)      174    (1)
DS$K_WARNING                   =00000000     174    (1)
DS$M_ABRTFLG                   =00000040     180    (1)
```

```
DS$M_BADTIME                =00100000     180    (1)
DS$M_BATCH                  =00400000     180    (1)
DS$M_BRKCLR                 =00001000     180    (1)
DS$M_BRKPT                  =00000800     180    (1)
DS$M_CHARFLG                =00000100     180    (1)
DS$M_CMDFLG                 =00000080     180    (1)
DS$M_CTRLC                  =00000001     180    (1)
DS$M_CTRLO                  =00010000     180    (1)
DS$M_DEVFLG                 =00000200     180    (1)
DS$M_DISABLCC               =01000000     180    (1)
DS$M_DONFLG                 =00002000     180    (1)
DS$M_ERRFLG                 =00000010     180    (1)
DS$M_EXCEPT                 =00080000     180    (1)
DS$M_EXETST                 =00040000     180    (1)
DS$M_HLTFLG                 =00000008     180    (1)
DS$M_LODFLG                 =00000002     180    (1)
DS$M_MEMMGT                 =00008000     180    (1)
DS$M_NI                     =04000000     180    (1)
DS$M_OUTPUT                 =00800000     180    (1)
DS$M_RUBFLG                 =00000020     180    (1)
DS$M_SCRIPT                 =00200000     180    (1)
DS$M_SETIMR                 =02000000     180    (1)
DS$M_STRFLG                 =00000004     180    (1)
DS$M_SUBT                   =00004000     180    (1)
DS$M_SYSFLG                 =00000400     180    (1)
DS$M_TIMED                  =02000000     180    (1)
DS$M_TIMED_OUT              =08000000     180    (1)
DS$M_TIMRON                 =00020000     180    (1)
DS$SOFTIPL5                  00000000-XR                691    (1)
DS$V_ABRTFLG                =00000006     180    (1)
DS$V_BADTIME                =00000014     180    (1)
DS$V_BATCH                  =00000016     180    (1)
DS$V_BRKCLR                 =0000000C     180    (1)
DS$V_BRKPT                  =0000000B     180    (1)
DS$V_CHARFLG                =00000008     180    (1)
DS$V_CMDFLG                 =00000007     180    (1)
DS$V_CTRLC                  =00000000     180    (1)
DS$V_CTRLO                  =00000010     180    (1)
DS$V_DEVFLG                 =00000009     180    (1)
DS$V_DISABLCC               =00000018     180    (1)
DS$V_DONFLG                 =0000000D     180    (1)
DS$V_ERRFLG                 =00000004     180    (1)
DS$V_EXCEPT                 =00000013     180    (1)
DS$V_EXETST                 =00000012     180    (1)
DS$V_HLTFLG                 =00000003     180    (1)
DS$V_LODFLG                 =00000001     180    (1)
DS$V_MEMMGT                 =0000000F     180    (1)
DS$V_NI                     =0000001A     180    (1)
DS$V_OUTPUT                 =00000017     180    (1)
DS$V_RUBFLG                 =00000005     180    (1)
DS$V_SCRIPT                 =00000015     180    (1)
DS$V_SETIMR                 =00000019     180    (1)
DS$V_STRFLG                 =00000002     180    (1)
DS$V_SUBT                   =0000000E     180    (1)
DS$V_SYSFLG                 =0000000A     180    (1)
DS$V_TIMED                  =00000019     180    (1)
DS$V_TIMED_OUT              =0000001B     180    (1)
```

```
DS$V_TIMRON                     =00000011     180    (1)    #-326    (1)    #-363    (1)    #-453    (1)    #-592    (1)
DS$_AP_NORMAL_BREAK             =00660150     174    (1)
DS$_ARITH                       =006600D0     174    (1)
DS$_ASBE                        =00660118     174    (1)
DS$_BADLINK                     =006600F0     174    (1)
DS$_BADTYPE                     =006600E8     174    (1)
DS$_BIIC                        =00660120     174    (1)
DS$_CHME                        =006600A8     174    (1)
DS$_CHMK                        =006600E0     174    (1)
DS$_DEVNAME                     =00660108     174    (1)
DS$_ERROR                       =00660002     174    (1)
DS$_FHWE                        =00660068     174    (1)
DS$_FRAGBUF                     =00660080     174    (1)
DS$_GK_EXE_MCHK                 =00000000     181    (1)
DS$_GK_INITSCB                  =00000002     181    (1)    #-376    (1)
DS$_GK_INT_WORK                 =00000003     181    (1)
DS$_GK_TST$MCHK                 =00000001     181    (1)
DS$_ICBUSY                      =006600C8     174    (1)    #-455    (1)
DS$_ICERR                       =006600C0     174    (1)
DS$_IHWE                        =00660060     174    (1)
DS$_ILLCHAR                     =00660018     174    (1)
DS$_ILLPAGCNT                   =00660078     174    (1)
DS$_ILLUNIT                     =00660100     174    (1)
DS$_INIT_FAIL                   =00660140     174    (1)
DS$_INSFMEM                     =00660050     174    (1)
DS$_INVCPU                      =00660130     174    (1)
DS$_IPL2HI                      =006600B8     174    (1)
DS$_IVADDR                      =00660040     174    (1)    #-430    (1)
DS$_IVVECT                      =00660038     174    (1)    #-641    (1)
DS$_KRNLSTK                     =00660090     174    (1)
DS$_LOGIC                       =00660070     174    (1)
DS$_MCHK                        =00660088     174    (1)
DS$_MEM_ALLOC_ERR               =00660138     174    (1)
DS$_MMOFF                       =00660058     174    (1)
DS$_NEEDUNIT                    =006600F8     174    (1)
DS$_NODE                        =00660128     174    (1)
DS$_NOPCS                       =00660110     174    (1)
DS$_NORMAL                      =00660001     174    (1)    #-516    (1)    #-594    (1)
DS$_NOSUPPORT                   =006600B1     174    (1)
DS$_NOTALLOWMP                  =00660148     174    (1)
DS$_NOTDON                      =00660030     174    (1)
DS$_NOTIMP                      =006600B0     174    (1)      174    (1)
DS$_NULLSTR                     =00660010     174    (1)
DS$_OVERFLOW                    =00660008     174    (1)
DS$_POWER                       =00660098     174    (1)
DS$_PROGERR                     =00660020     174    (1)
DS$_SEVERE                      =00660004     174    (1)
DS$_TRANSL                      =006600A0     174    (1)
DS$_TRUNCATE                    =00660028     174    (1)
DS$_UNEXPINT                    =006600D8     174    (1)
DS$_UNSUPPDEV                   =00660158     174    (1)
DS$_VASFULL                     =00660048     174    (1)
DS$_WARNING                     =00660000     174    (1)      174    (1)
DSI$CHANNEL_VEC                  00000000-XR             386    (1)
DSI$TIMER                        00000000-XR             693    (1)
DSI$TIMSRV                       00000000-XR             275    (1)
DSR$FAULT_CLEAR                  00000000-XR             377    (1)
```

```
DSX$CLRVEC                      000001A6-R   555    (1)
DSX$CLRVEC_X                    00000228-R   596    (1)
DSX$INITSCB                     00000000-R   321    (1)
DSX$SETIPL                      0000024A-R   665    (1)
DSX$SETVEC                      000000C7-R   426    (1)
DSX$SETVEC_X                    0000019F-R   518    (1)    #-457    (1)
EXE$FORKDSPTH                   00000000-XR             692    (1)      694    (1)      695    (1)      696    (1)
                                                        697    (1)
EXE$GB_CPUTYPE                  00000000-XR           #-459    (1)
EXE$GL_SCB                      0000000D-R   208    (1)  #-375    (1)
EXE_ACCVIO                      00000000-XR             235    (1)
EXE_ARITH                       00000000-XR             240    (1)
EXE_BREAK                       00000000-XR             238    (1)
EXE_CHME                        00000000-XR             244    (1)
EXE_CHMS                        00000000-XR             245    (1)
EXE_CHMU                        00000000-XR             246    (1)
EXE_CMODKRNL                    00000000-XR             243    (1)
EXE_COMPAT                      00000000-XR             239    (1)
EXE_KRNLSTK                     00000000-XR             229    (1)
EXE_MCHK                        00000000-XR             228    (1)
EXE_OPCCUS                      00000000-XR             232    (1)
EXE_OPCDEC                      00000000-XR             231    (1)
EXE_POWER                       00000000-XR             230    (1)
EXE_RADRMOD                     00000000-XR             234    (1)
EXE_ROPRAND                     00000000-XR             233    (1)
EXE_TBIT                        00000000-XR             237    (1)
EXE_TRANSL                      00000000-XR             236    (1)
EXE_UNEXPINT                    00000000-XR             387    (1)      718    (1)
ICCS$M_ERR                      =80000000    184    (1)  #-470    (1)  #-481    (1)
ICCS$M_INT                      =00000080    185    (1)  #-471    (1)  #-482    (1)
IOC$IOPOST                       00000000-XR             690    (1)
IS                              =00000001    182    (1)    228    (1)      229    (1)      230    (1)      275    (1)
                                                        353    (1)      583    (1)
KB_CHECK                         00000000-XR             328    (1)      519    (1)      597    (1)
ONLY_SCB                         00000000-XR             356    (1)
PR$_ICCS                        =00000018             #-483    (1)  #-485    (1)
PR$_IPL                         =00000012             #-337    (1)  #-379    (1)  #-672    (1)  #-707    (1)
PR$_SCBB                        =00000011             #-374    (1)
PR$_SID                         =0000003E             #-466    (1)
PR$_SID_TYPUV2                  =00000008             #-459    (1)
PSL$S_IPL                       =00000005             #-674    (1)
PSL$V_IPL                       =00000010             #-673    (1)
PSL$V_IS                        =0000001A    179    (1)  #-323    (1)  #-667    (1)
SCB$L_BREAK                      0000002C             #-441    (1)  #-564    (1)
SCB$L_CHMK                       00000040             #-436    (1)  #-559    (1)
SCB$L_SFTLVL1                    00000084             #-492    (1)  #-574    (1)
SCB$L_SFTLVL15                   000000BC             #-494    (1)  #-576    (1)
SCB$L_TBIT                       00000028             #-446    (1)  #-569    (1)
SCB$L_TIMER                      000000C0             #-451    (1)  #-589    (1)
SCBVECTOR_000                    00000000-XR             227    (1)
SCBVECTOR_038                    00000000-XR             241    (1)
SCBVECTOR_03C                    00000000-XR             242    (1)
SCBVECTOR_050                    00000000-XR             247    (1)
SCBVECTOR_054                    00000000-XR             248    (1)
SCBVECTOR_058                    00000000-XR             249    (1)
SCBVECTOR_05C                    00000000-XR             250    (1)
SCBVECTOR_060                    00000000-XR             251    (1)
```

```
SCBVECTOR_064                 00000000-XR                  252    (1)
SCBVECTOR_068                 00000000-XR                  253    (1)
SCBVECTOR_06C                 00000000-XR                  254    (1)
SCBVECTOR_070                 00000000-XR                  255    (1)
SCBVECTOR_074                 00000000-XR                  256    (1)
SCBVECTOR_078                 00000000-XR                  257    (1)
SCBVECTOR_07C                 00000000-XR                  258    (1)
SCBVECTOR_080                 00000000-XR                  259    (1)
SCBVECTOR_0C4                 00000000-XR                  276    (1)
SCBVECTOR_0C8                 00000000-XR                  277    (1)
SCBVECTOR_0CC                 00000000-XR                  278    (1)
SCBVECTOR_0D0                 00000000-XR                  279    (1)
SCBVECTOR_0D4                 00000000-XR                  280    (1)
SCBVECTOR_0D8                 00000000-XR                  281    (1)
SCBVECTOR_0DC                 00000000-XR                  282    (1)
SCBVECTOR_0E0                 00000000-XR                  283    (1)
SCBVECTOR_0E4                 00000000-XR                  284    (1)
SCBVECTOR_0E8                 00000000-XR                  285    (1)
SCBVECTOR_0EC                 00000000-XR                  286    (1)
SCBVECTOR_0F0                 00000000-XR                  287    (1)
SCBVECTOR_0F4                 00000000-XR                  288    (1)
SCBVECTOR_0F8                 00000000-XR                  289    (1)
SCBVECTOR_0FC                 00000000-XR                  290    (1)
SCB_ACCVIO                    00000020-R   235    (1)
SCB_ARITH                     00000034-R   240    (1)
SCB_BASE                      00000000-XR                  339    (1)      373    (1)      434    (1)      513    (1)
                                                        #-588    (1)    #-635    (1)
SCB_BREAK                     0000002C-R   238    (1)
SCB_CHME                      00000044-R   244    (1)
SCB_CHMK                      00000040-R   243    (1)
SCB_CHMS                      00000048-R   245    (1)
SCB_CHMU                      0000004C-R   246    (1)
SCB_COMPAT                    00000030-R   239    (1)
SCB_IMAGE                     00000000-R   226    (1)      209    (1)      340    (1)    #-586    (1)
SCB_KRNLSTK                   00000008-R   229    (1)
SCB_MCHK                      00000004-R   228    (1)
SCB_OPCCUS                    00000014-R   232    (1)
SCB_OPCDEC                    00000010-R   231    (1)
SCB_POWER                     0000000C-R   230    (1)
SCB_RADRMOD                   0000001C-R   234    (1)
SCB_ROPRAND                   00000018-R   233    (1)
SCB_SFTLVL1                   00000084-R   260    (1)
SCB_SFTLVL10                  000000A8-R   269    (1)
SCB_SFTLVL11                  000000AC-R   270    (1)
SCB_SFTLVL12                  000000B0-R   271    (1)
SCB_SFTLVL13                  000000B4-R   272    (1)
SCB_SFTLVL14                  000000B8-R   273    (1)
SCB_SFTLVL15                  000000BC-R   274    (1)
SCB_SFTLVL2                   00000088-R   261    (1)
SCB_SFTLVL3                   0000008C-R   262    (1)
SCB_SFTLVL4                   00000090-R   263    (1)
SCB_SFTLVL5                   00000094-R   264    (1)
SCB_SFTLVL6                   00000098-R   265    (1)
SCB_SFTLVL7                   0000009C-R   266    (1)
SCB_SFTLVL8                   000000A0-R   267    (1)
SCB_SFTLVL9                   000000A4-R   268    (1)
SCB_TBIT                      00000028-R   237    (1)
```

```
SCB_TIMER                       000000C0-R   275    (1)
SCB_TRANSL                      00000024-R   236    (1)
SCB_UNKINT                      00000000-XR                  345    (1)    #-354    (1)    #-385    (1)      583    (1)
                                                           #-635    (1)
SCH$ASTDEL                      00000000-XR                  688    (1)
SETVEC$_CODE                    =0000000C    178    (1)
SETVEC$_NARGS                   =00000003    178    (1)
SETVEC$_SRVADR                  =00000008    178    (1)
SETVEC$_VECTOR                  =00000004    178    (1)
SIZ...                          =00000001    180    (1)     180    (1)
SOFT$INT                        000002B4-R   705    (1)     260    (1)      261    (1)      262    (1)      263    (1)
                                                            264    (1)      265    (1)      266    (1)      267    (1)
                                                            268    (1)      269    (1)      270    (1)      271    (1)
                                                            272    (1)      273    (1)      274    (1)
SOFT$INT_A                      00000274-R   685    (1)    #-712    (1)    #-723    (1)
SS$_NORMAL                      00000000-XR                 #-325    (1)    #-668    (1)
UNKNOWN_INT                     00000000-R   384    (1)     346    (1)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	27	00:00:00.03	00:00:00.19
Command processing	913	00:00:00.28	00:00:00.80
Pass 1	597	00:00:01.63	00:00:03.29
Symbol table sort	0	00:00:00.13	00:00:00.13
Pass 2	30	00:00:00.47	00:00:01.16
Symbol table output	2	00:00:00.04	00:00:00.13
Psect synopsis output	2	00:00:00.01	00:00:00.15
Cross-reference output	5	00:00:00.17	00:00:00.29
Assembler run totals	1578	00:00:02.76	00:00:06.14

The working set limit was 2400 pages.
84505 bytes (166 pages) of virtual memory were used to buffer the intermediate code.
There were 30 pages of symbol table space allocated to hold 454 non-local and 33 local symbols.
733 source lines were read in Pass 1, producing 55 object records in Pass 2.
22 pages of virtual memory were used to define 19 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	4
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	5
SYS$COMMON:[SYSLIB]LIB.MLB;2	2
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	8
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	19

```
455 GETS were required to define 19 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 150 Libraries and External Symbols ; [12]
(1) 160 External Symbol Declarations
(1) 185 Macros and Equated Symbols
(1) 206 Data Psect Declarations
(1) 243 Work Psect Declarations
(1) 267 Absolute Psect Declarations
(1) 281 SCRIPT$INIT - Initialize script
(1) 323 SCRIPT$OPEN - Initialize a script file
(1) 480 SCRIPT$FLUSH, STOP, CONT - Terminate all scripts open
(1) 554 SCRIPT$FINISH - Terminate script input file
(1) 609 DS_GETLINE - Get program data input line
(1) 1058 COPY_IT - Copy and translate
(1) 1115 ADVANCE - Advance to next record in buffer

```
0000    ; DEC/CMS REPLACEMENT HISTORY, Element SCRIPT.MAR
0000    ;  10    7-MAR-1988 09:40:05 FORTUNA "Add to code to load CLI$T_BUFFER with the file
0000    ; *9    15-APR-1987 16:06:31 FORTUNA "REMOVE EXTRA CALL TO CLK$RE_INIT FROM FLUSH RO
0000    ; *8    14-APR-1987 16:00:38 MARTIN "PSTAR UPDATE"
0000    ; *7    15-OCT-1986 11:08:37 BERGAZZI "FIX DS$GT_PROMPT BUG FOR VSDP"
0000    ; *6    23-JUN-1986 14:22:18 MARTIN "SAME"
0000    ; *5    23-JUN-1986 14:19:07 MARTIN "DONE"
0000    ; *4    23-JUN-1986 10:59:50 MARTIN "DONE"
0000    ; *3    23-JUN-1986 10:56:59 MARTIN "DONE"
0000    ; *2    23-JUN-1986 09:45:00 MARTIN "DONE"
0000    ; *1     6-FEB-1986 15:22:27 DS ""
0000    ; DEC/CMS REPLACEMENT HISTORY, Element SCRIPT.MAR
0000            .Title  SCRIPT  *** SCRIPT Read from command stream
0000            .Ident  /10-27/                                                    ;G:9
0000            .NoShow Conditionals    ; For all the conditionals in the RMS macros
0000            .DSABL  GBL
0000
0000    ;
0000    ; Copyright (c) 1977, 1981, 1985, 1986, 1987                                ;G:8
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0000
0000    ;++
0000    ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR.
0000    ;
0000    ; ABSTRACT:
0000    ;
0000    ; ENVIRONMENT:
0000    ;
0000    ; AUTHOR:       KEN CHAPMAN     10-NOV-77       VERSION 01.
0000    ;
0000    ; MODIFICATIONS:
0000    ;               Roger Riggs     20-Jun-78       Version 02.
0000    ;               True implementation of scripting in USER mode.
0000    ;       01      Added code to implement "skipping... " for mismatched scripts
0000    ;               Roger Riggs     12-Jun-1979
0000    ;       02      changed W^ to "" on DSA$GL_FLAGS references
0000    ;               Roger Riggs, 17-Mar-1980, Version 5.3
0000    ;       03      DS$LOAD returns changed, reflected by getting SS$_NORMAL
0000    ;               Even if file was truncated.
0000    ;               Dave Butenhof   28-apr-80
0000    ;       04      Use $GET and $PUT for input/output if DS run from command file
0000    ;               Roger Riggs, 3-Sep-1980, Version 6.0
```

```
                        0000     58 ;       05      Modified SCRIPT$OPEN to use RMS instead of load
                        0000     59 ;
                        0000     60 ;               Dave Butenhof, 10-sep-1980, Version 6.0
                        0000     61 ;       06      Fix user mode RMS GETLINE code to perform case translation
```

```
0000     63 ;        07      - Jack Stansbury, 22-Oct-1981, Version 6.5
0000     64 ;                Fixed truncation errors. Also added .LIBRARY statements for
0000     65 ;                $DS and $DIAG.
0000     66 ;
0000     67 ;        08      - Dave Butenhof, 12-Nov-1981, version 6.5
0000     68 ;                Implement SET VERIFY/CLEAR VERIFY function.  When cleared,
0000     69 ;                this flag will cause command script input not to be echoed.
0000     70 ;                This is basically for the System Functional Text (EVXBB).
0000     71 ;                                                                    ;G:9
0000     72 ;        09      - Dave Butenhof, 17-Nov-1981, version 6.5
0000     73 ;                Implement type code bytes for all prompts.  The type code
0000     74 ;                will not be used in comparison of script file prompts,
0000     75 ;                but will be typed out to console or log file, if BINARY
0000     76 ;                flag is set.
0000     77 ;
0000     78 ;        10      -Jack Stansbury, 18-Dec-1981, Version 6.6
0000     79 ;                Added a little code in SCRIPT$FLUSH that will clear out the
0000     80 ;                QA bit in the DSA flags. This is to insure that QA gets turned
0000     81 ;                off when a Control-C interrupts a diagnostic in a script file,
0000     82 ;                and a non-continuable command (i.e., one that causes the script
0000     83 ;                file to be flushed) is issued. Before, if a START command was
0000     84 ;                issued, and a Control-C was typed, and a subsequent START
0000     85 ;                command was typed, the second one could be screwed up.
0000     86 ;
0000     87 ;        11      -Jack Stansbury, 26-Feb-1982, Version 6.6
0000     88 ;                Added comments to the DS_GETLINE routine to aid in
0000     89 ;                deciphering it.
0000     90 ;
0000     91 ;        12      - Jack Stansbury, 18-Mar-1982, Version 6.?
0000     92 ;                Took out any reference to the TypMsg routine. This is so
0000     93 ;                that type-coding can be added. Also added some new DS macros
0000     94 ;                that should make this more understandable.
0000     95 ;
0000     96 ;        13      Marion Baggett, 31-Mar-1982, Version 6.7
0000     97 ;                Added SYS$LIBRARY:LIB/
0000     98 ;
0000     99 ;        14      Marion Baggett, 8-Apr-1982, Version 6.7
0000    100 ;                Added type coding.
0000    101 ;
0000    102 ;        15      Jack Stansbury, 12-Apr-1982, Version 6.7
0000    103 ;                Added support for the Customer Runnable Diagnostics package.
0000    104 ;
0000    105 ;        16      John Ciukaj,    4-Apr-1983,     version 6.11
0000    106 ;                - Redefined reference to CRD bits in DSA Flags to
0000    107 ;                  distinguish between online and offline
0000    108 ;
0000    109 ;        17      Peter Green,    20-Jul-1983,    version 6.12
0000    110 ;                Added code to support scripting where prompts are
0000    111 ;                printed to the terminal and an answer is given by
0000    112 ;                the user. This is only done when the script prompt
0000    113 ;                ends with "\\".
0000    114 ;
0000    115 ;        18      M. Baggett      25-Jan-1984     Version 6.14
0000    116 ;                Changed dynamic allocation of XAB, FAB, RAB to static form
0000    117 ;                so script files will work.
0000    118 ;
0000    119 ;        19      M. Baggett      8-Feb_1985      Version 8.1
```

```
0000   120 ;               Changed COPY_IT to not change apha characters to uppers
0000   121 ;               case if ULTRIX.
0000   122 ;
0000   123 ;       20      Ted Salem       March 22, 1985  Version 8.2
0000   124 ;               Added interlock code to DS_GETLINE.
0000   125 ;
0000   126 ;       21      M. Baggett      20-June-1985    Version 8.3
0000   127 ;               Change some ULTRIX names.
0000   128 ;
0000   129 ;       22      Amy Iorio       10-July-1985    Version 8.3
0000   130 ;               Put ASK> prompt in for $DSASKxxx macros.
0000   131 ;
0000   132 ;       23      Domenic Andella 25-Sept-1985    Version 9.0
0000   133 ;               Fixed two truncation errors, BSBW's to JSB's
0000   134 ;                                                                       ;G:5
0000   135 ;       24      I. Martin       23-June-1986    Version 10.2            ;G:5
0000   136 ;               Changed literal to symbolic string.                     ;G:3
0000   137 ;                                                                       ;G:7
0000   138 ;       25      Bob Bergazzi    9-Oct-1986      Version 10.4            ;G:7
0000   139 ;               Fixed previous edit.                                    ;G:7
0000   140 ;                                                                       ;G:8
0000   141 ;       26      Ingrid Martin   1-Apr-1987      Version 10.8            ;G:9
0000   142 ;               RRR updates (do like nautilus).                         ;G:8
0000   143 ;                                                                       ;G:9
0000   144 ;       27      Bob Bergazzi    15-apr-1987     Version 10.8            ;G:9
0000   145 ;               Removed extra JSB to CLK$RE_INIT because it is already called ;G:9
0000   146 ;               once in the preceding $DS_CLRVEC on the timer vector.  No     ;G:9
0000   147 ;               symptom observed.                                       ;G:9
0000   148 ;--
```

```
0000   150          .SBTTL  Libraries and External Symbols  ;                    [12]
0000   151 ;
0000   152 ; INCLUDE FILES:
0000   153 ;
0000   154          .LIBRARY        /SYS$LIBRARY:LIB/       ;                    [13]
0000   155          .Library        /$CRD/                  ;                    [15]
0000   156          .LIBRARY        /$DS/                   ;                    [07]
0000   157          .LIBRARY        /$DIAG/                 ;                    [07]
0000   158
```

```
0000   160          .SBTTL  External Symbol Declarations
0000   161
0000   162 ;
0000   163 ; EXTERNAL SYMBOLS
0000   164 ;
0000   165          .EXTRN  DS$GT_PROMPT                                                    ;G:3
0000   166          .EXTRN  DS$CLI,DSX$PRINT , DS_ERRSUP, DS$LOAD          ;                [12]
0000   167          .EXTRN  DSR$COMPLETION, DS$ABORT,CLK$RE_INIT,DS$CLRVEC
0000   168          .EXTRN  SCAN$COMPARE, SCAN$SPACES
0000   169          .EXTRN  DS$GW_TTOUT, DS$GW_TTIN
0000   170          .EXTRN  DS$GL_CLIBASE
0000   171          .EXTRN  SYS$FAO, SYS$QIOW, SYS$QIO, SYS$WAKE, SYS$HIBER, SYS$READEF
0000   172          .EXTRN  SS$_NORMAL, SS$_ENDOFFILE, SS$_CONTROLC, SS$_ILLIOFUNC
0000   173          .EXTRN  IO$_READPROMPT ,IO$_WRITEVBLK, IO$_READVBLK
0000   174          .EXTRN  DS$GL_FLAGS
0000   175          .EXTRN  EXE$ALONONPAGED, EXE$DEANONPAGED
0000   176          .EXTRN  DS$K_BUFSIZ, DS$GT_BUFFER
0000   177          .EXTRN  QIO$CLEANUP, INIT_CONTEXT, BEGIN
0000   178          .EXTRN  DS$RAB_INPUT, DS$RAB_OUTPUT
0000   179          .EXTRN  DSX$TYPE_OUT                ;                                   [09]
0000   180          .EXTRN  DEBUG_THE_SUCKER            ;                                   [99]
0000   181          .Extrn  DS$GA_CRD_DS_Interface  ; The address of the routine to ...     [15]
0000   182          .EXTRN  ULTRIX_V_MODE,ULTRIX_FLAGS      ; Ultrix flag
0000   183          .EXTRN  PRNT_PRMT
```

```
                                0000   185          .SBTTL Macros and Equated Symbols
                                0000   186 ;
                                0000   187 ; EQUATED SYMBOLS:
                                0000   188 ;
                                0000   189
                    00000400    0000   190          SCRIPT$MINCORE == 2*512          ; NEEDS AT LEAST TWO PAGES FOR SCRIPT   [12]
                    00000006    0000   191          pr$_sid_typ8nn  = 6              ; nautilus [26]                          ;G:8
                    00000011    0000   192          pr$_sid_typ8rr  = 17             ; RRR [26]                               ;G:8
                                0000   193          $DS_SCBDEF
                                0000   194          $DS_DSADEF
                                0000   195          $DS_DSDEF
                                0000   196          DSFDEF
                                0000   197          CLIDEF
                                0000   198          $FABDEF
                                0000                .SAVE   LOCAL_BLOCK
                                0000                .PSECT  $ABS$,ABS
                    00000000    FE70                .=0
                                0000                .RESTORE
                                0000   199          $RMSDEF
                                0000                .SAVE   LOCAL_BLOCK
                                0000                .PSECT  $ABS$,ABS
                    00000000    FE70                .=0
                                0000                .RESTORE
                                0000   200          $RABDEF
                                0000                .SAVE   LOCAL_BLOCK
                                0000                .PSECT  $ABS$,ABS
                    00000000    FE70                .=0
                                0000                .RESTORE
                                0000   201          $XABDEF
                                0000                .SAVE   LOCAL_BLOCK
                                0000                .PSECT  $ABS$,ABS
                    00000000    FE70                .=0
                                0000                .RESTORE
                                0000   202          $XABFHCDEF
                                0000                .SAVE   LOCAL_BLOCK
                                0000                .PSECT  $ABS$,ABS
                    00000000    FE70                .=0
                                0000                .RESTORE
                                0000   203          $DS_TypeDef                      ; Define DS error codes                 [09]
                                0000   204          $CRD_Literals                    ; define some CRD equated symbols       [15]
```

```
                                  0000   206          .SBTTL Data Psect Declarations
                              00000000   207          .Psect  Data, Shr, Noexe, Nowrt, Byte
                                  0000   208 ;
                                  0000   209 ; STORAGE:
                                  0000   210 ;
                                  0000   211          MODNAM  SCRIPT
          54 50 49 52 43 53 00'   0000       $MODULE:        .ASCIC  \SCRIPT\
                              06  0000
                                  0007   212
                                  0007   213 FMT_PRMT:                                  ; Prompt for $DSASKxxx macros [22]
          20 3E 4B 53 41 20 00'   0007   214          .ASCIC  " ASK> "
                              06  0007
                                  000E   215
                                  000E   216 T_DEF_COM:
                    4D 4F 43 2E   000E   217          .ASCII  ".COM"
                                  0012   218
                                  0012   219 T_NULL:
                              00' 0012   220          .ASCIC  ""
                              00  0012
                                  0013   221
                                  0013   222 T_EOF:
       3E 46 4F 45 3C 20 40 00'   0013   223          .ASCIC  "a <EOF>"
                              07  0013
                                  001B   224
                                  001B   225 T_PROMPT:
    2F 21 44 41 21 43 41 21 00'   001B   226          .ASCIC  "!AC!AD!/"
                              08  001B
                                  0024   227
                                  0024   228 T_PROMPT2:
          43 41 21 43 41 21 00'   0024   229          .ASCIC  "!AC!AC"
                              06  0024
                                  002B   230
                                  002B   231 T_PROMPT3:
             2F 21 53 41 21 00'   002B   232          .ASCIC  "!AS!/"
                              05  002B
                                  0031   233
                                  0031   234 T_SKIP:
2E 2E 20 67 6E 69 70 70 69 6B 53 00'   0031   235          .ASCIC  'Skipping ..."!AD"!/'
       2F 21 22 44 41 21 22 2E   003D
                              13  0031
                                  0045   236
                                  0045   237 T_ECHO:
    2F 21 44 41 21 53 41 21 00'   0045   238          .ASCIC  '!AS!AD!/'      ; Format line echo to log file
                              08  0045
                                  004E   239
                                  004E   240 T_PNF:
43 41 21 22 20 74 70 6D 6F 72 50 00'   004E   241          .ASCIC  'Prompt "!AC" not found in script!/'
20 64 6E 75 6F 66 20 74 6F 6E 20 22   005A
   2F 21 74 70 69 72 63 73 20 6E 69   0066
                              22  004E
```

```
                     0071   243          .SBTTL  Work Psect Declarations
                 00000000   244          .PSECT  Work, Noshr, Noexe, Wrt, Long
                     0000   245 SCRIPT_XAB:     $XABFHC          ; XAB                                [18]
                       1D   0000                .BYTE XAB$C_FHC
                       2C   0001                .BYTE XAB$C_FHCLEN
                 0000002C   0002                .BLKB XAB$C_FHCLEN-2
                 00000004   002C            .=$$.TAB+XAB$L_NXT
                 00000000'  0004                .ADDRESS        <0>
                 0000002C   0008            .=$$.TABEND
                     002C   246 SCRIPT_FAB:     $FAB    XAB=SCRIPT_XAB  ; FAB                        [18]
                       03   002C                .BYTE FAB$C_BID
                       50   002D                .BYTE FAB$C_BLN
                 0000007C   002E                .BLKB FAB$C_BLN-2
                 00000030   007C                .=$$.TAB+FAB$L_FOP
                 00000000'  0030                .ADDRESS        $$.TMP
                 0000003C   0034                .=$$.TAB+FAB$L_ALQ
                 00000000'  003C                .ADDRESS        0
                     0000   0040                .WORD   0
                       00   0042                .BYTE   $$.TMP
                       00   0043                .BYTE   $$.TMP
                 00000000'  0044                .ADDRESS        0
                       00   0048                .BYTE   0
                       00   0049                .BYTE   FAB$C_SEQ
                       00   004A                .BYTE   $$.TMP
                       02   004B                .BYTE   FAB$C_VAR
                       00   004C                .BYTE   $$.TMP
                       00   004D                .BYTE   0
                     0000   004E                .WORD
                 00000000'  0050                .ADDRESS        SCRIPT_XAB
                 00000000'  0054                .ADDRESS        0
                 00000000'  0058                .ADDRESS        0
                 00000000'  005C                .ADDRESS        0
                       00   0060                .BYTE   0
                       00   0061                .BYTE   0
                     0000   0062                .WORD   0
                 00000000'  0064                .ADDRESS        0
                     0000   0068                .WORD   0
                       00   006A                .BYTE   0
                       00   006B                .BYTE   0
                 00000074   006C                .=$$.TAB+FAB$W_GBC
                     0000   0074                .WORD   0
                       00   0076                .BYTE   <<0@FAB$V_LNM_MODE> + <0@FAB$V_CHAN_MODE> + -
                 0000007C   0077            .=$$.TABEND
                     007C   247 SCRIPT_RAB:     $RAB    FAB=SCRIPT_FAB  ;                            [18]
                       01   007C                .BYTE RAB$C_BID
                       44   007D                .BYTE RAB$C_BLN
                 000000C0   007E                .BLKB RAB$C_BLN-2
                 00000080   00C0                .=$$.TAB+RAB$L_ROP
                 00000000'  0080                .ADDRESS        $$.TMP
                 00000094   0084                .=$$.TAB+RAB$L_CTX
                 00000000'  0094                .ADDRESS        0
                 0000009A   0098                .=$$.TAB+RAB$B_RAC
                       00   009A                .BYTE   RAB$C_SEQ
                       00   009B                .BYTE   0
                     0000   009C                .WORD   0
                     0000   009E                .WORD   0
                 00000000'  00A0                .ADDRESS        0
```

```
                    00000000' 00A4                  .ADDRESS        0
                    00000000' 00A8                  .ADDRESS        0
                    00000000' 00AC                  .ADDRESS        0
                          00  00B0                  .BYTE   0
                          00  00B1                  .BYTE   0
                          00  00B2                  .BYTE   0
                          00  00B3                  .BYTE   0
                    00000000' 00B4                  .ADDRESS        0
                    0000002C' 00B8                  .ADDRESS        SCRIPT_FAB
                    00000000' 00BC                  .ADDRESS        0
                              00C0    248
                              00C0    249 PRMT_ADR:
                    00000000  00C0    250           .LONG   0               ; HOLDS SOURCE ADDRESS FOR USER PROMPT          [22]
                              00C4    251 BLD_PRMT:
                    00000000  00C4    252           .LONG   0               ; USED TO BUILD ON TO USER PROMPT 'ASK>'        [22]
                              00C8    253 PRMT_LEN:
                    00000000  00C8    254           .LONG   0               ; HOLDS COUNT OF ASCIC STRING                   [22]
                              00CC    255 L_LINK:
                    000000D0  00CC    256           .BLKL   1               ; ADDRESS (IF ANY) OF CURRENT SCRIPT DESCRIPTOR
                              00D0    257
                              00D0    258 L_FLAGS:
                    000000D4  00D0    259           .BLKL   1               ; FLAG BITS
                              00D4    260
                    00000001  00D4    261           V_ECHOED=1              ; SET IF LINE HAS BEEN READ BUT NOT ECHOED
                              00D4    262
                              00D4    263 DS$GB_QIOACT::
                          00  00D4    264           .BYTE   0               ; Low Bit set if input QIO active
                              00D5    265                                   ; Used by PRINTx in user mode to cancel input
```

```
                        00D5   267          .SBTTL Absolute Psect Declarations
                        00D5   268          .SAVE
                        00D5   269          .PSECT  $ABS$, ABS
                00000000 FE70  270 .=0
                00000000 0000  271 SC$L_LINK:       .BLKL   1       ; ADDRESS (IF ANY) OF NEXT STACKED SCRIPT
                00000004 0000  272                  .BLKL   1       ; UNUSED
                00000008 0004  273 SC$W_SIZE:       .BLKW   1       ; SIZE OF ALLOCATED SPACE
                0000000A 0008  274 SC$W_LEN:        .BLKW   1       ; Length of current record SC$W_CURR
                0000000C 000A  275 SC$W_CURR:       .BLKW   1       ; OFFSET TO CURRENT RECORD IN BUFFER
                0000000E 000C  276 SC$W_END:        .BLKW   1       ; NUMBER OF BYTES IN THIS BUFFER
                00000010 000E  277 SC$A_BUF:        .BLKB   0       ; OFFSET TO START OF TEXT
                00000010 0010  278 SC$C_BLN=.
                      000000D5 279          .RESTORE
```

```
                     00D5   281          .SBTTL  SCRIPT$INIT -   Initialize script
                 00000000   282          .Psect  Code, Shr, Exe, Nowrt, Byte
                     0000   283 ;**
                     0000   284 ; FUNCTIONAL DESCRIPTION:
                     0000   285 ;
                     0000   286 ;       This routine is called from KERNEL during initialization to
                     0000   287 ;       initialize the SCRIPT functionality.
                     0000   288 ;
                     0000   289 ; CALLING SEQUENCE:
                     0000   290 ;
                     0000   291 ;       BSBW    SCRIPT$INIT
                     0000   292 ;
                     0000   293 ; INPUT PARAMETERS:
                     0000   294 ;
                     0000   295 ;       NONE
                     0000   296 ;
                     0000   297 ; IMPLICIT INPUTS:
                     0000   298 ;
                     0000   299 ;       NONE
                     0000   300 ;
                     0000   301 ; OUTPUT PARAMETERS:
                     0000   302 ;
                     0000   303 ;       NONE
                     0000   304 ;
                     0000   305 ; IMPLICIT OUTPUTS:
                     0000   306 ;
                     0000   307 ;       NONE
                     0000   308 ;
                     0000   309 ; COMPLETION CODES:
                     0000   310 ;
                     0000   311 ;       NONE
                     0000   312 ;
                     0000   313 ; SIDE EFFECTS:
                     0000   314 ;
                     0000   315 ;       NONE
                     0000   316 ;--
```

```
                        0000   318 SCRIPT$INIT::
000000CC'EF    D4       0000   319         CLRL    L_LINK                  ; Clear link to first script
          0190    30     0006   320         BSBW    SCRIPT$STOP             ; Indicate no scripts active          [11]
                  05     0009   321         RSB                             ; Return
```

```
                     000A   323          .SBTTL  SCRIPT$OPEN -   Initialize a script file
                0000000A    324          .Psect  Code, Shr, Exe, Nowrt, Byte
                     000A   325 ;++
                     000A   326 ; FUNCTIONAL DESCRIPTION:
                     000A   327 ;
                     000A   328 ;       This routine is called from CLI to process a afilespec command.
                     000A   329 ;       It allocates space for the necessary internal data structures,
                     000A   330 ;       Open the file specified and sets a flag that input should be
                     000A   331 ;       taken from the script file instead of the console.
                     000A   332 ;
                     000A   333 ; CALLING SEQUENCE:
                     000A   334 ;
                     000A   335 ;       BSBW    SCRIPT$OPEN
                     000A   336 ;
                     000A   337 ; INPUT PARAMETERS:
                     000A   338 ;
                     000A   339 ;       NONE
                     000A   340 ;
                     000A   341 ; IMPLICIT INPUTS:
                     000A   342 ;
                     000A   343 ;       CLI$GL_BASE + CLI$Q_FILE        Length and Address of filespec
                     000A   344 ;
                     000A   345 ; OUTPUT PARAMETERS:
                     000A   346 ;
                     000A   347 ;       NONE
                     000A   348 ;
                     000A   349 ; IMPLICIT OUTPUTS:
                     000A   350 ;
                     000A   351 ;       DS$V_SCRIPT                     May be set in DS$GL_FLAGS
                     000A   352 ;
                     000A   353 ; COMPLETION CODES:
                     000A   354 ;
                     000A   355 ;       RMS Standard completion codes
                     000A   356 ;
                     000A   357 ; SIDE EFFECTS:
                     000A   358 ;
                     000A   359 ;       NONE
                     000A   360 ;--
```

```
                                000A   362 SCRIPT$OPEN::
                    014A   30   000A   363         BSBW    SCRIPT$FLUSH            ; Flush scripts if console command      [11]
          00000000'EF      16   000D   364         JSB     INIT_CONTEXT            ; Refresh Stacks, AST,PCB,PHD etc       [07]
                                0013   365         Br_If_User      10$             ; If user mode, branch                  [12]
     0000FE00'EF    1C    E0   0013                BBS     #DSA$V_User, -                  ; If bit set, branch            [28]
                    07          001A                          L^DSA$GL_Flags, 10$           ;                               [28]
     00000000'EF    6C    FA   001B   366         CALLG   (AP),QIO$CLEANUP        ; Flush current QIO database
                                0022   367
                                0022   368 ;
                                0022   369 ; Set pointer to XAB
                                0022   370 ;
                                0022   371
     57   00000000'EF      9E   0022   372 10$:    MOVAB   SCRIPT_XAB,R7           ; SAVE ADDRESS OF XAB                   [18]
                                0029   373 ;
                                0029   374 ; Fill in FAB
                                0029   375 ;
     59   0000002C'EF      9E   0029   376         MOVAB   SCRIPT_FAB,R9           ; SAVE ADDRESS OF FAB                   [18]
     52   00000000'EF      9E   0030   377         MOVAB   DS$GL_CLIBASE, R2       ; Address of CLI database               [11]
        34 A9    08 A2     90   0037   378         MOVB    CLI$Q_FILE (R2), -      ; File name size                        [11]
                                003C   379                   FAB$B_FNS (R9)        ;                                       [11]
        2C A9    0C A2     D0   003C   380         MOVL    CLI$Q_FILE+4 (R2), -    ; File name address                     [11]
                                0041   381                   FAB$L_FNA (R9)        ;                                       [11]
           35 A9    04     90   0041   382         MOVB    #4, FAB$B_DNS (R9)      ; Default name size                     [11]
  30 A9   0000000E'EF      9E   0045   383         MOVAB   L^T_DEF_COM, -          ; Default name address                  [07]
                                004D   384                   FAB$L_DNA (R9)        ;                                       [11]
```

```
                                  004D   ;+
                                  004D   ; Set pointer to RAB
                                  004D   ;-
58   0000007C'EF   9E             004D           MOVAB   SCRIPT_RAB,R8          ; SAVE ADDRESS OF RAB                [18]
                                  0054   ;+
                                  0054   ; $OPEN the file
                                  0054   ;-
                                  0054
                                  0054           $OPEN   FAB = (R9)
                 69   DF          0054           PUSHAL  (R9)
00000000'GF      01   FB          0056           CALLS   #$$.TMP1,G^SYS$OPEN
     00000000'EF     16          005D           JSB     DSR$COMPLETION         ; Print errors if any
            03 50    E8          0063           BLBS    R0,70$                 ; Branch to continue
             00E8    31          0066           BRW     SCRIPT$OPEN_X          ; Exit w/error
                                  0069
                                  0069   ;+
                                  0069   ; Allocate buffer for script
                                  0069   ;-
                                  0069
 50   10 A7     09   78          0069   70$:    ASHL    #9,XAB$L_EBK(R7),R0    ; Get length of file
      51   14 A7    3C          006E           MOVZWL  XAB$W_FFB(R7),R1       ; Get first free byte
   51   10 A041    9E          0072           MOVAB   SC$C_BLN(R0)[R1],R1    ; Length required for script + a little
            FF86'   30          0077           BSBW    EXE$ALONONPAGED        ; Allocate space for buffer
            03 50    E8          007A           BLBS    R0, 71$                ; Branch around if no error          [12]
             0081    31          007D           BRW     160$                   ; Branch if error, Close and exit    [12]
                                  0080
                 62   7C          0080   71$:    CLRQ    (R2)                   ; Clear first part of SC$...         [12]
            08 A2    7C          0082           CLRQ    8(R2)                  ; Clear second part of SC$...
         5B     52   D0          0085           MOVL    R2,R11                 ; base script control area
      08 AB     51   B0          0088           MOVW    R1,SC$W_SIZE(R11)      ; Set the length allocated
6B   000000CC'EF    D0          008C           MOVL    L^L_LINK,SC$L_LINK(R11) ; Make current script the previous  [07]
000000CC'EF      6B   DE          0093           MOVAL   (R11),L^L_LINK         ; Make this the current script       [07]
                                  009A           Clear_StrFlg                   ; Clear started flag                 [12]
00000000'EF      02   E4          009A           BBSC    #DS$V_StrFlg, -        ; Branch if STRFLG bit is set to     [29]
                 00               00A1                     L^DS$GL_Flags, 30000$ ; ...                                [29]
                                  00A2   30000$:                                ; ... here. Clear bit regardless.    [29]
                                  00A2           Clear_CtrlC                    ; Clear ^C flag                      [12]
00000000'EF      00   E4          00A2           BBSC    #DS$V_CtrlC, -         ; Branch if CTRLC bit is set to      [29]
                 00               00A9                     L^DS$GL_Flags, 30001$ ; ...                                [29]
                                  00AA   30001$:                                ; ... here. Clear bit regardless.    [29]
      53   10 AB    9E          00AA           MOVAB   SC$A_BUF(R11),R3       ; Address of free space in buffer
   54   51   10    C3          00AE           SUBL3   #SC$A_BUF,R1,R4        ; Length left in buffer
```

```
                                00B2   421 ;+
                                00B2   422 ; Connect to record stream
                                00B2   423 ;-
                                00B2   424
                                00B2   425          $CONNECT RAB = (R8)
                          68    DF   00B2                PUSHAL  (R8)
00000000'GF               01    FB   00B4                CALLS   #$$.TMP1,G^SYS$CONNECT
                       43 50    E9   00BB   426          BLBC    R0,160$                 ; Branch if error, Close and exit
                                00BE   427
   24 A8                01 A3    9E   00BE   428 100$:   MOVAB   1(R3), RAB$L_UBF(R8)   ; Set address to put data
   20 A8                FF 8F    9B   00C3   429          MOVZBW  #255, RAB$W_USZ(R8)     ; Limit size to 255 characters
54    00000100           8F    D1   00C8   430          CMPL    #256, R4                ; Room for count byte and 255 characters?
                             05    15   00CF   431          BLEQ    110$                    ; Branch if there is
 20 A8                54    01    A3   00D1   432          SUBW3   #1, R4, RAB$W_USZ(R8)   ; Shorten transfer size
                                00D6   433
                                00D6   434 110$:   $GET    RAB = (R8)              ; $GET a record
                          68    DF   00D6                PUSHAL  (R8)
00000000'GF               01    FB   00D8                CALLS   #$$.TMP1,G^SYS$GET
                       13 50    E9   00DF   435          BLBC    R0, 130$                ; Branch if error, includes EOF, RTB
      50               22 A8    3C   00E2   436          MOVZWL  RAB$W_RSZ(R8), R0       ; Get actual record length
                63     50    90   00E6   437          MOVB    R0, (R3)                ; Set length of record
   53             01 A340    9E   00E9   438          MOVAB   1(R3)[R0], R3           ; Set new free
                54    50    C2   00EE   439          SUBL    R0, R4                  ; Decrement length remaining
                      54    D7   00F1   440          DECL    R4                      ; Less one for length
                      C9    11   00F3   441          BRB     100$                    ; Try again
```

```
                        00F5   443 ;+
                        00F5   444 ; Error, EOF, or Record too big on GET
                        00F5   445 ;-
                        00F5   446
            52   50  D0  00F5   447 130$:   MOVL    R0,R2                       ; Save return code
                        00F8   448          $DISCONNECT     RAB = (R8)
                    68  DF  00F8           PUSHAL  (R8)
      00000000'GF   01  FB  00FA           CALLS   #$$.TMP1,G^SYS$DISCONNECT
                        0101   449
                        0101   450 160$:   $CLOSE  FAB = (R9)
                    69  DF  0101           PUSHAL  (R9)
      00000000'GF   01  FB  0103           CALLS   #$$.TMP1,G^SYS$CLOSE
            50   52  D0  010A   451          MOVL    R2,R0                       ; Restore error code
      0001827A 8F   50  D1  010D   452          CMPL    R0, #RMS$_EOF               ; End of file?
                    0B  13  0114   453          BEQL    180$                        ; Branch if legit EOF
           00000000'EF  16  0116   454          JSB     DSR$COMPLETION              ; Report the error
                  0096  30  011C   455          BSBW    SCRIPT$FINISH               ; Error, flush the script
                        011F   456
                    30  11  011F   457 170$:   BRB     SCRIPT$OPEN_X               ; Exit
                        0121   458
                        0121   459 ;+
                        0121   460 ; EOF
                        0121   461 ;-
                        0121   462
            50   53  D0  0121   463 180$:   MOVL    R3, R0                      ; Free address in buffer
         51 50   5B  C3  0124   464          SUBL3   R11, R0, R1                 ; Length used
      0E AB 51   10  A3  0128   465          SUBW3   #SC$A_BUF, R1, SC$W_END(R11); Save length of data
            51 0F A1  9E  012D   466          MOVAB   15(R1), R1                  ; Round up to block boundry
      08 AB 51   0F  AB  0131   467          BICW3   #15, R1, SC$W_SIZE(R11)     ; Truncate to block boundry and save
            54   0F  AA  0136   468          BICW    #15, R4                     ; Length remaining to block boundry
                0E  13  0139   469          BEQL    190$                        ; None, finish
         50 0F A0  9E  013B   470          MOVAB   15(R0), R0                  ; Round up to block boundry
            50   0F  CA  013F   471          BICL    #15, R0                     ; Finish rounding
      08 A0 54   B0  0142   472          MOVW    R4, 8(R0)                   ; Set size of section to be released
               FEB7' 30  0146   473          BSBW    EXE$DEANONPAGED             ; Release the unused portion
                        0149   474
                        0149   475 190$:   Set_Script                          ; Set to script mode and exit          [12]
      00000000'EF   15  E2  0149           BBSS    #DS$V_Script, -             ; Branch if SCRIPT bit is set to       [29]
                    00      0150                     L^DS$GL_Flags, 30002$      ; ...                                  [29]
                        0151       30002$:                                     ; ... here. Set bit regardless.        [29]
                        0151   476
                        0151   477 SCRIPT$OPEN_X:
           00000000'EF  17  0151   478          JMP     BEGIN                       ; And force reentry of CLI
```

```
                     0157   480          .SBTTL  SCRIPT$FLUSH, STOP, CONT -      Terminate all scripts open
                00000157   481          .Psect  Code, Shr, Exe, Nowrt, Byte
                     0157   482 ;++
                     0157   483 ; FUNCTIONAL DESCRIPTION:
                     0157   484 ;
                     0157   485 ;       SCRIPT$FLUSH    Will SCRIPT$FINISH until L_LINK is zero.
                     0157   486 ;       SCRIPT$STOP     Clears DS$V_SCRIPT
                     0157   487 ;       SCRIPT$CONT     Sets DS$V_SCRIPT if L_LINK NEQ 0
                     0157   488 ;
                     0157   489 ; CALLING SEQUENCE:
                     0157   490 ;
                     0157   491 ;       BSBW    SCRIPT$FLUSH
                     0157   492 ;       BSBW    SCRIPT$STOP
                     0157   493 ;       BSBW    SCRIPT$CONT
                     0157   494 ;
                     0157   495 ; INPUT PARAMETERS:
                     0157   496 ;
                     0157   497 ;       NONE
                     0157   498 ;
                     0157   499 ; IMPLICIT INPUTS:
                     0157   500 ;
                     0157   501 ;       Current DS$GL_FLAGS and script OWN data
                     0157   502 ;
                     0157   503 ; OUTPUT PARAMETERS:
                     0157   504 ;
                     0157   505 ;       NONE
                     0157   506 ;
                     0157   507 ; IMPLICIT OUTPUTS:
                     0157   508 ;
                     0157   509 ;       NONE
                     0157   510 ;
                     0157   511 ; COMPLETION CODES:
                     0157   512 ;
                     0157   513 ;       SS$_NORMAL
                     0157   514 ;
                     0157   515 ; SIDE EFFECTS:
                     0157   516 ;
                     0157   517 ;       NONE
                     0157   518 ;--
```

```
                        0157   520 SCRIPT$FLUSH::
06   0000FE17'EF   91   0157   521          CMPB    DSA$GL_SID+3,#PR$_sid_typ8NN          ; if we are nautilus [26] ;G
                09   13 015E   522          BEQL    3$                                    ; then 3$                 ;G:8
11   0000FE17'EF   91   0160   523          CMPB    DSA$GL_SID+3,#PR$_sid_typ8RR          ; if we are not RRR [26] ;G:
                15   12 0167   524          BNEQ    5$                                    ; then 5$                 ;G:8
                        0169   525 3$:      BR_IF_USER      5$                            ; else if nautilus or     ;G:8
0000FE00'EF   1C   E0   0169                BBS     #DSA$V_User, -                ; If bit set, branch                [28]
                0D      0170                  L^DSA$GL_Flags, 5$                  ;                                   [28]
                        0171   526                                                        ; RRR, and user mode then 5$
                        0171   527          $DS_CLRVEC_S -                        ; clr interval timer vector
                        0171   528                  #SCB$L_TIMER
     000000C0 8F   DD   0171                        PUSHL   #SCB$L_TIMER
00000000'9F   01   FB   0177                        CALLS   #1, a#DS$CLRVEC
                        017E   529                                                ; Removed call to CLK$RE_INIT   [27]  ;G:9
                        017E   530 5$:
                        017E   531          Clear_QA                              ; Turn off the QA flag              [12]
0000FE00'EF   0F   E4   017E                BBSC    #DSA$V_QA, -                  ; Branch if QA bit is set to        [29]
                00      0185                  L^DSA$GL_Flags, 30003$              ; ...
                        0186      30003$:                                         ; ... here. Clear bit regardless.   [29]
                        0186   532
                        0186   533 10$:     Br_If_Script    20$                   ; Branch if script mode             [12]
00000000'EF   15   E0   0186                BBS     #DS$V_Script, -                   ; If bit set, branch          [28]
                0A      018D                  L^DS$GL_Flags, 20$                  ;                                   [28]
                25   10 018E   534          BSBB    SCRIPT$FINISH                 ; YES, FINISH TOP LEVEL             [07]
     000000CC'EF   D5   0190   535          TSTL    L^L_LINK                      ; ANY SCRIPTS ACTIVE?               [07]
                EE   12 0196   536          BNEQ    10$                           ; AND TRY AGAIN                     [10]
                        0198   537
                05      0198   538 20$:     RSB
                        0199   539
                        0199   540
                        0199   541 SCRIPT$STOP::
                        0199   542          Clear_Script                          ; Clear script flag                 [12]
00000000'EF   15   E4   0199                BBSC    #DS$V_Script, -               ; Branch if SCRIPT bit is set to    [29]
                00      01A0                  L^DS$GL_Flags, 30004$               ; ...                               [29]
                        01A1      30004$:                                         ; ... here. Clear bit regardless.   [29]
                05      01A1   543          RSB                                   ;                                   [12]
                        01A2   544
                        01A2   545
                        01A2   546 SCRIPT$CONT::
                F5   10 01A2   547          BSBB    SCRIPT$STOP                   ; Clear script flag
     000000CC'EF   D5   01A4   548          TSTL    L^L_LINK                      ; Any scripts present?              [07]
                08   13 01AA   549          BEQL    10$                           ; Branch if not
                        01AC   550          Set_Script                            ; Set script flag                   [12]
00000000'EF   15   E2   01AC                BBSS    #DS$V_Script, -               ; Branch if SCRIPT bit is set to    [29]
                00      01B3                  L^DS$GL_Flags, 30005$               ; ...                               [29]
                        01B4      30005$:                                         ; ... here. Set bit regardless.     [29]
                        01B4   551
                05      01B4   552 10$:     RSB
```

```
                     554          .SBTTL  SCRIPT$FINISH - Terminate script input file
                     555          .Psect  Code, Shr, Exe, Nowrt, Byte
                     556 ;++
                     557 ; FUNCTIONAL DESCRIPTION:
                     558 ;
                     559 ;       This routine will $CLOSE the current script file (if any) and return the
                     560 ;       space allocated. If this is the last script file, it will clear the
                     561 ;       DS$V_SCRIPT flag in DS$GL_FLAGS.
                     562 ;
                     563 ; CALLING SEQUENCE:
                     564 ;
                     565 ;       BSBW    SCRIPT$FINISH
                     566 ;
                     567 ; INPUT PARAMETERS:
                     568 ;
                     569 ;       NONE
                     570 ;
                     571 ; IMPLICIT INPUTS:
                     572 ;
                     573 ;       Current DS$GL_FLAGS and Script's OWN data.
                     574 ;
                     575 ; OUTPUT PARAMETERS:
                     576 ;
                     577 ;       NONE
                     578 ;
                     579 ; IMPLICIT OUTPUTS:
                     580 ;
                     581 ;       DS$GL_SCRIPT and OWN DATA
                     582 ;
                     583 ; COMPLETION CODES:
                     584 ;
                     585 ;       SS$_NORMAL
                     586 ;
                     587 ; SIDE EFFECTS:
                     588 ;
                     589 ;       NONE
                     590 ;--
```

```
                                01B5    592 SCRIPT$FINISH:
                          3C    BB  01B5    593         PUSHR   #^M<R2, R3, R4, R5>     ; Save registers
                                01B7    594
          50    000000CC'EF     D0  01B7    595 10$:    MOVL    L^L_LINK, R0            ; GET POINTER TO CURRENT SCRIPT         [07]
                          12    13  01BE    596         BEQL    30$                     ; NONE, EXIT RIGHT AWAY
          000000CC'EF     60    D0  01C0    597         MOVL    SC$L_LINK(R0),L^L_LINK  ; 'AKE NEXT CURRENT                     [07]
                    FE36'       30  01C7    598         BSBW    EXE$DEANONPAGED         ; DEALLOCATE IT
                                01CA    599
              000000CC'EF       D5  01CA    600 20$:    TSTL    L^L_LINK                ; ANY CURRENT SCRIPT?                   [07]
                          02    12  01D0    601         BNEQ    40$                     ; YES, JUST EXIT
                                01D2    602
                          C5    10  01D2    603 30$:    BSBB    SCRIPT$STOP             ; Clear script active flag              [11]
                                01D4    604
                    50    00'   D0  01D4    605 40$:    MOVL    S^#SS$_NORMAL, R0       ; IT WORKED!
                          3C    BA  01D7    606         POPR    #^M<R2, R3, R4, R5>     ; Restore registers
                                05  01D9    607         RSB                             ; RETURN
```

```
                        609          .SBTTL  DS_GETLINE -    Get program data input line
                        610          .Psect  Code, Shr, Exe, Nowrt, Byte
                        611 ;++
                        612 ; FUNCTIONAL DESCRIPTION:
                        613 ;
                        614 ;       This routine returns a line from the input stream. It may be from the consol
                        615 ;       from a script file. If the first character of the user prompt from ASK$????
                        616 ;       <NULL> the operator is prompted directly without consulting the script.
                        617 ;       Syncronization between the scripts and DS_??LINE is accomplished by matching
                        618 ;       prompt string with the line in the script file.  If it does not match and
                        619 ;       DS_GETLINE was called the program is aborted, If DS_SUPERLINE was called the
                        620 ;       is ignored and the next line is examined. The prompt string and leading spac
                        621 ;       tabs are removed from the script line before it is returned to the program.
                        622 ;       addition lower case characters in the script are translated to uppercase. If
                        623 ;       input line is expected from the operator and the OPERTOR flag is clear a nul
                        624 ;       line is returned.  Currently the ASK$???? routines apply the program specifi
                        625 ;       default value in the case of a null line.
                        626 ;
                        627 ; CALLING SEQUENCE:
                        628 ;
                        629 ;       CALL    DS_GETLINE
                        630 ;       CALL    DS_SUPERLINE
                        631 ;
                        632 ; INPUT PARAMETERS:
                        633 ;
                        634 ;        4(AP) -        STRING BUFFER ADDRESS
                        635 ;        8(AP) -        LONGWORD FOR RETURNED STRING LENGTH
                        636 ;       12(AP) -        STRING BUFFER SIZE
                        637 ;       16(AP) -        Address of ASCIC user prompt
                        638 ;       20(AP) -        Address of ASCIC extra prompt text
```

```
01DA    640 ; IMPLICIT INPUTS:
01DA    641 ;
01DA    642 ;       NONE
01DA    643 ;
01DA    644 ; OUTPUT PARAMETERS:
01DA    645 ;
01DA    646 ;       NONE
01DA    647 ;
01DA    648 ; IMPLICIT OUTPUTS:
01DA    649 ;
01DA    650 ;       NONE
01DA    651 ;
01DA    652 ; COMPLETION CODES:
01DA    653 ;
01DA    654 ;       SS$_NORMAL
01DA    655 ;
01DA    656 ; REGISTER USAGE:
01DA    657 ;
01DA    658 ;       R4      Length of current line in script
01DA    659 ;       R5      Address of current line in script
01DA    660 ;       R6      Flags
01DA    661 ;                 bit 0 set if supervisor request, else clear
01DA    662 ;                 bit 1 set if already printed "prompt not found text"
01DA    663 ;       R7      Address of ASCIC user prompt
01DA    664 ;       R8      address of informational prompt
01DA    665 ;       R11     Base of current script block
01DA    666 ;
01DA    667 ; SIDE EFFECTS:
01DA    668 ;
01DA    669 ;       R1 = RETURNED STRING LENGTH
01DA    670 ;--
```

```
                                0BFC  01DA   672          .ENTRY  DS_SUPERLINE,^M<R2,R3,R4,R5,R6,R7,R8,R9,R11>
                                      01DC   673
                          56    01    D0   01DC   674          MOVL    #1, R6                      ; Flag supervisor request
                                53    11   01DF   675          BRB     COMMON                      ; Join at common
                                      01E1   676
                                0BFC  01E1   677          .ENTRY  DS_GETLINE,^M<R2,R3,R4,R5,R6,R7,R8,R9,R11>
                                      01E3   678
                    00000000'EF   D5   01E3   679          TSTL    PRNT_PRMT                   ; See if ASK> is to be printed
                                47    13   01E9   680          BEQL    10$                         ; If zero branch around
                                      01EB   681
                                      01EB   682
                     7E   10 AC   D0   01EB   683          MOVL    16(AP),-(SP)                ; Address of prompt descriptor
                          6E    D6   01EF   684          INCL    (SP)                        ; Pass count, get to address of prompt
                     7E   10 BC   9A   01F1   685          MOVZBL  a16(AP),-(SP)               ; Mov count of prompt to use as length
    000000C5'EF      04 BE   6E   28   01F5   686          MOVC3   (SP),a4(SP),BLD_PRMT+1      ; Length # of char., moved to buffer
                                      01FE   687
                04 AE   10 BC   9A   01FE   688          MOVZBL  a16(AP),4(SP)               ; Length of ASK prompt
          04 AE   000000C5'8F   C0   0203   689          ADDL2   #BLD_PRMT+1,4(SP)           ; Add count of prompt to start address
             6E   00000007'EF   9A   020B   690          MOVZBL  FMT_PRMT,(SP)               ; Count of $DSASKxxx prompt
    04 BE   00000008'EF   6E   28   0212   691          MOVC3   (SP),FMT_PRMT+1,a4(SP)      ; Mov ASK> into buffer
                          8E    7C   021B   692          CLRQ    (SP)+                       ; Clear the data off stack
          00000007'EF   10 BC   81   021D   693          ADDB3   a16(AP),FMT_PRMT,BLD_PRMT; Put added counts into buffer
                    000000C4'EF         0225
          10 AC     000000C4'EF   DE   022A   694          MOVAL   BLD_PRMT,16(AP)             ; Buffer address into expected position
                                      0232   695
                                      0232   696
                          56    D4   0232   697 10$:      CLRL    R6                          ; Flag user request
                                      0234   698
                                      0234   699
                                      0234   700 COMMON:
               59   56    D0   0234   701          MOVL    R6,R9                       ; Save r6                                   [20]
    57   00000012'EF   9E   0237   702          MOVAB   L^T_NULL, R7                ; Initially a null user prompt              [07]
               58   57    D0   023E   703          MOVL    R7, R8                      ; Null information prompt
               04   6C    D1   0241   704          CMPL    (AP), #4                    ; Is user prompt address present?
                    0D    1F   0244   705          BLSSU   10$                         ; Branch if not
             57   10 AC   D0   0246   706          MOVL    16(AP), R7                  ; Yes use it
                  05   6C    D1   024A   707          CMPL    (AP), #5                    ; Is user info prompt present?
                       04    1F   024D   708          BLSSU   10$                         ; Branch if not
             58   14 AC   D0   024F   709          MOVL    20(AP), R8                  ; Yes, use it
                          0253   710
                          0253   711 10$:      Br_If_Not_Script        20$         ; Branch if using console now               [12]
00000000'EF       15    E1   0253              BBC     #DS$V_Script, -                     ; If bit not set, branch            [28]
                  12         025A                        L^DS$GL_Flags, 20$          ;                                   [28]
    5B   000000CC'EF   D0   025B   712          MOVL    L^L_LINK, R11               ; Any script active?                        [07]
                       09    13   0262   713          BEQL    20$                         ; Branch if no script active
                          0264   714
                       67    95   0264   715          TSTB    (R7)                        ; null user prompt?
                       08    13   0266   716          BEQL    30$                         ; Yes, continue
                    01 A7    95   0268   717          TSTB    1(R7)                       ; Is first character of prompt null?
                       03    12   026B   718          BNEQ    30$                         ; Branch if can be scripted
                          026D   719
                     00B9    31   026D   720 20$:      BRW     CONSOLE                     ; Branch to use console
                          0270   721
                     035F    30   0270   722 30$:      BSBW    ADVANCE                     ; Point to next record
                    0F 50    E8   0273   723          BLBS    R0, 40$                     ; Branch if not <EOF>
    55   00000013'EF   9E   0276   724          MOVAB   L^T_EOF, R5                 ; Text for "a <EOF>"                        [07]
               54   85    9A   027D   725          MOVZBL  (R5)+, R4                   ; length of "a <EOF>"
```

```
                0085   30  0280   726          BSBW    PRINT_LINE              ; Type prompt and text--CH TO WORD DISP
                  AF   11  0283   727          BRB     COMMON                  ; And try again
```

```
                      54   D5  0285    729 40$:    TSTL    R4                      ; Any characters in line?
                      09   13  0287    730         BEQL    50$                     ; no, use it as is
                  65  21   91  0289    731         CMPB    #^A"!", (R5)            ; Comment line?
                      04   12  028C    732         BNEQ    50$                     ; No, use it
                      78   10  028E    733         BSBB    PRINT_LINE              ; Type prompt and text
                      A2   11  0290    734         BRB     COMMON                  ; Try again
                                0292    735
                  53  57   D0  0292    736 50$:    MOVL    R7, R3                  ; Get address of user prompt
                  52  83   9A  0295    737         MOVZBL  (R3)+, R2               ; Get length of ASCIC string
                     FD65'  30  0298    738         BSBW    SCAN$COMPARE            ; Compare the strings
                      52   D5  029B    739         TSTL    R2                      ; Check for exhausted prompt string
                      4A   13  029D    740         BEQL    80$                     ; Branch if prompt match
              15 56   01   E2  029F    741         BBSS    #1, R6, 60$             ; Branch if already told of error
                                02A3    742
                      57   DD  02A3    743         PUSHL   R7                      ; Address of prompt string
            0000004E'EF    9F  02A5    744         PUSHAB  L^T_PNF                 ; Edit string for "Prompt Not Found"    [07]
                  7E   01   9A  02AB    745         movzbl  #DS$K_PrintF,-(SP)      ; Routine name constant                 [14]
                  7E   1E   98  02AE    746         cvtbl   #DS$K_Type_Script_Pnf,-(SP)     ; The typecode constant         [14]
        00000000'GF    04   FB  02B1    747         CALLS   #4, G^DSX$Print         ; Type it                               [14]
                                02B8    748
                   22 56   E9  02B8    749 60$:    BLBC    R6, 70$                 ; Branch if user request
               50  0C AB   3C  02BB    750         MOVZWL  SC$W_CURR(R11), R0      ; Get current offset
                  10 AB40   9F  02BF    751         PUSHAB  SC$A_BUF(R11)[R0]       ; Address of string
               7E  0A AB   3C  02C3    752         MOVZWL  SC$W_LEN(R11), -(SP)    ; Length of string
            00000031'EF    9F  02C7    753         PUSHAB  L^T_SKIP                ; Edit string for "skipping"            [07]
                  7E   01   9A  02CD    754         movzbl  #DS$K_printf,-(sp)      ; Routine                               [14]
                  7E   1F   98  02D0    755         cvtbl   #DS$K_type_script_skip,-(sp)    ; Print code.                   [14]
        00000000'GF    05   FB  02D3    756         CALLS   #5, G^DSX$PRINT         ; Print it                              [14]
                     FF57   31  02DA    757         BRW     COMMON                  ; Branch to try again
                                02DD    758
            0A AB   0A AB   B2  02DD    759 70$:    MCOMW   SC$W_LEN(R11), -
                                02E2    760                 SC$W_LEN(R11)       ; Complement len so record is used again
        00000000'9F    6C   FA  02E2    761         CALLG   (AP), a#DS$ABORT        ; Program request...abort program
                                02E9    762
                     FD14'  30  02E9    763 80$:    BSBW    SCAN$SPACES             ; Remove spaces and tabs from input
                                02EC    764                                         ;                                       [17]
            5C5C 8F    65   B1  02EC    765         CMPW    (R5),#^X5C5C            ; CHECK FOR // AT THE END OF PROMPT     [17]
                      03   12  02F1    766         BNEQ    90$                     ; IF NOT CONTINUE SCRIPT
                    0033   31  02F3    767         BRW     CONSOLE                 ; IF YES PRINT PROMPT AND WAIT FOR ANSWER
                                02F6    768 90$:                                    ;
                      10   10  02F6    769         BSBB    PRINT_LINE              ; Type it
                    02A7   30  02F8    770         BSBW    COPY_IT                 ; Copy input to buffer
                                02FB    771
                51  08 BC   D0  02FB    772         MOVL    @8(AP), R1              ; Get length of returned line
                   50  00'   D0  02FF    773         MOVL    S^#SS$_NORMAL, R0       ; It worked!
                                0302    774
            0000059B'EF    17  0302    775         JMP     DS_GETLINE_X_CHECK      ; Jump to exit :make sure interlock is clear
                                0308    776                                         ; and then return to caller
```

```
                          0308   778 ;+
                          0308   779 ; Little subroutine to print a line iff the Verify bit is set.
                          0308   780 ;-
                          0308   781
                          0308   782 PRINT_LINE:
                          0308   783          Br_If_Not_Verify        10$     ; Skip output if VERIFY is clear        [12]
0000FE00'EF    09   E1   0308                BBC     #DSA$V_Verify, -        ; If bit not set, branch        [29]
               18         030F                  L^DSA$GL_Flags, 10$           ;                               [29]
          7E   54   7D   0310   784          MOVQ    R4, -(SP)               ; Push length/address of data
               57   DD   0313   785          PUSHL   R7                      ; Push address of ASCIC user prompt
     0000001B'EF   9F   0315   786          PUSHAB  L^T_PROMPT              ; Type prompt and returned line         [07]
          7E   01   9A   031B   787          movzbl  #DS$K_printf,-(sp)      ; routine.                              [14]
          7E   20   98   031E   788          cvtbl   #DS$K_type_script_prompt,-(sp)  ; code                          [14]
00000000'GF    06   FB   0321   789          CALLS   #6, G^DSX$PRINT         ; Type prompt and returned line         [14]
                          0328   790
                     05   0328   791 10$:    RSB                             ; Return                                [08]
```

```
                          0329   793 ;+
                          0329   794 ; No DS script currently active; get input from SYS$INPUT
                          0329   795 ;-
                          0329   796
                          0329   797 CONSOLE:
     51   00000024'EF   9E  0329   798          MOVAB   L^T_PROMPT2, R1          ; Address of edit string                [07]
          50    81     9A  0330   799          MOVZBL  (R1)+, R0                ; Get length of string
          7E    50     7D  0333   800          MOVQ    R0, -(SP)                ; Push descriptor
          00000000'EF  9F  0336   801          PUSHAB  L^DS$GT_BUFFER           ; Address of buffer                     [07]
       7E   0000'8F    3C  033C   802          MOVZWL  #DS$K_BUFSIZ, -(SP)      ; Length of output buffer
                52     D4  0341   803          clrl    r2                       ; Indicator to save space               [09]
                       0343   804          Br_If_Not_Binary        20$      ; If not BINARY, branch around          [12]
0000FE00'EF     01     E1  0343                BBC     #DSA$V_Binary, -                 ; If bit not set, branch [29]
                23         034A                  L^DSA$GL_Flags, 20$              ;                        [29]
          50   04 AE   D0  034B   805          movl    4(sp), r0                ; Get address of buffer                 [09]
             60   02   90  034F   806          movb    #ds$k_type_user_prompt, -; Set first byte to the type code ...   [09]
                       0352   807                  (r0)                     ; ... for general prompt                [09]
                12 56   E9  0352   808          blbc    r6, 10$                  ; Branch if it's not DS>                [09]
             67   04     91  0355   809          cmpb    #4, (r7)                 ; Compare length to "DS> "              [09]
                  0D     12  0358   810          bneq    10$                      ; If not, can't be DS>                  [09]
00000001'EF     01   A7   D1  035A   811          CMPL    1(R7), DS$GT_PROMPT+1    ; is it really "DS>"                    [25]
                  03     12  0362   812          bneq    10$                      ; Skip if not                           [09]
             60   01     90  0364   813          movb    #ds$k_type_ds_prompt, - ; Otherwise, load ...                    [09]
                       0367   814                  (r0)                     ; ... DS prompt code                    [09]
                       0367   815
                  6E     D7  0367   816 10$:     decl    (sp)                     ; Don't let FAO overwrite the type      [09]
                04 AE    D6  0369   817          incl    4(sp)                    ;                                       [09]
                  52     D6  036C   818          incl    r2                       ; Remember that BINARY is set           [09]
                       036E   819
          7E   57     7D  036E   820 20$:     MOVQ    R7, -(SP)                ; Push user prompt, info prompt         [09]
            08 AE     7F  0371   821          PUSHAQ  8(SP)                    ; Address of buffer descriptor
            0C AE     3F  0374   822          PUSHAW  12(SP)                   ; Address to store final length
            18 AE     7F  0377   823          PUSHAQ  24(SP)                   ; Address of descriptor of edit string
00000000'9F     05     FB  037A   824          CALLS   #5, a#SYS$FAO            ; Edit prompt
          54 52     E9  0381   825          blbc    r2, 60$                  ; Branch if not BINARY                  [09]
             6E     D6  0384   826          incl    (sp)                     ; Now include type code in string       [09]
          04 AE     D7  0386   827          decl    4(sp)                    ;                                       [09]
```

```
                                0389    829 ;
                                0389    830 ; DEBUG ***
                                0389    831 ;
          48 00000000'EF   E9   0389    832          blbc    L^Debug_the_sucker, 50$ ; Skip debug stuff if flag clear        [99]
                       1F  BB   0390    833          pushr   #^M<r0, r1, r2, r3, r4> ; Make debug transparent                [99]
                    54 6E  9E   0392    834          movab   (sp), r4                ; Save current sp                       [99]
                       12  11   0395    835          brb     40$                     ; Skip format string                    [99]
                                0397    836
5A 21 3D 70 74 5B 0000039F'010E0000'    0397    837 30$:     .ascid  "[tp=!ZB]!/"            ; Format string                 [12]
                    2F 21 5D 42 03A5
                                03A9    838
                    5E 0A  C2   03A9    839 40$:     subl2   #10, sp                 ; Allocate space on stack               [99]
                       6E  9F   03AC    840          pushab  (sp)                    ; Set it's address                      [99]
                    7E 0A  9A   03AE    841          movzbl  #10, -(sp)              ; And it's length                       [99]
                    53 6E  9E   03B1    842          movab   (sp), r3                ; And remember it                       [99]
                 7E   18 B4  9A   03B4    843          movzbl  a24(r4), -(sp)          ; Final argument for FAO                [99]
                      18 B4  94   03B8    844          clrb    a24(r4)                 ; Clear it out                          [99]
                       63  9F   03BB    845          pushab  (r3)                    ; Where to put length                   [99]
                       63  9F   03BD    846          pushab  (r3)                    ; Address of result buffer              [99]
                    D5 AF  9F   03BF    847          pushab  30$                     ; Address of format string              [99]
          00000000'GF   04  FB   03C2    848          calls   #4, G^sys$fao           ; FAO it                                [99]
                    7E  63  7D   03C9    849          movq    (r3), -(sp)             ; Push address of result string         [99]
          00000000'EF   02  FB   03CC    850          calls   #2, dsx$type_out        ; Print it                              [99]
                    5E  64  9E   03D3    851          movab   (r4), sp                ; Restore initial stack                 [99]
                        1F  BA   03D6    852          popr    #^M<r0, r1, r2, r3, r4> ; Restore registers                     [99]
                                03D8    853
                                03D8    854 50$:                                    ;                                       [99]
                                03D8    855
                                03D8    856 ;
                                03D8    857 ; DEBUG ***
                                03D8    858 ;
                                03D8    859
                    7E  7C      03D8    860 60$:     CLRQ    -(SP)                  ; Space for IOSB                        [09]
                 21 56  E8      03DA    861          BLBS    R6, 70$                ; Branch if command mode
                                03DD    862          Br_If_Oper      70$            ; If operator present, branch around    [12]
0000FE00'EF         0C  E0      03DD                 BBS     #DSA$V_Oper, -                 ; If bit set, branch            [29]
                    19          03E4                         L^DSA$GL_Flags, 70$    ;                                       [29]
                 08 AE  7F      03E5    863          PUSHAQ  8(SP)                  ; Address of prompt descriptor
              0000002B'EF   9F  03E8    864          PUSHAB  L^T_PROMPT3            ; Edit string address                   [07]
                    7E  01  9A  03EE    865          movzbl  #DS$K_printf,-(sp)     ; Routine                               [14]
                    7E  20  98  03F1    866          cvtbl   #DS$K_type_script_prompt,-(sp) ; Code.                         [14]
00000000'GF         04  FB      03F4    867          CALLS   #4, G^DSX$PRINT        ; Type it ...                           [14]
                  0192  31      03FB    868          BRW     DS_GETLINE_OKAY_X      ; ... and exit w/null input line        [11]
```

```
                          03FE   870 ;
                          03FE   871 ; Separate flow into two primary cases: if DS$V_BATCH bit is set, then
                          03FE   872 ; SYS$INPUT is a file, and we are in user mode: utilize RMS routines to
                          03FE   873 ; manipulate file.  Otherwise, use QIO since it must run in standalone.
                          03FE   874 ;
                          03FE   875
                          03FE   876 70$:    Br_If_Not_Batch 100$             ; Branch if terminal or mailbox control [12]
00000000'EF   16   E1     03FE              BBC     #DS$V_Batch, -             ; If bit not set, branch        [28]
                61        0405                        L^DS$GL_Flags, 100$      ;                               [28]
                          0406   877
                          0406   878 ;+
                          0406   879 ; RMS SYS$INPUT processing.  Use $GET to read record, and 'fake' echo
                          0406   880 ; via $PUT (PRINT call) to SYS$OUTPUT
                          0406   881 ;-
                          0406   882
53   00000000'EF   9E     0406   883         MOVAB   DS$RAB_OUTPUT, R3        ; Point to output RAB
52   00000000'EF   9E     040D   884         MOVAB   DS$RAB_INPUT, R2         ; Point to input RAB
     54    08 AE   9E     0414   885         MOVAB   8(SP), R4                ; Save pointer to prompt descriptor
   24 A2    04 AC   D0     0418   886         MOVL    4(AP), RAB$L_UBF(R2)     ; Load input buffer address
   20 A2    0C AC   B0     041D   887         MOVW    12(AP), RAB$W_USZ(R2)    ;  And size of same
                    62   DF 0422   888         $GET    (R2)                     ; Read a record
                          0422              PUSHAL  (R2)
00000000'GF    01   FB     0424              CALLS   #$$.TMP1,G^SYS$GET
          11 50   E8     042B   889         BLBS    R0, 90$                  ; Exit if error
0001827A 8F    50   D1     042E   890         CMPL    R0, #RMS$_EOF            ; If this is end-of-file time
               05   12     0435   891         BNEQ    80$                      ; :then
    50   0000'8F   3C     0437   892         MOVZWL  #SS$_ENDOFFILE, R0       ; ::pretend it was SS end-of-file
                          043C   893
          0154   31     043C   894 80$:    BRW     DS_GETLINE_X             ; Exit routine                  [11]
                          043F   895
     50   22 A2   3C     043F   896 90$:    MOVZWL  RAB$W_RSZ(R2), R0        ; Get size of input line
        6E    01   B0     0443   897         MOVW    #1, (SP)                 ; Set success code in IOSB
     02 AE    50   B0     0446   898         MOVW    R0, 2(SP)                ; Set it into IOSB for common code
        28 A2   DD     044A   899         PUSHL   RAB$L_RBF(R2)            ; Address of input record
           50   DD     044D   900         PUSHL   R0                       ; Size of input record
           54   DD     044F   901         PUSHL   R4                       ; Pointer to prompt descriptor
    00000045'EF   9F     0451   902         PUSHAB  L^T_ECHO                 ; Pointer to ASCIC control string [07]
       7E    01   9A     0457   903         movzbl  #DS$K_printf,-(sp)       ; routine.                        [14]
       7E    21   98     045A   904         cvtbl   #DS$K_type_script_echo,-(sp)    ; code                     [14]
00000000'GF    06   FB     045D   905         CALLS   #6, G^DSX$PRINT          ; Output                        [14]
          0109   31     0464   906         BRW     CHECK_STATUS             ; Skip ahead                    [11]
```

```
                                0467    908 ;*
                                0467    909 ; QIO SYS$INPUT.  Attempt QIO read with prompt--this will fail if SYS$INPUT
                                0467    910 ; is a mailbox.
                                0467    911 ;-
                                0467    912
                                0467    913 100$:   Br_If_CRD_AutoTest_Off  110$    ; If running CRD-AutoTest, branch       [16]
          0000FE00'EF    0B     E0      0467                BBS     #DSA$V_CRD_Autotest_Off, -      ; If bit set, branch    [36]
                         12             046E                  L^DSA$GL_Flags, 110$      ;                               [36]
                                046F    914         Br_If_CRD_MenuTest_On   110$    ; If running CRD-MenuTest, branch       [16]
          0000FE00'EF    12     E0      046F                BBS     #DSA$V_CRD_MenuTest_On, -       ; If bit set, branch    [36]
                         0A             0476                  L^DSA$GL_Flags, 110$      ;                               [36]
                                0477    915         Br_If_CRD_MenuTest_Off  110$    ; If running CRD Menu Test, branch      [16]
          0000FE00'EF    10     E0      0477                BBS     #DSA$V_CRD_MenuTest_Off, -      ; If bit set, branch    [36]
                         02             047E                  L^DSA$GL_Flags, 110$      ;                               [36]
                         45     11      047F    916         Brb     114$                    ; Else, skip all this CRD crap  [15]
                                0481    917
                      21 56     E9      0481    918 110$:   BlbC    R6, 112$                ; If user prompt, branch        [15]
                                0484    919
                                0484    920         ;*
                                0484    921         ; This is a DS prompt (i.e., "DS> "). Push the address and length of    [15]
                                0484    922         ; where to put the returned string as parameters 4 and 3.               [15]
                                0484    923         ;-
                                0484    924
                      04 BC     DF      0484    925         PushAL  @4 (AP)                 ; Push address of string as param-4     [15]
                      0C AC     DD      0487    926         PushL   12 (AP)                 ; Push length of string as param-3      [15]
                         01     DD      048A    927         PushL   #DS$K_Type_DS_Prompt    ; Push typecode as param-2              [15]
                         01     DD      048C    928         PushL   #CRD$K_TypeCode         ; Push type of call as param-1          [15]
          00000000'FF    04     FB      048E    929         CallS   #4, @L^DS$GA_CRD_DS_Interface   ; And call the routine!       [15]
                                0495    930
                                0495    931         ;*
                                0495    932         ; If the routine returns:                                               [15]
                                0495    933         ;       Success => return the string that this routine returned.        [15]
                                0495    934         ;                  (High word of R0 = length of the returned string).   [15]
                                0495    935         ;       Failure => do the QIO and return that string.                   [15]
                                0495    936         ; Note the the length of the returned string is stored in the high word [15]
                                0495    937         ; of R0. Thus, the Extract-Zero-Extended-Field instruction below.       [15]
                                0495    938         ;-
                                0495    939
                         2E 50  E9      0495    940         BlbC    R0, 114$                ; Do the QIO if the routine fails       [15]
                                0498    941
          51    50    10   10  EF      0498    942         ExtZV   #16, #16, R0, R1        ; Return the length of the string ...   [15]
                   08 BC   51  D0      049D    943         MovL    R1, @8 (AP)             ; ... in both R1 and the 2nd parameter  [15]
                      50   00' D0      04A1    944         MovL    S^#SS$_Normal, R0       ; Return success                        [15]
                           04  04      04A4    945         Ret                             ; Return to the DS caller               [15]
                                04A5    946
                                04A5    947         ;*
                                04A5    948         ; This is a user prompt. Push the address and length of the user's      [15]
                                04A5    949         ; prompt as parameters 4 and 3.                                         [15]
                                04A5    950         ;-
                                04A5    951
                      0C AE     DD      04A5    952 112$:   PushL   12 (SP)                 ; Push address of prompt as param-4     [15]
                      08 AE     DD      04A8    953         PushL   8  (SP)                 ; Push length of prompt as param-3      [15]
                         02     DD      04AB    954         PushL   #DS$K_Type_User_Prompt  ; Push typecode as param-2              [15]
                         01     DD      04AD    955         PushL   #CRD$K_TypeCode         ; Push type of call as param-1          [15]
          00000000'FF    04     FB      04AF    956         CallS   #4, @L^DS$GA_CRD_DS_Interface   ; And call the routine!       [15]
                                04B6    957
                                04B6    958         ;*
```

```
                                04B6          ; If the routine returns:                                          [15]
                                04B6          ;       Success => return the string that this routine returned.   [15]
                                04B6          ;                  (High word of R0 = length of the returned string).  [15]
                                04B6          ;       Failure => do the QIO and return that string.              [15]
                                04B6          ; Note the the length of the returned string is stored in the high word [15]
                                04B6          ; of R0. Thus, the Extract-Zero-Extended-Field instruction below.  [15]
                                04B6          ;-
                                04B6
                0D 50    E9     04B6          BlbC    R0, 114$                ; Do the QIO if the routine fails  [15]
                                04B9
     51   50   10   10    EF     04B9          ExtZV   #16, #16, R0, R1        ; Return the length of the string ...  [15]
           08 BC   51    D0     04BE          MovL    R1, @8 (AP)             ; ... in both R1 and the 2nd parameter  [15]
              50   00'   D0     04C2          MovL    S^#SS$_Normal, R0       ; Return success                   [15]
                         04     04C5          Ret                             ; Return to the DS caller          [15]
                                04C6
              50   6E    7E     04C6  114$:   MOVAQ   (SP), R0                ; Point to allocated IOSB          [15]
                                04C9          Br_If_Not_User  115$            ; Skip next if not user mode       [12]
     0000FE00'EF   1C    E1     04C9          BBC     #DSA$V_User, -                  ; If bit not set, branch
                   07           04D0                    L^DSA$GL_Flags, 115$            ;
     000000D4'EF   01    88     04D1          BISB    #1, DS$GB_QIOACT        ; Set input QIO active             [15]
                                04D8
                                04D8  115$:   $QIOW_S   , -                   ; No efn                           [07]
                                04D8                    L^DS$GW_TTIN, -       ; Channel number
                                04D8                    S^#IO$_READPROMPT, -  ; Function code
                                04D8                    (R0), -               ; IOSB
                                04D8                    ,, -                  ; No ASTadr or ASTprm
                                04D8                    P1=@4(AP), -          ; Buffer address
                                04D8                    P2=12(AP), -          ; Buffer size
                                04D8                    P5=12(R0), -          ; Prompt buffer address
                                04D8                    P6=8(R0)              ; Prompt buffer size
                08 A0    DD     04D8                  PUSHL   8(R0)
                0C A0    DD     04DB                  PUSHL   12(R0)
                   7E    7C     04DE                  CLRQ    -(SP)
                0C AC    DD     04E0                  PUSHL   12(AP)
                04 BC    DF     04E3                  PUSHAL  @4(AP)
                   7E    7C     04E6                  CLRQ    -(SP)
                   60    7F     04E8                  PUSHAQ  (R0)
              7E   00'   3C     04EA                  MOVZWL  S^#IO$_READPROMPT,-(SP)
     7E   00000000'EF    3C     04ED                  MOVZWL  L^DS$GW_TTIN,-(SP)
                   00    DD     04F4                  PUSHL   #0
     00000000'GF   0C    FB     04F6                  CALLS   #12,G^SYS$QIOW
                                04FD
          000000D4'EF    94     04FD  118$:   CLRB    DS$GB_QIOACT            ; Clear QIO active
        50   0000'8F    B1     0503          CMPW    #SS$_ILLIOFUNC, R0      ; Did readprompt fail?
                   03    13     0508          BEQL    120$                    ; Yes try w/ prompt
                 0063    31     050A          BRW     CHECK_STATUS            ; Branch to check the status       [11]
```

```
                                050D   993 ;+
                                050D   994 ; Mail box read: Fake "read with prompt" function via write followed by read.
                                050D   995 ;-
                                050D   996
                50   6E   7E    050D   997 120$:   MOVAQ   (SP), R0                ; Current stack level
                                0510   998
                                0510   999         $QIOW_S     ,-                  ; No efn                                [07]
                                0510  1000                   L^DS$GW_TTOUT,-       ; Channel number                        [11]
                                0510  1001                   S^#IO$_WRITEVBLK,-    ; Function code                         [11]
                                0510  1002                   (R0),-                ; IOSB                                  [11]
                                0510  1003                   P1=@12(R0),-          ; Prompt buffer address                 [11]
                                0510  1004                   P2=8(R0)              ; Prompt buffer size                    [11]
                   7E   7C      0510                  CLRQ    -(SP)
                   7E   7C      0512                  CLRQ    -(SP)
                08 A0   DD      0514                  PUSHL   8(R0)
                0C B0   DF      0517                  PUSHAL  @12(R0)
                   7E   7C      051A                  CLRQ    -(SP)
                   60   7F      051C                  PUSHAQ  (R0)
             7E    00'  3C      051E                  MOVZWL  S^#IO$_WRITEVBLK,-(SP)
7E   00000000'EF   3C      0521                  MOVZWL  L^DS$GW_TTOUT,-(SP)
                   00   DD      0528                  PUSHL   #0
00000000'GF        0C   FB      052A                  CALLS   #12,G^SYS$QIOW
               5F 50   E9      0531  1005            BLBC    R0, DS_GETLINE_X      ; Finish if error on prompt             [11]
               5C 6E   E9      0534  1006            BLBC    (SP), DS_GETLINE_X    ; Finish if error on prompt             [11]
                50   6E   7E    0537  1007            MOVAQ   (SP), R0              ; Current stack level
                                053A  1008            Br_If_Not_User  130$          ; Skip if not usermode                  [12]
0000FE00'EF        1C   E1      053A                  BBC     #DSA$V_User,-                 ; If bit not set, branch
                   07           0541                    L^DSA$GL_Flags, 130$                ;
000000D4'EF        01   88      0542  1009            BISB    #1, DS$GB_QIOACT      ; Flag input QIO active
                                0549  1010
                                0549  1011 130$:     $QIOW_S     ,-                ; No efn                                [07]
                                0549  1012                   L^DS$GW_TTIN,-        ; Channel number                        [11]
                                0549  1013                   S^#IO$_READVBLK,-     ; Function code                         [11]
                                0549  1014                   (R0),-                ; IOSB                                  [11]
                                0549  1015                   P1=@4(AP),-           ; Buffer address                        [11]
                                0549  1016                   P2=12(AP)             ; Buffer size                           [11]
                   7E   7C      0549                  CLRQ    -(SP)
                   7E   7C      054B                  CLRQ    -(SP)
                0C AC   DD      054D                  PUSHL   12(AP)
                04 BC   DF      0550                  PUSHAL  @4(AP)
                   7E   7C      0553                  CLRQ    -(SP)
                   60   7F      0555                  PUSHAQ  (R0)
             7E    00'  3C      0557                  MOVZWL  S^#IO$_READVBLK,-(SP)
7E   00000000'EF   3C      055A                  MOVZWL  L^DS$GW_TTIN,-(SP)
                   00   DD      0561                  PUSHL   #0
00000000'GF        0C   FB      0563                  CALLS   #12,G^SYS$QIOW
     000000D4'EF   94          056A  1017            CLRB    DS$GB_QIOACT          ; Flag input QIO inactive
                                0570  1018
                                0570  1019 ;+
                                0570  1020 ; Fall into the common completion part.                                        [11]
                                0570  1021 ;-
```

```
                                0570  ;+
                                0570  ; Common completion section, joined from RMS section and both QIO sections
                                0570  ; via branch.  Check status and translate output.
                                0570  ;-
                                0570
                                0570  CHECK_STATUS:                                  ;                                        [11]
                 20 50    E9    0570          BLBC    R0, DS_GETLINE_X               ; RETURN IF QIO FAILED                   [11]
                 1D 6E    E9    0573          BLBC    (SP), DS_GETLINE_X             ; Return if QIO failed                   [11]
                                0576
          50   0000'8F    3C    0576          MOVZWL  #SS$_ENDOFFILE, R0             ; ASSUME END OF FILE
    04 AE   0001001A 8F   D1    057B          CMPL    #^X1001A, 4(SP)                ; SINGLE CHARACTER TERM=^Z?
                    0E    13    0583          BEQL    DS_GETLINE_X                   ; Exit with EOF                          [11]
                                0585
          54    02 AE    3C    0585          MOVZWL  2(SP), R4                      ; GET STRING LENGTH
          55    04 AC    D0    0589          MOVL    4(AP), R5                      ; Address of input string
                  0012    30    058D          BSBW    COPY_IT                        ; Copy and translate
                                0590
                                0590  ;+
                                0590  ; Here if no error
                                0590  ;-
                                0590
                                0590  DS_GETLINE_OKAY_X:                             ;                                        [11]
             50    00'    D0    0590          MOVL    S^#SS$_NORMAL, R0              ; Return success!
                                0593
                                0593  DS_GETLINE_X:                                  ;                                        [11]
          51    02 AE    3C    0593          MOVZWL  2(SP), R1                      ; Return the string length ...           [11]
          08 BC    51    D0    0597          MOVL    R1, @8(AP)                     ; ... in both places                     [11]
                                059B
                                059B  DS_GETLINE_X_CHECK:
                 03 59    E9    059B          BLBC    R9,80$                         ; Branch if we entered through GETline  [20]
                  0000    31    059E          BRW     EXIT                           ; Otherwise we entered through SUPERline[20]
                                05A1  80$:
                                05A1
                         04     05A1  EXIT :  RET                                    ; Return to caller
```

```
                        05A2  1058          .SBTTL  COPY_IT -       Copy and translate
                   000005A2  1059          .PSECT  Code, Shr, Exe, NoWrt, Byte
                        05A2  1060 ;++
                        05A2  1061 ; FUNCTIONAL DESCRIPTION:
                        05A2  1062 ;
                        05A2  1063 ;       This routine is used to copy a line to the user buffer
                        05A2  1064 ;       It translates lower case alpha's to upper case if not ULTRIX.
                        05A2  1065 ;
                        05A2  1066 ; CALLING SEQUENCE:
                        05A2  1067 ;
                        05A2  1068 ;       BSBW    COPY_IT
                        05A2  1069 ;
                        05A2  1070 ; INPUT PARAMETERS:
                        05A2  1071 ;
                        05A2  1072 ;       NONE
                        05A2  1073 ;
                        05A2  1074 ; IMPLICIT INPUTS:
                        05A2  1075 ;
                        05A2  1076 ;       R4      Length of string to be copied
                        05A2  1077 ;       R5      Address of string to be copied
                        05A2  1078 ;       4(AP)   Address of user buffer
                        05A2  1079 ;       8(AP)   Address to store length of line returned
                        05A2  1080 ;       12(AP)  Length of user buffer
                        05A2  1081 ;
                        05A2  1082 ; OUTPUT PARAMETERS:
                        05A2  1083 ;
                        05A2  1084 ;       NONE
                        05A2  1085 ;
                        05A2  1086 ; IMPLICIT OUTPUTS:
                        05A2  1087 ;
                        05A2  1088 ;       4(AP)   buffer written
                        05A2  1089 ;       @8(AP)  written with length of buffer
                        05A2  1090 ;
                        05A2  1091 ; SIDE EFFECTS:
                        05A2  1092 ;
                        05A2  1093 ;       NONE
                        05A2  1094 ;
                        05A2  1095 ; COMPLETION CODES:
                        05A2  1096 ;
                        05A2  1097 ;       NONE
                        05A2  1098 ;--
```

```
                                  05A2  1100 COPY_IT:
                 0C AC    54   D1  05A2  1101          CMPL    R4, 12(AP)                ; Is buffer large enough?
                          04   15  05A6  1102          BLEQ    10$                       ; Branch if it is
                 54    0C AC   D0  05A8  1103          MOVL    12(AP), R4                ; Shorten record
                                  05AC  1104 10$:
                 08 BC    54   D0  05AC  1105          MOVL    R4, @8(AP)                ; Store length of record
                 50    04 AC   D0  05B0  1106          MOVL    4(AP), R0                 ; Get address of buffer
                          18   11  05B4  1107          BRB     30$                       ; Start with count of length
                    80    85   90  05B6  1108 20$:     MOVB    (R5)+, (R0)+              ; Copy a byte
              10 FF A0    06   E1  05B9  1109          BBC     #6, -1(R0), 30$           ; Branch if not alpha
  04 00000000'EF  00000000'8F  E0  05BE  1110          BBS     #ULTRIX_V_MODE, L^ULTRIX_FLAGS, 30$ ; Do not change if ULTRIX   [19]
                 FF A0    20   8A  05CA  1111          BICB2   #32, -1(R0)               ; force it to upper case
                       E5 54   F4  05CE  1112 30$:     SOBGEQ  R4, 20$                   ; Count and branch
                                05  05D1  1113          RSB                               ; Return to caller
```

```
                05D2  1115          .SBTTL  ADVANCE -       Advance to next record in buffer
           000005D2  1116          .PSECT  Code, Shr, Exe, NoWrt, Byte
                05D2  1117 ;++
                05D2  1118 ; FUNCTIONAL DESCRIPTION:
                05D2  1119 ;
                05D2  1120 ;       Simulate the RMS $GET routine, deblocking records from disk blocks.
                05D2  1121 ;       Note that .SC$W_CUR(R11) + SC$A_BUF(R11) is address of current record
                05D2  1122 ;       Also .SC$W_LEN(R11) is length of that record.
                05D2  1123 ;       If length is negative the same record is to be used again and length
                05D2  1124 ;       is the complement of the record length.
                05D2  1125 ;
                05D2  1126 ; CALLING SEQUENCE:
                05D2  1127 ;
                05D2  1128 ;       BSBB    ADVANCE
                05D2  1129 ;
                05D2  1130 ; INPUT PARAMETERS:
                05D2  1131 ;
                05D2  1132 ;       NONE
                05D2  1133 ;
                05D2  1134 ; IMPLICIT INPUTS:
                05D2  1135 ;
                05D2  1136 ;       NONE
                05D2  1137 ;
                05D2  1138 ; OUTPUT PARAMETERS:
                05D2  1139 ;
                05D2  1140 ;       NONE
                05D2  1141 ;
                05D2  1142 ; IMPLICIT OUTPUTS:
                05D2  1143 ;
                05D2  1144 ;       SC$W_CURR       Offset to current record
                05D2  1145 ;       SC$W_LEN        Length of current record
                05D2  1146 ;       R4              Length of current record
                05D2  1147 ;       R5              Address of current record
                05D2  1148 ;
                05D2  1149 ; COMPLETION CODES:
                05D2  1150 ;
                05D2  1151 ;       SS$_NORMAL
                05D2  1152 ;       SS$_ENDOFFILE
                05D2  1153 ;
                05D2  1154 ; SIDE EFFECTS:
                05D2  1155 ;
                05D2  1156 ;       THE CURRENT SCRIPT DESCRIPTOR IS UPDATED.
                05D2  1157 ;
                05D2  1158 ; REGISTER USAGE:
                05D2  1159 ;
                05D2  1160 ;       R11     Assumed to contain the base for the current script block
                05D2  1161 ;       R5      Current offset within buffer
                05D2  1162 ;       R4      Length of current record
                05D2  1163 ;--
```

```
                     05D2  1165 ADVANCE:
      55   0C AB   32  05D2  1166          CVTWL   SC$W_CURR(R11), R5      ; Get current offset
      54   0A AB   32  05D6  1167          CVTWL   SC$W_LEN(R11), R4       ; Get negated length
           12      19  05DA  1168          BLSS    60$                     ; Branch if record should be used again
                       05DC  1169
      55   54      C0  05DC  1170          ADDL    R4, R5                  ; Skip previous record
      55   0E AB   B1  05DF  1171          CMPW    SC$W_END(R11), R5       ; Past end of data?
           21      15  05E3  1172          BLEQ    80$                     ; Branch if end of file
54    10 AB45    9A  05E5  1173          MOVZBL  SC$A_BUF(R11)[R5], R4   ; Get length of next record
           55      D6  05EA  1174          INCL    R5                      ; Point to data
           03      11  05EC  1175          BRB     70$                     ; Branch to finish
                       05EE  1176
      54   54      D2  05EE  1177 60$:     MCOML   R4, R4                  ; Fix length
                       05F1  1178
      0C AB   55   B0  05F1  1179 70$:     MOVW    R5, SC$W_CURR(R11)      ; Put current offset back
      0C AB   55   B0  05F5  1180          MOVW    R5, SC$W_CURR(R11)      ; Put current offset back
      0A AB   54   B0  05F9  1181          MOVW    R4, SC$W_LEN(R11)       ; Set current length
55    10 AB45    9E  05FD  1182          MOVAB   SC$A_BUF(R11)[R5], R5   ; Absolute address of line
      50   00'    D0  0602  1183          MOVL    S^#SS$_NORMAL, R0       ; It worked!
                   05  0605  1184          RSB
                       0606  1185 80$:
         FBAC      30  0606  1186          BSBW    SCRIPT$FINISH           ; Remove current script file
50    0000'8F    3C  0609  1187          MOVZWL  #SS$_ENDOFFILE, R0      ; Indicate the end
                   05  060E  1188          RSB                             ; Return
                       060F  1189          .END
```

```
$$.TAB                          = 0000007C R   D   03
$$.TABEND                       = 000000C0 R   D   03
$$.TMP                          = 00000000     D
$$.TMP1                         = 00000001     D
$$.TMP2                         = 00000062
$$T1                            = 00000001     D
$ER                             = 00000001     D
$MODULE                           00000000 R   D   02
ADVANCE                           000005D2 R   D   04
BEGIN                             ********   X     00
BIT...                          = 00000003     D
BLD_PRMT                          000000C4 R   D   03
CHECK_STATUS                      00000570 R   D   04
CLI$K_BUFSIZ                    = 00000100     D
CLI$K_SIZE                        0000044C     D
CLI$L_ADDRESS                     00000018     D
CLI$L_COMMAND                     00000004     D
CLI$L_DATA                        0000001C     D
CLI$L_FLAGS                       00000000     D
CLI$L_FLAGS2                      00000444     D
CLI$L_LAST                        00000024     D
CLI$L_NEXT                        00000030     D
CLI$L_PASS                        0000002C     D
CLI$L_SUBT                        00000028     D
CLI$L_TEMP_BASE                   00000448     D
CLI$L_TEST                        00000020     D
CLI$M_START_OR_RUN              = 00000008     D
CLI$Q_BUFQWD                      00000034     D
CLI$Q_FILE                        00000008     D
CLI$Q_SECTION                     00000010     D
CLI$Q_TIME                        0000043C     D
CLI$T_BUFFER                      0000003C     D
CLI$V_ADAPTER                   = 00000018     D
CLI$V_ADR                       = 0000000B     D
CLI$V_ASCII                     = 00000013     D
CLI$V_BASE_QUAL                 = 00000002     D
CLI$V_BREAK                     = 0000000A     D
CLI$V_BRIEF                     = 0000001B     D
CLI$V_BYTE                      = 0000000D     D
CLI$V_CLEAR                     = 00000002     D
CLI$V_DEC                       = 00000010     D
CLI$V_DEFAULT                   = 0000000C     D
CLI$V_DEPOSIT                   = 00000019     D
CLI$V_EVENT                     = 00000008     D
CLI$V_EXAM                      = 00000005     D
CLI$V_FLAGS                     = 00000009     D
CLI$V_HEX                       = 00000012     D
CLI$V_KERNEL                    = 00000017     D
CLI$V_LOAD                      = 00000006     D
CLI$V_LONG                      = 0000000F     D
CLI$V_NEXT                      = 00000001     D
CLI$V_NOALLOC                   = 00000000     D
CLI$V_NOTNUF                    = 00000001     D
CLI$V_OCT                       = 00000011     D
CLI$V_PREG                      = 0000001A     D
CLI$V_QA                        = 00000007     D
CLI$V_QACKLOOPLOOPS             = 0000001C     D
CLI$V_QAERRORPRINTS             = 0000001B     D
CLI$V_QAMULTIPLEPASS            = 0000001F     D
CLI$V_QASUBTESTLOOPS            = 0000001E     D
CLI$V_QATESTLOOPS               = 0000001D     D
CLI$V_REG                       = 00000014     D
CLI$V_REQUIRED                  = 00000000     D
CLI$V_RUN                       = 00000015     D
CLI$V_SET                       = 00000003     D
CLI$V_SHOW                      = 00000004     D
CLI$V_START_OR_RUN              = 00000003     D
CLI$V_VALSEC                    = 00000016     D
CLI$V_WORD                      = 0000000E     D
CLK$RE_INIT                       ********   X     00
COMMON                            00000234 R   D   04
CONSOLE                           00000329 R   D   04
COPY_IT                           000005A2 R   D   04
CRD$K_CRD_INITIALIZATION        = 00000000   G D
CRD$K_DS_CONTROL_C              = 00000001   G D
CRD$K_DS_FLAGS                  = 00000000   G D
CRD$K_FAILURE                   = 00000000     D
CRD$K_HOOK_POINT                = 00000000   G D
CRD$K_LAST_ACCESS_CODE          = 00000002   G D
CRD$K_LAST_DS_VARIABLE          = 00000002   G D
CRD$K_LAST_FUNCTION             = 00000002   G D
CRD$K_LAST_HOOK_POINT           = 00000001   G D
CRD$K_READ                      = 00000000   G D
CRD$K_SUCCESS                   = 00000001     D
CRD$K_TYPECODE                  = 00000001   G D
CRD$K_WRITE                     = 00000001   G D
DEBUG_THE_SUCKER                  ********     X     00
DS$ABORT                          ********     X     00
DS$CLI                            ********     X     00
DS$CLRVEC                         ********     X     00
DS$GA_CRD_DS_INTERFACE            ********     X     00
DS$GB_QIOACT                      000000D4 RG  D     03
DS$GL_CLIBASE                     ********     X     00
DS$GL_FLAGS                       ********     X     00
DS$GT_BUFFER                      ********     X     00
DS$GT_PROMPT                      ********     X     00
DS$GW_TTIN                        ********     X     00
DS$GW_TTOUT                       ********     X     00
DS$K_BUFSIZ                       ********     X     00
DS$K_ERROR                      = 00000002     D
DS$K_NORMAL                     = 00000001     D
DS$K_PRINTB                     = 00000002     D
DS$K_PRINTF                     = 00000001     D
DS$K_PRINTI                     = 00000000     D
DS$K_PRINTX                     = 00000003     D
DS$K_SEVERE                     = 00000004     D
DS$K_SUBSYS                     = 00000066     D
DS$K_TYPE_ABORT_PROGRAM         = 00000014     D
DS$K_TYPE_ABORT_TEST            = 00000013     D
DS$K_TYPE_COMMAND_ERR           = 00000015     D
DS$K_TYPE_COMMAND_OUT           = 00000016     D
DS$K_TYPE_CRD_AUTOTEST          = 0000001A     D
DS$K_TYPE_DS_PROMPT             = 00000001     D
DS$K_TYPE_DS_START              = 0000001D     D
```

```
DS$K_TYPE_ERRDEV                = 00000008    D
DS$K_TYPE_ERRHARD               = 00000006    D
DS$K_TYPE_ERROR_BODY            = 00000009    D
DS$K_TYPE_ERROR_END             = 0000000A    D
DS$K_TYPE_ERRPREP               = 0000001B    D
DS$K_TYPE_ERRSOFT               = 00000007    D
DS$K_TYPE_ERRSUP                = 00000004    D
DS$K_TYPE_ERRSYS                = 00000005    D
DS$K_TYPE_ERR_HALT              = 0000000D    D
DS$K_TYPE_EXCEPTION             = 0000000C    D
DS$K_TYPE_EXCEPTION_HEAD        = 0000000B    D
DS$K_TYPE_FIRST_PASS            = 00000011    D
DS$K_TYPE_GENERAL               = 00000000    D
DS$K_TYPE_GENERAL_ERROR         = 00000003    D
DS$K_TYPE_NO_TESTS              = 00000012    D
DS$K_TYPE_PARAM_ERROR           = 0000001C    D
DS$K_TYPE_PROGRAM_END           = 00000010    D
DS$K_TYPE_PROGRAM_INFO          = 00000017    D
DS$K_TYPE_PROGRAM_START         = 0000000F    D
DS$K_TYPE_QIO_INVADP            = 00000024    D
DS$K_TYPE_QIO_NODRIVER          = 00000022    D
DS$K_TYPE_QIO_WRONGVER          = 00000023    D
DS$K_TYPE_SCRIPT_ECHO           = 00000021    D
DS$K_TYPE_SCRIPT_PNF            = 0000001E    D
DS$K_TYPE_SCRIPT_PROMPT         = 00000020    D
DS$K_TYPE_SCRIPT_SKIP           = 0000001F    D
DS$K_TYPE_SEQUENCE_ERROR        = 00000019    D
DS$K_TYPE_START_ERR             = 00000018    D
DS$K_TYPE_START_LIST            = 00000025    D
DS$K_TYPE_SUMMARY               = 0000000E    D
DS$K_TYPE_USER_PROMPT           = 00000002    D
DS$K_WARNING                    = 00000000    D
DS$LOAD                           ********    X   00
DS$M_ABRTFLG                    = 00000040    D
DS$M_BADTIME                    = 00100000    D
DS$M_BATCH                      = 00400000    D
DS$M_BRKCLR                     = 00001000    D
DS$M_BRKPT                      = 00000800    D
DS$M_CHARFLG                    = 00000100    D
DS$M_CMDFLG                     = 00000080    D
DS$M_CTRLC                      = 00000001    D
DS$M_CTRLO                      = 00010000    D
DS$M_DEVFLG                     = 00000200    D
DS$M_DISABLCC                   = 01000000    D
DS$M_DONFLG                     = 00002000    D
DS$M_ERRFLG                     = 00000010    D
DS$M_EXCEPT                     = 00080000    D
DS$M_EXETST                     = 00040000    D
DS$M_HLTFLG                     = 00000008    D
DS$M_LODFLG                     = 00000002    D
DS$M_MEMMGT                     = 00008000    D
DS$M_NI                         = 04000000    D
DS$M_OUTPUT                     = 00800000    D
DS$M_RUBFLG                     = 00000020    D
DS$M_SCRIPT                     = 00200000    D
DS$M_SETIMR                     = 02000000    D
DS$M_STRFLG                     = 00000004    D
DS$M_SUBT                       = 00004000    D
DS$M_SYSFLG                     = 00000400    D
DS$M_TIMED                      = 02000000    D
DS$M_TIMED_OUT                  = 08000000    D
DS$M_TIMRON                     = 00020000    D
DS$RAB_INPUT                      ********    X   00
DS$RAB_OUTPUT                     ********    X   00
DS$V_ABRTFLG                    = 00000006    D
DS$V_BADTIME                    = 00000014    D
DS$V_BATCH                      = 00000016    D
DS$V_BRKCLR                     = 0000000C    D
DS$V_BRKPT                      = 0000000B    D
DS$V_CHARFLG                    = 00000008    D
DS$V_CMDFLG                     = 00000007    D
DS$V_CTRLC                      = 00000000    D
DS$V_CTRLO                      = 00000010    D
DS$V_DEVFLG                     = 00000009    D
DS$V_DISABLCC                   = 00000018    D
DS$V_DONFLG                     = 0000000D    D
DS$V_ERRFLG                     = 00000004    D
DS$V_EXCEPT                     = 00000013    D
DS$V_EXETST                     = 00000012    D
DS$V_HLTFLG                     = 00000003    D
DS$V_LODFLG                     = 00000001    D
DS$V_MEMMGT                     = 0000000F    D
DS$V_NI                         = 0000001A    D
DS$V_OUTPUT                     = 00000017    D
DS$V_RUBFLG                     = 00000005    D
DS$V_SCRIPT                     = 00000015    D
DS$V_SETIMR                     = 00000019    D
DS$V_STRFLG                     = 00000002    D
DS$V_SUBT                       = 0000000E    D
DS$V_SYSFLG                     = 0000000A    D
DS$V_TIMED                      = 00000019    D
DS$V_TIMED_OUT                  = 0000001B    D
DS$V_TIMRON                     = 00000011    D
DS$_AP_NORMAL_BREAK             = 00660150    D
DS$_ARITH                       = 006600D0    D
DS$_ASBE                        = 00660118    D
DS$_BADLINK                     = 006600F0    D
DS$_BADTYPE                     = 006600E8    D
DS$_BIIC                        = 00660120    D
DS$_CHME                        = 006600A8    D
DS$_CHMK                        = 006600E0    D
DS$_DEVNAME                     = 00660108    D
DS$_ERROR                       = 00660002    D
DS$_FHWE                        = 00660068    D
DS$_FRAGBUF                     = 00660080    D
DS$_ICBUSY                      = 006600C8    D
DS$_ICERR                       = 006600C0    D
DS$_IHWE                        = 00660060    D
DS$_ILLCHAR                     = 00660018    D
DS$_ILLPAGCNT                   = 00660078    D
DS$_ILLUNIT                     = 00660100    D
DS$_INIT_FAIL                   = 00660140    D
DS$_INSFMEM                     = 00660050    D
DS$_INVCPU                      = 00660130    D
```

```
DS$_IPL2HI                      = 006600B8    D
DS$_IVADDR                      = 00660040    D
DS$_IVVECT                      = 00660038    D
DS$_KRNLSTK                     = 00660090    D
DS$_LOGIC                       = 00660070    D
DS$_MCHK                        = 00660088    D
DS$_MEM_ALLOC_ERR               = 00660138    D
DS$_MMOFF                       = 00660058    D
DS$_NEEDUNIT                    = 006600F8    D
DS$_NODE                        = 00660128    D
DS$_NOPCS                       = 00660110    D
DS$_NORMAL                      = 00660001    D
DS$_NOSUPPORT                   = 006600B1    D
DS$_NOTALLOWMP                  = 00660148    D
DS$_NOTDON                      = 00660030    D
DS$_NOTIMP                      = 006600B0    D
DS$_NULLSTR                     = 00660010    D
DS$_OVERFLOW                    = 00660008    D
DS$_POWER                       = 00660098    D
DS$_PROGERR                     = 00660020    D
DS$_SEVERE                      = 00660004    D
DS$_TRANSL                      = 006600A0    D
DS$_TRUNCATE                    = 00660028    D
DS$_UNEXPINT                    = 006600D8    D
DS$_UNSUPPDEV                   = 00660158    D
DS$_VASFULL                     = 00660048    D
DS$_WARNING                     = 00660000    D
DSA$AL_APTMAIL                    0000FE00    D
DSA$AT_APTTXT                     0000FA00    D
DSA$GL_APTCOM                     0000FE04    D
DSA$GL_DEVLEN                     0000FE58    D
DSA$GL_ERRNO                      0000FE44    D
DSA$GL_EVENT                      0000FE48    D
DSA$GL_FLAGS                      0000FE00    D
DSA$GL_MSGTYP                     0000FE40    D
DSA$GL_PASSES                     0000FE08    D
DSA$GL_PASSNO                     0000FE54    D
DSA$GL_SECTNO                     0000FE10    D
DSA$GL_SID                        0000FE14    D
DSA$GL_SUBTNO                     0000FE4C    D
DSA$GL_TESTNO                     0000FE50    D
DSA$GL_UNITS                      0000FE0C    D
DSA$GQ_MSGPTR                     0000FE68    D
DSA$GT_DEVNAM                     0000FE5C    D
DSA$V_BINARY                    = 00000001    D
DSA$V_CRD_AUTOTEST_OFF          = 0000000B    D
DSA$V_CRD_MENUTEST_OFF          = 00000010    D
DSA$V_CRD_MENUTEST_ON           = 00000012    D
DSA$V_OPER                      = 0000000C    D
DSA$V_QA                        = 0000000F    D
DSA$V_USER                      = 0000001C    D
DSA$V_VERIFY                    = 00000009    D
DSR$COMPLETION                    ********  X   00
DSX$PRINT                         ********  X   00
DSX$TYPE_OUT                      ********  X   00
DS_ERRSUP                         ********  X   00
DS_GETLINE                        000001E1  RG  D   04
DS_GETLINE_OKAY_X                 00000590  R   D   04
DS_GETLINE_X                      00000593  R   D   04
DS_GETLINE_X_CHECK                0000059B  R   D   04
DS_SUPERLINE                      000001DA  RG  D   04
EXE$ALONONPAGED                   ********      X   00
EXE$DEANONPAGED                   ********      X   00
EXIT                              000005A1  R   D   04
FAB$B_DNS                       = 00000035      D
FAB$B_FNS                       = 00000034      D
FAB$C_BID                       = 00000003      D
FAB$C_BLN                       = 00000050      D
FAB$C_SEQ                       = 00000000      D
FAB$C_VAR                       = 00000002      D
FAB$L_ALQ                       = 00000010      D
FAB$L_DNA                       = 00000030      D
FAB$L_FNA                       = 0000002C      D
FAB$L_FOP                       = 00000004      D
FAB$V_CHAN_MODE                 = 00000002      D
FAB$V_FILE_MODE                 = 00000004      D
FAB$V_LNM_MODE                  = 00000000      D
FAB$W_GBC                       = 00000048      D
FALSE                           = 00000000      D
FMT_PRMT                          00000007  R   D   02
INIT_CONTEXT                      ********      X   00
IO$_READPROMPT                    ********      X   00
IO$_READVBLK                      ********      X   00
IO$_WRITEVBLK                     ********      X   00
L_FLAGS                           000000D0  R   D   03
L_LINK                            000000CC  R   D   03
OFF                             = 00000000      D
ON                              = 00000001      D
PR$_SID_TYP8NN                  = 00000006      D
PR$_SID_TYP8RR                  = 00000011      D
PRINT_LINE                        00000308  R   D   04
PRMT_ADR                          000000C0  R   D   03
PRMT_LEN                          000000C8  R   D   03
PRNT_PRMT                         ********      X   00
QIO$CLEANUP                       ********      X   00
RAB$B_RAC                       = 0000001E      D
RAB$C_BID                       = 00000001      D
RAB$C_BLN                       = 00000044      D
RAB$C_SEQ                       = 00000000      D
RAB$L_CTX                       = 00000018      D
RAB$L_RBF                       = 00000028      D
RAB$L_ROP                       = 00000004      D
RAB$L_UBF                       = 00000024      D
RAB$W_RSZ                       = 00000022      D
RAB$W_USZ                       = 00000020      D
RMS$_EOF                        = 0001827A      D
SC$A_BUF                          00000010      D
SC$C_BLN                        = 00000010      D
SC$L_LINK                         00000000      D
SC$W_CURR                         0000000C      D
SC$W_END                          0000000E      D
SC$W_LEN                          0000000A      D
SC$W_SIZE                         00000008      D
SCAN$COMPARE                      ********      X   00
```

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SCAN$SPACES                     ********    X   00
SCB$L_ACCESS                    00000020     D
SCB$L_ARITH                     00000034     D
SCB$L_BREAK                     0000002C     D
SCB$L_CHME                      00000044     D
SCB$L_CHMK                      00000040     D
SCB$L_CHMS                      00000048     D
SCB$L_CHMU                      0000004C     D
SCB$L_COMPAT                    00000030     D
SCB$L_KNLSTK                    00000008     D
SCB$L_MACHCHK                   00000004     D
SCB$L_OPCCUS                    00000014     D
SCB$L_OPCDEC                    00000010     D
SCB$L_POWER                     0000000C     D
SCB$L_RADRMOD                   0000001C     D
SCB$L_ROPRAND                   00000018     D
SCB$L_RXDB                      000000F8     D
SCB$L_SFTLVL1                   00000084     D
SCB$L_SFTLVL10                  000000A8     D
SCB$L_SFTLVL11                  000000AC     D
SCB$L_SFTLVL12                  000000B0     D
SCB$L_SFTLVL13                  000000B4     D
SCB$L_SFTLVL14                  000000B8     D
SCB$L_SFTLVL15                  000000BC     D
SCB$L_SFTLVL2                   00000088     D
SCB$L_SFTLVL3                   0000008C     D
SCB$L_SFTLVL4                   00000090     D
SCB$L_SFTLVL5                   00000094     D
SCB$L_SFTLVL6                   00000098     D
SCB$L_SFTLVL7                   0000009C     D
SCB$L_SFTLVL8                   000000A0     D
SCB$L_SFTLVL9                   000000A4     D
SCB$L_TBIT                      00000028     D
SCB$L_TIMER                     000000C0     D
SCB$L_TRANSL                    00000024     D
SCB$L_TXDB                      000000FC     D
SCB$L_VM                        00000038     D
SCB$L_ZERO                      00000000     D
SCRIPT$CONT                     000001A2  RG  D   04
SCRIPT$FINISH                   000001B5  R   D   04
SCRIPT$FLUSH                    00000157  RG  D   04
SCRIPT$INIT                     00000000  RG  D   04
SCRIPT$MINCORE                = 00000400   G  D
SCRIPT$OPEN                     0000000A  RG  D   04
SCRIPT$OPEN_X                   00000151  R   D   04
SCRIPT$STOP                     00000199  RG  D   04
SCRIPT_FAB                      0000002C  R   D   03
SCRIPT_RAB                      0000007C  R   D   03
SCRIPT_XAB                      00000000  R   D   03
SIZ...                        = 00000001      D
SS$_CONTROLC                    ********     X   00
SS$_ENDOFFILE                   ********     X   00
SS$_ILLIOFUNC                   ********     X   00
SS$_NORMAL                      ********     X   00
SYS$CLOSE                       ********   G     04
SYS$CONNECT                     ********   G     04
SYS$DISCONNECT                  ********   G     04
SYS$FAO                         ********     X   00
SYS$GET                         ********   G     04
SYS$HIBER                       ********     X   00
SYS$OPEN                        ********   G     04
SYS$QIO                         ********     X   00
SYS$QIOW                        ********   GX    00
SYS$READEF                      ********     X   00
SYS$WAKE                        ********     X   00
TRUE                          = 00000001      D
T_DEF_COM                       0000000E  R   D   02
T_ECHO                          00000045  R   D   02
T_EOF                           00000013  R   D   02
T_NULL                          00000012  R   D   02
T_PNF                           0000004E  R   D   02
T_PROMPT                        0000001B  R   D   02
T_PROMPT2                       00000024  R   D   02
T_PROMPT3                       0000002B  R   D   02
T_SKIP                          00000031  R   D   02
ULTRIX_FLAGS                    ********     X   00
ULTRIX_V_MODE                   ********     X   00
V_ECHOED                      = 00000001      D
XAB$C_FHC                     = 0000001D      D
XAB$C_FHCLEN                  = 0000002C      D
XAB$L_EBK                     = 00000010      D
XAB$L_NXT                     = 00000004      D
XAB$W_FFB                     = 00000014      D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000FE70 (65136.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
DATA	00000071 (113.)	02 (2.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC BYTE
WORK	000000D5 (213.)	03 (3.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC LONG
CODE	0000060F (1551.)	04 (4.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC BYTE

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$.TAB	=0000007C-R	247 (1)	245 (1) 246 (1) 247 (1)
$$.TABEND	=000000C0-R	247 (1)	245 (1) 246 (1) 247 (1)
$$.TMP	=00000000	247 (1)	246 (1) 247 (1)
$$.TMP1	=00000001	888 (1)	394 (1) 425 (1) 434 (1) 448 (1)
			450 (1) 888 (1)
$$.TMP2	=00000062	888 (1)	394 (1) 425 (1) 434 (1) 448 (1)
			450 (1) 888 (1)
$$T1	=00000001	1016 (1)	1004 (1) 1016 (1) 986 (1)
$ER	=00000001	211 (1)	
$MODULE	00000000-R	211 (1)	
ADVANCE	000005D2-R	1165 (1)	#-722 (1)
BEGIN	00000000-XR		177 (1) 478 (1)
BIT...	=00000003	204 (1)	195 (1) 196 (1) 203 (1) 204 (1)
BLD_PRMT	000000C4-R	251 (1)	686 (1) #-689 (1) #-693 (1) 694 (1)
CHECK_STATUS	00000570-R	1028 (1)	#-906 (1) #-991 (1)
CLI$K_BUFSIZ	=00000100	197 (1)	197 (1)
CLI$K_SIZE	0000044C	197 (1)	
CLI$L_ADDRESS	00000018	197 (1)	
CLI$L_COMMAND	00000004	197 (1)	
CLI$L_DATA	0000001C	197 (1)	
CLI$L_FLAGS	00000000	197 (1)	
CLI$L_FLAGS2	00000444	197 (1)	
CLI$L_LAST	00000024	197 (1)	
CLI$L_NEXT	00000030	197 (1)	
CLI$L_PASS	0000002C	197 (1)	
CLI$L_SUBT	00000028	197 (1)	
CLI$L_TEMP_BASE	00000448	197 (1)	
CLI$L_TEST	00000020	197 (1)	
CLI$M_START_OR_RUN	=00000008	197 (1)	
CLI$Q_BUFQWD	00000034	197 (1)	
CLI$Q_FILE	00000008	197 (1)	#-378 (1) #-380 (1)
CLI$Q_SECTION	00000010	197 (1)	
CLI$Q_TIME	0000043C	197 (1)	
CLI$T_BUFFER	0000003C	197 (1)	
CLI$V_ADAPTER	=00000018	197 (1)	
CLI$V_ADR	=0000000B	197 (1)	
CLI$V_ASCII	=00000013	197 (1)	
CLI$V_BASE_QUAL	=00000002	197 (1)	
CLI$V_BREAK	=0000000A	197 (1)	
CLI$V_BRIEF	=0000001B	197 (1)	
CLI$V_BYTE	=0000000D	197 (1)	
CLI$V_CLEAR	=00000002	197 (1)	
CLI$V_DEC	=00000010	197 (1)	
CLI$V_DEFAULT	=0000000C	197 (1)	
CLI$V_DEPOSIT	=00000019	197 (1)	
CLI$V_EVENT	=00000008	197 (1)	
CLI$V_EXAM	=00000005	197 (1)	
CLI$V_FLAGS	=00000009	197 (1)	
CLI$V_HEX	=00000012	197 (1)	
CLI$V_KERNEL	=00000017	197 (1)	

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CLI$V_LOAD                    =00000006     197    (1)
CLI$V_LONG                    =0000000F     197    (1)
CLI$V_NEXT                    =00000001     197    (1)
CLI$V_NOALLOC                 =00000000     197    (1)
CLI$V_NOTNUF                  =00000001     197    (1)
CLI$V_OCT                     =00000011     197    (1)
CLI$V_PREG                    =0000001A     197    (1)
CLI$V_QA                      =00000007     197    (1)
CLI$V_QACKLOOPLOOPS           =0000001C     197    (1)
CLI$V_QAERRORPRINTS           =0000001B     197    (1)
CLI$V_QAMULTIPLEPASS          =0000001F     197    (1)
CLI$V_QASUBTESTLOOPS          =0000001E     197    (1)
CLI$V_QATESTLOOPS             =0000001D     197    (1)
CLI$V_REG                     =00000014     197    (1)
CLI$V_REQUIRED                =00000000     197    (1)
CLI$V_RUN                     =00000015     197    (1)
CLI$V_SET                     =00000003     197    (1)
CLI$V_SHOW                    =00000004     197    (1)
CLI$V_START_OR_RUN            =00000003     197    (1)      197    (1)
CLI$V_VALSEC                  =00000016     197    (1)
CLI$V_WORD                    =0000000E     197    (1)
CLK$RE_INIT                    00000000-XR                  167    (1)
COMMON                         00000234-R   700    (1)    #-675    (1)    #-727    (1)    #-734    (1)    #-757    (1)
CONSOLE                        00000329-R   797    (1)    #-720    (1)    #-767    (1)
COPY_IT                        000005A2-R   1100   (1)    #-1038   (1)    #-770    (1)
CRD$K_CRD_INITIALIZATION      =00000000     204    (1)
CRD$K_DS_CONTROL_C            =00000001     204    (1)
CRD$K_DS_FLAGS                =00000000     204    (1)
CRD$K_FAILURE                 =00000000     204    (1)
CRD$K_HOOK_POINT              =00000000     204    (1)
CRD$K_LAST_ACCESS_CODE        =00000002     204    (1)
CRD$K_LAST_DS_VARIABLE        =00000002     204    (1)
CRD$K_LAST_FUNCTION           =00000002     204    (1)
CRD$K_LAST_HOOK_POINT         =00000001     204    (1)
CRD$K_READ                    =00000000     204    (1)
CRD$K_SUCCESS                 =00000001     204    (1)
CRD$K_TYPECODE                =00000001     204    (1)    #-928    (1)    #-955    (1)
CRD$K_WRITE                   =00000001     204    (1)
DEBUG_THE_SUCKER               00000000-XR                  180    (1)    #-832    (1)
DS$ABORT                       00000000-XR                  167    (1)      761    (1)
DS$CLI                         00000000-XR                  166    (1)
DS$CLRVEC                      00000000-XR                  167    (1)      528    (1)
DS$GA_CRD_DS_INTERFACE         00000000-XR                  181    (1)      929    (1)      956    (1)
DS$GB_QIOACT                   000000D4-R   263    (1)    #-1009   (1)    #-1017   (1)    #-976    (1)    #-988    (1)
DS$GL_CLIBASE                  00000000-XR                  170    (1)      377    (1)
DS$GL_FLAGS                    00000000-XR                  174    (1)      416    (1)      417    (1)      475    (1)
                                                            533    (1)      542    (1)      550    (1)      711    (1)
                                                            876    (1)
DS$GT_BUFFER                   00000000-XR                  176    (1)      801    (1)
DS$GT_PROMPT                   00000000-XR                  165    (1)    #-811    (1)
DS$GW_TTIN                     00000000-XR                #-1016   (1)      169    (1)    #-986    (1)
DS$GW_TTOUT                    00000000-XR                #-1004   (1)      169    (1)
DS$K_BUFSIZ                    00000000-XR                  176    (1)    #-802    (1)
DS$K_ERROR                    =00000002     195    (1)
DS$K_NORMAL                   =00000001     195    (1)
DS$K_PRINTB                   =00000002     203    (1)
DS$K_PRINTF                   =00000001     203    (1)    #-745    (1)    #-754    (1)    #-787    (1)    #-865    (1)
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                                                        #-903    (1)
DS$K_PRINTI                     =00000000     203    (1)
DS$K_PRINTX                     =00000003     203    (1)
DS$K_SEVERE                     =00000004     195    (1)
DS$K_SUBSYS                     =00000066     195    (1)      195    (1)
DS$K_TYPE_ABORT_PROGRAM         =00000014     203    (1)
DS$K_TYPE_ABORT_TEST            =00000013     203    (1)
DS$K_TYPE_COMMAND_ERR           =00000015     203    (1)
DS$K_TYPE_COMMAND_OUT           =00000016     203    (1)
DS$K_TYPE_CRD_AUTOTEST          =0000001A     203    (1)
DS$K_TYPE_DS_PROMPT             =00000001     203    (1)    #-813    (1)    #-927    (1)
DS$K_TYPE_DS_START              =0000001D     203    (1)
DS$K_TYPE_ERRDEV                =00000008     203    (1)
DS$K_TYPE_ERRHARD               =00000006     203    (1)
DS$K_TYPE_ERROR_BODY            =00000009     203    (1)
DS$K_TYPE_ERROR_END             =0000000A     203    (1)
DS$K_TYPE_ERRPREP               =0000001B     203    (1)
DS$K_TYPE_ERRSOFT               =00000007     203    (1)
DS$K_TYPE_ERRSUP                =00000004     203    (1)
DS$K_TYPE_ERRSYS                =00000005     203    (1)
DS$K_TYPE_ERR_HALT              =0000000D     203    (1)
DS$K_TYPE_EXCEPTION             =0000000C     203    (1)
DS$K_TYPE_EXCEPTION_HEAD        =0000000B     203    (1)
DS$K_TYPE_FIRST_PASS            =00000011     203    (1)
DS$K_TYPE_GENERAL               =00000000     203    (1)
DS$K_TYPE_GENERAL_ERROR         =00000003     203    (1)
DS$K_TYPE_NO_TESTS              =00000012     203    (1)
DS$K_TYPE_PARAM_ERROR           =0000001C     203    (1)
DS$K_TYPE_PROGRAM_END           =00000010     203    (1)
DS$K_TYPE_PROGRAM_INFO          =00000017     203    (1)
DS$K_TYPE_PROGRAM_START         =0000000F     203    (1)
DS$K_TYPE_QIO_INVADP            =00000024     203    (1)
DS$K_TYPE_QIO_NODRIVER          =00000022     203    (1)
DS$K_TYPE_QIO_WRONGVER          =00000023     203    (1)
DS$K_TYPE_SCRIPT_ECHO           =00000021     203    (1)    #-904    (1)
DS$K_TYPE_SCRIPT_PNF            =0000001E     203    (1)    #-746    (1)
DS$K_TYPE_SCRIPT_PROMPT         =00000020     203    (1)    #-788    (1)    #-866    (1)
DS$K_TYPE_SCRIPT_SKIP           =0000001F     203    (1)    #-755    (1)
DS$K_TYPE_SEQUENCE_ERROR        =00000019     203    (1)
DS$K_TYPE_START_ERR             =00000018     203    (1)
DS$K_TYPE_START_LIST            =00000025     203    (1)
DS$K_TYPE_SUMMARY               =0000000E     203    (1)
DS$K_TYPE_USER_PROMPT           =00000002     203    (1)    #-806    (1)    #-954    (1)
DS$K_WARNING                    =00000000     195    (1)
DS$LOAD                          00000000-XR                    166    (1)
DS$M_ABRTFLG                    =00000040     196    (1)
DS$M_BADTIME                    =00100000     196    (1)
DS$M_BATCH                      =00400000     196    (1)
DS$M_BRKCLR                     =00001000     196    (1)
DS$M_BRKPT                      =00000800     196    (1)
DS$M_CHARFLG                    =00000100     196    (1)
DS$M_CMDFLG                     =00000080     196    (1)
DS$M_CTRLC                      =00000001     196    (1)
DS$M_CTRLO                      =00010000     196    (1)
DS$M_DEVFLG                     =00000200     196    (1)
DS$M_DISABLCC                   =01000000     196    (1)
DS$M_DONFLG                     =00002000     196    (1)
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DS$M_ERRFLG                     =00000010      196     (1)
DS$M_EXCEPT                     =00080000      196     (1)
DS$M_EXETST                     =00040000      196     (1)
DS$M_HLTFLG                     =00000008      196     (1)
DS$M_LODFLG                     =00000002      196     (1)
DS$M_MEMMGT                     =00008000      196     (1)
DS$M_NI                         =04000000      196     (1)
DS$M_OUTPUT                     =00800000      196     (1)
DS$M_RUBFLG                     =00000020      196     (1)
DS$M_SCRIPT                     =00200000      196     (1)
DS$M_SETIMR                     =02000000      196     (1)
DS$M_STRFLG                     =00000004      196     (1)
DS$M_SUBT                       =00004000      196     (1)
DS$M_SYSFLG                     =00000400      196     (1)
DS$M_TIMED                      =02000000      196     (1)
DS$M_TIMED_OUT                  =08000000      196     (1)
DS$M_TIMRON                     =00020000      196     (1)
DS$RAB_INPUT                     00000000-XR                    178     (1)      884     (1)
DS$RAB_OUTPUT                    00000000-XR                    178     (1)      883     (1)
DS$V_ABRTFLG                    =00000006      196     (1)
DS$V_BADTIME                    =00000014      196     (1)
DS$V_BATCH                      =00000016      196     (1)    #-876    (1)
DS$V_BRKCLR                     =0000000C      196     (1)
DS$V_BRKPT                      =0000000B      196     (1)
DS$V_CHARFLG                    =00000008      196     (1)
DS$V_CMDFLG                     =00000007      196     (1)
DS$V_CTRLC                      =00000000      196     (1)    #-417    (1)
DS$V_CTRLO                      =00000010      196     (1)
DS$V_DEVFLG                     =00000009      196     (1)
DS$V_DISABLCC                   =00000018      196     (1)
DS$V_DONFLG                     =0000000D      196     (1)
DS$V_ERRFLG                     =00000004      196     (1)
DS$V_EXCEPT                     =00000013      196     (1)
DS$V_EXETST                     =00000012      196     (1)
DS$V_HLTFLG                     =00000003      196     (1)
DS$V_LODFLG                     =00000001      196     (1)
DS$V_MEMMGT                     =0000000F      196     (1)
DS$V_NI                         =0000001A      196     (1)
DS$V_OUTPUT                     =00000017      196     (1)
DS$V_RUBFLG                     =00000005      196     (1)
DS$V_SCRIPT                     =00000015      196     (1)    #-475    (1)    #-533    (1)    #-542    (1)    #-550    (1)
                                                              #-711    (1)
DS$V_SETIMR                     =00000019      196     (1)
DS$V_STRFLG                     =00000002      196     (1)    #-416    (1)
DS$V_SUBT                       =0000000E      196     (1)
DS$V_SYSFLG                     =0000000A      196     (1)
DS$V_TIMED                      =00000019      196     (1)
DS$V_TIMED_OUT                  =0000001B      196     (1)
DS$V_TIMRON                     =00000011      196     (1)
DS$_AP_NORMAL_BREAK             =00660150      195     (1)
DS$_ARITH                       =006600D0      195     (1)
DS$_ASBE                        =00660118      195     (1)
DS$_BADLINK                     =006600F0      195     (1)
DS$_BADTYPE                     =006600E8      195     (1)
DS$_BIIC                        =00660120      195     (1)
DS$_CHME                        =006600A8      195     (1)
DS$_CHMK                        =006600E0      195     (1)
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DS$_DEVNAME                     =00660108      195     (1)
DS$_ERROR                       =00660002      195     (1)
DS$_FHWE                        =00660068      195     (1)
DS$_FRAGBUF                     =00660080      195     (1)
DS$_ICBUSY                      =006600C8      195     (1)
DS$_ICERR                       =006600C0      195     (1)
DS$_IHWE                        =00660060      195     (1)
DS$_ILLCHAR                     =00660018      195     (1)
DS$_ILLPAGCNT                   =00660078      195     (1)
DS$_ILLUNIT                     =00660100      195     (1)
DS$_INIT_FAIL                   =00660140      195     (1)
DS$_INSFMEM                     =00660050      195     (1)
DS$_INVCPU                      =00660130      195     (1)
DS$_IPL2HI                      =006600B8      195     (1)
DS$_IVADDR                      =00660040      195     (1)
DS$_IVVECT                      =00660038      195     (1)
DS$_KRNLSTK                     =00660090      195     (1)
DS$_LOGIC                       =00660070      195     (1)
DS$_MCHK                        =00660088      195     (1)
DS$_MEM_ALLOC_ERR               =00660138      195     (1)
DS$_MMOFF                       =00660058      195     (1)
DS$_NEEDUNIT                    =006600F8      195     (1)
DS$_NODE                        =00660128      195     (1)
DS$_NOPCS                       =00660110      195     (1)
DS$_NORMAL                      =00660001      195     (1)
DS$_NOSUPPORT                   =006600B1      195     (1)
DS$_NOTALLOWMP                  =00660148      195     (1)
DS$_NOTDON                      =00660030      195     (1)
DS$_NOTIMP                      =006600B0      195     (1)       195     (1)
DS$_NULLSTR                     =00660010      195     (1)
DS$_OVERFLOW                    =00660008      195     (1)
DS$_POWER                       =00660098      195     (1)
DS$_PROGERR                     =00660020      195     (1)
DS$_SEVERE                      =00660004      195     (1)
DS$_TRANSL                      =006600A0      195     (1)
DS$_TRUNCATE                    =00660028      195     (1)
DS$_UNEXPINT                    =006600D8      195     (1)
DS$_UNSUPPDEV                   =00660158      195     (1)
DS$_VASFULL                     =00660048      195     (1)
DS$_WARNING                     =00660000      195     (1)       195     (1)
DSA$GL_FLAGS                     0000FE00                        1008    (1)      365    (1)      525    (1)      531    (1)
                                                                 783    (1)      804    (1)      862    (1)      913    (1)
                                                                 914    (1)      915    (1)      975    (1)
DSA$GL_SID                       0000FE14                      #-521    (1)    #-523    (1)
DSA$V_BINARY                    =00000001                      #-804    (1)
DSA$V_CRD_AUTOTEST_OFF          =0000000B                      #-913    (1)
DSA$V_CRD_MENUTEST_OFF          =00000010                      #-915    (1)
DSA$V_CRD_MENUTEST_ON           =00000012                      #-914    (1)
DSA$V_OPER                      =0000000C                      #-862    (1)
DSA$V_QA                        =0000000F                      #-531    (1)
DSA$V_USER                      =0000001C                     #-1008    (1)    #-365    (1)    #-525    (1)    #-975    (1)
DSA$V_VERIFY                    =00000009                      #-783    (1)
DSR$COMPLETION                   00000000-XR                    167    (1)      395    (1)      454    (1)
DSX$PRINT                        00000000-XR                    166    (1)      747    (1)      756    (1)      789    (1)
                                                                867    (1)      905    (1)
DSX$TYPE_OUT                     00000000-XR                    179    (1)      850    (1)
DS_ERRSUP                        00000000-XR                    166    (1)
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DS_GETLINE                  000001E1-R   677    (1)
DS_GETLINE_OKAY_X           00000590-R   1044   (1)    #-868    (1)
DS_GETLINE_X                00000593-R   1047   (1)    #-1005   (1)    #-1006   (1)    #-1029   (1)    #-1030   (1)
                                                       #-1034   (1)    #-894    (1)
DS_GETLINE_X_CHECK          0000059B-R   1051   (1)      775    (1)
DS_SUPERLINE                000001DA-R   672    (1)
EXE$ALONONPAGED             00000000-XR                 175    (1)    #-406    (1)
EXE$DEANONPAGED             00000000-XR                 175    (1)    #-473    (1)    #-598    (1)
EXIT                        000005A1-R   1056   (1)    #-1053   (1)
FAB$B_DNS                  =00000035                   #-382    (1)
FAB$B_FNS                  =00000034                   #-379    (1)
FAB$C_BID                  =00000003                    246    (1)
FAB$C_BLN                  =00000050                    246    (1)
FAB$C_SEQ                  =00000000                    246    (1)
FAB$C_VAR                  =00000002                    246    (1)
FAB$L_ALQ                  =00000010                    246    (1)
FAB$L_DNA                  =00000030                   #-384    (1)
FAB$L_FNA                  =0000002C                   #-381    (1)
FAB$L_FOP                  =00000004                    246    (1)
FAB$V_CHAN_MODE            =00000002                    246    (1)
FAB$V_FILE_MODE            =00000004                    246    (1)
FAB$V_LNM_MODE             =00000000                    246    (1)
FAB$W_GBC                  =00000048                    246    (1)
FALSE                      =00000000     204    (1)
FMT_PRMT                    00000007-R   213    (1)    #-690    (1)      691    (1)    #-693    (1)
INIT_CONTEXT                00000000-XR                 177    (1)      364    (1)
IO$_READPROMPT              00000000-XR                 173    (1)    #-986    (1)
IO$_READVBLK                00000000-XR                #-1016   (1)      173    (1)
IO$_WRITEVBLK               00000000-XR                #-1004   (1)      173    (1)
L_FLAGS                     000000D0-R   258    (1)
L_LINK                      000000CC-R   255    (1)    #-319    (1)    #-414    (1)    #-415    (1)    #-535    (1)
                                                       #-548    (1)    #-595    (1)    #-597    (1)    #-600    (1)
                                                       #-712    (1)
OFF                        =00000000     204    (1)
ON                         =00000001     204    (1)
PR$_SID_TYP8NN             =00000006     191    (1)    #-521    (1)
PR$_SID_TYP8RR             =00000011     192    (1)    #-523    (1)
PRINT_LINE                  00000308-R   782    (1)    #-726    (1)    #-733    (1)    #-769    (1)
PRMT_ADR                    000000C0-R   249    (1)
PRMT_LEN                    000000C8-R   253    (1)
PRNT_PRMT                   00000000-XR                 183    (1)    #-679    (1)
QIO$CLEANUP                 00000000-XR                 177    (1)      366    (1)
RAB$B_RAC                  =0000001E                    247    (1)
RAB$C_BID                  =00000001                    247    (1)
RAB$C_BLN                  =00000044                    247    (1)
RAB$C_SEQ                  =00000000                    247    (1)
RAB$L_CTX                  =00000018                    247    (1)
RAB$L_RBF                  =00000028                   #-899    (1)
RAB$L_ROP                  =00000004                    247    (1)
RAB$L_UBF                  =00000024                   #-428    (1)    #-886    (1)
RAB$W_RSZ                  =00000022                   #-436    (1)    #-896    (1)
RAB$W_USZ                  =00000020                   #-429    (1)    #-432    (1)    #-887    (1)
RMS$_EOF                   =0001827A                   #-452    (1)    #-890    (1)
SC$A_BUF                    00000010     277    (1)    #-1173   (1)     1182    (1)      418    (1)    #-419    (1)
                                                       #-465    (1)      751    (1)
SC$C_BLN                   =00000010     278    (1)      405    (1)
SC$L_LINK                   00000000     271    (1)    #-414    (1)    #-597    (1)
```

```
SC$W_CURR                       0000000C     275     (1)    #-1166   (1)    #-1179   (1)    #-1180   (1)    #-750    (1)
SC$W_END                        0000000E     276     (1)    #-1171   (1)    #-465    (1)
SC$W_LEN                        0000000A     274     (1)    #-1167   (1)    #-1181   (1)    #-752    (1)    #-759    (1)
                                                            #-760    (1)
SC$W_SIZE                       00000008     273     (1)    #-413    (1)    #-467    (1)
SCAN$COMPARE                    00000000-XR                   168     (1)    #-738    (1)
SCAN$SPACES                     00000000-XR                   168     (1)    #-763    (1)
SCB$L_TIMER                     000000C0                    #-528    (1)
SCRIPT$CONT                     000001A2-R   546     (1)
SCRIPT$FINISH                   000001B5-R   592     (1)    #-1186   (1)    #-455    (1)    #-534    (1)
SCRIPT$FLUSH                    00000157-R   520     (1)    #-363    (1)
SCRIPT$INIT                     00000000-R   318     (1)
SCRIPT$MINCORE                 =00000400     190     (1)
SCRIPT$OPEN                     0000000A-R   362     (1)
SCRIPT$OPEN_X                   00000151-R   477     (1)    #-397    (1)    #-457    (1)
SCRIPT$STOP                     00000199-R   541     (1)    #-320    (1)    #-547    (1)    #-603    (1)
SCRIPT_FAB                      0000002C-R   246     (1)     247     (1)     376     (1)
SCRIPT_RAB                      0000007C-R   247     (1)     389     (1)
SCRIPT_XAB                      00000000-R   245     (1)     246     (1)     372     (1)
SIZ...                         =00000001     196     (1)     196     (1)
SS$_CONTROLC                    00000000-XR                   172     (1)
SS$_ENDOFFILE                   00000000-XR                 #-1032    (1)    #-1187   (1)     172     (1)    #-892    (1)
SS$_ILLIOFUNC                   00000000-XR                   172     (1)    #-989    (1)
SS$_NORMAL                      00000000-XR                 #-1045    (1)    #-1183   (1)     172     (1)    #-605    (1)
                                                            #-773     (1)    #-944    (1)    #-971    (1)
SYS$CLOSE                       00000000-XR                   450     (1)
SYS$CONNECT                     00000000-XR                   425     (1)
SYS$DISCONNECT                  00000000-XR                   448     (1)
SYS$FAO                         00000000-XR                   171     (1)     824     (1)     848     (1)
SYS$GET                         00000000-XR                   434     (1)     888     (1)
SYS$HIBER                       00000000-XR                   171     (1)
SYS$OPEN                        00000000-XR                   394     (1)
SYS$QIO                         00000000-XR                   171     (1)
SYS$QIOW                        00000000-XR                  1004     (1)    1016     (1)     171     (1)     986     (1)
SYS$READEF                      00000000-XR                   171     (1)
SYS$WAKE                        00000000-XR                   171     (1)
TRUE                           =00000001     204     (1)
T_DEF_COM                       0000000E-R   216     (1)     383     (1)
T_ECHO                          00000045-R   237     (1)     902     (1)
T_EOF                           00000013-R   222     (1)     724     (1)
T_NULL                          00000012-R   219     (1)     702     (1)
T_PNF                           0000004E-R   240     (1)     744     (1)
T_PROMPT                        0000001B-R   225     (1)     786     (1)
T_PROMPT2                       00000024-R   228     (1)     798     (1)
T_PROMPT3                       0000002B-R   231     (1)     864     (1)
T_SKIP                          00000031-R   234     (1)     753     (1)
ULTRIX_FLAGS                    00000000-XR                  1110     (1)     182     (1)
ULTRIX_V_MODE                   00000000-XR                #-1110     (1)     182     (1)
V_ECHOED                       =00000001     261     (1)
XAB$C_FHC                      =0000001D                    245     (1)
XAB$C_FHCLEN                   =0000002C                    245     (1)
XAB$L_EBK                      =00000010                  #-403     (1)
XAB$L_NXT                      =00000004                    245     (1)
XAB$W_FFB                      =00000014                  #-404     (1)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	37	00:00:00.02	00:00:00.21
Command processing	931	00:00:00.31	00:00:00.83
Pass 1	844	00:00:03.40	00:00:06.74
Symbol table sort	0	00:00:00.27	00:00:00.26
Pass 2	19	00:00:00.91	00:00:01.91
Symbol table output	2	00:00:00.06	00:00:00.25
Psect synopsis output	0	00:00:00.00	00:00:00.00
Cross-reference output	5	00:00:00.26	00:00:00.44
Assembler run totals	1840	00:00:05.23	00:00:10.64

The working set limit was 3400 pages.
204019 bytes (399 pages) of virtual memory were used to buffer the intermediate code.
There were 60 pages of symbol table space allocated to hold 1060 non-local and 60 local symbols.
1189 source lines were read in Pass 1, producing 80 object records in Pass 2.
74 pages of virtual memory were used to define 56 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	5
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	19
DISK$DS:[DS.LOCAL.RELEASE.WORK]CRD.MLB;1	1
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	27
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	52

1465 GETS were required to define 52 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element SHOWMEMORY.B32
;    0002  0      !  4    15-MAR-1988 13:49:34 MI "Defined external symbols for macro CMK"
;    0003  0      ! *3    16-SEP-1987 15:33:18 GEARIN "CHANGED MFPR CALLS TO CALL CMK MACRO [SO MODE CAN BE CHANGED IF NECCESSARY] BEF
;    0004  0      !EXAMINED"
;    0005  0      ! *2    21-MAR-1986 15:27:48 BAGGETT "DISPLAY OF ULTRIX BUFFER ADDED"
;    0006  0      ! *1     6-FEB-1986 15:22:30 DS ""
;    0007  0      ! DEC/CMS REPLACEMENT HISTORY, Element SHOWMEMORY.B32
;    0008  0      %Title '*** SHOWMEM Handle Show Memory command'
;    0009  0      Module ShowMemory (                                ! Supervisor SHOW MEMORY command
;    0010  0                         Ident = '10.10-3',                                                  !G:3
;    0011  0                         Addressing_Mode (External = Long_Relative),
;    0012  0                         Debug,
;    0013  0                         OptLevel = 3,
;    0014  0                         NoZip
;    0015  0                         ) =
;    0016  0      !
;    0017  0      ! Copyright (c) 1982, 1983, 1984, 1986                                               !G:2
;    0018  0      ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
;    0019  0      !
;    0020  0      ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
;    0021  0      ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
;    0022  0      ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
;    0023  0      ! MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
;    0024  0      ! EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
;    0025  0      ! TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
;    0026  0      ! REMAIN IN DEC.
;    0027  0      !
;    0028  0      ! THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
;    0029  0      ! AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
;    0030  0      ! CORPORATION.
;    0031  0      !
;    0032  0      ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
;    0033  0      ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
;    0034  0      !
;    0035  0
;    0036  0      !++
;    0037  0      ! Facility:
;    0038  0      !
;    0039  0      !       Diagnostic Supervisor
;    0040  0      !
;    0041  0      ! Abstract:
;    0042  0      !
;    0043  0      !       List physical memory map (virtual in user mode).
;    0044  0      !
;    0045  0      ! Environment:
;    0046  0      !
;    0047  0      !       Diagnostic Supervisor
;    0048  0      !
;    0049  0      ! Author:
;    0050  0      !
;    0051  0      !       Dave Butenhof           05-Feb-1982
;    0052  0      !
;    0053  0      ! Modified by:
;    0054  0      !
;    0055  0      ! [01] Dave Butenhof, 25-Mar-1982, version 6.7
;    0056  0      !       Fix order of non-paged pool and lookaside list typeouts,
;    0057  0      !       mask out region select bits (31, 32) on P0BR and P1BR addresses
```

```
;    0058  0      !       (to make them physical, not virtual), and change top-of-DS and
;    0059  0      !       physical-memory-size messages to show Kb, not bytes (easier to
;    0060  0      !       read).  Also, print amount of available buffer space on /Buffer,
;    0061  0      !       and cut down on code some by setting all option bits if /All is
;    0062  0      !       set, instead of checking it throughout.
;    0063  0      !
;    0064  0      ! [02] Richard Brown, 9-July-82, Version 6.8
;    0065  0      !       Add printing of debugger memory allocation.
;    0066  0      !
;    0067  0      ! [03] Jack Stansbury, 14-September-1982, Version 6.9
;    0068  0      !       Added showing the buffer count.
;    0069  0      !
;    0070  0      !       04      Bob Bergazzi    May 17, 1983    version 6.11
;    0071  0      !               Changed the order of searching libraries.
;    0072  0      !
;    0073  0      !       05      Bob Bergazzi    Aug 29,1983     Version 6.13
;    0074  0      !               Added the VRSETMEM routine which sets a new memory
;    0075  0      !               size and then starts VDS at 10000. Doesn't get
;    0076  0      !               here in user mode.
;    0077  0      !
;    0078  0      !       06      Bob Bergazzi    Feb 14, 1984    Version 6.14
;    0079  0      !               Fixed VRSETMEM to call INI$LOAD_DEVICE which
;    0080  0      !               makes ptables for the console and boot devices.
;    0081  0      !                                                                       !G:2
;    0082  0      !       07      M. Baggett      10-March-1986   Version 10              !G:2
;    0083  0      !               Added printout for ULTRIX buffer.                       !G:2
;    0084  0      !                                                                       !G:3
;    0085  0      !       ******* VERSION #'s CORRESPOND TO GENERATION #'S FOR NOW ON *******  !G:3
;    0086  0      !                                                                       !G:3
;    0087  0      !       03      David Gearin    15-Sept-1987    Version 10.10           !G:3
;    0088  0      !               Modified showmemory routine to call cmk macro instead   !G:3
;    0089  0      !               of merely moving ipr values via MFPR.  This allows for  !G:3
;    0090  0      !               showing of ipr's when the current mode is not kernel.   !G:3
;    0091  0      !--
;    0092  0
;    0093  1      begin
;    0094  1      !
;    0095  1      ! Table of contents:
;    0096  1      !
;    0097  1
;    0098  1      !
;    0099  1      ! Include files:
;    0100  1      !
;    0101  1
;    0102  1      Library '$Diag';                        !                               [04]
;    0103  1
;    0104  1      Library '$Ds';                          !                               [04]
;    0105  1
;    0106  1      Library 'Sys$Library:Lib';              !                               [04]
;    0107  1
;    0108  1      !
;    0109  1      ! Included macros and literals                                          !G:3
;    0110  1      !                                                                       !G:3
;    0111  1      !                                                                       !G:3
;    0112  1      ! Macros:
;    0113  1      !                                                                       !G:3
;    0114  1              CMKDEF;                                                        !G:3
```

```
;    0115  1
;    0116  1     !                                                                                    !G:3
;    0117  1     ! Psect Definitions:
;    0118  1     !
;    0119  1
;    0120  1     Psect Plit   = Data (NoExecute, Share, NoWrite, Addressing_Mode (Long_Relative));
;    0121  1     Psect Own    = Work (NoExecute, NoShare, Write, Addressing_Mode (Long_Relative));
;    0122  1     Psect Global = Work (NoExecute, NoShare, Write, Addressing_Mode (Long_Relative));
;    0123  1     Psect Code   = Code (Execute, Share, NoWrite);
;    0124  1
;    0125  1     !
;    0126  1     ! Equated Symbols:
;    0127  1     !
;    0128  1
;    0129  1     $Ds_DsaDef;                                         ! Define DSA locations
;    0130  1     $Ds_TypeDef;                                        ! Define type codes
;    0131  1
;    0132  1     linkage                                                                              !G:3
;    0133  1             jsb_mfpr = jsb: GLOBAL (r3 = 3, r5 = 5);                                     !G:3
;    0134  1     Literal                                             ! Bits in ShowMemoryFlags
;    0135  1         Sm_V_Map = 0,                                   ! /Map
;    0136  1         Sm_V_Buffer = 1,                                ! /Buffer
;    0137  1         Sm_V_Data = 2,                                  ! /Data_Structure
;    0138  1         Sm_V_All = 3,                                   ! /All
;    0139  1         CR = 13,
;    0140  1         LF = 10;
;    0141  1
;    0142  1     Bind                                                ! Format strings
;    0143  1         Format = $Ascic ('!22<!XL !-(%D!SL)!> : !AC!/'),
;    0144  1         Format2= $Ascic ('!22<!XL !-(%D!SL)!> : !AC!AC!/'),
;    0145  1         Format3= $Ascic ('!22<!XL !-(%D!SL)!> :  !AC!AC!/'),
;    0146  1         Format4= $Ascic ('!22<!XL (!SLKb)!> : !AC!/'),      !                            [01]
;    0147  1         Format5= $Ascic ('!22<!XL (!SLKb)!> : !AC!AC!/'),   !                            [01]
;    0148  1         Format6= $Ascic ('!22  : !AC!/');                   !              [02]
;    0149  1
;    0150  1     Bind                                                ! Common text parts
;    0151  1         T_Reserved  = $Ascic ('Reserved page'),
;    0152  1         T_DS        = $Ascic ('Diagnostic Supervisor'),
;    0153  1         T_Kernel    = $Ascic ('Kernel'),
;    0154  1         T_Interrupt = $Ascic ('Interrupt'),
;    0155  1         T_Executive = $Ascic ('Executive'),
;    0156  1         T_Supervisor= $Ascic ('Supervisor'),
;    0157  1         T_User      = $Ascic ('User'),
;    0158  1         T_Stack     = $Ascic (' stack base'),
;    0159  1         T_SP        = $Ascic (' SP'),
;    0160  1         T_P0        = $Ascic ('P0'),
;    0161  1         T_P1        = $Ascic ('P1'),
;    0162  1         T_System    = $Ascic ('System'),
;    0163  1         T_Base      = $Ascic (' Page Table base'),
;    0164  1         T_Length    = $Ascic (' Page Table length (longwords)'),
;    0165  1         T_P0_BufCnt = $Ascic ('Pages in P0 space in use for buffers'),      !            [03]
;    0166  1         T_P1_BufCnt = $Ascic ('Pages in P1 space in use for buffers'),      !            [03]
;    0167  1         T_S0_BufCnt = $Ascic ('Pages in System space in use for buffers'),  !            [03]
;    0168  1         T_BufferSpace = $Ascic ('Available  buffer space ');                !            [01]
;    0169  1
;    0170  1     !
;    0171  1     ! Own storage:
```

```
;    0172  1      !
;    0173  1
;    0174  1      Global
;    0175  1          ShowMemoryFlags : BitVector [4],                                                    !G:3
;    0176  1          ds$gl_ipr_value: long;                                                              !G:3
;    0177  1
;    0178  1      !
;    0179  1      ! External references:
;    0180  1      !
;    0181  1
;    0182  1      External
;    0183  1          Ds$GB_TypeCode : Byte,                      ! Type code
;    0184  1          Ds$GL_Flags,                                ! Common flags (LODFLG)
;    0185  1          DS$GL_BufCnt : VECTOR [3, LONG],            ! The three buffer counts                   [03]
;    0186  1          Ax_Buff,                                    ! Actual end of DS image
;    0187  1          Phd_Base,                                   ! Base of Process Header
;    0188  1          Pcb_Base,                                   ! Base of Hardware PCB
;    0189  1          Ds$AX_Jib,                                  ! Base of pseudo JIB
;    0190  1          Ds$AX_Arb,                                  ! Base of pseudo ARB
;    0191  1          Ds$AX_SoftPCB,                              ! Base of pseudo software PCB
;    0192  1          Scb_Base,                                   ! Base of SCB
;    0193  1          Stack_Base,                                 ! Base of stack space
;    0194  1          KStkPtr,                                    ! Beginning of Kernel stack
;    0195  1          IStkPtr,                                    !
;    0196  1          EStkPtr,                                    !
;    0197  1          SStkPtr,                                    !
;    0198  1          UStkPtr,                                    !
;    0199  1          Ds$A_PrgBgn,                                ! Where program starts
;    0200  1          POPT_Base,                                  ! End of built-in storage (_LAST)
;    0201  1          Ds$GL_LookAside,                            ! Start of Look-aside IRP list
;    0202  1          Exe$GL_Splitadr,                            ! Address of non-paged pool split
;    0203  1          Ds$GA_LastAdr,                              ! End of run-time DS
;    0204  1          Ds$GL_MemSize,                              ! Size of physical memory
;    0205  1          DS$GL_SET_MEMSIZE,                          ! Size of physical memory desired           [05]
;    0206  1          debug_lo,                                   ! Bottom of debugger                        [02]
;    0207  1          debug_hi,                                   ! Top of debugger                           [02]
;    0208  1          ultrix_iob_add;                             ! Start of ULTRIX buffer space  [07]  !G:2
;    0209  1
;    0210  1      Forward Routine
;    0211  1          DSR$CheckLoad  : Jsb_None,
;    0212  1          DSV$ShowMemory : Jsb_None NoValue,
;    0213  1          ShowMemory     : NoValue,
;    0214  1          VRSETMEM       : JSB_CLI ;                 !                                           [05]
```

```
;    0216  1     %Sbttl 'Is a program loaded, really?'
;    0217  1
;    0218  1     Global Routine DSR$CheckLoad : Jsb_None =
;    0219  2     Begin                                                                                                                                
```

```
                                .PSECT  WORK,NOEXE,2

00000 SHOWMEMORYFLAGS::
                                .BLKB   1
00001                           .BLKB   3
00004 DS$GL_IPR_VALUE::
                                .BLKB   4

      DSA$AL_APTMAIL=     65024
      DSA$GL_FLAGS=       65024
      DSA$GL_APTCOM=      65028
      DSA$GL_PASSES=      65032
      DSA$GL_UNITS=       65036
      DSA$GL_SECTNO=      65040
      DSA$GL_SID=         65044
      DSA$GL_MSGTYP=      65088
      DSA$GL_ERRNO=       65092
      DSA$GL_EVENT=       65096
      DSA$GL_SUBTNO=      65100
      DSA$GL_TESTNO=      65104
      DSA$GL_PASSNO=      65108
      DSA$GL_DEVLEN=      65112
      DSA$GL_DEVNAM=      65116
      DSA$GL_MSGPTR=      65128
      FORMAT=             P.AAA
      FORMAT2=            P.AAB
      FORMAT3=            P.AAC
      FORMAT4=            P.AAD
      FORMAT5=            P.AAE
      FORMAT6=            P.AAF
      T_RESERVED=         P.AAG
      T_DS=               P.AAH
      T_KERNEL=           P.AAI
      T_INTERRUPT=        P.AAJ
      T_EXECUTIVE=        P.AAK
      T_SUPERVISOR=       P.AAL
      T_USER=             P.AAM
      T_STACK=            P.AAN
      T_SP=               P.AAO
      T_P0=               P.AAP
      T_P1=               P.AAQ
      T_SYSTEM=           P.AAR
      T_BASE=             P.AAS
      T_LENGTH=           P.AAT
      T_P0_BUFCNT=        P.AAU
      T_P1_BUFCNT=        P.AAV
      T_S0_BUFCNT=        P.AAW
      T_BUFFERSPACE=      P.AAX
                .EXTRN  DS$GB_TYPECODE, DS$GL_FLAGS
                .EXTRN  DS$GL_BUFCNT, AX_BUFF
                .EXTRN  PHD_BASE, PCB_BASE
                .EXTRN  DS$AX_JIB, DS$AX_ARB
                .EXTRN  DS$AX_SOFTPCB, SCB_BASE
                .EXTRN  STACK_BASE, KSTKPTR
                .EXTRN  ISTKPTR, ESTKPTR
                .EXTRN  SSTKPTR, USTKPTR
```

```
                                                        .EXTRN  DS$A_PRGBGN, POPT_BASE
                                                        .EXTRN  DS$GL_LOOKASIDE
                                                        .EXTRN  EXE$GL_SPLITADR
                                                        .EXTRN  DS$GA_LASTADR, DS$GL_MEMSIZE
                                                        .EXTRN  DS$GL_SET_MEMSIZE
                                                        .EXTRN  DEBUG_LO, DEBUG_HI
                                                        .EXTRN  ULTRIX_IOB_ADD

                                                        .PSECT  CODE,NOWRT,  SHR,2

                                        50  D4 00000 DSR$CHECKLOAD::
                                                        CLRL    R0                              ; 0220
        01 00000204   9F        08      02  ED 00002            CMPZV   #2, #8, @#^X00000204, #1    ;
                                        02  12 0000B            BNEQ    1$                      ;
                                        50  D6 0000D            INCL    R0                      ;
        51 00000000G  EF        01      01  EF 0000F 1$:       EXTZV   #1, #1, DS$GL_FLAGS, R1     ;
                                51      51  D2 00018            MCOML   R1, R1                  ;
                                50      51  CA 0001B            BICL2   R1, R0                  ;
                                            05 0001E            RSB                             ;

; Routine Size:  31 bytes,    Routine Base:  CODE + 0000
```

```
;   0223  1     %Sbttl 'DSV$ShowMemory routine'
;   0224  1
;   0225  1     Global Routine DSV$ShowMemory : Jsb_None NoValue =
;   0226  2         Begin
;   0227  2         ShowMemory ()                                   ! Just CALLS routine
;   0228  1         End;



                        0000V  CF          00  FB 00000 DSV$SHOWMEMORY::
                                                        CALLS   #0, SHOWMEMORY                          ; 0227
                                               05 00005 RSB                                             ; 0228

; Routine Size:  6 bytes,    Routine Base:  CODE + 001F
```

```
;    0230  1      %Sbttl 'ShowMemory Routine'
;    0231  1
;    0232  1      Routine ShowMemory : NoValue =
;    0233  2          Begin
;    0234  2
;    0235  2          Local
;    0236  2              temp_psl: BitVector [32],                                                   !G:3
;    0237  2              Temp,
;    0238  2              MemoryFlags : BitVector [4],
;    0239  2              OnLine : Byte;
;    0240  2                                                                                          !G:3
;    0241  2           global register                                                                !G:3
;    0242  2              r3 = 3, r5 = 5;                                                             !G:3
;    0243  2
;    0244  2          MemoryFlags = .ShowMemoryFlags<0, 4>;              ! Get flags locally
;    0245  2
;    0246  2          If .MemoryFlags Eql 0                              ! Default is /Map
;    0247  2          Then
;    0248  2              MemoryFlags [Sm_V_Map] = 1;
;    0249  2                                                                                          !G:3
;    0250  2          If .MemoryFlags [Sm_V_All]                         ! Set all option bits if /All                    [01]
;    0251  2          Then                                               !                                                [01]
;    0252  3              Begin                                          !                                                [01]
;    0253  3              MemoryFlags [Sm_V_Map] = 1;                    !                                                [01]
;    0254  3              MemoryFlags [Sm_V_Buffer] = 1;                 !                                                [01]
;    0255  3              MemoryFlags [Sm_V_Data] = 1                    !                                                [01]
;    0256  2              End;                                           !                                                [01]
;    0257  2
;    0258  2          OnLine = .Dsa$V_User;                              ! Get user mode bit locally
;    0259  2          Ds$GB_TypeCode = Ds$K_Type_Command_Out;
;    0260  2
;    0261  2          If .MemoryFlags [Sm_V_Map]                         !                                                [01]
;    0262  2          Then
; P  0263  2              $Ds_PrintF (                                   ! First page of memory
; P  0264  2                  Format,
; P  0265  2                  0,
; P  0266  2                  T_Reserved
;    0267  2                  );
;    0268  2
;    0269  2          If .MemoryFlags [Sm_V_Map]                         !                                                [01]
;    0270  2          Then
; P  0271  2              $Ds_PrintF (                                   ! Begin of diagnostic
; P  0272  2                  Format,
; P  0273  2                  Ds$A_PrgBgn,
; P  0274  2                  $Ascic ('Beginning of diagnostic region')
;    0275  2                  );
;    0276  2
;    0277  2          If .MemoryFlags [Sm_V_Map] And DSR$CheckLoad ()    !                                                [01]
;    0278  2          Then
; P  0279  2              $Ds_PrintF (                                   ! End of diagnostic
; P  0280  2                  Format,
; P  0281  2                  .L$A_LastAdr,
; P  0282  2                  $Ascic ('End of loaded diagnostic')
;    0283  2                  );
;    0284  2
;    0285  2          If .MemoryFlags [Sm_V_Buffer]                      ! If /Buffer or /All                             [01]
;    0286  2           And Dsr$CheckLoad ()                              ! .. and diagnostic is loaded                    [01]
```

```
;   0287  2          Then                                                  !                                                  [01]
; P 0288  2              $Ds_PrintF (                                      ! Available buffer space                           [01]
; P 0289  2                  Format5,                                      !                                                  [01]
; P 0290  2                  %X'FA00' - .L$A_LastAdr,                      ! .. amount available                              [01]
; P 0291  2                  (%X'FA00' - .L$A_LastAdr)/1024,               ! .. same in Kb                                    [01]
; P 0292  2                  T_BufferSpace,                                !                                                  [01]
; P 0293  2                  $Ascic ('below Supervisor')                   !                                                  [01]
;   0294  2                  );                                            !                                                  [01]
;   0295  2
;   0296  2          If .MemoryFlags [Sm_V_Map] Or .MemoryFlags [Sm_V_Data]      !                                            [01]
;   0297  2          Then
; P 0298  2              $Ds_PrintF (                                      ! APT Ptext buffer
; P 0299  2                  Format,
; P 0300  2                  %X'FA00',
; P 0301  2                  $Ascic ('APT Ptext buffer')
;   0302  2                  );
;   0303  2
;   0304  2          If .MemoryFlags [Sm_V_Map]                            !                                                  [01]
;   0305  2           Or .MemoryFlags [Sm_V_Data]
;   0306  2          Then
; P 0307  2              $Ds_PrintF (                                      ! APT mailbox
; P 0308  2                  Format,
; P 0309  2                  %X'FE00',
; P 0310  2                  $Ascic ('APT Mailbox')
;   0311  2                  );
;   0312  2
;   0313  2          If .MemoryFlags [Sm_V_Map]                            !                                                  [01]
;   0314  2          Then
; P 0315  2              $Ds_PrintF (                                      ! Begin of Supervisor
; P 0316  2                  Format2,
; P 0317  2                  %X'10000',
; P 0318  2                  $Ascic ('Beginning of '),
; P 0319  2                  T_DS
;   0320  2                  );
;   0321  2
;   0322  2          If .MemoryFlags [Sm_V_Map]                            !                                                  [01]
;   0323  2          Then
; P 0324  2              $Ds_PrintF (                                      ! Top of DS image
; P 0325  2                  Format,
; P 0326  2                  Ax_Buff,
; P 0327  2                  $Ascic ('End of Supervisor load image')
;   0328  2                  );
;   0329  2
;   0330  2          If .MemoryFlags [Sm_V_Data] And Not .OnLine           !                                                  [01]
;   0331  2          Then
;   0332  3              Begin
; P 0333  3              $Ds_PrintF (                                      ! PHD
; P 0334  3                  Format,
; P 0335  3                  Phd_Base,
; P 0336  3                  $Ascic ('PHD')
;   0337  3                  );
; P 0338  3              $Ds_PrintF (                                      ! hardware PCB
; P 0339  3                  Format,
; P 0340  3                  Pcb_Base,
; P 0341  3                  $Ascic ('Hardware PCB')
;   0342  3                  );
; P 0343  3              $Ds_PrintF (                                      ! JIB
```

```
;  P 0344  3                Format,
;  P 0345  3                Ds$AX_Jib,
;  P 0346  3                $Ascic ('JIB')
;    0347  3                );
;  P 0348  3            $Ds_PrintF (                        ! ARB
;  P 0349  3                Format,
;  P 0350  3                Ds$AX_Arb,
;  P 0351  3                $Ascic ('ARB')
;    0352  3                );
;  P 0353  3            $Ds_PrintF (                        ! software PCB
;  P 0354  3                Format,
;  P 0355  3                Ds$AX_SoftPCB,
;  P 0356  3                $Ascic ('Software PCB')
;    0357  3                );
;  P 0358  3            $Ds_PrintF (                        ! SCB
;  P 0359  3                Format,
;  P 0360  3                SCB_Base,
;  P 0361  3                $Ascic ('SCB')
;    0362  3                );                                                    !G:3
;  P 0363  3            $Ds_PrintF (                        ! Reserved page
;  P 0364  3                Format,
;  P 0365  3                Stack_Base,
;  P 0366  3                T_Reserved
;    0367  3                );
;    0368  3            r3 = pr$_ksp;                                             !G:3
;    0369  3            r5 = 1;                                                   !G:3
;    0370  3            cmk (sgipr);                                              !G:3
;  P 0371  3            $Ds_PrintF (                        ! Kernel Stack pointer
;  P 0372  3                Format2,                        !                    [03]
;  P 0373  3                .ds$gl_ipr_value,                                     !G:3
;  P 0374  3                T_Kernel,
;  P 0375  3                T_SP
;    0376  3                );
;  P 0377  3            $Ds_PrintF (                        ! Kernel Stack pointer base
;  P 0378  3                Format3,                        !                    [03]
;  P 0379  3                KStkPtr,
;  P 0380  3                T_Kernel,
;  P 0381  3                T_Stack
;    0382  3                );
;    0383  3            r3 = pr$_isp;                                             !G:3
;    0384  3            r5 = 1;                                                   !G:3
;    0385  3            cmk (sgipr);                                              !G:3
;  P 0386  3            $Ds_PrintF (                        ! Interrupt Stack pointer
;  P 0387  3                Format2,                        !                    [03]
;  P 0388  3                .ds$gl_ipr_value,                                     !G:3
;  P 0389  3                T_Interrupt,
;  P 0390  3                T_SP
;    0391  3                );
;  P 0392  3            $Ds_PrintF (                        ! Interrupt Stack pointer base
;  P 0393  3                Format3,                        !                    [03]
;  P 0394  3                IStkPtr,
;  P 0395  3                T_Interrupt,
;  P 0396  3                T_Stack
;    0397  3                );
;    0398  3            r3 = pr$_esp;                                             !G:3
;    0399  3            r5 = 1;                                                   !G:3
;    0400  3            cmk (sgipr);                                              !G:3
```

```
;P 0401  3              $Ds_PrintF (                        ! Executive Stack pointer
;P 0402  3                  Format2,                        !                                   [03]
;P 0403  3                  .ds$gl_ipr_value,                                                   !G:3
;P 0404  3                  T_Executive,
;P 0405  3                  T_SP
;   0406  3                  );
;P 0407  3              $Ds_PrintF (                        ! Executive Stack pointer base
;P 0408  3                  Format3,                        !                                   [03]
;P 0409  3                  EStkPtr,
;P 0410  3                  T_Executive,
;P 0411  3                  T_Stack
;   0412  3                  );
;   0413  3              r3 = pr$_ssp;                                                           !G:3
;   0414  3              r5 = 1;                                                                 !G:3
;   0415  3              cmk (sgipr);                                                            !G:3
;P 0416  3              $Ds_PrintF (                        ! Supervisor Stack pointer
;P 0417  3                  Format2,                        !                                   [03]
;P 0418  3                  .ds$gl_ipr_value,                                                   !G:3
;P 0419  3                  T_Supervisor,
;P 0420  3                  T_SP
;   0421  3                  );
;P 0422  3              $Ds_PrintF (                        ! Supervisor Stack pointer base
;P 0423  3                  Format3,                        !                                   [03]
;P 0424  3                  SStkPtr,
;P 0425  3                  T_Supervisor,
;P 0426  3                  T_Stack
;   0427  3                  );
;   0428  3              r3 = pr$_usp;                                                           !G:3
;   0429  3              r5 = 1;                                                                 !G:3
;   0430  3              cmk (sgipr);                                                            !G:3
;P 0431  3              $Ds_PrintF (                        ! User Stack pointer
;P 0432  3                  Format2,                        !                                   [03]
;P 0433  3                  .ds$gl_ipr_value,                                                   !G:3
;P 0434  3                  T_User,
;P 0435  3                  T_SP
;   0436  3                  );
;P 0437  3              $Ds_PrintF (                        ! User Stack pointer base
;P 0438  3                  Format3,                        !                                   [03]
;P 0439  3                  UStkPtr,
;P 0440  3                  T_User,
;P 0441  3                  T_Stack
;   0442  3                  );
;   0443  3              r3 = pr$_p0br;                                                          !G:3
;   0444  3              r5 = 1;                                                                 !G:3
;   0445  3              cmk (sgipr);                                                            !G:3
;P 0446  3              $Ds_PrintF (                        ! P0 Page table                     !G:3
;P 0447  3                  Format2,
;P 0448  3                  .ds$gl_ipr_value<0, 30>,            !
;P 0449  3                  T_P0,
;P 0450  3                  T_Base
;   0451  3                  );
;   0452  3              r3 = pr$_p0lr;                                                          !G:3
;   0453  3              r5 = 1;                                                                 !G:3
;   0454  3              cmk (sgipr);                                                            !G:3
;P 0455  3              $Ds_PrintF (                        ! P0 Page table
;P 0456  3                  Format3,                                                            !G:3
;P 0457  3                  .ds$gl_ipr_value,                                                   !G:3
```

```
;  P 0458  3                T_P0,
;  P 0459  3                T_Length
;    0460  3                );
;    0461  3            r3 = pr$_p1br;                                                          !G:3
;    0462  3            r5 = 1;                                                                 !G:3
;    0463  3            cmk (sgipr);                                                            !G:3
;  P 0464  3            $Ds_PrintF (                    ! P1 Page table                         !G:3
;  P 0465  3                Format2,
;  P 0466  3                .ds$gl_ipr_value<0, 30>,          !
;  P 0467  3                T_P1,
;  P 0468  3                T_Base
;    0469  3                );
;    0470  3            r3 = pr$_p1lr;                                                          !G:3
;    0471  3            r5 = 1;                                                                 !G:3
;    0472  3            cmk (sgipr);                                                            !G:3
;  P 0473  3            $Ds_PrintF (                    ! P1 Page table                         !G:3
;  P 0474  3                Format3,                                                            !G:3
;  P 0475  3                .ds$gl_ipr_value,                                                   !G:3
;  P 0476  3                T_P1,
;  P 0477  3                T_Length
;    0478  3                );
;    0479  3            r3 = pr$_sbr;                                                           !G:3
;    0480  3            r5 = 1;                                                                 !G:3
;    0481  3            cmk (sgipr);                                                            !G:3
;  P 0482  3            $Ds_PrintF (                    ! System Page table
;  P 0483  3                Format2,
;  P 0484  3                .ds$gl_ipr_value,                                                   !G:3
;  P 0485  3                T_System,
;  P 0486  3                T_Base
;    0487  3                );                                                                  !G:3
;    0488  3            r3 = pr$_slr;                                                           !G:3
;    0489  3            r5 = 1;                                                                 !G:3
;    0490  3            cmk (sgipr);                                                            !G:3
;  P 0491  3            $Ds_PrintF (                    ! System Page table
;  P 0492  3                Format3,
;  P 0493  3                .ds$gl_ipr_value,                                                   !G:3
;  P 0494  3                T_System,
;  P 0495  3                T_Length
;    0496  4                )
;    0497  2            End;
;    0498  2        If .MemoryFlags [Sm_V_Map]          !                                                   [07]
;    0499  2         Then                                                                       !G:2
;  P 0500  2            $Ds_PrintF (                    ! ULTRIX buffer space   [07]            !G:2
;  P 0501  2                Format,                                                            !G:2
;  P 0502  2                .ultrix_iob_add,                                                   !G:2
;  P 0503  2                $Ascic ('Start of ULTRIX buffer space')                            !G:2
;    0504  2                );                                                                 !G:2
;    0505  2
;    0506  2         If .MemoryFlags [Sm_V_Map] Or .MemoryFlags [Sm_V_Data]      !                       [01]
;    0507  2         Then
;    0508  3            Begin
;  P 0509  3            $Ds_PrintF (                    ! Non-Paged Pool
;  P 0510  3                Format,
;  P 0511  3                .Ds$GL_LookAside,
;  P 0512  3                $Ascic ('Start of Supervisor memory pool')
;    0513  3                );
;    0514  3
```

```
;    0515  3              If .Ds$GL_LookAside Neq .Exe$GL_SplitAdr
;    0516  3              Then
; P  0517  3                  $Ds_PrintF (                                ! Lookaside list start
; P  0518  3                      Format,
; P  0519  3                      .Exe$GL_SplitAdr,
; P  0520  3                      $Ascic ('Start of IRP Look-aside list')
;    0521  3                      );
;    0522  3
;    0523  2                  End;
;    0524  2
;    0525  2              If .MemoryFlags [Sm_V_Map]                      !                                [01]
;    0526  2               Or .MemoryFlags [Sm_V_Data]
;    0527  2              Then
; P  0528  2                  $Ds_PrintF (                                ! Top of run-time DS
; P  0529  2                      Format5,
; P  0530  2                      .Ds$GA_LastAdr,
; P  0531  2                      (.Ds$GA_LastAdr + 1023)/1024,           ! # of Kb (next higher)          [01]
; P  0532  2                      $Ascic ('Top of run-time '),
; P  0533  2                      T_DS
;    0534  2                      );
;    0535  2
;    0536  2              If .MemoryFlags [Sm_V_Buffer]                   ! If /Buffer or /All             [01]
;    0537  3               And (.Ds$GL_MemSize Gtr .Ds$GA_LastAdr)        !                                [01]
;    0538  2              Then                                            !                                [01]
; P  0539  2                  $Ds_PrintF (                                ! Available buffer space         [01]
; P  0540  2                      Format5,                                !                                [01]
; P  0541  2                      .Ds$GL_MemSize - .Ds$GA_LastAdr,        ! .. amount available            [01]
; P  0542  2                      (.Ds$GL_MemSize - .Ds$GA_LastAdr)/1024, ! .. same in Kb                  [01]
; P  0543  2                      T_BufferSpace,                          !                                [01]
; P  0544  2                      $Ascic ('above Supervisor')             !                                [01]
;    0545  2                      );                                      !                                [01]
;    0546  2
;    0547  2              If .MemoryFlags [Sm_V_Buffer] Then              ! If /Buffer or /All             [03]
;    0548  3                  Begin                                       !                                [03]
; P  0549  3                  $DS_PrintF (                                ! Print the amount of buffer space being used in  [03]
; P  0550  3                      Format,                                 ! . . . P0 space.                [03]
; P  0551  3                      .DS$GL_BufCnt [0],                      ! . . . This is the number of pages  [03]
; P  0552  3                      T_P0_BufCnt                             !                                [03]
;    0553  3                      );                                      !                                [03]
; P  0554  3                  $DS_PrintF (                                ! Print the amount of buffer space being used in  [03]
; P  0555  3                      Format,                                 ! . . . P1 space.                [03]
; P  0556  3                      .DS$GL_BufCnt [1],                      ! . . . This is the number of pages  [03]
; P  0557  3                      T_P1_BufCnt                             !                                [03]
;•   0558  3                      );                                      !                                [03]
; P  0559  3                  $DS_PrintF (                                ! Print the amount of buffer space being used in  [03]
; P  0560  3                      Format,                                 ! . . . S0 space.                [03]
; P  0561  3                      .DS$GL_BufCnt [2],                      ! . . . This is the number of pages  [03]
; P  0562  3                      T_S0_BufCnt                             !                                [03]
;    0563  3                      );                                      !                                [03]
;    0564  2                  End;                                        !                                [03]
;    0565  2
;    0566  2              If .dsa$v_debug                                 !If debugger is loaded, print its limits.  [02]
;    0567  2              then
;    0568  3                  begin
; P  0569  3                  $ds_printf (format,
; P  0570  3                              .debug_lo,
;    0571  3                             $ascic ('Bottom of debugger'));
```

```
;   0572  3             if not .online
;   0573  3             then
; P 0574  3                 $ds_printf (format6,
;   0575  3                             $ascic (' (includes allocation for symbol tables)'));
; P 0576  3             $ds_printf (format,
; P 0577  3                         .debug_hi,
;   0578  3                         $ascic ('Top of debugger'));
;   0579  2             end;
;   0580  2
;   0581  2         If Not .OnLine
;   0582  2         Then
; P 0583  2             $Ds_PrintF (                                    ! Top of physical memory
; P 0584  2                 Format4,
; P 0585  2                 .Ds$GL_MemSize,
; P 0586  2                 .Ds$GL_MemSize/1024,                        ! Kb of memory                                  [01]
; P 0587  2                 $Ascic ('Top of physical memory')
;   0588  2                 );
;   0589  2         Ds$GB_TypeCode = 0;                                 ! Clear sticky typecode
;   0590  1         End;


                                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

64  20  66  6F  20  67  6E  69  6E  6E  69  67  65  42  1E  001C7 P.AAY:  .ASCII  <30>\Beginning of diagnostic region\        ;
6F  69  67  65  72  20  63  69  74  73  6F  6E  67  61  69  001D6                                                            ;
                                                        6E  001E5                                                            ;
20  64  65  64  61  6F  6C  20  66  6F  20  64  6E  45  18  001E6 P.AAZ:  .ASCII  <24>\End of loaded diagnostic\              ;
                    63  69  74  73  6F  6E  67  61  69  64  001F5                                                            ;
73  69  76  72  65  70  75  53  20  77  6F  6C  65  62  10  001FF P.ABA:  .ASCII  <16>\below Supervisor\                      ;
                                                    72  6F  0020E                                                            ;
66  66  75  62  20  74  78  65  74  50  20  54  50  41  10  00210 P.ABB:  .ASCII  <16>\APT Ptext buffer\                      ;
                                                    72  65  0021F                                                            ;
            78  6F  62  6C  69  61  4D  20  54  50  41  0B  00221 P.ABC:  .ASCII  <11>\APT Mailbox\                           ;
    20  66  6F  20  67  6E  69  6E  6E  69  67  65  42  0D  0022D P.ABD:  .ASCII  <13>\Beginning of \                         ;
69  76  72  65  70  75  53  20  66  6F  20  64  6E  45  1C  0023B P.ABE:  .ASCII  <28>\End of Supervisor load image\          ;
    65  67  61  6D  69  20  64  61  6F  6C  20  72  6F  73  0024A                                                            ;
                                            44  48  50  03  00258 P.ABF:  .ASCII  <3>\PHD\                                    ;
        42  43  50  20  65  72  61  77  64  72  61  48  0C  0025C P.ABG:  .ASCII  <12>\Hardware PCB\                          ;
                                            42  49  4A  03  00269 P.ABH:  .ASCII  <3>\JIB\                                    ;
                                            42  52  41  03  0026D P.ABI:  .ASCII  <3>\ARB\                                    ;
        42  43  50  20  65  72  61  77  74  66  6F  53  0C  00271 P.ABJ:  .ASCII  <12>\Software PCB\                          ;
                                            42  43  53  03  0027E P.ABK:  .ASCII  <3>\SCB\                                    ;
49  52  54  4C  55  20  66  6F  20  74  72  61  74  53  1C  00282 P.ABL:  .ASCII  <28>\Start of ULTRIX buffer space\          ;
    65  63  61  70  73  20  72  65  66  66  75  62  20  58  00291                                                            ;
72  65  70  75  53  20  66  6F  20  74  72  61  74  53  1F  0029F P.ABM:  .ASCII  <31>\Start of Supervisor memory pool\       ;
6F  70  20  79  72  6F  6D  65  6D  20  72  6F  73  69  76  002AE                                                            ;
                                                    6C  6F  002BD                                                            ;
4C  20  50  52  49  20  66  6F  20  74  72  61  74  53  1C  002BF P.ABN:  .ASCII  <28>\Start of IRP Look-aside list\          ;
    74  73  69  6C  20  65  64  69  73  61  2D  6B  6F  6F  002CE                                                            ;
6D  69  74  2D  6E  75  72  20  66  6F  20  70  6F  54  10  002DC P.ABO:  .ASCII  <16>\Top of run-time \                      ;
                                                    20  65  002EB                                                            ;
73  69  76  72  65  70  75  53  20  65  76  6F  62  61  10  002ED P.ABP:  .ASCII  <16>\above Supervisor\                      ;
                                                    72  6F  002FC                                                            ;
75  62  65  64  20  66  6F  20  6D  6F  74  74  6F  42  12  002FE P.ABQ:  .ASCII  <18>\Bottom of debugger\                    ;
                                            72  65  67  67  0030D                                                            ;
6C  6C  61  20  73  65  64  75  6C  63  6E  69  28  20  28  00311 P.ABR:  .ASCII  \( (includes allocation for symbol tables\  ;
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```
                                  53  D4 000BE 4$:    CLRL    R3                                  ; 0296
                     05           52  93 000C0        BITB    MEMORYFLAGS, #5                     ;
                                  10  13 000C3        BEQL    5$                                  ;
                                  53  D6 000C5        INCL    R3                                  ;
                          0210    C6  9F 000C7        PUSHAB  P.ABB                               ; 0302
                     7E     FA00  8F  3C 000CB        MOVZWL  #64000, -(SP)                       ;
                                  56  DD 000D0        PUSHL   R6                                  ;
                     67           03  FB 000D2        CALLS   #3, DS$PRINTF                       ;
                     0E           53  E9 000D5 5$:    BLBC    R3, 6$                              ; 0304
                          0221    C6  9F 000D8        PUSHAB  P.ABC                               ; 0311
                     7E     FE00  8F  3C 000DC        MOVZWL  #65024, -(SP)                       ;
                                  56  DD 000E1        PUSHL   R6                                  ;
                     67           03  FB 000E3        CALLS   #3, DS$PRINTF                       ;
                     26           52  E9 000E6 6$:    BLBC    MEMORYFLAGS, 7$                     ; 0313
                          00AD    C6  9F 000E9        PUSHAB  T_DS                                ; 0320
                          022D    C6  9F 000ED        PUSHAB  P.ABD                               ;
                       00010000   8F  DD 000F1        PUSHL   #65536                              ;
                             1C   A6  9F 000F7        PUSHAB  FORMAT2                             ;
                     67           04  FB 000FA        CALLS   #4, DS$PRINTF                       ;
                     0F           52  E9 000FD        BLBC    MEMORYFLAGS, 7$                     ; 0322
                          023B    C6  9F 00100        PUSHAB  P.ABE                               ; 0328
                       00000000G  EF  9F 00104        PUSHAB  AX_BUFF                             ;
                                  56  DD 0010A        PUSHL   R6                                  ;
                     67           03  FB 0010C        CALLS   #3, DS$PRINTF                       ;
          03         52           02  E0 0010F 7$:    BBS     #2, MEMORYFLAGS, 9$                 ; 0330
                                02AE  31 00113 8$:    BRW     32$                                 ;
                     FA           54  E8 00116 9$:    BLBS    ONLINE, 8$                          ;
                          0258    C6  9F 00119        PUSHAB  P.ABF                               ; 0337
                       00000000G  EF  9F 0011D        PUSHAB  PHD_BASE                            ;
                                  56  DD 00123        PUSHL   R6                                  ;
                     67           03  FB 00125        CALLS   #3, DS$PRINTF                       ;
                          025C    C6  9F 00128        PUSHAB  P.ABG                               ; 0342
                       00000000G  EF  9F 0012C        PUSHAB  PCB_BASE                            ;
                                  56  DD 00132        PUSHL   R6                                  ;
                     67           03  FB 00134        CALLS   #3, DS$PRINTF                       ;
                          0269    C6  9F 00137        PUSHAB  P.ABH                               ; 0347
                       00000000G  EF  9F 0013B        PUSHAB  DS$AX_JIB                           ;
                                  56  DD 00141        PUSHL   R6                                  ;
                     67           03  FB 00143        CALLS   #3, DS$PRINTF                       ;
                          026D    C6  9F 00146        PUSHAB  P.ABI                               ; 0352
                       00000000G  EF  9F 0014A        PUSHAB  DS$AX_ARB                           ;
                                  56  DD 00150        PUSHL   R6                                  ;
                     67           03  FB 00152        CALLS   #3, DS$PRINTF                       ;
                          0271    C6  9F 00155        PUSHAB  P.ABJ                               ; 0357
                       00000000G  EF  9F 00159        PUSHAB  DS$AX_SOFTPCB                       ;
                                  56  DD 0015F        PUSHL   R6                                  ;
                     67           03  FB 00161        CALLS   #3, DS$PRINTF                       ;
                          027E    C6  9F 00164        PUSHAB  P.ABK                               ; 0362
                       00000000G  EF  9F 00168        PUSHAB  SCB_BASE                            ;
                                  56  DD 0016E        PUSHL   R6                                  ;
                     67           03  FB 00170        CALLS   #3, DS$PRINTF                       ;
                          009F    C6  9F 00173        PUSHAB  T_RESERVED                          ; 0367
                       00000000G  EF  9F 00177        PUSHAB  STACK_BASE                          ;
                                  56  DD 0017D        PUSHL   R6                                  ;
                     67           03  FB 0017F        CALLS   #3, DS$PRINTF                       ;
                                  53  D4 00182        CLRL    R3                                  ; 0368
                     55           01  D0 00184        MOVL    #1, R5                              ; 0369
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                                50  DC 00187          MOVPSL  TEMP_PSL                          ; 0370
      0A          50            1A  E1 00189          BBC     #26, TEMP_PSL, 10$                ;
                  5E            04  C2 0018D          SUBL2   #4, SP                            ;
                  6E            50  D0 00190          MOVL    TEMP_PSL, (SP)                    ;
                                69  16 00193          JSB     CMK$SGIPR                         ;
                                05  11 00195          BRB     11$                               ;
                  50            0A  90 00197 10$:     MOVB    #10, TEMP_CHMK_CODE               ;
                                50  BC 0019A          CHMK    TEMP_CHMK_CODE                    ;
                        00FA    C6  9F 0019C 11$:     PUSHAB  T_SP                              ; 0376
                        00C3    C6  9F 001A0          PUSHAB  T_KERNEL                          ;
                                68  DD 001A4          PUSHL   DS$GL_IPR_VALUE                   ;
                          1C    A6  9F 001A6          PUSHAB  FORMAT2                           ;
                  67            04  FB 001A9          CALLS   #4, DS$PRINTF                     ;
                        00EE    C6  9F 001AC          PUSHAB  T_STACK                           ; 0382
                        00C3    C6  9F 001B0          PUSHAB  T_KERNEL                          ;
                    00000000G   EF  9F 001B4          PUSHAB  KSTKPTR                           ;
                          3B    A6  9F 001BA          PUSHAB  FORMAT3                           ;
                  67            04  FB 001BD          CALLS   #4, DS$PRINTF                     ;
                  53            04  D0 001C0          MOVL    #4, R3                            ; 0383
                  55            01  D0 001C3          MOVL    #1, R5                            ; 0384
                                50  DC 001C6          MOVPSL  TEMP_PSL                          ; 0385
      0A          50            1A  E1 001C8          BBC     #26, TEMP_PSL, 12$                ;
                  5E            04  C2 001CC          SUBL2   #4, SP                            ;
                  6E            50  D0 001CF          MOVL    TEMP_PSL, (SP)                    ;
                                69  16 001D2          JSB     CMK$SGIPR                         ;
                                05  11 001D4          BRB     13$                               ;
                  50            0A  90 001D6 12$:     MOVB    #10, TEMP_CHMK_CODE               ;
                                50  BC 001D9          CHMK    TEMP_CHMK_CODE                    ;
                        00FA    C6  9F 001DB 13$:     PUSHAB  T_SP                              ; 0391
                        00CA    C6  9F 001DF          PUSHAB  T_INTERRUPT                       ;
                                68  DD 001E3          PUSHL   DS$GL_IPR_VALUE                   ;
                          1C    A6  9F 001E5          PUSHAB  FORMAT2                           ;
                  67            04  FB 001E8          CALLS   #4, DS$PRINTF                     ;
                        00EE    C6  9F 001EB          PUSHAB  T_STACK                           ; 0397
                        00CA    C6  9F 001EF          PUSHAB  T_INTERRUPT                       ;
                    00000000G   EF  9F 001F3          PUSHAB  ISTKPTR                           ;
                          3B    A6  9F 001F9          PUSHAB  FORMAT3                           ;
                  67            04  FB 001FC          CALLS   #4, DS$PRINTF                     ;
                  53            01  D0 001FF          MOVL    #1, R3                            ; 0398
                  55            01  D0 00202          MOVL    #1, R5                            ; 0399
                                50  DC 00205          MOVPSL  TEMP_PSL                          ; 0400
      0A          50            1A  E1 00207          BBC     #26, TEMP_PSL, 14$                ;
                  5E            04  C2 0020B          SUBL2   #4, SP                            ;
                  6E            50  D0 0020E          MOVL    TEMP_PSL, (SP)                    ;
                                69  16 00211          JSB     CMK$SGIPR                         ;
                                05  11 00213          BRB     15$                               ;
                  50            0A  90 00215 14$:     MOVB    #10, TEMP_CHMK_CODE               ;
                                50  BC 00218          CHMK    TEMP_CHMK_CODE                    ;
                        00FA    C6  9F 0021A 15$:     PUSHAB  T_SP                              ; 0406
                        00D4    C6  9F 0021E          PUSHAB  T_EXECUTIVE                       ;
                                68  DD 00222          PUSHL   DS$GL_IPR_VALUE                   ;
                          1C    A6  9F 00224          PUSHAB  FORMAT2                           ;
                  67            04  FB 00227          CALLS   #4, DS$PRINTF                     ;
                        00EE    C6  9F 0022A          PUSHAB  T_STACK                           ; 0412
                        00D4    C6  9F 0022E          PUSHAB  T_EXECUTIVE                       ;
                    00000000G   EF  9F 00232          PUSHAB  ESTKPTR                           ;
                          3B    A6  9F 00238          PUSHAB  FORMAT3                           ;
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                    67          04  FB 0023B        CALLS   #4, DS$PRINTF                          ;
                    53          02  D0 0023E        MOVL    #2, R3                                 ; 0413
                    55          01  D0 00241        MOVL    #1, R5                                 ; 0414
                                50  DC 00244        MOVPSL  TEMP_PSL                               ; 0415
          0A        50          1A  E1 00246        BBC     #26, TEMP_PSL, 16$                     ;
                    5E          04  C2 0024A        SUBL2   #4, SP                                 ;
                    6E          50  D0 0024D        MOVL    TEMP_PSL, (SP)                         ;
                                69  16 00250        JSB     CMK$SGIPR                              ;
                                05  11 00252        BRB     17$                                    ;
                    50          0A  90 00254 16$:   MOVB    #10, TEMP_CHMK_CODE                    ;
                                50  BC 00257        CHMK    TEMP_CHMK_CODE                         ;
                          00FA  C6  9F 00259 17$:   PUSHAB  T_SP                                   ; 0421
                          00DE  C6  9F 0025D        PUSHAB  T_SUPERVISOR                           ;
                                68  DD 00261        PUSHL   DS$GL_IPR_VALUE                        ;
                            1C  A6  9F 00263        PUSHAB  FORMAT2                                ;
                    67          04  FB 00266        CALLS   #4, DS$PRINTF                          ;
                          00EE  C6  9F 00269        PUSHAB  T_STACK                                ; 0427
                          00DE  C6  9F 0026D        PUSHAB  T_SUPERVISOR                           ;
                      00000000G EF  9F 00271        PUSHAB  SSTKPTR                                ;
                            3B  A6  9F 00277        PUSHAB  FORMAT3                                ;
                    67          04  FB 0027A        CALLS   #4, DS$PRINTF                          ;
                    53          03  D0 0027D        MOVL    #3, R3                                 ; 0428
                    55          01  D0 00280        MOVL    #1, R5                                 ; 0429
                                50  DC 00283        MOVPSL  TEMP_PSL                               ; 0430
          0A        50          1A  E1 00285        BBC     #26, TEMP_PSL, 18$                     ;
                    5E          04  C2 00289        SUBL2   #4, SP                                 ;
                    6E          50  D0 0028C        MOVL    TEMP_PSL, (SP)                         ;
                                69  16 0028F        JSB     CMK$SGIPR                              ;
                                05  11 00291        BRB     19$                                    ;
                    50          0A  90 00293 18$:   MOVB    #10, TEMP_CHMK_CODE                    ;
                                50  BC 00296        CHMK    TEMP_CHMK_CODE                         ;
                          00FA  C6  9F 00298 19$:   PUSHAB  T_SP                                   ; 0436
                          00E9  C6  9F 0029C        PUSHAB  T_USER                                 ;
                                68  DD 002A0        PUSHL   DS$GL_IPR_VALUE                        ;
                            1C  A6  9F 002A2        PUSHAB  FORMAT2                                ;
                    67          04  FB 002A5        CALLS   #4, DS$PRINTF                          ;
                          00EE  C6  9F 002A8        PUSHAB  T_STACK                                ; 0442
                          00E9  C6  9F 002AC        PUSHAB  T_USER                                 ;
                      00000000G EF  9F 002B0        PUSHAB  USTKPTR                                ;
                            3B  A6  9F 002B6        PUSHAB  FORMAT3                                ;
                    67          04  FB 002B9        CALLS   #4, DS$PRINTF                          ;
                    53          08  D0 002BC        MOVL    #8, R3                                 ; 0443
                    55          01  D0 002BF        MOVL    #1, R5                                 ; 0444
                                50  DC 002C2        MOVPSL  TEMP_PSL                               ; 0445
          0A        50          1A  E1 002C4        BBC     #26, TEMP_PSL, 20$                     ;
                    5E          04  C2 002C8        SUBL2   #4, SP                                 ;
                    6E          50  D0 002CB        MOVL    TEMP_PSL, (SP)                         ;
                                69  16 002CE        JSB     CMK$SGIPR                              ;
                                05  11 002D0        BRB     21$                                    ;
                    50          0A  90 002D2 20$:   MOVB    #10, TEMP_CHMK_CODE                    ;
                                50  BC 002D5        CHMK    TEMP_CHMK_CODE                         ;
                          010B  C6  9F 002D7 21$:   PUSHAB  T_BASE                                 ; 0451
                          00FE  C6  9F 002DB        PUSHAB  T_P0                                   ;
    7E    68        1E          00  EF 002DF        EXTZV   #0, #30, DS$GL_IPR_VALUE, -(SP)        ;
                            1C  A6  9F 002E4        PUSHAB  FORMAT2                                ;
                    67          04  FB 002E7        CALLS   #4, DS$PRINTF                          ;
                    53          09  D0 002EA        MOVL    #9, R3                                 ; 0452
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                        55          01  D0 002ED        MOVL    #1, R5                                  ; 0453
                                    50  DC 002F0        MOVPSL  TEMP_PSL                                ; 0454
                0A      50          1A  E1 002F2        BBC     #26, TEMP_PSL, 22$                      ;
                        5E          04  C2 002F6        SUBL2   #4, SP                                  ;
                        6E          50  D0 002F9        MOVL    TEMP_PSL, (SP)                          ;
                                    69  16 002FC        JSB     CMK$SGIPR                               ;
                                    05  11 002FE        BRB     23$                                     ;
                        50          0A  90 00300 22$:   MOVB    #10, TEMP_CHMK_CODE                     ;
                                    50  BC 00303        CHMK    TEMP_CHMK_CODE                          ;
                            011C    C6  9F 00305 23$:   PUSHAB  T_LENGTH                                ; 0460
                            00FE    C6  9F 00309        PUSHAB  T_P0                                    ;
                                    68  DD 0030D        PUSHL   DS$GL_IPR_VALUE                         ;
                              3B    A6  9F 0030F        PUSHAB  FORMAT3                                 ;
                        67          04  FB 00312        CALLS   #4, DS$PRINTF                           ;
                        53          0A  D0 00315        MOVL    #10, R3                                 ; 0461
                        55          01  D0 00318        MOVL    #1, R5                                  ; 0462
                                    50  DC 0031B        MOVPSL  TEMP_PSL                                ; 0463
                0A      50          1A  E1 0031D        BBC     #26, TEMP_PSL, 24$                      ;
                        5E          04  C2 00321        SUBL2   #4, SP                                  ;
                        6E          50  D0 00324        MOVL    TEMP_PSL, (SP)                          ;
                                    69  16 00327        JSB     CMK$SGIPR                               ;
                                    05  11 00329        BRB     25$                                     ;
                        50          0A  90 0032B 24$:   MOVB    #10, TEMP_CHMK_CODE                     ;
                                    50  BC 0032E        CHMK    TEMP_CHMK_CODE                          ;
                            010B    C6  9F 00330 25$:   PUSHAB  T_BASE                                  ; 0469
                            0101    C6  9F 00334        PUSHAB  T_P1                                    ;
        7E      68      1E          00  EF 00338        EXTZV   #0, #30, DS$GL_IPR_VALUE, -(SP)         ;
                              1C    A6  9F 0033D        PUSHAB  FORMAT2                                 ;
                        67          04  FB 00340        CALLS   #4, DS$PRINTF                           ;
                        53          0B  D0 00343        MOVL    #11, R3                                 ; 0470
                        55          01  D0 00346        MOVL    #1, R5                                  ; 0471
                                    50  DC 00349        MOVPSL  TEMP_PSL                                ; 0472
                0A      50          1A  E1 0034B        BBC     #26, TEMP_PSL, 26$                      ;
                        5E          04  C2 0034F        SUBL2   #4, SP                                  ;
                        6E          50  D0 00352        MOVL    TEMP_PSL, (SP)                          ;
                                    69  16 00355        JSB     CMK$SGIPR                               ;
                                    05  11 00357        BRB     27$                                     ;
                        50          0A  90 00359 26$:   MOVB    #10, TEMP_CHMK_CODE                     ;
                                    50  BC 0035C        CHMK    TEMP_CHMK_CODE                          ;
                            011C    C6  9F 0035E 27$:   PUSHAB  T_LENGTH                                ; 0478
                            0101    C6  9F 00362        PUSHAB  T_P1                                    ;
                                    68  DD 00366        PUSHL   DS$GL_IPR_VALUE                         ;
                              3B    A6  9F 00368        PUSHAB  FORMAT3                                 ;
                        67          04  FB 0036B        CALLS   #4, DS$PRINTF                           ;
                        53          0C  D0 0036E        MOVL    #12, R3                                 ; 0479
                        55          01  D0 00371        MOVL    #1, R5                                  ; 0480
                                    50  DC 00374        MOVPSL  TEMP_PSL                                ; 0481
                0A      50          1A  E1 00376        BBC     #26, TEMP_PSL, 28$                      ;
                        5E          04  C2 0037A        SUBL2   #4, SP                                  ;
                        6E          50  D0 0037D        MOVL    TEMP_PSL, (SP)                          ;
                                    69  16 00380        JSB     CMK$SGIPR                               ;
                                    05  11 00382        BRB     29$                                     ;
                        50          0A  90 00384 28$:   MOVB    #10, TEMP_CHMK_CODE                     ;
                                    50  BC 00387        CHMK    TEMP_CHMK_CODE                          ;
                            010B    C6  9F 00389 29$:   PUSHAB  T_BASE                                  ; 0487
                            0104    C6  9F 0038D        PUSHAB  T_SYSTEM                                ;
                                    68  DD 00391        PUSHL   DS$GL_IPR_VALUE                         ;
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                          1C   A6  9F 00393          PUSHAB  FORMAT2                                  ;
                 67            04  FB 00396          CALLS   #4, DS$PRINTF                            ;
                 53            0D  D0 00399          MOVL    #13, R3                                  ; 0488
                 55            01  D0 0039C          MOVL    #1, R5                                   ; 0489
                               50  DC 0039F          MOVPSL  TEMP_PSL                                 ; 0490
      0A         50            1A  E1 003A1          BBC     #26, TEMP_PSL, 30$                       ;
                 5E            04  C2 003A5          SUBL2   #4, SP                                   ;
                 6E            50  D0 003A8          MOVL    TEMP_PSL, (SP)                           ;
                               69  16 003AB          JSB     CMK$SGIPR                                ;
                               05  11 003AD          BRB     31$                                      ;
                 50            0A  90 003AF 30$:     MOVB    #10, TEMP_CHMK_CODE                      ;
                               50  BC 003B2          CHMK    TEMP_CHMK_CODE                           ;
                       011C    C6  9F 003B4 31$:     PUSHAB  T_LENGTH                                 ; 0496
                       0104    C6  9F 003B8          PUSHAB  T_SYSTEM                                 ;
                               68  DD 003BC          PUSHL   DS$GL_IPR_VALUE                          ;
                          3B   A6  9F 003BE          PUSHAB  FORMAT3                                  ;
                 67            04  FB 003C1          CALLS   #4, DS$PRINTF                            ;
                 0F            52  E9 003C4 32$:     BLBC    MEMORYFLAGS, 33$                         ; 0498
                       0282    C6  9F 003C7          PUSHAB  P.ABL                                    ; 0504
                    00000000G  EF  DD 003CB          PUSHL   ULTRIX_IOB_ADD                           ;
                               56  DD 003D1          PUSHL   R6                                       ;
                 67            03  FB 003D3          CALLS   #3, DS$PRINTF                            ;
                               53  D4 003D6 33$:     CLRL    R3                                       ; 0506
                 05            52  93 003D8          BITB    MEMORYFLAGS, #5                          ;
                               2D  13 003DB          BEQL    34$                                      ;
                               53  D6 003DD          INCL    R3                                       ;
                       029F    C6  9F 003DF          PUSHAB  P.ABM                                    ; 0513
                    00000000G  EF  DD 003E3          PUSHL   DS$GL_LOOKASIDE                          ;
                               56  DD 003E9          PUSHL   R6                                       ;
                 67            03  FB 003EB          CALLS   #3, DS$PRINTF                            ;
   00000000G     EF 00000000G  EF  D1 003EE          CMPL    DS$GL_LOOKASIDE, EXE$GL_SPLITADR         ; 0515
                               0F  13 003F9          BEQL    34$                                      ;
                       02BF    C6  9F 003FB          PUSHAB  P.ABN                                    ; 0521
                    00000000G  EF  DD 003FF          PUSHL   EXE$GL_SPLITADR                          ;
                               56  DD 00405          PUSHL   R6                                       ;
                 67            03  FB 00407          CALLS   #3, DS$PRINTF                            ;
                 20            53  E9 0040A 34$:     BLBC    R3, 35$                                  ; 0525
                       00AD    C6  9F 0040D          PUSHAB  T_DS                                     ; 0534
                       02DC    C6  9F 00411          PUSHAB  P.ABO                                    ;
      50         6A 000003FF  8F  C1 00415          ADDL3   #1023, DS$GA_LASTADR, R0                 ;
      7E         50 00000400  8F  C7 0041D          DIVL3   #1024, R0, -(SP)                         ;
                               6A  DD 00425          PUSHL   DS$GA_LASTADR                            ;
                          75   A6  9F 00427          PUSHAB  FORMAT5                                  ;
                 67            05  FB 0042A          CALLS   #5, DS$PRINTF                            ;
      52         52            01  E1 0042D 35$:     BBC     #1, MEMORYFLAGS, 37$                     ; 0536
                 6A            6B  D1 00431          CMPL    DS$GL_MEMSIZE, DS$GA_LASTADR             ; 0537
                               1C  15 00434          BLEQ    36$                                      ;
                       02ED    C6  9F 00436          PUSHAB  P.ABP                                    ; 0545
                       01AE    C6  9F 0043A          PUSHAB  T_BUFFERSPACE                            ;
      50         6B            6A  C3 0043E          SUBL3   DS$GA_LASTADR, DS$GL_MEMSIZE, R0         ;
      7E         50 00000400  8F  C7 00442          DIVL3   #1024, R0, -(SP)                         ;
                               50  DD 0044A          PUSHL   R0                                       ;
                          75   A6  9F 0044C          PUSHAB  FORMAT5                                  ;
                 67            05  FB 0044F          CALLS   #5, DS$PRINTF                            ;
      2D         52            01  E1 00452 36$:     BBC     #1, MEMORYFLAGS, 37$                     ; 0547
                       013B    C6  9F 00456          PUSHAB  T_P0_BUFCNT                              ; 0553
                    00000000G  EF  DD 0045A          PUSHL   DS$GL_BUFCNT                             ;
```

```
                                    56  DD 00460          PUSHL   R6                                  ;
                        67          03  FB 00462          CALLS   #3, DS$PRINTF                       ;
                            0160    C6  9F 00465          PUSHAB  T_P1_BUFCNT                         ; 0558
                       00000000G    EF  DD 00469          PUSHL   DS$GL_BUFCNT+4                      ;
                                    56  DD 0046F          PUSHL   R6                                  ;
                        67          03  FB 00471          CALLS   #3, DS$PRINTF                       ;
                            0185    C6  9F 00474          PUSHAB  T_S0_BUFCNT                         ; 0563
                       00000000G    EF  DD 00478          PUSHL   DS$GL_BUFCNT+8                      ;
                                    56  DD 0047E          PUSHL   R6                                  ;
                        67          03  FB 00480          CALLS   #3, DS$PRINTF                       ;
          2C 0000FE03   9F          02  E1 00483 37$:     BBC     #2, a#^X0000FE03, 39$               ; 0567
                            02FE    C6  9F 0048B          PUSHAB  P.ABQ                               ; 0571
                       00000000G    EF  DD 0048F          PUSHL   DEBUG_LO                            ;
                                    56  DD 00495          PUSHL   R6                                  ;
                        67          03  FB 00497          CALLS   #3, DS$PRINTF                       ;
                        0B          54  E8 0049A          BLBS    ONLINE, 38$                         ; 0572
                            0311    C6  9F 0049D          PUSHAB  P.ABR                               ; 0575
                            0092    C6  9F 004A1          PUSHAB  FORMAT6                             ;
                        67          02  FB 004A5          CALLS   #2, DS$PRINTF                       ;
                            033A    C6  9F 004A8 38$:     PUSHAB  P.ABS                               ; 0578
                       00000000G    EF  DD 004AC          PUSHL   DEBUG_HI                            ;
                                    56  DD 004B2          PUSHL   R6                                  ;
                        67          03  FB 004B4          CALLS   #3, DS$PRINTF                       ;
                        14          54  E8 004B7 39$:     BLBS    ONLINE, 40$                         ; 0581
                            034A    C6  9F 004BA          PUSHAB  P.ABT                               ; 0588
          7E            6B 00000400 8F  C7 004BE          DIVL3   #1024, DS$GL_MEMSIZE, -(SP)         ;
                                    6B  DD 004C6          PUSHL   DS$GL_MEMSIZE                       ;
                              5B    A6  9F 004C8          PUSHAB  FORMAT4                             ;
                        67          04  FB 004CB          CALLS   #4, DS$PRINTF                       ;
                       00000000G    EF  94 004CE 40$:     CLRB    DS$GB_TYPECODE                      ; 0589
                                        04 004D4          RET                                         ; 0590

; Routine Size:  1237 bytes,    Routine Base:  CODE + 0025


;   0591  1
```

```
;    0593  1      !                                                                          BEGIN   [05]
;    0594  1      %SBTTL 'VRSETMEM'
;    0595  1
;    0596  1      GLOBAL ROUTINE VRSETMEM (CLI_BASE) : JSB_CLI =
;    0597  1
;    0598  1      !++
;    0599  1      ! FUNCTIONAL DESCRIPTION:
;    0600  1      !
;    0601  1      !       This routine is called from the CLI module. It sets the value of
;    0602  1      !       DS$GL_SET_MEMSIZE to the value specified, remaps memory, and goes
;    0603  1      !       to command level (DS>).
;    0604  1      !
;    0605  1      ! CALLER(S):
;    0606  1      !
;    0607  1      !       CLI
;    0608  1      !
;    0609  1      ! FORMAL PARAMETERS:
;    0610  1      !
;    0611  1      !       R2 - Points to the CLI data table base.
;    0612  1      !
;    0613  1      ! IMPLICIT INPUTS:
;    0614  1      !
;    0615  1      !       CLI_BASE [CLI$L_DATA]  - Indicates the new value of memory.
;    0616  1      !
;    0617  1      ! IMPLICIT OUTPUTS:
;    0618  1      !
;    0619  1      !       New value for DS$GL_SET_MEMSIZE.
;    0620  1      !
;    0621  1      ! COMPLETION CODES:
;    0622  1      !
;    0623  1      !       None
;    0624  1      !
;    0625  1      ! SIDE EFFECTS:
;    0626  1      !
;    0627  1      !       Executes user's cleanup code.
;    0628  1      !--
;    0629  1
;    0630  2      BEGIN
;    0631  2
;    0632  2          EXTERNAL ROUTINE
;    0633  2              BEGIN_BLISS : INT,
;    0634  2              DSR$MMENABLE : JSB_0,
;    0635  2              DS_CLEANUP : JSB_NONE,
;    0636  2              INI$LOAD_DEVICE : JSB_NONE,                                !       [06]
;    0637  2              INI$PTABLE : JSB_NONE,
;    0638  2              MAPMEM : JSB_NONE,
;    0639  2              SCRIPT$FLUSH : JSB_NONE;
;    0640  2
;    0641  2          LOCAL
;    0642  2              WASSET;
;    0643  2
;    0644  2          MAP
;    0645  2              CLI_BASE : REF BLOCK [, BYTE];
;    0646  2
;    0647  3          IF (.CLI_BASE [CLI$L_DATA] LSS 0)
;    0648  3              THEN $DS_PRINTF ($ASCIC (%STRING ('?? Error, negative number of pages specified!!', %CHAR (CR, LF))))
;    0649  3              ELSE BEGIN
```

```
;   0650  3                     DS$GL_SET_MEMSIZE = .CLI_BASE [CLI$L_DATA];          ! Set the new value of memory
;   0651  3                     SCRIPT$FLUSH ();                                     ! Flush scripts if console command
;   0652  3                     DS_CLEANUP ();                                       ! Execute user's cleanup code
;   0653  3                     WASSET = DSR$MMENABLE (0);                           ! Turn off memory management
;   0654  3                     MAPMEM ();                                           ! Remap memory with new value
;   0655  3                     IF .WASSET EQL SS$_WASSET THEN DSR$MMENABLE (1);     ! Reset memory management if on before
;   0656  3                     INI$PTABLE ();                                       ! Initialize P-tables
;   0657  3                     INI$LOAD_DEVICE ();                                  ! ATT console and boot devices          [06]
;   0658  3                     BEGIN_BLISS ()                                       ! Reset and go to DS>
;   0659  3                 END
;   0660  1     END;                                                                 !                                End    [05]


                                                        .PSECT  DATA,NOWRT,NOEXE,  SHR,2

61  67  65  6E  20  2C  72  6F  72  72  45  20  3F  3F  30  00361 P.ABU:  .ASCII  \0?? Error, negative number of pages spec\  ;
20  66  6F  20  72  65  62  6D  75  6E  20  65  76  69  74  00370                                                              ;
                    63  65  70  73  20  73  65  67  61  70  0037F                                                              ;
                        0A  0D  21  21  64  65  69  66  69  00389        .ASCII  \ified!!\<13><10>                             ;

                                                        .EXTRN  BEGIN_BLISS, DSR$MMENABLE
                                                        .EXTRN  DS_CLEANUP, INI$LOAD_DEVICE
                                                        .EXTRN  INI$PTABLE, MAPMEM
                                                        .EXTRN  SCRIPT$FLUSH

                                                        .PSECT  CODE,NOWRT,  SHR,2

                                    52  DD 00000 VRSETMEM::
                                                        PUSHL   R2                                          ; 0596
                                1C  A2  D5 00002        TSTL    28(CLI_BASE)                                ; 0647
                                    0F  18 00005        BGEQ    1$                                          ;
                        00000000'   EF  9F 00007        PUSHAB  P.ABU                                       ; 0648
              00000000G  9F             01  FB 0000D    CALLS   #1, @#DS$PRINTF                             ;
                                    45  11 00014        BRB     3$                                          ;
              00000000G  EF       1C  A2  D0 00016 1$:    MOVL    28(CLI_BASE), DS$GL_SET_MEMSIZE         ; 0650
                        00000000G   EF  16 0001E        JSB     SCRIPT$FLUSH                                ; 0651
                        00000000G   EF  16 00024        JSB     DS_CLEANUP                                  ; 0652
                                    50  D4 0002A        CLRL    R0                                          ; 0653
                        00000000G   EF  16 0002C        JSB     DSR$MMENABLE                                ;
                     52             50  D0 00032        MOVL    R0, WASSET                                  ;
                        00000000G   EF  16 00035        JSB     MAPMEM                                      ; 0654
                     09             52  D1 0003B        CMPL    WASSET, #9                                  ; 0655
                                    09  12 0003E        BNEQ    2$                                          ;
                     50             01  D0 00040        MOVL    #1, R0                                      ;
                        00000000G   EF  16 00043        JSB     DSR$MMENABLE                                ;
                        00000000G   EF  16 00049 2$:    JSB     INI$PTABLE                                  ; 0656
                        00000000G   EF  16 0004F        JSB     INI$LOAD_DEVICE                             ; 0657
                        00000000G   EF  16 00055        JSB     BEGIN_BLISS                                 ; 0658
                                    04  BA 0005B 3$:    POPR    #^M<R2>                                     ; 0660
                                    05  0005D          RSB                                                 ;

; Routine Size:  94 bytes,    Routine Base:  CODE + 04FA

;   0661  1
;   0662  1     End                                                  ! End of module
```

```
;   0663  0     Eludom



;                                  PSECT SUMMARY
;
;       Name                    Bytes                        Attributes
;
;  DATA                           914  NOVEC,NOWRT,  RD ,NOEXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  WORK                             8  NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  CODE                          1368  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)



Symbol                    Type  Defined  Referenced ...
------------------------ -------- ----- ---------------
$ASCIC                   Macro    Lib01   143     144     145     146     147     148     151     152     153     154     155
                                          156     157     158     159     160     161     162     163     164     165     166
                                          167     168     274     282     293     301     310     318     327     336     341
                                          346     351     356     361     503     512     520     532     544     571     575
                                          578     587     648
$DS_DSADEF               Macro    Lib01   129
$DS_PRINTF               Macro    Lib01   263     271     279     288     298     307     315     324     333     338     343
                                          348     353     358     363     371     377     386     392     401     407     416
                                          422     431     437     446     455     464     473     482     491     500     509
                                          517     528     539     549     554     559     569     574     576     583     648
$DS_TYPEDEF              Macro    Lib01   130
$EQULST                  Macro    Lib03   114     130
AX_BUFF                  External   186   328a
BEGIN_BLISS              ExtRout    633   658c
CHMK                     Builtin    370   370
                         Builtin    385   385
                         Builtin    400   400
                         Builtin    415   415
                         Builtin    430   430
                         Builtin    445   445
                         Builtin    454   454
                         Builtin    463   463
                         Builtin    472   472
                         Builtin    481   481
                         Builtin    490   490
CLI$L_DATA               Macro    Lib02   647     650
CLI_BASE                 RoutForm   596   645m    647a.   650a.
CMK                      Macro    Lib02   370     385     400     415     430     445     454     463     472     481     490
CMK$SGIPR                ExtRout    370   370c    385e    385c    400e    400c    415e    415c    430e    430c    445e    445c
                                          454e    454c    463e    463c    472e    472c    481e    481c    490e    490c
CMK$_APBOOT              Literal    114
CMK$_ASTEXIT             Literal    114
CMK$_CANTIM              Literal    114
CMK$_HIBER               Literal    114
CMK$_INITSCB             Literal    114
CMK$_LAST                Literal    114
```

Symbol	Type	Defined	Referenced ...										
CMK$_MMENABLE	Literal	114											
CMK$_RCONSOLE	Literal	114											
CMK$_REFRESH	Literal	114											
CMK$_SCHDWK	Literal	114											
CMK$_SETIMR	Literal	114											
CMK$_SETIPL	Literal	114											
CMK$_SETPRT	Literal	114											
CMK$_SGIPR	Literal	114	370	385	400	415	430	445	454	463	472	481	490
CMK$_TCONSOLE	Literal	114											
CMKDEF	Macro	Lib02	114										
CR	Literal	139	648										
DEBUG_HI	External	207	578.										
DEBUG_LO	External	206	571.										
DS$AX_ARB	External	190	352a										
DS$AX_JIB	External	189	347a										
DS$AX_SOFTPCB	External	191	357a										
DS$A_PRGBGN	External	199	275a										
DS$GA_LASTADR	External	203	534.	537.	545.								
DS$GB_TYPECODE	External	183	259=	589=									
DS$GL_BUFCNT	External	185	553.	558.	563.								
DS$GL_FLAGS	External	184	220.										
DS$GL_IPR_VALUE	Global	176	376.	391.	406.	421.	436.	451.	460.	469.	478.	487.	496.
DS$GL_LOOKASIDE	External	201	513.	515.									
DS$GL_MEMSIZE	External	204	537.	545.	588.								
DS$GL_SET_MEMSIZE	External	205	650=										
DS$K_PRINTB	Literal	130											
DS$K_PRINTF	Literal	130											
DS$K_PRINTI	Literal	130											
DS$K_PRINTX	Literal	130											
DS$K_TYPE_ABORT_PROGRAM	Literal	130											
DS$K_TYPE_ABORT_TEST	Literal	130											
DS$K_TYPE_COMMAND_ERR	Literal	130											
DS$K_TYPE_COMMAND_OUT	Literal	130	259										
DS$K_TYPE_CRD_AUTOTEST	Literal	130											
DS$K_TYPE_DS_PROMPT	Literal	130											
DS$K_TYPE_DS_START	Literal	130											
DS$K_TYPE_ERRDEV	Literal	130											
DS$K_TYPE_ERRHARD	Literal	130											
DS$K_TYPE_ERROR_BODY	Literal	130											
DS$K_TYPE_ERROR_END	Literal	130											
DS$K_TYPE_ERRPREP	Literal	130											
DS$K_TYPE_ERRSOFT	Literal	130											
DS$K_TYPE_ERRSUP	Literal	130											
DS$K_TYPE_ERRSYS	Literal	130											
DS$K_TYPE_ERR_HALT	Literal	130											
DS$K_TYPE_EXCEPTION	Literal	130											
DS$K_TYPE_EXCEPTION_HEAD	Literal	130											
DS$K_TYPE_FIRST_PASS	Literal	130											
DS$K_TYPE_GENERAL	Literal	130											
DS$K_TYPE_GENERAL_ERROR	Literal	130											
DS$K_TYPE_NO_TESTS	Literal	130											
DS$K_TYPE_PARAM_ERROR	Literal	130											
DS$K_TYPE_PROGRAM_END	Literal	130											
DS$K_TYPE_PROGRAM_INFO	Literal	130											
DS$K_TYPE_PROGRAM_START	Literal	130											

Symbol	Type	Defined	Referenced ...
DS$K_TYPE_QIO_INVADP	Literal	130	
DS$K_TYPE_QIO_NODRIVER	Literal	130	
DS$K_TYPE_QIO_WRONGVER	Literal	130	
DS$K_TYPE_SCRIPT_ECHO	Literal	130	
DS$K_TYPE_SCRIPT_PNF	Literal	130	
DS$K_TYPE_SCRIPT_PROMPT	Literal	130	
DS$K_TYPE_SCRIPT_SKIP	Literal	130	
DS$K_TYPE_SEQUENCE_ERROR	Literal	130	
DS$K_TYPE_START_ERR	Literal	130	
DS$K_TYPE_START_LIST	Literal	130	
DS$K_TYPE_SUMMARY	Literal	130	
DS$K_TYPE_USER_PROMPT	Literal	130	
DS$PRINTF	ExtRout	267	267c 275e 275c 283e 283c 294e 294c 302e 302c 311e 311c 320e 320c 328e 328c 337e 337c 342e 342c 347e 347c 352e 352c 357e 357c 362e 362c 367e 367c 376e 376c 382e 382c 391e 391c 397e 397c 406e 406c 412e 412c 421e 421c 427e 427c 436e 436c 442e 442c 451e 451c 460e 460c 469e 469c 478e 478c 487e 487c 496e 496c 504e 504c 513e 513c 521e 521c 534e 534c 545e 545c 553e 553c 558e 558c 563e 563c 571e 571c 575e 575c 578e 578c 588e 588c 648e 648c
DS$V_LODFLG	Macro	Lib02	220
DSA$AL_APTMAIL	Bind	129	129
DSA$GL_APTCOM	Bind	129	
DSA$GL_DEVLEN	Bind	129	
DSA$GL_DEVNAM	Bind	129	
DSA$GL_ERRNO	Bind	129	
DSA$GL_EVENT	Bind	129	
DSA$GL_FLAGS	Bind	129	258 566
DSA$GL_MSGPTR	Bind	129	
DSA$GL_MSGTYP	Bind	129	
DSA$GL_PASSES	Bind	129	
DSA$GL_PASSNO	Bind	129	
DSA$GL_SECTNO	Bind	129	
DSA$GL_SID	Bind	129	
DSA$GL_SUBTNO	Bind	129	
DSA$GL_TESTNO	Bind	129	
DSA$GL_UNITS	Bind	129	
DSA$V_DEBUG	Macro	Lib01	566
DSA$V_USER	Macro	Lib01	258
DSR$CHECKLOAD	GlobRout	218	211f 277c 286c
DSR$MMENABLE	ExtRout	634	653c 655c
DSV$SHOWMEMORY	GlobRout	225	212f
DS_CLEANUP	ExtRout	635	652c
ENV$S_SUPER	Literal	Lib01	220
ENV$V_SUPER	Literal	Lib01	220
ENV$_SUPER	Literal	Lib01	220
ESTKPTR	External	196	412a
EXE$GL_SPLITADR	External	202	515. 521.
FORMAT	Bind	143	267a 275a 283a 302a 311a 328a 337a 342a 347a 352a 357a 362a 367a 504a 513a 521a 553a 558a 563a 571a 578a
FORMAT2	Bind	144	320a 376a 391a 406a 421a 436a 451a 469a 487a
FORMAT3	Bind	145	382a 397a 412a 427a 442a 460a 478a 496a
FORMAT4	Bind	146	588a
FORMAT5	Bind	147	294a 534a 545a
FORMAT6	Bind	148	575a

Symbol	Type	Defined	Referenced ...
GET1ST_	Macro	Lib03	114 130
GET2ND_	Unbound		114 130
INI$LOAD_DEVICE	ExtRout	636	657c
INI$PTABLE	ExtRout	637	656c
INT	Linkage	Lib02	633
ISTKPTR	External	195	397a
JSB_0	Linkage	Lib02	634
JSB_CLI	Linkage	Lib02	214 596
JSB_MFPR	Linkage	133	370 385 400 415 430 445 454 463 472 481 490
JSB_NONE	Linkage	Lib02	211 212 218 225 635 636 637 638 639
KSTKPTR	External	194	382a
L$A_LASTADR	Literal	Lib01	283 294
L$L_ENVIRON	Literal	Lib01	220
LF	Literal	140	648
MAPMEM	ExtRout	638	654c
MEMORYFLAGS	Local	238	244= 246. 248= 250. 253= 254= 255= 261. 269. 277. 285. 296. 304. 305. 313. 322. 330. 498. 506. 525. 526. 536. 547.
MOVPSL	Builtin	370	370
	Builtin	385	385
	Builtin	400	400
	Builtin	415	415
	Builtin	430	430
	Builtin	445	445
	Builtin	454	454
	Builtin	463	463
	Builtin	472	472
	Builtin	481	481
	Builtin	490	490
NUL2ND_	Macro	Lib03	114 130
ONLINE	Local	239	258= 330. 572. 581.
P0PT_BASE	External	200	
PCB_BASE	External	188	342a
PHD_BASE	External	187	337a
PR$_ESP	Literal	Lib03	398
PR$_ISP	Literal	Lib03	383
PR$_KSP	Literal	Lib03	368
PR$_P0BR	Literal	Lib03	443
PR$_P0LR	Literal	Lib03	452
PR$_P1BR	Literal	Lib03	461
PR$_P1LR	Literal	Lib03	470
PR$_SBR	Literal	Lib03	479
PR$_SLR	Literal	Lib03	488
PR$_SSP	Literal	Lib03	413
PR$_USP	Literal	Lib03	428
R3	GlobReg	242	368= 383= 398= 413= 428= 443= 452= 461= 470= 479= 488=
R5	GlobReg	242	369= 384= 399= 414= 429= 444= 453= 462= 471= 480= 489=
SCB_BASE	External	192	362a
SCRIPT$FLUSH	ExtRout	639	651c
SHOWMEMORY	Routine	232	213f 227c
SHOWMEMORYFLAGS	Global	175	244.
SM_V_ALL	Literal	138	250
SM_V_BUFFER	Literal	136	254 285 536 547
SM_V_DATA	Literal	137	255 296 305 330 506 526
SM_V_MAP	Literal	135	248 253 261 269 277 296 304 313 322 498 506

Symbol	Type	Defined	Referenced ...				
			525				
SP	Builtin	370	370=	370.	370a=		
	Builtin	385	385=	385.	385a=		
	Builtin	400	400=	400.	400a=		
	Builtin	415	415=	415.	415a=		
	Builtin	430	430=	430.	430a=		
	Builtin	445	445=	445.	445a=		
	Builtin	454	454=	454.	454a=		
	Builtin	463	463=	463.	463a=		
	Builtin	472	472=	472.	472a=		
	Builtin	481	481=	481.	481a=		
	Builtin	490	490=	490.	490a=		
SS$_WASSET	Literal	Lib03	655				
SSTKPTR	External	197	427a				
STACK_BASE	External	193	367a				
TEMP	Local	237					
TEMP_CHMK_CODE	Local	370	370=	370.			
	Local	385	385=	385.			
	Local	400	400=	400.			
	Local	415	415=	415.			
	Local	430	430=	430.			
	Local	445	445=	445.			
	Local	454	454=	454.			
	Local	463	463=	463.			
	Local	472	472=	472.			
	Local	481	481=	481.			
	Local	490	490=	490.			
TEMP_PSL	Local	236					
	Local	370	370=	370.			
	Local	385	385=	385.			
	Local	400	400=	400.			
	Local	415	415=	415.			
	Local	430	430=	430.			
	Local	445	445=	445.			
	Local	454	454=	454.			
	Local	463	463=	463.			
	Local	472	472=	472.			
	Local	481	481=	481.			
	Local	490	490=	490.			
T_BASE	Bind	163	451a	469a	487a		
T_BUFFERSPACE	Bind	160	294a	545a			
T_DS	Bind	152	320a	534a			
T_EXECUTIVE	Bind	155	406a	412a			
T_INTERRUPT	Bind	154	391a	397a			
T_KERNEL	Bind	153	376a	382a			
T_LENGTH	Bind	164	460a	478a	496a		
T_P0	Bind	160	451a	460a			
T_P0_BUFCNT	Bind	165	553a				
T_P1	Bind	161	469a	478a			
T_P1_BUFCNT	Bind	166	558a				
T_RESERVED	Bind	151	267a	367a			
T_S0_BUFCNT	Bind	167	563a				
T_SP	Bind	159	376a	391a	406a	421a	436a
T_STACK	Bind	158	382a	397a	412a	427a	442a
T_SUPERVISOR	Bind	156	421a	427a			

Symbol	Type	Defined	Referenced ...	
T_SYSTEM	Bind	162	487a	496a
T_USER	Bind	157	436a	442a
ULTRIX_IOB_ADD	External	208	504.	
USTKPTR	External	198	442a	
VRSETMEM	GlobRout	596	214f	
WASSET	Local	642	653=	655.

CROSS REFERENCE MAP

Line #	Event	File ...
1	Source (start)	DISK$DS:[DS.LOCAL.RELEASE.WORK]SHOWMEMORY.B32;1
9	Module SHOWMEMORY	
102	Library #1	DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
104	Library #2	DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
106	Library #3	SYS$COMMON:[SYSLIB]LIB.L32;3
663	Eludom SHOWMEMORY	

KEY TO REFERENCE TYPE FLAGS

.	Fetch
=	Store
c	Routine call
a	Address use
a	Indirect use
e	External, external routine, or external literal declaration
f	Forward or forward routine declaration
h	Condition handler enabling
m	Map declaration
u	Undeclare declaration

Library Statistics

File	Symbols Total	Symbols Loaded	Symbols Percent	Pages Mapped	Processing Time
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1	942	11	1	96	00:00.0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1	675	8	1	47	00:00.0
SYS$COMMON:[SYSLIB]LIB.L32;3	21522	15	0	1156	00:00.9

COMMAND QUALIFIERS

```
;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:SHOWMEMORY.B32
```

```
; Size:          1368 code + 922 data bytes
; Run Time:        00:05.8
; Elapsed Time:    00:08.6
; Lines/CPU Min:    6894
; Lexemes/CPU-Min:106492
; Memory Used:  420 pages
; Compilation Complete
```

Table of contents

(3) 249 Declarations
(3) 364 VRStart and VRReStart Routines
(3) 813 VRAbort and DSX$Abort Routines
(4) 950 VRSupport Routines
(4) 1011 DSV$SHOWTESTS
(4) 1050 VRShowSections Routine

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element START.MAR
0000     2 ; *12   11-FEB-1988 13:41:03 MCCARRON "Changed copyright date"
0000     3 ; *11    8-FEB-1988 16:47:24 MCCARRON "Changed according to printrev changes"
0000     4 ; *10   27-AUG-1987 09:49:49 MEIER "CHANGES TO DS"
0000     5 ; *9     9-JUN-1986 10:36:00 BERGAZZI "CHANGE TYPECODE ON /START FOR VSDP"
0000     6 ; *8    28-MAY-1986 13:31:47 BERGAZZI "/TIME CHANGE"
0000     7 ; *7    20-MAY-1986 10:24:37 BERGAZZI "/TIME"
0000     8 ; *6    31-MAR-1986 16:37:36 BAGGETT "FINISHED"
0000     9 ; *5    28-MAR-1986 10:44:01 BAGGETT "DEVICE NAMES SEPARATED WHEN TESTING"
0000    10 ; *4    19-MAR-1986 15:57:35 MUSE "<no reason given>"
0000    11 ; *3    19-MAR-1986 15:44:57 MUSE "<no reason given>"
0000    12 ; *2    10-MAR-1986 10:48:25 ANDELLA "<no reason given>"
0000    13 ; *1     6-FEB-1986 15:22:34 DS ""
0000    14 ; DEC/CMS REPLACEMENT HISTORY, Element START.MAR
0000    15          .TITLE  START   *** START Handle START command
0000    16          .IDENT  /10.11-12/                                          ;G:12
0000    17          .NoShow Conditionals
0000    18
0000    19 ;
0000    20 ; Copyright (c) 1977, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988     ;G:12
0000    21 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000    22 ;
0000    23 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0000    24 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
0000    25 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
0000    26 ; MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
0000    27 ; EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
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0000    33 ; CORPORATION.
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0000    35 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0000    36 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    37
0000    38 ;++
0000    39 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR.
0000    40 ;
0000    41 ; ABSTRACT:     CONTAINS ALL PROGRAM STARTING AND STOPPING FUNCTIONS:
0000    42 ;                        "START" COMMAND SUBROUTINE.
0000    43 ;                        "CONTINUE" COMMAND SUBROUTINE.
0000    44 ;                        "ABORT" COMMAND SUBROUTINE.
0000    45 ;                        $DS_ABORT DIAGNOSTIC SERVICE PROCEDURE.
0000    46 ;
0000    47 ; ENVIRONMENT:
0000    48 ;
0000    49 ; AUTHOR:       KEN CHAPMAN     10-NOV-77       VERSION 01.
```

```
                                0000     51 ; MODIFIED BY:
                                0000     52 ;                    TOM SOUTTER     17-NOV-77       VERSION 02 (ESSAA-3.04).
                                0000     53 ;            01      DSPR #25 - CONTINUE FROM BREAKPOINT PROBLEMS.
                                0000     54 ;            02      DSPR #42 - APT FUNCTION UPDATE.
                                0000     55 ;            03      FIX TO AVOID "BUG CHECK" WHEN PROCEEDING FROM AN EXCEPTION.
                                0000     56 ;
                                0000     57 ;                    KEN CHAPMAN     08-DEC-77       VERSION 03 (ESSAA-3.05).
                                0000     58 ;            04      ADD NEW-LINE TO END OF PROGRAM TITLE MESSAGE.
                                0000     59 ;            05      DSPR #4, #5 - ADDED CONTINUE AND ABORT MESSAGES.
                                0000     60 ;
                                0000     61 ;                    N. HOWGATE      15-FEB-78       VERSION 04 (ESSAA-4.00).
                                0000     62 ;            06      QIO SUPPORT
                                0000     63 ;
                                0000     64 ;                    KEN CHAPMAN     20-MAR-78       VERSION 05 (ESSAA-4.01).
                                0000     65 ;            07      ALLOW CONTINUE FROM ANY BREAKPOINT OR ^C.
                                0000     66 ;            08      ADD TEST COUNT TO PROGRAM TITLE MESSAGE.
                                0000     67 ;            09      CLEAR TIMER VECTOR IN STARTUP SEQUENCE.
                                0000     68 ;                    Roger Riggs     12-Jun-78       VERSION 06 (ESSAA-4.03).
                                0000     69 ;            10      Standardizing program related messages.
                                0000     70 ;                    NICK HOWGATE    23-JUN-78
                                0000     71 ;            11      CORRECT 'APT' ABORT PROBLEM
                                0000     72 ;                    Roger Riggs             07-Aug-78
                                0000     73 ;            12      Install test number range checking, also update DS$GL_NUMTEST.
                                0000     74 ;                    Fix so DS$M_DONFLG is set by DS_CLEANUP and not checked
                                0000     75 ;                    before calling it.
                                0000     76 ;            13      Changes reflected by new structure of basic loop.
                                0000     77 ;                    i.e. START and RESTART commands call test program directly
                                0000     78 ;                    Roger Riggs             23-OCT-1978     VERSION 07 (ESSAA-5.01)
                                0000     79 ;            14      Changes to VRSTART to support new QIO initialization.
                                0000     80 ;            15      Added code to verify that this program is compatible with
                                0000     81 ;                    this supervisor, via ENV$V_SUPER, Value must match
                                0000     82 ;                    ENV$_SUPER, in DIAG. Updated when supervisor interface
                                0000     83 ;                    changes REQUIRE diagnostic changes.
                                0000     84 ;                    Roger Riggs     4-Sept-1979
                                0000     85 ;            17      Removed check of APT flag during start command
                                0000     86 ;                    Roger Riggs, 14-Feb-1980, Vervsion 5.2
                                0000     87 ;            18      Changed so program will not be started if QIO initialization
                                0000     88 ;                    fails, QIO has already printed the error message.
                                0000     89 ;                    Roger Riggs, 12-Mar-1980, Version 5.3
                                0000     90 ;            19      In VRABORT or DSX$ABORT change mode back to kernel before
                                0000     91 ;                    doing cleanup but after the abort message is printed
                                0000     92 ;                    Roger Riggs, 5-Jun-1980, Version 5.4
                                0000     93 ;
                                0000     94 ;            20      Added code to change mode and stack back to kernel
                                0000     95 ;                    before calling cleanup as a result of start.
```

```
                        0000     97 ;       21      - dave butenhof, 09-Sep-1981, version 6.-
                        0000     98 ;               It is desirable, under APT, and if program error had
                        0000     99 ;               occured, to have ABORT leave machine state intact, for
                        0000    100 ;               purposes of isolating error.  Add special code to skip
                        0000    101 ;               INIT_CONTEXT and CLEANUP calls if in APT mode and error
                        0000    102 ;               flag set.
                        0000    103 ;
                        0000    104 ;       22      - Marion Baggett 80-oct-1981 Version 6.-
                        0000    105 ;               Added new entry point to support command SHOW SUPPORT
                        0000    106 ;
                        0000    107 ;       23      - Jack Stansbury, 21-Oct-1981, Version 6.-
                        0000    108 ;               Added calls to QA$MAIN for the QA enhancement.
                        0000    109 ;               Also added .LIBRARY statements for $DS and $DIAG.
                        0000    110 ;
                        0000    111 ;       24      - Jack Stansbury, 22-Oct-1981, Version 6.-
                        0000    112 ;               Fixed truncation errors.
                        0000    113 ;
                        0000    114 ;       25      - Jack Stansbury, 26-Oct-1981, Version 6.-
                        0000    115 ;               Changed most of the error messages to mixed case
                        0000    116 ;               (as per government affirmative action regulations)!
                        0000    117 ;
                        0000    118 ;       26      - Dave Butenhof, 19-Nov-1981, version 6.-
                        0000    119 ;               Add type codes to printouts
                        0000    120 ;
                        0000    121 ;       27      - Jack Stansbury, 16-Nov-1981, Version 6.5
                        0000    122 ;               Added the VRSHOWSECTIONS routine.
                        0000    123 ;
                        0000    124 ;       28      - Jack Stansbury, 21-Nov-1981, Version 6.5
                        0000    125 ;               Commented out three of the calls to QA_MAIN because it
                        0000    126 ;               appears they will not be needed for the 6.5 DS version.
                        0000    127 ;
                        0000    128 ;       29      - Jack Stansbury, 5-Jan-1982, Version 6.6
                        0000    129 ;               Added comments to the START routine in preparation for the
                        0000    130 ;               version 30 changes. Also took out the commented-out calls
                        0000    131 ;               to QA_MAIN since I will not be needing them.
                        0000    132 ;
                        0000    133 ;       30      - Jack Stansbury, 6-Jan-1982, Version 6.6
                        0000    134 ;               Added code and moved other code around in the START routine so
                        0000    135 ;               as to facilitate the "QA Start Loop".
                        0000    136 ;
                        0000    137 ;       31      - Jack Stansbury, 15-Jan-1982, Version 6.6
                        0000    138 ;               Changed the FMT_PROG header line so that it would print the
                        0000    139 ;               number of tests on the first line. Only the time appears on the
                        0000    140 ;               second line. This is in keeping with the EndPass message and
                        0000    141 ;               the End-Of-Looping message (in EndSub).
                        0000    142 ;
                        0000    143 ;       32      - Jack Stansbury, 20-Jan-1982, Version 6.6
                        0000    144 ;               Added code to not print the header line if the QA Loop on
                        0000    145 ;               Subtest check was executing and if a flag bit had been cleared.
                        0000    146 ;               This prevents the header line from being output once for every
                        0000    147 ;               subtest in the diagnostic when the Loop on Subtest check
                        0000    148 ;               routine is executing.
                        0000    149 ;
                        0000    150 ;       33      Marion Baggett, 9-Apr-1982, Version 6.7
                        0000    151 ;               Added .NoShow Conditionals after .IDENT , ordered .LIBRARY
                        0000    152 ;               statements. Change DS$PRINTF statement to use type codes
                        0000    153 ;
```

```
0000   154 ;       34      Richard Brown, 30-June-82, Version 6.8
0000   155 ;               Addition of call to MAP_DEBUGGER so repeated STARTs will
0000   156 ;               not wipe out the debugger once it has been loaded.
0000   157 ;               Also, addition of loading debugger before diagnostic is
0000   158 ;               started, if proper flag is set.
0000   159 ;
0000   160 ;       35      Marion Baggett, 24-Sept-82  Version 6.9
0000   161 ;               Fixed truncation error.
0000   162 ;
0000   163 ;       36      Bob Bergazzi    2-Nov-1982      Version 6.9
0000   164 ;               Changed VRSTART so that if we are loaded under APT do not
0000   165 ;               check the DSA$V_LOAD_DEBUGGER flag. APT sets this flag for
0000   166 ;               reasons long since lost. When running under APT, every
0000   167 ;               START would cause the supervisor to try and load the debugger
0000   168 ;               from the console device and cause APT to timeout.
0000   169 ;
0000   170 ;       37      Jack Stansbury, 8-Mar-1983, Version 6.11
0000   171 ;               Changed the abort routines to make sure they print the true
0000   172 ;               (if there is one) user PC.
0000   173 ;
0000   174 ;       38      John Ciukaj     3-May-1983      Version 6.11
0000   175 ;               - Alter Start routine so that an error does not occur
0000   176 ;                 when an ambiguous section name is found AND the section name
0000   177 ;                 is equivalent to the name entered.
0000   178 ;
0000   179 ;       39      Bob Bergazzi    May 16, 1983    Version 6.11
0000   180 ;               Changed the order of the .LIB statements.
0000   181 ;
0000   182 ;       40      Bob Bergazzi    Sep 21, 1983    Version 6.13
0000   183 ;               Added BIN_TIME quadword in PSECT WORK for START/TIME switch.
0000   184 ;               Just before call to DISPATCH, do a $SETIMR if /TIME was given.
0000   185 ;               Commented out for version 6.13 and 6.14, and 7.0
0000   186 ;
0000   187 ;       41      Bob Bergazzi    Jan. 26, 1984   Version 6.14
0000   188 ;               Fixed ABORT so it won't print out VMS system addresses as the
0000   189 ;               user PC.
0000   190 ;
0000   191 ;       42      Ted Salem       Aug. 3, 1984    Version 7.10
0000   192 ;               Added SHOW TESTS command.
0000   193 ;
0000   194 ;       43      Bob Bergazzi    Feb. 26, 1985   Version 8.1
0000   195 ;               Fixed edit [40] (/TIME).
0000   196 ;
0000   197 ;       44      Bob Bergazzi    Mar. 4, 1985    Version 8.1
0000   198 ;               Commented out edit 43.
0000   199 ;
0000   200 ;       45      Amy Iorio       June 17, 1985   Version 8.3
0000   201 ;               clear externals for Printrev
0000   202 ;
0000   203 ;       46      Ted Salem       Oct. 15, 1985   Version 9.0
0000   204 ;               Do above (#45) properly by clearing
0000   205 ;               entire date structure.
0000   206 ;
0000   207 ;       47      J. Baranski     1-Nov-1985      Version 9.1
0000   208 ;               Un Comment Out START/TIME.
0000   209 ;
0000   210 ;       48      M. Baggett      14-Jan-1986     Version 9.1
```

```
0000   ;                Stop truncating long device name when starting program
0000   ;                                                                                ;G:2
0000   ;        49      Domenic Andella 7-Feb-86        Version 10.0                    ;G:2
0000   ;                For every start or run sequence in an mp system, the            ;G:2
0000   ;                primary processor should clear its own interlocking             ;G:2
0000   ;                data structures, therefore add jsb to MP$_CLEAR_LOCKS           ;G:2
0000   ;                in routine VRSTART. In addition, clear MP$GR_BOOTED_PROCESSORS, ;G:2
0000   ;                MP$GR_IDLING_PROCESSORS, MP$GL_FLAGS, and MP$GL_CONDITION_FLAGS. ;G:
0000   ;                                                                                ;G:2
0000   ;        50      M. Baggett      26-Mar-1986     Version 10                      ;G:5
0000   ;                Separate device names in list printed after starting test       ;G:5
0000   ;                with tabs.                                                      ;G:5
0000   ;                                                                                ;G:5
0000   ;        51      M. Baggett      31-Mar-1986     Version 10                      ;G:6
0000   ;                Fixed so diagnostics run offline.                               ;G:6
0000   ;                                                                                ;G:6
0000   ;        52      Bob Bergazzi    16-May-1986     Version 10.1                    ;G:7
0000   ;                Added /TIME changes.                                            ;G:7
0000   ;                                                                                ;G:8
0000   ;        53      Bob Bergazzi    28-May-1986     Version 10.1                    ;G:8
0000   ;                Changed running under VMS from elapsed time to execution        ;G:8
0000   ;                time.                                                           ;G:8
0000   ;                                                                                ;G:9
0000   ;        54      Bob Bergazzi    9-Jun-1986      Version 10.2                    ;G:9
0000   ;                Changed typecode on /TIME abort to DS$K_TYPE_PROGRAM_END.       ;G:9
0000   ;                It turns out that VSDP uses these typecodes.                    ;G:9
0000   ;                                                                                ;G:10
0000   ;        10      Stephen Meier   27-Aug-1987     Version 10.9                    ;G:10
0000   ;                Recompile to included changes to BR_IF_NOT_MP in DS.            ;G:10
0000   ;                                                                                ;G:10
0000   ;                Paul McCarron   4-Feb-1988      Version 10.11                   ;G:12
0000   ;                Put in calls to DSX$DEALLOCATE, which is used with              ;G:11
0000   ;                DSX$PRINTREV.                                                   ;G:11
0000   ;                                                                                ;G:11
0000   ;                Paul McCarron   11-Feb-1988     Version 10.11                   ;G:12
0000   ;                Fix copyright date etc.                                         ;G:12
0000   ;--
```

```
                        0000    249          .SBTTL  Declarations
                        0000    250 ;
                        0000    251 ; INCLUDE FILES:
                        0000    252 ;
                        0000    253          .LIBRARY        /Sys$library:lib/       ;                       [33]
                        0000    254          .LIBRARY        /$DS/                   ;                       [39]
                        0000    255          .LIBRARY        /$DIAG/                 ;                       [39]
                        0000    256
                        0000    257 ;
                        0000    258 ; MACROS:
                        0000    259 ;
                        0000    260
                        0000    261 ;
                        0000    262 ; EXTERNALS:
                        0000    263 ;
                        0000    264          .WEAK   MP$_CLEAR_LOCKS                         ;[49]                   ;G:2
                        0000    265          .WEAK   MP$GR_BOOTED_PROCESSORS                 ;[49]                   ;G:2
                        0000    266          .WEAK   MP$GR_IDLING_PROCESSORS                 ;[49]                   ;G:2
                        0000    267          .WEAK   MP$GL_FLAGS                             ;[49]                   ;G:2
                        0000    268          .WEAK   MP$GL_CONDITION_FLAGS                   ;[49]                   ;G:2
                        0000    269
                        0000    270 ;
                        0000    271 ; EQUATED SYMBOLS:
                        0000    272 ;
                        0000    276          $DS_CFDEF
                        0000    277          $DS_CLIDEF
                        0000    278          $DS_DSADEF
                        0000    279          $DS_ENVDEF
                        0000    280          $DS_HDRDEF
                        0000    281          $DS_SCBDEF
                        0000    282          $PRDEF
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .PSECT  $ABS$,ABS
                00000000 FE70                .=0
                        0000                 .RESTORE
                        0000    283          APTDEF
                        0000    284          CLIDEF
                        0000    285          DSPDEF
                        0000    286          DSFDEF
                        0000    287          DSQA                            ; DSQA$K constant definitions       [32]
                        0000    288          DS_QADEFS                       ; Other QA$K constant definitions   [32]
                        0000    289          $ds_typedef                     ; Define type codes                 [26]
                        0000    290
```

```
        00000000   295          .PSECT  WORK, NOSHR, NOEXE, WRT, LONG                          ;  [40]
            0000   296
00000008    0000   297 BIN_TIME::      .BLKQ 1                  ; Holds converted 64-bit time      [40]
            0008   298                                          ; specified by user with /TIME     [40]
00000010    0008   299 BEGIN_TIME::    .BLKQ 1                  ; Holds absolute time when diag was[40]
            0010   300                                          ; started.                         [40]
00000018    0010   301 POLL_TIME::     .BLKQ 1                  ; Holds abs time at KB_CHECK.  [40][52] ;G:7
            0018   302
0000001C    0018   303 DUE_TIME::      .BLKL   1                ; Holds absolute time when diag [52]  ;G:7
            001C   304                                          ; is due                        [52]  ;G:7
```

```
                                  00000000   306          .PSECT  Data, Shr, NoExe, NoWrt, Byte
                                      0000   307
                                      0000   308          MODNAM  START
                  54 52 41 54 53 00'  0000       $MODULE:         .ASCIC  \START\
                                  05  0000
                                      0006   309
                                      0006   310 FMT_PROG:                                                          ;  [25]
61 72 67 6F 72 50 20 2E 2E 2F 21 00'  0006   311          .ASCIC  "!/.. Program: !AC, revision !UL.!UL, !UL test!%S,!/"-  ;  [31]
69 76 65 72 20 2C 43 41 21 20 3A 6D   0012
4C 55 21 2E 4C 55 21 20 6E 6F 69 73   001E
25 21 74 73 65 74 20 4C 55 21 20 2C   002A
25 21 20 74 61 20 20 20 2F 21 2C 53   0036
                        2F 21 2E 54   0042
                                  3F  0006
                                      0046   312                  "   at !%T.!/"                                  ;  [31]
                                      0046   313
                                      0046   314 FMT_ABORT:                                                         ;  [25]
65 74 72 6F 62 41 20 2E 2E 2F 21 00'  0046   315          .ASCIC  \!/.. Aborted program at pass !UL, !AS, PC !XL.!/\      ;  [25]
74 61 20 6D 61 72 67 6F 72 70 20 64   0052
21 20 2C 4C 55 21 20 73 73 61 70 20   005E
21 2E 4C 58 21 20 43 50 20 2C 53 41   006A
                                  2F  0076
                                  30  0046
                                      0077   316
                                      0077   317 Fmt_Abort_No_PC:                                                   ;  [37]
65 74 72 6F 62 41 20 2E 2E 2F 21 00'  0077   318          .ASCIC  \!/.. Aborted program at pass !UL, !AS.!/\              ;  [37]
74 61 20 6D 61 72 67 6F 72 70 20 64   0083
21 20 2C 4C 55 21 20 73 73 61 70 20   008F
                     2F 21 2E 53 41   009B
                                  28  0077
                                      00A0   319
                                      00A0   320 FMTCTR:                                                                ;G:10
                           2F 21 00'  00A0   321          .ASCIC  \!/\                                                 ;  [42]
                                  02  00A0
                                      00A3   322
                                      00A3   323 FMTTRACE:                                                          ;  [42]
21 20 74 73 65 54 20 2E 2E 2F 21 00'  00A3   324          .ASCIC  \!/.. Test !UB: !AC \                                ;  [42]
            20 43 41 21 20 3A 42 55   00AF
                                  13  00A3
                                      00B7   325
                                      00B7   326 FMT_TIME_EXPIRED:
6C 20 65 6D 69 54 20 2E 2E 2F 21 00'  00B7   327          .ASCIC  "!/.. Time limit has expired at pass !UL, !AS, PC !XL.!/"; [40]
70 78 65 20 73 61 68 20 74 69 6D 69   00C3
73 73 61 70 20 74 61 20 64 65 72 69   00CF
50 20 2C 53 41 21 20 2C 4C 55 21 20   00DB
            2F 21 2E 4C 58 21 20 43   00E7
                                  37  00B7
                                      00EF   328
                                      00EF   329 FMT_TIME_EXPIRED_NO_PC:
6C 20 65 6D 69 54 20 2E 2E 2F 21 00'  00EF   330          .ASCIC  "!/.. Time limit has expired at pass !UL, !AS.!/"       ;  [40]
70 78 65 20 73 61 68 20 74 69 6D 69   00FB
73 73 61 70 20 74 61 20 64 65 72 69   0107
2F 21 2E 53 41 21 20 2C 4C 55 21 20   0113
                                  2F  00EF
```

```
                                        011F   332 FMT_TESTRANGE:                                                    ;  [25]
21 20 79 6C 6E 4F 20 3F 3F 2F 21 00'    011F   333         .ASCIC  \!/?? Only !UL test!%S, check test range.!/\          ;  [25]
20 2C 53 25 21 74 73 65 74 20 4C 55     012B
72 20 74 73 65 74 20 6B 63 65 68 63     0137
                2F 21 2E 65 67 6E 61    0143
                                   2A   011F
                                        014A   334
                                        014A   335 FMT_NOUNITS:                                                      ;  [25]
73 74 69 6E 75 20 6F 4E 20 3F 3F 00'    014A   336         .ASCIC  "?? No units to test, none selected with device type(s)!/";[25]
6F 6E 20 2C 74 73 65 74 20 6F 74 20     0156
20 64 65 74 63 65 6C 65 73 20 65 6E     0162
20 65 63 69 76 65 64 20 68 74 69 77     016E
         2F 21 29 73 28 65 70 79 74     017A
                                   38   014A
                                        0183   337
                                        0183   338 FMT_START:                                                        ;  [25]
6F 72 70 20 6F 4E 20 3F 3F 2F 21 00'    0183   339         .ASCIC  \!/?? No program loaded.!/\                         ;  [25]
2E 64 65 64 61 6F 6C 20 6D 61 72 67     018F
                              2F 21     019B
                                   19   0183
                                        019D   340
                                        019D   341 FMT_ILLSEC:                                                       ;  [25]
61 67 65 6C 6C 49 20 3F 3F 2F 21 00'    019D   342         .ASCIC  \!/?? Illegal section name, should be one of!/\       ;  [25]
61 6E 20 6E 6F 69 74 63 65 73 20 6C     01A9
62 20 64 6C 75 6F 68 73 20 2C 65 6D     01B5
      2F 21 66 6F 20 65 6E 6F 20 65     01C1
                                   2D   019D
                                        01CB   343
                                        01CB   344 FMT_AMBSEC:                                                       ;  [25]
75 67 69 62 6D 41 20 3F 3F 2F 21 00'    01CB   345         .ASCIC  \!/?? Ambiguous section name, should be one of!/\     ;  [25]
20 6E 6F 69 74 63 65 73 20 73 75 6F     01D7
64 6C 75 6F 68 73 20 2C 65 6D 61 6E     01E3
2F 21 66 6F 20 65 6E 6F 20 65 62 20     01EF
                                   2F   01CB
                                        01FB   346
                                        01FB   347 FMT_SECTIONS:                                                     ;  [27]
6E 69 61 74 6E 6F 63 20 43 41 21 00'    01FB   348         .ASCIC  "!AC contains the following sections:!/"            ;  [27]
77 6F 6C 6C 6F 66 20 65 68 74 20 73     0207
73 6E 6F 69 74 63 65 73 20 67 6E 69     0213
                           2F 21 3A     021F
                                   26   01FB
                                        0222   349
                                        0222   350 FMT_TESTING:                                                      ;  [25]
      20 3A 67 6E 69 74 73 65 54 00'    0222   351         .ASCIC  \Testing: \                                 ;[25][48][50] ;G:5
                                   09   0222
                                        022C   352 FMT_NAMES:                                                                ;G:5
                     20 53 41 21 00'    022C   353         .ASCIC  \!AS \                                      ;[50]         ;G:5
                                   04   022C
                                        0231   354 FMT_CRLF:                                                                 ;G:5
                           2F 21 00'    0231   355         .ASCIC  \!/\                                        ;[50]         ;G:5
                                   02   0231
                                        0234   356
                                        0234   357 FMT_MISMATCH:                                          ;       [25]
76 65 72 20 73 69 68 54 20 3F 3F 00'    0234   358         .ASCIC  "?? This rev of diagnostic will not run with this"-   ;  [25]
74 73 6F 6E 67 61 69 64 20 66 6F 20     0240
20 74 6F 6E 20 6C 6C 69 77 20 63 69     024C
69 68 74 20 68 74 69 77 20 6E 75 72     0258
```

```
                                  73  0264
21 72 6F 73 69 76 72 65 70 75 73 20  0265   359                 " supervisor!/"                                  ;       [25]
                                  2F  0271
                                  3D  0234
                                      0272   360
                                      0272   361 FMT_NODEVICE:                                                     ;       [22]
76 65 64 20 6F 4E 20 3F 3F 2F 21 00' 0272   362          .ASCIC  \!/?? No device support list in program.!/\      ;       [22]
20 74 72 6F 70 70 75 73 20 65 63 69  027E
67 6F 72 70 20 6E 69 20 74 73 69 6C  028A
                  2F 21 2E 6D 61 72  0296
                                  29  0272
```

```
                     029C   364          .SBTTL  VRStart and VRReStart Routines
                  00000000  365          .PSECT  Code, Shr, Exe, NoWrt, Byte
                     0000   366 ;++
                     0000   367 ; FUNCTIONAL DESCRIPTION:
                     0000   368 ;
                     0000   369 ;       This subroutine is called from CLI to start the program.  It verifies
                     0000   370 ;       command parameters and builds P-tables from the selected devices, and if
                     0000   371 ;       necessary, initializes the QIO database.
                     0000   372 ;
                     0000   373 ; CALLING SEQUENCE:
                     0000   374 ;
                     0000   375 ;       Subroutine call from the command line interpreter.
                     0000   376 ;
                     0000   377 ; INPUT PARAMETERS:
                     0000   378 ;
                     0000   379 ;       NONE
                     0000   380 ;
                     0000   381 ; IMPLICIT INPUTS:
                     0000   382 ;
                     0000   383 ;       R2              = BASE ADDRESS FOR CLI DATA BLOCK.
                     0000   384 ;       CLI$L_TEST(R2)  = FIRST TEST TO EXECUTE.
                     0000   385 ;       CLI$L_LAST(R2)  = LAST TEST TO EXECUTE.
                     0000   386 ;       CLI$L_PASS(R2)  = NUMBER OF PASSES TO RUN.
                     0000   387 ;       CLI$L_SUBT(R2)  = SUBTEST NUMBER FOR LOOP.
                     0000   388 ;       L$L_UNIT        = MAXIMUM NUMBER OF UNITS.
                     0000   389 ;
                     0000   390 ; OUTPUT PARAMETERS:    NONE
                     0000   391 ;
                     0000   392 ; IMPLICIT OUTPUTS:     NONE
                     0000   393 ;
                     0000   394 ; COMPLETION CODES:     NONE
                     0000   395 ;
                     0000   396 ; SIDE EFFECTS:
                     0000   397 ;
                     0000   398 ;       MAPFREE is called to initialize free memory Device for QIO may be
                     0000   399 ;       initialized
                     0000   400 ;
                     0000   401 ; REGISTER USAGE:
                     0000   402 ;
                     0000   403 ;       R2 = BASE ADDRESS FOR CLI DATA BLOCK.
                     0000   404 ;       R3 = UNIT COUNT.
                     0000   405 ;       R4 = SECTION NAME ADDRESS LIST POINTER.
                     0000   406 ;       R5 = SECTION NAME LIST COUNTER.
                     0000   407 ;       R6 = SECTION NAME ASCII POINTER.
                     0000   408 ;       R7 = INPUT CHARACTER COUNT.
                     0000   409 ;       R8 = INPUT ASCII POINTER.
                     0000   410 ;       R9 = Equivalent name flag                                    [38]
                     0000   411 ;       R10= Ambiguous name flag                                     [38]
                     0000   412 ;--
```

```
                                0000   414 ;+
                                0000   415 ;       This is the entry point for the CLI call. Check to see if a     [29]
                                0000   416 ;       program has been loaded.                                        [29]
                                0000   417 ;-
                                0000   418
                                0000   419 VRSTART::
                                0000   420             BR_IF_NOT_MP    5$                  ; Branch if not an mp system    [49]  ;G:2
    05000000 8F   00000000'8F   D1   0000             CMPL    #DS$GK_SID,#^X05000000              ; Branch if Scorpio [61]
                          27    13   000B             BEQL    30000$                      ; Yes, branch
    06000000 8F   00000000'8F   D1   000D             CMPL    #DS$GK_SID,#^X06000000              ; Branch if Nautilus [61]
                          1A    13   0018             BEQL    30000$                      ; Yes, branch                   ;G:23
    11000000 8F   00000000'8F   D1   001A             CMPL    #DS$GK_SID,#^X11000000              ; Branch if RRR [69]            ;G:20
                          0D    13   0025             BEQL    30000$                                                      ;G:23
    0A000000 8F   00000000'8F   D1   0027             CMPL    #DS$GK_SID,#^X0A000000              ; Branch if LLL [69]            ;G:20
                          1E    12   0032             BNEQ    5$                                                          ;G:18
                                0034         30000$:
                00000000'EF     16   0034   421       JSB     MP$_CLEAR_LOCKS             ; Clear the Pp's intlk struc    [49]  ;G:2
                00000000'EF     D4   003A   422       CLRL    MP$GR_BOOTED_PROCESSORS     ; Clear mp flags                [49]  ;G:2
                00000000'EF     D4   0040   423       CLRL    MP$GR_IDLING_PROCESSORS     ;       "                       [49]  ;G:2
                00000000'EF     D4   0046   424       CLRL    MP$GL_FLAGS                 ;       "                       [49]  ;G:2
                00000000'EF     D4   004C   425       CLRL    MP$GL_CONDITION_FLAGS       ;       "                       [49]  ;G:2
          00000000'EF   01      E0   0052   426 5$:   BBS     #DS$V_LODFLG, -             ; CHECK LOAD FLAG.                      ;G:2
                          16          0059   427               L^DS$GL_FLAGS, 10$          ;                               [30]
                                      005A   428       $PRINT  #ds$k_type_command_err, -           ; Command error message [26]
                                      005A   429               #ds$k_printf, -             ; .. use printf                 [26]
                                      005A   430               L^FMT_START                 ; "No program loaded"           [26]
                00000183'EF     9F   005A                     PUSHAB  L^FMT_START
                      7E    01    9A   0060                   movzbl  #ds$k_printf, -(sp)
                      7E    15    98   0063                   cvtbl   #ds$k_type_command_err, -(sp)
    00000000'GF       03          FB   0066                   CALLS   #$$N+2, G^DSX$PRINT
                    039A          31   006D   431       BRW     VRSTART_X                   ; Exit routine                  [29]
                                0070   432
                                0070   433 10$:   Br_If_Apt       20$                     ; APT sets this flag so don't check[36]
    0000FE00'EF       1F          E0   0070             BBS     #DSA$V_Apt, -                       ; If bit set, branch            [29]
                          14          0077               L^DSA$GL_Flags, 20$               ;                               [29]
                          1E          E1   0078   434       BBC     #DSA$V_LOAD_DEBUGGER,-  ; it IF USER HAS TYPED "/DEBUG" [36]
                  0C 0000FE00'EF            007A   435               DSA$GL_FLAGS,20$        ;THEN                           [34]
                00000000'EF     16   0080   436       JSB     ACT_DEFAULT_DBG             ;  GET DEFAULT FILENAME FOR DEBUGGER[34]
                00000000'EF     16   0086   437       JSB     DSV$DEBUG                   ;  LOAD AND START THE DEBUGGER  [34]
                40000000 8F     CA   008C   438 20$:   BICL2   #DSA$M_LOAD_DEBUGGER,-     ; Set up for new /DEBUG command [36]
                0000FE00'EF            0092   439               L^DSA$GL_FLAGS            ;                               [36]
                    0381        30   0097   440       BSBW    Check_QA_Bit                ; Set or clear QA DSA bit       [30]
                                009A   441       QA_MAIN Start_VRStart               ; Call QA$Main                  [30]
                          16    DD   009A                   PUSHL   #DSQA$K_Start_VRStart
    00000000'9F       01          FB   009C                   CALLS   #1, a#QA$MAIN
```

```
                          00A3   443 ;+
                          00A3   444 ;       Check to make sure the diagnostic and this Supervisor match.    [29]
                          00A3   445 ;       Also initialize context and call QA$Main.                       [29]
                          00A3   446 ;-
                          00A3   447
                          00A3   448 VRRESTART::
                          00A3   449 START1:
                          00A3   450                                                                          ;G:11
                          00A3   451
          00000000'EF   16  00A3   452          JSB     SCRIPT$FLUSH              ; Flush scripts if console cmd  [24]
50  00000204 9F   08  02  EF  00A9   453          extzv   #env$v_super, -           ;                               [26]
                          00B2   454                    #env$s_super, -           ;                               [26]
                          00B2   455                    a#l$l_environ, r0         ; Fetch Diagnostic version      [26]
              01  50   D1  00B2   456          cmpl    r0, #env$_super           ; Is it identical?              [26]
                  16   13  00B5   457          BEQL    10$                       ; Branch if valid
                          00B7   458          $PRINT  #ds$k_type_start_err, -   ; Error starting diagnostic     [26]
                          00B7   459                    #ds$k_printf, -           ; .. use PRINTF                 [26]
                          00B7   460                    L^FMT_MISMATCH            ; Inform of mismatch            [26]
          00000234'EF   9F  00B7                        PUSHAB  L^FMT_MISMATCH
             7E   01   9A  00BD                        movzbl  #ds$k_printf, -(sp)
             7E   18   98  00C0                        cvtbl   #ds$k_type_start_err, -(sp)
       00000000'GF   03   FB  00C3                        CALLS   #$$N+2, G^DSX$PRINT
              033D   31  00CA   461          BRW     VRSTART_X                 ; And Exit
                          00CD   462
          00000000'EF   16  00CD   463 10$:   JSB     INIT_CONTEXT              ; Reset stacks and modes        [24]
              0345   30  00D3   464          BSBW    Check_QA_Bit              ; Set or clear QA DSA bit. Note:[30]
                          00D6   465                                            ; the QA bit was cleared by the [30]
                          00D6   466                                            ; SCRIPT$FLUSH routine above.   [30]
                          00D6   467          QA_MAIN Start_VRRestart           ; Call QA$Main                  [30]
          12  DD  00D6                        PUSHL   #DSQA$K_Start_VRRestart
00000000'9F   01  FB  00D8                        CALLS   #1, a#QA$MAIN
```

```
                                00DF    469 ;+
                                00DF    470 ;       Cleanup the previous diagnostic and QIO (if applicable).        [29]
                                00DF    471 ;-
                                00DF    472
                00000000'EF   16 00DF    473         JSB     DS_CLEANUP              ; DO CLEANUP IF NECESSARY       [24]
                                00E5    474
          0000FE00'EF   1C   E0 00E5    475         BBS     #DSA$V_USER, -
                              07 00EC    476                 DSA$GL_FLAGS, 15$       ; SKIP QIO$CLEANUP IN USERMODE
          00000000'EF   00   FB 00ED    477         CALLS   #0,QIO$CLEANUP          ; Remove traces of QIO database
```

```
                                  00F4   479 ;+
                                  00F4   480 ;       Check the requested section name.                                  [29]
                                  00F4   481 ;-
                                  00F4   482
          52   00000000'EF   DE   00F4   483 15$:    MOVAL   DS$GL_CLIBASE, R2        ; Adress the CLI vector.          [30]
               0000FE10'EF   D4   00FB   484         CLRL    DSA$GL_SECTNO            ; INIT SECTION TO "DEFAULT".
                      10 A2   D5   0101   485         TSTL    CLI$Q_SECTION(R2)        ; CHECK FOR SECTION SWITCH.
                         03   12   0104   486         BNEQ    18$                      ; If found, continue              [26]
                       00A7   31   0106   487         brw     50$                      ; Branch                          [26]
                                  0109   488
          54   00000250'EF   D0   0109   489 18$:    MOVL    L$A_SECNAM, R4           ; GET SECTION LIST ADDRESS.
                   55   84   D0   0110   490         MOVL    (R4)+, R5                ; GET SECTION COUNT.
                                  0113   491
                         5A   D4   0113   492         CLRL    R10                      ; Ambiguous name Flag             [38]
                   56   84   D0   0115   493 20$:    MOVL    (R4)+, R6                ; GET SECTION NAME ASCII POINTER.
                         59   D4   0118   494         CLRL    R9                       ; Equivalent name Flag            [38]
                57   10 A2   D0   011A   495         MOVL    CLI$Q_SECTION(R2), R7    ; GET REQUESTED SECTION ASCII CNT.
                58   14 A2   D0   011E   496         MOVL    CLI$Q_SECTION+4(R2), R8  ; GET STRING POINTER.
                   57   66   91   0122   497         CMPB    (R6), R7                 ; CHECK LENGTHS.                  [38]
                         57   19   0125   498         BLSS    40$                      ; BR IF INPUT TOO LONG.
                   57   86   91   0127   499         CMPB    (R6)+,R7                 ; Characters Equivalent           [38]
                         02   12   012A   500         BNEQ    30$                      ; No                              [38]
                         59   D6   012C   501         INCL    R9                       ; Yes                             [38]
                                  012E   502
                   88   86   91   012E   503 30$:    CMPB    (R6)+, (R8)+             ; COMPARE CHARACTERS.
                         4B   12   0131   504         BNEQ    40$                      ; BR IF MISMATCH.
                      F8 57   F5   0133   505         SOBGTR  R7, 30$                  ; COUNT CHARACTERS.
0000FE10'EF   00000250'FF   55   C3   0136   506         SUBL3   R5, @L$A_SECNAM, -       ; COMPUTE SECTION NUMBER.
                                  0142   507                   DSA$GL_SECTNO
                         59   D5   0142   508         TSTL    R9                       ; Equivalent name                 [38]
                         07   13   0144   509         BEQL    32$                      ; No                              [38]
                3B 62   16   E3   0146   510         BBCS    #CLI$V_VALSEC, -         ; SET  VALID SECTION FLG.
                                  014A   511                   CLI$L_FLAGS(R2), 42$   ;                                 [38]
                                  014A   512                                            ; Set Valid Section Flag          [38]
                       0038   31   014A   513         BRW     42$                      ; All Done                        [38]
                                  014D   514 32$:                                       ;                                 [38]
                2D 62   16   E3   014D   515         BBCS    #CLI$V_VALSEC, -         ; SET AND CHECK VALID SECTION FLG.
                                  0151   516                   CLI$L_FLAGS(R2), 40$
                   5A   01   D0   0151   517         MOVL    #1, R10                  ; Indicate Ambiguous name         [38]
                       0027   31   0154   518         BRW     40$                      ; Continue with list              [38]
                                  0157   519 35$:                                       ;                                 [38]
                                  0157   520         $PRINT  #-ds$k_type_command_err, -      ; command error (sticky)[26]
                                  0157   521                   #ds$k_printf, -        ; .. use PRINTF                   [26]
                                  0157   522                   L^FMT_AMBSEC           ; "?? Ambiguous section name."    [26]
               000001CB'EF   9F   0157                         PUSHAB  L^FMT_AMBSEC
                   7E   01   9A   015D                         movzbl  #ds$k_printf, -(sp)
                7E   EB 8F   98   0160                         cvtbl   #-ds$k_type_command_err, -(sp)
          00000000'GF   03   FB   0164                         CALLS   #$$N+2, G^DSX$PRINT
          50   00000250 9F   D0   016B   523         MOVL    @#L$A_SECNAM,R0          ; Point to section names
                       02C3   30   0172   524         BSBW    PRLIST                   ; Print list
               00000000'EF   94   0175   525         clrb    L^ds$gb_typecode         ; Clear type code after done      [26]
                       028C   31   017B   526         BRW     VRSTART_X
```

```
                94 55   F5  017E   528 40$:   SOBGTR  R5, 20$                  ; COUNT SECTIONS.
                   5A   D5  0181   529        TSTL    R10                      ; Ambiguous Name found?          [38]
                   D2   12  0183   530        BNEQ    35$                      ; Yes                            [38]
                            0185   531 42$:                                    ;                                [38]
          27 62    16   E0  0185   532        BBS     #CLI$V_VALSEC, -         ; CHECK FOR A VALID SECTION.
                            0189   533                  CLI$L_FLAGS(R2), 50$
                            0189   534        $PRINT  #-ds$k_type_command_err, -      ; Command error (sticky)[26]
                            0189   535                  #ds$k_printf, -        ; .. use PRINTF                  [26]
                            0189   536                  L^FMT_ILLSEC           ; "?? Illegal section name."     [26]
        0000019D'EF    9F  0189                       PUSHAB  L^FMT_ILLSEC
             7E    01   9A  018F                       movzbl  #ds$k_printf, -(sp)
          7E    EB 8F   98  0192                       cvtbl   #-ds$k_type_command_err, -(sp)
    00000000'GF    03   FB  0196                       CALLS   #$$N+2, G^DSX$PRINT
    50  00000250 9F     D0  019D   537        MOVL    a#L$A_SECNAM,R0          ; Point to section names
                0291    30  01A4   538        BSBW    PRLIST                   ; Print section names
        00000000'EF    94  01A7   539        clrb    L^ds$gb_typecode         ; Clear type code after done     [26]
                025A    31  01AD   540        BRW     VRSTART_X                ; Exit                           [27]
```

```
                        01B0    542 ;+
                        01B0    543 ;       The section name checked out. Set the default flags.        [29]
                        01B0    544 ;-
                        01B0    545
                        01B0    546 50$:
                     CA 01B0    547         BICL2   # DS$M_DONFLG ! -       ; CLEAR CLEANUP DONE
                        01B1    548                   DS$M_STRFLG ! -       ; AND PROGRAM STARTED
                        01B1    549                   DS$M_HLTFLG ! -       ; AND HALTED ON ERROR
                        01B1    550                   DS$M_CTRLC  ! -       ; AND STOPPED BY ^C
                        01B1    551                   DS$M_BRKPT  ! -       ; AND STOPPED BY BREAKPOINT
                        01B1    552                   DS$M_EXCEPT   -       ; AND STOPPED BY EXCEPTION
00000000'EF   0008280D 8F       01B1    553                 , L^DS$GL_FLAGS         ; IN THE GLOBAL FLAGS       [24]
```

```
                                01BB    555 ;+
                                01BB    556 ;       Check the requested test numbers (i.e. TEST:x:y).               [29]
                                01BB    557 ;-
                                01BB    558
      50    00000254'FF    D0   01BB    559          MOVL    aL$A_TSTCNT, R0             ; GET ACTUAL TEST COUNT.
      00000000'EF    50    D0   01C2    560          MOVL    R0,L^DS$GL_NUMTEST          ; SET HIGHEST TEST NUMBER       [24]
                     51    D4   01C9    561          CLRL    R1                          ; Address page zero
      0000FE08'EF    2C A2 D0   01CB    562          MOVL    CLI$L_PASS(R2), -           ; PASS COUNT
                                01D3    563            DSA$GL_PASSES
      00000000'EF    20 A2 D0   01D3    564          MOVL    CLI$L_TEST(R2), -           ; FIRST TEST NUMBER             [24]
                                01DB    565            L^DS$GL_FSTTEST
                     43    19   01DB    566          BLSS    95$                         ; MUST BE POSITIVE
                     06    12   01DD    567          BNEQ    80$                         ; SKIP IF NOT BLANK.
            00000000'EF    D6   01DF    568          INCL    L^DS$GL_FSTTEST             ; START AT TEST 1.              [24]
                                01E5    569
      00000000'EF    24 A2 D0   01E5    570 80$:     MOVL    CLI$L_LAST(R2), -           ; LAST TEST NUMBER.             [24]
                                01ED    571            L^DS$GL_LSTTEST             ;                               [24]
                     31    19   01ED    572          BLSS    95$                         ; MUST BE POSITIVE
                     0B    12   01EF    573          BNEQ    90$                         ; SKIP IF NOT 0.
00000000'EF    00000000'EF    D0   01F1    574          MOVL    L^DS$GL_NUMTEST, -          ; DEFAULT LAST TEST.
                                01FC    575            L^DS$GL_LSTTEST             ;                               [24]
                                01FC    576
00000000'EF    00000000'EF    D1   01FC    577 90$:     CMPL    L^DS$GL_FSTTEST, -          ; FIRST TEST NUMBER IN RANGE?   [24]
                                0207    578            L^DS$GL_NUMTEST             ;                               [24]
                     17    14   0207    579          BGTR    95$                         ; NO, ERROR AND EXIT TO COMMAND
00000000'EF    00000000'EF    D1   0209    580          CMPL    L^DS$GL_LSTTEST, -          ; LAST TEST NUMBER IN RANGE?    [24]
                                0214    581            L^DS$GL_NUMTEST             ;                               [24]
                     0A    14   0214    582          BGTR    95$                         ; NO, ERROR AND EXIT TO COMMAND
                                0216    583
00000000'EF    28 A2 D0   0216    584          MOVL    CLI$L_SUBT(R2), -           ; SUBTEST NUMBER.               [24]
                                021E    585            L^DS$GL_SUBTEST             ;                               [24]
                     1C    11   021E    586          BRB     100$                        ; CONTINUE
                                0220    587
                                0220    588 95$:     $PRINT  #ds$k_type_command_err, -       ; Command error         [26]
                                0220    589              #ds$k_printf, -           ; .. use PRINTF                 [26]
                                0220    590              L^FMT_TESTRANGE, -        ; .. format                     [26]
                                0220    591              L^DS$GL_NUMTEST           ; .. error in test numbers      [26]
            00000000'EF    DD   0220                    PUSHL   L^DS$GL_NUMTEST
            0000011F'EF    9F   0226                    PUSHAB  L^FMT_TESTRANGE
                  7E    01    9A   022C                    movzbl  #ds$k_printf, -(sp)
                  7E    15    98   022F                    cvtbl   #ds$k_type_command_err, -(sp)
         00000000'GF    04    FB   0232                    CALLS   #$$N+2, G^DSX$PRINT
                     01CE    31   0239    592          BRW     VRSTART_X                   ; EXIT
```

```
                                023C   594 ;+
                                023C   595 ;       Print the diagnostic header lines, except under special
                                023C   596 ;       circumstances.                                          [29]
                                023C   597 ;-
                                023C   598
                                023C   599 100$:   QA_MAIN Start_Before_Header     ; Call QA$Main          [30]
                          17    DD     023C               PUSHL   #DSQA$K_Start_Before_Header
00000000'9F               01    FB     023E               CALLS   #1, a#QA$MAIN
                                0245   600
0000FE00'EF               0F    E1     0245   601         BBC     #DSA$V_QA, -            ; If not running QA, branch.  [32]
                          1A             024C   602                   L^DSA$GL_FLAGS, 104$  ;                       [32]
                          03    E0     024D   603         BBS     #QA$K_LOOP_ON_SUBTEST,- ; If the Loop on Subtest check [32]
                00000000'EF            024F   604                   L^QA$AOB_CHECK_STATE,-; is executing, branch.  [32]
                          0A             0254   605                   103$                  ;                       [32]
                          05    E0     0255   606         BBS     #QA$K_ERROR_PHASE_ONE,- ; If the Error Phase One check [32]
                00000000'EF            0257   607                   L^QA$AOB_CHECK_STATE,-; is executing, branch.  [32]
                          02             025C   608                   103$                  ;                       [32]
                          08    11     025D   609         BRB     104$                    ; Otherwise, branch and print [32]
                                025F   610                                                 ; header.               [32]
                                025F   611
00000000'EF               06    E0     025F   612 103$:   BBS     #QA$K_NO_HEADER, -      ; If header should not be printed,[32]
                          27             0266   613                   L^QA$AOB_FLAGS, -     ; then branch around the print. [32]
                                0267   614                   105$                    ;                       [32]
                                0267   615
                                0267   616 104$:   $PRINT   #ds$k_type_program_start, -     ; Start program         [32]
                                0267   617                   #ds$k_printf, -         ; .. Use PRINTF         [26]
                                0267   618                   L^FMT_PROG, -           ; .. Format string      [26]
                                0267   619                   L$A_NAME(R1), -         ; .. Program name.      [26]
                                0267   620                   L$L_REV(R1), -          ; .. revision           [26]
                                0267   621                   L$L_UPDATE(R1), -       ; .. update             [26]
                                0267   622                   a1$a_tstcnt, -          ; .. number of tests    [26]
                                0267   623                   #0                      ; .. current time       [26]
                          00    DD     0267                 PUSHL   #0
                00000254'FF     DD     0269                 PUSHL   a1$a_tstcnt
                    0210 C1     DD     026F                 PUSHL   L$L_UPDATE(R1)
                    020C C1     DD     0273                 PUSHL   L$L_REV(R1)
                    0208 C1     DD     0277                 PUSHL   L$A_NAME(R1)
                00000006'EF     9F     027B                 PUSHAB  L^FMT_PROG
                      7E    01    9A     0281                 movzbl  #ds$k_printf, -(sp)
                      7E    0F    98     0284                 cvtbl   #ds$k_type_program_start, -(sp)
00000000'GF                   08    FB     0287                 CALLS   #$$N+2, G^DSX$PRINT
                                0287   624
                                028E   625 105$:                                       ;                       [32]
```

```
                                 028E   627 ;+
                                 028E   628 ;       Make Ptables for all the units. Print what this diagnostic is   [29]
                                 028E   629 ;       testing.                                                        [29]
                                 028E   630 ;-
                                 028E   631
                0000FE0C'EF   D4  028E   632           CLRL    DSA$GL_UNITS                ; Initialize unit counter
                00000220'EF   D5  0294   633           TSTL    L$L_UNIT                    ; Does program test units?
                        03    12  029A   634           BNEQ    107$                        ; Yes, go generate Ptables for them.[32]
                      00AC    31  029C   635           BRW     170$                        ; No, skip unit dependent setup.[32]
                                 029F   636
        00000000'EF     00    FB  029F   637 107$:     CALLS   #0,DSP$GEN_PTABLES          ; Make P-tables for selected units
                                 02A6   638
    54  0000FE0C'EF     01    C3  02A6   639           SUBL3   #1,DSA$GL_UNITS,R4          ; Highest unit number
                        27    18  02AE   640           BGEQ    110$                        ; Branch if one found           [29]
                                 02B0   641
                                 02B0   642           $PRINT  #-ds$k_type_start_err, -    ; Error starting                [26]
                                 02B0   643                     #ds$k_printf, -           ; .. use PRINTF                 [26]
                                 02B0   644                     L^FMT_NOUNITS             ; .. no units to test text      [26]
                0000014A'EF   9F  02B0                         PUSHAB  L^FMT_NOUNITS
                      7E      01  02B6                         movzbl  #ds$k_printf, -(sp)
                    7E    E8    8F  02B9                       cvtbl   #-ds$k_type_start_err, -(sp)
                00000000'GF     03  02BD                       CALLS   #$$N+2, G^DSX$PRINT
                50  0000021C   9F  02C4   645           MOVL    a#L$A_DEVP,R0               ; Get address of DEVTYP list
                        016A    30  02CB   646           BSBW    PRLIST                      ; Print device types            [29]
                00000000'EF     94  02CE   647           clrb    L^ds$gb_typecode            ; Clear sticky type code        [26]
                        0133    31  02D4   648           BRW     VRSTART_X                   ; RETURN TO COMMAND MODE
```

```
                        02D7    650 ;+
                        02D7    651 ; If QA is running, AND if either the Loop on Subtest check or the     [32]
                        02D7    652 ; Error Phase One check is executing, do not print the "Testing: ..."  [32]
                        02D7    653 ; message unless the No_Header bit is False. This stops the message    [32]
                        02D7    654 ; being printed too many times.                                        [32]
                        02D7    655 ;-
                        02D7    656
0000FE00'EF   0F   E1   02D7    657 110$:   BBC     #DSA$V_QA, -                ; If not running QA, branch.    [32]
              1A        02DE    658           L^DSA$GL_FLAGS, 120$  ;                                       [32]
              03   E0   02DF    659         BBS     #QA$K_LOOP_ON_SUBTEST,- ; If the Loop on Subtest check is [32]
     00000000'EF        02E1    660           L^QA$AOB_CHECK_STATE,-; executing, branch.                    [32]
              0A        02E6    661           115$                  ;                                       [32]
              05   E0   02E7    662         BBS     #QA$K_ERROR_PHASE_ONE,- ; If the Error Phase One check is [32]
     00000000'EF        02E9    663           L^QA$AOB_CHECK_STATE,-; executing, branch.                    [32]
              02        02EE    664           115$                  ;                                       [32]
              08   11   02EF    665         BRB     120$                    ; Otherwise, branch and print   [32]
                        02F1    666                                         ; message.                      [32]
                        02F1    667
00000000'EF   06   E0   02F1    668 115$:   BBS     #QA$K_NO_HEADER, -          ; If header should not be printed, [32]
              52        02F8    669           L^QA$AOB_FLAGS, -           ; then branch around the print. [32]
                        02F9    670           130$                        ;                               [32]
                        02F9    671
                        02F9    672 120$:   $DS_GPHARD_S    R4,-(SP)        ; Get P-table address           [32]
              7E   DF   02F9                PUSHAL  -(SP)
              54   DD   02FB                PUSHL   R4
00000000'9F   02   FB   02FD                CALLS   #2, a#DS$GPHARD
         F2   54   F4   0304    673         SOBGEQ  R4, 120$                ; Decrement and branch if more  [32]
                        0307    674
         50   03   9A   0307    675         MOVZBL  #3,R0                   ; Total parameter count         [26][50] ;G:
     00000222'EF   9F   030A    676         PUSHAB  L^FMT_TESTING           ; ASCIC EDIT STRING             [24]
              01   DD   0310    677         pushl   #ds$k_printf            ; Use printf                    [26]
              17   DD   0312    678         pushl   #ds$k_type_program_info ; Program info type code        [26]
     00000000'GF   50   FB   0314    679         CALLS   R0, G^DSX$PRINT         ; TYPE IT                       [26]
54   0000FE0C'EF   01   C3   031B    680         SUBL3   #1,DSA$GL_UNITS,R4      ; Number of names to print      [51]  ;G:6
         50   04   9A   0323    681 125$:   MOVZBL  #4,R0                   ; Total parameter count         [51]  ;G:6
     0000022C'EF   9F   0326    682         pushab  I^FMT_NAMES             ; Name control string           [50]  ;G:5
              01   DD   032C    683         pushl   #ds$k_printf            ; Use printf                    [50]  ;G:5
              17   DD   032E    684         pushl   #ds$k_type_program_info ; Program info type code        [50]  ;G:5
     00000000'GF   50   FB   0330    685         CALLS   R0, G^DSX$PRINT         ; TYPE IT                       [50]  ;G:5
         E9   54   F4   0337    686         SOBGEQ  R4,125$                 ; Decrement and branch if more  [50]  ;G:5
     00000231'EF   9F   033A    687         pushab  I^FMT_CRLF              ; Terminate line control string [50]  ;G:5
              01   DD   0340    688         pushl   #ds$k_printf            ; Use printf                    [50]  ;G:5
              17   DD   0342    689         pushl   #ds$k_type_program_info ; Program info type code        [50]  ;G:5
     00000000'GF   03   FB   0344    690         CALLS   #3, G^DSX$PRINT         ; TYPE IT                       [50]  ;G:6
                        034B    691 130$:                                   ;                               [32]
```

```
                                  034B   693 ;+                                                                                  ;G:10
                                  034B   694 ;       Add to the QIO database.        ;                                   [29]
                                  034B   695 ;-
                                  034B   696
          0000FE00'EF   1C   E0   034B   697 170$:   BBS     #DSA$V_USER, -          ; BRANCH IF USER MODE
                        57        0352   698                   DSA$GL_FLAGS, 180$
          00000000'EF   00   FB   0353   699         CALLS   #0,L^MAPFREE            ; Map free memory                   [24]
          0000FE00'EF   1A   E1   035A   700         BBC     #DSA$V_DEBUG, -         ; IF DEBUGGER IS RESIDENT           [34]
                        06        0361   701                 DSA$GL_FLAGS,172$       ; THEN                              [34]
               00000000'EF   16   0362   702         JSB     MAP_DEBUGGER            ;    MAP DEBUGGER'S MEMORY SPACE[34]
                                  0368   703 172$:                                   ;                                   [34]
                                  0368   704         $DS_CLRVEC_S #SCB$L_TIMER       ; Reset timer vector
               000000C0 8F   DD   0368                       PUSHL   #SCB$L_TIMER
          00000000'9F   01   FB   036E                       CALLS   #1, a#DS$CLRVEC
                                  0375   705
   02   00000204'EF   02   00   ED   0375   706         CMPZV   #0,#2,L$L_ENVIRON, -
                                  037E   707                 #SEP_FUNCTIONAL         ; System and Functional?
                        2A   12   037E   708         BNEQ    180$                    ; Branch if should not add unit to QIO
                        54   D4   0380   709         CLRL    R4                      ; Start with unit zero
                                  0382   710
                                  0382   711 175$:   $DS_GPHARD_S    R4,-(SP)        ; Get P-table address
                        7E   DF   0382                       PUSHAL  -(SP)
                        54   DD   0384                       PUSHL   R4
          00000000'9F   02   FB   0386                       CALLS   #2, a#DS$GPHARD
                   51   8E   D0   038D   712         MOVL    (SP)+,R1                ; P-table address
                     17 50   E9   0390   713         BLBC    R0,180$                 ; Exit if error
                        51   DD   0393   714         PUSHL   R1                      ; Push for addunit
          00000000'EF   01   FB   0395   715         CALLS   #1,QIO$ADDUNIT          ; Add this unit to QIO database
                     03 50   E8   039C   716         BLBS    R0,177$                 ;                                   [50]  ;G:7
                      0068   31   039F   717         BRW     VRSTART_X               ; Return to CLI if errors                 ;G:7
      D8 54   0000FE0C'EF   F2   03A2   718 177$:   AOBLSS  DSA$GL_UNITS, R4, 175$  ; Count and continue if more units       ;G:7
```

```
                          03AA    720 ;*
                          03AA    721 ;       Reinitialize the stacks, set the started flag, dispatch the     [29]
                          03AA    722 ;       tests, and go back to command mode. Note: the DISPATCH routine  [29]
                          03AA    723 ;       will return to here only if the EndPass routine is NOT done.    [29]
                          03AA    724 ;       Just before call to DISPATCH, do a GET_TIME if a TIME switch was[52]   ;G:8
                          03AA    725 ;       given on the START or RUN command.                                    ;G:7
                          03AA    726 ;       Load up BEGIN_TIME with the time at which we did the             [52]  ;G:8
                          03AA    727 ;       GET_TIME, in case the user does a ^C and a                       [52]  ;G:8
                          03AA    728 ;       CONTINUE, we can figure out how much more to run.                [40]  ;G:8
                          03AA    729 ;-
                          03AA    730
          00000000'EF   16  03AA    731 180$:   JSB     INIT_CONTEXT                ; REINITIALIZE STACKS ETC.      [24]  ;G:7
     00000000'EF    04   C8  03B0    732         BISL    #DS$M_STRFLG, -             ; SET PROGRAM STARTED           [24]
                            03B7    733           L^DS$GL_FLAGS                     ;                               [24]
00000000'EF  00000000'EF   7D  03B7    734         MOVQ    L^BIN_TIME,L^BIN_TIME       ; /TIME given? (test for zero)  [40]
                     03    12  03C2    735         BNEQ    182$                        ;                               [52]  ;G:7
                   003D    31  03C4    736         BRW     190$                        ; Branch if not                 [40]  ;G:7
                            03C7    737                                                                                   ;G:7
                     03    BB  03C7    738 182$:   PUSHR   #^M<R0,R1>                  ; Used by $GETTIM               [52]  ;G:7
          00000008'EF    DF  03C9    739         PUSHAL  BEGIN_TIME                  ; Address to store result       [52][53] ;G:
     00000000'EF    01    FB  03CF    740         CALLS   #1,GET_TIME                 ; Use TODR to calculate time    [52]  ;G:7
                     03    BA  03D6    741         POPR    #^M<R0,R1>                  ; Used by $GETTIM               [52]  ;G:7
                            03D8    742                                                                                   ;G:7
00000018'EF  00000008'EF   7D  03D8    743         MOVQ    L^BEGIN_TIME,L^DUE_TIME ; Initialize DUE_TIME               [52]  ;G:7
00000018'EF  00000000'EF   C2  03E3    744         SUBL2   L^BIN_TIME,L^DUE_TIME   ; Low order                         [52]  ;G:7
0000001C'EF  00000004'EF   D9  03EE    745         SBWC    L^BIN_TIME+4,L^DUE_TIME+4 ; High order                      [52]  ;G:7
00000000'EF  02000000 8F   C8  03F9    746         BISL2   #DS$M_TIMED,DS$GL_FLAGS ; This run is TIMED.            [52]  ;G:7
                            0404    747
          00000000'EF   16  0404    748 190$:   JSB     DISPATCH                    ; CALL PROGRAM                  [24]
                            040A    749
```

```
                        040A   751 ;+
                        040A   752 ;       End of the VRSTART routine. Return indirectly to the CLI routine.[29]
                        040A   753 ;-
                        040A   754
                        040A   755 VRSTART_X:
00000000'EF   02000000 8F   CA  040A   756          BICL2   #DS$M_TIMED,DS$GL_FLAGS ; Clear TIMED flag.              [52]  ;G:7
              00000000'EF   17  0415   757          JMP     BEGIN                     ; Return to command decoder    [24]  ;G:7
```

```
                                041B   759 ;*
                                041B   760 ;       Routine to turn the QA flag on or off depending on whether      [29]  ;G:7
                                041B   761 ;       or not the CLI QA flag was set. This routine destroys R0.      [30]  ;G:7
                                041B   762 ;       Usage:                                                         [30]  ;G:7
                                041B   763 ;               BSBB    Check_QA_Bit                                   [30]  ;G:7
                                041B   764 ;               BSBW    Check_QA_Bit                                   [30]  ;G:7
                                041B   765 ;               JSB     Check_QA_Bit                                   [30]  ;G:7
                                041B   766 ;-                                                                            ;G:10
                                041B   767 Check_QA_Bit:
        50   00000000'EF   DE   041B   768         MOVAL   DS$GL_CLIBASE, R0       ; Readdress CLI command area   [30]  ;G:7
             09 60    07   E1   0422   769         BBC     #CLI$V_QA, -            ; If bit clear, go clear DSA bit[23]  ;G:7
                                0426   770           CLI$L_FLAGS (R0), 20$ ;                                      [30]  ;G:7
        0000FE00'EF   0F   E3   0426   771         BBCS    #DSA$V_QA, -            ; Set DSA QA bit               [23]  ;G:7
                      00        042D   772           DSA$GL_FLAGS, 10$     ;                                      [30]  ;G:7
                                042E   773                                                                             ;G:10
                           05   042E   774 10$:    RSB                             ; Return to caller             [30]  ;G:7
                                042F   775
        0000FE00'EF   0F   E5   042F   776 20$:    BBCC    #DSA$V_QA, -            ; Clear DSA QA bit             [30]  ;G:7
                      00        0436   777           DSA$GL_FLAGS, 30$     ;                                      [30]  ;G:7
                                0437   778                                 ;                                      [23]  ;G:7
                                0437   779                                                                             ;G:10
                           05   0437   780 30$:    RSB                             ; Return to caller              [30]
```

```
                        0438   782 ;+
                        0438   783 ; This routine is used to print a list of ascic NAMES. R0= address of list.
                        0438   784 ; Usage:
                        0438   785 ;       JSB     PRLIST
                        0438   786 ;       BSBW    PRLIST
                        0438   787 ;       BSBB    PRLIST
                        0438   788 ;-
                        0438   789
                        0438   790 PRLIST:
          51    60      D0     0438   791         MOVL    (R0),R1                 ; Get number of entries in list
       7E   2F21  8F      B0   043B   792         MOVW    #^A"!/",-(SP)           ; Create edit string starting with "!/"
                  05      11   0440   793         BRB     20$                     ; Skip first ","
       7E   202C  8F      B0   0442   794 10$:     MOVW    #^A", ",-(SP)           ; append ", "
       7E   4341  8F      B0   0447   795 20$:     MOVW    #^A"AC",-(SP)           ; Append "AC"
            7E    21      90   044C   796         MOVB    #^A"!",-(SP)            ; Append "!"
              F0  51      F5   044F   797         SOBGTR  R1,10$                  ; one for each parameter in list
    51    60    05      C5   0452   798         MULL3   #5,(R0),R1              ; Get count back
            7E    51      90   0456   799         MOVB    R1,-(SP)                ; Make edit string ASCIC
            51    60      D0   0459   800         MOVL    (R0),R1                 ; Get count back
                6041      DD   045C   801 30$:     PUSHL   (R0)[R1]                ; Push address of argument
              FA  51      F5   045F   802         SOBGTR  R1,30$                  ; Each address now on stack
            51    60      D0   0462   803         MOVL    (R0),R1                 ; Get count back
                6E41      DF   0465   804         PUSHAL  (SP)[R1]                ; Address of ASCIC string
            51    03      C0   0468   805         ADDL2   #3,R1                   ; Total count of print args     [33]
            7E    01      9A   046B   806         movzbl  #ds$k_printf,-(sp)      ; Use PRINTF                    [33]
            7E    25      98   046E   807         cvtbl   #ds$k_type_start_list,-(sp)     ; Code               [33]
00000000'GF   51      FB   0471   808         CALLS   R1, G^DSX$PRINT         ; Print the text                [33]
            50    8E      9A   0478   809         MOVZBL  (SP)+,R0                ; Get length of edit string
            5E    50      C0   047B   810         ADDL    R0,SP                   ; Remove edit string from stack
                  05      05   047E   811         RSB                             ; Return
```

```
                        813          .SBTTL  VRAbort and DSX$Abort Routines
                        814 ;++
                        815 ; FUNCTIONAL DESCRIPTION:
                        816 ;
                        817 ;       ABORTS CURRENT USER PROGRAM AFTER ERROR HALT, ^C, BREAKPOINT, OR
                        818 ;       EXCEPTION, OR /TIME HAS EXPIRED.                                [40]
                        819 ;
                        820 ; CALLING SEQUENCE:
                        821 ;
                        822 ;       BSBW    VRABORT
                        823 ; -or-  CALLG   (SP),DS$ABORT
                        824 ; -or-  from DSI$TIME_AST, fix up the argument list to return to VRABORT [40]
                        825 ;
                        826 ; INPUT PARAMETERS:
                        827 ;
                        828 ;       NONE
                        829 ;
                        830 ; IMPLICIT INPUTS:
                        831 ;
                        832 ;       (AP)    - USER REGISTER LIST.
                        833 ;       DS$GL_FLAGS:
                        834 ;               DS$V_BRKPT      - BREAKPOINT FLAG.
                        835 ;               DS$V_EXCEPT     - EXCEPTION FLAG.
                        836 ;               DS$V_HLTFLG     - ERROR HALT FLAG.
                        837 ;               DS$V_CMDFLG     - COMMAND MODE FLAG.
                        838 ;               DS$V_DONFLG     - PROGRAM COMPLETE FLAG.
                        839 ;
                        840 ; OUTPUT PARAMETERS:    NONE
                        841 ;
                        842 ; IMPLICIT OUTPUTS:     NONE
                        843 ;
                        844 ; COMPLETION CODES:     NONE
                        845 ;
                        846 ; SIDE EFFECTS:
                        847 ;
                        848 ;       ALL USER PROGRAM CONTEXT CLEARED.
                        849 ;--
```

```
                        0000  047F   851 .ENTRY  DSX$ABORT,^M<>
                              0481   852
          0000FE00'EF    0F   E1  0481   853          BBC     #DSA$V_QA, -                ; If not running QA, branch.     [32]
                         16       0488   854            L^DSA$GL_FLAGS, 10$       ;                                [32]
                         05   E1  0489   855          BBC     #QA$K_ERROR_PHASE_ONE, -; If not running the Error Phase [32]
                              048B   856            L^QA$AOB_CHECK_STATE,-; One check, branch.              [32]
            0E 00000000'EF        048B   857            10$                       ;                                [32]
                         CA       0491   858          BICL2   #DS$M_HLTFLG ! -            ; Clear halt on error.           [32]
                              0492   859             DS$M_BRKPT  ! -            ; Clear "breakpoint" flag.       [32]
                              0492   860             DS$M_EXCEPT   -            ; Clear "exception" flag.        [32]
    00000000'EF   00080808 8F        0492   861            ,L^DS$GL_FLAGS            ;                                [32]
                       FC04   31  049C   862          BRW     VRRESTART                   ; Go back and Restart the diag   [32]
                              049F   863
               50   10 AD   D0  049F   864 10$:     MOVL    16(FP),R0                   ; Get callers PC                 [32]
                         04   11  04A3   865          BRB     IS_IT_USER_PC               ; Is this really a user PC?      [37]
                              04A5   866
                              04A5   867 VRABORT::
               50   3C AC   D0  04A5   868          MOVL    60(AP),R0                   ; Get PC from CLI args
                              04A9   869
                              04A9   870          ;+
                              04A9   871          ; Now, check to make sure this is a user's PC (i.e., less than   [37]
                              04A9   872          ; %X'10000'). If R0 is GTR 10000, then look for the user's PC on [37]
                              04A9   873          ; the call frame stack.                                          [37]
                              04A9   874          ;-
                              04A9   875 DSI$ABORT::                                  ; Entry point for /TIME abort    [43]
                              04A9   876 IS_IT_USER_PC:                               ; Is this really a user PC?      [37]
          00010000'EF    50   D1  04A9   877          CMPL    R0, ^X00010000              ; Compare the start of VDS code  [37]
                         07   1B  04B0   878          BLEQU   VRABORT_COM                 ; If < 10000, it's user PC       [41]
          00000000'EF    00   FB  04B2   879          CALLS   #0, L^DSR$FIND_USER_PC      ; Search on the stack for it     [37]
                              04B9   880
                              04B9   881 VRABORT_COM:
                              04B9   882          ;+
                              04B9   883          ; R0 now contains either a user PC or 0.                         [37]
                              04B9   884          ;-
                         01   BB  04B9   885          PUSHR   #^MR0                       ; Save PC at error for PRINTF below
                              04BB   886
          00000000'EF    16   04BB   887          JSB     SCRIPT$FLUSH                ; Flush scripts if console command[24]
                         CA   04C1   888          BICL2   # DS$M_HLTFLG ! -           ; CLEAR HALT ON ERROR.
                              04C2   889            DS$M_BRKPT  ! -           ; CLEAR "BREAKPOINT" FLAG.
                              04C2   890            DS$M_EXCEPT   -           ; CLEAR "EXCEPTION" FLAG.
    00000000'EF   00080808 8F        04C2   891            , L^DS$GL_FLAGS           ;                                [24]
          00000000'EF    02   E0  04CC   892          BBS     #DS$V_STRFLG, -             ; Started?                       [24]
                         03   04D3   893            L^DS$GL_FLAGS,5$          ;                                [24]
                       00C6   31  04D4   894          BRW     100$                        ; Branch if not started          [40]
          00000000'EF    16   04D7   895 5$:     JSB     DS_TESTID                   ; GET TEST/SUBTEST STRING.       [35]
                              04DD   896
                         01   BA  04DD   897          POPR    #^MR0                       ; Restore PC at error
               50   00   D1  04DF   898          CmpL    #0, R0                      ; Did we find a real user PC?    [37]
                         4E   13  04E2   899          Beql    15$                         ; Branch if we did not           [37]
          00000000'EF    1B   E4  04E4   900          BBSC    #DS$V_TIMED_OUT, -          ; ABORT or /TIME ran out?        [52] ;G:7
                         23   04EB   901            L^DS$GL_FLAGS,10$         ;                                [40]
                              04EC   902
                              04EC   903          $PRINT  #DS$K_TYPE_ABORT_PROGRAM, -; Abort program message       [26]
                              04EC   904            #DS$K_PRINTF, -           ; ... use PrintF                 [26]
                              04EC   905            L^FMT_ABORT, -            ; ... abort message              [26]
                              04EC   906            DSA$GL_PASSNO, -          ; ... current pass number        [37]
                              04EC   907            #DS$GQ_TESTID, -          ; ... test id                    [37]
```

```
                                04EC   908                      R0                          ; ... user PC                                [37]
                          50    DD   04EC                     PUSHL   R0
                00000000'8F     DD   04EE                     PUSHL   #DS$GQ_TESTID
                0000FE54'EF     DD   04F4                     PUSHL   DSA$GL_PASSNO
                00000046'EF     9F   04FA                     PUSHAB  L^FMT_ABORT
                   7E   01      9A   0500                     movzbl  #DS$K_PRINTF, -(sp)
                   7E   14      98   0503                     cvtbl   #DS$K_TYPE_ABORT_PROGRAM, -(sp)
             00000000'GF   06    FB   0506                     CALLS   #$$N+2, G^DSX$PRINT
                          6B    11   050D   909          BRB     25$                         ; Do rest of abort                           [37]
                                050F   910
                                050F   911 10$:      $PRINT  #DS$K_TYPE_PROGRAM_END, - ; CRD should never see this.[40][54] ;G:9
                                050F   912                      #DS$K_PRINTF, -             ; PRINTF                                     [40]
                                050F   913                      L^FMT_TIME_EXPIRED, -       ; the message                                [40]
                                050F   914                      DSA$GL_PASSNO, -            ; current pass number                        [40]
                                050F   915                      #DS$GQ_TESTID, -            ; test and subtest                           [40]
                                050F   916                      R0
                          50    DD   050F                     PUSHL   R0
                00000000'8F     DD   0511                     PUSHL   #DS$GQ_TESTID
                0000FE54'EF     DD   0517                     PUSHL   DSA$GL_PASSNO
                000000B7'EF     9F   051D                     PUSHAB  L^FMT_TIME_EXPIRED
                   7E   01      9A   0523                     movzbl  #DS$K_PRINTF, -(sp)
                   7E   10      98   0526                     cvtbl   #DS$K_TYPE_PROGRAM_END, -(sp)
             00000000'GF   06    FB   0529                     CALLS   #$$N+2, G^DSX$PRINT
                          48    11   0530   917          BRB     25$                         ; Do rest of /TIME abort                     [40]
                                0532   918
             00000000'EF   1B    E4   0532   919 15$:      BBSC    #DS$V_TIMED_OUT, -          ; ABORT or /TIME ran out?                    [52] ;G:7
                          21         0539   920                      L^DS$GL_FLAGS,20$           ;                                            [40]
                                053A   921
                                053A   922          $Print  #DS$K_Type_Abort_Program, -; Abort program typecode                  [37]
                                053A   923                    #DS$K_PrintF, -             ; ... use PrintF                             [37]
                                053A   924                    L^Fmt_Abort_No_PC, -        ; ... abort message                          [37]
                                053A   925                    DSA$GL_PassNo, -            ; ... the current pass number               [37]
                                053A   926                    #DS$GQ_TestId               ; ... test/subtest                           [37]
                00000000'8F     DD   053A                     PUSHL   #DS$GQ_TestId
                0000FE54'EF     DD   0540                     PUSHL   DSA$GL_PassNo
                00000077'EF     9F   0546                     PUSHAB  L^Fmt_Abort_No_PC
                   7E   01      9A   054C                     movzbl  #DS$K_PrintF, -(sp)
                   7E   14      98   054F                     cvtbl   #DS$K_Type_Abort_Program, -(sp)
             00000000'GF   05    FB   0552                     CALLS   #$$N+2, G^DSX$PRINT
                          1F    11   0559   927          BRB     25$                         ; Finish the ABORT                           [40]
                                055B   928
                                055B   929 20$:      $PRINT  #DS$K_TYPE_PROGRAM_END, - ; CRD should never see this.[40][54] ;G:9
                                055B   930                      #DS$K_PRINTF, -             ; PRINTF                                     [40]
                                055B   931                      L^FMT_TIME_EXPIRED_NO_PC, -     ; the message                            [40]
                                055B   932                      DSA$GL_PASSNO, -            ; current pass number                        [40]
                                055B   933                      #DS$GQ_TESTID               ; test and subtest                           [40]
                00000000'8F     DD   055B                     PUSHL   #DS$GQ_TESTID
                0000FE54'EF     DD   0561                     PUSHL   DSA$GL_PASSNO
                000000EF'EF     9F   0567                     PUSHAB  L^FMT_TIME_EXPIRED_NO_PC
                   7E   01      9A   056D                     movzbl  #DS$K_PRINTF, -(sp)
                   7E   10      98   0570                     cvtbl   #DS$K_TYPE_PROGRAM_END, -(sp)
             00000000'GF   05    FB   0573                     CALLS   #$$N+2, G^DSX$PRINT
                                057A   934
             0000FE00'EF   1F    E1   057A   935 25$:      Bbc     #DSA$V_Apt, -               ; Clean up if not in APT mode                [37]
                          08         0581   936                       DSA$GL_Flags, 50$           ;                                            [21]
             00000000'EF   04    E0   0582   937          Bbs     #DS$V_ErrFlg, -             ; Skip cleanup if APT mode                   [21]
                          0C         0589   938                       DS$GL_Flags, 75$            ; ... and there was an error                [21]
```

```
                                 058A   939
        00000000'EF    16        058A   940 50$:    Jsb     Init_Context            ; Reset stacks and all              [24]
        00000000'EF    16        0590   941         Jsb     DS_Cleanup              ; Do user cleanup                   [24]
                                 0596   942
   00000000'EF    04    CA        0596   943 75$:    BicL    #DS$M_StrFlg, -         ; Clear start flag                  [21]
                                 059D   944                  DS$GL_Flags             ;                                   [21]
                                 059D   945
   0000FE40'EF    06    D0        059D   946 100$:   MOVL    #APM$_ABTDON, -
                                 05A4   947                  DSA$GL_MSGTYP           ; YES- INDICATE ABORT DONE
        00000000'EF    17        05A4   948         JMP     BEGIN                   ; TRANSFER TO SUPERVISOR CLEANUP.  [24]
```

```
05AA    950          .SBTTL  VRSupport Routines
05AA    951 ;++
05AA    952 ; FUNCTIONAL DESCRIPTION:
05AA    953 ;
05AA    954 ;       This subroutine is called from CLI to show the devices a diagnostic
05AA    955 ;       supports.  It will issue messages for no diagnostics loaded, no
05AA    956 ;       devices supported.
05AA    957 ;
05AA    958 ; CALLING SEQUENCE:
05AA    959 ;
05AA    960 ;       SUBROUTINE CALL FROM THE COMMAND LINE INTERPRETER.
05AA    961 ;
05AA    962 ; INPUT PARAMETERS:
05AA    963 ;
05AA    964 ;       NONE
05AA    965 ;
05AA    966 ; IMPLICIT INPUTS:
05AA    967 ;
05AA    968 ;       NONE
05AA    969 ;
05AA    970 ; OUTPUT PARAMETERS:    NONE
05AA    971 ;
05AA    972 ; IMPLICIT OUTPUTS:     NONE
05AA    973 ;
05AA    974 ; COMPLETION CODES:     NONE
05AA    975 ;
05AA    976 ; SIDE EFFECTS:         NONE
05AA    977 ;
05AA    978 ;--
```

```
                                05AA   980 VRSUPPORT::                                ;                                       [22]
            00000000'EF   01    E0 05AA   981          BBS     #DS$V_LODFLG, -          ; Check load flag.                      [22]
                          14       05B1   982            L^DS$GL_FLAGS, 10$            ;                                       [22]
                                05B2   983 5$:     $PRINT  #ds$k_type_command_err,-; Command error                           [26]
                                05B2   984            #ds$k_printf, -          ; .. use PRINTF                         [26]
                                05B2   985            L^FMT_START              ;                                       [22]
                  00000183'EF   9F 05B2                 PUSHAB  L^FMT_START
                        7E   01   9A 05B8               movzbl  #ds$k_printf, -(sp)
                        7E   15   98 05BB               cvtbl   #ds$k_type_command_err, -(sp)
            00000000'GF   03    FB 05BE               CALLS   #$$N+2, G^DSX$PRINT
                          05    05C5   986          RSB                              ; Return to caller.                     [22]
                                05C6   987
   01   00000204 9F   08   02    ED 05C6   988 10$:     cmpzv   #env$v_super, -          ; Make sure a diagnostic is really[26]
                                05CF   989             #env$s_super, -          ; .. loaded, and has the correct [26]
                                05CF   990             a#l$l_environ, -         ; .. version for this           [26]
                                05CF   991             #env$_super              ; .. Supervisor                 [26]
                          E1    12 05CF   992          bneq    5$                       ; If not, error                         [26]
            50    0000021C 9F   D0 05D1   993          MOVL    a#L$A_DEVP,R0            ; Get address of DEVTYP list            [22]
                        51    60   D0 05D8   994          MOVL    (R0),R1                  ; Get value pointed to                  [22]
                          51    D5 05DB   995          TSTL    R1                       ; Check if device list exists           [22]
                          14    12 05DD   996          BNEQ    20$                      ; Branch if list exists                 [22]
                                05DF   997
                                05DF   998          $PRINT  #ds$k_type_command_out,-; Command output (no devices)            [26]
                                05DF   999            #ds$k_printf, -          ; .. use PRINTF                         [26]
                                05DF  1000            L^FMT_NODEVICE           ; "No device supported."                [22]
                  00000272'EF   9F 05DF                 PUSHAB  L^FMT_NODEVICE
                        7E   01   9A 05E5               movzbl  #ds$k_printf, -(sp)
                        7E   16   98 05E8               cvtbl   #ds$k_type_command_out, -(sp)
            00000000'GF   03    FB 05EB               CALLS   #$$N+2, G^DSX$PRINT
                          05    05F2  1001          RSB                              ; Return to caller                      [20]
                                05F3  1002
                       16   90    05F3  1003 20$:     movb    #ds$k_type_command_out,-; Set command type code          [26]
                  00000000'EF         05F5  1004            L^ds$gb_typecode         ; .. in global                  [26]
                           FE3B   30 05FA  1005          BSBW    PRLIST                   ; Print device types                    [20]
                  00000000'EF   94    05FD  1006          clrb    L^ds$gb_typecode         ; Clear type code                       [26]
                          05    0603  1007          RSB                              ; Return to caller                      [20]
                                0604  1008 ;
                                0604  1009 ;
```

```
                                0604  1011          .SBTTL  DSV$SHOWTESTS
                                0604  1012 ;
                                0604  1013 ;
                                0604  1014 DSV$SHOWTESTS::
                                0604  1015 ;                                                        ; test program
          00000000'EF   01   E0 0604  1016          BBS     #DS$V_LODFLG, -         ; Check the load flag    [42]
                        16      060B  1017            L^DS$GL_FLAGS, 10$    ;                        [42]
                                060C  1018 5$:      $PRINT  #DS$K_TYPE_COMMAND_ERR,-                 ; [42]
                                060C  1019            #DS$K_PRINTF, -         ; Print the command error [42]
                                060C  1020            L^FMT_Start                                    ; [42]
                00000183'EF   9F  060C                PUSHAB  L^FMT_Start
                        7E    01  9A  0612                movzbl  #DS$K_PRINTF, -(sp)
                        7E    15  98  0615                cvtbl   #DS$K_TYPE_COMMAND_ERR, -(sp)
          00000000'GF   03    FB  0618                CALLS   #$$N+2, G^DSX$PRINT
                      004D  31      061F  1021          BRW     SHOWTESTS_X             ; Exit from section      [42]
                                0622  1022
01  00000204 9F   08    02   ED 0622  1023 10$:     CMPZV   #ENV$V_SUPER, -         ; Make sure a diagnostic  [42]
                                062B  1024            #ENV$S_SUPER, -         ; is really loaded, and   [42]
                                062B  1025            @#L$L_ENVIRON, -        ; Has the correct version [42]
                                062B  1026            #ENV$_SUPER             ; for this supervisor     [42]
                        DF    12  062B  1027          BNEQ    5$                      ; If not then error       [42]
                                062D  1028
                        30    BB  062D  1029          PUSHR   #^M<R4,R5>              ; Save Registers          [42]
                        54    D4  062F  1030          CLRL    R4                      ; and clear R1.           [42]
                  55    54    18  C5  0631  1031 20$:     MULL3   #DSP$K_SIZE, R4, R5                       ; [42]
            55    00000218'FF45   9E  0635  1032          MOVAB   @L$A_DTP[R5], R5        ; Get Address of table  ; [42]
                        0C    A5  D5  063D  1033          TSTL    DSP$A_TEST(R5)          ; Test displ. in table    [42]
                        1E    13  0640  1034          BEQL    30$                     ; and exit if zero        [42]
                                0642  1035
                                0642  1036          $PRINT  #DS$K_TYPE_PROGRAM_INFO,- ; and print test msg  ; [42]
                                0642  1037            #DS$K_PRINTF, -                                ; [42]
                                0642  1038            L^FMTTRACE, -                                  ; [42]
                                0642  1039            @DSP$A_BASE(R5), -                             ; [42]
                                0642  1040            DSP$A_MSG(R5)                                  ; [42]
                      04    A5  DD  0642                PUSHL   DSP$A_MSG(R5)
                      00    B5  DD  0645                PUSHL   @DSP$A_BASE(R5)
                000000A3'EF   9F  0648                PUSHAB  L^FMTTRACE
                        7E    01  9A  064E                movzbl  #DS$K_PRINTF, -(sp)
                        7E    17  98  0651                cvtbl   #DS$K_TYPE_PROGRAM_INFO, -(sp)
          00000000'GF   05    FB  0654                CALLS   #$$N+2, G^DSX$PRINT
                        54    D6  065B  1041          INCL    R4                      ; Increment index         [42]
                      D1    AF  17  065D  1042          JMP     20$                     ; and jump for next test  [42]
                        30    BA  0660  1043 30$:     POPR    #^M<R5,R4>              ; Restore registers       [42]
                                0662  1044          $DS_PRINTF_S  FMTCTR            ; Carriage return         [42]
                000000A0'EF   9F  0662                PUSHAB  FMTCTR
          00000000'9F   01    FB  0668                CALLS   #$$N, @#DS$PRINTF
                                066F  1045
                                066F  1046 SHOWTESTS_X:                                            ; [42]
                        05      066F  1047          RSB                                            ; [42]
                                0670  1048 ;
```

```
0670  1050          .SBTTL  VRShowSections Routine
0670  1051 ;++
0670  1052 ; FUNCTIONAL DESCRIPTION:
0670  1053 ;
0670  1054 ;       This subroutine is called from CLI to show the sections that
0670  1055 ;       a diagnostic supports.
0670  1056 ;
0670  1057 ; CALLING SEQUENCE:
0670  1058 ;
0670  1059 ;       JSB     VRSHOWSECTIONS
0670  1060 ;
0670  1061 ; INPUT PARAMETERS:
0670  1062 ;
0670  1063 ;       NONE
0670  1064 ;
0670  1065 ; IMPLICIT INPUTS:
0670  1066 ;
0670  1067 ;       L$A_SECNAM - Pointer to list of section names
0670  1068 ;       L$A_NAME   - Pointer to diagnostic program name
0670  1069 ;
0670  1070 ; OUTPUT PARAMETERS:
0670  1071 ;
0670  1072 ;       NONE
0670  1073 ;
0670  1074 ; IMPLICIT OUTPUTS:
0670  1075 ;
0670  1076 ;       NONE
0670  1077 ;
0670  1078 ; COMPLETION CODES:
0670  1079 ;
0670  1080 ;       NONE
0670  1081 ;
0670  1082 ; SIDE EFFECTS:
0670  1083 ;
0670  1084 ;       NONE
0670  1085 ;
0670  1086 ;--
```

```
                                0670  1088 VRSHOWSECTIONS::
                                0670  1089
          00000000'EF   01   E0  0670  1090          BBS     #DS$V_LODFLG, -                 ; Check load flag.          [27]
                        14      0677  1091                    L^DS$GL_FLAGS, 10$              ;                           [27]
                                0678  1092 5$:      $PRINT  #ds$k_type_command_err, -       ; Command error            [26]
                                0678  1093                    #ds$k_printf, -                 ; .. use PRINTF             [26]
                                0678  1094                    L^FMT_START                     ; .. No diagnostic running.[27]
                00000183'EF   9F  0678                        PUSHAB  L^FMT_START
                      7E   01   9A  067E                      movzbl  #ds$k_printf, -(sp)
                      7E   15   98  0681                      cvtbl   #ds$k_type_command_err, -(sp)
          00000000'GF   03        FB  0684                    CALLS   #$$N+2, G^DSX$PRINT
                                05  068B  1095          RSB                                     ; Return to caller.         [27]
                                068C  1096
01  00000204 9F   08   02   ED  068C  1097 10$:      cmpzv   #env$v_super, -         ; Make sure a diagnostic is really [26]
                                0695  1098                    #env$s_super, -         ; .. loaded, and has the correct   [26]
                                0695  1099                    a#l$l_environ, -        ; .. version for this              [26]
                                0695  1100                    #env$_super             ; .. Supervisor                    [26]
                        E1      12  0695  1101          bneq    5$                      ; If not, error                    [26]
                                0697  1102          $PRINT  #-ds$k_type_command_out, -      ; Command output (sticky)  [26]
                                0697  1103                    #ds$k_printf, -         ; .. use PRINTF                    [26]
                                0697  1104                    L^FMT_SECTIONS, -       ; .. format                        [26]
                                0697  1105                    L^L$A_NAME              ; .. the sections message          [27]
                00000208'EF   DD  0697                        PUSHL   L^L$A_NAME
                000001FB'EF   9F  069D                        PUSHAB  L^FMT_SECTIONS
                      7E   01   9A  06A3                      movzbl  #ds$k_printf, -(sp)
                   7E   EA   8F   98  06A6                    cvtbl   #-ds$k_type_command_out, -(sp)
          00000000'GF   04        FB  06AA                    CALLS   #$$N+2, G^DSX$PRINT
50  00000250 9F   D0        06B1  1106          MOVL    a#L$A_SECNAM,R0                 ; Point to section names   [27]
                FD7D    30  06B8  1107          BSBW    PRLIST                          ; Print list of sections   [27]
          00000000'EF   94  06BB  1108          clrb    L^ds$gb_typecode                ; Clear sticky code        [26]
                        05  06C1  1109          RSB                                     ;                          [27]
                            06C2  1110          .END
```

```
$$N                             = 00000002     D
$ER                             = 00000001     D
$MODULE                           00000000 R   D  03
ACT_DEFAULT_DBG                   ********     X  04
APC$_ABORT                      = 00000006     D
APC$_CONTINUE                   = 00000009     D
APC$_DUMP                       = 00000003     D
APC$_NOP                        = 00000000     D
APC$_START                      = 00000005     D
APC$_ZERO                       = 00000004     D
APM$_ABTDON                     = 00000006     D
APM$_DEVERR                     = 00000002     D
APM$_DONE                       = 0000000A     D
APM$_EXCEPT                     = 0000000B     D
APM$_HARDERR                    = 00000003     D
APM$_MORE                       = 00000008     D
APM$_NOMES                      = 00000000     D
APM$_PREPERR                    = 0000000C     D
APM$_PRGERR                     = 00000005     D
APM$_SOFTERR                    = 00000004     D
APM$_SPOOL                      = 00000009     D
APM$_SYSERR                     = 00000001     D
BEGIN                             ********     X  04
BEGIN_TIME                        00000008 RG  D  02
BIN_TIME                          00000000 RG  D  02
BIT...                          = 00000004     D
CEP_FUNCTIONAL                  = 00000000     D
CEP_REPAIR                      = 00000001     D
CF$L_AP                           00000008     D
CF$L_FP                           0000000C     D
CF$L_ONCOND                       00000000     D
CF$L_PC                           00000010     D
CF$L_REG                          00000014     D
CF$W_MASK                         00000006     D
CF$W_PSW                          00000004     D
CHECK_QA_BIT                      0000041B R   D  04
CLI$K_ALNUM                     = 00000087     D
CLI$K_ALPHA                     = 00000086     D
CLI$K_BIF                       = 00000083     D
CLI$K_BIFS                      = 00000094     D
CLI$K_BR                        = 00000082     D
CLI$K_BUFSIZ                    = 00000100     D
CLI$K_CALL                      = 00000092     D
CLI$K_COMMA                     = 0000008E     D
CLI$K_DEC                       = 0000008A     D
CLI$K_EOL                       = 00000091     D
CLI$K_ERROR                     = 00000080     D
CLI$K_EXIT                      = 00000081     D
CLI$K_FILE                      = 00000095     D
CLI$K_HEX                       = 00000089     D
CLI$K_KEYWORD                   = 0000008C     D
CLI$K_NUM                       = 00000085     D
CLI$K_OCT                       = 00000088     D
CLI$K_RETURN                    = 00000093     D
CLI$K_SIZE                        0000044C     D
CLI$K_SLASH                     = 00000090     D
CLI$K_SPACE                     = 00000084     D
CLI$K_STRING                    = 0000008B     D
CLI$K_SYMBOL                    = 0000008D     D
CLI$K_VALUE                     = 0000008F     D
CLI$L_ADDRESS                     00000018     D
CLI$L_COMMAND                     00000004     D
CLI$L_DATA                        0000001C     D
CLI$L_FLAGS                       00000000     D
CLI$L_FLAGS2                      00000444     D
CLI$L_LAST                        00000024     D
CLI$L_NEXT                        00000030     D
CLI$L_PASS                        0000002C     D
CLI$L_SUBT                        00000028     D
CLI$L_TEMP_BASE                   00000448     D
CLI$L_TEST                        00000020     D
CLI$M_START_OR_RUN              = 00000008     D
CLI$Q_BUFQWD                      00000034     D
CLI$Q_FILE                        00000008     D
CLI$Q_SECTION                     00000010     D
CLI$Q_TIME                        0000043C     D
CLI$T_BUFFER                      0000003C     D
CLI$V_ADAPTER                   = 00000018     D
CLI$V_ADR                       = 0000000B     D
CLI$V_ASCII                     = 00000013     D
CLI$V_BASE_QUAL                 = 00000002     D
CLI$V_BREAK                     = 0000000A     D
CLI$V_BRIEF                     = 0000001B     D
CLI$V_BYTE                      = 0000000D     D
CLI$V_CLEAR                     = 00000002     D
CLI$V_DEC                       = 00000010     D
CLI$V_DEFAULT                   = 0000000C     D
CLI$V_DEPOSIT                   = 00000019     D
CLI$V_EVENT                     = 00000008     D
CLI$V_EXAM                      = 00000005     D
CLI$V_FLAGS                     = 00000009     D
CLI$V_HEX                       = 00000012     D
CLI$V_KERNEL                    = 00000017     D
CLI$V_LOAD                      = 00000006     D
CLI$V_LONG                      = 0000000F     D
CLI$V_NEXT                      = 00000001     D
CLI$V_NOALLOC                   = 00000000     D
CLI$V_NOTNUF                    = 00000001     D
CLI$V_OCT                       = 00000011     D
CLI$V_PREG                      = 0000001A     D
CLI$V_QA                        = 00000007     D
CLI$V_QACKLOOPLOOPS             = 0000001C     D
CLI$V_QAERRORPRINTS             = 0000001B     D
CLI$V_QAMULTIPLEPASS            = 0000001F     D
CLI$V_QASUBTESTLOOPS            = 0000001E     D
CLI$V_QATESTLOOPS               = 0000001D     D
CLI$V_REG                       = 00000014     D
CLI$V_REQUIRED                  = 00000000     D
CLI$V_RUN                       = 00000015     D
CLI$V_SET                       = 00000003     D
CLI$V_SHOW                      = 00000004     D
CLI$V_START_OR_RUN              = 00000003     D
CLI$V_VALSEC                    = 00000016     D
CLI$V_WORD                      = 0000000E     D
```

```
DISPATCH                        ********  X   04
DS$CLRVEC                       ********  X   04
DS$GB_TYPECODE                  ********  X   04
DS$GK_SID                       ********  X   04
DS$GL_CLIBASE                   ********  X   04
DS$GL_FLAGS                     ********  X   04
DS$GL_FSTTEST                   ********  X   04
DS$GL_LSTTEST                   ********  X   04
DS$GL_NUMTEST                   ********  X   04
DS$GL_SUBTEST                   ********  X   04
DS$GPHARD                       ********  X   04
DS$GQ_TESTID                    ********  X   04
DS$K_BBC                      = 0000001D  G D
DS$K_BBCC                     = 00000021  G D
DS$K_BBCCI                    = 00000023  G D
DS$K_BBCS                     = 0000001F  G D
DS$K_BBS                      = 0000001C  G D
DS$K_BBSC                     = 00000020  G D
DS$K_BBSS                     = 0000001E  G D
DS$K_BBSSI                    = 00000022  G D
DS$K_BCC_M                    = 0000001B  G D
DS$K_BCS_M                    = 0000001A  G D
DS$K_BEQLU_B                  = 00000005  G D
DS$K_BEQLU_M                  = 00000011  G D
DS$K_BEQL_B                   = 00000004  G D
DS$K_BEQL_M                   = 00000010  G D
DS$K_BERROR                   = 00000026  G D
DS$K_BGEQU_B                  = 00000007  G D
DS$K_BGEQU_M                  = 00000013  G D
DS$K_BGEQ_B                   = 00000006  G D
DS$K_BGEQ_M                   = 00000012  G D
DS$K_BGTRU_B                  = 00000009  G D
DS$K_BGTRU_M                  = 00000015  G D
DS$K_BGTR_B                   = 00000008  G D
DS$K_BGTR_M                   = 00000014  G D
DS$K_BLBC                     = 00000025  G D
DS$K_BLBS                     = 00000024  G D
DS$K_BLEQU_B                  = 00000003  G D
DS$K_BLEQU_M                  = 0000000F  G D
DS$K_BLEQ_B                   = 00000002  G D
DS$K_BLEQ_M                   = 0000000E  G D
DS$K_BLSSU_B                  = 00000001  G D
DS$K_BLSSU_M                  = 0000000D  G D
DS$K_BLSS_B                   = 00000000  G D
DS$K_BLSS_M                   = 0000000C  G D
DS$K_BNEQU_B                  = 0000000B  G D
DS$K_BNEQU_M                  = 00000017  G D
DS$K_BNEQ_B                   = 0000000A  G D
DS$K_BNEQ_M                   = 00000016  G D
DS$K_BNERROR                  = 00000027  G D
DS$K_BVC_M                    = 00000019  G D
DS$K_BVS_M                    = 00000018  G D
DS$K_DS_STARTING_LOCATION     = 00010000    D
DS$K_PRINTB                   = 00000002    D
DS$K_PRINTF                   = 00000001    D
DS$K_PRINTI                   = 00000000    D
DS$K_PRINTX                   = 00000003    D
DS$K_TYPE_ABORT_PROGRAM       = 00000014    D
DS$K_TYPE_ABORT_TEST          = 00000013    D
DS$K_TYPE_COMMAND_ERR         = 00000015    D
DS$K_TYPE_COMMAND_OUT         = 00000016    D
DS$K_TYPE_CRD_AUTOTEST        = 0000001A    D
DS$K_TYPE_DS_PROMPT           = 00000001    D
DS$K_TYPE_DS_START            = 0000001D    D
DS$K_TYPE_ERRDEV              = 00000008    D
DS$K_TYPE_ERRHARD             = 00000006    D
DS$K_TYPE_ERROR_BODY          = 00000009    D
DS$K_TYPE_ERROR_END           = 0000000A    D
DS$K_TYPE_ERRPREP             = 0000001B    D
DS$K_TYPE_ERRSOFT             = 00000007    D
DS$K_TYPE_ERRSUP              = 00000004    D
DS$K_TYPE_ERRSYS              = 00000005    D
DS$K_TYPE_ERR_HALT            = 0000000D    D
DS$K_TYPE_EXCEPTION           = 0000000C    D
DS$K_TYPE_EXCEPTION_HEAD      = 0000000B    D
DS$K_TYPE_FIRST_PASS          = 00000011    D
DS$K_TYPE_GENERAL             = 00000000    D
DS$K_TYPE_GENERAL_ERROR       = 00000003    D
DS$K_TYPE_NO_TESTS            = 00000012    D
DS$K_TYPE_PARAM_ERROR         = 0000001C    D
DS$K_TYPE_PROGRAM_END         = 00000010    D
DS$K_TYPE_PROGRAM_INFO        = 00000017    D
DS$K_TYPE_PROGRAM_START       = 0000000F    D
DS$K_TYPE_QIO_INVADP          = 00000024    D
DS$K_TYPE_QIO_NODRIVER        = 00000022    D
DS$K_TYPE_QIO_WRONGVER        = 00000023    D
DS$K_TYPE_SCRIPT_ECHO         = 00000021    D
DS$K_TYPE_SCRIPT_PNF          = 0000001E    D
DS$K_TYPE_SCRIPT_PROMPT       = 00000020    D
DS$K_TYPE_SCRIPT_SKIP         = 0000001F    D
DS$K_TYPE_SEQUENCE_ERROR      = 00000019    D
DS$K_TYPE_START_ERR           = 00000018    D
DS$K_TYPE_START_LIST          = 00000025    D
DS$K_TYPE_SUMMARY             = 0000000E    D
DS$K_TYPE_USER_PROMPT         = 00000002    D
DS$M_ABRTFLG                  = 00000040    D
DS$M_BADTIME                  = 00100000    D
DS$M_BATCH                    = 00400000    D
DS$M_BRKCLR                   = 00001000    D
DS$M_BRKPT                    = 00000800    D
DS$M_CHARFLG                  = 00000100    D
DS$M_CMDFLG                   = 00000080    D
DS$M_CTRLC                    = 00000001    D
DS$M_CTRLO                    = 00010000    D
DS$M_DEVFLG                   = 00000200    D
DS$M_DISABLCC                 = 01000000    D
DS$M_DONFLG                   = 00002000    D
DS$M_ERRFLG                   = 00000010    D
DS$M_EXCEPT                   = 00080000    D
DS$M_EXETST                   = 00040000    D
DS$M_HLTFLG                   = 00000008    D
DS$M_LODFLG                   = 00000002    D
DS$M_MEMMGT                   = 00008000    D
DS$M_NI                       = 04000000    D
```

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DS$M_OUTPUT                     = 00800000     D
DS$M_RUBFLG                     = 00000020     D
DS$M_SCRIPT                     = 00200000     D
DS$M_SETIMR                     = 02000000     D
DS$M_STRFLG                     = 00000004     D
DS$M_SUBT                       = 00004000     D
DS$M_SYSFLG                     = 00000400     D
DS$M_TIMED                      = 02000000     D
DS$M_TIMED_OUT                  = 08000000     D
DS$M_TIMRON                     = 00020000     D
DS$PRINTF                         ********   X   04
DS$V_ABRTFLG                    = 00000006     D
DS$V_BADTIME                    = 00000014     D
DS$V_BATCH                      = 00000016     D
DS$V_BRKCLR                     = 0000000C     D
DS$V_BRKPT                      = 0000000B     D
DS$V_CHARFLG                    = 00000008     D
DS$V_CMDFLG                     = 00000007     D
DS$V_CTRLC                      = 00000000     D
DS$V_CTRLO                      = 00000010     D
DS$V_DEVFLG                     = 00000009     D
DS$V_DISABLCC                   = 00000018     D
DS$V_DONFLG                     = 0000000D     D
DS$V_ERRFLG                     = 00000004     D
DS$V_EXCEPT                     = 00000013     D
DS$V_EXETST                     = 00000012     D
DS$V_HLTFLG                     = 00000003     D
DS$V_LODFLG                     = 00000001     D
DS$V_MEMMGT                     = 0000000F     D
DS$V_NI                         = 0000001A     D
DS$V_OUTPUT                     = 00000017     D
DS$V_RUBFLG                     = 00000005     D
DS$V_SCRIPT                     = 00000015     D
DS$V_SETIMR                     = 00000019     D
DS$V_STRFLG                     = 00000002     D
DS$V_SUBT                       = 0000000E     D
DS$V_SYSFLG                     = 0000000A     D
DS$V_TIMED                      = 00000019     D
DS$V_TIMED_OUT                  = 0000001B     D
DS$V_TIMRON                     = 00000011     D
DSA$AL_APTMAIL                    0000FE00     D
DSA$AT_APTTXT                     0000FA00     D
DSA$GL_APTCOM                     0000FE04     D
DSA$GL_DEVLEN                     0000FE58     D
DSA$GL_ERRNO                      0000FE44     D
DSA$GL_EVENT                      0000FE48     D
DSA$GL_FLAGS                      0000FE00     D
DSA$GL_MSGTYP                     0000FE40     D
DSA$GL_PASSES                     0000FE08     D
DSA$GL_PASSNO                     0000FE54     D
DSA$GL_SECTNO                     0000FE10     D
DSA$GL_SID                        0000FE14     D
DSA$GL_SUBTNO                     0000FE4C     D
DSA$GL_TESTNO                     0000FE50     D
DSA$GL_UNITS                      0000FE0C     D
DSA$GQ_MSGPTR                     0000FE68     D
DSA$GT_DEVNAM                     0000FE5C     D
DSA$M_LOAD_DEBUGGER             = 40000000     D
DSA$V_APT                       = 0000001F     D
DSA$V_DEBUG                     = 0000001A     D
DSA$V_LOAD_DEBUGGER             = 0000001E     D
DSA$V_QA                        = 0000000F     D
DSA$V_USER                      = 0000001C     D
DSI$ABORT                         00004A9 RG D   04
DSP$A_BASE                        00000000     D
DSP$A_DATA                        00000008     D
DSP$A_MSG                         00000004     D
DSP$A_TEST                        0000000C     D
DSP$GEN_PTABLES                   ********   X   04
DSP$K_SIZE                      = 00000018     D
DSP$Q_SECTION                     00000010     D
DSQA$K_DISPAT_AFTER_INIT        = 00000014     D
DSQA$K_DISPAT_BEFORE_INIT       = 00000013     D
DSQA$K_DISPAT_CALLTEST          = 00000015     D
DSQA$K_DISPAT_DONE_TESTS        = 00000018     D
DSQA$K_DISPAT_DSX$ENDPASS_BGN   = 00000001     D
DSQA$K_DISPAT_DSX$ENDPASS_END   = 00000002     D
DSQA$K_DISPAT_DSX$ENDPASS_MID   = 00000000     D
DSQA$K_DISPAT_DS_CLEANUP_BGN    = 00000003     D
DSQA$K_DISPAT_DS_CLEANUP_END    = 00000004     D
DSQA$K_DUMMY_1                  = 00000007     D
DSQA$K_ERROR_ERROR_BGN          = 00000006     D
DSQA$K_ERROR_ERROR_END          = 00000005     D
DSQA$K_KERNEL_INIT_CONTEXT      = 00000008     D
DSQA$K_LOOP_DSX$BGNSUB          = 00000009     D
DSQA$K_LOOP_DSX$CKLOOP          = 0000000B     D
DSQA$K_LOOP_DSX$ENDSUB          = 0000000A     D
DSQA$K_PARAM_DSX$GETADDRESS     = 0000000E     D
DSQA$K_PARAM_DSX$GETDATA        = 0000000C     D
DSQA$K_PARAM_DSX$GETLOGICAL     = 0000000F     D
DSQA$K_PARAM_DSX$GETSTRING      = 00000010     D
DSQA$K_PARAM_DSX$GETVIELD       = 0000000D     D
DSQA$K_QA_DSX$BRANCH            = 00000011     D
DSQA$K_START_BEFORE_HEADER      = 00000017     D
DSQA$K_START_VRRESTART          = 00000012     D
DSQA$K_START_VRSTART            = 00000016     D
DSR$FIND_USER_PC                  ********   X   04
DSV$DEBUG                         ********   X   04
DSV$SHOWTESTS                     00000604 RG D   04
DSX$ABORT                         0000047F RG D   04
DSX$PRINT                         ********   X   04
DS_CLEANUP                        ********   X   04
DS_TESTID                         ********   X   04
DUE_TIME                          00000018 RG D   02
ENV$M_DOMAIN                    = 00000002     D
ENV$M_LEVEL                     = 00000001     D
ENV$M_SUPER                     = 000003FC     D
ENV$S_DOMAIN                    = 00000001     D
ENV$S_LEVEL                     = 00000001     D
ENV$S_SUPER                     = 00000008     D
ENV$V_DOMAIN                    = 00000001     D
ENV$V_LEVEL                     = 00000000     D
ENV$V_SUPER                     = 00000002     D
ENV$_CPU                        = 00000000     D
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ENV$_FUNCTIONAL                 =  00000000     D
ENV$_REPAIR                     =  00000001     D
ENV$_SUPER                      =  00000001     D
ENV$_SYSTEM                     =  00000001     D
FALSE                           =  00000000     D
FMTCTR                             000000A0 R   D   03
FMTTRACE                           000000A3 R   D   03
FMT_ABORT                          00000046 R   D   03
FMT_ABORT_NO_PC                    00000077 R   D   03
FMT_AMBSEC                         000001CB R   D   03
FMT_CRLF                           00000231 R   D   03
FMT_ILLSEC                         0000019D R   D   03
FMT_MISMATCH                       00000234 R   D   03
FMT_NAMES                          0000022C R   D   03
FMT_NODEVICE                       00000272 R   D   03
FMT_NOUNITS                        0000014A R   D   03
FMT_PROG                           00000006 R   D   03
FMT_SECTIONS                       000001FB R   D   03
FMT_START                          00000183 R   D   03
FMT_TESTING                        00000222 R   D   03
FMT_TESTRANGE                      0000011F R   D   03
FMT_TIME_EXPIRED                   000000B7 R   D   03
FMT_TIME_EXPIRED_NO_PC             000000EF R   D   03
GET_TIME                           ********   X     04
INIT_CONTEXT                       ********   X     04
IS_IT_USER_PC                      000004A9 R   D   04
L$A_CCP                            00000240     D
L$A_DEVP                           0000021C     D
L$A_DREG                           00000224     D
L$A_DTP                            00000218     D
L$A_ICP                            0000023C     D
L$A_LASTADR                        00000214     D
L$A_NAME                           00000208     D
L$A_REPP                           00000244     D
L$A_SECNAM                         00000250     D
L$A_STATAB                         00000248     D
L$A_TSTCNT                         00000254     D
L$L_ENVIRON                        00000204     D
L$L_ERRTYP                         0000024C     D
L$L_HEADLENGTH                     00000200     D
L$L_REV                            0000020C     D
L$L_UNIT                           00000220     D
L$L_UNUSED                         00000228     D
L$L_UPDATE                         00000210     D
MAPFREE                            ********   X     04
MAP_DEBUGGER                       ********   X     04
MP$GL_CONDITION_FLAGS              ********W  GX    00
MP$GL_FLAGS                        ********W  GX    00
MP$GR_BOOTED_PROCESSORS            ********W  GX    00
MP$GR_IDLING_PROCESSORS            ********W  GX    00
MP$_CLEAR_LOCKS                    ********W  GX    00
OFF                             =  00000000     D
ON                              =  00000001     D
POLL_TIME                          00000010 RG  D   02
PRLIST                             00000438 R   D   04
QA$AOB_CHECK_STATE                 ********   X     04
QA$AOB_FLAGS                       ********   X     04
QA$K_ABORT_NOW                  =  00000007     D
QA$K_APT_PHASE_ONE              =  0000000B     D
QA$K_APT_PHASE_TWO              =  0000000C     D
QA$K_BAD_ADDRESS                =  00000009     D
QA$K_CONTROL_C_CONT             =  0000000A     D
QA$K_DEALLOCATION               =  0000000E     D
QA$K_ERROR_PHASE_ONE            =  00000005     D
QA$K_ERROR_PHASE_THREE          =  00000007     D
QA$K_ERROR_PHASE_TWO            =  00000006     D
QA$K_FAILURE                    =  00000000     D
QA$K_FIRST_BRANCH_CODE          =  00000000     D
QA$K_FIRST_TIME                 =  00000005     D
QA$K_INIT_CONTEXT_DONE          =  00000003     D
QA$K_LAST_BRANCH_CODE           =  00000025     D
QA$K_LOOP_ON_SUBTEST            =  00000003     D
QA$K_LOOP_ON_TEST               =  00000002     D
QA$K_LOOP_TEST_DONE             =  00000004     D
QA$K_MEMORY_MANAGE              =  0000000D     D
QA$K_MULTIPLE_PASS              =  00000001     D
QA$K_NODEF                      =  00000000     D
QA$K_NORMAL_START               =  00000000     D
QA$K_NO_HEADER                  =  00000006     D
QA$K_NUMBER_OF_CHECKS           =  0000000F     D
QA$K_NUMBER_QA_FLAGS            =  00000008     D
QA$K_NUMB_ROUTINE_STATES        =  00000004     D
QA$K_QA_DEBUG                   =  00000001     D
QA$K_QA_DONE                    =  00000002     D
QA$K_RUN_BACKWARDS              =  00000004     D
QA$K_SECTION                    =  00000008     D
QA$K_SUCCESS                    =  00000001     D
QA$MAIN                            ********   X     04
QA$V_CHECK_DONE                 =  00000003     D
QA$V_DOING_CLEANUP              =  00000002     D
QA$V_ERROR_FOUND                =  00000001     D
QA$V_INIT_DONE                  =  00000000     D
QIO$ADDUNIT                        ********   X     04
QIO$CLEANUP                        ********   X     04
SCB$L_ACCESS                       00000020     D
SCB$L_ARITH                        00000034     D
SCB$L_BREAK                        0000002C     D
SCB$L_CHME                         00000044     D
SCB$L_CHMK                         00000040     D
SCB$L_CHMS                         00000048     D
SCB$L_CHMU                         0000004C     D
SCB$L_COMPAT                       00000030     D
SCB$L_KNLSTK                       00000008     D
SCB$L_MACHCHK                      00000004     D
SCB$L_OPCCUS                       00000014     D
SCB$L_OPCDEC                       00000010     D
SCB$L_POWER                        0000000C     D
SCB$L_RADRMOD                      0000001C     D
SCB$L_ROPRAND                      00000018     D
SCB$L_RXDB                         000000F8     D
SCB$L_SFTLVL1                      00000084     D
SCB$L_SFTLVL10                     000000A8     D
SCB$L_SFTLVL11                     000000AC     D
SCB$L_SFTLVL12                     000000B0     D
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SCB$L_SFTLVL13                  000000B4     D
SCB$L_SFTLVL14                  000000B8     D
SCB$L_SFTLVL15                  000000BC     D
SCB$L_SFTLVL2                   00000088     D
SCB$L_SFTLVL3                   0000008C     D
SCB$L_SFTLVL4                   00000090     D
SCB$L_SFTLVL5                   00000094     D
SCB$L_SFTLVL6                   00000098     D
SCB$L_SFTLVL7                   0000009C     D
SCB$L_SFTLVL8                   000000A0     D
SCB$L_SFTLVL9                   000000A4     D
SCB$L_TBIT                      00000028     D
SCB$L_TIMER                     000000C0     D
SCB$L_TRANSL                    00000024     D
SCB$L_TXDB                      000000FC     D
SCB$L_VM                        00000038     D
SCB$L_ZERO                      00000000     D
SCRIPT$FLUSH                    ********   X    04
SEP_FUNCTIONAL                = 00000002     D
SEP_REPAIR                    = 00000003     D
SHOWTESTS_X                     0000066F R   D    04
SIZ...                        = 00000001     D
START1                          000000A3 R   D    04
TRUE                          = 00000001     D
VRABORT                         000004A5 RG  D    04
VRABORT_COM                     000004B9 R   D    04
VRRESTART                       000000A3 RG  D    04
VRSHOWSECTIONS                  00000670 RG  D    04
VRSTART                         00000000 RG  D    04
VRSTART_X                       0000040A R   D    04
VRSUPPORT                       000005AA RG  D    04
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000FE70 (65136.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
WORK	0000001C (28.)	02 (2.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC LONG
DATA	0000029C (668.)	03 (3.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC BYTE
CODE	000006C2 (1730.)	04 (4.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC BYTE

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$$N	=00000002	1105 (4)	#-1000 (4) #-1020 (4) 1040 (4) #-1044 (4) #-1094 (4) 1105 (4) #-430 (3) #-460 (3) #-522 (3) #-536 (3) 591 (3) 623 (3) #-644 (3) 908 (4) 916 (4) 926 (4) 933 (4) #-985 (4)
$ER	=00000001	308 (3)	
$MODULE	00000000-R	308 (3)	
ACT_DEFAULT_DBG	00000000-XR		436 (3)
APC$_ABORT	=00000006	283 (3)	
APC$_CONTINUE	=00000009	283 (3)	
APC$_DUMP	=00000003	283 (3)	
APC$_NOP	=00000000	283 (3)	
APC$_START	=00000005	283 (3)	
APC$_ZERO	=00000004	283 (3)	
APM$_ABTDON	=00000006	283 (3)	#-946 (4)
APM$_DEVERR	=00000002	283 (3)	
APM$_DONE	=0000000A	283 (3)	
APM$_EXCEPT	=0000000B	283 (3)	
APM$_HARDERR	=00000003	283 (3)	
APM$_MORE	=00000008	283 (3)	
APM$_NOMES	=00000000	283 (3)	
APM$_PREPERR	=0000000C	283 (3)	
APM$_PRGERR	=00000005	283 (3)	
APM$_SOFTERR	=00000004	283 (3)	
APM$_SPOOL	=00000009	283 (3)	
APM$_SYSERR	=00000001	283 (3)	
BEGIN	00000000-XR		757 (3) 948 (4)
BEGIN_TIME	00000008-R	299 (3)	739 (3) #-743 (3)
BIN_TIME	00000000-R	297 (3)	#-734 (3) #-744 (3) #-745 (3)
BIT...	=00000004	289 (3)	277 (3) 279 (3) 286 (3) 287 (3) 288 (3) 289 (3)
CEP_FUNCTIONAL	=00000000	279 (3)	
CEP_REPAIR	=00000001	279 (3)	
CHECK_QA_BIT	0000041B-R	767 (3)	#-440 (3) #-464 (3)
CLI$K_ALNUM	=00000087	277 (3)	
CLI$K_ALPHA	=00000086	277 (3)	
CLI$K_BIF	=00000083	277 (3)	
CLI$K_BIFS	=00000094	277 (3)	
CLI$K_BR	=00000082	277 (3)	
CLI$K_BUFSIZ	=00000100	284 (3)	284 (3)
CLI$K_CALL	=00000092	277 (3)	
CLI$K_COMMA	=0000008E	277 (3)	
CLI$K_DEC	=0000008A	277 (3)	
CLI$K_EOL	=00000091	277 (3)	
CLI$K_ERROR	=00000080	277 (3)	
CLI$K_EXIT	=00000081	277 (3)	
CLI$K_FILE	=00000095	277 (3)	
CLI$K_HEX	=00000089	277 (3)	
CLI$K_KEYWORD	=0000008C	277 (3)	
CLI$K_NUM	=00000085	277 (3)	

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CLI$K_OCT                       =00000088     277     (3)
CLI$K_RETURN                    =00000093     277     (3)
CLI$K_SIZE                       0000044C     284     (3)
CLI$K_SLASH                     =00000090     277     (3)
CLI$K_SPACE                     =00000084     277     (3)
CLI$K_STRING                    =0000008B     277     (3)
CLI$K_SYMBOL                    =0000008D     277     (3)
CLI$K_VALUE                     =0000008F     277     (3)
CLI$L_ADDRESS                    00000018     284     (3)
CLI$L_COMMAND                    00000004     284     (3)
CLI$L_DATA                       0000001C     284     (3)
CLI$L_FLAGS                      00000000     284     (3)      511    (3)      516    (3)      533    (3)      770    (3)
CLI$L_FLAGS2                     00000444     284     (3)
CLI$L_LAST                       00000024     284     (3)   #-570    (3)
CLI$L_NEXT                       00000030     284     (3)
CLI$L_PASS                       0000002C     284     (3)   #-562    (3)
CLI$L_SUBT                       00000028     284     (3)   #-584    (3)
CLI$L_TEMP_BASE                  00000448     284     (3)
CLI$L_TEST                       00000020     284     (3)   #-564    (3)
CLI$M_START_OR_RUN              =00000008     284     (3)
CLI$Q_BUFQWD                     00000034     284     (3)
CLI$Q_FILE                       00000008     284     (3)
CLI$Q_SECTION                    00000010     284     (3)   #-485    (3)   #-495    (3)   #-496    (3)
CLI$Q_TIME                       0000043C     284     (3)
CLI$T_BUFFER                     0000003C     284     (3)
CLI$V_ADAPTER                   =00000018     284     (3)
CLI$V_ADR                       =0000000B     284     (3)
CLI$V_ASCII                     =00000013     284     (3)
CLI$V_BASE_QUAL                 =00000002     284     (3)
CLI$V_BREAK                     =0000000A     284     (3)
CLI$V_BRIEF                     =0000001B     284     (3)
CLI$V_BYTE                      =0000000D     284     (3)
CLI$V_CLEAR                     =00000002     284     (3)
CLI$V_DEC                       =00000010     284     (3)
CLI$V_DEFAULT                   =0000000C     284     (3)
CLI$V_DEPOSIT                   =00000019     284     (3)
CLI$V_EVENT                     =00000008     284     (3)
CLI$V_EXAM                      =00000005     284     (3)
CLI$V_FLAGS                     =00000009     284     (3)
CLI$V_HEX                       =00000012     284     (3)
CLI$V_KERNEL                    =00000017     284     (3)
CLI$V_LOAD                      =00000006     284     (3)
CLI$V_LONG                      =0000000F     284     (3)
CLI$V_NEXT                      =00000001     284     (3)
CLI$V_NOALLOC                   =00000000     284     (3)
CLI$V_NOTNUF                    =00000001     284     (3)
CLI$V_OCT                       =00000011     284     (3)
CLI$V_PREG                      =0000001A     284     (3)
CLI$V_QA                        =00000007     284     (3)   #-769    (3)
CLI$V_QACKLOOPLOOPS             =0000001C     284     (3)
CLI$V_QAERRORPRINTS             =0000001B     284     (3)
CLI$V_QAMULTIPLEPASS            =0000001F     284     (3)
CLI$V_QASUBTESTLOOPS            =0000001E     284     (3)
CLI$V_QATESTLOOPS               =0000001D     284     (3)
CLI$V_REG                       =00000014     284     (3)
CLI$V_REQUIRED                  =00000000     284     (3)
CLI$V_RUN                       =00000015     284     (3)
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CLI$V_SET                       =00000003     284     (3)
CLI$V_SHOW                      =00000004     284     (3)
CLI$V_START_OR_RUN              =00000003     284     (3)     284     (3)
CLI$V_VALSEC                    =00000016     284     (3)   #-510     (3)   #-515     (3)   #-532     (3)
CLI$V_WORD                      =0000000E     284     (3)
DISPATCH                         00000000-XR                  748     (3)
DS$CLRVEC                        00000000-XR                  704     (3)
DS$GB_TYPECODE                   00000000-XR                #-1004    (4)   #-1006    (4)   #-1108    (4)   #-525     (3)
                                                            #-539     (3)   #-647     (3)
DS$GK_SID                        00000000-XR                #-420     (3)
DS$GL_CLIBASE                    00000000-XR                  483     (3)     768     (3)
DS$GL_FLAGS                      00000000-XR                 1017     (4)    1091     (4)     427     (3)   #-553     (3)
                                                            #-733     (3)   #-746     (3)   #-756     (3)   #-861     (4)
                                                            #-891     (4)     893     (4)     901     (4)     920     (4)
                                                              938     (4)   #-944     (4)     982     (4)
DS$GL_FSTTEST                    00000000-XR                #-565     (3)   #-568     (3)   #-577     (3)
DS$GL_LSTTEST                    00000000-XR                #-571     (3)   #-575     (3)   #-580     (3)
DS$GL_NUMTEST                    00000000-XR                #-560     (3)   #-574     (3)   #-578     (3)   #-581     (3)
                                                            #-591     (3)
DS$GL_SUBTEST                    00000000-XR                #-585     (3)
DS$GPHARD                        00000000-XR                  672     (3)     711     (3)
DS$GQ_TESTID                     00000000-XR                #-908     (4)   #-916     (4)   #-926     (4)   #-933     (4)
DS$K_BBC                        =0000001D     288     (3)
DS$K_BBCC                       =00000021     288     (3)
DS$K_BBCCI                      =00000023     288     (3)
DS$K_BBCS                       =0000001F     288     (3)
DS$K_BBS                        =0000001C     288     (3)
DS$K_BBSC                       =00000020     288     (3)
DS$K_BBSS                       =0000001E     288     (3)
DS$K_BBSSI                      =00000022     288     (3)
DS$K_BCC_M                      =0000001B     288     (3)
DS$K_BCS_M                      =0000001A     288     (3)
DS$K_BEQLU_B                    =00000005     288     (3)
DS$K_BEQLU_M                    =00000011     288     (3)
DS$K_BEQL_B                     =00000004     288     (3)
DS$K_BEQL_M                     =00000010     288     (3)
DS$K_BERROR                     =00000026     288     (3)
DS$K_BGEQU_B                    =00000007     288     (3)
DS$K_BGEQU_M                    =00000013     288     (3)
DS$K_BGEQ_B                     =00000006     288     (3)
DS$K_BGEQ_M                     =00000012     288     (3)
DS$K_BGTRU_B                    =00000009     288     (3)
DS$K_BGTRU_M                    =00000015     288     (3)
DS$K_BGTR_B                     =00000008     288     (3)
DS$K_BGTR_M                     =00000014     288     (3)
DS$K_BLBC                       =00000025     288     (3)     288     (3)
DS$K_BLBS                       =00000024     288     (3)
DS$K_BLEQU_B                    =00000003     288     (3)
DS$K_BLEQU_M                    =0000000F     288     (3)
DS$K_BLEQ_B                     =00000002     288     (3)
DS$K_BLEQ_M                     =0000000E     288     (3)
DS$K_BLSSU_B                    =00000001     288     (3)
DS$K_BLSSU_M                    =0000000D     288     (3)
DS$K_BLSS_B                     =00000000     288     (3)     288     (3)
DS$K_BLSS_M                     =0000000C     288     (3)
DS$K_BNEQU_B                    =0000000B     288     (3)
DS$K_BNEQU_M                    =00000017     288     (3)
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DS$K_BNEQ_B                     =0000000A     288    (3)
DS$K_BNEQ_M                     =00000016     288    (3)
DS$K_BNERROR                    =00000027     288    (3)
DS$K_BVC_M                      =00000019     288    (3)
DS$K_BVS_M                      =00000018     288    (3)
DS$K_DS_STARTING_LOCATION       =00010000     288    (3)
DS$K_PRINTB                     =00000002     289    (3)
DS$K_PRINTF                     =00000001     289    (3)    #-1000   (4)   #-1020   (4)   #-1040   (4)   #-1094   (4)
                                                            #-1105   (4)   #-430    (3)   #-460    (3)   #-522    (3)
                                                            #-536    (3)   #-591    (3)   #-623    (3)   #-644    (3)
                                                            #-677    (3)   #-683    (3)   #-688    (3)   #-806    (3)
                                                            #-908    (4)   #-916    (4)   #-926    (4)   #-933    (4)
                                                            #-985    (4)
DS$K_PRINTI                     =00000000     289    (3)
DS$K_PRINTX                     =00000003     289    (3)
DS$K_TYPE_ABORT_PROGRAM         =00000014     289    (3)    #-908    (4)   #-926    (4)
DS$K_TYPE_ABORT_TEST            =00000013     289    (3)
DS$K_TYPE_COMMAND_ERR           =00000015     289    (3)    #-1020   (4)   #-1094   (4)   #-430    (3)   #-522    (3)
                                                            #-536    (3)   #-591    (3)   #-985    (4)
DS$K_TYPE_COMMAND_OUT           =00000016     289    (3)    #-1000   (4)   #-1003   (4)   #-1105   (4)
DS$K_TYPE_CRD_AUTOTEST          =0000001A     289    (3)
DS$K_TYPE_DS_PROMPT             =00000001     289    (3)
DS$K_TYPE_DS_START              =0000001D     289    (3)
DS$K_TYPE_ERRDEV                =00000008     289    (3)
DS$K_TYPE_ERRHARD               =00000006     289    (3)
DS$K_TYPE_ERROR_BODY            =00000009     289    (3)
DS$K_TYPE_ERROR_END             =0000000A     289    (3)
DS$K_TYPE_ERRPREP               =0000001B     289    (3)
DS$K_TYPE_ERRSOFT               =00000007     289    (3)
DS$K_TYPE_ERRSUP                =00000004     289    (3)
DS$K_TYPE_ERRSYS                =00000005     289    (3)
DS$K_TYPE_ERR_HALT              =0000000D     289    (3)
DS$K_TYPE_EXCEPTION             =0000000C     289    (3)
DS$K_TYPE_EXCEPTION_HEAD        =0000000B     289    (3)
DS$K_TYPE_FIRST_PASS            =00000011     289    (3)
DS$K_TYPE_GENERAL               =00000000     289    (3)
DS$K_TYPE_GENERAL_ERROR         =00000003     289    (3)
DS$K_TYPE_NO_TESTS              =00000012     289    (3)
DS$K_TYPE_PARAM_ERROR           =0000001C     289    (3)
DS$K_TYPE_PROGRAM_END           =00000010     289    (3)    #-916    (4)   #-933    (4)
DS$K_TYPE_PROGRAM_INFO          =00000017     289    (3)    #-1040   (4)   #-678    (3)   #-684    (3)   #-689    (3)
DS$K_TYPE_PROGRAM_START         =0000000F     289    (3)    #-623    (3)
DS$K_TYPE_QIO_INVADP            =00000024     289    (3)
DS$K_TYPE_QIO_NODRIVER          =00000022     289    (3)
DS$K_TYPE_QIO_WRONGVER          =00000023     289    (3)
DS$K_TYPE_SCRIPT_ECHO           =00000021     289    (3)
DS$K_TYPE_SCRIPT_PNF            =0000001E     289    (3)
DS$K_TYPE_SCRIPT_PROMPT         =00000020     289    (3)
DS$K_TYPE_SCRIPT_SKIP           =0000001F     289    (3)
DS$K_TYPE_SEQUENCE_ERROR        =00000019     289    (3)
DS$K_TYPE_START_ERR             =00000018     289    (3)    #-460    (3)   #-644    (3)
DS$K_TYPE_START_LIST            =00000025     289    (3)    #-807    (3)
DS$K_TYPE_SUMMARY               =0000000E     289    (3)
DS$K_TYPE_USER_PROMPT           =00000002     289    (3)
DS$M_ABRTFLG                    =00000040     286    (3)
DS$M_BADTIME                    =00100000     286    (3)
DS$M_BATCH                      =00400000     286    (3)
```

```
DS$M_BRKCLR                     =00001000     286     (3)
DS$M_BRKPT                      =00000800     286     (3)    #-551    (3)    #-859    (4)    #-889    (4)
DS$M_CHARFLG                    =00000100     286     (3)
DS$M_CMDFLG                     =00000080     286     (3)
DS$M_CTRLC                      =00000001     286     (3)    #-550    (3)
DS$M_CTRLO                      =00010000     286     (3)
DS$M_DEVFLG                     =00000200     286     (3)
DS$M_DISABLCC                   =01000000     286     (3)
DS$M_DONFLG                     =00002000     286     (3)    #-547    (3)
DS$M_ERRFLG                     =00000010     286     (3)
DS$M_EXCEPT                     =00080000     286     (3)    #-552    (3)    #-860    (4)    #-890    (4)
DS$M_EXETST                     =00040000     286     (3)
DS$M_HLTFLG                     =00000008     286     (3)    #-549    (3)    #-858    (4)    #-888    (4)
DS$M_LODFLG                     =00000002     286     (3)
DS$M_MEMMGT                     =00008000     286     (3)
DS$M_NI                         =04000000     286     (3)
DS$M_OUTPUT                     =00800000     286     (3)
DS$M_RUBFLG                     =00000020     286     (3)
DS$M_SCRIPT                     =00200000     286     (3)
DS$M_SETIMR                     =02000000     286     (3)
DS$M_STRFLG                     =00000004     286     (3)    #-548    (3)    #-732    (3)    #-943    (4)
DS$M_SUBT                       =00004000     286     (3)
DS$M_SYSFLG                     =00000400     286     (3)
DS$M_TIMED                      =02000000     286     (3)    #-746    (3)    #-756    (3)
DS$M_TIMED_OUT                  =08000000     286     (3)
DS$M_TIMRON                     =00020000     286     (3)
DS$PRINTF                        00000000-XR                  1044    (4)
DS$V_ABRTFLG                    =00000006     286     (3)
DS$V_BADTIME                    =00000014     286     (3)
DS$V_BATCH                      =00000016     286     (3)
DS$V_BRKCLR                     =0000000C     286     (3)
DS$V_BRKPT                      =0000000B     286     (3)
DS$V_CHARFLG                    =00000008     286     (3)
DS$V_CMDFLG                     =00000007     286     (3)
DS$V_CTRLC                      =00000000     286     (3)
DS$V_CTRLO                      =00000010     286     (3)
DS$V_DEVFLG                     =00000009     286     (3)
DS$V_DISABLCC                   =00000018     286     (3)
DS$V_DONFLG                     =0000000D     286     (3)
DS$V_ERRFLG                     =00000004     286     (3)    #-937    (4)
DS$V_EXCEPT                     =00000013     286     (3)
DS$V_EXETST                     =00000012     286     (3)
DS$V_HLTFLG                     =00000003     286     (3)
DS$V_LODFLG                     =00000001     286     (3)    #-1016   (4)    #-1090   (4)    #-426    (3)    #-981    (4)
DS$V_MEMMGT                     =0000000F     286     (3)
DS$V_NI                         =0000001A     286     (3)
DS$V_OUTPUT                     =00000017     286     (3)
DS$V_RUBFLG                     =00000005     286     (3)
DS$V_SCRIPT                     =00000015     286     (3)
DS$V_SETIMR                     =00000019     286     (3)
DS$V_STRFLG                     =00000002     286     (3)    #-892    (4)
DS$V_SUBT                       =0000000E     286     (3)
DS$V_SYSFLG                     =0000000A     286     (3)
DS$V_TIMED                      =00000019     286     (3)
DS$V_TIMED_OUT                  =0000001B     286     (3)    #-900    (4)    #-919    (4)
DS$V_TIMRON                     =00000011     286     (3)
DSA$GL_FLAGS                     0000FE00                    433     (3)     435     (3)    #-439    (3)     476     (3)
```

```
                                                    602  (3)      658  (3)      698  (3)      701  (3)
                                                    772  (3)      777  (3)      854  (4)      936  (4)
DSA$GL_MSGTYP                    0000FE40          #-947  (4)
DSA$GL_PASSES                    0000FE08          #-563  (3)
DSA$GL_PASSNO                    0000FE54          #-908  (4)   #-916  (4)   #-926  (4)   #-933  (4)
DSA$GL_SECTNO                    0000FE10          #-484  (3)   #-507  (3)
DSA$GL_UNITS                     0000FE0C          #-632  (3)   #-639  (3)   #-680  (3)   #-718  (3)
DSA$M_LOAD_DEBUGGER             =40000000          #-438  (3)
DSA$V_APT                       =0000001F          #-433  (3)   #-935  (4)
DSA$V_DEBUG                     =0000001A          #-700  (3)
DSA$V_LOAD_DEBUGGER             =0000001E          #-434  (3)
DSA$V_QA                        =0000000F          #-601  (3)   #-657  (3)   #-771  (3)   #-776  (3)
                                                   #-853  (4)
DSA$V_USER                      =0000001C          #-475  (3)   #-697  (3)
DSI$ABORT                        000004A9-R  875   (4)
DSP$A_BASE                       00000000    285   (3)  #-1040  (4)
DSP$A_DATA                       00000008    285   (3)
DSP$A_MSG                        00000004    285   (3)  #-1040  (4)
DSP$A_TEST                       0000000C    285   (3)  #-1033  (4)
DSP$GEN_PTABLES                  00000000-XR              637  (3)
DSP$K_SIZE                      =00000018    285   (3)  #-1031  (4)
DSP$Q_SECTION                    00000010    285   (3)
DSQA$K_DISPAT_AFTER_INIT        =00000014    287   (3)
DSQA$K_DISPAT_BEFORE_INIT       =00000013    287   (3)
DSQA$K_DISPAT_CALLTEST          =00000015    287   (3)
DSQA$K_DISPAT_DONE_TESTS        =00000018    287   (3)
DSQA$K_DISPAT_DSX$ENDPASS_BGN   =00000001    287   (3)
DSQA$K_DISPAT_DSX$ENDPASS_END   =00000002    287   (3)
DSQA$K_DISPAT_DSX$ENDPASS_MID   =00000000    287   (3)
DSQA$K_DISPAT_DS_CLEANUP_BGN    =00000003    287   (3)
DSQA$K_DISPAT_DS_CLEANUP_END    =00000004    287   (3)
DSQA$K_DUMMY_1                  =00000007    287   (3)
DSQA$K_ERROR_ERROR_BGN          =00000006    287   (3)
DSQA$K_ERROR_ERROR_END          =00000005    287   (3)
DSQA$K_KERNEL_INIT_CONTEXT      =00000008    287   (3)
DSQA$K_LOOP_DSX$BGNSUB          =00000009    287   (3)
DSQA$K_LOOP_DSX$CKLOOP          =0000000B    287   (3)
DSQA$K_LOOP_DSX$ENDSUB          =0000000A    287   (3)
DSQA$K_PARAM_DSX$GETADDRESS     =0000000E    287   (3)
DSQA$K_PARAM_DSX$GETDATA        =0000000C    287   (3)
DSQA$K_PARAM_DSX$GETLOGICAL     =0000000F    287   (3)
DSQA$K_PARAM_DSX$GETSTRING      =00000010    287   (3)
DSQA$K_PARAM_DSX$GETVIELD       =0000000D    287   (3)
DSQA$K_QA_DSX$BRANCH            =00000011    287   (3)
DSQA$K_START_BEFORE_HEADER      =00000017    287   (3)  #-599  (3)
DSQA$K_START_VRRESTART          =00000012    287   (3)  #-467  (3)
DSQA$K_START_VRSTART            =00000016    287   (3)  #-441  (3)
DSR$FIND_USER_PC                 00000000-XR              879  (4)
DSV$DEBUG                        00000000-XR              437  (3)
DSV$SHOWTESTS                    00000604-R  1014  (4)
DSX$ABORT                        0000047F-R  851   (4)
DSX$PRINT                        00000000-XR         1000  (4)   1020  (4)   1040  (4)   1094  (4)
                                                    1105  (4)   430  (3)   460  (3)   522  (3)
                                                    536  (3)   591  (3)   623  (3)   644  (3)
                                                    679  (3)   685  (3)   690  (3)   808  (3)
                                                    908  (4)   916  (4)   926  (4)   933  (4)
                                                    985  (4)
```

```
DS_CLEANUP                      00000000-XR                     473     (3)     941     (4)
DS_TESTID                       00000000-XR                     895     (4)
DUE_TIME                        00000018-R      303     (3)     #-743   (3)     #-744   (3)     #-745   (3)
ENV$M_DOMAIN                    =00000002       279     (3)
ENV$M_LEVEL                     =00000001       279     (3)
ENV$M_SUPER                     =000003FC       279     (3)
ENV$S_DOMAIN                    =00000001       279     (3)
ENV$S_LEVEL                     =00000001       279     (3)
ENV$S_SUPER                     =00000008       279     (3)     #-1024  (4)     #-1098  (4)     #-454   (3)     #-989   (4)
ENV$V_DOMAIN                    =00000001       279     (3)     279     (3)
ENV$V_LEVEL                     =00000000       279     (3)     279     (3)
ENV$V_SUPER                     =00000002       279     (3)     #-1023  (4)     #-1097  (4)     #-453   (3)     #-988   (4)
ENV$_CPU                        =00000000       279     (3)     279     (3)
ENV$_FUNCTIONAL                 =00000000       279     (3)     279     (3)
ENV$_REPAIR                     =00000001       279     (3)     279     (3)
ENV$_SUPER                      =00000001       279     (3)     #-1026  (4)     #-1100  (4)     #-456   (3)     #-991   (4)
ENV$_SYSTEM                     =00000001       279     (3)     279     (3)
FALSE                           =00000000       288     (3)
FMTCTR                          000000A0-R      320     (3)     1044    (4)
FMTTRACE                        000000A3-R      323     (3)     1040    (4)
FMT_ABORT                       00000046-R      314     (3)     908     (4)
FMT_ABORT_NO_PC                 00000077-R      317     (3)     926     (4)
FMT_AMBSEC                      000001CB-R      344     (3)     522     (3)
FMT_CRLF                        00000231-R      354     (3)     687     (3)
FMT_ILLSEC                      0000019D-R      341     (3)     536     (3)
FMT_MISMATCH                    00000234-R      357     (3)     460     (3)
FMT_NAMES                       0000022C-R      352     (3)     682     (3)
FMT_NODEVICE                    00000272-R      361     (3)     1000    (4)
FMT_NOUNITS                     0000014A-R      335     (3)     644     (3)
FMT_PROG                        00000006-R      310     (3)     623     (3)
FMT_SECTIONS                    000001FB-R      347     (3)     1105    (4)
FMT_START                       00000183-R      338     (3)     1020    (4)     1094    (4)     430     (3)     985     (4)
FMT_TESTING                     00000222-R      350     (3)     676     (3)
FMT_TESTRANGE                   0000011F-R      332     (3)     591     (3)
FMT_TIME_EXPIRED                000000B7-R      326     (3)     916     (4)
FMT_TIME_EXPIRED_NO_PC          000000EF-R      329     (3)     933     (4)
GET_TIME                        00000000-XR                     740     (3)
INIT_CONTEXT                    00000000-XR                     463     (3)     731     (3)     940     (4)
IS_IT_USER_PC                   000004A9-R      876     (4)     #-865   (4)
L$A_DEVP                        0000021C                        #-645   (3)     #-993   (4)
L$A_DTP                         00000218                        1032    (4)
L$A_NAME                        00000208                        #-1105  (4)     #-623   (3)
L$A_SECNAM                      00000250                        #-1106  (4)     #-489   (3)     #-506   (3)     #-523   (3)
                                                                #-537   (3)
L$A_TSTCNT                      00000254                        #-559   (3)     #-623   (3)
L$L_ENVIRON                     00000204                        1025    (4)     1099    (4)     455     (3)     706     (3)
                                                                990     (4)
L$L_REV                         0000020C                        #-623   (3)
L$L_UNIT                        00000220                        #-633   (3)
L$L_UPDATE                      00000210                        #-623   (3)
MAPFREE                         00000000-XR                     699     (3)
MAP_DEBUGGER                    00000000-XR                     702     (3)
MP$GL_CONDITION_FLAGS           00000000-XR                     268     (3)     #-425   (3)
MP$GL_FLAGS                     00000000-XR                     267     (3)     #-424   (3)
MP$GR_BOOTED_PROCESSORS         00000000-XR                     265     (3)     #-422   (3)
MP$GR_IDLING_PROCESSORS         00000000-XR                     266     (3)     #-423   (3)
MP$_CLEAR_LOCKS                 00000000-XR                     264     (3)     421     (3)
```

```
OFF                             =00000000     288    (3)
ON                              =00000001     288    (3)
POLL_TIME                        00000010-R   301    (3)
PRLIST                           00000438-R   790    (3)    #-1005  (4)    #-1107  (4)    #-524   (3)    #-538   (3)
                                                           #-646   (3)
QA$AOB_CHECK_STATE               00000000-XR            604     (3)    607     (3)    660     (3)    663     (3)
                                                        856     (4)
QA$AOB_FLAGS                     00000000-XR            613     (3)    669     (3)
QA$K_ABORT_NOW                  =00000007     288    (3)
QA$K_APT_PHASE_ONE              =0000000B     288    (3)
QA$K_APT_PHASE_TWO              =0000000C     288    (3)
QA$K_BAD_ADDRESS                =00000009     288    (3)
QA$K_CONTROL_C_CONT             =0000000A     288    (3)
QA$K_DEALLOCATION               =0000000E     288    (3)
QA$K_ERROR_PHASE_ONE            =00000005     288    (3)    #-606   (3)    #-662   (3)    #-855   (4)
QA$K_ERROR_PHASE_THREE          =00000007     288    (3)
QA$K_ERROR_PHASE_TWO            =00000006     288    (3)
QA$K_FAILURE                    =00000000     288    (3)
QA$K_FIRST_BRANCH_CODE          =00000000     288    (3)
QA$K_FIRST_TIME                 =00000005     288    (3)
QA$K_INIT_CONTEXT_DONE          =00000003     288    (3)
QA$K_LAST_BRANCH_CODE           =00000025     288    (3)
QA$K_LOOP_ON_SUBTEST            =00000003     288    (3)    #-603   (3)    #-659   (3)
QA$K_LOOP_ON_TEST               =00000002     288    (3)
QA$K_LOOP_TEST_DONE             =00000004     288    (3)
QA$K_MEMORY_MANAGE              =0000000D     288    (3)
QA$K_MULTIPLE_PASS              =00000001     288    (3)
QA$K_NODEF                      =00000000     288    (3)
QA$K_NORMAL_START               =00000000     288    (3)
QA$K_NO_HEADER                  =00000006     288    (3)    #-612   (3)    #-668   (3)
QA$K_NUMBER_OF_CHECKS           =0000000F     288    (3)
QA$K_NUMBER_QA_FLAGS            =00000008     288    (3)
QA$K_NUMB_ROUTINE_STATES        =00000004     288    (3)
QA$K_QA_DEBUG                   =00000001     288    (3)
QA$K_QA_DONE                    =00000002     288    (3)
QA$K_RUN_BACKWARDS              =00000004     288    (3)
QA$K_SECTION                    =00000008     288    (3)
QA$K_SUCCESS                    =00000001     288    (3)
QA$MAIN                          00000000-XR            441     (3)    467     (3)    599     (3)
QA$V_CHECK_DONE                 =00000003     288    (3)
QA$V_DOING_CLEANUP              =00000002     288    (3)
QA$V_ERROR_FOUND                =00000001     288    (3)
QA$V_INIT_DONE                  =00000000     288    (3)
QIO$ADDUNIT                      00000000-XR            715     (3)
QIO$CLEANUP                      00000000-XR            477     (3)
SCB$L_TIMER                      000000C0               #-704   (3)
SCRIPT$FLUSH                     00000000-XR            452     (3)    887     (4)
SEP_FUNCTIONAL                  =00000002     279    (3)    #-707   (3)
SEP_REPAIR                      =00000003     279    (3)
SHOWTESTS_X                      0000066F-R   1046   (4)    #-1021  (4)
SIZ...                          =00000001     286    (3)    279     (3)    286     (3)
START1                           000000A3-R   449    (3)
TRUE                            =00000001     288    (3)
VRABORT                          000004A5-R   867    (4)
VRABORT_COM                      000004B9-R   881    (4)    #-878   (4)
VRRESTART                        000000A3-R   448    (3)    #-862   (4)
VRSHOWSECTIONS                   00000670-R   1088   (4)
```

```
VRSTART                         00000000-R   419    (3)
VRSTART_X                       0000040A-R   755    (3)    #-431    (3)    #-461    (3)    #-526    (3)    #-540    (3)
                                                           #-592    (3)    #-648    (3)    #-717    (3)
VRSUPPORT                       000005AA-R   980    (4)
```

```
                                        +-------------------------+
                                        ! Performance indicators !
                                        +-------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    22    00:00:00.05    00:00:00.19
Command processing               892    00:00:00.25    00:00:00.96
Pass 1                           893    00:00:03.13    00:00:05.38
Symbol table sort                  0    00:00:00.17    00:00:00.17
Pass 2                            47    00:00:00.87    00:00:01.77
Symbol table output                2    00:00:00.06    00:00:00.23
Psect synopsis output              2    00:00:00.01    00:00:00.01
Cross-reference output             6    00:00:00.31    00:00:00.50
Assembler run totals            1866    00:00:04.85    00:00:09.21

The working set limit was 2900 pages.
202868 bytes (397 pages) of virtual memory were used to buffer the intermediate code.
There were 40 pages of symbol table space allocated to hold 643 non-local and 58 local symbols.
1110 source lines were read in Pass 1, producing 64 object records in Pass 2.
47 pages of virtual memory were used to define 31 macros.

                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              12
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                11
SYS$COMMON:[SYSLIB]LIB.MLB;2                            0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                 0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1               0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1              0
SYS$COMMON:[SYSLIB]LIB.MLB;2                            0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                        6
SYS$COMMON:[SYSLIB]STARLET.MLB;2                        0
TOTALS (all libraries)                                 29

808 GETS were required to define 29 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 69 Declarations
(1) 224 Hardware Interrupt codes
(1) 312 Register definitions
(1) 447 TM78/TU78 Bootstrap driver

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element TFBTDRIVR.MAR
0000     2 ; *1     6-FEB-1986 15:22:44 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element TFBTDRIVR.MAR
0000     4         .Title  TfBtDrivr - TM78 bootdriver
0000     5         .Ident  /6-05/
0000     6         .Disable Global
0000     7
0000     8 ;
0000     9 ;                          Copyright (c) 1982, 1983,1984, by
0000    10 ;               Digital Equipment Corporation, Maynard, Mass.
0000    11 ;
0000    12 ; This software is furnished under a license and may be used and  copied
0000    13 ; only  in  accordance  with  the  terms  of  such  license and with the
0000    14 ; inclusion of the above copyright notice.  This software or  any  other
0000    15 ; copies  thereof may not be provided or otherwise made available to any
0000    16 ; other person.  No title to and ownership of  the  software  is  hereby
0000    17 ; transferred.
0000    18 ;
0000    19 ; The information in this software is subject to change  without  notice
0000    20 ; and  should  not  be  construed  as  a commitment by Digital Equipment
0000    21 ; Corporation.
0000    22 ;
0000    23 ; Digital assumes no responsibility for the use or  reliability  of  its
0000    24 ; software on equipment which is not supplied by Digital.
0000    25 ;
0000    26
0000    27 ;++
0000    28 ; Facility:     Boots
0000    29 ;
0000    30 ; Abstract:
0000    31 ;       This module contains the bootstrap device driver for
0000    32 ;       MASSbus TM78 based magtapes (currently only TU78)
0000    33 ;
0000    34 ;
0000    35 ; Environment:  kernel mode
0000    36 ;
0000    37 ; Author:  Dave Butenhof, 14-May-1982
0000    38 ;
0000    39 ; Modified:
0000    40
0000    41 ;       [01]    Marion Baggett Aug-16-1982
0000    42 ;               Change code to wait for rewind to complete with other than
0000    43 ;               a rewind Hardware Interrupt code. Clear massbus status errors
0000    44 ;               so no controller errors are returned. Do not retry if EOF status
0000    45 ;               Marion Baggett Jul-27-1982
0000    46 ;               Change the definition of Space_F and Space_R to commands
0000    47 ;               that actually work. (space forward record & space reverse record.)
0000    48 ;
0000    49 ;               Marion Baggett Jul-26-1982
0000    50 ;               Change some parameter checks and code.
0000    51 ;
0000    52 ;               MARION BAGGETT JUNE-23-1982
0000    53 ;               Modifying program to work.
0000    54 ;
0000    55 ;       02      Bob Bergazzi    May 16, 1983    Version 6.11
0000    56 ;               Changed the order of the .LIB statements.
0000    57 ;
```

```
                                ;       03      M. Baggett      May 18, 1983    Version 6.11
                                ;               Fixed problem with false signals in new machines when
                                ;               polling on registers.
                                ;
                                ;       04      M. Baggett      June 10, 1983   Version 6.11
                                ;               Hang loading file. Read at 6250 bpi. Read from all drives.
                                ;
                                ;       05      R.E.MUSE        9 January 1984  Version 6.14
                                ;               Added macro definition for $PRDEF - Version 4 changes
                                ;
                                ;--
                                        .Subtitle       Declarations
                                ;
                                ; Include Files:
                                ;
                                        .Library        /SYS$LIBRARY:LIB/
                                        .Library        /$DS/
                                        .Library        /$DIAG/

                                        $BtdDef                         ; Define boot device types
                                        .SAVE   LOCAL_BLOCK
                                        .RESTORE
                                        $IoDef                          ; Define I/O function codes
                                        .SAVE   LOCAL_BLOCK
                                        .RESTORE
                                        $MbaDef                         ; Define MASSBUS adapter registers
                                        .SAVE   LOCAL_BLOCK
                                        .RESTORE
                                        $NdtDef                         ; Define NEXUS device types
                                        .SAVE   LOCAL_BLOCK
                                        .RESTORE
                                        $RpbDef                         ; Define RPB offsets
                                        .SAVE   LOCAL_BLOCK
                                        .RESTORE
                                        $SsDef                          ; Define system status codes
                                        .SAVE   LOCAL_BLOCK
                                        .RESTORE
                                        $DS_DSSDEF                      ; DEFINE SUPERVISOR SERVICE ENTRIES
                                ;
                                ; Macros:
                                ;
                                        .MACRO  $PRDEF,$GBL

                                        $DEFINI PR,$GBL

                                $EQU    PR$_KSP 0
                                $EQU    PR$_ESP 1
                                $EQU    PR$_SSP 2
                                $EQU    PR$_USP 3
                                $EQU    PR$_ISP 4
                                $EQU    PR$_P0BR        8
                                $EQU    PR$_P0LR        9
                                $EQU    PR$_P1BR        10
                                $EQU    PR$_P1LR        11
                                $EQU    PR$_SBR 12
                                $EQU    PR$_SLR 13
```

```
0000    103  $EQU    PR$_PCBB          16
0000    104  $EQU    PR$_SCBB          17
0000    105  $EQU    PR$_IPL 18
0000    106  $EQU    PR$_ASTLVL        19
0000    107  $EQU    PR$_SIRR          20
0000    108  $EQU    PR$_SISR          21
0000    109  $EQU    PR$_ICCS          24
0000    110  $EQU    PR$_NICR          25
0000    111  $EQU    PR$_ICR 26
0000    112  $EQU    PR$_TODR          27
0000    113  $EQU    PR$_RXCS          32
0000    114  $EQU    PR$_RXDB          33
0000    115  $EQU    PR$_TXCS          34
0000    116  $EQU    PR$_TXDB          35
0000    117  $EQU    PR$_ACCS          40
0000    118  $EQU    PR$_ACCR          41
0000    119  $EQU    PR$_MAPEN         56
0000    120  $EQU    PR$_TBIA          57
0000    121  $EQU    PR$_TBIS          58
0000    122  $EQU    PR$_PME 61
0000    123  $EQU    PR$_SID 62
0000    124  $EQU    PR$_TBCHK         63
0000    125  $EQU    PR$V_SID_SN       0
0000    126  $EQU    PR$S_SID_SN       12
0000    127  $EQU    PR$V_SID_PL       12
0000    128  $EQU    PR$S_SID_PL       3
0000    129  $EQU    PR$V_SID_ECO      15
0000    130  $EQU    PR$S_SID_ECO      9
0000    131  $EQU    PR$V_SID_TYPE     24
0000    132  $EQU    PR$S_SID_TYPE     8
0000    133  $EQU    PR$_SID_TYP780    1
0000    134  $EQU    PR$_SID_TYP750    2
0000    135  $EQU    PR$_SID_TYP730    3
0000    136  $EQU    PR$_SID_TYP7VV    4
0000    137  $EQU    PR$_SID_TYPMAX    4
0000    138  $EQU    PR$_WCSA          44
0000    139  $EQU    PR$_WCSD          45
0000    140  $EQU    PR$_SBIFS         48
0000    141  $EQU    PR$_SBIS          49
0000    142  $EQU    PR$_SBISC         50
0000    143  $EQU    PR$_SBIMT         51
0000    144  $EQU    PR$_SBIER         52
0000    145  $EQU    PR$_SBITA         53
0000    146  $EQU    PR$_SBIQC         54
0000    147  $EQU    PR$_CMIERR        23
0000    148  $EQU    PR$_CSRS          28
0000    149  $EQU    PR$_CSRD          29
0000    150  $EQU    PR$_CSTS          30
0000    151  $EQU    PR$_CSTD          31
0000    152  $EQU    PR$_TBDR          36
0000    153  $EQU    PR$_CADR          37
0000    154  $EQU    PR$_MCESR         38
0000    155  $EQU    PR$_CAER          39
0000    156  $EQU    PR$_UBRESET       55
0000    157  $EQU    PR$_PAMACC        64
0000    158  $EQU    PR$_PAMLOC        65
0000    159  $EQU    PR$_CSWP          66
```

```
                        0000   160  $EQU    PR$_CRBT        67
                        0000   161  $EQU    PR$_MCTL1       68
                        0000   162  $EQU    PR$_MCTL2       69
                        0000   163  $EQU    PR$_MGEN        70
                        0000   164  $EQU    PR$_MTBER       71
                        0000   165  $EQU    PR$_MEAR        72
                        0000   166  $EQU    PR$_MDCR1       73
                        0000   167  $EQU    PR$_MEDR        74
                        0000   168  $EQU    PR$_MECCR       75
                        0000   169
                        0000   170          $DEFEND PR,$GBL,DEF
                        0000   171
                        0000   172          .ENDM   $PRDEF
                        0000   173
                        0000   174          $PRDEF                          ; Define processor registers
                        0000                .SAVE   LOCAL_BLOCK
                        0000                .PSECT  $ABS$,ABS
                00000000 0610               .=0
                        0000                .RESTORE
                        0000   175
                        0000   176 ;
                        0000   177 ; Equated Symbols:
                        0000   178 ;
                        0000   179
                000000B1 0000  180 Btd$K_Tm = 177          ; TM-03 tape drive
                000000B2 0000  181 Btd$K_Ts = 178          ; TS-11 tape drive
                000000B3 0000  182 Btd$K_Tf = 179          ; TM-78 tape drive
                        0000   183
                        0000   184 ;
                        0000   185 ; TM-78/TU-78 Function codes
                        0000   186 ;
                        0000   187
                00000001 0000  188 Go       = 1
                00000006 0000  189 Rewind   = 3*2          ; Rewind
                00000008 0000  190 Sense_F  = 4*2          ; Sense slave status
                00000010 0000  191 Space_F  = 8*2          ; Space forward record and stop if tape mark          [01]
                00000012 0000  192 Space_R  = 9*2          ; Space reverse record and stop if tape mark          [01]
                00000038 0000  193 Read_F   = 28*2         ; Read forward
                        0000   194
                        0000   195
                        0000   196 ;
                        0000   197 ; Timeout values (in 10-mS, for use with TODR)
                        0000   198 ;
                        0000   199
                00002710 0000  200 TU78_Max_Rewind_Time    = 100*100
                000088B8 0000  201 TU78_Max_Space_Time     = 350*100
                000001F4 0000  202 TU78_Normal_Time        = 5*100
                        0000   203
                        0000   204 ;
                        0000   205 ; MASSbus error bits
                        0000   206 ;
                        0000   207
                        0000   208 MBA$M_Sr_Error= MBA$M_Sr_Rdto ! -
                        0000   209                 MBA$M_Sr_Isto ! -
                        0000   210                 MBA$M_Sr_Rds ! -
                        0000   211                 MBA$M_Sr_ErConf ! -
                        0000   212                 MBA$M_Sr_InvMap ! -
```

```
                 0000   213          MBA$M_Sr_Mappe ! -
                 0000   214          MBA$M_Sr_Mdpe ! -
                 0000   215          MBA$M_Sr_Mxf ! -
                 0000   216          MBA$M_Sr_WckLwr ! -
                 0000   217          MBA$M_Sr_WckUpr ! -
                 0000   218          MBA$M_Sr_Dlt ! -
                 0000   219          MBA$M_Sr_McPe ! -
                 0000   220          MBA$M_Sr_Ned ! -
        000E0F7F 0000   221          MBA$M_Sr_Pge
                 0000   222
```

```
                                0000   224 .Subtitle       Hardware Interrupt codes
                                0000   225
                                0000   226 ;
                                0000   227 ; Interrupt codes that may result from both data transfer operations and
                                0000   228 ;       non-data transfer operations.
                                0000   229 ;
                                0000   230
                    00000001    0000   231 Hic_Done=1              ; Operation completed as expected
                    00000002    0000   232 Hic_Tm=2                ; Unexpected tape mark
                    00000003    0000   233 Hic_Bot=3               ; Unexpected beginning of tape
                    00000004    0000   234 Hic_Eot=4               ; Tape is positioned beyond end of tape marker (write)
                    00000008    0000   235 Hic_Fpt=8               ; Write was attempted on a file protected tape
                    00000009    0000   236 Hic_Not_Rdy=9           ; TU is on line but tape is rewinding or loading, or
                                0000   237                         ;  a DSE or rewind is being performed from the other
                                0000   238                         ;  port
                    0000000A    0000   239 Hic_Not_Avail=10        ; TU is not switched to this port, but is on-line
                    0000000B    0000   240 Hic_Off_Line=11        ; TU is not switched on-line with a tape loaded
                    0000000C    0000   241 Hic_Non_Ex=12          ; TU does not exist or power is off
                    0000000D    0000   242 Hic_Not_Capable=13     ;  1.  Incorrect I.D. burst
                                0000   243                         ;  2.  No record or tape mark detected
                    00000017    0000   244 Hic_Bad_Tape=23        ; Tape position is lost
                    00000018    0000   245 Hic_Tm_Fault_A=24      ; Software (microcode) or TM78 hardware is broken -
                                0000   246                         ;  see failure code for details
                    00000019    0000   247 Hic_Tu_Fault_A=25      ; Tape unit hardware is broken - see failure code
                                0000   248
                                0000   249 ;
                                0000   250 ; Interrupt codes which result only from data transfer operations.
                                0000   251 ;
                                0000   252
                    00000010    0000   253 Hic_Long_Rec=16        ; Last record read was longer than BYTE COUNT value,
                                0000   254                         ;  but was otherwise correctly read.  The tape position
                                0000   255                         ;  is after the long record.  BYTE COUNT is set to actual
                                0000   256                         ;  record length.  RECORD COUNT is set to number of
                                0000   257                         ;  records left.
                                0000   258
                    00000011    0000   259 Hic_Short_Rec=17       ; Last record read was shorter than initial BYTE COUNT
                                0000   260                         ;  value, but is otherwise correctly in memory.  Tape
                                0000   261                         ;  position is after the short record.  BYTE COUNT is
                                0000   262                         ;  set to the actual record length.  RECORD COUNT is
                                0000   263                         ;  set to the number of records left.
                                0000   264
                    00000012    0000   265 Hic_Retry=18           ; Error, the initial operation should be repeated.
                                0000   266                         ;  Tape positioned for retry.  BYTE COUNT is set to
                                0000   267                         ;  its initial value.  RECORD COUNT is set to the number
                                0000   268                         ;  of records left.
                                0000   269
                    00000013    0000   270 Hic_Read_Opp=19        ; Read error.  The initial read should be performed in
                                0000   271                         ;  the opposite direction.  Tape is positioned after the
                                0000   272                         ;  bad record.  BYTE COUNT is set to number of bytes to
                                0000   273                         ;  be read.  RECORD COUNT is set to number of records left.
                                0000   274
                    00000014    0000   275 Hic_Unreadable=20      ; Read retries have failed to read the record.  Tape is
                                0000   276                         ;  positioned after the record.  BYTE COUNT is set to
                                0000   277                         ;  the number of bytes transfered.  RECORD COUNT is set
                                0000   278                         ;  the number of records left.
                                0000   279
                    00000015    0000   280 Hic_Error=21           ; An error has occurred which requires a retry, but SER
```

```
                     0000   281                         ;  is set.  (EXCLUDES length errors).  Tape is positioned
                     0000   282                         ;  after the bad record.  BYTE COUNT is set to the number
                     0000   283                         ;  of bytes transfered.  RECORD COUNT is set to the number
                     0000   284                         ;  of records left.
                     0000   285
00000016             0000   286 Hic_Eot_Error=22        ; A write error has occurred beyond the EOT marker, and
                     0000   287                         ;  SER is set.  Tape is positioned after the bad record.
                     0000   288                         ;  BYTE COUNT is set to the number of records transferred.
                     0000   289                         ;  RECORD COUNT is set to the number of records left.
                     0000   290
                     0000   291 ;
                     0000   292 ; Interrupt codes which result only from non-data transfer operations.
                     0000   293 ;
                     0000   294
00000005             0000   295 Hic_Leot=5              ; Unexpected logical EOT (2 tape marks)
00000006             0000   296 Hic_Nop=6               ; No-op completed
00000007             0000   297 Hic_Rewinding=7         ; Rewind in progress, done interrupt will follow when
                     0000   298                         ;  at BOT
                     0000   299
                     0000   300 ;
                     0000   301 ; TM78 initiated interrupt codes.
                     0000   302 ;
                     0000   303
0000000F             0000   304 Hic_On_Line=15         ; A tape unit has come on-line with a tape loaded, or
                     0000   305                         ;  a rewind has finished on the other port for the
                     0000   306                         ;  accessed tape unit.
0000001A             0000   307 Hic_Tm_Fault_B=26       ; The TM78 is broken.
0000001B             0000   308 Hic_Tu_Fault_B=27       ; The tape unit is broken.
0000001C             0000   309 Hic_Mb_Fault=28         ; A MASSBUS error has occurred.
                     0000   310
```

```
                     0000   312 .Subtitle       Register definitions
                     0000   313
                     0000   314 ;
                     0000   315 ; TM-78/TU-78 MASSbus Register Offsets
                     0000   316 ;
                     0000   317
                     0000   318
                     0000   319          $DefIni MF
                     0000                .SAVE   LOCAL_BLOCK
                     0000                .PSECT  $ABS$,ABS
           00000000  0610                .=0
                     0000   320
                     0000   321 $Def     MF_CS1              .BlkL   1       ; Drive Control Register
                     0000                .IIF    NB,MF_CS1,      MF_CS1:
           00000004  0000                .IIF    NB,,.BlkL,      .BlkL   1
                     0004   322          _Vield  MF_CS1,0,<-             ; Drive Control Register bit definitions
                     0004   323                  <GO,,M>,-              ; Go bit
                     0004   324                  <FCODE,5>,-            ; Function code
                     0004   325                  <IE,,M>,-              ;
                     0004   326                  <RDY,,M>,-             ;
                     0004   327                  <A16,,M>,-             ;
                     0004   328                  <A17,,M>,-             ;
                     0004   329                  <PSEL,,M>,-            ;
                     0004   330                  <DVA,,M>,-             ; Device available
                     0004   331                  <,1>,-                 ;
                     0004   332                  <MCPE,,M>,-            ;
                     0004   333                  <TRE,,M>,-             ;
                     0004   334                  <SC,,M>,-              ;
                     0004   335          >                              ;
                     0004   336 $Def     MF_IS               .BlkL   1       ; Interrupt Status Register.
                     0004                .IIF    NB,MF_IS,       MF_IS:
           00000008  0004                .IIF    NB,,.BlkL,      .BlkL   1
                     0008   337          _Vield  MF_IS,0,<-              ; Interrupt status dit definitions.
                     0008   338                  <DTIC,6,M>,-           ; Data transfer interrupt code.
                     0008   339                  <,2>,-                 ; Reserved bits.
                     0008   340                  <DPR,,M>,-             ;
                     0008   341                  <,1>,-                 ; Reserved bit.
                     0008   342                  <DTFC,6>,-             ; Data transfer failure code.
                     0008   343          >
                     0008   344 $Def     MF_TC               .BlkL   1       ; Tape Control Register.
                     0008                .IIF    NB,MF_TC,       MF_TC:
           0000000C  0008                .IIF    NB,,.BlkL,      .BlkL   1
                     000C   345          _Vield  MF_TC,0,<-              ; Tape control bit definitions.
                     000C   346                  <CMDADR,2>,-           ; CMDADR specifies which tape unit.
                     000C   347                  <RC,6,M>,-             ; Record count.
                     000C   348                  <SC,4>,-               ; Skip count.
                     000C   349                  <FMT,3>,-              ; Format.
                     000C   350                  <SER,,M>,-             ; Suppress error repositioning.
                     000C   351          >
                     000C   352 $Def     MF_MR1              .BLKL   1       ; Diagnostics/Maintenance Register #1.
                     000C                .IIF    NB,MF_MR1,      MF_MR1:
           00000010  000C                .IIF    NB,,.BLKL,      .BLKL   1
                     0010   353 $Def     MF_AB               .BlkL   1       ; Attention Bit Register
                     0010                .IIF    NB,MF_AB,       MF_AB:
           00000014  0010                .IIF    NB,,.BlkL,      .BlkL   1
                     0014   354 $Def     MF_BC               .BlkL   1       ; Byte Count Register.
                     0014                .IIF    NB,MF_BC,       MF_BC:
```

```
                    00000018  0014                    .IIF    NB,.BIkL,       .BIkL   1
                              0018    355 $Def        MF_DT           .BIkL   1       ; Drive Type Register
                              0018                    .IIF    NB,MF_DT,       MF_DT:
                    0000001C  0018                    .IIF    NB,.BIkL,       .BIkL   1
                              001C    356             _Vield  MF_DT,0,<-              ; Drive type register field definitions
                              001C    357                     <DTN,9,M>,-             ; Drive type number.
                              001C    358                     <,1>,-                  ; Reserved bit.
                              001C    359                     <,1>,-                  ; Reserved bit.
                              001C    360                     <DMB,,M>,-              ; Dual MASSBUS port option if set.
                              001C    361                     <7CH,,M>,-              ; 7-Channel tape (always 0).
                              001C    362                     <MOH,,M>,-              ; Moving head (always 0).
                              001C    363                     <TAP,,M>,-              ; Tape drive (always 1).
                              001C    364                     <NSA,,M>,-              ; Not sector addressable (always 0).
                              001C    365             >                               ;
                              001C    366 $Def        MF_DS           .BIkL   1       ; Drive Status Register
                              001C                    .IIF    NB,MF_DS,       MF_DS:
                    00000020  001C                    .IIF    NB,.BIkL,       .BIkL   1
                              0020    367             _Vield  MF_DS,0,<-              ; Drive status register bit definitions.
                              0020    368                     <,4>,-                  ; Reserved bits.
                              0020    369                     <DSE,,M>,-              ; Unit doing erase portion of DSE cmd.
                              0020    370                     <MAINT,,M>,-            ; Unit is in maintenance mode.
                              0020    371                     <SHR,,M>,-              ; Unit available to both MASSBUS ports.
                              0020    372                     <AVAIL,,M>,-            ; Unit available to this MASSBUS.
                              0020    373                     <FPT,,M>,-              ; Unit is file protected.
                              0020    374                     <EOT,,M>,-              ; End of tape.
                              0020    375                     <BOT,,M>,-              ; Beginning of tape.
                              0020    376                     <PE,,M>,-               ; Unit set for PE (1600 BPI) format.
                              0020    377                     <REW,,M>,-              ; Rewind is in progress.
                              0020    378                     <ONL,,M>,-              ; Unit on-line, tape is mounted.
                              0020    379                     <PRES,,M>,-             ; Unit is powered up.
                              0020    380                     <RDY,,M>,-              ; Unit ready.
                              0020    381             >                               ;
                              0020    382 $Def        MF_SN           .BIkL   1       ; Serial Number Register
                              0020                    .IIF    NB,MF_SN,       MF_SN:
                    00000024  0020                    .IIF    NB,.BIkL,       .BIkL   1
                              0024    383 $Def        MF_MR2          .BIkL   1       ; Diagnostics/maintenance Register #2.
                              0024                    .IIF    NB,MF_MR2,      MF_MR2:
                    00000028  0024                    .IIF    NB,.BIkL,       .BIkL   1
                              0028    384 $Def        MF_MR3          .BIkL   1       ; Diagnostics/Maintenance Register #3.
                              0028                    .IIF    NB,MF_MR3,      MF_MR3:
                    0000002C  0028                    .IIF    NB,.BIkL,       .BIkL   1
                              002C    385 $Def        MF_NDTA         .BIkL   1       ; Non-data Transfer Attention Register.
                              002C                    .IIF    NB,MF_NDTA,     MF_NDTA:
                    00000030  002C                    .IIF    NB,.BIkL,       .BIkL   1
                              0030    386             _Vield  MF_NDTA,0,<-            ; Non-data transfer field definitions.
                              0030    387                     <NDIC,6,M>,-            ; NDT interrupt code.
                              0030    388                     <,2>,-                  ; Reserved bits.
                              0030    389                     <ATAD,2>,-              ; Attention address (unit #).
                              0030    390                     <NDFC,6>,-              ; NDT failure code.
                              0030    391             >
                              0030    392 $Def        MF_NDT0         .BIkL   1       ; Nondata Transfer Cmd Reg. (Unit #0).
                              0030                    .IIF    NB,MF_NDT0,     MF_NDT0:
                    00000034  0030                    .IIF    NB,.BIkL,       .BIkL   1
                              0034    393             _Vield  MF_NDT0,0,<-            ; Nondata transfer command field defs.
                              0034    394                     <GO,,M>,-               ; Go bit.
                              0034    395                     <FCODE,5>,-             ; Function code.
                              0034    396                     <,2>,-                  ; Reserved bits.
```

```
                     0034   397                 <CCNT,8>,-              ; Command count.
                     0034   398             >
                     0034   399 $Def     MF_NDT1         .BlkL   1       ; Nondata Transfer Cmd Reg. (Unit #1).
                     0034                .IIF    NB,MF_NDT1,     MF_NDT1:
                00000038  0034                .IIF    NB,.BlkL,       .BlkL   1
                     0038   400          _Vield  MF_NDT1,0,<-            ; Nondata transfer command field defs.
                     0038   401                  <GO,,M>,-               ; Go bit.
                     0038   402                  <FCODE,5>,-             ; Function code.
                     0038   403                  <,2>,-                  ; Reserved bits.
                     0038   404                  <CCNT,8>,-              ; Command count.
                     0038   405             >
                     0038   406 $Def     MF_NDT2         .BlkL   1       ; Nondata Transfer Cmd Reg. (Unit #2).
                     0038                .IIF    NB,MF_NDT2,     MF_NDT2:
                0000003C  0038                .IIF    NB,.BlkL,       .BlkL   1
                     003C   407          _Vield  MF_NDT2,0,<-            ; Nondata transfer command field defs.
                     003C   408                  <GO,,M>,-               ; Go bit.
                     003C   409                  <FCODE,5>,-             ; Function code.
                     003C   410                  <,2>,-                  ; Reserved bits.
                     003C   411                  <CCNT,8>,-              ; Command count.
                     003C   412             >
                     003C   413 $Def     MF_NDT3         .BlkL   1       ; Nondata Transfer Cmd Reg. (Unit #3).
                     003C                .IIF    NB,MF_NDT3,     MF_NDT3:
                00000040  003C                .IIF    NB,.BlkL,       .BlkL   1
                     0040   414          _Vield  MF_NDT3,0,<-            ; Nondata transfer command field defs.
                     0040   415                  <GO,,M>,-               ; Go bit.
                     0040   416                  <FCODE,5>,-             ; Function code.
                     0040   417                  <,2>,-                  ; Reserved bits.
                     0040   418                  <CCNT,8>,-              ; Command count.
                     0040   419             >
                     0040   420 $Def     MF_IA           .BlkL   1       ; Internal Address Register.
                     0040                .IIF    NB,MF_IA,       MF_IA:
                00000044  0040                .IIF    NB,.BlkL,       .BlkL   1
                     0044   421 $Def     MF_ID           .BlkL   1       ; Internal Data Register.
                     0044                .IIF    NB,MF_ID,       MF_ID:
                00000048  0044                .IIF    NB,.BlkL,       .BlkL   1
                     0048   422          _Vield  MF_ID,0,<-              ; Internal data field definitions.
                     0048   423                  <ID,8>,-                ; Actual internal data to be sent.
                     0048   424                  <HOLD,,M>,-             ;
                     0048   425                  <HLDA,,M>,-             ; (Read-only)
                     0048   426                  <EVPAR,,M>,-            ;
                     0048   427                  <CPE,,M>,-              ; (Read only)
                     0048 • 428                  <ILR,,M>,-              ; (Read only)
                     0048 • 429                  <MCPE,,M>,-             ; (Read only)
                     0048   430                  <TMCLR,,M>,-            ;
                     0048   431                  <TMRDY,,M>,-            ; (Read only)
                     0048   432             >
                     0048   433
                     0048   434          $DefEnd MF
                     0000                .RESTORE
                     0000   435
                     0000   436
                     0000   437
                     0000   438 ;
                     0000   439 ; Boot Driver Table Entry
                     0000   440 ;
                     0000   441
                     0000   442          $Boot_Driver    DevType = Btd$K_TF,-    ; Device type (MASSbus)
```

```
                     0000   443                      Size = TM78_DrvSiz,-    ; Driver size
                     0000   444                      Addr = TM78_Driver,-    ; Driver address
                     0000   445                      Entry = TM78_Driver,-   ; Entry point
                     0000   446                      DrivrName = DriverName  ; Driver name
                 00000000                .PSECT  BOOTDRIVR_4
                     FFFF  0000          .WORD   -1
                     00B3  0002          .WORD   Btd$K_TF
                 00000000  0004          .LONG   0
                 000002CD' 0008          .LONG   TM78_DrvSiz
                 00000008' 000C          .LONG   TM78_Driver-$TABLE
                 00000000' 0010          .LONG   TM78_Driver-TM78_Driver
                 000002C0' 0014          .LONG   DriverName-TM78_Driver
                 00000000                .PSECT  BOOTDRIVR_2
                     0000   447          .Subtitle       TM78/TU78 Bootstrap driver
                     0000   448
                     0000   449 ;++
                     0000   450 ;
                     0000   451 ; Inputs:
                     0000   452 ;
                     0000   453 ;       R3      - base address of adapter's register space
                     0000   454 ;       R5      - LBN for current piece of transfer
                     0000   455 ;       R6      - contains 0
                     0000   456 ;       R8      - size of transfer in bytes
                     0000   457 ;       R9      - address of the RPB
                     0000   458 ;       R10     - starting address of transfer (byte offset in first
                     0000   459 ;                 page ORed with starting map register number)
                     0000   460 ;       R11     - Block number at start of transfer
                     0000   461 ;
                     0000   462 ;       FUNC(AP)- I/O operation (IO$_READLBLK or IO$_REWIND only)
                     0000   463 ;       MODE(AP)- Address interpretation mode (0 = physical, 1 = virtual)
                     0000   464 ;       SIZE(AP)- Size of buffer in bytes
                     0000   465 ;       BUF(AP) - Address of buffer
                     0000   466 ;
                     0000   467 ; Implicit inputs:
                     0000   468 ;
                     0000   469 ;       RPB$B_SLAVE     - Slave number of drive
                     0000   470 ;       RPB$W_UNIT      - RPB field containing boot device unit number
                     0000   471 ;
                     0000   472 ;
                     0000   473 ; Outputs:
                     0000   474 ;
                     0000   475 ;       R0 - status code
                     0000   476 ;
                     0000   477 ;               SS$_NORMAL      - successful transfer
                     0000   478 ;               SS$_TIMEOUT     - DEVICE FAIL TO RESPOND TO COMMAND IN TIME
                     0000   479 ;               SS$_ENDOFFILE   - A TAPE MARK WAS READ.
                     0000   480 ;               SS$_DEVOFFLINE  - DEVICE IS OFFLINE
                     0000   481 ;               SS$_DATAOVERRUN - DATA READ EXCEEDED SIZE OF BUFFER
                     0000   482 ;               SS$_ILLIOFUNC   - COMMAND WAS NOT VALID FOR THIS DRIVE.
                     0000   483 ;               SS$_NOSUCHDEV   - UNSUPPORTED DEVICE
                     0000   484 ;
                     0000   485 ;       R1 - Number of bytes transferred during a READ operation
                     0000   486 ;
                     0000   487 ;       This routine destroys R1, R5, R6, and R7. Within the routine,
                     0000   488 ;       register usage is as follows:
                     0000   489 ;
                     0000   490 ;               R5      - used in logical to physical calculation
```

```
                     0000   491 ;                  R6      - drive type according to device register
                     0000   492 ;                  R7      - address of the 1st MBA external register for
                     0000   493 ;                            this unit on the MBA
                     0000   494 ;
                     0000   495 ;--
                     0000   496
                     0000   497 ;
                     0000   498 ; Local storage
                     0000   499 ;
           00000004  0000   500 Stack:  .BlkL   1                       ; Save initial stack
                     0004   501 Tf_DtDesc:                              ; Drive type codes
                0000 0041   0004   502         .Word   ^X41, -          ; .. TU78
                     0008   503                 0                      ; .. end of table
                     0008   504
           00000004  0008   505 Buf = 4
           00000008  0008   506 Size = 8
           0000000C  0008   507 LBN = 12
           00000010  0008   508 Func = 16
           00000014  0008   509 Mode = 20
                     0008   510
                     0008   511 TM78_DRIVER::                           ; TM78 boot driver
              04 AE   D4  0008   512         CLRL    4(SP)               ; CLEAR RETRY COUNTER                   [01]
          F1 AF   6E   9E  000B   513         MovAB   (Sp), Stack         ; Save entry stack pointer              [01]
          08 A3   00   D2  000F   514         MComL   #0, Mba$L_Sr(R3)    ; Clear MASSbus adapter errors
          04 A3   04   CA  0013   515         BICL2   #MBA$M_CR_IE, MBA$L_CR(R3) ; Disable MBA interrupts if left on  [01]
          57   64 A9   3C  0017   516         MovZWL  Rpb$W_Unit(R9), R7  ; Get MASSBUS SLOT NUMBER
             51   57   D0  001B   517         MOVL    R7,R1               ; Get MASSBUS SLOT NUMBER               [04]
       57   57   07   78  001E   518         AshL    #7, R7, R7          ; Align to unit number field
    57   0400 C347   9E  0022   519         MovAB   Mba$L_Erb(R3)[R7], R7 ; Form address of drive registers
                     0028   520 ;
                     0028   521 ; Initialize the TM78 (this section of code is functionally identical
                     0028   522 ; to that in the VMS driver TFDRIVER).
                     0028   523 ;
44 A7   00004000 8F   C8  0028   524         BisL    #Mf_Id_M_TmClr, -   ; Clear out the
                     0030   525                  Mf_Id(R7)              ; .. TM78
        50   FA 8F   9A  0030   526         MovZBL  #250, R0            ; Wait a bit
             FD 50   F5  0034   527 10$:     SobGtr  R0, 10$             ; Spin on ourselves
          50   01   19   78  0037   528         AshL    #25, #1, R0         ; Load #2000000 count
44 A7   00008000 8F   D3  003B   529 20$:     BitL    #Mf_Id_M_TmRdy, mf_id(R7)       ; Test the READY bit
                 03   12  0043   530         BNeq    30$                 ; Branch out of loop if SET
             F3 50   F5  0045   531         SobGtr  R0, 20$             ; Spin on the bit
        56   67 A9   9A  0048   532 30$:     MovZBL  Rpb$B_Slave(R9), R6 ; Get slave number of TU78
       51   01   51   78  004C   533         AshL    R1, #1, R1          ; Get MASSBUS SLOT NUMBER MASK          [04]
         10 A7   51   D0  0050   534         MovL    R1, Mf_Ab(R7)       ; Clear MASSBUS SLOT ATTEN BIT.
        52   FA 8F   9A  0054   535         MovZBL  #250, R2            ; Small 'timer'
             FD 52   F5  0058   536 40$:     SobGtr  R2, 40$             ; Spin on it to let ATTN clear
       30 A746   09   9A  005B   537         MovZBL  #Sense_F!Go, -      ; Set a SENSE function
                     0060   538                  Mf_Ndt0(R7)[R6]        ; .. to get drive type
       52   01   19   78  0060   539         AshL    #25, #1, R2         ; Set timeout
                 08 A3   DD  0064   540 50$:     PushL   Mba$L_Sr(R3)        ; Get MBA status register
   8E   00010000 8F   D3  0067   541         BitL    #Mba$M_Sr_Attn, (Sp)+   ; Check the attention bit
                 03   12  006E   542         BNeq    60$                 ; Exit loop when it sets
             F1 52   F5  0070   543         SobGtr  R2, 50$             ; Spin on the bit
         10 A7   51   D3  0073   544 60$:     BitL    R1, Mf_Ab(R7)       ; Do we have drive attention?
                 09   12  0077   545         BNeq    80$                 ; Yes, so OK
   50   00000084 8F   D0  0079   546         MovL    #SS$_DevOffLine, R0 ; Device offline
                 4E   11  0080   547 70$:     Brb     Return              ; No go
```

```
                50    0908 8F    3C   0082    548 80$:    MOVZWL  #SS$_NOSUCHDEV,R0       ; ASSUME DOES NOT EXIT                  [01]
                      18 A7    DD   0087    549         PushL   Mf_Dt(R7)                 ; Get the drive type register
            6E   FFFFFE00 8F    CA   008A    550         BicL2   #^C<Mf_Dt_M_Dtn>, (Sp)    ; Clear all but type
                52    FF6F CF    9E   0091    551         MovAB   Tf_DtDesc, R2             ; Address of drive type table
                      82    6E   B1   0096    552 90$:    CmpW    (Sp), (R2)+               ; Compare next entry in table
                            06   13   0099    553         BEql    100$                      ; Exit loop if OK
                            62   B5   009B    554         TstW    (R2)                      ; Is there another entry?
                            F7   12   009D    555         BNeq    90$                       ; Yes, check it
                            DF   11   009F    556         Brb     70$                       ; Unsupported device type
                            8E   D5   00A1    557 100$:   TstL    (Sp)+                     ; Remove temporary
                  10 A7     51   D0   00A3    558         MovL    R1, Mf_Ab(R7)             ; Clear attention bit
                  08 A7     56   D0   00A7    559         MovL    R6, Mf_Tc(R7)             ; Select slave and set format           [04]
                                   00AB    560
                                   00AB    561 ;+
                                   00AB    562 ; branch on function type
                                   00AB    563 ;-
                                   00AB    564
                  21    10 AC     D1   00AB    565 120$:   CmpL    Func(AP), #IO$_ReadLBlk   ; Read logical block?
                                33   13   00AF    566         BEql    E_Read                    ; Execute read function
                  24    10 AC     D1   00B1    567         CmpL    Func(AP), #IO$_Rewind     ; Rewind?
                                1F   13   00B5    568         BEql    E_Rewind                  ; Do a rewind
                  25    10 AC     D1   00B7    569         CmpL    Func(AP), #IO$_SkipFile   ; Skip past eof
                                52   13   00BB    570         BEql    E_SkipFile                ; Do it
                  26    10 AC     D1   00BD    571         CmpL    Func(AP), #IO$_SkipRecord ; Skip records?
                                49   13   00C1    572         BEql    E_SkipRecord_1            ; Do it
                        50    01   D0   00C3    573         MovL    #SS$_Normal, R0           ; Assume normal completion
                  10 AC     04   D1   00C6    574         CmpL    #IO$_DrvClr, Func(AP)     ; Is this drive clear?
                                04   13   00CA    575         BEql    Return                    ; Yes, all done, exit
                  50    F4 8F    9A   00CC    576         MovZBL  #SS$_IllIOFunc, R0        ; illegal I/O function
                                   00D0    577 Return:
                5E   FF2C CF     D0   00D0    578         MovL    Stack, Sp                 ; Restore entry stack
                                05   00D5    579         Rsb                               ; Return to caller
                                   00D6    580
                                   00D6    581 ;+
                                   00D6    582 ; Rewind slave drive, wait for completion
                                   00D6    583 ;-
                                   00D6    584
                                   00D6    585 E_Rewind:
            30 A746     07   D0   00D6    586         MovL    #Rewind+Go, -             ; Set function
                                   00DB    587                  Mf_Ndt0(R7)[R6]          ; .. in non-data transfer reg
                52   2710 8F     3C   00DB    588         MovZWL  #TU78_Max_Rewind_Time,R2  ; Set minimum timeout
                       0124     30   00E0    589         BsbW    Wait_Ndt                  ; Wait for ready to set
                                05   00E3    590         Rsb                               ; Exit
                                   00E4    591 ;+
                                   00E4    592 ; Read block of data
                                   00E4    593 ;-
                                   00E4    594
                                   00E4    595 E_Read:
                  10 A3     58   CE   00E4    596         MNegL   R8, Mba$L_BCR(R3)         ; Set transfer byte count
                  0C A3     5A   D0   00E8    597         MovL    R10, Mba$L_VAR(R3)        ; Set as virtual starting address
                     67     39   D0   00EC    598         MovL    #Read_F+Go, Mf_CS1(R7)    ; Start the read
                52   01F4 8F     3C   00EF    599         MovZWL  #TU78_Normal_Time, R2     ; Set minimum timeout
                       0114     30   00F4    600         BsbW    Wait_Dt                   ; Wait for it to finish
                         11 50  E9   00F7    601 10$:    BlbC    R0, 20$                   ; Branch if error                       [01]
                  51    14 A7    D0   00FA    602         MovL    Mf_Bc(R7), R1             ; Get bytes read
                     51    51   3C   00FE    603         MovZWL  R1, R1                    ; Byte count only
                     58    51   B1   0101    604         CmpW    R1, R8                    ; More data than buffer?
```

```
                  05   1B  0104          BLeqU   20$                      ; Branch if transfer not truncated      [01]
        50   0838 8F   3C  0106          MovZWL  #SS$_DataOverun, R0      ; Change return code
                       05  010B  20$:    Rsb                              ;                                       [01]
                           010C
                           010C  ;+
                           010C  ; Skip hop to SkipRecord
                           010C  ;-
                           010C
                           010C  E_SkipRecord_1:                          ;
                 00B8  31  010C          BrW     E_SkipRecord             ; Hop along
                           010F
                           010F  ;+
                           010F  ; Skip to end of file
                           010F  ; P1 is negative if backwards else forwards
                           010F  ;-
                           010F
                           010F  E_SkipFile:
              50   01  D0  010F          MovL    #Ss$_Normal, R0          ; Assume it works
              7E   11  9A  0112          MovZBL  #Space_F+GO, -(Sp)       ; Set space forward                     [01]
        03 04 AC   1F  E1  0115          BbC     #31, Buf(AP), 10$        ; Branch if forward is desired
              6E   13  9A  011A          MovZBL  #Space_R+GO, (Sp)        ; Change to reverse                     [01]
        01 AE   FF 8F  90  011D  10$:    MovB    #255, 1(Sp)              ; Set maximum count
        30 A746   6E   D0  0122          MovL    (Sp), Mf_Ndt0(R7)[R6]    ; Execute command
        52   88B8 8F   3C  0127          MovZWL  #TU78_Max_Space_Time, R2; Set timeout value
                 00D8  30  012C          BsbW    Wait_Ndt                 ; Wait for it to finish
                           012F
                 03 50  E8  012F          BlbS    R0, 20$                  ; Branch if success status              [04]
                 0087  31  0132          BRW     130$                     ; BRANCH if  TM, EOT or other errors    [04]
  44 A7   00004000 8F   C8  0135  20$:    BisL    #Mf_Id_M_TmClr, -        ; Clear out the                         [04]
                           013D                  Mf_Id(R7)                ; .. TM78
        50   FA 8F   9A  013D          MovZBL  #250, R0                 ; Wait a bit
             FD 50   F5  0141  30$:    SobGtr  R0, 30$                  ; Spin on ourselves
        50   01   19  78  0144          AshL    #25, #1, R0              ; Load #2000000 count
  44 A7   00008000 8F   D3  0148  40$:    BitL    #Mf_Id_M_TmRdy, Mf_Id(R7)        ; Test the READY bit
                   03  12  0150          BNeq    50$                      ; Branch out of loop if SET
             F3 50   F5  0152          SobGtr  R0,40$                   ; Spin on the bit
        51   64 A9   3C  0155  50$:    MOVZWL  RPB$W_UNIT(R9),R1        ; GET MASSBUS SLOT NUMBER
        51   01   51  78  0159          AshL    R1, #1, R1               ; Get DRIVE attention bit mask
        10 A7   51   D0  015D          MovL    R1, Mf_Ab(R7)            ; Clear DRIVE attention
        52   FA 8F   9A  0161          MovZBL  #250, R2                 ; Small 'timer'
             FD 52   F5  0165  55$:    SobGtr  R2, 55$                  ; Spin on it to let ATTN clear
        30 A746   09  9A  0168          MovZBL  #Sense_F!Go, -           ; Set a SENSE function
                           016D                  Mf_Ndt0(R7)[R6]         ; .. to get drive type
        52   01   19  78  016D          AshL    #25, #1, R2              ; Set timeout
             08 A3   DD  0171  60$:    PushL   Mba$L_Sr(R3)             ; Get MBA status register
    8E   00010000 8F   D3  0174          BitL    #Mba$M_Sr_Attn, (Sp)+    ; Check the attention bit
                   03  12  017B          BNeq    70$                      ; Exit loop when it sets
             F1 52   F5  017D          SobGtr  R2, 60$                  ; Spin on the bit
        10 A7   51   D3  0180  70$:    BitL    R1, Mf_Ab(R7)            ; Do we have drive attention?
                   0A  12  0184          BNeq    90$                      ; Yes, so OK
    50   00000084 8F   D0  0186          MovL    #SS$_DevOffLine, R0      ; Device offline
                 FF40  31  018D  80$:    BrW     Return                   ; No go
        50   0908 8F   3C  0190  90$:    MOVZWL  #SS$_NOSUCHDEV,R0        ; ASSUME DOES NOT EXIT                  [01]
             18 A7   DD  0195          PushL   Mf_Dt(R7)                ; Get the drive type register
    6E   FFFFFE00 8F   CA  0198          BicL2   #^C<Mf_Dt_M_Dtn>, (Sp)   ; Clear all but type
        52   FE61 CF   9E  019F          MovAB   Tf_DtDesc, R2            ; Address of drive type table
             82   6E  B1  01A4  100$:   CmpW    (Sp), (R2)+              ; Compare next entry in table
```

```
                     06   13   01A7   662          BEql    110$                    ; Exit loop if OK
                     62   B5   01A9   663          TstW    (R2)                    ; Is there another entry?
                     F7   12   01AB   664          BNeq    100$                    ; Yes, check it
                     DE   11   01AD   665          Brb     80$                     ; Unsupported device type
                     8E   D5   01AF   666 110$:     TstL    (Sp)+                   ; Remove temporary
               10 A7 51   D0   01B1   667          MovL    R1, Mf_Ab(R7)           ; Clear attention bit
               08 A7 56   D0   01B5   668          MovL    R6, Mf_Tc(R7)           ; Select slave and set format
                  FF61    31   01B9   669          BRW     10$                     ; LOOP FOR TAPE MARK OR ERROR          [04]
                          01BC   670
                  51   02   D1   01BC   671 130$:     CmpL    #Hic_Tm, R1             ; Was a tape mark detected?
                     03   12   01BF   672          BNeq    140$                    ; Nope - keep the error code
                  50   01   9A   01C1   673          MovZBL  #Ss$_Normal, R0         ; Change return to normal if at EOF
                     8E   D5   01C4   674 140$:     TstL    (Sp)+                   ; Remove temporary
                          05   01C6   675          Rsb                             ;
                          01C7   676
                          01C7   677 ;+
                          01C7   678 ; Skip to end of record, read w/o buffer
                          01C7   679 ; P1 is negative if backwards else forwards
                          01C7   680 ;-
                          01C7   681
                          01C7   682 E_SkipRecord:
                  50   01   D0   01C7   683          MOVL    #SS$_NORMAL,R0          ; ASSUME IT WORKS
                     30   BB   01CA   684          PUSHR   #^M<R4,R5>              ; SAVE REGISTER USED                   [01]
                  7E   11   9A   01CC   685          MovZBL  #Space_F+GO, -(Sp)      ; Assume space forward                 [01]
               54    04 AC   D0   01CF   686          MovL    Buf(Ap), R4             ; Set desired space count
                     08   14   01D3   687          BGTR    10$                     ; Branch if record count was positive  [01]
                     2B   13   01D5   688          BEql    30$                     ; Branch if count 0
                  6E   13   9A   01D7   689          MovZBL  #Space_R+GO, (Sp)       ; Change to reverse                    [01]
                  54   54   CE   01DA   690          MNEGL   R4,R4                   ; Change to positive value.            [01]
               55    FF 8F   9A   01DD   691 10$:     MovZBL  #255, R5                ; Set max count we can use
                  55   54   D1   01E1   692          CmpL    R4, R5                  ; Is requested value possible?
                     03   18   01E4   693          BGeq    20$                     ; Branch if too big
                  55   54   D0   01E6   694          MovL    R4, R5                  ; Use it if smaller
               01 AE   55   90   01E9   695 20$:     MOVB    R5,1(SP)                ; Set number of times to repeat command [01]
            30 A746    6E   D0   01ED   696          MovL    (Sp), Mf_Ndt0(R7)[R6]   ; Do the command
            52   88B8 8F   3C   01F2   697          MovZWL  #TU78_Max_Space_Time, R2; Set timeout value
                    000D   30   01F7   698          BsbW    Wait_Ndt                ; Wait for it to finish
                  05 50    E9   01FA   699          BlbC    R0, 30$                 ; Exit on error
                  54   55   C2   01FD   700          SubL    R5, R4                  ; Calculate remaining count
                     DB   14   0200   701          BGtr    10$                     ; Loop til done
                     8E   D5   0202   702 30$:     TstL    (Sp)+                   ; Remove temporary
                     30   BA   0204   703          POPR    #^M<R4,R5>              ; RESTORE REGISTERS                    [01]
                          05   0206   704          Rsb
                          0207   705
                          0207   706
                          0207   707 ;+
                          0207   708 ; Wait for slave to quiesce
                          0207   709 ;
                          0207   710 ; R2 => timeout (in 10-mS)
                          0207   711 ; R6 = SLAVE  NUMBER
                          0207   712 ; Return:
                          0207   713 ;  R0 => status code
                          0207   714 ;  R1 => HIC code
                          0207   715 ;-
                          0207   716
                          0207   717 Wait_Ndt:                                    ; Wait non-data transfer
                     01   DD   0207   718          PushL   #1                      ; Set flag
```

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                  02   11  0209          Brb     Wait                    ; Join common
                           020B  Wait_Dt:                                ; Wait data transfer
                  7E   D4  020B          ClrL    -(Sp)                   ; Clear flag
                           020D
                           020D  Wait:
             7E   1B   DB  020D          Mfpr    #Pr$_Todr, -(Sp)        ; Get current time
             52   8E   C0  0210          AddL2   (Sp)+, R2               ; Calculate time
                           0213  10$:
                07 6E   E8  0213          BLBS    (SP),15$                ; BRANCH IF NDT                          [01]
                08 A3   D5  0216          TSTL    MBA$L_SR(R3)            ; Check if massbus DTBUSY bit is set     [01]
                   18   19  0219          BLSS    17$                     ; Branch if busy                         [01]
                   28   11  021B          BRB     20$                     ; Continue if but cleared                [01]
                   50   D4  021D  15$:    CLRL    R0                      ; Initialize counter                     [03]
   F8 50   00000064 8F   F3  021F  16$:    AOBLEQ  #100,R0,16$             ; Wait before accessing registers        [03]
          50   10 A7   D0  0227          MOVL    MF_AB(R7),R0            ; Read attention register                [01]
          51   64 A9   3C  022B          MOVZWL  RPB$W_UNIT(R9),R1       ; READ DRIVE NUMBER ON MASSBUS           [04]
          12 50   51   E0  022F          BBS     R1, R0, 20$             ; Wait for TM78 drive attention sets     [01]
             7E   1B   DB  0233  17$:    Mfpr    #Pr$_Todr, -(Sp)        ; Get current TODR
             52   8E   D1  0236          CmpL    (Sp)+, R2               ; Compare with timeout
                  D8   1F  0239          BLssU   10$                     ; Continue loop if OK
      50   0000022C 8F   D0  023B          MovL    #SS$_Timeout, R0        ; Set timeout failure                    [01]
                FE8B   31  0242          BrW     Return                  ; Return with error
                           0245
                06 6E   E9  0245  20$:    BlbC    (Sp), 30$               ; Branch if data transfer
          51   2C A7   D0  0248          MovL    Mf_Ndta(R7), R1         ; Get interrupt code
                   04   11  024C          BrB     40$                     ; Join common
          51   04 A7   D0  024E  30$:    MovL    Mf_Is(R7), R1           ; Get data transfer code
                           0252
                           0252  Assume Mf_Ndta_M_Ndic Eq Mf_Is_M_Dtic
                           0252
      51   FFFFFFC0 8F   CA  0252  40$:    BicL2   #^C<Mf_Ndta_M_Ndic>, R1 ; Mask off extraneous bits
         50   0084 8F   3C  0259          MovZWL  #SS$_DevOffLine, R0     ; Assume offline
             0A   51   D1  025E          CmpL    R1, #Hic_Not_Avail      ; Not available
                  5C   13  0261          BEql    60$                     ;
             0C   51   D1  0263          CmpL    R1, #Hic_Non_Ex         ; Not existant
                  57   13  0266          BEql    60$                     ;
             0B   51   D1  0268          CmpL    R1, #Hic_Off_Line       ; Off line
                  52   13  026B          BEql    60$                     ;
         50   0870 8F   3C  026D          MovZWL  #SS$_EndOfFile, R0      ; Assume end of file
             02   51   D1  0272          CmpL    R1, #Hic_Tm             ; Tape mark
                  48   13  0275          BEql    60$                     ;
             04   51   D1  0277          CmpL    R1, #Hic_Eot            ; End of tape
                  43   13  027A          BEql    60$                     ;
             05   51   D1  027C          CmpL    R1, #Hic_LEot           ; 2 tape marks
                  3E   13  027F          BEql    60$                     ;
             50   01   D0  0281          MovL    #SS$_Normal, R0         ; Assume OK
             03   51   D1  0284          CmpL    R1, #Hic_Bot            ; at BOT                                 [01]
                  36   13  0287          BEql    60$                     ;                                        [01]
             01   51   D1  0289          CmpL    R1, #Hic_Done           ; Done
                  27   13  028C          BEql    50$                     ;
             07   51   D1  028E          CmpL    R1, #Hic_Rewinding      ; rewinding in progress
                  0F   12  0291          BNEQ    45$                     ;                                        [01]
          51   64 A9   3C  0293          MOVZWL  RPB$W_UNIT(R9), R1      ; GET MASSBUS SLOT NUMBER                [04]
         51   01   51   78  0297          ASHL    R1, #1, R1              ; GET MASSBUS SLOT BIT MASK              [04]
          10 A7   51   D0  029B          MOVL    R1, MF_AB(R7)           ; CLEAR DRIVE ATTENTION BIT
                FF71   31  029F          BRW     10$                     ; GO WAIT FOR ATTENTION BIT TO SET AGAIN [01
             11   51   D1  02A2  45$:    CmpL    R1, #Hic_Short_Rec      ; Short record?
```

```
                        0E   13  02A5   776          BEql    50$                      ;
                   10   51   D1  02A7   777          CmpL    R1, #Hic_Long_Rec        ; Long record?
                        09   13  02AA   778          BEql    50$                      ;
          50   00000054 8F   D0  02AC   779          MovL    #SS$_CtrlErr, R0         ; Other codes are failure
                        0A   11  02B3   780          Brb     60$                      ; Exit
                                 02B5   781
       08 A3   000E0F7F 8F   D3  02B5   782 50$:     BitL    #Mba$M_Sr_Error, -       ; Check for
                                 02BD   783                   Mba$L_Sr(R3)            ; .. any adapter errors
                        03   12  02BD   784          BNeq    70$                      ; Branch any errors
                                 02BF   785
                        8E   D5  02BF   786 60$:     TstL    (Sp)+                    ; Remove temporary
                             05  02C1   787          Rsb                              ; Return
                08 A3   00   D2  02C2   788 70$:     MCOML   #0,MBA$L_SR(R3)          ; CLEAR ANY MASSBUS ERRORS.          [01]
                        F7   11  02C6   789          BRB     60$                      ; RETURN STATUS.                     [01]
                                 02C8   790 DriverName:                               ; Boot device driver name
58 45 2E 52 45 56 49 52 44 46 54 00' 02C8   791          .Ascic  /TFDRIVER.EXE/           ; TFDRIVER
                             45  02D4
                             0C  02C8
                                 02D5   792
                      000002CD   02D5   793 TM78_DrvSiz = .-TM78_Driver
                                 02D5   794
                                 02D5   795          .End
```

```
$TABLE                          = 00000000 R  D  02
BTD$K_TF                        = 000000B3    D
BTD$K_TM                        = 000000B1    D
BTD$K_TS                        = 000000B2    D
BUF                             = 00000004    D
DRIVERNAME                        000002C8 R  D  03
DS$ABORT                          00010020    D
DS$ASKADR                         00010090    D
DS$ASKDATA                        00010080    D
DS$ASKLGCL                        00010098    D
DS$ASKSTR                         000100A0    D
DS$ASKVLD                         00010088    D
DS$ATTACH                         000101A8    D
DS$BGNSUB                         00010030    D
DS$BRANCH                         000100A8    D
DS$BREAK                          00010058    D
DS$CANWAIT                        00010070    D
DS$CHANNEL                        00010180    D
DS$CKLOOP                         00010040    D
DS$CLRVEC                         00010168    D
DS$CNTRLC                         00010078    D
DS$CVTREG                         000100B0    D
DS$ENDPASS                        00010010    D
DS$ENDSUB                         00010038    D
DS$ERRDEV                         000100C8    D
DS$ERRHARD                        000100D0    D
DS$ERRPREP                        00010108    D
DS$ERRSOFT                        000100D8    D
DS$ERRSYS                         000100C0    D
DS$ESCAPE                         00010050    D
DS$FREEDBGSYM                     000101B8    D
DS$GETBUF                         00010120    D
DS$GETMEM                         00010130    D
DS$GETTERM                        000101C8    D
DS$GPHARD                         00010018    D
DS$HELP                           000101B0    D
DS$INITSCB                        00010170    D
DS$INLOOP                         00010048    D
DS$LOAD                           00010198    D
DS$LOADPCS                        000101C0    D
DS$MAPDBGBLOCK                    00010118    D
DS$MEMSIZE                        000101D8    D
DS$MMOFF                          00010158    D
DS$MMON                           00010150    D
DS$MOVPHY                         00010148    D
DS$MOVVRT                         00010140    D
DS$PARSE                          000100B8    D
DS$PRINTB                         000100E0    D
DS$PRINTF                         000100F0    D
DS$PRINTS                         000100F8    D
DS$PRINTSIG                       00010100    D
DS$PRINTX                         000100E8    D
DS$PROBE                          000101A0    D
DS$RELBUF                         00010128    D
DS$RELMEM                         00010138    D
DS$SERVICE_DISPATCHER             000101D0    D
DS$SETIPL                         00010178    D
DS$SETMAP                         00010188    D
DS$SETPRIEXV                      00010110    D
DS$SETVEC                         00010160    D
DS$SHOCHAN                        00010190    D
DS$SUMMARY                        00010028    D
DS$WAITMS                         00010060    D
DS$WAITUS                         00010068    D
E_READ                            000000E4 R  D  03
E_REWIND                          000000D6 R  D  03
E_SKIPFILE                        0000010F R  D  03
E_SKIPRECORD                      000001C7 R  D  03
E_SKIPRECORD_1                    0000010C R  D  03
FUNC                            = 00000010    D
GO                              = 00000001    D
HIC_BAD_TAPE                    = 00000017    D
HIC_BOT                         = 00000003    D
HIC_DONE                        = 00000001    D
HIC_EOT                         = 00000004    D
HIC_EOT_ERROR                   = 00000016    D
HIC_ERROR                       = 00000015    D
HIC_FPT                         = 00000008    D
HIC_LEOT                        = 00000005    D
HIC_LONG_REC                    = 00000010    D
HIC_MB_FAULT                    = 0000001C    D
HIC_NON_EX                      = 0000000C    D
HIC_NOP                         = 00000006    D
HIC_NOT_AVAIL                   = 0000000A    D
HIC_NOT_CAPABLE                 = 0000000D    D
HIC_NOT_RDY                     = 00000009    D
HIC_OFF_LINE                    = 0000000B    D
HIC_ON_LINE                     = 0000000F    D
HIC_READ_OPP                    = 00000013    D
HIC_RETRY                       = 00000012    D
HIC_REWINDING                   = 00000007    D
HIC_SHORT_REC                   = 00000011    D
HIC_TM                          = 00000002    D
HIC_TM_FAULT_A                  = 00000018    D
HIC_TM_FAULT_B                  = 0000001A    D
HIC_TU_FAULT_A                  = 00000019    D
HIC_TU_FAULT_B                  = 0000001B    D
HIC_UNREADABLE                  = 00000014    D
IO$_DRVCLR                      = 00000004    D
IO$_READLBLK                    = 00000021    D
IO$_REWIND                      = 00000024    D
IO$_SKIPFILE                    = 00000025    D
IO$_SKIPRECORD                  = 00000026    D
LBN                             = 0000000C    D
MBA$L_BCR                       = 00000010    D
MBA$L_CR                        = 00000004    D
MBA$L_ERB                       = 00000400    D
MBA$L_SR                        = 00000008    D
MBA$L_VAR                       = 0000000C    D
MBA$M_CR_IE                     = 00000004    D
MBA$M_SR_ATTN                   = 00010000    D
MBA$M_SR_DLT                    = 00000800    D
MBA$M_SR_ERCONF                 = 00000008    D
MBA$M_SR_ERROR                  = 000E0F7F    D
```

```
MBA$M_SR_INVMAP                 = 00000010     D
MBA$M_SR_ISTO                   = 00000002     D
MBA$M_SR_MAPPE                  = 00000020     D
MBA$M_SR_MCPE                   = 00020000     D
MBA$M_SR_MDPE                   = 00000040     D
MBA$M_SR_MXF                    = 00000100     D
MBA$M_SR_NED                    = 00040000     D
MBA$M_SR_PGE                    = 00080000     D
MBA$M_SR_RDS                    = 00000004     D
MBA$M_SR_RDTO                   = 00000001     D
MBA$M_SR_WCKLWR                 = 00000200     D
MBA$M_SR_WCKUPR                 = 00000400     D
MF_AB                             00000010     D
MF_BC                             00000014     D
MF_CS1                            00000000     D
MF_DS                             0000001C     D
MF_DT                             00000018     D
MF_DT_M_DTN                     = 000001FF     D
MF_IA                             00000040     D
MF_ID                             00000044     D
MF_ID_M_TMCLR                   = 00004000     D
MF_ID_M_TMRDY                   = 00008000     D
MF_IS                             00000004     D
MF_IS_M_DTIC                    = 0000003F     D
MF_MR1                            0000000C     D
MF_MR2                            00000024     D
MF_MR3                            00000028     D
MF_NDT0                           00000030     D
MF_NDT1                           00000034     D
MF_NDT2                           00000038     D
MF_NDT3                           0000003C     D
MF_NDTA                           0000002C     D
MF_NDTA_M_NDIC                  = 0000003F     D
MF_SN                             00000020     D
MF_TC                             00000008     D
MODE                            = 00000014     D
PR$_TODR                        = 0000001B     D
READ_F                          = 00000038     D
RETURN                            000000D0 R   D   03
REWIND                          = 00000006     D
RPB$B_SLAVE                     = 00000067     D
RPB$W_UNIT                      = 00000064     D
SENSE_F                         = 00000008     D
SIZ...                          = 00000001     D
SIZE                            = 00000008     D
SPACE_F                         = 00000010     D
SPACE_R                         = 00000012     D
SS$_CTRLERR                     = 00000054     D
SS$_DATAOVERUN                  = 00000838     D
SS$_DEVOFFLINE                  = 00000084     D
SS$_ENDOFFILE                   = 00000870     D
SS$_ILLIOFUNC                   = 000000F4     D
SS$_NORMAL                      = 00000001     D
SS$_NOSUCHDEV                   = 00000908     D
SS$_TIMEOUT                     = 0000022C     D
STACK                             00000000 R   D   03
SYS$ALLOC                         00010238     D

SYS$ASCTIM                        00010248     D
SYS$ASSIGN                        00010250     D
SYS$BINTIM                        00010258     D
SYS$CANCEL                        00010260     D
SYS$CANTIM                        00010268     D
SYS$CLOSE                         000105B8     D
SYS$CLREF                         00010298     D
SYS$CONNECT                       000105C0     D
SYS$DALLOC                        000102D8     D
SYS$DASSGN                        000102E0     D
SYS$DISCONNECT                    000105D0     D
SYS$FAO                           00010350     D
SYS$FAOL                          00010358     D
SYS$GET                           00010580     D
SYS$GETCHN                        000104C8     D
SYS$GETTIM                        00010378     D
SYS$LKWSET                        000103A0     D
SYS$NUMTIM                        000103B8     D
SYS$OPEN                          00010608     D
SYS$QIO                           000103C8     D
SYS$QIOW                          00010200     D
SYS$READ                          00010590     D
SYS$READEF                        000103D0     D
SYS$SETAST                        000103F8     D
SYS$SETEF                         00010400     D
SYS$SETIMR                        00010420     D
SYS$SETPRI                        00010428     D
SYS$SETPRT                        00010430     D
SYS$SETRWM                        00010438     D
SYS$SETSWM                        00010448     D
SYS$ULKPAG                        00010460     D
SYS$ULWSET                        00010468     D
SYS$UNWIND                        00010470     D
SYS$WAITFR                        00010478     D
SYS$WFLAND                        00010488     D
SYS$WFLOR                         00010490     D
TF_DTDESC                         00000004 R   D   03
TM78_DRIVER                       00000008 RG  D   03
TM78_DRVSIZ                     = 000002CD     D
TU78_MAX_REWIND_TIME            = 00002710     D
TU78_MAX_SPACE_TIME             = 000088B8     D
TU78_NORMAL_TIME                = 000001F4     D
WAIT                              0000020D R   D   03
WAIT_DT                           0000020B R   D   03
WAIT_NDT                          00000207 R   D   03
```

```
                                    +----------------+
                                    ! Psect synopsis !
                                    +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                           00010610  (67088.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
BOOTDRIVR_4                     00000018  (   24.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
BOOTDRIVR_2                     000002D5  (  725.)  03 (  3.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$TABLE	=00000000-R	446 (1)	446 (1)
BTD$K_TF	=000000B3	182 (1)	446 (1)
BTD$K_TM	=000000B1	180 (1)	
BTD$K_TS	=000000B2	181 (1)	
BUF	=00000004	505 (1)	624 (1) #-686 (1)
DRIVERNAME	000002C8-R	790 (1)	446 (1)
E_READ	000000E4-R	595 (1)	#-566 (1)
E_REWIND	000000D6-R	585 (1)	#-568 (1)
E_SKIPFILE	0000010F-R	621 (1)	#-570 (1)
E_SKIPRECORD	000001C7-R	682 (1)	#-614 (1)
E_SKIPRECORD_1	0000010C-R	613 (1)	#-572 (1)
FUNC	=00000010	508 (1)	#-565 (1) #-567 (1) #-569 (1) #-571 (1)
			#-574 (1)
GO	=00000001	188 (1)	#-537 (1) #-586 (1) #-598 (1) #-623 (1)
			#-625 (1) #-646 (1) #-685 (1) #-689 (1)
HIC_BAD_TAPE	=00000017	244 (1)	
HIC_BOT	=00000003	233 (1)	#-765 (1)
HIC_DONE	=00000001	231 (1)	#-767 (1)
HIC_EOT	=00000004	234 (1)	#-760 (1)
HIC_EOT_ERROR	=00000016	286 (1)	
HIC_ERROR	=00000015	280 (1)	
HIC_FPT	=00000008	235 (1)	
HIC_LEOT	=00000005	295 (1)	#-762 (1)
HIC_LONG_REC	=00000010	253 (1)	#-777 (1)
HIC_MB_FAULT	=0000001C	309 (1)	
HIC_NON_EX	=0000000C	241 (1)	#-753 (1)
HIC_NOP	=00000006	296 (1)	
HIC_NOT_AVAIL	=0000000A	239 (1)	#-751 (1)
HIC_NOT_CAPABLE	=0000000D	242 (1)	
HIC_NOT_RDY	=00000009	236 (1)	
HIC_OFF_LINE	=0000000B	240 (1)	#-755 (1)
HIC_ON_LINE	=0000000F	304 (1)	
HIC_READ_OPP	=00000013	270 (1)	
HIC_RETRY	=00000012	265 (1)	
HIC_REWINDING	=00000007	297 (1)	#-769 (1)
HIC_SHORT_REC	=00000011	259 (1)	#-775 (1)
HIC_TM	=00000002	232 (1)	#-671 (1) #-758 (1)
HIC_TM_FAULT_A	=00000018	245 (1)	
HIC_TM_FAULT_B	=0000001A	307 (1)	
HIC_TU_FAULT_A	=00000019	247 (1)	
HIC_TU_FAULT_B	=0000001B	308 (1)	
HIC_UNREADABLE	=00000014	275 (1)	
IO$_DRVCLR	=00000004		#-574 (1)
IO$_READLBLK	=00000021		#-565 (1)
IO$_REWIND	=00000024		#-567 (1)
IO$_SKIPFILE	=00000025		#-569 (1)
IO$_SKIPRECORD	=00000026		#-571 (1)
LBN	=0000000C	507 (1)	
MBA$L_BCR	=00000010		#-596 (1)
MBA$L_CR	=00000004		#-515 (1)

```
MBA$L_ERB                       =00000400                       519     (1)
MBA$L_SR                        =00000008                     #-514     (1)     #-540     (1)     #-649     (1)     #-728     (1)
                                                              #-783     (1)     #-788     (1)
MBA$L_VAR                       =0000000C                     #-597     (1)
MBA$M_CR_IE                     =00000004                     #-515     (1)
MBA$M_SR_ATTN                   =00010000                     #-541     (1)     #-650     (1)
MBA$M_SR_DLT                    =00000800                       218     (1)
MBA$M_SR_ERCONF                 =00000008                       211     (1)
MBA$M_SR_ERROR                  =000E0F7F       221     (1)   #-782     (1)
MBA$M_SR_INVMAP                 =00000010                       212     (1)
MBA$M_SR_ISTO                   =00000002                       209     (1)
MBA$M_SR_MAPPE                  =00000020                       213     (1)
MBA$M_SR_MCPE                   =00020000                       219     (1)
MBA$M_SR_MDPE                   =00000040                       214     (1)
MBA$M_SR_MXF                    =00000100                       215     (1)
MBA$M_SR_NED                    =00040000                       220     (1)
MBA$M_SR_PGE                    =00080000                       221     (1)
MBA$M_SR_RDS                    =00000004                       210     (1)
MBA$M_SR_RDTO                   =00000001                       208     (1)
MBA$M_SR_WCKLWR                 =00000200                       216     (1)
MBA$M_SR_WCKUPR                 =00000400                       217     (1)
MF_AB                            00000010                     #-534     (1)     #-544     (1)     #-558     (1)     #-643     (1)
                                                              #-653     (1)     #-667     (1)     #-733     (1)     #-773     (1)
MF_BC                            00000014                     #-602     (1)
MF_CS1                           00000000                     #-598     (1)
MF_DT                            00000018                     #-549     (1)     #-658     (1)
MF_DT_M_DTN                     =000001FF                     #-550     (1)     #-659     (1)
MF_ID                            00000044                     #-525     (1)     #-529     (1)     #-634     (1)     #-638     (1)
MF_ID_M_TMCLR                   =00004000                     #-524     (1)     #-633     (1)
MF_ID_M_TMRDY                   =00008000                     #-529     (1)     #-638     (1)
MF_IS                            00000004                     #-745     (1)
MF_IS_M_DTIC                    =0000003F                       747     (1)
MF_NDTO                          00000030                     #-538     (1)     #-587     (1)     #-627     (1)     #-647     (1)
                                                              #-696     (1)
MF_NDTA                          0000002C                     #-743     (1)
MF_NDTA_M_NDIC                  =0000003F                       747     (1)     #-749     (1)
MF_TC                            00000008                     #-559     (1)     #-668     (1)
MODE                            =00000014       509     (1)
PR$_TODR                        =0000001B                     #-724     (1)     #-736     (1)
READ_F                          =00000038       193     (1)   #-598     (1)
RETURN                           000000D0-R     577     (1)   #-547     (1)     #-575     (1)     #-656     (1)     #-740     (1)
REWIND                          =00000006       189     (1)   #-586     (1)
RPB$B_SLAVE                     =00000067                     #-532     (1)
RPB$W_UNIT                      =00000064                     #-516     (1)     #-641     (1)     #-734     (1)     #-771     (1)
SENSE_F                         =00000008       190     (1)   #-537     (1)     #-646     (1)
SIZE                            =00000008       506     (1)
SPACE_F                         =00000010       191     (1)   #-623     (1)     #-685     (1)
SPACE_R                         =00000012       192     (1)   #-625     (1)     #-689     (1)
SS$_CTRLERR                     =00000054                     #-779     (1)
SS$_DATAOVERUN                  =00000838                     #-606     (1)
SS$_DEVOFFLINE                  =00000084                     #-546     (1)     #-655     (1)     #-750     (1)
SS$_ENDOFFILE                   =00000870                     #-757     (1)
SS$_ILLIOFUNC                   =000000F4                     #-576     (1)
SS$_NORMAL                      =00000001                     #-573     (1)     #-622     (1)     #-673     (1)     #-683     (1)
                                                              #-764     (1)
SS$_NOSUCHDEV                   =00000908                     #-548     (1)     #-657     (1)
SS$_TIMEOUT                     =0000022C                     #-739     (1)
```

```
STACK                            00000000-R   500    (1)    #-513    (1)    #-578    (1)
TF_DTDESC                        00000004-R   501    (1)     551     (1)     660     (1)
TM78_DRIVER                      00000008-R   511    (1)     446     (1)     793     (1)
TM78_DRVSIZ                     =000002CD     793    (1)     446     (1)
TU78_MAX_REWIND_TIME            =00002710     200    (1)    #-588    (1)
TU78_MAX_SPACE_TIME             =000088B8     201    (1)    #-628    (1)    #-697    (1)
TU78_NORMAL_TIME                =000001F4     202    (1)    #-599    (1)
WAIT                             0000020D-R   723    (1)    #-719    (1)
WAIT_DT                          0000020B-R   720    (1)    #-600    (1)
WAIT_NDT                         00000207-R   717    (1)    #-589    (1)    #-629    (1)    #-698    (1)
```

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	43	00:00:00.00	00:00:00.21
Command processing	959	00:00:00.31	00:00:00.92
Pass 1	821	00:00:02.88	00:00:04.56
Symbol table sort	0	00:00:00.38	00:00:00.38
Pass 2	219	00:00:00.83	00:00:01.41
Symbol table output	12	00:00:00.04	00:00:00.20
Psect synopsis output	2	00:00:00.00	00:00:00.00
Cross-reference output	4	00:00:00.08	00:00:00.11
Assembler run totals	2062	00:00:04.52	00:00:07.79

```
The working set limit was 2900 pages.
164186 bytes (321 pages) of virtual memory were used to buffer the intermediate code.
There were 80 pages of symbol table space allocated to hold 1365 non-local and 41 local symbols.
795 source lines were read in Pass 1, producing 87 object records in Pass 2.
19 pages of virtual memory were used to define 18 macros.
```

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	1
SYS$COMMON:[SYSLIB]LIB.MLB;2	4
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	7
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	13

```
1227 GETS were required to define 13 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(2) 45 DECLARATIONS
(3) 196 TM03/TE16/TU45/TU77 Bootstrap driver

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element TMBTDRIVR.MAR
0000     2 ; *1     6-FEB-1986 15:22:46 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element TMBTDRIVR.MAR
0000     4         .TITLE  TMBTDRIVR - MASSBUS TAPE BOOT DRIVER
0000     5         .IDENT  /01-02/
0000     6         .DISABLE GLOBAL
0000     7
0000     8 ;
0000     9 ;                          COPYRIGHT (c) 1979 BY
0000    10 ;               DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.
0000    11 ;
0000    12 ; THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND  COPIED
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0000    17 ; TRANSFERRED.
0000    18 ;
0000    19 ; THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE
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0000    21 ; CORPORATION.
0000    22 ;
0000    23 ; DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS
0000    24 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.
0000    25 ;
0000    26
0000    27 ;++
0000    28 ; FACILITY:     BOOTS
0000    29 ;
0000    30 ; ABSTRACT:
0000    31 ;       This module contains the bootstrap device driver for
0000    32 ;       MASSBUS TM03 based magtapes (TE16,TU77,TU45)
0000    33 ;
0000    34 ; ENVIRONMENT:  kernel mode
0000    35 ;
0000    36 ; AUTHOR:  Roger Riggs, CREATION DATE:  4-Sep-1980
0000    37 ;
0000    38 ;--
0000    39 ; Modified:
0000    40 ;
0000    41 ;                   Roger Riggs, 22-oct-1980, Version 6.1
0000    42 ;       01          Added code to support IO$_DRVCLR.
0000    43 ;       02          changed RET's to RSB for version 4 interface of Bootdrivr
```

```
                     0000     45          .SBTTL  DECLARATIONS
                     0000     46 ;
                     0000     47 ; INCLUDE FILES:
                     0000     48 ;
                     0000     49
                     0000     50          $BTDDEF                         ; Define boot device types
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     51          $IODEF                          ; Define I/O function codes
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     52          $MBADEF                         ; Define MASSBUS adapter registers
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     53          $NDTDEF                         ; Define NEXUS device types
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     54          $PRDEF                          ; Define processor registers
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     55          $RPBDEF                         ; Define RPB offsets
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     56          $SSDEF                          ; Define system status codes
                     0000                 .SAVE   LOCAL_BLOCK
                     0000                 .RESTORE
                     0000     57
                     0000     58 ;
                     0000     59 ; MACROS:
                     0000     60 ;
                     0000     61
                     0000     62
                     0000     63 ;
                     0000     64 ; EQUATED SYMBOLS:
                     0000     65 ;
000000B1             0000     66 BTD$K_TM = 177 ; Temp
                     0000     67
                     0000     68 ;
                     0000     69 ; TM03/TE16/TU45/TU77 Function codes
                     0000     70 ;
00000001             0000     71 GO       = 1
00000006             0000     72 REWIND   = 3*2           ;Rewind
00000008             0000     73 CLEAR    = 4*2           ;Drive Clear
00000018             0000     74 SPACE_F  = 12*2          ;Space forward
0000001A             0000     75 SPACE_R  = 13*2          ;Space reverse
00000038             0000     76 READ_F   = 28*2          ;Read forward
                     0000     77
                     0000     78
                     0000     79 ;
                     0000     80 ; MASSBUS error bits
                     0000     81 ;
                     0000     82 mba$m_sr_error= mba$m_sr_rdto ! -
                     0000     83                 mba$m_sr_isto ! -
                     0000     84                 mba$m_sr_rds ! -
                     0000     85                 mba$m_sr_erconf ! -
                     0000     86                 mba$m_sr_invmap ! -
                     0000     87                 mba$m_sr_mappe ! -
```

```
                     0000     88                 mba$m_sr_mdpe ! -
                     0000     89                 mba$m_sr_mxf ! -
                     0000     90                 mba$m_sr_wcklwr ! -
                     0000     91                 mba$m_sr_wckupr ! -
                     0000     92                 mba$m_sr_dlt ! -
                     0000     93                 mba$m_sr_mcpe ! -
                     0000     94                 mba$m_sr_ned ! -
                000E0F7F     0000     95                 mba$m_sr_pge
                     0000     96 ;
                     0000     97 ; TM03/TE16/TU45/TU77 MASSBUS REGISTER OFFSETS
                     0000     98 ;
                     0000     99
                     0000    100
                     0000    101         $DEFINI MT
                     0000                .SAVE   LOCAL_BLOCK
                     0000    102
                     0000    103 $DEF    MT_CS1          .BLKL   1       ;DRIVE CONTROL REGISTER
                     0000                .IIF    NB,MT_CS1,      MT_CS1:
                00000004     0000                .IIF    NB,.BLKL,       .BLKL   1
                     0004    104                 _VIELD  MT_CS1,0,<-             ; DRIVE CONTROL REGISTER BIT DEFINITIONS
                     0004    105                         <GO,,M>,-               ; GO BIT
                     0004    106                         <FCODE,5>-              ; FUNCTION CODE
                     0004    107                 >                               ;
                     0004    108 $DEF    MT_DS           .BLKL   1       ;DRIVE STATUS REGISTER
                     0004                .IIF    NB,MT_DS,       MT_DS:
                00000008     0004                .IIF    NB,.BLKL,       .BLKL   1
                     0008    109                 _VIELD  MT_DS,0,<-              ; DRIVE STATUS REGISTER BIT DEFINITIONS
                     0008    110                         <SLA,,M>,-              ; SLAVE ATTENTION
                     0008    111                         <BOT,,M>,-              ; BEGINNING OF TAPE
                     0008    112                         <TM,,M>,-               ; TAPE MARK
                     0008    113                         <IDB,,M>,-              ; IDENTIFICATION BURST
                     0008    114                         <SDWN,,M>,-             ; SLOWING DOWN
                     0008    115                         <PES,,M>,-              ; PHASE ENCODED
                     0008    116                         <SSC,,M>,-              ; SLAVE STATUS CHANGE
                     0008    117                         <DRY,,M>,-              ; DRIVE READY
                     0008    118                         <DPR,,M>,-              ; DRIVE PRESENT
                     0008    119                         <,1>,-                  ; RESERVED BIT
                     0008    120                         <EOT,,M>,-              ; END OF TAPE
                     0008    121                         <WRL,,M>,-              ; DRIVE WRITE LOCKED
                     0008    122                         <MOL,,M>,-              ; MEDIUM ONLINE
                     0008    123                         <PIP,,M>,-              ; POSITIONING IN PROGRESS
                     0008    124                         <ERR,,M>,-              ; COMPOSIT ERROR
                     0008    125                         <ATA,,M>-               ; ATTENTION ACTIVE
                     0008    126                 >                               ;
                     0008    127 $DEF    MT_ER           .BLKL   1       ;ERROR REGISTER
                     0008                .IIF    NB,MT_ER,       MT_ER:
                0000000C     0008                .IIF    NB,.BLKL,       .BLKL   1
                     000C    128                 _VIELD  MT_ER,0,<-              ; ERROR REGISTER BIT DEFINITIONS
                     000C    129                         <ILF,,M>,-              ; ILLEGAL FUNCTION
                     000C    130                         <ILR,,M>,-              ; ILLEGAL REGISTER
                     000C    131                         <RMR,,M>,-              ; REGISTER MODIFY REFUSED
                     000C    132                         <CPAR,,M>,-             ; CONTROL BUS PARITY ERROR
                     000C    133                         <FMT,,M>,-              ; FORMAT ERROR
                     000C    134                         <DPAR,,M>,-             ; DATA BUS PARITY ERROR
                     000C    135                         <INC,0,M>,-             ; INCORRECTABLE ERROR (PE)
                     000C    136                         <VPE,,M>,-              ; VERTICLE PARITY ERROR (NRZI)
                     000C    137                         <PEF,0,M>,-             ; FORMAT ERROR (PE)
```

```
                     000C   138                     <LRC,,M>,-              ; LONGITUDINAL PARITY ERROR (NRZI)
                     000C   139                     <NSG,,M>,-              ; NONSTANDARD GAP
                     000C   140                     <FCE,,M>,-              ; FRAME COUNT ERROR
                     000C   141                     <CS,0,M>,-              ; CORRECTABLE SKEW (PE)
                     000C   142                     <ITM,,M>,-              ; ILLEGAL TAPE MARK
                     000C   143                     <NEF,,M>,-              ; NONEXECUTABLE FUNCTION
                     000C   144                     <DTE,,M>,-              ; DRIVE TIMING ERROR
                     000C   145                     <OPI,,M>,-              ; OPERATION INCOMPLETE
                     000C   146                     <UNS,,M>,-              ; DRIVE UNSAFE
                     000C   147                     <COR,0,M>,-             ; CORRECTABLE DATA ERROR (PE)
                     000C   148                     <CRC,,M>,-              ; CRC ERROR (NRZI)
                     000C   149                 >                           ;
                     000C   150 $DEF     MT_MR               .BLKL   1       ;MAINTENANCE REGISTER
                     000C               .IIF     NB,MT_MR,       MT_MR:
                     000C               .IIF     NB,.BLKL,       .BLKL   1
                     0010   151 $DEF     MT_AS               .BLKL   1       ;ATTENTION SUMMARY REGISTER
                     0010               .IIF     NB,MT_AS,       MT_AS:
                     0010               .IIF     NB,.BLKL,       .BLKL   1
                     0014   152 $DEF     MT_FC               .BLKL   1       ;FRAME COUNT REGISTER
                     0014               .IIF     NB,MT_FC,       MT_FC:
                     0014               .IIF     NB,.BLKL,       .BLKL   1
                     0018   153 $DEF     MT_DT               .BLKL   1       ;DRIVE TYPE REGISTER
                     0018               .IIF     NB,MT_DT,       MT_DT:
                     0018               .IIF     NB,.BLKL,       .BLKL   1
                     001C   154         _VIELD   MT_DT,0,<-                 ; DRIVE TYPE REGISTER FIELD DEFINITIONS
                     001C   155                  <DTN,9>,-                  ; DRIVE TYPE NUMBER
                     001C   156                  <,1>,-                     ; RESERVED BIT
                     001C   157                  <SPR,,M>,-                 ; SLAVE PRESENT
                     001C   158                  <DRQ,,M>,-                 ; DRIVE REQUEST REQUIRED (ALWAYS 0)
                     001C   159                  <7CH,,M>,-                 ; 7-CHANNEL TAPE (ALWAYS 0)
                     001C   160                  <MOH,,M>,-                 ; MOVING HEAD (ALWAYS 0)
                     001C   161                  <TAP,,M>,-                 ; TAPE DRIVE (ALWAYS 1)
                     001C   162                 >                           ;
                     001C   163 $DEF     MT_CC               .BLKL   1       ;CHECK CHARACTER REGISTER
                     001C               .IIF     NB,MT_CC,       MT_CC:
                     001C               .IIF     NB,.BLKL,       .BLKL   1
                     0020   164 $DEF     MT_SN               .BLKL   1       ;SERIAL NUMBER REGISTER
                     0020               .IIF     NB,MT_SN,       MT_SN:
                     0020               .IIF     NB,.BLKL,       .BLKL   1
                     0024   165 $DEF     MT_TC               .BLKL   1       ;MAGTAPE CONTROL REGISTER
                     0024               .IIF     NB,MT_TC,       MT_TC:
                     0024               .IIF     NB,.BLKL,       .BLKL   1
                     0028   166         _VIELD   MT_TC,0,<-                 ; TAPE CONTROL REGISTER FIELD DEFFINITIONS
                     0028   167                  <SSEL,3>,-                 ; SLAVE SELECT
                     0028   168                  <EPAR,1,M>,-               ; EVEN PARITY
                     0028   169                  <FSEL,4,M>,-               ; FORMAT SELECT
                     0028   170                  <DEN,3,M>,-                ; DENSITY
                     0028   171                  <,1>,-                     ; RESERVED BIT
                     0028   172                  <EABO,,M>,-                ; ENABLE ABORT ON TRANSFER ERROR
                     0028   173                  <TCW,,M>,-                 ; TAPE CONTROL WRITE
                     0028   174                  <FCS,,M>,-                 ; FRAME COUNT STATUS
                     0028   175                  <ACCL,,M>,-                ; ACCELERATOR
                     0028   176                 >                           ;
                     0028   177
                     0028   178         $DEFEND MT
                     0000               .RESTORE
                     0000   179
```

```
                     0000   180
                     0000   181
                     0000   182 ;
                     0000   183 ; OWN STORAGE:
                     0000   184 ;
                     0000   185
                     0000   186 ;
                     0000   187 ; BOOT DRIVER TABLE ENTRY
                     0000   188 ;
                     0000   189
                     0000   190          $BOOT_DRIVER    DEVTYPE = BTD$K_TM,-    ; Device type (MASSBUS)
                     0000   191                          SIZE = TM03_DRVSIZ,-    ; Driver size
                     0000   192                          ADDR = TM03_DRIVER,-    ; Driver address
                     0000   193                          ENTRY = TM03_DRIVER,-   ; Entry point
                     0000   194                          DRIVRNAME = DRIVERNAME  ; Driver name
                  00000000                .PSECT  BOOTDRIVR_4
                FFFF  0000                .WORD   -1
                00B1  0002                .WORD   BTD$K_TM
            00000000  0004                .LONG   0
            00000142' 0008                .LONG   TM03_DRVSIZ
            00000000' 000C                .LONG   TM03_DRIVER-$TABLE
            00000000' 0010                .LONG   TM03_DRIVER-TM03_DRIVER
            00000135' 0014                .LONG   DRIVERNAME-TM03_DRIVER
                  00000000                .PSECT  BOOTDRIVR_2
```

```
                                0000    196          .SBTTL  TM03/TE16/TU45/TU77 Bootstrap driver
                                0000    197
                                0000    198 ;++
                                0000    199 ;
                                0000    200 ; Inputs:
                                0000    201 ;
                                0000    202 ;       R3      - base address of adapter's register space
                                0000    203 ;       R5      - LBN for current piece of transfer
                                0000    204 ;       R6      - contains 0
                                0000    205 ;       R8      - size of transfer in bytes
                                0000    206 ;       R9      - address of the RPB
                                0000    207 ;       R10     - starting address of transfer (byte offset in first
                                0000    208 ;                 page ORed with starting map register number)
                                0000    209 ;       R11     - Block number at start of transfer
                                0000    210 ;
                                0000    211 ;       FUNC(AP)- I/O operation (IO$_READLBLK or IO$_REWIND only)
                                0000    212 ;       MODE(AP)- Address interpretation mode (0 = physical, 1 = virtual)
                                0000    213 ;       SIZE(AP)- Size of buffer in bytes
                                0000    214 ;       BUF(AP) - Address of buffer
                                0000    215 ;
                                0000    216 ; Implicit inputs:
                                0000    217 ;
                                0000    218 ;       RPB$B_SLAVE     - Slave number of drive
                                0000    219 ;       RPB$W_UNIT      - RPB field containing boot device unit number
                                0000    220 ;
                                0000    221 ;
                                0000    222 ; Outputs:
                                0000    223 ;
                                0000    224 ;       R0 - status code
                                0000    225 ;
                                0000    226 ;               SS$_NORMAL      - successful transfer
                                0000    227 ;               SS$_NOSUCHDEV   - unsupported device
                                0000    228 ;
                                0000    229 ;       R1 - Number of bytes transferred during a READ operation
                                0000    230 ;
                                0000    231 ;       This routine destroys R1, R5, R6, and R7. Within the routine,
                                0000    232 ;       register usage is as follows:
                                0000    233 ;
                                0000    234 ;               R5      - used in logical to physical calculation
                                0000    235 ;               R6      - drive type according to device register
                                0000    236 ;                         used in logical to physical calculation
                                0000    237 ;               R7      - address of the 1st MBA external register for
                                0000    238 ;                         this unit on the MBA
                                0000    239 ;
                                0000    240 ;--
                                0000    241
                    00000004    0000    242 BUF = 4
                    00000008    0000    243 SIZE = 8
                    0000000C    0000    244 LBN = 12
                    00000010    0000    245 FUNC = 16
                    00000014    0000    246 MODE = 20
                                0000    247
                                0000    248 TM03_DRIVER::                               ; TM03 - TU16,TU77,TU45 driver
          04 AE     D4          0000    249          CLRL    4(SP)                      ; Clear retry counter ****************
    08 A3   00     D2           0003    250          MCOML   #0,MBA$L_SR(R3)            ; Clear MASSBUS adapter errors
 57   64 A9     3C              0007    251          MOVZWL  RPB$W_UNIT(R9),R7          ; GET UNIT NUMBER OF BOOT DEVICE
57   57   07     78             000B    252          ASHL    #7,R7,R7                   ; ALIGN TO UNIT NUMBER FIELD
```

```
                57   0400 C347   9E   000F   253          MOVAB   MBA$L_ERB(R3)[R7],R7    ; FORM ADDRESS OF DRIVE REGISTERS
         50      67 A9    C0 8F   81   0015   254          ADDB3   #^XC0,RPB$B_SLAVE(R9),R0; Get unit number and set format
                 24 A7     50   9A   001B   255          MOVZBL  R0, MT_TC(R7)           ; Select slave and set format
                                   001F   256
                 51    04 A7    D0   001F   257 10$:      MOVL    MT_DS(R7),R1            ; Get current status
                 F8 51     0D   E0   0023   258          BBS     #MT_DS_V_PIP,R1,10$     ; Branch if still positioning
                                   0027   259
                    67     09   D0   0027   260          MOVL    #CLEAR+GO,MT_CS1(R7)    ; Clear controller and current slave
              50    0908 8F   3C   002A   261          MOVZWL  #SS$_NOSUCHDEV,R0       ; Assume does not exist
        08 A3  00040000 8F   D3   002F   262          BITL    #MBA$M_SR_NED,MBA$L_SR(R3)  ; Does drive exist?
                       46   12   0037   263          BNEQ    RETURN                  ; Return if not
              50    0084 8F   3C   0039   264          MOVZWL  #SS$_DEVOFFLINE,R0      ; Assume medium offline
        04 A7  00001000 8F   D3   003E   265          BITL    #MT_DS_M_MOL,MT_DS(R7)  ; Is it on line?
                       37   13   0046   266          BEQL    RETURN                  ; Branch if not
                                   0048   267
                                   0048   268 ;+
                                   0048   269 ; Check type code for TE16,TU45,TU77
                                   0048   270 ;-
                  56   18 A7    D0   0048   271          MOVL    MT_DT(R7),R6            ; GET DRIVE TYPE
                                   004C   272          CASE    R6,TYPE=B,LIMIT=#<^X29>,DISPLIST=<-
                                   004C   273                  30$,30$,20$,30$>        ; TE16=X'29', TU45=X'2A, TU77=X'2C'
               03'  29   56   8F   004C               CASEB   R6,#<^X29>,S^#<<30001$-30000$>/2>-1
                                   0050       30000$:
                             000A' 0050               .SIGNED_WORD    30$-30000$
                             000A' 0052               .SIGNED_WORD    30$-30000$
                             0008' 0054               .SIGNED_WORD    20$-30000$
                             000A' 0056               .SIGNED_WORD    30$-30000$
                                   0058       30001$:
                       25   11   0058   274 20$:      BRB     RETURN                  ; Exit unknown device type
                                   005A   275
                                   005A   276 ;+
                                   005A   277 ; branch on function type
                                   005A   278 ;-
        21    10 AC    D1   005A   279 30$:      CMPL    FUNC(AP),#IO$_READLBLK  ; Read logical block?
                       27   13   005E   280          BEQL    E_READ                  ; Execute read function
        24    10 AC    D1   0060   281          CMPL    FUNC(AP),#IO$_REWIND    ; Rewind?
                       1A   13   0064   282          BEQL    E_REWIND                ; Do a rewind
        25    10 AC    D1   0066   283          CMPL    FUNC(AP),#IO$_SKIPFILE  ; Skip past eof
                       3E   13   006A   284          BEQL    E_SKIPFILE              ; Do it
        26    10 AC    D1   006C   285          CMPL    FUNC(AP),#IO$_SKIPRECORD; Skip records?
                       63   13   0070   286          BEQL    E_SKIPRECORD            ; Do it
        50     F4 8F    9A   0072   287          MOVZBL  #SS$_ILLIOFUNC,R0       ; illegal I/O function
           50     01    D0   0076   288          MOVL    #SS$_NORMAL, R0         ; Assume normal completion
        10 AC     04    D1   0079   289          CMPL    #IO$_DRVCLR, FUNC(AP)   ; Is this drive clear?
                  00   13   007D   290          BEQL    RETURN                  ; Yes, all done, exit
                                   007F   291 RETURN:
                       05   007F   292          RSB                             ; Return to caller
                                   0080   293 ;+
                                   0080   294 ; Rewind slave drive, don't wait for completion
                                   0080   295 ;-
                                   0080   296 E_REWIND:
           67     07    D0   0080   297          MOVL    #REWIND+GO,MT_CS1(R7)   ; Issue rewind function
              006D   30   0083   298          BSBW    WAIT                    ; Wait for ready to set
                       05   0086   299          RSB                             ; Exit
                                   0087   300 ;+
                                   0087   301 ; Read block of data
                                   0087   302 ;-
```

```
                                0087   E_READ:
          10 A3    58    CE     0087           MNEGL   R8,MBA$L_BCR(R3)          ; SET TRANSFER BYTE COUNT
          0C A3    5A    D0     008B           MOVL    R10,MBA$L_VAR(R3)         ; AND SET AS VIRTUAL STARTING ADDRESS
                                008F
             67    39    D0     008F           MOVL    #READ_F+GO,MT_CS1(R7)     ; Start the read
                005E    30     0092           BSBW    WAIT                      ; Wait for it to finish
              11 50     E9     0095           BLBC    R0,20$                    ; Branch if error
          51  14 A7     D0     0098           MOVL    MT_FC(R7),R1              ; Get bytes read
             51    51    3C     009C           MOVZWL  R1,R1                     ; Byte count only
             58    51    B1     009F           CMPW    R1,R8                     ; More data than buffer?
                   05    1B     00A2           BLEQU   20$                       ; Branch if transfer not truncated
       50    0838 8F     3C     00A4           MOVZWL  #SS$_DATAOVERUN,R0        ; Change return code
                         05     00A9   20$:    RSB
                                00AA
                                00AA   ;+
                                00AA   ; Skip to end of file
                                00AA   ; P1 is negative if backwards else forwards
                                00AA   ;-
                                00AA   E_SKIPFILE:
             50    01    D0     00AA           MOVL    #SS$_NORMAL,R0            ; Assume it works
             67    18    9A     00AD           MOVZBL  #SPACE_F,MT_CS1(R7)       ; Set function to space forward
  14 A7   00007FFF 8F     CE     00B0           MNEGL   #32767,MT_FC(R7)          ; Set record count from parameter
       03 04 AC    1F    E1     00B8           BBC     #31,BUF(AP),10$           ; Branch if forward is desired
                                00BD
             67    1A    9A     00BD           MOVZBL  #SPACE_R,MT_CS1(R7)       ; Set function to space reverse
                                00C0
             67    01    C8     00C0   10$:    BISL    #GO,MT_CS1(R7)            ; Start the position
                002D    30     00C3           BSBW    WAIT                      ; Wait for it to finish
              E1 50     E8     00C6           BLBS    R0,E_SKIPFILE             ; Branch if normal return, large file
          51  04 A7     D0     00C9           MOVL    MT_DS(R7),R1              ; Get drive status?
          03 51    02    E1     00CD           BBC     #MT_DS_V_TM,R1,20$        ; Branch if no tape mark
             50    01    3C     00D1           MOVZWL  #SS$_NORMAL,R0            ; Change return to normal if at EOF
                         05     00D4   20$:    RSB
                                00D5
                                00D5   ;+
                                00D5   ; Skip to end of record, read w/o buffer
                                00D5   ; P1 is negative if backwards else forwards
                                00D5   ;-
                                00D5   E_SKIPRECORD:
             50    01    D0     00D5           MOVL    #SS$_NORMAL,R0            ; Assume it works
             67    18    9A     00D8           MOVZBL  #SPACE_F,MT_CS1(R7)       ; Set function to space forward
       14 A7  04 AC     CE     00DB           MNEGL   BUF(AP),MT_FC(R7)         ; Set record count from parameter
                   0A    15     00E0           BLEQ    10$                       ; Branch if record count was positive
                   0E    13     00E2           BEQL    90$                       ; Branch if count 0
                                00E4
             67    1A    9A     00E4           MOVZBL  #SPACE_R,MT_CS1(R7)       ; Set function to space reverse
       14 A7  04 AC     D0     00E7           MOVL    BUF(AP),MT_FC(R7)         ; Set record count
                                00EC
             67    01    C8     00EC   10$:    BISL    #GO,MT_CS1(R7)            ; Start the position
                0001    30     00EF           BSBW    WAIT                      ; Wait for it to finish
                                00F2   90$:
                         05     00F2           RSB
                                00F3
                                00F3
                                00F3   ;+
                                00F3   ; Wait for slave to quiesce
                                00F3   ;-
```

```
                                  00F3   WAIT:
                  50   67   D0   00F3          MOVL    MT_CS1(R7),R0           ; Get CS1 including GO bit
                    FA 50   E8   00F6          BLBS    R0,WAIT                 ; Wait until GO clears
                                  00F9
                51   04 A7   D0   00F9   20$:   MOVL    MT_DS(R7),R1            ; Get drive status
                F8 51   07   E1   00FD          BBC     #MT_DS_V_DRY,R1,20$     ; Branch if not ready for new command
                                  0101
              50   0084 8F   3C   0101          MOVZWL  #SS$_DEVOFFLINE,R0      ; Assume offline
                2A 51   0C   E1   0106          BBC     #MT_DS_V_MOL,R1,50$     ; Branch if offline
                                  010A
              50   0870 8F   3C   010A          MOVZWL  #SS$_ENDOFFILE,R0       ; Assume EOF sensed
                21 51   02   E0   010F          BBS     #MT_DS_V_TM,R1,50$      ; Branch if tape mark sensed
                1D 51   0A   E0   0113          BBS     #MT_DS_V_EOT,R1,50$     ; Branch if end of tape
                                  0117
              50   0054 8F   3C   0117          MOVZWL  #SS$_CTRLERR,R0         ; Assume error
        08 A3   000E0F7F 8F   D3   011C          BITL    #MBA$M_SR_ERROR,MBA$L_SR(R3) ;Any adapter errors
                         0E   12   0124          BNEQ    50$                     ; Branch any errors
                                  0126
                51   08 A7   D0   0126          MOVL    MT_ER(R7),R1            ; Get error register
              51   FDFF 8F   B3   012A          BITW    #^CMT_ER_M_FCE,R1       ; Any error except frame count error?
                         03   12   012F          BNEQ    50$                     ; Branch if so
                  50   01   D0   0131          MOVL    #SS$_NORMAL,R0          ; Otherwise normal
                             05   0134   50$:   RSB                             ; Return
                                  0135
                                  0135   DRIVERNAME:                             ; Boot device driver name
58 45 2E 52 45 56 49 52 44 4D 54 00'  0135          .ASCIC  /TMDRIVER.EXE/          ; TMDRIVER
                             45   0141
                             0C   0135
                                  0142
                      00000142    0142   TM03_DRVSIZ = .-TM03_DRIVER
                                  0142
                                  0142          .END
```

```
$TABLE                          = 00000000 R   D   02
BTD$K_TM                        = 000000B1     D
BUF                             = 00000004     D
CLEAR                           = 00000008     D
DRIVERNAME                        00000135 R   D   03
E_READ                            00000087 R   D   03
E_REWIND                          00000080 R   D   03
E_SKIPFILE                        000000AA R   D   03
E_SKIPRECORD                      000000D5 R   D   03
FUNC                            = 00000010     D
GO                              = 00000001     D
IO$_DRVCLR                      = 00000004     D
IO$_READLBLK                    = 00000021     D
IO$_REWIND                      = 00000024     D
IO$_SKIPFILE                    = 00000025     D
IO$_SKIPRECORD                  = 00000026     D
LBN                             = 0000000C     D
MBA$L_BCR                       = 00000010     D
MBA$L_ERB                       = 00000400     D
MBA$L_SR                        = 00000008     D
MBA$L_VAR                       = 0000000C     D
MBA$M_SR_DLT                    = 00000800     D
MBA$M_SR_ERCONF                 = 00000008     D
MBA$M_SR_ERROR                  = 000E0F7F     D
MBA$M_SR_INVMAP                 = 00000010     D
MBA$M_SR_ISTO                   = 00000002     D
MBA$M_SR_MAPPE                  = 00000020     D
MBA$M_SR_MCPE                   = 00020000     D
MBA$M_SR_MDPE                   = 00000040     D
MBA$M_SR_MXF                    = 00000100     D
MBA$M_SR_NED                    = 00040000     D
MBA$M_SR_PGE                    = 00080000     D
MBA$M_SR_RDS                    = 00000004     D
MBA$M_SR_RDTO                   = 00000001     D
MBA$M_SR_WCKLWR                 = 00000200     D
MBA$M_SR_WCKUPR                 = 00000400     D
MODE                            = 00000014     D
MT_AS                             00000010     D
MT_CC                             0000001C     D
MT_CS1                            00000000     D
MT_DS                             00000004     D
MT_DS_M_MOL                     = 00001000     D
MT_DS_V_DRY                     = 00000007     D
MT_DS_V_EOT                     = 0000000A     D
MT_DS_V_MOL                     = 0000000C     D
MT_DS_V_PIP                     = 0000000D     D
MT_DS_V_TM                      = 00000002     D
MT_DT                             00000018     D
MT_ER                             00000008     D
MT_ER_M_FCE                     = 00000200     D
MT_FC                             00000014     D
MT_MR                             0000000C     D
MT_SN                             00000020     D
MT_TC                             00000024     D
READ_F                          = 00000038     D
RETURN                            0000007F R   D   03
REWIND                          = 00000006     D
RPB$B_SLAVE                     = 00000067     D
RPB$W_UNIT                      = 00000064     D
SIZ...                          = 00000001     D
SIZE                            = 00000008     D
SPACE_F                         = 00000018     D
SPACE_R                         = 0000001A     D
SS$_CTRLERR                     = 00000054     D
SS$_DATAOVERUN                  = 00000838     D
SS$_DEVOFFLINE                  = 00000084     D
SS$_ENDOFFILE                   = 00000870     D
SS$_ILLIOFUNC                   = 000000F4     D
SS$_NORMAL                      = 00000001     D
SS$_NOSUCHDEV                   = 00000908     D
TM03_DRIVER                       00000000 RG  D   03
TM03_DRVSIZ                     = 00000142     D
WAIT                              000000F3 R   D   03
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	00000028 (40.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
BOOTDRIVR_4	00000018 (24.)	02 (2.)	NOPIC USR CON REL LCL NOSHR EXE RD WRT NOVEC BYTE
BOOTDRIVR_2	00000142 (322.)	03 (3.)	NOPIC USR CON REL LCL NOSHR EXE RD WRT NOVEC BYTE

```
                                  +-------------------------+
                                  ! Symbol Cross Reference !
                                  +-------------------------+

SYMBOL                    VALUE        DEFINITION      REFERENCES...
------                    -----        ----------      -------------
$TABLE                   =00000000-R   194    (2)      194    (2)
BTD$K_TM                 =000000B1     66     (2)      194    (2)
BUF                      =00000004     242    (3)      325    (3)    #-344    (3)    #-349    (3)
CLEAR                    =00000008     73     (2)    #-260    (3)
DRIVERNAME                00000135-R   384    (3)      194    (2)
E_READ                    00000087-R   303    (3)    #-280    (3)
E_REWIND                  00000080-R   296    (3)    #-282    (3)
E_SKIPFILE                000000AA-R   321    (3)    #-284    (3)    #-331    (3)
E_SKIPRECORD              000000D5-R   341    (3)    #-286    (3)
FUNC                     =00000010     245    (3)    #-279    (3)    #-281    (3)    #-283    (3)    #-285    (3)
                                                     #-289    (3)
GO                       =00000001     71     (2)    #-260    (3)    #-297    (3)    #-307    (3)    #-329    (3)
                                                     #-351    (3)
IO$_DRVCLR               =00000004                   #-289    (3)
IO$_READLBLK             =00000021                   #-279    (3)
IO$_REWIND               =00000024                   #-281    (3)
IO$_SKIPFILE             =00000025                   #-283    (3)
IO$_SKIPRECORD           =00000026                   #-285    (3)
LBN                      =0000000C     244    (3)
MBA$L_BCR                =00000010                   #-304    (3)
MBA$L_ERB                =00000400                     253    (3)
MBA$L_SR                 =00000008                   #-250    (3)    #-262    (3)    #-375    (3)
MBA$L_VAR                =0000000C                   #-305    (3)
MBA$M_SR_DLT             =00000800                     92     (2)
MBA$M_SR_ERCONF          =00000008                     85     (2)
MBA$M_SR_ERROR           =000E0F7F     95     (2)    #-375    (3)
MBA$M_SR_INVMAP          =00000010                     86     (2)
MBA$M_SR_ISTO            =00000002                     83     (2)
MBA$M_SR_MAPPE           =00000020                     87     (2)
MBA$M_SR_MCPE            =00020000                     93     (2)
MBA$M_SR_MDPE            =00000040                     88     (2)
MBA$M_SR_MXF             =00000100                     89     (2)
MBA$M_SR_NED             =00040000                   #-262    (3)      94     (2)
MBA$M_SR_PGE             =00080000                     95     (2)
MBA$M_SR_RDS             =00000004                     84     (2)
MBA$M_SR_RDTO            =00000001                     82     (2)
MBA$M_SR_WCKLWR          =00000200                     90     (2)
MBA$M_SR_WCKUPR          =00000400                     91     (2)
MODE                     =00000014     246    (3)
MT_CS1                    00000000                   #-260    (3)    #-297    (3)    #-307    (3)    #-323    (3)
                                                     #-327    (3)    #-329    (3)    #-343    (3)    #-348    (3)
                                                     #-351    (3)    #-361    (3)
MT_DS                     00000004                   #-257    (3)    #-265    (3)    #-332    (3)    #-364    (3)
MT_DS_M_MOL              =00001000                   #-265    (3)
MT_DS_V_DRY              =00000007                   #-365    (3)
MT_DS_V_EOT              =0000000A                   #-372    (3)
MT_DS_V_MOL              =0000000C                   #-368    (3)
MT_DS_V_PIP              =0000000D                   #-258    (3)
MT_DS_V_TM               =00000002                   #-333    (3)    #-371    (3)
MT_DT                     00000018                   #-271    (3)
```

```
MT_ER                    00000008                  #-378    (3)
MT_ER_M_FCE             =00000200                  #-379    (3)
MT_FC                    00000014                  #-310    (3)    #-324    (3)    #-344    (3)    #-349    (3)
MT_TC                    00000024                  #-255    (3)
READ_F                  =00000038     76     (2)   #-307    (3)
RETURN                   0000007F-R   291    (3)   #-263    (3)    #-266    (3)    #-274    (3)    #-290    (3)
REWIND                  =00000006     72     (2)   #-297    (3)
RPB$B_SLAVE             =00000067                  #-254    (3)
RPB$W_UNIT              =00000064                  #-251    (3)
SIZE                    =00000008     243    (3)
SPACE_F                 =00000018     74     (2)   #-323    (3)    #-343    (3)
SPACE_R                 =0000001A     75     (2)   #-327    (3)    #-348    (3)
SS$_CTRLERR             =00000054                  #-374    (3)
SS$_DATAOVERUN          =00000838                  #-314    (3)
SS$_DEVOFFLINE          =00000084                  #-264    (3)    #-367    (3)
SS$_ENDOFFILE           =00000870                  #-370    (3)
SS$_ILLIOFUNC           =000000F4                  #-287    (3)
SS$_NORMAL              =00000001                  #-288    (3)    #-322    (3)    #-334    (3)    #-342    (3)
                                                   #-381    (3)
SS$_NOSUCHDEV           =00000908                  #-261    (3)
TM03_DRIVER              00000000-R   248    (3)     194    (2)      387    (3)
TM03_DRVSIZ             =00000142     387    (3)     194    (2)
WAIT                     000000F3-R   360    (3)   #-298    (3)    #-308    (3)    #-330    (3)    #-352    (3)
                                                   #-362    (3)

                                        +-------------------------+
                                        ! Performance indicators !
                                        +-------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    38    00:00:00.02    00:00:00.23
Command processing               924    00:00:00.29    00:00:00.93
Pass 1                           581    00:00:02.22    00:00:03.45
Symbol table sort                  0    00:00:00.34    00:00:00.34
Pass 2                            21    00:00:00.62    00:00:01.08
Symbol table output                2    00:00:00.03    00:00:00.08
Psect synopsis output              0    00:00:00.00    00:00:00.00
Cross-reference output             3    00:00:00.05    00:00:00.10
Assembler run totals            1571    00:00:03.57    00:00:06.21

The working set limit was 2900 pages.
136960 bytes (268 pages) of virtual memory were used to buffer the intermediate code.
There were 70 pages of symbol table space allocated to hold 1236 non-local and 12 local symbols.
389 source lines were read in Pass 1, producing 79 object records in Pass 2.
18 pages of virtual memory were used to define 17 macros.
```

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                  1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1                1
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1               0
SYS$COMMON:[SYSLIB]LIB.MLB;2                             4
SYS$COMMON:[SYSLIB]STARLET.MLB;2                         7
SYS$COMMON:[SYSLIB]STARLET.MLB;2                         0
TOTALS (all libraries)                                  13

1213 GETS were required to define 13 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(2) 49 DECLARATIONS
(3) 315 TS11/TS04, TU80 Bootstrap driver

```
0000    ; DEC/CMS REPLACEMENT HISTORY, Element TSBTDRIVR.MAR
0000    ; *1     6-FEB-1986 15:22:48 DS ""
0000    ; DEC/CMS REPLACEMENT HISTORY, Element TSBTDRIVR.MAR
0000            .TITLE  TSBTDRIVR       *** TSBTDRIVR driver for TS11/TS04, TU80 magtape
0000            .IDENT  /V01-02/
0000            .DISABLE GLOBAL
0000
0000    ;
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0000    ;
0000
0000    ;++
0000    ; FACILITY:     DIAGNOSTIC SUPERVISOR
0000    ;
0000    ; ABSTRACT:
0000    ;       This module contains the file load driver for
0000    ;       UNIBUS TS11/TS04 and TU80 magtape
0000    ;
0000    ; ENVIRONMENT:  kernel mode
0000    ;
0000    ; AUTHOR:  Roger Riggs, CREATION DATE:  2-OCT-1980
0000    ;
0000    ; MODIFIED BY:
0000    ;
0000    ;       01      Bob Bergazzi    Aug 30, 1982    v6.9
0000    ;               Changed MS$CMD to reside all on one page. Routine
0000    ;               MAP_VA won't work if MS$CMD is split over a page boundary
0000    ;
0000    ;       02      Marion Baggett  Dec 01, 1982    V6.10
0000    ;               Added comment changes for TU80.
0000
0000    ;--
```

```
                        0000     49          .SBTTL  DECLARATIONS
                        0000     50 ;
                        0000     51 ; INCLUDE FILES:
                        0000     52 ;
                        0000     53
                        0000     54          $BTDDEF                         ; Define boot device types
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .RESTORE
                        0000     55          $IODEF                          ; Define I/O function codes
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .RESTORE
                        0000     56          $NDTDEF                         ; Define NEXUS device types
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .RESTORE
                        0000     57          $PTEDEF                         ; Define page table entry
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .RESTORE
                        0000     58          $PRDEF                          ; Define processor registers
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .RESTORE
                        0000     59          $RPBDEF                         ; Define RPB offsets
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .RESTORE
                        0000     60          $SSDEF                          ; Define system status codes
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .RESTORE
                        0000     61          $VADEF                          ; Define virtural address fields
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .RESTORE
                        0000     62
                        0000     63 ;
                        0000     64 ; MACROS:
                        0000     65 ;
                        0000     66
                        0000     67
                        0000     68 ;
                        0000     69 ; EQUATED SYMBOLS:
                        0000     70 ;
000000B1                0000     71 BTD$K_TM = 177 ; Temp
000000B2                0000     72 btd$k_TS = 178 ; Temp
                        0000     73
                        0000     74 ;
                        0000     75 ; LOCAL SYMBOLS
                        0000     76 ;
                        0000     77
                        0000     78 ;
                        0000     79 ; TS11/TS04, TU80 COMMAND PACKET DEFINITION
                        0000     80 ;
                        0000     81 ;
                        0000     82
                        0000     83          $DEFINI MS
                        0000                 .SAVE   LOCAL_BLOCK
                        0000     84
                        0000     85
00000000                0000     86 .=0                                      ;RESET PC??????
                        0000     87 $DEF     MS_CPHD .BLKW   1               ;COMMAND PACKET HEADER
                        0000                 .IIF    NB,MS_CPHD,     MS_CPHD:
```

```
                    00000002  0000                .IIF    NB,..BLKW,          .BLKW   1
                              0002    88          _VIELD  MS_CPHD,0,<-
                              0002    89                  <COD,5>,-           ;COMMAND CODE FIELD
                              0002    90                  <,2>,-              ;B5-B6 ALWAYS 0 FOR TS04
                              0002    91                  <IE,,M>,-           ;INTERRUPT ENABLE
                              0002    92                  <MOD,4>,-           ;COMMAND MODE FIELD(B11-B8)
                              0002    93                                      ; B8=REVERSE & B9=RETRY
                              0002    94                  <SWB,,M>,-          ;SWAP BYTES BIT(B12)
                              0002    95                  <OPP,,M>,-          ;OPPOSITE BIT(B13)
                              0002    96                  <CVC,,M>,-          ;CLEAR VOLUME CHECK(B14)
                              0002    97                  <ACK,,M>,-          ;ACKNOWLEDGE BIT(B15)
                              0002    98                  >
                              0002    99 $DEF     MS_BACT .BLKW   1           ;BUS ADDRESS(B15-B0) OR COUNT
                              0002                .IIF    NB,MS_BACT,         MS_BACT:
                    00000004  0002                .IIF    NB,..BLKW,          .BLKW   1
                              0004   100 $DEF     MS_BA1  .BLKW   1           ;BUS ADDRESS B17-B16(RIGHT JUST)
                              0004                .IIF    NB,MS_BA1,          MS_BA1:
                    00000006  0004                .IIF    NB,..BLKW,          .BLKW   1
                              0006   101 $DEF     MS_CNT  .BLKW   1           ;BYTE COUNT
                              0006                .IIF    NB,MS_CNT,          MS_CNT:
                    00000008  0006                .IIF    NB,..BLKW,          .BLKW   1
                              0008   102                                      ;FOR WRITE CHARACTERISTIC DATA
                              0008   103 $DEF     MS_MBA0 .BLKW   1           ;MESSAGE BUFFER ADDR. WRD 1
                              0008                .IIF    NB,MS_MBA0,         MS_MBA0:
                    0000000A  0008                .IIF    NB,..BLKW,          .BLKW   1
                              000A   104 $DEF     MS_MBA1 .BLKW   1           ;MESSAGE BUFFER ADDR. WRD 2
                              000A                .IIF    NB,MS_MBA1,         MS_MBA1:
                    0000000C  000A                .IIF    NB,..BLKW,          .BLKW   1
                              000C   105 $DEF     MS_LNTH .BLKW   1           ;MESSAGE BUFFER LENGTH(ALWAYS 14.)
                              000C                .IIF    NB,MS_LNTH,         MS_LNTH:
                    0000000E  000C                .IIF    NB,..BLKW,          .BLKW   1
                              000E   106 $DEF     MS_CHWD .BLKW   1           ;CHARACTERISTIC WORD
                              000E                .IIF    NB,MS_CHWD,         MS_CHWD:
                    00000010  000E                .IIF    NB,..BLKW,          .BLKW   1
                              0010   107          _VIELD  MS_CHWD,4,<-
                              0010   108                  <ERI,,M>,-          ;ENABLE MESSAGE BUFFER RELEASE INTERRUPTS
                              0010   109                  <EAI,,M>,-          ;ENABLE ATTENTION INTERRUPTS
                              0010   110                  <ENB,,M>,-          ;USED WITH ESS BIT***
                              0010   111                  <ESS,,M>,-          ;ENABLE SKIP TAPE MARKS STOP
                              0010   112          >
                              0010   113
                              0010   114 ;
                              0010   115 ; TS11/TS04,TU80  MESSAGE PACKET DEFINITION
                              0010   116 ;
                              0010   117
                              0010   118
                              0010   119 $DEF     MS_MHD  .BLKW   1           ;MESSAGE PACKET
                              0010                .IIF    NB,MS_MHD,          MS_MHD:
                    00000012  0010                .IIF    NB,..BLKW,          .BLKW   1
                              0012   120          _VIELD  MS_MHD,0,<-          ;MESSAGE HEADER WORD
                              0012   121                  <COD,5>,-           ;MESSAGE CODE FIELD
                              0012   122                  <FMT,3>,-           ;FORMAT FIELD
                              0012   123                  <CLS,4>,-           ;CLASS CODE FIELD
                              0012   124                  <RSR,3>,-           ;RESERVED FIELD
                              0012   125                  <ACK,,M>,-          ;MESSAGE ACKNOWLEDGE BIT(B15)
                              0012   126          >                           ;
                              0012   127 $DEF     MS_LNH  .BLKW   1           ;MESSAGE LENGTH WORD
```

```
                     0012                .IIF    NB,MS_LNH,      MS_LNH:
00000014             0012                .IIF    NB,.BLKW,       .BLKW   1
                     0014    128                                         ;HIGH BYTE=0,LOW BYTE=1010(LENGTH)
                     0014    129 $DEF    MS_RBPC .BLKW   1               ;RESIDUAL BYTE/POSITION COUNT
                     0014                .IIF    NB,MS_RBPC,     MS_RBPC:
00000016             0014                .IIF    NB,.BLKW,       .BLKW   1
                     0016    130 $DEF    MS_XSR0 .BLKW   1               ;EXTENDED STATUS REGISTER 0
                     0016                .IIF    NB,MS_XSR0,     MS_XSR0:
00000018             0016                .IIF    NB,.BLKW,       .BLKW   1
                     0018    131         _VIELD  MS_XSR0,0,<-            ;
                     0018    132                 <EOT,,M>,-              ;END OF TAPE DETECTED(B0)
                     0018    133                 <BOT,,M>,-              ;BEGINNING OF TAPE(B1)
                     0018    134                 <WLK,,M>,-              ;WRITE LOCKED(B2)
                     0018    135                 <PED,,M>,-              ;PHASE ENCODED DRIVE(B3)
                     0018    136                 <VCK,,M>,-              ;VOLUME CHECK(B4)
                     0018    137                 <IE,,M>,-               ;INTERRUPT WAS ENABLED(B5)
                     0018    138                 <ONL,,M>,-              ;DEVICE ON-LINE(B6)
                     0018    139                 <MOT,,M>,-              ;TAPE MOVING ON LAST COMMAND(B7)
                     0018    140                 <ILA,,M>,-              ;ILLEGAL ADDRESS(B8)
                     0018    141                 <ILC,,M>,-              ;ILLEGAL COMMAND(B9)
                     0018    142                 <NEF,,M>,-              ;NON-EXECUTALBE FUNCTION(B10)
                     0018    143                 <WLE,,M>,-              ;WRITE LOCK ERROR(B11)
                     0018    144                 <RLL,,M>,-              ;RECORD LENGTH LONG(B12)
                     0018    145                 <LET,,M>,-              ;LOGICAL END OF TAPE(B13)
                     0018    146                 <RLS,,M>,-              ;RECORD LENGTH SHORT(B14)
                     0018    147                 <TMK,,M>,-              ;TAPE MARK DETECTED(B15)
                     0018    148         >                               ;
                     0018    149 $DEF    MS_XSR1 .BLKW   1               ;EXTENDED STATUS REGISTER 1
                     0018                .IIF    NB,MS_XSR1,     MS_XSR1:
0000001A             0018                .IIF    NB,.BLKW,       .BLKW   1
                     001A    150         _VIELD  MS_XSR1,0,<-            ;
                     001A    151                 <MTE,,M>,-              ;(PE) MULTI-TRACK ERROR
                     001A    152                         -               ;(NRZ) VERTICAL PARITY ERROR
                     001A    153                 <UNC,,M>,-              ;(PE) UNCORRECTABLE DATA ERROR(B1)
                     001A    154                         -               ;(NRZ) CYCLIC REDUNDANCY CHECK ERROR
                     001A    155                 <POL,,M>,-              ;(PE) POSTAMBLE LONG(B2)
                     001A    156                         -               ;(NRZ) LONGITUDINAL REDUNDANCY CHECK ERROR
                     001A    157                 <POS,,M>,-              ;(PE) POSTAMBLE SHORT(B3)
                     001A    158                         -               ;(NRZ) NOISE RECORD
                     001A    159                 <IED,,M>,-              ;(PE) INVALID END DATA(B4)
                     001A    160                         -               ;(NRZ) LRC WAS 0.
                     001A    161                 <IPO,,M>,-              ;(PE) INVALID POSTAMBLE(B5)
                     001A    162                         -               ;(NRZ) ILLEGAL TAPE MARK
                     001A    163                 <SYN,,M>,-              ;(PE) SYNCH ERROR(B6)
                     001A    164                         -               ;(NRZ) FRAME DROPOUT
                     001A    165                 <IPR,,M>,-              ;(PE) INVALID PREAMBLE(B7)
                     001A    166                 <,1>,-                  ;RESERVED BIT
                     001A    167                 <SCK,,M>,-              ;SPEED CHECK(B9)
                     001A    168                 <DBF,,M>,-              ;(PE) DESKEW BUFFER FAIL(B10)
                     001A    169                         -               ;(NRZ) NRZ BOARD FIFO OVERFLOW
                     001A    170                 <TIG,,M>,-              ;TRASH IN GAP(B11)
                     001A    171                 <CRS,,M>,-              ;CREASE DETECTED(B12)
                     001A    172                 <COR,,M>,-              ;CORRCTABLE DATA(B13)
                     001A    173                 <,1>,-                  ;UNUSED BIT(B14)
                     001A    174                 <DLT,,M>,-              ;DATA LATE(B15)
                     001A    175         >
                     001A    176 $DEF    MS_XSR2 .BLKW   1               ;EXTENDED STATUS REGISTER 2
```

```
                    001A                .IIF    NB,MS_XSR2,     MS_XSR2:
          0000001C  001A                .IIF    NB,.BLKW,       .BLKW   1
                    001C    177         _VIELD  MS_XSR2,0,<-            ;
                    001C    178                 <DTP,8>,-               ;DEAD TRACK PARITY,B7-B0
                    001C    179                 <XSK,,M>,-              ;EXCESSIVE SKEW(B9)
                    001C    180                 <WCF,,M>,-              ;WRITE CLOCK FAIL(B10),BROKEN HARDWARE
                    001C    181                 <,1>,-                  ;B11 NOT USED
                    001C    182                 <CAF,,M>,-              ;CAPSTAN ACCELERATION FAIL(B12)
                    001C    183                 <BPE,,M>,-              ;SERIAL BUS PARITY ERROR AT DRIVE(B13)
                    001C    184                 <SIP,,M>,-              ;SILO PARITY ERROR(B14)
                    001C    185                 <OPM,,M>,-              ;OPERATION IN PROGRESS(B15)
                    001C    186         >
                    001C    187 $DEF    MS_XSR3 .BLKW   1               ;EXTENDED STATUS REGISER 3
                    001C                .IIF    NB,MS_XSR3,     MS_XSR3:
          0000001E  001C                .IIF    NB,.BLKW,       .BLKW   1
                    001E    188         _VIELD  MS_XSR3,0,<-            ;
                    001E    189                 <RIB,,M>,-              ;REVERSE INTO BOT(B0)
                    001E    190                 <LXS,,M>,-              ;LIMIT EXCEEDED STATICALLY(B1)
                    001E    191                 <NOI,,M>,-              ;NOISE RECORD(B2)
                    001E    192                 <DCK,,M>,-              ;DENSITY CHECK(B3)
                    001E    193                 <CRF,,M>,-              ;CAPSTAN RESPONSE FAIL(B4)
                    001E    194                 <REV,,M>,-              ;TAPE MOVED BACKWARDS(B5)
                    001E    195                 <OPI,,M>,-              ;OPERATION IN COMPLETE(B6)
                    001E    196                 <LMX,,M>,-              ;TAPE LIMIT EXCEEDED(B7)
                    001E    197                 <FEC,8>,-               ;B15-B8, FATAL ERROR CODE(U-DIAGNOSTIC)
                    001E    198         >
                    001E    199
                    001E    200         $DEFEND MS
                    0000                .RESTORE
                    0000    201
                    0000    202 ;
                    0000    203 ; TS11/TS04,TU80 TSSR TERMINATION CLASS CODES
                    0000    204 ;
                    0000    205
          00000000  0000    206 TCC_NML=0                               ;NORAML TERMINATION
          00000001  0000    207 TCC_ATN=1                               ;ATTENTION CONDITION
          00000002  0000    208 TCC_TSA=2                               ;TAPE STATUS ALERT
          00000003  0000    209 TCC_FNR=3                               ;FUNCTION REJECT
          00000004  0000    210 TCC_REM=4                               ;RECOVERABLE ERROR(TAPE MOVED)
          00000005  0000    211 TCC_REN=5                               ;RECOVERABLE ERROR(TAPE NOT MOVED)
          00000006  0000    212 TCC_UER=6                               ;UNRECOVERABLE ERROR(TAPE POSI. LOST)
          00000007  0000    213 TCC_FTL=7                               ;FATAL CONTROLLER ERROR
                    0000    214
                    0000    215 ;
                    0000    216 ; FATAL CLASS (FC) CODES IN TSSR
                    0000    217 ;
                    0000    218
          00000000  0000    219 FCC_IDF=0                               ;INTERNAL DIAG. FAILURE
          00000001  0000    220 FCC_CPE=1                               ;IO SEQUENCE CROM PARITY ERROR
          00000002  0000    221 FCC_UPE=2                               ;U-PROCESSOR CROM PARITY ERROR OR OTHER
          00000003  0000    222 FCC_LAP=3                               ;LOSS OF AC POWER DETECTED
                    0000    223
                    0000    224 ;
                    0000    225 ; TS11/TS04, TU80 MESSAGE CODES IN MS_MHD_COD
                    0000    226 ;
                    0000    227
          00000010  0000    228 MSG_END=^O020                           ;END
```

```
00000011  0000   229 MSG_FAL=^O021                          ;FAIL
00000012  0000   230 MSG_ERR=^O022                          ;ERROR
00000013  0000   231 MSG_ATN=^O023                          ;ATTENTION
00000014  0000   232 MSG_LOG=^O024                          ;LOG (NOT USED)
          0000   233
          0000   234 ;
          0000   235 ; CLASS CODE FOR MESSAGE CODES (MS_MHD_CLS VALUES)
          0000   236 ;
          0000   237
          0000   238                                  ;**WHEN MSG TYPE=ATTENTION**
00000000  0000   239 CLS_ONF=0                              ;ON OR OFFLINE
00000001  0000   240 CLS_MDF=1                              ;MICRO DIAG. FAILURE
          0000   241                                  ;**WHEN MSG TYPE=FAIL**
00000000  0000   242 CLS_PTB=0                              ;PACKET BAD(SERIAL BUS PARITY ERROR)
00000001  0000   243 CLS_OTHER=1                            ;OTHERS
00000002  0000   244 CLS_WLN=2                              ;WRITE LOCK ERROR OR NON-EXECUTABLE FUNCTION
00000003  0000   245 CLS_MDE=3                              ;MICRO DIAGNOSTIC ERROR
          0000   246
          0000   247 ;
          0000   248 ; TS11/TS04, TU80 HARDWARE COMMAND MODES/CODES
          0000   249 ;
          0000   250
          0000   251                                      ; INTERRUPT ENABLE & ACKNOWLEDGE
00000000  0000   252 HC_NOP=0                          ;SIMULATED NOP(REAL NO OPERATION)
00000000  0000   253 HC_PAK=HC_NOP                          ;SIMULATED PACK ACKNOWLEDGE
00000000  0000   254 HC_WCK=HC_NOP                          ;SIMULATED WRITE CHECK
00000000  0000   255 HC_WKR=HC_NOP                          ;SIMULATED WRITE CHECK REVERSE
00000000  0000   256 HC_RPS=HC_NOP                          ;SIMULATED READ IN PRESET
00000000  0000   257 HC_SCH=HC_NOP                          ;SIMULATED SET CHARACTERISTICS
          0000   258
          0000   259
0000C001  0000   260 HC_RDN=^O00001!MS_CPHD_M_CVC!MS_CPHD_M_ACK       ;* READ NEXT (FORWARD)
0000C004  0000   261 HC_WRC=^O00004!MS_CPHD_M_CVC!MS_CPHD_M_ACK       ;+ WRITE CHARACTERISTICS
0000C008  0000   262 HC_SRF=^O00010!MS_CPHD_M_CVC!MS_CPHD_M_ACK       ;$ SPACE RECORDS FORWARD
0000C108  0000   263 HC_SRR=^O00410!MS_CPHD_M_CVC!MS_CPHD_M_ACK       ;$ SPACE RECORDS REVERSE
0000C208  0000   264 HC_STF=^O01010!MS_CPHD_M_CVC!MS_CPHD_M_ACK       ;$ SKIP TAPE MARKS FORWARD
0000C308  0000   265 HC_STR=^O01410!MS_CPHD_M_CVC!MS_CPHD_M_ACK       ;$ SKIP TAPE MARKS REVERSE
0000C408  0000   266 HC_RWD=^O02010!MS_CPHD_M_CVC!MS_CPHD_M_ACK       ;$ REWIND
0000C10A  0000   267 HC_UNL=^O00412!MS_CPHD_M_CVC!MS_CPHD_M_ACK       ;- REWIND AND UNLOAD
0000C00B  0000   268 HC_DRI=^O00013!MS_CPHD_M_CVC!MS_CPHD_M_ACK       ;- DRIVER INITIALIZE
0000C00F  0000   269 HC_GST=^O00017!MS_CPHD_M_CVC!MS_CPHD_M_ACK       ;- GET STATUS IMMEDIATE
          0000   270                                      ;**NOTE**
          0000   271                                      ; * => DATA XFR
          0000   272                                      ; + => (SPECIAL)
          0000   273                                      ; $ => POSITION
          0000   274                                      ; - => FORMAT,CONTROL,INITIALIZE,& STATUS
          0000   275 ;+
          0000   276 ; TSSR defs
          0000   277 ;-
          0000   278
00000000  0000   279 TSDB     = 0                       ; Offset to TSDB
00000000  0000   280 TSBA     = 0                       ; Offset to TSBA
00000002  0000   281 TSSR     = 2                       ; Offset to TSSR
          0000   282
          0000   283 $VIELD  MS_TSSR,1,<-                ;TS11/TS04, TU80 STATUS REGISTER(B0 UNUSED)
          0000   284         <TCC,3>,-                   ;TERMINATION CLASS CODE FIELD
          0000   285         <FC,2>,-                    ;FATAL ERROR CLASS CODE FIELD
```

```
                     0000   286          <OFL,,M>,-                ;DEVICE IS OFF-LINE(B6)
                     0000   287          <SSR,,M>,-                ;SUBSYSTEM READY(B7)
                     0000   288          <A16,,M>,-                ;BUFFER ADDRESS BIT 16
                     0000   289          <A17,,M>,-                ;BUFFER ADDRESS BIT 17
                     0000   290          <NBA,,M>,-                ;NEED BUFFER ADDRESS(B10)
                     0000   291          <NXM,,M>,-                ;NON-EXISTENT MEMORY(B11)
                     0000   292          <RMR,,M>,-                ;REGISTER MODIFICATION REFUSED(B12)
                     0000   293          <SPE,,M>,-                ;SERIAL BUS PARITY ERROR(B13)
                     0000   294          <UPE,,M>,-                ;UNIBUS PARITY ERROR(B14)
                     0000   295          <SC,,M>,-                 ;SPECIAL CONDITION(B15)
                     0000   296          >                         ;
                     0000   297
                     0000   298 ;
                     0000   299 ; OWN
                     0000   300 ;
                00000000    301          .PSECT  DATA, SHR, NOEXE, NOWRT, 5
           00000020  0000    302 MS$CMD::         .BLKW   16        ; Command packet/char data/message area
                     0020   303
                     0020   304
                     0020   305 ;
                     0020   306 ; BOOT DRIVER TABLE ENTRY
                     0020   307 ;
                     0020   308
                     0020   309          $BOOT_DRIVER    DEVTYPE = BTD$K_TS,-    ; Device type (UNIBUS)
                     0020   310                          SIZE = TS11_DRVSIZ,-    ; Driver size
                     0020   311                          ADDR = TS11_DRIVER,-    ; Driver address
                     0020   312                          ENTRY = TS11_DRIVER,-   ; Entry point
                     0020   313                          DRIVRNAME = DRIVERNAME  ; Driver name
                00000000            .PSECT  BOOTDRIVR_4
                    FFFF  0000      .WORD   -1
                    00B2  0002      .WORD   BTD$K_TS
           00000000     0004      .LONG   0
           000001D2'    0008      .LONG   TS11_DRVSIZ
           00000000'    000C      .LONG   TS11_DRIVER-$TABLE
           00000000'    0010      .LONG   TS11_DRIVER-TS11_DRIVER
           000001C5'    0014      .LONG   DRIVERNAME-TS11_DRIVER
                00000000            .PSECT  BOOTDRIVR_2
```

```
                        315          .SBTTL  TS11/TS04, TU80 Bootstrap driver
                        316
                        317 ;++
                        318 ; Functional description:
                        319 ;
                        320 ;       This routine performs basic magnetic tape positioning.
                        321 ;       functions are supported for read, rewind, skip files (forward
                        322 ;       backward) and skip records (forward and backward). It also
                        323 ;       support drive clear.  Drive clear must be called before the first
                        324 ;       tape operation as it is necessary to initialize the tape subsystem
                        325 ;       prior to the first position or transfer operation.
                        326 ;       Drive clear initialization clears the Need Buffer Address (NBA)
                        327 ;       bit in the drive. This bit can be reset by a UNIBUS reset/init
                        328 ;       which in the TS11 causes the tape to be rewound. If NBA is set
                        329 ;       the function is rejected with tape position lost.
                        330 ;
                        331 ; Inputs:
                        332 ;
                        333 ;       R3      - base address of adapter's register space
                        334 ;       R5      - LBN for current piece of transfer
                        335 ;       R6      - contains 0
                        336 ;       R7      - Address of devices CSR
                        337 ;       R8      - size of transfer in bytes
                        338 ;       R9      - address of the RPB
                        339 ;       R10     - starting address of transfer (byte offset in first
                        340 ;                 page ORed with starting map register number)
                        341 ;
                        342 ;       FUNC(AP)- I/O operation (IO$_READLBLK or IO$_REWIND only)
                        343 ;       MODE(AP)- Address interpretation mode (0 = physical, 1 = virtual)
                        344 ;       SIZE(AP)- Size of buffer in bytes
                        345 ;       BUF(AP) - Address of buffer
                        346 ;
                        347 ; Implicit inputs:
                        348 ;
                        349 ;       RPB$B_SLAVE     - Slave number of drive
                        350 ;       RPB$W_UNIT      - RPB field containing boot device unit number
                        351 ;
                        352 ;
                        353 ; Outputs:
                        354 ;
                        355 ;       R0 - status code
                        356 ;
                        357 ;               SS$_NORMAL      - successful transfer
                        358 ;               SS$_TAPEPOSLOST - Tape position lost
                        359 ;               SS$_TIMEOUT     - Device timeout
                        360 ;               SS$_DATAOVERUN  - Record too long
                        361 ;               SS$_ILLIOFUNC   - Illegal I/O function
                        362 ;               SS$_CTRLERR     - Controller error
                        363 ;               SS$_ENDOFFILE   - Tape mark was read
                        364 ;               SS$_DEVOFFLINE  - Device is offline
                        365 ;
                        366 ;       R1 - Number of bytes transferred during a READ operation
                        367 ; Register usage:
                        368 ;
                        369 ;               R5      - Map number of map for command area
                        370 ;               R11     - Address of command buffer
                        371 ;
```

```
                        0000    372 ;--
                        0000    373
00000004                0000    374 BUF = 4
00000008                0000    375 SIZE = 8
0000000C                0000    376 LBN = 12
00000010                0000    377 FUNC = 16
00000014                0000    378 MODE = 20
```

```
                        0000   380 TS11_DRIVER::                           ; TS11/TS04, TU80  driver
                        0000   381
            04 AE   D4  0000   382         CLRL    4(SP)                    ; Clear retry count ****************
       52   02 A7   B0  0003   383         MOVW    TSSR(R7), R2             ; Get current status
       0C 52   0A   E1  0007   384         BBC     #MS_TSSR_V_NBA, R2, 10$  ; Branch if not reset since last op
       04   10 AC   D1  000B   385         CMPL    FUNC(AP),#IO$_DRVCLR     ; Drive clear?
                06   13  000F   386         BEQL    10$                      ; If so continue
     50   0224 8F   3C  0011   387         MOVZWL  #SS$_TAPEPOSLOST, R0     ; Assume tape position lost
                05   0016   388         RSB
                        0017   389
            09   00   EF  0017   390 10$:   EXTZV   #VA$V_BYTE, #VA$S_BYTE,-
            55   5A          001A   391                 R10, R5              ; Byte offset from start
      55   03FF C845   9E  001C   392         MOVAB   ^X3FF(R8)[R5],R5         ; Length of transfer + extra page
   55   55   F7 8F   78  0022   393         ASHL    #-9, R5, R5              ; Number of pages to mapped + 1
                        0027   394
   5B   00000000'8F   D0  0027   395         MOVL    #MS$CMD, R11             ; Address of command area
            15   09   EF  002E   396         EXTZV   #VA$V_VPN, #VA$S_VPN,-
            50   5B          0031   397                 R11, R0              ; Get PFN to map
      51   0800 C345   DE  0033   398         MOVAL   ^X800(R3)[R5], R1        ; Address of map register
   61   90000000 E0   9E  0039   399         MOVAB   <PTE$M_VALID!PTE$C_KW>(R0), -
                        0040   400                 (R1)                     ; Map first page
      81   81   01   C1  0040   401         ADDL3   #1, (R1)+, (R1)+         ; Map 2nd page
                61   D4  0044   402         CLRL    (R1)                     ; And clear 3rd
                        0046   403
   10 AB   8000 8F   B0  0046   404         MOVW    #MS_MHD_M_ACK,MS_MHD(R11); Set ACK in message buffer
        50   10 AB   3E  004C   405         MOVAW   MS_MHD(R11), R0          ; Copy message buffer address
                013C   30  0050   406         BSBW    MAP_VA                   ; Get UNIBUS address of this VA
                        0053   407
      08 AB   50   D0  0053   408         MOVL    R0, MS_MBA0(R11)         ; Set address of message buffer
      0C AB   0E   B0  0057   409         MOVW    #14, MS_LNTH(R11)        ; Length of message buffer
           0E AB   B4  005B   410         CLRW    MS_CHWD(R11)             ; Characteristics word
                        005E   411
   6B   C004 8F   B0  005E   412         MOVW    #HC_WRC, MS_CPHD(R11)    ; Write characteristics command
     50   08 AB   9E  0063   413         MOVAB   MS_MBA0(R11), R0         ; Address of characteristic data
          0125   30  0067   414         BSBW    MAP_VA                   ; Get UNIBUS address of this VA
      02 AB   50   D0  006A   415         MOVL    R0, MS_BACT(R11)         ; Set low and high address
      06 AB   08   B0  006E   416         MOVW    #8, MS_CNT(R11)          ; Set length of area
                        0072   417
            010C   30  0072   418         BSBW    EXECUTE                  ; Execute function
            00A5   30  0075   419         BSBW    WAIT                     ; Wait for Subsystem Ready to set
          25 50    E9  0078   420         BLBC    R0,RETURN                ; Exit if subsystem ready does not set
                        007B   421
                        007B   422
                        007B   423 ;+
                        007B   424 ; branch on function type
                        007B   425 ;-
      21   10 AC   D1  007B   426         CMPL    FUNC(AP),#IO$_READLBLK   ; Read logical block?
                2F   13  007F   427         BEQL    E_READ                   ; Execute read function
      24   10 AC   D1  0081   428         CMPL    FUNC(AP),#IO$_REWIND     ; Rewind?
                1A   13  0085   429         BEQL    E_REWIND                 ; Do a rewind
      25   10 AC   D1  0087   430         CMPL    FUNC(AP),#IO$_SKIPFILE   ; Skip past eof
                4C   13  008B   431         BEQL    E_SKIPFILE               ; Do it
      26   10 AC   D1  008D   432         CMPL    FUNC(AP),#IO$_SKIPRECORD ; Skip records?
                68   13  0091   433         BEQL    E_SKIPRECORD             ; Do it
         50   01   D0  0093   434         MOVL    #SS$_NORMAL, R0          ; Assume normal completion
      04   10 AC   D1  0096   435         CMPL    FUNC(AP),#IO$_DRVCLR     ; Drive clear?
                04   13  009A   436         BEQL    RETURN                   ; If so have already done it
```

```
                50   F4 8F    9A  009C    437          MOVZBL  #SS$_ILLIOFUNC,R0       ; illegal I/O function
                                  00A0    438 RETURN:
                             05   00A0    439          RSB                             ; Return to caller
                                  00A1    440 ;+
                                  00A1    441 ; Rewind slave drive, wait for completion
                                  00A1    442 ;-
                                  00A1    443 E_REWIND:
             6B   C408 8F    B0   00A1    444          MOVW    #HC_RWD, MS_CPHD(R11)   ; Set function to rewind
                  50   5B    D0   00A6    445          MOVL    R11, R0                 ; VA to map
                     00D5    30   00A9    446          BSBW    EXECUTE                 ; Execute function
                     006E    30   00AC    447          BSBW    WAIT                    ; Wait for ready to set
                             05   00AF    448          RSB                             ; Exit
                                  00B0    449 ;+
                                  00B0    450 ; Read block of data
                                  00B0    451 ;-
                                  00B0    452 E_READ:
             6B   C001 8F    B0   00B0    453          MOVW    #HC_RDN, MS_CPHD(R11)   ; Set function to read next
               02 AB   5A    D0   00B5    454          MOVL    R10, MS_BACT(R11)       ; Set address to read to
               06 AB   58    B0   00B9    455          MOVW    R8, MS_CNT(R11)         ; Set length to read
                     00C1    30   00BD    456          BSBW    EXECUTE                 ; Execute function
                     005A    30   00C0    457          BSBW    WAIT                    ; Wait for completion
               51    14 AB   3C   00C3    458          MOVZWL  MS_RBPC(R11), R1        ; Bytes residual byte count
             51   58   51    C3   00C7    459          SUBL3   R1, R8, R1              ; From desired length is transfered
                  0A 50      E9   00CB    460          BLBC    R0, 20$                 ; Branch if complete failure
          05 16 AB   0C      E1   00CE    461          BBC     #MS_XSR0_V_RLL, MS_XSR0(R11), -
                                  00D3    462                  20$                     ; Branch if record not longer than buf
             50   0838 8F    3C   00D3    463          MOVZWL  #SS$_DATAOVERUN, R0     ; Longer, change return
                             05   00D8    464 20$:     RSB
                                  00D9    465
                                  00D9    466 ;+
                                  00D9    467 ; Skip to end of file
                                  00D9    468 ; P1 is negative if backwards else forwards
                                  00D9    469 ;-
                                  00D9    470 E_SKIPFILE:
                50   01    D0   00D9    471          MOVL    #SS$_NORMAL,R0          ; Assume it works
             6B   C208 8F    B0   00DC    472          MOVW    #HC_STF, MS_CPHD(R11)   ; Set function to space tape marks
          02 AB   04 AC      F7   00E1    473          CVTLW   BUF(AP), MS_BACT(R11)   ; Set count of marks to skip
                     0C      14   00E6    474          BGTR    10$                     ; Branch if positive
                     10      13   00E8    475          BEQL    20$                     ; Branch if count 0
             6B   C308 8F    B0   00EA    476          MOVW    #HC_STR, MS_CPHD(R11)   ; Set function to space marks reverse
          02 AB   02 AB      AE   00EF    477          MNEGW   MS_BACT(R11),MS_BACT(R11); Make count positive
                                  00F4    478
                     008A    30   00F4    479 10$:     BSBW    EXECUTE                 ; Start function
                                  00F7    480
                     0023    30   00F7    481          BSBW    WAIT                    ; Wait for it to finish
                             05   00FA    482 20$:     RSB
                                  00FB    483
                                  00FB    484 ;+
                                  00FB    485 ; Skip to end of record, read w/o buffer
                                  00FB    486 ; P1 is negative if backwards else forwards
                                  00FB    487 ;-
                                  00FB    488 E_SKIPRECORD:
                50   01    D0   00FB    489          MOVL    #SS$_NORMAL,R0          ; Assume it works
             6B   C008 8F    B0   00FE    490          MOVW    #HC_SRF, MS_CPHD(R11)   ; Assume forward
          02 AB   04 AC      F7   0103    491          CVTLW   BUF(AP), MS_BACT(R11)   ; Set record count
                     0C      14   0108    492          BGTR    30$                     ; All set, execute
                     10      13   010A    493          BEQL    50$                     ; Finish if space = 0
```

```
                6B   C108 8F    B0  010C   494          MOVW    #HC_SRR, MS_CPHD(R11)   ; Function = space reverse
              02 AB    02 AB    AE  0111   495          MNEGW   MS_BACT(R11),MS_BACT(R11); Set record count
                                    0116   496
                       0068     30  0116   497 30$:     BSBW    EXECUTE                 ; Translate R11 command and execute
                       0001     30  0119   498          BSBW    WAIT                    ; Wait for it to finish
                                    011C   499
                                30  011C   500 50$:     RSB
                                    011D   501
                                    011D   502
                                    011D   503 ;+
                                    011D   504 ; Wait for slave to quiesce
                                    011D   505 ;-
                                    011D   506 WAIT:
             50   3B9ACA00 8F    D0  011D   507          MOVL    #1000000000, R0         ; time out counter
              02 A7   0080 8F    B3  0124   508 10$:     BITW    #MS_TSSR_M_SSR, TSSR(R7); Subsystem ready?
                         09     12  012A   509          BNEQ    20$                     ; Exit if subsystem ready
                         F5 50  F5  012C   510          SOBGTR  R0, 10$                 ; Count and try again
                50   022C 8F    3C  012F   511          MOVZWL  #SS$_TIMEOUT, R0        ; Set return code
                                30  0134   512          RSB                             ; return
                                    0135   513
                50   0054 8F    3C  0135   514 20$:     MOVZWL  #SS$_CTRLERR, R0        ; Assume controller error
                51   7C00 8F    B3  013A   515          BITW    #MS_TSSR_M_UPE ! MS_TSSR_M_SPE ! -
                                    013F   516                  MS_TSSR_M_RMR ! MS_TSSR_M_NXM ! -
                                    013F   517                  MS_TSSR_M_NBA, R1       ; Any fatal errors?
                         3F     12  013F   518          BNEQ    90$                     ; Exit if any
                                    0141   519
                  51   02 A7    32  0141   520          CVTWL   TSSR(R7), R1            ; Get TSSR
                         36     18  0145   521          BGEQ    80$                     ; Branch if SC clear, normal
                                    0147   522
                  51   03   01    EF  0147   523          EXTZV   #MS_TSSR_V_TCC, #MS_TSSR_S_TCC, -
                            50          014B   524                  R1, R0                  ; Get termination class
                                        014C   525          CASE    R0, LIMIT = #TCC_NML, DISPLIST = <80$, 80$, 50$, 60$>
                03'  00   50    AF  014C           CASEW   R0,#TCC_NML,S^#<<30001$-30000$>/2>-1
                                    0150       30000$:
                           002D'    0150           .SIGNED_WORD    80$-30000$
                           002D'    0152           .SIGNED_WORD    80$-30000$
                           000F'    0154           .SIGNED_WORD    50$-30000$
                           001E'    0156           .SIGNED_WORD    60$-30000$
                                    0158       30001$:
                50   0054 8F    3C  0158   526          MOVZWL  #SS$_CTRLERR, R0        ; Assume controller error
                         21     11  015D   527          BRB     90$                     ; And exit
                                    015F   528
                                    015F   529 ;+
                                    015F   530 ; Tape status condition
                                    015F   531 ;-
             16 AB   8003 8F    B3  015F   532 50$:     BITW    #MS_XSR0_M_TMK ! -
                                    0165   533                  MS_XSR0_M_BOT ! -
                                    0165   534                  MS_XSR0_M_EOT, -
                                    0165   535                  MS_XSR0(R11)            ;Tape mark detected?
                         16     13  0165   536          BEQL    80$                     ; No, exit normal
                50   0870 8F    3C  0167   537          MOVZWL  #SS$_ENDOFFILE,R0       ; Assume EOF sensed
                         12     11  016C   538          BRB     90$                     ; Exit
                                    016E   539
                                    016E   540 ;+
                                    016E   541 ; Function reject
                                    016E   542 ;-
                                    016E   543 60$:
```

```
                50    84 8F    9A  016E    544          MOVZBL  #SS$_DEVOFFLINE,R0      ; Assume offline
             09 16 AB    06    E1  0172    545          BBC     #MS_XSR0_V_ONL, -
                                   0177    546                  MS_XSR0(R11), 90$      ; Branch if offline
                                   0177    547
                50    54 8F    9A  0177    548          MOVZBL  #SS$_CTRLERR,R0          ; Assume error
                         03    11  017B    549          BRB     90$                      ; Exit
                                   017D    550 ;+
                                   017D    551 ; Success
                                   017D    552 ;-
                   50    01    D0  017D    553 80$:     MOVL    #SS$_NORMAL, R0          ; Success
                         05    0180    554 90$:     RSB                              ; Return from WAIT
                                   0181    555
                                   0181    556
                                   0181    557 ;+
                                   0181    558 ; Execute command pointer @R11
                                   0181    559 ;-
                                   0181    560 EXECUTE:
                   50    5B    D0  0181    561          MOVL    R11, R0                  ; VA to map
                         09    10  0184    562          BSBB    MAP_VA                   ; Map to UNIBUS space
                51 50    10    9C  0186    563          ROTL    #16, R0, R1              ; Position bits 16 & 17
                67 51 50    A9    018A    564          BISW3   R0, R1, TSBA(R7)         ; Execute the function
                         05    018E    565          RSB
                                   018F    566
                                   018F    567 ;+
                                   018F    568 ; Map and translate VA to UNIBUS address
                                   018F    569 ; R0 is VA to be mapped to UNIBUS space
                                   018F    570 ;       R0      VA to be mapped
                                   018F    571 ;       R3      Base of adapter space
                                   018F    572 ;       R5      Map register number assigned for command/message area
                                   018F    573 ;               may require two maps
                                   018F    574 ;-
                                   018F    575 MAP_VA:
             51    00000000'8F    D0  018F    576          MOVL    #MS$CMD, R1              ; Get command address
              51    51    F7 8F    78  0196    577          ASHL    #-9, R1,R1               ; PFN only
                                   019B    578
                50    15    09    ED  019B    579          CMPZV   #VA$V_VPN, #VA$S_VPN, -
                               51        019F    580                  R0, R1           ; Does VA map same page?
                               07    12  01A0    581          BNEQ    10$              ; Branch if should be other page
             50    15    09    55    F0  01A2    582          INSV    R5, #VA$V_VPN, #VA$S_VPN, -
                                   01A7    583                  R0                       ; Insert UNIBUS PFN
                               15    11  01A7    584          BRB     20$              ; Exit
                                   01A9    585
                               51    D6  01A9    586 10$:     INCL    R1               ; Next map maps next PFN
                54    15    09    ED  01AB    587          CMPZV   #VA$V_VPN, #VA$S_VPN, -
                               51        01AF    588                  R4, R1           ; Does it map this page?
                               0D    12  01B0    589          BNEQ    30$              ; Abort if page not mapped by either
             50    15    09    55    F0  01B2    590          INSV    R5, #VA$V_VPN, #VA$S_VPN, -
                                   01B7    591                  R0                       ; Insert UNIBUS PFN
              50    00000200 8F    C0  01B7    592          ADDL    #^X200, R0           ; Map to next page
                                   01BE    593
                         05    01BE    594 20$:     RSB                              ; Return
                                   01BF    595
                   50    2C    3C  01BF    596 30$:     MOVZWL  #SS$_ABORT, R0           ; Set return code
                         8E    D5  01C2    597          TSTL    (SP)+                    ; Return extra return address
                         05    01C4    598          RSB                              ; And return from bootdriver
                                   01C5    599
                                   01C5    600
```

```
                                  01C5   601 DRIVERNAME:                          ; Boot device driver name
58 45 2E 52 45 56 49 52 44 53 54 00' 01C5   602         .ASCIC  /TSDRIVER.EXE/        ; TSDRIVER
                              45  01D1
                              0C  01C5
                                  01D2   603
                        000001D2  01D2   604 TS11_DRVSIZ = .-TS11_DRIVER
                                  01D2   605
                                  01D2   606         .END
```

```
$TABLE                          = 00000000 R   D  03        MS_CPHD_M_ACK                   = 00008000     D
BIT...                          = 00000010     D           MS_CPHD_M_CVC                   = 00004000     D
BTD$K_TM                        = 000000B1     D           MS_LNH                            00000012     D
BTD$K_TS                        = 000000B2     D           MS_LNTH                           0000000C     D
BUF                             = 00000004     D           MS_MBA0                           00000008     D
CLS_MDE                         = 00000003     D           MS_MBA1                           0000000A     D
CLS_MDF                         = 00000001     D           MS_MHD                            00000010     D
CLS_ONF                         = 00000000     D           MS_MHD_M_ACK                    = 00008000     D
CLS_OTHER                       = 00000001     D           MS_RBPC                           00000014     D
CLS_PTB                         = 00000000     D           MS_TSSR_M_A16                   = 00000100     D
CLS_WLN                         = 00000002     D           MS_TSSR_M_A17                   = 00000200     D
DRIVERNAME                        000001C5 R   D  04        MS_TSSR_M_NBA                   = 00000400     D
EXECUTE                           00000181 R   D  04        MS_TSSR_M_NXM                   = 00000800     D
E_READ                            000000B0 R   D  04        MS_TSSR_M_OFL                   = 00000040     D
E_REWIND                          000000A1 R   D  04        MS_TSSR_M_RMR                   = 00001000     D
E_SKIPFILE                        000000D9 R   D  04        MS_TSSR_M_SC                    = 00008000     D
E_SKIPRECORD                      000000FB R   D  04        MS_TSSR_M_SPE                   = 00002000     D
FCC_CPE                         = 00000001     D           MS_TSSR_M_SSR                   = 00000080     D
FCC_IDF                         = 00000000     D           MS_TSSR_M_UPE                   = 00004000     D
FCC_LAP                         = 00000003     D           MS_TSSR_S_FC                    = 00000002     D
FCC_UPE                         = 00000002     D           MS_TSSR_S_TCC                   = 00000003     D
FUNC                            = 00000010     D           MS_TSSR_V_A16                   = 00000008     D
HC_DRI                          = 0000C00B     D           MS_TSSR_V_A17                   = 00000009     D
HC_GST                          = 0000C00F     D           MS_TSSR_V_FC                    = 00000004     D
HC_NOP                          = 00000000     D           MS_TSSR_V_NBA                   = 0000000A     D
HC_PAK                          = 00000000     D           MS_TSSR_V_NXM                   = 0000000B     D
HC_RDN                          = 0000C001     D           MS_TSSR_V_OFL                   = 00000006     D
HC_RPS                          = 00000000     D           MS_TSSR_V_RMR                   = 0000000C     D
HC_RWD                          = 0000C408     D           MS_TSSR_V_SC                    = 0000000F     D
HC_SCH                          = 00000000     D           MS_TSSR_V_SPE                   = 0000000D     D
HC_SRF                          = 0000C008     D           MS_TSSR_V_SSR                   = 00000007     D
HC_SRR                          = 0000C108     D           MS_TSSR_V_TCC                   = 00000001     D
HC_STF                          = 0000C208     D           MS_TSSR_V_UPE                   = 0000000E     D
HC_STR                          = 0000C308     D           MS_XSR0                           00000016     D
HC_UNL                          = 0000C10A     D           MS_XSR0_M_BOT                   = 00000002     D
HC_WCK                          = 00000000     D           MS_XSR0_M_EOT                   = 00000001     D
HC_WKR                          = 00000000     D           MS_XSR0_M_TMK                   = 00008000     D
HC_WRC                          = 0000C004     D           MS_XSR0_V_ONL                   = 00000006     D
IO$_DRVCLR                      = 00000004     D           MS_XSR0_V_RLL                   = 0000000C     D
IO$_READLBLK                    = 00000021     D           MS_XSR1                           00000018     D
IO$_REWIND                      = 00000024     D           MS_XSR2                           0000001A     D
IO$_SKIPFILE                    = 00000025     D           MS_XSR3                           0000001C     D
IO$_SKIPRECORD                  = 00000026     D           PTE$C_KW                        = 10000000     D
LBN                             = 0000000C     D           PTE$M_VALID                     = 80000000     D
MAP_VA                            0000018F R   D  04        RETURN                            000000A0 R   D  04
MODE                            = 00000014     D           SIZ...                          = 00000001     D
MS$CMD                            00000000 RG  D  02        SIZE                            = 00000008     D
MSG_ATN                         = 00000013     D           SS$_ABORT                       = 0000002C     D
MSG_END                         = 00000010     D           SS$_CTRLERR                     = 00000054     D
MSG_ERR                         = 00000012     D           SS$_DATAOVERUN                  = 00000838     D
MSG_FAL                         = 00000011     D           SS$_DEVOFFLINE                  = 00000084     D
MSG_LOG                         = 00000014     D           SS$_ENDOFFILE                   = 00000870     D
MS_BA1                            00000004     D           SS$_ILLIOFUNC                   = 000000F4     D
MS_BACT                           00000002     D           SS$_NORMAL                      = 00000001     D
MS_CHWD                           0000000E     D           SS$_TAPEPOSLOST                 = 00000224     D
MS_CNT                            00000006     D           SS$_TIMEOUT                     = 0000022C     D
MS_CPHD                           00000000     D           TCC_ATN                         = 00000001     D
```

```
TCC_FNR                         = 00000003    D
TCC_FTL                         = 00000007    D
TCC_NML                         = 00000000    D
TCC_REM                         = 00000004    D
TCC_REN                         = 00000005    D
TCC_TSA                         = 00000002    D
TCC_UER                         = 00000006    D
TS11_DRIVER                       00000000 RG D  04
TS11_DRVSIZ                     = 000001D2    D
TSBA                            = 00000000    D
TSDB                            = 00000000    D
TSSR                            = 00000002    D
VA$S_BYTE                       = 00000009    D
VA$S_VPN                        = 00000015    D
VA$V_BYTE                       = 00000000    D
VA$V_VPN                        = 00000009    D
WAIT                              0000011D R  D  04
```

+----------------+
! Psect synopsis !
+----------------+

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	0000001E (30.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
DATA	00000020 (32.)	02 (2.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC 21
BOOTDRIVR_4	00000018 (24.)	03 (3.)	NOPIC USR CON REL LCL NOSHR EXE RD WRT NOVEC BYTE
BOOTDRIVR_2	000001D2 (466.)	04 (4.)	NOPIC USR CON REL LCL NOSHR EXE RD WRT NOVEC BYTE

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
$TABLE	=00000000-R	313 (2)	313 (2)
BIT...	=00000010	296 (2)	296 (2)
BTD$K_TM	=000000B1	71 (2)	
BTD$K_TS	=000000B2	72 (2)	313 (2)
BUF	=00000004	374 (3)	#-473 (4) #-491 (4)
CLS_MDE	=00000003	245 (2)	
CLS_MDF	=00000001	240 (2)	
CLS_ONF	=00000000	239 (2)	
CLS_OTHER	=00000001	243 (2)	
CLS_PTB	=00000000	242 (2)	
CLS_WLN	=00000002	244 (2)	
DRIVERNAME	000001C5-R	601 (4)	313 (2)
EXECUTE	00000181-R	560 (4)	#-418 (4) #-446 (4) #-456 (4) #-479 (4)
			#-497 (4)
E_READ	000000B0-R	452 (4)	#-427 (4)
E_REWIND	000000A1-R	443 (4)	#-429 (4)
E_SKIPFILE	000000D9-R	470 (4)	#-431 (4)
E_SKIPRECORD	000000FB-R	488 (4)	#-433 (4)
FCC_CPE	=00000001	220 (2)	
FCC_IDF	=00000000	219 (2)	
FCC_LAP	=00000003	222 (2)	
FCC_UPE	=00000002	221 (2)	
FUNC	=00000010	377 (3)	#-385 (4) #-426 (4) #-428 (4) #-430 (4)
			#-432 (4) #-435 (4)
HC_DRI	=0000C00B	268 (2)	
HC_GST	=0000C00F	269 (2)	
HC_NOP	=00000000	252 (2)	253 (2) 254 (2) 255 (2) 256 (2)
			257 (2)
HC_PAK	=00000000	253 (2)	
HC_RDN	=0000C001	260 (2)	#-453 (4)
HC_RPS	=00000000	256 (2)	
HC_RWD	=0000C408	266 (2)	#-444 (4)
HC_SCH	=00000000	257 (2)	
HC_SRF	=0000C008	262 (2)	#-490 (4)
HC_SRR	=0000C108	263 (2)	#-494 (4)
HC_STF	=0000C208	264 (2)	#-472 (4)
HC_STR	=0000C308	265 (2)	#-476 (4)
HC_UNL	=0000C10A	267 (2)	
HC_WCK	=00000000	254 (2)	
HC_WKR	=00000000	255 (2)	
HC_WRC	=0000C004	261 (2)	#-412 (4)
IO$_DRVCLR	=00000004		#-385 (4) #-435 (4)
IO$_READLBLK	=00000021		#-426 (4)
IO$_REWIND	=00000024		#-428 (4)
IO$_SKIPFILE	=00000025		#-430 (4)
IO$_SKIPRECORD	=00000026		#-432 (4)
LBN	=0000000C	376 (3)	
MAP_VA	0000018F-R	575 (4)	#-406 (4) #-414 (4) #-562 (4)
MODE	=00000014	378 (3)	
MS$CMD	00000000-R	302 (2)	#-395 (4) #-576 (4)

```
MSG_ATN                         =00000013     231     (2)
MSG_END                         =00000010     228     (2)
MSG_ERR                         =00000012     230     (2)
MSG_FAL                         =00000011     229     (2)
MSG_LOG                         =00000014     232     (2)
MS_BACT                          00000002                       #-415    (4)     #-454    (4)     #-473    (4)     #-477    (4)
                                                                #-491    (4)     #-495    (4)
MS_CHWD                          0000000E                       #-410    (4)
MS_CNT                           00000006                       #-416    (4)     #-455    (4)
MS_CPHD                          00000000                       #-412    (4)     #-444    (4)     #-453    (4)     #-472    (4)
                                                                #-476    (4)     #-490    (4)     #-494    (4)
MS_CPHD_M_ACK                   =00008000                         260    (2)       261    (2)       262    (2)       263    (2)
                                                                  264    (2)       265    (2)       266    (2)       267    (2)
                                                                  268    (2)       269    (2)
MS_CPHD_M_CVC                   =00004000                         260    (2)       261    (2)       262    (2)       263    (2)
                                                                  264    (2)       265    (2)       266    (2)       267    (2)
                                                                  268    (2)       269    (2)
MS_LNTH                          0000000C                       #-409    (4)
MS_MBA0                          00000008                       #-408    (4)       413    (4)
MS_MHD                           00000010                       #-404    (4)       405    (4)
MS_MHD_M_ACK                    =00008000                       #-404    (4)
MS_RBPC                          00000014                       #-458    (4)
MS_TSSR_M_A16                   =00000100     296     (2)
MS_TSSR_M_A17                   =00000200     296     (2)
MS_TSSR_M_NBA                   =00000400     296     (2)       #-517    (4)
MS_TSSR_M_NXM                   =00000800     296     (2)       #-516    (4)
MS_TSSR_M_OFL                   =00000040     296     (2)
MS_TSSR_M_RMR                   =00001000     296     (2)       #-516    (4)
MS_TSSR_M_SC                    =00008000     296     (2)
MS_TSSR_M_SPE                   =00002000     296     (2)       #-515    (4)
MS_TSSR_M_SSR                   =00000080     296     (2)       #-508    (4)
MS_TSSR_M_UPE                   =00004000     296     (2)       #-515    (4)
MS_TSSR_S_FC                    =00000002     296     (2)
MS_TSSR_S_TCC                   =00000003     296     (2)       #-523    (4)
MS_TSSR_V_A16                   =00000008     296     (2)
MS_TSSR_V_A17                   =00000009     296     (2)
MS_TSSR_V_FC                    =00000004     296     (2)
MS_TSSR_V_NBA                   =0000000A     296     (2)       #-384    (4)
MS_TSSR_V_NXM                   =0000000B     296     (2)
MS_TSSR_V_OFL                   =00000006     296     (2)
MS_TSSR_V_RMR                   =0000000C     296     (2)
MS_TSSR_V_SC                    =0000000F     296     (2)
MS_TSSR_V_SPE                   =0000000D     296     (2)
MS_TSSR_V_SSR                   =00000007     296     (2)
MS_TSSR_V_TCC                   =00000001     296     (2)       #-523    (4)
MS_TSSR_V_UPE                   =0000000E     296     (2)
MS_XSR0                          00000016                         461    (4)     #-535    (4)       546    (4)
MS_XSR0_M_BOT                   =00000002                       #-533    (4)
MS_XSR0_M_EOT                   =00000001                       #-534    (4)
MS_XSR0_M_TMK                   =00008000                       #-532    (4)
MS_XSR0_V_ONL                   =00000006                       #-545    (4)
MS_XSR0_V_RLL                   =0000000C                       #-461    (4)
PTE$C_KW                        =10000000                         399    (4)
PTE$M_VALID                     =80000000                         399    (4)
RETURN                           000000A0-R    438     (4)       #-420    (4)     #-436    (4)
SIZ...                          =00000001     296     (2)         296    (2)
SIZE                            =00000008     375     (3)
```

```
SS$_ABORT                       =0000002C                             #-596    (4)
SS$_CTRLERR                     =00000054                             #-514    (4)     #-526    (4)     #-548    (4)
SS$_DATAOVERUN                  =00000838                             #-463    (4)
SS$_DEVOFFLINE                  =00000084                             #-544    (4)
SS$_ENDOFFILE                   =00000870                             #-537    (4)
SS$_ILLIOFUNC                   =000000F4                             #-437    (4)
SS$_NORMAL                      =00000001                             #-434    (4)     #-471    (4)     #-489    (4)     #-553    (4)
SS$_TAPEPOSLOST                 =00000224                             #-387    (4)
SS$_TIMEOUT                     =0000022C                             #-511    (4)
TCC_ATN                         =00000001       207     (2)
TCC_FNR                         =00000003       209     (2)
TCC_FTL                         =00000007       213     (2)
TCC_NML                         =00000000       206     (2)     #-525    (4)
TCC_REM                         =00000004       210     (2)
TCC_REN                         =00000005       211     (2)
TCC_TSA                         =00000002       208     (2)
TCC_UER                         =00000006       212     (2)
TS11_DRIVER                      00000000-R     380     (4)       313    (2)       604    (4)
TS11_DRVSIZ                     =000001D2       604     (4)       313    (2)
TSBA                            =00000000       280     (2)     #-564    (4)
TSDB                            =00000000       279     (2)
TSSR                            =00000002       281     (2)     #-383    (4)     #-508    (4)     #-520    (4)
VA$S_BYTE                       =00000009                             #-390    (4)
VA$S_VPN                        =00000015                             #-396    (4)     #-579    (4)     #-582    (4)     #-587    (4)
                                                                      #-590    (4)
VA$V_BYTE                       =00000000                             #-390    (4)
VA$V_VPN                        =00000009                             #-396    (4)     #-579    (4)     #-582    (4)     #-587    (4)
                                                                      #-590    (4)
WAIT                             0000011D-R     506     (4)     #-419    (4)     #-447    (4)     #-457    (4)     #-481    (4)
                                                                      #-498    (4)
```

+-------------------------+
! Performance indicators !
+-------------------------+

Phase	Page faults	CPU Time	Elapsed Time
Initialization	25	00:00:00.03	00:00:00.19
Command processing	929	00:00:00.29	00:00:00.89
Pass 1	708	00:00:02.63	00:00:03.92
Symbol table sort	1	00:00:00.37	00:00:00.37
Pass 2	69	00:00:00.76	00:00:01.53
Symbol table output	2	00:00:00.02	00:00:00.08
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	4	00:00:00.08	00:00:00.11
Assembler run totals	1742	00:00:04.19	00:00:07.10

The working set limit was 2400 pages.
149901 bytes (293 pages) of virtual memory were used to buffer the intermediate code.
There were 70 pages of symbol table space allocated to hold 1303 non-local and 17 local symbols.
606 source lines were read in Pass 1, producing 85 object records in Pass 2.
19 pages of virtual memory were used to define 18 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	1
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	1
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	5
SYS$COMMON:[SYSLIB]STARLET.MLB;2	7
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	14

1201 GETS were required to define 14 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

```
;    0001  0      ! DEC/CMS REPLACEMENT HISTORY, Element ULTRIX.B32
;    0002  0      ! *4    28-JUL-1986 10:35:51 BAGGETT "ULTRIX LOAD COMMAND FINISH."
;    0003  0      ! *3    25-JUL-1986 15:06:01 BAGGETT "LOAD COMMAND WORKS ON ULTRIX DISKS"
;    0004  0      ! *2    21-MAR-1986 15:26:29 BAGGETT "STATIC MEMORY REMOVE FOR MODULE"
;    0005  0      ! *1     6-FEB-1986 15:22:50 DS ""
;    0006  0      ! DEC/CMS REPLACEMENT HISTORY, Element ULTRIX.B32
;    0007  0       %title '*** ULTRIX Disk RMS routines'
;    0008  0       module ULTRIX (                                    ! RMS$OPEN, RMS$GET, RMS$READ services
;    0009  0                      ident = '01-05',                                                    !G:3
;    0010  0                      ADDRESSING_MODE (EXTERNAL = LONG_RELATIVE,
;    0011  0                      NONEXTERNAL = LONG_RELATIVE)
;    0012  0                      ) =
;    0013  0       !
;    0014  0       ! Copyright (c) 1985, 1986                                                         !G:2
;    0015  0       ! DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
;    0016  0       !
;    0017  0       ! THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
;    0018  0       ! COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
;    0019  0       ! ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
;    0020  0       ! MAY NOT BE PROVIDED OR  OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON
;    0021  0       ! EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
;    0022  0       ! TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
;    0023  0       ! REMAIN IN DEC.
;    0024  0       !
;    0025  0       ! THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
;    0026  0       ! AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
;    0027  0       ! CORPORATION.
;    0028  0       !
;    0029  0       ! DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
;    0030  0       ! SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
;    0031  0
;    0032  0       !++
;    0033  0       ! FACILITY: Diagnostic Supervisor
;    0034  0       !
;    0035  0       ! ABSTRACT:
;    0036  0       !
;    0037  0       !      This module emulates RMS functions on ULTRIX media.
;    0038  0       !
;    0039  0       ! AUTHOR:
;    0040  0       !      M. BAGGETT              22-May-1985
;    0041  0       !
;    0042  0       ! MODIFIED BY:
;    0043  0       !      05      M. Baggett      24-Jul-1986     VDS 10                              !G:3
;    0044  0       !              Fix LOAD command and add documentation.                             !G:3
;    0045  0       !
;    0046  0       !      04      M. Baggett      10-March-1986   VDS 10                              !G:2
;    0047  0       !              Remove Static buffers and allow partition                           !G:2
;    0048  0       !              specifier to be number or letter.                                   !G:2
;    0049  0       !                                                                                  !G:2
;    0050  0       !      03      M. Baggett      4-Dec-1985      VDS 9.0
;    0051  0       !              Modified READ to allow starting at a given block
;    0052  0       !              within the file and only reading a specified
;    0053  0       !              number of bytes.
;    0054  0       !
;    0055  0       !      02      M. Baggett      8-Nov-1985      VDS 9.0
;    0056  0       !              Allow large files to load.
;    0057  0       !
```

```
;   0058  0       !      01      M. Baggett      22-Aug-1985     VDS 8.3
;   0059  0       !              Fix directory command to always give
;   0060  0       !              directory not found for bad directories.
;   0061  0       !--
;   0062  0
```

```
;    0063  0
;    0064  0      %sbttl 'declarations'
;    0065  1      begin
;    0066  1      !
;    0067  1      ! include files:
;    0068  1      !
;    0069  1
;    0070  1      library '$diag';                !                                                    [03]
;    0071  1
;    0072  1      library '$ds';                  !                                                    [03]
;    0073  1
;    0074  1      library 'sys$library:lib.l32';
;    0075  1      builtin
;    0076  1            rot;
;    0077  1      !
;    0078  1      ! local declarations
;    0079  1      !
;    0080  1
;    0081  1      linkage
;    0082  1          jsb_ultrix = jsb (register = 0) : global (block = 6, vbn = 7, offset = 8,  cblock = 9, rab = 10, fab =11);
;    0083  1
;    0084  1      !
;    0085  1      ! table of contents:
;    0086  1      !
;    0087  1
;    0088  1      forward routine
;    0089  1          ultrix$advance : jsb_ultrix novalue,        ! Advance RFA
;    0090  1          ultrix$access : jsb_ultrix,                 ! Access a VBN
;    0091  1          ultrix$open : call_rms,                     ! RMS$OPEN emulator--open file
;    0092  1          ultrix$get : call_rms,                      ! RMS$GET emulator--deblock record
;    0093  1          ultrix$openi: jsb_ultrix,                   ! Read in specified data
;    0094  1          ultrix$sbmap: jsb_ultrix,                   ! Map to blk # to Superblock
;    0095  1          ultrix$find:  jsb_ultrix,                   ! Find file
;    0096  1          ultrix$dlook: jsb_ultrix,                   ! Look for directory
;    0097  1          ultrix$readdir: Jsb_ultrix,                 ! Get directory inode #
;    0098  1          ultrix$getc:  jsb_ultrix,                   ! Get characters from file
;    0099  1          ultrix$ptinfo: jsb_ultrix,                  ! Get partition information
;    0100  1          ultrix$devread: jsb_ultrix,                 ! Read a block from device
;    0101  1          ultrix$read: call_rms;                      ! Read the file.
;    0102  1      !
;    0103  1      ! Local definitions
;    0104  1      !
;    0105  1      !
;    0106  1      ! External references
;    0107  1      !
;    0108  1
;    0109  1      external
;    0110  1         end_size: byte addressing_mode (long_relative); ! Directory string len
;    0111  1
;    0112  1      external routine
;    0113  1          rms$alloc_cache : jsb_cblock,       ! Allocate cache blocks
;    0114  1          boo$qio : addressing_mode (long_relative), ! standalone 'level-3' QIO
;    0115  1          exe$alononpaged : jsb_alloc addressing_mode (long_relative);       ! Allocate static buffer space
;    0116  1
;    0117  1      !
;    0118  1      ! psect definitions:
;    0119  1      !
```

```
;    0120  1
;    0121  1      psect
;    0122  1          plit = data ( share, addressing_mode (long_relative));
;    0123  1
;    0124  1      psect
;    0125  1          own = work ( read, write);
;    0126  1
;    0127  1      psect
;    0128  1          global = work ( read, write);
;    0129  1
;    0130  1      psect
;    0131  1          code = code (share);
;    0132  1      OWN
;    0133  1      cc: LONG,
;    0134  1      transfer_size,
;    0135  1      N,
;    0136  1      i,
;    0137  1      j,
;    0138  1      sh,
;    0139  1      rlen,
;    0140  1      len,
;    0141  1      d,
;    0142  1      lbn,
;    0143  1      off,
;    0144  1      state,
;    0145  1      frag_size,                              ! Size of fragment in bytes.
;    0146  1      str_size,
;    0147  1      str_path,
;    0148  1      diff,
;    0149  1      tmp_boff,                           ! 001
;    0150  1      boff,
;    0151  1      qio_status,                             ! RETURN STATUS FROM READ FUNCTION
;    0152  1      start_lbn,                              ! STARTING LBN
;    0153  1      byte_coun,                              ! SIZE OF TRANSFER
;    0154  1      adrs_mode,                              ! ADDRESSING MODE
;    0155  1      io_functn,                              ! FUNCTION REQUESTED
;    0156  1      buff_addr,                              ! BUFFER TO PUB DATA
;    0157  1      q,
;    0158  1      bn,
;    0159  1      nb,
;    0160  1      blknos,                                 ! Fileblock number for indirect address
;    0161  1      dp;
;    0162  1
;    0163  1
;    0164  1
;    0165  1      LITERAL
;    0166  1
;    0167  1      !
;    0168  1       ! Cylinder group related limits.
;    0169  1       !
;    0170  1       ! For each cylinder we keep track of the availability of blocks at different
;    0171  1       ! rotational positions, so that we can lay out the data to be picked
;    0172  1       ! up with minimum rotational latency.  NRPOS is the number of rotational
;    0173  1       ! positions which we distinguish.  With NRPOS 8 the resolution of our
;    0174  1       ! summary information is 2ms for a typical 3600 rpm drive.
;    0175  1       !
;    0176  1      NRPOS   =       8,      ! number distinct rotational positions
```

```
;    0177  1
;    0178  1      !
;    0179  1      ! File system parameters and macros.
;    0180  1      !
;    0181  1      ! The file system is made out of blocks of at most MAXBSIZE units,
;    0182  1      ! with smaller units (fragments) only in the last direct block.
;    0183  1      ! MAXBSIZE primarily determines the size of buffers in the buffer
;    0184  1      ! pool. It may be made larger without any effect on existing
;    0185  1      ! file systems; however making it smaller make make some file
;    0186  1      ! systems unmountable.
;    0187  1      !
;    0188  1      ! Note that the blocked devices are assumed to have DEV_BSIZE
;    0189  1      ! "sectors" and that fragments must be some multiple of this size.
;    0190  1      ! Block devices are read in BLKDEV_IOSIZE units. This number must
;    0191  1      ! be a power of two and in the range of
;    0192  1      !      DEV_BSIZE <= BLKDEV_IOSIZE <= MAXBSIZE
;    0193  1
;    0194  1      MAXBSIZE = 8192,
;    0195  1
;    0196  1
;    0197  1      !
;    0198  1      ! The I node is the focus of all file activity in UNIX.
;    0199  1      ! There is a unique inode allocated for each active file,
;    0200  1      ! each current directory, each mounted-on file, text file, and the root.
;    0201  1      ! An inode is 'named' by its dev/inumber pair. (iget/iget.c)
;    0202  1      ! Data in icommon is read in from permanent inode on volume.
;    0203  1      !
;    0204  1
;    0205  1      NDADDR  = 12,           ! direct addresses in inode
;    0206  1      NIADDR  =  3,           ! indirect addresses in inode
;    0207  1
;    0208  1      !
;    0209  1      ! MINBSIZE is the smallest allowable block size.
;    0210  1      ! In order to insure that it is possible to create files of size
;    0211  1      ! 2^32 with only two levels of indirection, MINBSIZE is set to 4096.
;    0212  1      ! MINBSIZE must be big enough to hold a cylinder group block,
;    0213  1      ! thus changes to (struct cg) must keep its size within MINBSIZE.
;    0214  1      ! MAXCPG is limited only to dimension an array in (struct cg);
;    0215  1      ! it can be made larger as long as that structures size remains
;    0216  1      ! within the bounds dictated by MINBSIZE.
;    0217  1      ! Note that super blocks are always of size MAXBSIZE,
;    0218  1      ! and that MAXBSIZE must be >= MINBSIZE.
;    0219  1
;    0220  1      MAXCPG  =       32,     ! maximum fs_cpg
;    0221  1
;    0222  1      !
;    0223  1      ! The path name on which the file system is mounted is maintained
;    0224  1      ! in fs_fsmnt. MAXMNTLEN defines the amount of space allocated in
;    0225  1      ! the super block for this name.
;    0226  1      ! The limit on the amount of summary information per file system
;    0227  1      ! is defined by MAXCSBUFS. It is currently parameterized for a
;    0228  1      ! maximum of two million cylinders.
;    0229  1      !
;    0230  1      MAXMNTLEN  =   512,
;    0231  1      MAXCSBUFS  =   32,
;    0232  1      SBSIZE     =   8192,
;    0233  1      dinode_size = 128,              ! Size of dinode structure
```

```
;    0234  1     pt_size = 72,                   ! Size of partition table
;    0235  1
;    0236  1     !
;    0237  1     !
;    0238  1     ! BLOCK STRUCTURE OFFSET VALUES
;    0239  1     !
;    0240  1     chain_base  =  4,
;    0241  1     lastr_base  =  chain_base + 34,
;    0242  1     mode_base   =  chain_base + 42,
;    0243  1     fs_base     =  MAXBSIZE + 214,
;    0244  1     ndir_base   =  fs_base + 192,
;    0245  1     buf_start   =  214,
;    0246  1     ROOTINO  = 2,   ! i number of all roots
;    0247  1
;    0248  1     NBUFS   =   1,  ! one buffer to read to.
;    0249  1     MAXNAMLEN  =   255,
;    0250  1
;    0251  1     !
;    0252  1     ! The first boot and super blocks are given in absolute disk addresses.
;    0253  1     !
;    0254  1
;    0255  1     ! Super block for a file system.
;    0256  1     !
;    0257  1     FS_MAGIC    =   %X'011954',
;    0258  1
;    0259  1     PT_MAGIC    =   %X'032957',     ! Partition magic number
;    0260  1     B_TAPE      =   1,
;    0261  1     BBSIZE          =  8192,
;    0262  1     DEV_BSIZE       =  512,
;    0263  1     F_FILE          =  %X'8',       ! file instead of device !
;    0264  1     SBLOCK     =    (BBSIZE / DEV_BSIZE),
;    0265  1
;    0266  1     NFILES          =  4,
;    0267  1
;    0268  1
;    0269  1     READVBLK =  %X'21',
;    0270  1     PHYSMODE  = %X'0',
;    0271  1
;    0272  1     READ    = 0,
;    0273  1
;    0274  1     ! io type
;    0275  1     F_RDDATA     =  %X'0100',               ! read data
;    0276  1
;    0277  1     F_TYPEMASK   =  %X'ff00',
;    0278  1     F_ALLOC = %X'4',        ! buffer allocated
;    0279  1
;    0280  1     !  modes
;    0281  1     IFMT    =       %o'0170000',    ! type of file
;    0282  1     IFDIR   =       %o'0040000',    ! directory
;    0283  1     NULL    =       0;
;    0284  1
;    0285  1                                                                          !G:2
;    0286  1     GLOBAL LITERAL                                                       !G:2
;    0287  1     ULTRIX$IOB = FS_BASE + SBSIZE,  ! Buffer size for IOB Buffer  [04]   !G:2
;    0288  1     ULTRIX$B   = NBUFS * MAXBSIZE;  ! Buffer size for B buffer    [04]   !G:2
;    0289  1                                                                          !G:2
;    0290  1     !
```

```
;    0291  1      ! I/O block
;    0292  1      !
;    0293  1      FIELD
;    0294  1       iob_fields=
;    0295  1             SET                                          ! STRUCTURE
;    0296  1        iob$l_i_flgs             =  [0,0,32,0],
;    0297  1        iob$l_i_ino              =  [4,0,32,0],                ! inode, if file
;    0298  1         iob$z_i_chain           =  [chain_base,0,32,0],       ! array [2] of pointer to struct inode
;    0299  1         iob$w_i_flag            =  [8+chain_base,0,16,0],     !
;    0300  1         iob$w_i_count           =  [10+chain_base,0,16,0],    ! reference count
;    0301  1         iob$w_i_dev             =  [12+chain_base,0,16,0],    ! device where inode resides
;    0302  1         iob$w_i_shlockc         =  [14+chain_base,0,16,0],          ! count of shared locks on inode
;    0303  1         iob$w_i_exlockc         =  [16+chain_base,0,16,0],          ! count of exclusive locks on inode
;    0304  1         iob$l_i_number          =  [18+chain_base,0,32,0],          ! i number, 1-to-1 with device address
;    0305  1         iob$l_i_id              =  [22+chain_base,0,32,0],    ! unique identifier
;    0306  1         iob$l_i_fs              =  [26+chain_base,0,32,0],          ! pointer to struct fs
;    0307  1         iob$l_i_dquot           =  [30+chain_base,0,32,0],    ! pointer to struct dquot
;    0308  1         iob$z_i_unx             =  [34+chain_base,0,32,0],    !
;    0309  1          iob$l_if_lastr         =  [lastr_base,0,32,0],             ! last read [read-ahead]
;    0310  1          iob$l_is_socket        =  [lastr_base,0,32,0],             ! pointer to struct socket
;    0311  1          iob$z_i_fr             =  [lastr_base,0,32,0],             ! file sys associated with this inode
;    0312  1           iob$l_if_freef        =  [lastr_base,0,32,0],             ! pointer to struct inode
;    0313  1           iob$l_if_freeb        =  [4+lastr_base,0,32,0],           ! pointer to pointer to struct inode
;    0314  1        iob$z_i_ic               =  [4+42,0,32,0],             ! inode stucture
;    0315  1      !
;    0316  1      ! inode structure offsets (128 bytes long)
;    0317  1      !
;    0318  1          iob$w_ic_mode          =  [mode_base,0,16,0],              ! mode and type of file
;    0319  1          iob$w_ic_nlink         =  [2+mode_base,0,16,0],            ! number of links to file
;    0320  1          iob$w_ic_uid           =  [4+mode_base,0,16,0],            ! owner's user id
;    0321  1          iob$w_ic_gid           =  [6+mode_base,0,16,0],            ! owner's group id
;    0322  1          iob$z_ic_size          =  [8+mode_base,0,32,0],            ! number of bytes in file
;    0323  1           iob$z_val             =  [8+mode_base,0,32,0],            ! array [2] of long int
;    0324  1          iob$l_ic_atime         =  [16+mode_base,0,32,0],           ! time last accessed
;    0325  1          iob$l_ic_atspare       =  [20+mode_base,0,32,0],           !
;    0326  1          iob$l_ic_mtime         =  [24+mode_base,0,32,0],           ! time last modified
;    0327  1          iob$l_ic_mtspare       =  [28+mode_base,0,32,0],           !
;    0328  1          iob$l_ic_ctime         =  [32+mode_base,0,32,0],           ! last time inode changed
;    0329  1          iob$l_ic_ctspare       =  [36+mode_base,0,32,0],           !
;    0330  1          iob$z_ic_db            =  [40+mode_base,0,32,0],           ! disk block addresses
;    0331  1          iob$z_ic_ib            =  [40+4*NDADDR+mode_base,0,32,0],  ! indirect blocks
;    0332  1          iob$l_ic_flags         =  [40+4*NDADDR+4*NIADDR+mode_base,0,32,0],  ! status (unused)
;    0333  1          iob$l_ic_blocks        =  [104+mode_base,0,32,0],          ! blocks actually held
;    0334  1          iob$z_ic_spare         =  [108+mode_base,0,32,0],          ! reserved (unused) 5 longwords
;    0335  1
;    0336  1
;    0337  1        iob$l_i_unit             =  [174,0,32,0],              ! pseudo device unit
;    0338  1        iob$l_i_boff             =  [178,0,32,0],              ! block offset on device
;    0339  1        iob$l_i_cyloff           =  [182,0,32,0],              ! cylinder offset on device
;    0340  1        iob$l_i_offset           =  [186,0,32,0],              ! seek offset in file
;    0341  1        iob$l_i_bn               =  [190,0,32,0],              ! 1st block # of next read
;    0342  1        iob$l_i_ma               =  [194,0,32,0],              ! memory address of i/o buffer
;    0343  1        iob$l_i_cc               =  [198,0,32,0],              ! character counter of transfer
;    0344  1        iob$l_i_error            =  [202,0,32,0],              ! error # return
;    0345  1        iob$l_i_errcnt           =  [206,0,32,0],              ! error count for driver retries
;    0346  1        iob$l_i_errblk           =  [210,0,32,0],              ! block # in error for error reporting
;    0347  1        iob$z_i_buf              =  [214,0,32,0],              ! array  of MAXBSIZE char
```

```
;    0348  1        iob$z_i_un              =  [214+MAXBSIZE,0,32,0],          !
;    0349  1
;    0350  1      ! Partition SUPERBLOCK
;    0351  1      !
;    0352  1        iob$z_dummy             =  [fs_base,0,32,0],                ! array of SBSIZE characters
;    0353  1         iob$z_ui_fs             =  [fs_base,0,32,0],               ! struct fs (overlaps with above buffer)
;    0354  1          iob$l_fs_link           =  [fs_base,0,32,0],              ! pointer to struct fs
;    0355  1          iob$l_fs_rlink          =  [4+fs_base,0,32,0],            ! pointer to struct fs. used for incore supe
;    0356  1          iob$l_fs_sblkno         =  [8+fs_base,0,32,0],            ! address of super-block in filesys
;    0357  1          iob$l_fs_cblkno         =  [12+fs_base,0,32,0],           ! offset of cylinder in filesys
;    0358  1          iob$l_fs_iblkno         =  [16+fs_base,0,32,0],           ! offset of inode-blocks in filesys
;    0359  1          iob$l_fs_dblkno         =  [20+fs_base,0,32,0],           ! offset of first data after cg
;    0360  1          iob$l_fs_cgoffset       =  [24+fs_base,0,32,0],           ! cylinder group offset in cylinder
;    0361  1          iob$l_fs_cgmask         =  [28+fs_base,0,32,0],           ! used to calc mod fs_ntrak
;    0362  1          iob$l_fs_time           =  [32+fs_base,0,32,0],           ! last time written
;    0363  1          iob$l_fs_size           =  [36+fs_base,0,32,0],           ! number of blocks in fs
;    0364  1          iob$l_fs_dsize          =  [40+fs_base,0,32,0],           ! number of data blocks in fs
;    0365  1          iob$l_fs_ncg            =  [44+fs_base,0,32,0],           ! number of cylinder groups
;    0366  1          iob$l_fs_bsize          =  [48+fs_base,0,32,0],           ! size of basic blocks in fs
;    0367  1          iob$l_fs_fsize          =  [52+fs_base,0,32,0],           ! size of frag blocks in fs
;    0368  1          iob$l_fs_frag           =  [56+fs_base,0,32,0],           ! number of frags in a blocks in fs
;    0369  1          iob$l_fs_minfree        =  [60+fs_base,0,32,0],           ! min % of free blocks. Configuration parame
;    0370  1          iob$l_fs_rotdelay       =  [64+fs_base,0,32,0],           ! # of ms for optimal next block
;    0371  1          iob$l_fs_rpss           =  [68+fs_base,0,32,0],           ! disk revolutions per second
;    0372  1          iob$l_fs_bmask          =  [72+fs_base,0,32,0],           ! "blkoff"  calc of blk offsets. Fields can
;    0373  1          iob$l_fs_fmask          =  [76+fs_base,0,32,0],           ! "fragoff" calc of frag offsets
;    0374  1          iob$l_fs_bshift         =  [80+fs_base,0,32,0],           ! "lblkno" calc of logical blkno
;    0375  1          iob$l_fs_fshift         =  [84+fs_base,0,32,0],           ! "numfrags" calc number of frags
;    0376  1          iob$l_fs_maxcontig      =  [88+fs_base,0,32,0],           ! max # of contiguous blks. Configuration pa
;    0377  1          iob$l_fs_maxbpg         =  [92+fs_base,0,32,0],           ! max # of blks per cyl group
;    0378  1          iob$l_fs_fragshift      =  [96+fs_base,0,32,0],           ! block to frag shift. Fields can be compute
;    0379  1          iob$l_fs_fsbtodb        =  [100+fs_base,0,32,0],        ! fsbtodb and dbtofsb shift constant
;    0380  1          iob$l_fs_sbsize         =  [104+fs_base,0,32,0],        ! actual size of super blocks
;    0381  1          iob$l_fs_csmask         =  [108+fs_base,0,32,0],        ! csum block offset
;    0382  1          iob$l_fs_csshift        =  [112+fs_base,0,32,0],        ! csum block number
;    0383  1          iob$l_fs_nindir         =  [116+fs_base,0,32,0],        ! value of NINDIR
;    0384  1          iob$l_fs_inopb          =  [120+fs_base,0,32,0],        ! value of IOPB
;    0385  1          iob$l_fs_nspf           =  [124+fs_base,0,32,0],        ! value of NSPF
;    0386  1          iob$z_fs_sparecon       =  [128+fs_base,0,32,0],        ! array  of 6 longword
;    0387  1          iob$l_fs_csaddr         =  [152+fs_base,0,32,0],        ! blk addr of cyl grp summary area.Sizes determined
;    0388  1          iob$l_fs_cssize         =  [156+fs_base,0,32,0],        ! size of cyl grp summary area
;    0389  1          iob$l_fs_cgsize         =  [160+fs_base,0,32,0],        ! cylinder group size
;    0390  1          iob$l_fs_ntrak          =  [164+fs_base,0,32,0],        ! track per cylinder. Fields derived from hardware
;    0391  1          iob$l_fs_nsect          =  [168+fs_base,0,32,0],        ! sectors per track
;    0392  1          iob$l_fs_spc            =  [172+fs_base,0,32,0],        ! sectors per cylinder
;    0393  1          iob$l_fs_ncyl           =  [176+fs_base,0,32,0],        ! cylinders in file system. From driver partitioning
;    0394  1          iob$l_fs_cpg            =  [180+fs_base,0,32,0],        ! cylinders per group. Fields computed
;    0395  1          iob$l_fs_ipg            =  [184+fs_base,0,32,0],        ! inodes per group
;    0396  1          iob$l_fs_fpg            =  [188+fs_base,0,32,0],        ! lblocks per group. fs_frag
;    0397  1          iob$z_fs_cstotal        =  [192+fs_base,0,32,0],        ! struct csum. Re-computed after crashes
;    0398  1           iob$l_cs_ndir           =  [ndir_base,0,32,0],                ! number of directories
;    0399  1           iob$l_cs_nbfree         =  [4+ndir_base,0,32,0],              ! number of free blocks
;    0400  1           iob$l_cs_nifree         =  [8+ndir_base,0,32,0],              ! number of free inodes
;    0401  1           iob$l_cs_nffree         =  [12+ndir_base,0,32,0],             ! number of free frags
;    0402  1          iob$b_fs_fmod           =  [208+fs_base,0,8,0],         ! super block modified flag
;    0403  1          iob$b_fs_clean          =  [209+fs_base,0,8,0],         ! file system is clean flag
;    0404  1          iob$b_fs_ronly          =  [210+fs_base,0,8,0],         ! mounted read-only flag
```

```
;    0405  1          iob$b_fs_flags        =  [211+fs_base,0,8,0],                ! currently unused flag
;    0406  1          iob$z_fs_fsmnt        =  [212+fs_base,0,32,0],               ! array of chars. Fields keep current blk allo info
;    0407  1          iob$l_fs_cgrotor      =  [212+fs_base+MAXMNTLEN,0,32,0],           ! last cg searched
;    0408  1          iob$z_fs_csp          =  [212+4+fs_base+MAXMNTLEN,0,32,0],         ! array of fs_cs info buffers
;    0409  1          iob$l_fs_cpc          =  [212+4+fs_base+MAXMNTLEN+4*MAXCSBUFS,0,32,0],          ! cyl per cycle in postbl
;    0410  1          iob$z_fs_postbl       =  [212+8+fs_base+MAXMNTLEN+4*MAXCSBUFS,0,32,0],          ! array of head of blocks of
;    0411  1          iob$l_fs_magic        =  [212+8+fs_base+MAXMNTLEN+4*MAXCSBUFS+2*(MAXCPG*NRPOS),0,32,0],    ! magic number
;    0412  1          iob$b_fs_rotbl        =  [212+12+fs_base+MAXMNTLEN+4*MAXCSBUFS+2*(MAXCPG*NRPOS),0,16,0],          ! list of bl
;    0413  2        iob$l_pt_magic          =  [fs_base+(sbsize
;    0414  2                                          - pt_size                    ! subtract size of partition table since this table
;    0415  2                                                                       ! justified to aligned with the end of the iob super
;    0416  1                                                  ),0,32,0],           ! magic #. Indicating partition info exits.
;    0417  1          iob$l_pt_valid        =  [fs_base+(sbsize-pt_size)+4,0,32,0],      ! Set by driver if pt is current.
;    0418  1          iob$l_pt_part         =  [fs_base+(sbsize-pt_size)+8,0,32,0],      !
;    0419  1
;    0420  1      ! the following two fields are replicated 8 times as a pair. One for each partition.
;    0421  1          iob$l_pi_nblocks      =  [fs_base+(sbsize-pt_size)+8,0,32,0],      ! No. of sectors for the partition  (start o
;    0422  1          iob$l_pi_blkoff       =  [fs_base+(sbsize-pt_size)+12,0,32,0]      ! block offset for start of partition  (star
;    0423  1                     TES;
;    0424  1
;    0425  1
;    0426  1      FIELD
;    0427  1       DIRECT_fields =
;    0428  1             SET                                                     ! STRUCTURE
;    0429  1       direct$l_d_ino          =     [0,0,32,0],                     ! inode number of entry
;    0430  1       direct$w_d_reclen       =     [4,0,16,0],                     ! length of this record
;    0431  1       direct$w_d_namlen       =     [6,0,16,0],                     ! length of string in d_name
;    0432  1       direct$z_d_name         =     [8,0,32,0]                      ! area of MAXNAMLEN+1 of chars
;    0433  1                     TES;
;    0434  1      FIELD
;    0435  1       DIRSTUFF_fields =
;    0436  1             SET                                                     ! STRUCTURE
;    0437  1       DIRSTUFF$l_loc          =     [0,0,32,0],                     !
;    0438  1       DIRSTUFF$l_io           =     [4,0,32,0]                      ! pointer to iob
;    0439  1                     TES;
;    0440  1
;    0441  1
;    0442  1      FIELD
;    0443  1       DEVSW_fields =
;    0444  1             SET                                                     ! STRUCTURE
;    0445  1          devsw$l_dv_name          =     [0,0,32,0],                     ! pointer to char
;    0446  1          devsw$l_dv_strategy      =     [4,0,32,0],                     ! pointer to function
;    0447  1          devsw$l_dv_open          =     [8,0,32,0],                     ! pointer to function
;    0448  1          devsw$l_dv_close         =     [12,0,32,0],                    ! pointer to function
;    0449  1          devsw$l_dv_ioctl         =     [16,0,32,0],                    ! pointer to function
;    0450  1          devsw$l_dv_flags         =     [20,0,32,0]                     !
;    0451  1             TES;
;    0452  1
;    0453  1      FIELD
;    0454  1       PT_fields =
;    0455  1             SET                                                     ! STRUCTURE
;    0456  1             pt$l_magic          =     [0,0,32,0],                     ! magic # of sectors for the partition
;    0457  1             pt$l_valid          =     [4,0,32,0],                     ! set by driver if pt is current
;    0458  1             pt$l_part           =     [8,0,32,0],                     ! array or 8
;    0459  1              pt$l_nblocks       =     [8,0,32,0],                     ! # of sectors for the partition
;    0460  1              pt$l_blkoff        =     [12,0,32,0]                     ! block offset for start of partition
;    0461  1             TES;
```

```
;    0462  1
;    0463  1     OWN
;    0464  1     IOB: REF BLOCK[,BYTE] FIELD(IOB_FIELDS), ! Byte block storage [04]                    !G:2
;    0465  1     b: REF BLOCK[,BYTE],                                                                 !G:2
;    0466  1
;    0467  1
;    0468  1     !! DIRECT:      BLOCK[8 + MAXNAMLEN + 1, BYTE]  FIELD(DIRECT_fields),   ! Byte block storage
;    0469  1
;    0470  1     DIRSTUFF:       BLOCK[8, BYTE]  FIELD(DIRSTUFF_fields), ! Byte block storage
;    0471  1
;    0472  1
;    0473  1     !! PT:  BLOCK[pt_size, BYTE]  FIELD(PT_fields), ! Byte block storage
;    0474  1
;    0475  1     DEVSW:  BLOCK[24, BYTE]  FIELD(DEVSW_fields);   ! Byte block storage
;    0476  1
;    0477  1
;    0478  1     GLOBAL BIND                                                                          !G:2
;    0479  1     ULTRIX_IOB_ADD = IOB,                           ! Address of IOB buffer [04]         !G:2
;    0480  1     ULTRIX_B_ADD = B;                               ! Address of B buffer   [04]         !G:2
;    0481  1                                                                                          !G:2
;    0482  1     !
;    0483  1      ! Turn file system block numbers into disk block addresses.
;    0484  1      ! This maps file system blocks to device size blocks.
;    0485  1      !
;    0486  1
;    0487  1     !
;    0488  1     ! INOPB is the number of inodes in a secondary storage block.
;    0489  1
```

```
;    0490  1
;    0491  1      %sbttl 'Advance RFA'
;    0492  1      routine ultrix$advance (len) : jsb_ultrix novalue =
;    0493  1
;    0494  1      !++
;    0495  1      ! Functional description:
;    0496  1      !       Increment the internal 'RFA' (offset and vbn parts) by the
;    0497  1      !       specified number of bytes.
;    0498  1      !
;    0499  1      ! Inputs:
;    0500  1      !       len                     number of bytes to increment by
;    0501  1      !
;    0502  1      ! Implicit inputs:
;    0503  1      !       R7                      vbn
;    0504  1      !
;    0505  1      ! Outputs:
;    0506  1      !       none
;    0507  1      !
;    0508  1      ! Implicit outputs:
;    0509  1      !       R7                      new vbn
;    0510  1      !
;    0511  1      ! Side effects:
;    0512  1      !       none
;    0513  1      !
;    0514  1      ! Return codes:
;    0515  1      !       none
;    0516  1      !--
;    0517  1
;    0518  2          begin
;    0519  2
;    0520  2          external register
;    0521  2             vbn = 7,                        ! Virtual block number
;    0522  2             offset = 8;                     ! offset in VBN
;    0523  2
;    0524  2          vbn = .vbn + ((.offset+.len)/512);  ! Calculate new page
;    0525  2          offset = (.offset + .len) and 511   ! Truncate to offset in page
;    0526  1          end;                                ! of ultrix$advance


                                .TITLE  ULTRIX *** ULTRIX Disk RMS routines
                                .IDENT  \01-05\

                                .PSECT  WORK,NOEXE,2

00000 CC:               .BLKB   4
00004 TRANSFER_SIZE:
                        .BLKB   4
00008 N:                .BLKB   4
0000C I:                .BLKB   4
00010 J:                .BLKB   4
00014 SH:               .BLKB   4
00018 RLEN:             .BLKB   4
0001C LEN:              .BLKB   4
00020 D:                .BLKB   4
00024 LBN:              .BLKB   4
00028 OFF:              .BLKB   4
0002C STATE:            .BLKB   4
```

```
00030 FRAG_SIZE:
                .BLKB   4
00034 STR_SIZE:
                .BLKB   4
00038 STR_PATH:
                .BLKB   4
0003C DIFF:     .BLKB   4
00040 TMP_BOFF:
                .BLKB   4
00044 BOFF:     .BLKB   4
00048 QIO_STATUS:
                .BLKB   4
0004C START_LBN:
                .BLKB   4
00050 BYTE_COUN:
                .BLKB   4
00054 ADRS_MODE:
                .BLKB   4
00058 IO_FUNCTN:
                .BLKB   4
0005C BUFF_ADDR:
                .BLKB   4
00060 Q:        .BLKB   4
00064 BN:       .BLKB   4
00068 NB:       .BLKB   4
0006C BLKNOS:   .BLKB   4
00070 DP:       .BLKB   4
00074 IOB:      .BLKB   4
00078 B:        .BLKB   4
0007C DIRSTUFF:
                .BLKB   8
00084 DEVSW:    .BLKB   24

                ULTRIX$IOB==            16598
                ULTRIX$B==              8192
                ULTRIX_IOB_ADD==        IOB
                ULTRIX_B_ADD==          B
                        .EXTRN  END_SIZE, RMS$ALLOC_CACHE
                        .EXTRN  BOO$QIO, EXE$ALONONPAGED

                        .PSECT  CODE,NOWRT,  SHR,2

                51      58      50  C1 00000 ULTRIX$ADVANCE:
                                             ADDL3   LEN, OFFSET, R1                 ; 0524
                50      51 00000200 8F  C7 00004        DIVL3   #512, R1, R0        ;
                        57      50  C0 0000C            ADDL2   R0, VBN             ;
        58      51      09      00  EF 0000F            EXTZV   #0, #9, R1, OFFSET  ; 0525
                                    05 00014            RSB                         ; 0526

; Routine Size:  21 bytes,    Routine Base:  CODE + 0000
```

```
;    0527  1
;    0528  1       %sbttl 'Access file block'
;    0529  1       routine ultrix$access : jsb_ultrix =
;    0530  1
;    0531  1       !++
;    0532  1       ! Functional description:
;    0533  1       !       If the desired VBN is not currently cached, update cache to
;    0534  1       !       contain it.
;    0535  1       !
;    0536  1       ! Inputs:
;    0537  1       !       none
;    0538  1       !
;    0539  1       ! Implicit inputs:
;    0540  1       !       R7                      VBN to cache/access
;    0541  1       !       R9                      pointer to CBLOCK control structure
;    0542  1       !       R10                     pointer to RAB
;    0543  1       !
;    0544  1       ! Outputs:
;    0545  1       !       none
;    0546  1       !
;    0547  1       ! Implicit outputs:
;    0548  1       !       R6                      pointer to 'memory image' of file block
;    0549  1       !
;    0550  1       ! Side effects:
;    0551  1       !       may alter cache control structure of CBLOCK
;    0552  1       !
;    0553  1       ! Return codes:
;    0554  1       !       RMS$_NORMAL             OK
;    0555  1       !       RMS$_RFA                random RFA is illegal
;    0556  1       !       RMS$_EOF                VBN is past end of file
;    0557  1       !       RMS$_RER                File read error
;    0558  1       !--
;    0559  1
;    0560  2           begin
;    0561  2
;    0562  2           external register
;    0563  2              block = 6,
;    0564  2              vbn = 7,
;    0565  2              offset = 8,
;    0566  2              cblock = 9 : ref bblock,
;    0567  2              rab = 10 : ref bblock,
;    0568  2              fab = 11 : ref bblock;
;    0569  2
;    0570  2           local
;    0571  2              read_blocks;                            ! Blocks to EOF
;    0572  2
;    0573  2           bind
;    0574  2              cache = cblock [ctl$l_cache1] : vector; ! Map for convenience
;    0575  2
;    0576  2           read_blocks = .cblock [ctl$l_eofvbn] - .vbn;
;    0577  2
;    0578  2           if .read_blocks lss 0                       ! If no more blocks
;    0579  3              or (.read_blocks eql 0                   !  or at EOF block
;    0580  3              and .cblock [ctl$w_offbyte] eql 0)       !  and no bytes there
;    0581  2           then
;    0582  2              return
;    0583  2
```

```
;    0584  2                 if .rab [rab$b_rac] eql rab$c_rfa then rms$_rfa else rms$_eof;      ! Check for illegal vbn
;    0585  2
;    0586  2             if .vbn lss .cblock [ctl$l_lvbn]                ! If VBN isn't
;    0587  2                or .vbn geq .cblock [ctl$l_hvbn]             !  cached now
;    0588  2             then
;    0589  3                begin                                        ! then cache it
;    0590  3
;    0591  3                if .cblock [ctl$w_cache_size] eql 0          ! If no cache allocated
;    0592  3                then
;    0593  4                    begin
;    0594  4
;    0595  4                    local
;    0596  4                        stat;
;    0597  4
;    0598  4                    stat = rms$alloc_cache (1);              ! Allocate cache
;    0599  4
;    0600  4                    if not .stat
;    0601  4                    then
;    0602  4                        return rms$_dme                      ! Error if can't
;    0603  3                    end;
;    0604  3
;    0605  3                cblock [ctl$l_lvbn] = 0;                     ! Clear start vbn
;    0606  3                cblock [ctl$l_hvbn] = 0;                     ! Clear high vbn
;    0607  3                read_blocks = min (2,                        ! 3 blocks or to EOF
;    0608  3                    (.read_blocks*512 + .cblock [ctl$w_offbyte] + 511)/512 - 1);
;    0609  3                incr i from 0 to .read_blocks do             ! Read cache buffers
;    0610  4                    begin
;    0611  4
;    0612  4                    local
;    0613  4                        stat;
;    0614  4
;    0615  4                    iob[iob$l_i_ma] = .cache[.i];                ! Buffer to read to
;    0616  4                    iob[iob$l_i_offset] = (.vbn-1 + .i) * 512 ;      ! offset into file in bytes
;    0617  4                    iob[iob$l_i_cc]  =   512 ;                   ! # of bytes to read
;    0618  4                    stat = ultrix$getc() ;                       ! Read in data
;    0619  4
;    0620  4                    if not .stat                             ! If it failed
;    0621  4                    then
;    0622  5                        begin
;    0623  5                        rab [rab$l_stv] = .stat;             ! Load QIO return
;    0624  5                        return rms$_rer
;    0625  5                        end
;    0626  5
;    0627  3                    end;
;    0628  3
;    0629  3                cblock [ctl$l_lvbn] = .vbn;                  ! Set new low vbn
;    0630  3                cblock [ctl$l_hvbn] = .vbn + .read_blocks + 1    ! Set new high vbn
;    0631  2                end;
;    0632  2
;    0633  2             block = .cache [.vbn - .cblock [ctl$l_lvbn]];       ! Get buffer pointer
;    0634  2             1                                               ! Return success
;    0635  1             end;                                            ! of ultrix$access
```

```
                                        1C  BB 00000 ULTRIX$ACCESS:
                                                          PUSHR   #^M<R2,R3,R4>                                  ; 0529
                        54       2C     A9  9E 00002     MOVAB   44(CBLOCK), R4                                 ; 0574
          52       44   A9             57  C3 00006     SUBL3   VBN, 68(CBLOCK), READ_BLOCKS                   ; 0576
                                        07  19 0000B     BLSS    1$                                             ; 0578
                                        1D  12 0000D     BNEQ    3$                                             ; 0579
                                 42     A9  B5 0000F     TSTW    66(CBLOCK)                                     ; 0580
                                        18  12 00012     BNEQ    3$                                             ;
                        02       1E     AA  91 00014 1$: CMPB    30(RAB), #2                                    ; 0584
                                        09  12 00018     BNEQ    2$                                             ;
                        50 0001865C     8F  D0 0001A     MOVL    #99932, R0                                     ;
                                        30  11 00021     BRB     5$                                             ;
                        50 0001827A     8F  D0 00023 2$: MOVL    #98938, R0                                     ;
                                        27  11 0002A     BRB     5$                                             ; 0582
                   28   A9             57  D1 0002C 3$: CMPL    VBN, 40(CBLOCK)                                ; 0586
                                        09  19 00030     BLSS    4$                                             ;
                   24   A9             57  D1 00032     CMPL    VBN, 36(CBLOCK)                                ; 0587
                                        03  18 00036     BGEQ    4$                                             ;
                                      0087  31 00038     BRW     10$                                            ;
                                 0A     A9  B5 0003B 4$: TSTW    10(CBLOCK)                                     ; 0591
                                        15  12 0003E     BNEQ    6$                                             ;
                        50             01  D0 00040     MOVL    #1, R0                                         ; 0598
                           00000000G    EF  16 00043     JSB     RMS$ALLOC_CACHE                                ;
                        09             50  E8 00049     BLBS    STAT, 6$                                       ; 0600
                        50 000184D4     8F  D0 0004C     MOVL    #99540, R0                                     ; 0602
                                        79  11 00053 5$: BRB     11$                                            ;
                                 24     A9  7C 00055 6$: CLRQ    36(CBLOCK)                                     ; 0606
          50            52             09  78 00058     ASHL    #9, READ_BLOCKS, R0                            ; 0608
                        51       42     A9  3C 0005C     MOVZWL  66(CBLOCK), R1                                 ;
                        50     01FF C140  9E 00060     MOVAB   511(R1)[R0], R0                                ;
                        50 00000200     8F  C6 00066     DIVL2   #512, R0                                       ;
                                        50  D7 0006D     DECL    R0                                             ;
                        02             50  D1 0006F     CMPL    R0, #2                                         ; 0607
                                        03  15 00072     BLEQ    7$                                             ;
                        50             02  D0 00074     MOVL    #2, R0                                         ;
                        52             50  D0 00077 7$: MOVL    R0, READ_BLOCKS                                ;
                        53             01  CE 0007A     MNEGL   #1, I                                          ; 0609
                                        35  11 0007D     BRB     9$                                             ;
                        50 00000000'    EF  D0 0007F 8$: MOVL    IOB, R0                                        ; 0615
                   00C2 C0           6443  D0 00086     MOVL    (R4)[I], 194(R0)                               ;
                        51       FF A347  9E 0008C     MOVAB   -1(I)[VBN], R1                                 ; 0616
     00BA   C0          51             09  78 00091     ASHL    #9, R1, 186(R0)                                ;
                   00C6 C0     0200     8F  3C 00097     MOVZWL  #512, 198(R0)                                  ; 0617
                           00000000V    EF  16 0009E     JSB     ULTRIX$GETC                                    ; 0618
                        0D             50  E8 000A4     BLBS    STAT, 9$                                       ; 0620
                   0C   AA             50  D0 000A7     MOVL    STAT, 12(RAB)                                  ; 0623
                        50 0001C0F4     8F  D0 000AB     MOVL    #114932, R0                                    ; 0624
                                        1A  11 000B2     BRB     11$                                            ;
          C7            53             52  F3 000B4 9$: AOBLEQ  READ_BLOCKS, I, 8$                             ; 0609
                   28   A9             57  D0 000B8     MOVL    VBN, 40(CBLOCK)                                ; 0629
                   24   A9       01 A247  9E 000BC     MOVAB   1(READ_BLOCKS)[VBN], 36(CBLOCK)                ; 0630
          50            57       28     A9  C3 000C2 10$: SUBL3   40(CBLOCK), VBN, R0                            ; 0633
                        56           6440  D0 000C7     MOVL    (R4)[R0], BLOCK                                ;
                        50             01  D0 000CB     MOVL    #1, R0                                         ; 0635
                                        1C  BA 000CE 11$: POPR    #^M<R2,R3,R4>                                  ;
                                            05 000D0     RSB                                                    ;
```

```
; Routine Size:  209 bytes,    Routine Base:  CODE + 0015
```

```
;    0636  1
;    0637  1       %sbttl 'ULTRIX OPEN service'
;    0638  1
;    0639  1       global routine ultrix$open : call_rms =
;    0640  1
;    0641  1       !++
;    0642  1       ! Functional description:
;    0643  1       !       Access a file on ULTRIX files-11 disk media.  Return file parameters
;    0644  1       !       in the FAB and internal control block associated with the file
;    0645  1       !
;    0646  1       ! Inputs:
;    0647  1       !       none
;    0648  1       !
;    0649  1       ! Implicit inputs:
;    0650  1       !       R11     points to the FAB
;    0651  1       !       R9      points to the CBLOCK (internal RMS control block)
;    0652  1       !
;    0653  1       ! Outputs:
;    0654  1       ! str_path    - Pointer to start of directory "---/---/---..." following ')'.
;    0655  1       ! str_size    - length of directory string
;    0656  1       !
;    0657  1       !
;    0658  1       ! Implicit outputs:
;    0659  1       !       Several fields in the FAB and in the static file control block
;    0660  1       !       are altered to describe the file.  Also, if an XAB (XABFHC is
;    0661  1       !       the only XAB currently supported) exists, it will be filled in.
;    0662  1       !
;    0663  1       ! Side effects:
;    0664  1       !
;    0665  1       !
;    0666  1       ! Return status
;    0667  1       !       RMS$_DME        insufficient memory for buffer allocation
;    0668  1       !       RMS$_FNF        file not found
;    0669  1       !       RMS$_FNM        Bad file name
;    0670  1       !       RMS$_RER        QIO error on file access
;    0671  1       !       RMS$_NORMAL     success
;    0672  1       !--
;    0673  1
;    0674  2           begin
;    0675  2
;    0676  2           local
;    0677  2              stat;
;    0678  2
;    0679  2           external register
;    0680  2              cblock = 9 : ref bblock,        ! Pointer to control block
;    0681  2              rab = 10 : ref bblock,
;    0682  2              fab = 11 : ref bblock;          ! Pointer to FAB
;    0683  2            global register
;    0684  2              block = 6 : ref vector [,byte], ! Pointer to cache buffer
;    0685  2              vbn = 7,                        ! Current VBN in file
;    0686  2              offset = 8;                     ! Current offset in VBN
;    0687  2
;    0688  2
;    0689  2
;    0690  2           cblock [ctl$l_get] = ultrix$get;          ! Set GET routine address
;    0691  2           cblock [ctl$l_read] = ultrix$read;        ! Set READ routine address
;    0692  2           cblock [ctl$l_startlbn] = 0 ;             ! First LBN (if contiguous)
```

```
;   0693  2                                                 ! 0 if not
;   0694  2          fab [fab$b_org] = FAB$C_SEQ;           ! File organization
;   0695  2          fab [fab$b_rfm] = FAB$C_fix;           ! Record format, assume .exe file.
;   0696  2          fab [fab$w_mrs] = 512;                 ! Max. rec size
;   0697  2
;   0698  2                                                 ! initialize parameters
;   0699  2        iob[iob$l_i_flgs] = .iob[iob$l_i_flgs] OR F_ALLOC;  ! Set as being allocated
;   0700  2        iob[iob$l_i_unit] = 0 ;                  ! Initialize counter.
;   0701  2            iob[iob$l_i_boff] = CH$FIND_CH(.CBLOCK[CTL$W_FILE_LEN], .CBLOCK[CTL$L_FILE_PTR],%C',')+1;
;   0702  2           str_size  = .CBLOCK[CTL$W_FILE_LEN] - (.iob[iob$l_i_boff] -.CBLOCK[CTL$L_FILE_PTR]) - 1; ! update length
;   0703  2           str_path  = .iob[iob$l_i_boff]+1;      ! update pointer to include pass ')'
;   0704  2
;   0705  2                                                          ! Check partition indicator
;   0706  2                                                                                      !G:2
;   0707  2          IF  .(.iob[iob$l_i_boff])<0,8> GEQ %C'A' AND .(.iob[iob$l_i_boff])<0,8> LEQ %C'G' ! Check for letter only. [0
;   0708  2           THEN                                                                       !G:2
;   0709  2                iob[iob$l_i_unit] =  .(.iob[iob$l_i_boff])<0,8> -%c'A'   ! Change from ascii.  !G:2
;   0710  2           ELSE                                                                       !G:2
;   0711  3             BEGIN                                                                    !G:2
;   0712  3                 IF  .(.iob[iob$l_i_boff])<0,8> GEQ %C'a' AND .(.iob[iob$l_i_boff])<0,8> LEQ %C'g' ! Check for letter on
;   0713  3                  THEN                                                               !G:2
;   0714  3                   iob[iob$l_i_unit] =  .(.iob[iob$l_i_boff])<0,8> -%c'a'   ! Change from ascii.  !G:2
;   0715  3                  ELSE                                                               !G:2
;   0716  4                   BEGIN                                                             !G:2
;   0717  4                    IF  .(.iob[iob$l_i_boff])<0,8> GEQ %C'0' AND .(.iob[iob$l_i_boff])<0,8> LEQ %C'9' ! Check for numbe
;   0718  4                     THEN                                                            !G:2
;   0719  4                      iob[iob$l_i_unit] =  .(.iob[iob$l_i_boff])<0,8> -%c'0'   ! Change from ascii.  !G:2
;   0720  4                     ELSE                                                            !G:2
;   0721  4                      RETURN (RMS$_RER) ;                ! Exit with error. Bad unit number.  !G:2
;   0722  3                 END;                                                                 !G:2
;   0723  2             END;                                        !                    [04]    !G:2
;   0724  2                                                                                      !G:2
;   0725  2        str_path = .str_path + 1;          ! Point to next character.                 !G:2
;   0726  2        str_size = .str_size - 1;          ! Reduce length.                           !G:2
;   0727  2        iob[iob$l_i_boff] = .iob[iob$l_i_unit] ;          ! Set in proper field.
;   0728  2         !
;   0729  2         !      If we are opening a tape we don't do the disk partitioning
;   0730  2         !      stuff
;   0731  2         !
;   0732  2        IF  .devsw[devsw$l_dv_flags]  NEQ  B_TAPE
;   0733  2        THEN
;   0734  3                BEGIN
;   0735  3
;   0736  3                !
;   0737  3                !       Before we can actually open up the device we first must
;   0738  3                !       try to read the partition table if  exists
;   0739  3                !
;   0740  3
;   0741  3                tmp_boff = .iob[iob$l_i_boff];
;   0742  3                iob[iob$l_i_boff] = 0;
;   0743  3
;   0744  3                !
;   0745  3                !       Open up the "A" partition
;   0746  3                !
;   0747  3                iob[iob$l_i_ma] = iob[iob$z_ui_fs];                  ! set pointer to buffer
;   0748  3                iob[iob$l_i_cc] = SBSIZE;                  ! set size of transfer
;   0749  3                iob[iob$l_i_bn] =  SBLOCK;                 ! set 1st block to read superblock
```

```
;    0750  3                    iob[iob$l_i_offset] = 0;                        ! set offset for seek in file
;    0751  3
;    0752  3                    !
;    0753  3                    !       Read the superblock that may contain the partition
;    0754  3                    !       tables
;    0755  3                    !
;    0756  3                    IF  ultrix$devread()            ! Read in Superblock, Cylinder group block and I-list.
;    0757  3                    THEN
;    0758  4                            BEGIN                   !
;    0759  4                            !       Now check to see if partition table exists
;    0760  4                            !
;    0761  4                            IF  ( state =ultrix$ptinfo(.tmp_boff) )  EQL DS$_NOSUPPORT
;    0762  4                            THEN
;    0763  4                                    !       Partition table does not exist so just
;    0764  4                                    !       open the device that user has specified
;    0765  4                                    !
;    0766  4                            ELSE
;    0767  4                                    IF .state EQL  DS$_ERROR
;    0768  4                                    THEN RETURN (RMS$_RER)  ;       ! Exit on error.
;    0769  3                            END;
;    0770  3
;    0771  2                    END;
;    0772  2
;    0773  2                    !
;    0774  2                    !       We come here if we are a tape device
;    0775  2                    !       No special work for tape device
;    0776  2                    !       Just fall through as if disk
;    0777  2                    !
;    0778  2                    IF      .str_size LEQ  0
;    0779  2                            THEN
;    0780  3                               BEGIN
;    0781  3                               iob[iob$l_i_flgs]= .iob[iob$l_i_flgs] OR  1 ;
;    0782  3                                    iob[iob$l_i_cc] = 0;
;    0783  3                                    iob[iob$l_i_offset] = 0;
;    0784  3                                    return (RMS$_FNM);
;    0785  2                               END;
;    0786  2                    iob[iob$l_i_ma] = iob[iob$z_ui_fs];     ! Buffer to read to.
;    0787  2                    iob[iob$l_i_cc] = SBSIZE;               ! Character count to read
;    0788  2                    iob[iob$l_i_bn] = SBLOCK + .iob[iob$l_i_boff]; ! Starting block # to read in
;    0789  2                    iob[iob$l_i_offset] = 0;
;    0790  2                    IF  NOT ultrix$devread()                ! Read in superblock for this operation
;    0791  2                    THEN
;    0792  3                            BEGIN
;    0793  3                            iob[iob$l_i_flgs] = 0;
;    0794  3                                                            ! super block read error
;    0795  3                            return (RMS$_RER);
;    0796  2                            END;
;    0797  2
;    0798  2                    IF ( i = ultrix$find())  EQL 0          ! send address of start of "---/---/--..."
;    0799  2                    THEN
;    0800  3                            BEGIN
;    0801  3                            iob[iob$l_i_flgs] = 0;
;    0802  3                            return (RMS$_FNF);              ! File not found
;    0803  2                            END;
;    0804  2                    IF ultrix$openi(.i)  LSS  0             ! Insure current file is set up in IOB structure
;    0805  2                    THEN
;    0806  3                            BEGIN
```

```
;    0807  3                    iob[iob$l_i_flgs] = 0;
;    0808  3                    return (RMS$_FNF);
;    0809  2                    END;
;    0810  2                iob[iob$l_i_flgs] = .iob[iob$l_i_flgs]  OR  (F_FILE OR 1);
;    0811  2                                                        ! Get EOF block, which is
;    0812  2            cblock [ctl$l_eofvbn] =                     ! The EOF block VBN is
;    0813  2                1 + .iob[iob$z_ic_size]/512;            ! Convert bytes to  virtual blocks
;    0814  2            cblock [ctl$w_offbyte] = .iob[iob$z_ic_size] MOD 512; ! Get residual bytes.
;    0815  2                blknos  = 0;                            ! Initialize value flag.
;    0816  2                return  (RMS$_NORMAL);
;    0817  2
;    0818  1            end;                                        ! of ULTRIX$OPEN



                                        01FC 00000          .ENTRY  ULTRIX$OPEN, Save R2,R3,R4,R5,R6,R7,R8      ; 0639
                                54 00000000V  EF   9E 00002 MOVAB   ULTRIX$DEVREAD, R4                          ;
                                53 00000000'  EF   9E 00009 MOVAB   IOB, R3                                     ;
                             0C A9 00000000V  EF   9E 00010 MOVAB   ULTRIX$GET, 12(CBLOCK)                      ; 0690
                             10 A9 00000000V  EF   9E 00018 MOVAB   ULTRIX$READ, 16(CBLOCK)                     ; 0691
                                         50   A9   D4 00020 CLRL    80(CBLOCK)                                  ; 0692
                                         1D   AB   94 00023 CLRB    29(FAB)                                     ; 0694
                             1F  AB           01   90 00026 MOVB    #1, 31(FAB)                                 ; 0695
                             36  AB      0200 8F   B0 0002A MOVW    #512, 54(FAB)                               ; 0696
                                 57           63   D0 00030 MOVL    IOB, R7                                     ; 0699
                                 67           04   88 00033 BISB2   #4, (R7)                                    ;
                                 58      00AE C7   9E 00036 MOVAB   174(R7), R8                                 ; 0700
                                             68   D4 0003B CLRL    (R8)                                        ;
                                 52      00B2 C7   9E 0003D MOVAB   178(R7), R2                                 ; 0701
                                 56        48 A9   3C 00042 MOVZWL  72(CBLOCK), R6                             ;
                          4C  B9           56       2C 3A 00046 LOCC    #44, R6, @76(CBLOCK)                    ;
                                                    02 12 0004B BNEQ    1$                                      ;
                                                    51 D4 0004D CLRL    R1                                      ;
                                 62         01 A1   9E 0004F 1$: MOVAB   1(R1), (R2)                            ;
                                 50            62   D0 00053 MOVL    (R2), R0                                    ; 0702
                              51       4C A9       50   C3 00056 SUBL3   R0, 76(CBLOCK), R1                     ;
                                C0 A3       FF A146   9E 0005B MOVAB   -1(R1)[R6], STR_SIZE                     ;
                                C4 A3       01 A0     9E 00061 MOVAB   1(R0), STR_PATH                          ; 0703
                                41 8F           60   91 00066 CMPB    (R0), #65                                   ; 0707
                                                12   1F 0006A BLSSU   2$                                        ;
                                47 8F           60   91 0006C CMPB    (R0), #71                                   ;
                                                0C   1A 00070 BGTRU   2$                                        ;
                                 68             60   9A 00072 MOVZBL  (R0), (R8)                                ; 0709
                                 68 00000041    8F   C2 00075 SUBL2   #65, (R8)                                 ;
                                                2B   11 0007C BRB     6$                                        ;
                                61 8F           60   91 0007E 2$: CMPB    (R0), #97                           ; 0712
                                                12   1F 00082 BLSSU   3$                                        ;
                                67 8F           60   91 00084 CMPB    (R0), #103                              ;
                                                0C   1A 00088 BGTRU   3$                                        ;
                                 68             60   9A 0008A MOVZBL  (R0), (R8)                                ; 0714
                                 68 00000061    8F   C2 0008D SUBL2   #97, (R8)                                 ;
                                                13   11 00094 BRB     6$                                        ;
                                 30             60   91 00096 3$: CMPB    (R0), #48                           ; 0717
                                                03   1E 00099 BGEQU   5$                                        ;
                                             009D 31   0009B 4$: BRW     9$                                     ;
```

```
                                39          60  91 0009E 5$:    CMPB    (R0), #57                                ;
                                            F8  1A 000A1        BGTRU   4$                                       ;
                                68          60  9A 000A3        MOVZBL  (R0), (R8)                               ; 0719
                                68          30  C2 000A6        SUBL2   #48, (R8)                                ;
                                      C4    A3  D6 000A9 6$:    INCL    STR_PATH                                 ; 0725
                                      C0    A3  D7 000AC        DECL    STR_SIZE                                 ; 0726
                                62          68  D0 000AF        MOVL    (R8), (R2)                               ; 0727
                                01    24    A3  D1 000B2        CMPL    DEVSW+20, #1                             ; 0732
                                            43  13 000B6        BEQL    7$                                       ;
                          CC    A3          62  D0 000B8        MOVL    (R2), TMP_BOFF                           ; 0741
                                            62  D4 000BC        CLRL    (R2)                                     ; 0742
                        00C2    C7    20D6  C7  9E 000BE        MOVAB   8406(R7), 194(R7)                        ; 0747
                        00C6    C7    2000  8F  3C 000C5        MOVZWL  #8192, 198(R7)                           ; 0748
                        00BE    C7          10  D0 000CC        MOVL    #16, 190(R7)                             ; 0749
                                      00BA  C7  D4 000D1        CLRL    186(R7)                                  ; 0750
                                            64  16 000D5        JSB     ULTRIX$DEVREAD                           ; 0756
                                21          50  E9 000D7        BLBC    R0, 7$                                   ;
                                50    CC    A3  D0 000DA        MOVL    TMP_BOFF, R0                             ; 0761
                                   00000000V  EF  16 000DE        JSB     ULTRIX$PTINFO                            ;
                          B8    A3          50  D0 000E4        MOVL    R0, STATE                                ;
                    006600B1    8F          50  D1 000E8        CMPL    R0, #6684849                             ;
                                            0A  13 000EF        BEQL    7$                                       ;
                    00660002    8F    B8    A3  D1 000F1        CMPL    STATE, #6684674                          ; 0767
                                            40  13 000F9        BEQL    9$                                       ;
                                      C0    A3  D5 000FB 7$:    TSTL    STR_SIZE                                 ; 0778
                                            16  14 000FE        BGTR    8$                                       ;
                                50          63  D0 00100        MOVL    IOB, R0                                  ; 0781
                                60          01  88 00103        BISB2   #1, (R0)                                 ;
                                      00C6  C0  D4 00106        CLRL    198(R0)                                  ; 0782
                                      00BA  C0  D4 0010A        CLRL    186(R0)                                  ; 0783
                                50 0001852C 8F  D0 0010E        MOVL    #99628, R0                               ; 0784
                                            04  00115           RET                                              ;
                                50          63  D0 00116 8$:    MOVL    IOB, R0                                  ; 0786
                        00C2    C0    20D6  C0  9E 00119        MOVAB   8406(R0), 194(R0)                        ;
                        00C6    C0    2000  8F  3C 00120        MOVZWL  #8192, 198(R0)                           ; 0787
          00BE    C0    00B2    C0          10  C1 00127        ADDL3   #16, 178(R0), 190(R0)                    ; 0788
                                      00BA  C0  D4 0012F        CLRL    186(R0)                                  ; 0789
                                            64  16 00133        JSB     ULTRIX$DEVREAD                           ; 0790
                                0B          50  E8 00135        BLBS    R0, 10$                                  ;
                                      00    B3  D4 00138        CLRL    @IOB                                     ; 0793
                                50 0001C0F4 8F  D0 0013B 9$:    MOVL    #114932, R0                              ; 0795
                                            04  00142           RET                                              ;
                                   00000000V  EF  16 00143 10$:   JSB     ULTRIX$FIND                              ; 0798
                          98    A3          50  D0 00149        MOVL    R0, I                                    ;
                                            0E  13 0014D        BEQL    11$                                      ;
                                50    98    A3  D0 0014F        MOVL    I, R0                                    ; 0804
                                   00000000V  EF  16 00153        JSB     ULTRIX$OPENI                             ;
                                            50  D5 00159        TSTL    R0                                       ;
                                            0B  18 0015B        BGEQ    12$                                      ;
                                      00    B3  D4 0015D 11$:   CLRL    @IOB                                     ; 0807
                                50 00018292 8F  D0 00160        MOVL    #98962, R0                               ; 0808
                                            04  00167           RET                                              ;
                                50          63  D0 00168 12$:   MOVL    IOB, R0                                  ; 0810
                                60          09  88 0016B        BISB2   #9, (R0)                                 ;
                    51    36    A0 00000200 8F  C7 0016E        DIVL3   #512, 54(R0), R1                         ; 0813
                          44    A9    01    A1  9E 00177        MOVAB   1(R1), 68(CBLOCK)                        ;
    7E            00    36    A0          01  7A 0017C        EMUL    #1, 54(R0), #0, -(SP)                    ; 0814
```

```
          50            50          8E 00000200   8F  7B 00182        EDIV    #512, (SP)+, R0, R0                     ;
                                 42   A9           50  B0 0018B        MOVW    R0, 66(CBLOCK)                          ;
                                      F8           A3  D4 0018F        CLRL    BLKNOS                                  ; 0815
                                      50 00010001  8F  D0 00192        MOVL    #65537, R0                              ; 0816
                                                       04 00199        RET                                             ;

; Routine Size:  410 bytes,    Routine Base:  CODE + 00E6

;   0819  1
;   0820  1
;   0821  1
```

```
;    0823  1      %sbttl 'ultrix$find'                                                    !G:3
;    0824  1      routine ultrix$find  : jsb_ultrix  =
;    0825  1
;    0826  1      !++
;    0827  1      ! Functional description:
;    0828  1      !
;    0829  1      ! Addresses stored in inodes are capable of addressing fragments
;    0830  1      ! of several blocks. File system blocks of at most size MAXBSIZE can
;    0831  1      ! be optionally broken into 2, 4, or 8 pieces, each of which is
;    0832  1      ! addressible; these pieces may be DEV_BSIZE, or some multiple of
;    0833  1      ! a DEV_BSIZE unit.
;    0834  1      !
;    0835  1      ! Large files consist of exclusively large data blocks.  To avoid
;    0836  1      ! undue wasted disk space, the last data block of a small file may be
;    0837  1      ! allocated as only as many fragments of a large block as are
;    0838  1      ! necessary.  The file system format retains only a single pointer
;    0839  1      ! to such a fragment, which is a piece of a single large block that
;    0840  1      ! has been divided.  The size of such a fragment is determinable from
;    0841  1      ! information in the inode.  This field  is filled in when the disk
;    0842  1      ! is created.
;    0843  1      !
;    0844  1      ! The file system shows file size at the fragment level;
;    0845  1      ! to determine number of blocks, aligned fragments are examined.
;    0846  1      !
;    0847  1      ! The root inode is the root of the file system.
;    0848  1      ! Inode 0 can't be used for normal purposes and
;    0849  1      ! historically bad blocks were linked to inode 1,
;    0850  1      ! thus the root inode is 2. (inode 1 is no longer used for
;    0851  1      ! this purpose, however numerous dump tapes make this
;    0852  1      ! assumption, so we are stuck with it).
;    0853  1      !
;    0854  1      ! Inputs:
;    0855  1      !       none
;    0856  1      !
;    0857  1      ! Implicit inputs:
;    0858  1      ! str_path      - Pointer to start of directory "---/---/---..."
;    0859  1      ! str_size      - length of directory string
;    0860  1      ! CBLOCK        - Various fields
;    0861  1      !
;    0862  1      ! Outputs:
;    0863  1      ! inode # or zero if none.
;    0864  1      !
;    0865  1      ! Implicit outputs:
;    0866  1      !
;    0867  1      ! Side effects:
;    0868  1      !
;    0869  1      ! Return status
;    0870  1      !       none
;    0871  1      !
;    0872  1      ! --
;    0873  2      BEGIN
;    0874  2
;    0875  2          Local
;    0876  2             dn_ext : long,                                  ! Default name extension
;    0877  2             prev_n;                                         ! Previous inode #
;    0878  2          external register
;    0879  2             block = 6,
```

```
;    0880  2              vbn = 7,
;    0881  2              offset = 8,
;    0882  2              cblock = 9 : ref bblock,
;    0883  2              rab = 10 : ref bblock,
;    0884  2              fab = 11 : ref bblock;
;    0885  2
;    0886  2
;    0887  2              If ultrix$openi(ROOTINO) LSS 0                  ! ROOTINO = 2
;    0888  2              THEN
;    0889  2                   return (0);
;    0890  2              IF   .Fab[fab$l_dna] NEQ 0                      ! If present Convert to LC
;    0891  2                 THEN
;    0892  2                   dn_ext =  .(.Fab[fab$l_dna] +.Fab[fab$b_dns]-4) OR  '.   ';
;    0893  2              rlen = .str_size ;              ! initialize remain length
;    0894  2              while .rlen NEQ 0 DO
;    0895  3              BEGIN
;    0896  3                   while  .(.str_path)<0,8>  EQL %C'/' DO
;    0897  4                        BEGIN
;    0898  4                        str_size = .str_size - 1;               ! Go pass "/"
;    0899  4                        str_path = .str_path + 1;
;    0900  3                        END;
;    0901  3                   q = .str_path;
;    0902  3                   rlen = .str_size;                            ! save remaining length in string
;    0903  3                   while .(.q)<0,8> NEQ  %C'/' AND  .str_size NEQ  0  DO
;    0904  4                        BEGIN
;    0905  4                        str_size = .str_size - 1;
;    0906  4                        q = .q + 1;                             ! Find next "/" or EOL
;    0907  3                        END;
;    0908  3              IF        .str_size eql 0
;    0909  3                        THEN
;    0910  4                        BEGIN
;    0911  4                             str_size = .rlen;                  ! reset to remaing length of string
;    0912  4                             rlen = 0;                  ! signal end of string
;    0913  3                        END;
;    0914  3              IF (n = ultrix$dlook()) NEQ 0                   ! Get inode # for this link
;    0915  3              THEN
;    0916  4                        BEGIN
;    0917  4                        IF .rlen EQL  0                         ! exit if end of string
;    0918  4                           THEN                                 ! If this is the end of the string and not a directory
;    0919  4                                                                ! and a directory command was given, return previous inode
;    0920  5                                BEGIN
;    0921  6                                IF  (.Fab[fab$l_dna] NEQ 0 AND  .dn_ext  EQL '.dir')
;    0922  5                                  THEN
;    0923  6                                  BEGIN
;    0924  6                                    IF ultrix$openi(.n) LSS 0  ! Read in to check if this is a directory
;    0925  6                                      THEN
;    0926  7                                        RETURN (0)              ! File not found
;    0927  6                                      ELSE
;    0928  7                                        BEGIN
;    0929  7                                        IF  (.iob[iob$w_ic_mode] AND IFMT)  NEQ  IFDIR  ! Check if directory
;    0930  7                                         THEN
;    0931  8                                         BEGIN
;    0932  8                                          end_size = .Fab[fab$b_fns] -.str_size -1; ! Reflect true file
;    0933  9                                          RETURN (.prev_n)      ! Return previous inode # to be opened
;    0934  8                                         END
;    0935  7                                         ELSE RETURN(.n);       ! Return last inode #
;    0936  7                                        END
```

```
;   0937  6                                  END
;   0938  5                                ELSE
;   0939  4                              END;
;   0940  4                      IF ultrix$openi(.n) LSS 0        ! Set up IOB to current inode
;   0941  4                      THEN
;   0942  4                              RETURN (0);              ! File not found
;   0943  4                      str_path = .q;                   ! Update pointer in pathname
;   0944  4                      prev_n = .n;                     ! Update previous n value.
;   0945  4                      END
;   0946  3                ELSE
;   0947  4                      BEGIN
;   0948  4                      IF .rlen EQL  0                  ! exit if end of string
;   0949  4                         THEN                          ! If this is the end of the string and not a directory
;   0950  4                                                       ! and a directory command was given, return previous inode
;   0951  5                        BEGIN
;   0952  5                           IF  (.Fab[fab$l_dna] NEQ 0 AND  .dn_ext  EQL '.dir') AND
;   0953  6                                          ((.iob[iob$w_ic_mode] AND IFMT)  EQL  IFDIR)
;   0954  5                             THEN
;   0955  6                               BEGIN
;   0956  6
;   0957  6                          end_size = .Fab[fab$b_fns] -.str_size ; ! Reflect true file
;   0958  6                                IF .(.fab[fab$l_fna])<(.end_size-1)*8,8> EQL %C')' ! If only one name,error.
;   0959  7                                  THEN   RETURN (0) ! Error if no string left
;   0960  6                                  ELSE
;   0961  6                                 RETURN (.prev_n);    ! Return previous inode # to be opened
;   0962  6                               END
;   0963  5                             ELSE RETURN(0); ! Return error if not directory command
;   0964  5                          END
;   0965  4                           ELSE RETURN (0);
;   0966  3                      END;
;   0967  2              END;
;   0968  2              return (.n);
;   0969  1      END;
```

```
                                    0C  BB 00000 ULTRIX$FIND:
                                                        PUSHR   #^M<R2,R3>                          ; 0824
                      50            02  D0 00002        MOVL    #2, R0                              ; 0887
                         00000000V  EF  16 00005        JSB     ULTRIX$OPENI                        ;
                                    50  D5 0000B        TSTL    R0                                  ;
                                    03  18 0000D        BGEQ    1$                                  ;
                                  0186  31 0000F        BRW     16$                                 ;
                              30    AB  D5 00012 1$:    TSTL    48(FAB)                             ; 0890
                                    11  13 00015        BEQL    2$                                  ;
                      50      35    AB  9A 00017        MOVZBL  53(FAB), R0                         ; 0892
                      50      30    AB  C0 0001B        ADDL2   48(FAB), R0                         ;
          53        FC  A0 2020202E  8F  C9 0001F        BISL3   #538976302, -4(R0), DN_EXT          ;
             00000000'  EF 00000000' EF  D0 00028 2$:    MOVL    STR_SIZE, RLEN                      ; 0893
                         00000000'  EF  D5 00033 3$:    TSTL    RLEN                                ; 0894
                                    03  12 00039        BNEQ    4$                                  ;
                                  0151  31 0003B        BRW     15$                                 ;
                      2F 00000000'  FF  91 0003E 4$:    CMPB    @STR_PATH, #47                      ; 0896
                                    0E  12 00045        BNEQ    5$                                  ;
                         00000000'  EF  D7 00047        DECL    STR_SIZE                            ; 0898
```

```
                                 00000000'  EF  D6 0004D          INCL    STR_PATH                                  ; 0899
                                            E9  11 00053          BRB     4$                                        ;
                     00000000'  EF 00000000'  EF  D0 00055 5$:    MOVL    STR_PATH, Q                               ; 0901
                     00000000'  EF 00000000'  EF  D0 00060        MOVL    STR_SIZE, RLEN                            ; 0902
                                2F 00000000'  FF  91 0006B 6$:    CMPB    aQ, #47                                   ; 0903
                                            16  13 00072          BEQL    7$                                        ;
                                 00000000'  EF  D5 00074          TSTL    STR_SIZE                                  ;
                                            0E  13 0007A          BEQL    7$                                        ;
                                 00000000'  EF  D7 0007C          DECL    STR_SIZE                                  ; 0905
                                 00000000'  EF  D6 00082          INCL    Q                                         ; 0906
                                            E1  11 00088          BRB     6$                                        ;
                                 00000000'  EF  D5 0008A 7$:    TSTL    STR_SIZE                                  ; 0908
                                            11  12 00090          BNEQ    8$                                        ;
                     00000000'  EF 00000000'  EF  D0 00092        MOVL    RLEN, STR_SIZE                            ; 0911
                                 00000000'  EF  D4 0009D          CLRL    RLEN                                      ; 0912
                                 00000000V  EF  16 000A3 8$:    JSB     ULTRIX$DLOOK                              ; 0914
                     00000000'  EF            50  D0 000A9          MOVL    R0, N                                     ;
                                            03  12 000B0          BNEQ    9$                                        ;
                                          0080  31 000B2          BRW     13$                                       ;
                                 00000000'  EF  D5 000B5 9$:    TSTL    RLEN                                      ; 0917
                                            52  12 000BB          BNEQ    11$                                       ;
                                       30   AB  D5 000BD          TSTL    48(FAB)                                   ; 0921
                                            4D  13 000C0          BEQL    11$                                       ;
                     7269642E   8F            53  D1 000C2          CMPL    DN_EXT, #1919509550                       ;
                                            44  12 000C9          BNEQ    11$                                       ;
                                50 00000000'  EF  D0 000CB          MOVL    N, R0                                     ; 0924
                                 00000000V  EF  16 000D2          JSB     ULTRIX$OPENI                              ;
                                            50  D5 000D8          TSTL    R0                                        ;
                                            42  19 000DA          BLSS    12$                                       ;
                                50 00000000'  EF  D0 000DC          MOVL    IOB, R0                                   ; 0929
                                50       2E   A0  3C 000E3          MOVZWL  46(R0), R0                                ;
                                50 FFFF0FFF   8F  CA 000E7          BICL2   #-61441, R0                               ;
                     00004000   8F            50  D1 000EE          CMPL    R0, #16384                                ;
                                            03  12 000F5          BNEQ    10$                                       ;
                                          0095  31 000F7          BRW     15$                                       ;
                                50       34   AB  9A 000FA 10$:    MOVZBL  52(FAB), R0                               ; 0932
                                50 00000000'  EF  C2 000FE          SUBL2   STR_SIZE, R0                              ;
          00000000G  EF         50            01  83 00105          SUBB3   #1, R0, END_SIZE                          ;
                                            7B  11 0010D          BRB     14$                                       ; 0933
                                50 00000000'  EF  D0 0010F 11$:    MOVL    N, R0                                     ; 0940
                                 00000000V  EF  16 00116          JSB     ULTRIX$OPENI                              ;
                                            50  D5 0011C          TSTL    R0                                        ;
                                            78  19 0011E 12$:    BLSS    16$                                       ;
                     00000000'  EF 00000000'  EF  D0 00120        MOVL    Q, STR_PATH                               ; 0943
                                52 00000000'  EF  D0 0012B          MOVL    N, PREV_N                                 ; 0944
                                          FEFE  31 00132          BRW     3$                                        ;
                                 00000000'  EF  D5 00135 13$:    TSTL    RLEN                                      ; 0948
                                            5B  12 0013B          BNEQ    16$                                       ;
                                       30   AB  D5 0013D          TSTL    48(FAB)                                   ; 0952
                                            56  13 00140          BEQL    16$                                       ;
                     7269642E   8F            53  D1 00142          CMPL    DN_EXT, #1919509550                       ;
                                            4D  12 00149          BNEQ    16$                                       ;
                                50 00000000'  EF  D0 0014B          MOVL    IOB, R0                                   ; 0953
                                50       2E   A0  3C 00152          MOVZWL  46(R0), R0                                ;
                                50 FFFF0FFF   8F  CA 00156          BICL2   #-61441, R0                               ;
                     00004000   8F            50  D1 0015D          CMPL    R0, #16384                                ;
                                            32  12 00164          BNEQ    16$                                       ;
```

```
                00000000G  EF       34    AB 00000000'  EF  83 00166          SUBB3   STR_SIZE, 52(FAB), END_SIZE                    ; 0957
                                          50 00000000G  EF  9A 00173          MOVZBL  END_SIZE, R0                                   ; 0958
                                                        50  D7 0017A          DECL    R0                                             ;
                                                        50  08 C4 0017C       MULL2   #8, R0                                         ;
              51        2C   BB                         08  50 EF 0017F       EXTZV   R0, #8, @44(FAB), R1                           ;
                                                        29  51 D1 00185       CMPL    R1, #41                                        ;
                                                            0E 13 00188       BEQL    16$                                            ;
                                                        50  52 D0 0018A 14$:   MOVL    PREV_N, R0                                     ; 0961
                                                            0B 11 0018D       BRB     17$                                            ;
                                                        50 00000000'  EF  D0 0018F 15$:   MOVL    N, R0                              ; 0968
                                                            02 11 00196       BRB     17$                                            ;
                                                        50  D4 00198 16$:     CLRL    R0                                             ;
                                                        0C  BA 0019A 17$:     POPR    #^M<R2,R3>                                     ;
                                                            05 0019C          RSB                                                    ;

; Routine Size:  413 bytes,    Routine Base:  CODE + 0280
```

```
;    0970  1
;    0971  1       %sbttl 'ultrix$dlook'
;    0972  1       routine ultrix$dlook  : jsb_ultrix  =
;    0973  1
;    0974  1       !++
;    0975  1       ! Functional description:
;    0976  1       !
;    0977  1       ! Look at each inode in directory
;    0978  1       !
;    0979  1       ! A directory consists of some number of blocks of DIRBLKSIZ(currently 255)
;    0980  1       ! bytes, where DIRBLKSIZ is chosen such that it can be transferred
;    0981  1       ! to disk in a single atomic operation (e.g. 512 bytes on most machines).
;    0982  1       !
;    0983  1       ! Each DIRBLKSIZ byte block contains some number of directory entry
;    0984  1       ! structures, which are of variable length.  Each directory entry has
;    0985  1       ! a struct direct at the front of it, containing its inode number,
;    0986  1       ! the length of the entry, and the length of the name contained in
;    0987  1       ! the entry.  These are followed by the name padded to a 4 byte boundary
;    0988  1       ! with null bytes.  All names are guaranteed null terminated.
;    0989  1       ! The maximum length of a name in a directory is MAXNAMLEN.
;    0990  1       !
;    0991  1       !  All DIRBLKSIZ bytes
;    0992  1       ! in a directory block are claimed by the directory entries.  This
;    0993  1       ! usually results in the last entry in a directory having a large
;    0994  1       ! direct$w_d_reclen.   If the first entry of  a directory block is free,
;    0995  1       !  then its direct$l_d_ino is set to 0.  Entries other than the first
;    0996  1       ! in a directory do not normally have direct$l_d_ino set to 0.
;    0997  1       !
;    0998  1       ! Inputs:
;    0999  1       !       none
;    1000  1       !
;    1001  1       !  Implicit inputs:
;    1002  1       ! str_path      - Pointer to start of directory "---/---/---..."
;    1003  1       ! str_size      - length of directory string
;    1004  1       ! IOB           - Various fields
;    1005  1       !
;    1006  1       ! Outputs:
;    1007  1       !  Number for file inode  or zero if file not found.
;    1008  1       !
;    1009  1       ! Implicit outputs:
;    1010  1       !
;    1011  1       ! Side effects:
;    1012  1       !
;    1013  1       !
;    1014  1       ! Return status
;    1015  1       !       none
;    1016  1       !
;    1017  1       ! --
;    1018  1
;    1019  2     BEGIN
;    1020  2
;    1021  2          external register
;    1022  2             block = 6,
;    1023  2             vbn = 7,
;    1024  2             offset = 8,
;    1025  2             cblock = 9 : ref bblock,
;    1026  2             rab = 10 : ref bblock,
```

```
;   1027  2             fab = 11 : ref bblock;
;   1028  2
;   1029  2
;   1030  2             IF  .str_size EQL NULL                          ! exit if null string
;   1031  2             THEN
;   1032  2                     return (0);
;   1033  2             IF  (.iob[iob$w_ic_mode] AND IFMT)  NEQ  IFDIR          ! check for directory file type.
;   1034  2             THEN
;   1035  2                                                             ! not a directory
;   1036  2                     return (0);
;   1037  2             if  .iob[iob$z_val] EQL 0
;   1038  2             THEN
;   1039  2                     return (0);                             ! zero length directory
;   1040  2
;   1041  2             len = CH$FIND_CH(.str_size, .str_path, %C'/');
;   1042  2             IF .len eql 0                                   ! no delimiter found
;   1043  2             THEN
;   1044  2                     len = .str_size                         ! use remaining length
;   1045  2             ELSE
;   1046  2                     len = .len - .str_path;                 ! get difference if '/' found
;   1047  2             dirstuff[dirstuff$l_loc] = 0;                   ! Initialize accumulator.
;   1048  2
;   1049  2             While (dp = ultrix$readdir() ) NEQ NULL DO      ! get pointer to directory name structure.
;   1050  3             BEGIN
;   1051  3             IF  .(.dp)<0,32>  EQL 0                         ! Check if inode number for this name is zero.
;   1052  3             THEN
;   1053  3
;   1054  3             ELSE                                            ! Test if name matches returned name
;   1055  3                     IF  .(.dp)<48,16>  EQL  .len  AND  CH$COMPARE(.len, .str_path, .(.dp)<48,16>, (.dp)<64,32>) EQL 0
;   1056  3                     THEN
;   1057  3
;   1058  3
;   1059  3                             RETURN (.(.dp)<0,32>);          ! return inode number.
;   1060  2             END;
;   1061  2             RETURN (0);
;   1062  1     END;


                                        ●3C  BB 00000 ULTRIX$DLOOK:                                                  ●
                                                                  PUSHR   #^M<R2,R3,R4,R5>                          ; 0972
                          52 00000000'  EF  D0 00002              MOVL    STR_SIZE, R2                              ; 1030
                                        5C  13 00009              BEQL    5$                                        ;
                          50 00000000'  EF  D0 0000B              MOVL    IOB, R0                                   ; 1033
                          51        2E  A0  3C 00012              MOVZWL  46(R0), R1                                ;
                          51 FFFF0FFF   8F  CA 00016              BICL2   #-61441, R1                               ;
                 00004000  8F           51  D1 0001D              CMPL    R1, #16384                                ;
                                        7B  12 00024              BNEQ    7$                                        ;
                                   36   A0  D5 00026              TSTL    54(R0)                                    ; 1037
                                        76  13 00029              BEQL    7$                                        ;
        00000000'  FF     52           2F  3A 0002B              LOCC    #47, R2, aSTR_PATH                        ; 1041
                                        02  12 00033              BNEQ    1$                                        ;
                                        51  D4 00035              CLRL    R1                                        ;
                 00000000'  EF          51  D0 00037 1$:          MOVL    R1, LEN                                   ;
                                        09  12 0003E              BNEQ    2$                                        ; 1042
```

```
                        00000000'  EF            52  D0 00040          MOVL    R2, LEN                                  ; 1044
                                                 0B  11 00047          BRB     3$                                       ;
                        00000000'  EF 00000000'  EF  C2 00049 2$:      SUBL2   STR_PATH, LEN                            ; 1046
                                      00000000'  EF  D4 00054 3$:      CLRL    DIRSTUFF                                 ; 1047
                                      00000000V  EF  16 0005A 4$:      JSB     ULTRIX$READDIR                           ; 1049
                        00000000'  EF            50  D0 00060          MOVL    R0, DP                                   ;
                                                 38  13 00067 5$:      BEQL    7$                                       ;
                                   54 00000000'  EF  D0 00069          MOVL    DP, R4                                   ; 1051
                                                 64  D5 00070          TSTL    (R4)                                     ;
                                                 E6  13 00072          BEQL    4$                                       ;
00000000'  EF       06   A4        10            00  ED 00074          CMPZV   #0, #16, 6(R4), LEN                      ; 1055
                                                 DA  12 0007E          BNEQ    4$                                       ;
                                   55            01  D0 00080          MOVL    #1, R5                                   ;
      06   A4           00 00000000'  FF 00000000'  EF  2D 00083          CMPC5   LEN, @STR_PATH, #0, 6(R4), 8(R4)         ;
                                            08   A4     00091                                                            ;
                                                 03  1A 00093          BGTRU   6$                                       ;
                                   55            01  D9 00095          SBWC    #1, R5                                   ;
                                                 55  D5 00098 6$:      TSTL    R5                                       ;
                                                 BE  12 0009A          BNEQ    4$                                       ;
                                   50            64  D0 0009C          MOVL    (R4), R0                                 ; 1059
                                                 02  11 0009F          BRB     8$                                       ;
                                                 50  D4 000A1 7$:      CLRL    R0                                       ; 1061
                                                 3C  BA 000A3 8$:      POPR    #^M<R2,R3,R4,R5>                         ;
                                                     05 000A5          RSB                                              ;

; Routine Size:  166 bytes,    Routine Base:  CODE + 041D
```

```
;    1063  1
;    1064  1      %sbttl 'read directory'
;    1065  1      routine ultrix$readdir  : jsb_ultrix  =
;    1066  1
;    1067  1      !++
;    1068  1      ! Functional description:
;    1069  1      !
;    1070  1      ! get next entry in a directory structure.
;    1071  1      !
;    1072  1      ! Inputs:
;    1073  1      !      none
;    1074  1      !
;    1075  1      !  Implicit inputs:
;    1076  1      ! IOB          - Various fields
;    1077  1      !
;    1078  1      ! Outputs:
;    1079  1      ! Pointer to directory name structure, or zero if EOF.
;    1080  1      !
;    1081  1      ! Implicit outputs:
;    1082  1      !
;    1083  1      !
;    1084  1      ! Side effects:
;    1085  1      !
;    1086  1      ! Return status
;    1087  1      !      none
;    1088  1      !
;    1089  1      ! --
;    1090  1
;    1091  2      BEGIN
;    1092  2
;    1093  2           external register
;    1094  2              block = 6,
;    1095  2              vbn = 7,
;    1096  2              offset = 8,
;    1097  2              cblock = 9 : ref bblock,
;    1098  2              rab = 10 : ref bblock,
;    1099  2              fab = 11 : ref bblock;
;    1100  2
;    1101  2              WHILE   1   DO
;    1102  3              BEGIN
;    1103  3                      IF .dirstuff[dirstuff$l_loc]  GEQ  .iob[iob$z_val]      ! Check against # of bytes in files
;    1104  3                           THEN
;    1105  3                           return (NULL);
;    1106  3                      off = .dirstuff[dirstuff$l_loc] AND NOT .iob[iob$l_fs_bmask];  ! find block offset
;    1107  3                      IF  .off EQL 0
;    1108  3                      THEN
;    1109  4                           BEGIN
;    1110  4                           lbn =  (.dirstuff[dirstuff$l_loc] ^ -.iob[iob$l_fs_bshift]); ! Calculate blk # in file to re
;    1111  4                           d = ultrix$sbmap(.lbn);          ! Get disk address
;    1112  4                           IF  .d EQL 0
;    1113  4                                THEN
;    1114  4                                return NULL;                ! Error if null
;    1115  5                           iob[iob$l_i_bn] =  (.d ^ .iob[iob$l_fs_fsbtodb]) ! Convert file segment to disk block
;    1116  4                                                             + .iob[iob$l_i_boff];
;    1117  4                           iob[iob$l_i_ma] = iob[iob$z_i_buf];              ! Set buffer address
;    1118  4
;    1119  4                           ! Get size of file segment in characters
```

```
;    1120  5                IF .lbn GEQ NDADDR  OR  .iob[iob$z_val] GEQ  ((.lbn + 1) ^ .iob[iob$l_fs_bshift])
;    1121  4                 THEN
;    1122  4                     iob[iob$l_i_cc] = .iob[iob$l_fs_bsize]
;    1123  4                 ELSE
;    1124  4                     iob[iob$l_i_cc] = ((.iob[iob$z_val] MOD .iob[iob$l_fs_bmask]) + .iob[iob$l_fs_fsize] - 1) AND
;    1125  4                      .iob[iob$l_fs_fmask];
;    1126  4
;    1127  4                             IF NOT ultrix$devread()          ! Read in data
;    1128  4                             THEN
;    1129  4                                                              ! read error
;    1130  4                                 return (NULL);
;    1131  3                             END;
;    1132  3                         dp = iob[iob$z_i_buf] + .off;        ! Pointer to name direct structure.
;    1133  3                         dirstuff[dirstuff$l_loc] = .dirstuff[dirstuff$l_loc] + .(.dp)<32,16>; ! Set record length of this na
;    1134  3                         IF .(.dp)<0,32> NEQ 0                ! Check if null inode number.
;    1135  3                         THEN
;    1136  3                         return (.dp);
;    1137  2                 END;
;    1138  2         return (.dp);
;    1139  1         END;


                                    0C  BB 00000 ULTRIX$READDIR:
                                                     PUSHR   #^M<R2,R3>                      ; 1065
                          52 00000000'  EF  D0 00002         MOVL    IOB, R2                  ; 1103
                          51 00000000'  EF  D0 00009 1$:     MOVL    DIRSTUFF, R1             ;
                    36    A2            51  D1 00010         CMPL    R1, 54(R2)               ;
                                        03  19 00014         BLSS    3$                       ;
                                      00D4  31 00016 2$:     BRW     9$                       ;
00000000'  EF         51      211E    C2  CB 00019 3$:     BICL3   8478(R2), R1, OFF        ; 1106
                                        03  13 00023         BEQL    4$                       ; 1107
                                      0094  31 00025         BRW     8$                       ;
                          50      2126  C2  CE 00028 4$:     MNEGL   8486(R2), R0             ; 1110
00000000'  EF             51            50  78 0002D         ASHL    R0, R1, LBN              ;
                          50 00000000'  EF  D0 00035         MOVL    LBN, R0                  ; 1111
                             00000000V  EF  16 0003C         JSB     ULTRIX$SBMAP             ;
                00000000'  EF            50  D0 00042         MOVL    R0, D                    ;
                          51 00000000'  EF  D0 00049         MOVL    D, R1                    ; 1112
                                        C4  13 00050         BEQL    2$                       ;
                          50 00000000'  EF  D0 00052         MOVL    IOB, R0                  ; 1115
             51           51      213A  C0  78 00059         ASHL    8506(R0), R1, R1         ;
                   00BE   C0      00B2 D041  9E 0005F         MOVAB   @178(R0)[R1], 190(R0)    ; 1116
                   00C2   C0      00D6  C0  9E 00067         MOVAB   214(R0), 194(R0)         ; 1117
                          0C 00000000'  EF  D1 0006E         CMPL    LBN, #12                 ; 1120
                                        14  18 00075         BGEQ    5$                       ;
             51 00000000'  EF            01  C1 00077         ADDL3   #1, LBN, R1              ;
             51           51      2126  C0  78 0007F         ASHL    8486(R0), R1, R1         ;
                          51        36  A0  D1 00085         CMPL    54(R0), R1               ;
                                        09  19 00089         BLSS    6$                       ;
                   00C6   C0      2106  C0  D0 0008B 5$:     MOVL    8454(R0), 198(R0)        ; 1122
                                        1F  11 00092         BRB     7$                       ;
7E           00       36  A0            01  7A 00094 6$:     EMUL    #1, 54(R0), #0, -(SP)    ; 1124
51           51           8E      211E  C0  7B 0009A         EDIV    8478(R0), (SP)+, R1, R1  ;
                          51      210A  C0  C0 000A1         ADDL2   8458(R0), R1             ;
```

```
                                        51  D7 000A6          DECL    R1                                  ;
                          53     2122   C0  D2 000A8          MCOML   8482(R0), R3                        ; 1125
          00C6   C0       51            53  CB 000AD          BICL3   R3, R1, 198(R0)                     ;
                             00000000V  EF  16 000B3 7$:      JSB     ULTRIX$DEVREAD                      ; 1127
                          31            50  E9 000B9          BLBC    R0, 9$                              ;
                          52 00000000'  EF  D0 000BC 8$:      MOVL    IOB, R2                             ; 1132
                50        52 00000000'  EF  C1 000C3          ADDL3   OFF, R2, R0                         ;
                   00000000' EF     00D6  C0  9E 000CB          MOVAB   214(R0), DP                         ;
                          50 00000000'  EF  D0 000D4          MOVL    DP, R0                              ; 1133
                          51        04  A0  3C 000DB          MOVZWL  4(R0), R1                           ;
                   00000000' EF         51  C0 000DF          ADDL2   R1, DIRSTUFF                        ;
                                        60  D5 000E6          TSTL    (R0)                                ; 1134
                                        05  12 000E8          BNEQ    10$                                 ;
                                      FF1C  31 000EA          BRW     1$                                  ;
                                        50  D4 000ED 9$:      CLRL    R0                                  ; 1138
                                        0C  BA 000EF 10$:     POPR    #^M<R2,R3>                          ;
                                            05 000F1          RSB                                         ;

; Routine Size:  242 bytes,    Routine Base:  CODE + 04C3


;   1140  1
```

```
;    1141  1
;    1142  1       %sbttl 'open inode'
;    1143  1       routine ultrix$openi (n) : jsb_ultrix  =
;    1144  1
;    1145  1       !++
;    1146  1       ! Functional description:
;    1147  1       !
;    1148  1       ! n is the inode number of the entry
;    1149  1       !
;    1150  1       ! Directory structure with file lookup and inode. The inode values
;    1151  1       ! are filled into the IOB structure for this file.
;    1152  1       !
;    1153  1       ! Inputs:
;    1154  1       !
;    1155  1       !
;    1156  1       ! Implicit inputs:
;    1157  1       !       R7                          vbn
;    1158  1       !
;    1159  1       ! Outputs:
;    1160  1       !
;    1161  1       ! Character count of inode read in
;    1162  1       !
;    1163  1       ! Implicit outputs:
;    1164  1       !       R7                          new vbn
;    1165  1       !
;    1166  1       ! Side effects:
;    1167  1       !       Some fields in IOB are changed to reflect this inode
;    1168  1       !
;    1169  1       ! Return codes:
;    1170  1       !       none
;    1171  1       !--
;    1172  1
;    1173  2           begin
;    1174  2
;    1175  2           external register
;    1176  2              block = 6,
;    1177  2              vbn = 7,
;    1178  2              offset = 8,
;    1179  2              cblock = 9 : ref bblock,
;    1180  2              rab = 10 : ref bblock,
;    1181  2              fab = 11 : ref bblock;
;    1182  2
;    1183  2
;    1184  2              iob[iob$l_i_offset] = 0;                          ! no offset in file
;    1185  2                                                                 ! Turn file system block numbers into disk block addresses.
;    1186  2                                                                 ! This maps file system blocks to device size blocks.
;    1187  2              iob[iob$l_i_bn] =                                  ! first block # to read
;    1188  4                 ((   .iob[iob$l_fs_fpg] * (.n/.iob[iob$l_fs_ipg]) + .iob[iob$l_fs_cgoffset] *
;    1189  4                      ((.n/.iob[iob$l_fs_ipg]) MOD .iob[iob$l_fs_cgmask]) + .iob[iob$l_fs_iblkno] +
;    1190  4                         (((.n MOD .iob[iob$l_fs_ipg])/.iob[iob$l_fs_inopb]) ^ .iob[iob$l_fs_fragshift] ))
;    1191  2                      ^ .iob[iob$l_fs_fsbtodb])  + .iob[iob$l_i_boff];
;    1192  2              iob[iob$l_i_cc] = .iob[iob$l_fs_bsize];           ! get character count of data to transfer
;    1193  2              iob[iob$l_i_ma] = iob[iob$z_i_buf];               ! get address of buffer to read into for this transfer
;    1194  2              ultrix$devread();                          ! Read this block for directory inode
;    1195  2              cc = .iob[iob$l_i_cc] ;                    ! Get character count
;    1196  2
;    1197  2              INCR    LOOP  FROM 0 TO 128 DO             ! Overlay dat in iob for inode
```

```
;   1198  3          IOB[MODE_BASE+.LOOP,0,8,0] = .(.iob[iob$l_i_ma]+                  ! start of buffer
;   1199  3                    dinode_size*(.n MOD .iob[iob$l_fs_inopb]) +  ! offset to directory inode
;   1200  2                                                        .loop) ; ! move 128 bytes of directory inode.
;   1201  2                return (.cc);                    ! Return character count
;   1202  1     END;



                                                  0C  BB 00000 ULTRIX$OPENI:
                                                                  PUSHR   #^M<R2,R3>                          ; 1143
                                  53              50  D0 00002    MOVL    R0, R3                              ;
                                  51 00000000'    EF  D0 00005    MOVL    IOB, R1                             ; 1184
                                        00BA      C1  D4 0000C    CLRL    186(R1)                             ;
                  50              53      218E    C1  C7 00010    DIVL3   8590(R1), N, R0                     ; 1188
                  52      2192    C1              50  C5 00016    MULL3   R0, 8594(R1), R2                    ;
        7E        00              50              01  7A 0001C    EMUL    #1, R0, #0, -(SP)                   ; 1189
        50        50              8E      20F2    C1  7B 00021    EDIV    8434(R1), (SP)+, R0, R0             ;
                                  50      20EE    C1  C4 00028    MULL2   8430(R1), R0                        ;
                                  52              50  C0 0002D    ADDL2   R0, R2                              ;
                                  52      20E6    C1  C0 00030    ADDL2   8422(R1), R2                        ;
        7E        00              53              01  7A 00035    EMUL    #1, N, #0, -(SP)                    ; 1190
        50        50              8E      218E    C1  7B 0003A    EDIV    8590(R1), (SP)+, R0, R0             ;
                                  50      214E    C1  C6 00041    DIVL2   8526(R1), R0                        ;
                  50              50      2136    C1  78 00046    ASHL    8502(R1), R0, R0                    ;
                                  52              50  C0 0004C    ADDL2   R0, R2                              ;
                  52              52      213A    C1  78 0004F    ASHL    8506(R1), R2, R2                    ; 1191
                          00BE    C1      00B2 D142   9E 00055    MOVAB   @178(R1)[R2], 190(R1)               ;
                          00C6    C1      2106    C1  D0 0005D    MOVL    8454(R1), 198(R1)                   ; 1192
                          00C2    C1      00D6    C1  9E 00064    MOVAB   214(R1), 194(R1)                    ; 1193
                                      00000000V   EF  16 0006B    JSB     ULTRIX$DEVREAD                      ; 1194
                                  50 00000000'    EF  D0 00071    MOVL    IOB, R0                             ; 1195
                      00000000'   EF      00C6    C0  D0 00078    MOVL    198(R0), CC                         ;
                                                  52  D4 00081    CLRL    LOOP                                ; 1197
        7E        00              53              01  7A 00083 1$: EMUL    #1, N, #0, -(SP)                    ; 1199
        51        51              8E      214E    C0  7B 00088    EDIV    8526(R0), (SP)+, R1, R1             ;
                  51              51              07  78 0008F    ASHL    #7, R1, R1                          ;
                                  51      00C2    C0  C0 00093    ADDL2   194(R0), R1                         ;
                          2E A240             6241  90 00098    MOVB    (LOOP)[R1], 46(LOOP)[R0]            ;
                  DD              52 00000080     8F  F3 0009E    AOBLEQ  #128, LOOP, 1$                      ;
                                  50 00000000'    EF  D0 000A6    MOVL    CC, R0                              ; 1201
                                                  0C  BA 000AD    POPR    #^M<R2,R3>                          ;
                                                      05 000AF    RSB                                         ;

; Routine Size:  176 bytes,    Routine Base:  CODE + 05B5


;   1203  1
```

```
;    1204  1
;    1205  1      %sbttl 'ultrix$sbmap'                                                    !G:3
;    1206  1      routine ultrix$sbmap (bn) : jsb_ultrix  =
;    1207  1
;    1208  1      !++
;    1209  1      ! Functional description:
;    1210  1      !
;    1211  1      ! Superblock mapping of directory entries.
;    1212  1      !
;    1213  1      ! bn is block # in file.
;    1214  1      !
;    1215  1      ! Inputs:
;    1216  1      !       none
;    1217  1      !
;    1218  1      ! Implicit inputs:
;    1219  1      !       R7                      vbn
;    1220  1      !
;    1221  1      ! Output:
;    1222  1      !
;    1223  1      ! nb is address of block 'bn' on disk
;    1224  1      !
;    1225  1      ! Implicit outputs:
;    1226  1      !       none
;    1227  1      !
;    1228  1      ! Side effects:
;    1229  1      !
;    1230  1      ! Return codes:
;    1231  1      !       none
;    1232  1      ! --
;    1233  2      BEGIN
;    1234  2
;    1235  2          external register
;    1236  2              block = 6,
;    1237  2              vbn = 7,
;    1238  2              offset =8,
;    1239  2              cblock = 9 : ref bblock,
;    1240  2              rab = 10 : ref bblock,
;    1241  2              fab = 11 : ref bblock;
;    1242  2
;    1243  2
;    1244  2              if .bn LSS 0
;    1245  2              THEN
;    1246  3                      BEGIN
;    1247  3                                                              ! bn negative
;    1248  3                      return (0);                             ! Negative blk # not allowed
;    1249  2                      END;
;    1250  2
;    1251  2              !
;    1252  2              ! blocks 0<--->NDADDR are direct blocks
;    1253  2              !
;    1254  2              ! Direct address in inode
;    1255  2              !
;    1256  2              if .bn LSS NDADDR                               ! Check for mapping range of blk #
;    1257  2              THEN
;    1258  3                      BEGIN
;    1259  3                      nb = .iob[40+mode_base+(4*.bn),0,32,0]; ! Calculate disk address of blk #.
;    1260  3                      return (.nb);                           ! Return block address of data.
```

```
;   1261  2                     END;
;   1262  2
;   1263  2             !
;   1264  2             ! addresses NIADDR have single and double indirect blocks.
;   1265  2             ! the first step is to determine how many levels of indirection.
;   1266  2             !
;   1267  2             sh = 1;
;   1268  2             bn = .bn - NDADDR;          ! put in range of indirect pointer list
;   1269  2             j = NIADDR;             ! Initialize.
;   1270  2             WHILE   .j GTR  0 DO
;   1271  3                     BEGIN                       ! find indirect pointer to use
;   1272  3                     sh = .sh *  .iob[iob$l_fs_nindir];      ! Get # of indirects pointers in a file system blocks.
;   1273  3                     if .bn  LSS  .sh                        ! Check if within range.
;   1274  3                     THEN
;   1275  3                             EXITLOOP;
;   1276  3                     bn = .bn - .sh;   ! 1st loop : single indirect, 2nd loop: double indirect, 3rd loop: triple indirect
;   1277  3                     J = .J -1;
;   1278  2                     END;
;   1279  2             if  .j EQL 0
;   1280  2             THEN
;   1281  2                                     ! block number of file too big , error.
;   1282  2                     return (0);                     ! Error exit
;   1283  2
;   1284  2             !
;   1285  2             ! fetch the first indirect block address from the inode
;   1286  2             !
;   1287  2             nb = .iob[40+4*NDADDR+mode_base+(4*(NIADDR-.J)),0,32,0];
;   1288  2             if  .nb  EQL  0
;   1289  2             THEN                    ! block number of file not mapped to disk.
;   1290  2                     return (0);                     ! Error exit
;   1291  2
;   1292  2             !
;   1293  2             ! fetch through the indirect blocks
;   1294  2             !
;   1295  2             WHILE   .j LEQ NIADDR DO
;   1296  3             BEGIN
;   1297  3                     IF  .blknos  NEQ  .nb   ! If accessed before no need to re-read buffer
;   1298  3                     THEN
;   1299  4                          BEGIN
;   1300  4                             iob[iob$l_i_bn] =  (.nb ^ .iob[iob$l_fs_fsbtodb]) + .iob[iob$l_i_boff];
;   1301  4                             iob[iob$l_i_ma] = .b ;  ! buffer to read into.          [05]                    !G:3
;   1302  4                             iob[iob$l_i_cc] = .iob[iob$l_fs_bsize];
;   1303  4                             IF   NOT ultrix$devread()
;   1304  4                             THEN
;   1305  4                                                                             ! read error
;   1306  4                                 return (0);
;   1307  4                             blknos = .nb; ! flag as being currently in the buffer
;   1308  3                          END;
;   1309  3                     sh = .sh/.iob[iob$l_fs_nindir]; ! Set to base for computing offset index.
;   1310  3                     i = (.bn /.sh) MOD  .iob[iob$l_fs_nindir]; ! Compute index into buffer of pointers for this 'bn'.
;   1311  3                     nb = .(.b)<32*.i,32>;           ! Retrive pointer to next part of file or next level of indirect buf
;   1312  3                     IF .nb EQL 0                    ! If zero not mapped.
;   1313  3                     THEN
;   1314  3                                                     ! bn void
;   1315  3                             return (0);             !  Error exit; requested block not mapped.
;   1316  3             j = .j + 1;
;   1317  2             END;
```

```
;   1318  2          return (.nb);                                  ! Return block address of data on disk.
;   1319  2
;   1320  1     END;



                                          0C  BB 00000 ULTRIX$SBMAP:
                                                                  PUSHR   #^M<R2,R3>                                  ; 1206
                                 52          50  D0 00002         MOVL    R0, R2                                      ;
                                             03  18 00005         BGEQ    2$                                          ; 1244
                                          011E  31 00007 1$:      BRW     10$                                         ;
                                 0C          52  D1 0000A 2$:     CMPL    BN, #12                                     ; 1256
                                             13  18 0000D         BGEQ    4$                                          ;
                                 50 00000000'FF42  DE 0000F       MOVAL   @IOB[BN], R0                                ; 1259
                       00000000'  EF       56  A0  D0 00017       MOVL    86(R0), NB                                  ;
                                          00FD  31 0001F 3$:      BRW     9$                                          ; 1260
                       00000000'  EF          01  D0 00022 4$:     MOVL    #1, SH                                      ; 1267
                                 52          0C  C2 00029         SUBL2   #12, BN                                     ; 1268
                       00000000'  EF          03  D0 0002C         MOVL    #3, J                                       ; 1269
                                 51 00000000'  EF  D0 00033       MOVL    IOB, R1                                     ; 1272
                                    00000000'  EF  D5 0003A 5$:   TSTL    J                                           ; 1270
                                             21  15 00040         BLEQ    6$                                          ;
                       00000000'  EF     214A  C1  C4 00042       MULL2   8522(R1), SH                                ; 1272
                       00000000'  EF          52  D1 0004B         CMPL    BN, SH                                      ; 1273
                                             0F  19 00052         BLSS    6$                                          ;
                                 52 00000000'  EF  C2 00054       SUBL2   SH, BN                                      ; 1276
                                    00000000'  EF  D7 0005B       DECL    J                                           ; 1277
                                             D7  11 00061         BRB     5$                                          ;
                                 50 00000000'  EF  D0 00063 6$:   MOVL    J, R0                                       ; 1279
                                             9B  13 0006A         BEQL    1$                                          ;
                                 50          50  CE 0006C         MNEGL   R0, R0                                      ; 1287
                       00000000'  EF     0092 C140  D0 0006F       MOVL    146(R1)[R0], NB                             ;
                                             8C  13 00079         BEQL    1$                                          ; 1288
                                 53 00000000'  EF  D0 0007B       MOVL    NB, R3                                      ; 1297
                                 03 00000000'  EF  D1 00082 7$:   CMPL    J, #3                                       ; 1295
                                             94  14 00089         BGTR    3$                                          ;
                                 53 00000000'  EF  D1 0008B       CMPL    BLKNOS, R3                                  ; 1297
                                             39  13 00092         BEQL    8$                                          ;
                                 50 00000000'  EF  D0 00094       MOVL    IOB, R0                                     ; 1300
                       51        53     213A  C0  78 0009B       ASHL    8506(R0), R3, R1                            ;
                            00BE  C0     00B2 D041  9E 000A1       MOVAB   @178(R0)[R1], 190(R0)                       ;
                            00C2  C0 00000000'  EF  D0 000A9       MOVL    B, 194(R0)                                  ; 1301
                            00C6  C0     2106  C0  D0 000B2       MOVL    8454(R0), 198(R0)                           ; 1302
                                    00000000V  EF  16 000B9       JSB     ULTRIX$DEVREAD                              ; 1303
                                 66          50  E9 000BF         BLBC    R0, 10$                                     ;
                       00000000'  EF 00000000'  EF  D0 000C2       MOVL    NB, BLKNOS                                  ; 1307
                                 51 00000000'  EF  D0 000CD 8$:   MOVL    IOB, R1                                     ; 1309
                       00000000'  EF     214A  C1  C6 000D4       DIVL2   8522(R1), SH                                ;
                       50        52 00000000'  EF  C7 000DD       DIVL3   SH, BN, R0                                  ; 1310
          7E           00        50          01  7A 000E5         EMUL    #1, R0, #0, -(SP)                           ;
          50           50        8E     214A  C1  7B 000EA       EDIV    8522(R1), (SP)+, R0, R0                     ;
                       00000000'  EF          50  D0 000F1         MOVL    R0, I                                       ;
                       50 00000000'  EF          05  78 000F8       ASHL    #5, I, R0                                   ; 1311
00000000'  EF 00000000'  FF        20          50  EF 00100       EXTZV   R0, #32, @B, NB                             ;
                                 53 00000000'  EF  D0 0010D       MOVL    NB, R3                                      ; 1312
```

```
                                  12  13 00114          BEQL    10$                                  ;
                       00000000'  EF  D6 00116          INCL    J                                    ; 1316
                                FF63  31 0011C          BRW     7$                                   ;
                    50 00000000'  EF  D0 0011F 9$:      MOVL    NB, R0                               ; 1318
                                  02  11 00126          BRB     11$                                  ;
                                  50  D4 00128 10$:     CLRL    R0                                   ;
                                  0C  BA 0012A 11$:     POPR    #^M<R2,R3>                           ;
                                      05 0012C          RSB                                          ;

; Routine Size:  301 bytes,    Routine Base:  CODE + 0665
```

```
;    1321  1
;    1322  1       %sbttl 'ultrix$ptinfo'
;    1323  1       routine ultrix$ptinfo( boff) : jsb_ultrix  =
;    1324  1
;    1325  1       !++
;    1326  1       ! Functional description:
;    1327  1       !
;    1328  1       !       Called by ULTRIX$OPEN routine to get the partition table
;    1329  1       !       information to determine if another SUPERBLOCK should be
;    1330  1       !       read in to find the specified partition.
;    1331  1       ! Inputs:
;    1332  1       !       Boff    - Partition specifier for partition A -- H. (0 -- 7)
;    1333  1       !
;    1334  1       ! Implicit inputs:
;    1335  1       !       R7                      vbn
;    1336  1       !
;    1337  1       ! Output:
;    1338  1       !
;    1339  1       !
;    1340  1       ! Implicit outputs:
;    1341  1       !  IOB various fields in this structure
;    1342  1       !
;    1343  1       ! Side effects:
;    1344  1       !
;    1345  1       ! Return codes:
;    1346  1       !       RMS$_NORMAL             Partition table found.
;    1347  1       !       RMS$_NOSUPPORT          Partition table not support in this disk
;    1348  1       !       RMS$_ERROR              This is not a valid SUPERBLOCK
;    1349  1       ! --
;    1350  2       BEGIN
;    1351  2
;    1352  2            external register
;    1353  2               block = 6,
;    1354  2               vbn = 7,
;    1355  2               offset = 8,
;    1356  2               cblock = 9 : ref bblock,
;    1357  2               rab = 10 : ref bblock,
;    1358  2               fab = 11 : ref bblock;
;    1359  2
;    1360  2
;    1361  2               !
;    1362  2               !       Check to see if the block that was read in is a superblock
;    1363  2               !
;    1364  2               IF    .iob[iob$l_fs_magic]  EQL FS_MAGIC
;    1365  2               THEN
;    1366  3                       BEGIN
;    1367  3                       !
;    1368  3                       !       Get the possible partition table
;    1369  3                       !
;    1370  3                       !
;    1371  3                       !       Id the A real partition table
;    1372  3                       !
;    1373  3                       IF   .iob[iob$l_PT_MAGIC]  EQL  PT_MAGIC
;    1374  3                       THEN
;    1375  4                               BEGIN
;    1376  4
;    1377  4                               !
```

```
;   1378  4                         !       We have a real partition table so now
;   1379  4                         !       set the driver's partition table index
;   1380  4                         !
;   1381  4                         iob[iob$l_i_boff] = .iob[(fs_base+(sbsize-pt_size)+12+(8*.boff)),0,32,0];
;   1382  4                         return(DS$_NORMAL);             ! Partition tables are supported
;   1383  4                         END
;   1384  3                 ELSE
;   1385  3                         return(DS$_NOSUPPORT);          ! No partition table on this disk. Use current superblock.
;   1386  3                 END
;   1387  2             ELSE
;   1388  2                 return(DS$_ERROR);                      ! Invalid superblock data read; abort operation.
;   1389  2
;   1390  1     END;



                        51 00000000'  EF  D0 00000 ULTRIX$PTINFO:
                                                   MOVL    IOB, R1                                  ; 1364
                00011954  8F     2632  C1  D1 00007        CMPL    9778(R1), #72020                         ;
                                       25  12 00010        BNEQ    2$                                       ;
                00032957  8F     408E  C1  D1 00012        CMPL    16526(R1), #207191                       ; 1373
                                       12  12 0001B        BNEQ    1$                                       ;
                                409A C140  7F 0001D        PUSHAQ  16538(R1)[BOFF]                          ; 1381
                    00B2  C1           9E  D0 00022        MOVL    @(SP)+, 178(R1)                          ;
                        50 00660001   8F  D0 00027        MOVL    #6684673, R0                             ; 1382
                                           05 0002E        RSB                                              ;
                        50 006600B1   8F  D0 0002F 1$:    MOVL    #6684849, R0                             ; 1385
                                           05 00036        RSB                                              ;
                        50 00660002   8F  D0 00037 2$:    MOVL    #6684674, R0                             ; 1388
                                           05 0003E        RSB                                              ;

; Routine Size:  63 bytes,    Routine Base:  CODE + 0792

;   1391  1
```

```
;    1392  1
;    1393  1       %sbttl 'ultrix$devread'
;    1394  1       routine ultrix$devread : jsb_ultrix  =
;    1395  1
;    1396  1       !++
;    1397  1       ! Functional description:
;    1398  1       !
;    1399  1       ! Read the specified number of bytes from the disk.
;    1400  1       !
;    1401  1       ! Inputs:
;    1402  1       !       none
;    1403  1       !
;    1404  1       ! Implicit inputs:
;    1405  1       !       iob[iob$l_i_ma]         Address of buffer to write data to.
;    1406  1       !       iob[iob$l_i_cc]         Character count of data to read.
;    1407  1       !       iob[iob$l_i_bn]         Block number to start reading from.
;    1408  1       ! Outputs:
;    1409  1       ! Character count of data read in.
;    1410  1       !
;    1411  1       ! Implicit output:
;    1412  1       !       none
;    1413  1       !
;    1414  1       ! Side effects:
;    1415  1       ! The device is accessed.
;    1416  1       !
;    1417  1       ! Return codes:
;    1418  1       !       RMS$_NORMAL             if OK                                   !G:3
;    1419  1       !       RMS$_RER                if system read error (QIO)              !G:3
;    1420  1       !
;    1421  1       ! --
;    1422  2       BEGIN
;    1423  2
;    1424  2           external register
;    1425  2              block = 6,
;    1426  2              vbn = 7,
;    1427  2              offset = 8,
;    1428  2              cblock = 9 : ref bblock,
;    1429  2              rab = 10 : ref bblock,
;    1430  2              fab = 11: ref bblock;
;    1431  2
;    1432  2
;    1433  2              iob[iob$l_i_flgs] = .iob[iob$l_i_flgs] OR F_RDDATA;
;    1434  2              iob[iob$l_i_error] = 0;
;    1435  2              start_lbn = .iob[iob$l_i_bn];
;    1436  2              byte_coun = .iob[iob$l_i_cc];
;    1437  2              buff_addr = .iob[iob$l_i_ma];
;    1438  2              adrs_mode =  PHYSMODE;
;    1439  2              io_functn = READVBLK;
;    1440  2
;    1441  2              qio_status = boo$qio(.buff_addr, .byte_coun,  .start_lbn, .io_functn, .adrs_mode, .cblock[ct$l_rpb]);
;    1442  2
;    1443  2
;    1444  2              cc = .iob[iob$l_i_cc];
;    1445  2              iob[iob$l_i_flgs] = .iob[iob$l_i_flgs] AND  (NOT F_TYPEMASK);   ! set flag
;    1446  2              IF NOT .qio_status
;    1447  2                THEN
;    1448  2                   RETURN  RMS$_RER
```

```
;   1449  2                 ELSE
;   1450  2             RETURN  RMS$_NORMAL;
;   1451  1     END;



                        50 00000000'  EF  D0 00000 ULTRIX$DEVREAD:
                                                          MOVL    IOB, R0                          ; 1433
                  01    A0            01  88 00007        BISB2   #1, 1(R0)                        ;
                              00CA    C0  D4 0000B        CLRL    202(R0)                          ; 1434
          00000000'  EF       00BE    C0  D0 0000F        MOVL    190(R0), START_LBN               ; 1435
          00000000'  EF       00C6    C0  D0 00018        MOVL    198(R0), BYTE_COUN               ; 1436
          00000000'  EF       00C2    C0  D0 00021        MOVL    194(R0), BUFF_ADDR               ; 1437
                         00000000'    EF  D4 0002A        CLRL    ADRS_MODE                        ; 1438
          00000000'  EF               21  D0 00030        MOVL    #33, IO_FUNCTN                   ; 1439
                               38     A9  DD 00037        PUSHL   56(CBLOCK)                       ; 1441
                         00000000'    EF  DD 0003A        PUSHL   ADRS_MODE                        ;
                         00000000'    EF  DD 00040        PUSHL   IO_FUNCTN                        ;
                         00000000'    EF  DD 00046        PUSHL   START_LBN                        ;
                         00000000'    EF  DD 0004C        PUSHL   BYTE_COUN                        ;
                         00000000'    EF  DD 00052        PUSHL   BUFF_ADDR                        ;
          00000000G  EF               06  FB 00058        CALLS   #6, BOO$QIO                      ;
          00000000'  EF               50  D0 0005F        MOVL    R0, QIO_STATUS                   ;
                        50 00000000'  EF  D0 00066        MOVL    IOB, R0                          ; 1444
          00000000'  EF       00C6    C0  D0 0006D        MOVL    198(R0), CC                      ;
                               01     A0  94 00076        CLRB    1(R0)                            ; 1445
                        08 00000000'  EF  E8 00079        BLBS    QIO_STATUS, 1$                   ; 1446
                        50 0001C0F4   8F  D0 00080        MOVL    #114932, R0                      ; 1448
                                          05 00087        RSB                                      ;
                        50 00010001   8F  D0 00088 1$:    MOVL    #65537, R0                       ; 1450
                                          05 0008F        RSB                                      ;

; Routine Size:  144 bytes,    Routine Base:  CODE + 07D1


;   1452  1
```

```
;    1453  1
;    1454  1       %sbttl 'ULTRIX$GET routine'
;    1455  1
;    1456  1       global routine ultrix$get : call_rms =
;    1457  1
;    1458  1       !++
;    1459  1       ! Functional description:
;    1460  1       !       De-block and return a record from an ULTRIX file.
;    1461  1       !
;    1462  1       ! Inputs:
;    1463  1       !       none
;    1464  1       !
;    1465  1       ! Implicit inputs:
;    1466  1       !       R9                      CBLOCK pointer
;    1467  1       !       R10                     RAB pointer
;    1468  1       !       R11                     FAB pointer
;    1469  1       !       several fields in the above data structures
;    1470  1       !
;    1471  1       ! Outputs:
;    1472  1       !       none
;    1473  1       !
;    1474  1       ! Implicit outputs:
;    1475  1       !       RAB [rab$l_stv]         Set to error status of failing system service
;    1476  1       !       RAB [rab$l_rbf]         Set to user buffer
;    1477  1       !       RAB [rab$w_rsz]         Size of record copied to user buffer
;    1478  1       !
;    1479  1       ! Side effects:
;    1480  1       !       CBLOCK [ctl$w_rfa]      advanced one record if access was not
;    1481  1       !                               random-by-RFA
;    1482  1       !       CBLOCK                  cache control and cache buffers may be
;    1483  1       !                               altered if part or all of the record is
;    1484  1       !                               not within a block currently cached.
;    1485  1       !
;    1486  1       ! Return codes:
;    1487  1       !       RMS$_NORMAL             if OK
;    1488  1       !       RMS$_RER                if system read error (QIO)
;    1489  1       !       RMS$_RFA                if random RFA is beyond EOF
;    1490  1       !       RMS$_EOF                if RFA is beyond end of file
;    1491  1       !       RMS$_IRC                Illegal record
;    1492  1       !       RMS$_RTB                Record is too big for user buffer (truncated)
;    1493  1       !--
;    1494  1
;    1495  2           begin
;    1496  2
;    1497  2           external register
;    1498  2              cblock = 9 : ref bblock,                 ! Pointer to CBLOCK
;    1499  2              rab = 10 : ref bblock,                   ! Pointer to RAB
;    1500  2              fab = 11 : ref bblock;                   ! Pointer to FAB
;    1501  2
;    1502  2           global register
;    1503  2              block = 6 : ref vector [, byte],         ! Pointer to cache buffer
;    1504  2              vbn = 7,                                 ! Current VBN in file
;    1505  2              offset = 8;                              ! Current offset in VBN
;    1506  2
;    1507  2           local
;    1508  2              dn_ext : long,                           ! Default filename extension.
;    1509  2              LF_FLAG : byte,                          ! Line feed flag
```

```
;    1510  2              f_size : word,                          ! Full size of record
;    1511  2              size : long,                            ! Size of record
;    1512  2              lenlim : word,                          ! Size of user buffer
;    1513  2              ptr;                                    ! Address in user buffer
;    1514  2
;    1515  2            vbn = .cblock [ctl$l_vbn];                ! Extract vbn from next RFA
;    1516  2            offset = .cblock [ctl$w_byte];            ! Extract byte offset
;    1517  2
;    1518  2              IF   .Fab[fab$l_dna] NEQ 0                      ! If present Convert to LC
;    1519  2                 THEN
;    1520  2                      dn_ext =  .(.Fab[fab$l_dna] +.Fab[fab$b_dns]-4) OR '.   ';
;    1521  2
;    1522  2              if .rab [rab$b_rac] neq rab$c_rfa         ! If not random access
;    1523  2              then
;    1524  2                  ultrix$advance (.cblock [ctl$w_rec_size]);  ! Else advance to next
;    1525  2
;    1526  2              cblock [ctl$l_vbn] = .vbn;                ! Update CBLOCK vbn
;    1527  2              cblock [ctl$w_byte] = .offset;            !  and it's offset
;    1528  2
;    1529  2              if .vbn gtr .cblock [ctl$l_eofvbn] or .vbn eql .cblock [ctl$l_eofvbn] and .offset geq
;    1530  2                                                        .cblock [ctl$w_offbyte]                 ! If past file EOF
;    1531  2              then
;    1532  2                  return rms$_eof;                      ! can't read past EOF
;    1533  2
;    1534  3              (
;    1535  3
;    1536  3              local
;    1537  3                  stat;
;    1538  3
;    1539  3              stat = ultrix$access ();                          ! Load the block in cache
;    1540  2              if not .stat then return .stat);
;    1541  2              cblock [ctl$w_rec_size] =                 ! Set size of current record
;    1542  4              (if .fab [fab$l_dna] neq 0 AND (.dn_ext  EQL '.dir')
;    1543  3              then
;    1544  4                  begin
;    1545  4                  size = .(block [.offset])<32, 16>;  ! then fetch record size
;    1546  4                  if .size EQL 0 Then RETURN rms$_eof;
;    1547  4                  .size
;    1548  4                  end
;    1549  2              else size = .fab [fab$w_mrs]);            ! else get fixed size from FAB
;    1550  2
;    1551  2            ptr = rab [rab$l_rbf] = .rab [rab$l_ubf];  ! Point to user buffer
;    1552  2            lenlim = .rab [rab$w_usz];                ! Size limit
;    1553  2            rab [rab$w_rsz] = 0;                      ! Init output size
;    1554  2            f_size = .size;                           ! Store size, since SIZE moves
;    1555  2
;    1556  2            while 1 do                                        ! Copy over the record
;    1557  3               begin
;    1558  3
;    1559  3               local
;    1560  3                   length;
;    1561  3
;    1562  4               (
;    1563  4               local
;    1564  4                   stat;
;    1565  4
;    1566  4               stat = ultrix$access ();                       ! Be sure VBN is there
```

```
;    1567  3              if not .stat then return .stat);
;    1568  3              LF_FLAG = 0;                                    ! clear flag
;    1569  4              IF   .Fab[fab$l_dna]   NEQ 0  AND  ( .dn_ext  EQL '.hlp'
;    1570  4                                              OR  .dn_ext  EQL '.com')
;    1571  3              then
;    1572  4                      begin
;    1573  4                      IF (size = CH$FIND_CH(512-.offset , block[.offset], %x'0a') ) EQL 0 ! search for line feed character
;    1574  4
;    1575  4                      THEN
;    1576  5                              size =   (IF .VBN EQL .cblock[ctl$l_eofvbn]
;    1577  5                                        THEN  512 - .cblock[ctl$w_offbyte]- .offset   ! Set to EOF or
;    1578  5                                         ELSE 512 - .offset )                         ! remainder of this block
;    1579  5
;    1580  4                      ELSE
;    1581  5                              begin
;    1582  5                              size = .size - BLOCK[.offset]+1;        ! Character found.
;    1583  5                              LF_FLAG = 1;                            ! Set flag for char found.
;    1584  4                              end;
;    1585  3                      end;
;    1586  3              length = min ( .size, (512 - .offset), .lenlim);        ! Size to copy
;    1587  3              ptr = ch$move (.length, block [.offset], .ptr); ! Copy at least part of record
;    1588  3              rab [rab$w_rsz] = .rab [rab$w_rsz] + .length;   ! Update actual length so far
;    1589  3              size = .size - .length;                         ! Rest of record
;    1590  3              cblock [ctl$w_rec_size] = .rab[rab$w_rsz]  ;    ! Set to record size + LF.
;    1591  3
;    1592  3              if .size eql 0
;    1593  3              THEN
;    1594  4              BEGIN
;    1595  4              IF  (.LF_FLAG NEQ 0 AND .fab[fab$l_dna] NEQ 0) AND
;    1596  5                                      ( .dn_ext  EQL '.hlp'
;    1597  5                                        OR  .dn_ext  EQL '.com')
;    1598  5
;    1599  4              THEN                                                    ! If LF found on help or com file proceed.
;    1600  5                      BEGIN
;    1601  5                       rab [rab$w_rsz] = .rab [rab$w_rsz] -1;         !  No LF char send.
;    1602  5                      return rms$_normal;                             ! Return if done
;    1603  5                      END
;    1604  4              ELSE
;    1605  5              IF   .Fab[fab$l_dna]   NEQ 0  AND (.dn_ext  EQL '.hlp'
;    1606  5                                              OR .dn_ext  EQL '.com')
;    1607  4                      THEN                                            ! Continue searching for LF
;    1608  4                      ELSE
;    1609  4                      return rms$_normal
;    1610  4              ;                                                       ! Return if done
;    1611  3              END;
;    1612  3
;    1613  3              lenlim = .lenlim - .length;             ! Buffer size left
;    1614  3
;    1615  3              if .lenlim eql 0                        ! If no space left
;    1616  3              then
;    1617  4                  begin
;    1618  4                  rab [rab$l_stv] = .f_size;          ! Return true size
;    1619  4                  return rms$_rtb
;    1620  3                  end;
;    1621  3
;    1622  3              ultrix$advance (.length)                        ! Skip on to next block
;    1623  2              end;
```

```
;   1624  2
;   1625  2          rms$_normal
;   1626  1          end;



                                                  01FC 00000          .ENTRY  ULTRIX$GET, Save R2,R3,R4,R5,R6,R7,R8        ; 1456
                                 5E            1C  C2 00002          SUBL2   #28, SP                                      ;
                                 57        18  A9  D0 00005          MOVL    24(CBLOCK), VBN                              ; 1515
                                 58        1C  A9  3C 00009          MOVZWL  28(CBLOCK), OFFSET                           ; 1516
                                           30  AB  D5 0000D          TSTL    48(FAB)                                      ; 1518
                                               11  13 00010          BEQL    1$                                           ;
                                 50        35  AB  9A 00012          MOVZBL  53(FAB), R0                                  ; 1520
                                 50        30  AB  C0 00016          ADDL2   48(FAB), R0                                  ;
                     6E       FC  A0 2020202E  8F  C9 0001A          BISL3   #538976302, -4(R0), DN_EXT                   ;
                                 02        1E  AA  91 00023 1$:      CMPB    30(RAB), #2                                  ; 1522
                                               08  13 00027          BEQL    2$                                           ;
                                 50        1E  A9  3C 00029          MOVZWL  30(CBLOCK), R0                               ; 1524
                                         F76E  CF  16 0002D          JSB     ULTRIX$ADVANCE                               ;
                             18  A9            57  D0 00031 2$:      MOVL    VBN, 24(CBLOCK)                              ; 1526
                             1C  A9            58  B0 00035          MOVW    OFFSET, 28(CBLOCK)                           ; 1527
                             44  A9            57  D1 00039          CMPL    VBN, 68(CBLOCK)                              ; 1529
                                               29  14 0003D          BGTR    4$                                           ;
                                               08  12 0003F          BNEQ    3$                                           ;
        58       42  A9            10            00  ED 00041          CMPZV   #0, #16, 66(CBLOCK), OFFSET                  ; 1530
                                               1F  15 00047          BLEQ    4$                                           ;
                                         F767  CF  16 00049 3$:      JSB     ULTRIX$ACCESS                                ; 1539
                                 49            50  E9 0004D          BLBC    STAT, 8$                                     ; 1540
                                           30  AB  D5 00050          TSTL    48(FAB)                                      ; 1542
                                               1B  13 00053          BEQL    5$                                           ;
                     7269642E    8F            6E  D1 00055          CMPL    DN_EXT, #1919509550                          ;
                                               12  12 0005C          BNEQ    5$                                           ;
                                           04 A846  9F 0005E          PUSHAB  4(OFFSET)[BLOCK]                             ; 1545
                             08  AE            9E  3C 00062          MOVZWL  @(SP)+, SIZE                                 ;
                                               0D  12 00066          BNEQ    6$                                           ; 1546
                                 50 0001827A   8F  D0 00068 4$:      MOVL    #98938, R0                                   ;
                                                   04 0006F          RET                                                  ;
                             08  AE        36  AB  3C 00070 5$:      MOVZWL  54(FAB), SIZE                                ; 1549
                                 51        08  AE  D0 00075 6$:      MOVL    SIZE, R1                                     ;
                             1E  A9            51  B0 00079          MOVW    R1, 30(CBLOCK)                               ; 1541
                                 50        24  AA  D0 0007D          MOVL    36(RAB), R0                                  ; 1551
                             28  AA            50  D0 00081          MOVL    R0, 40(RAB)                                  ;
                                 53            50  D0 00085          MOVL    R0, PTR                                      ;
                             0C  AE        20  AA  B0 00088          MOVW    32(RAB), LENLIM                              ; 1552
                                           22  AA  B4 0008D          CLRW    34(RAB)                                      ; 1553
                             18  AE        08  AE  B0 00090          MOVW    SIZE, F_SIZE                                 ; 1554
                                         F71B  CF  16 00095 7$:      JSB     ULTRIX$ACCESS                                ; 1566
                                 01            50  E8 00099 8$:      BLBS    STAT, 9$                                     ; 1567
                                                   04 0009C          RET                                                  ;
                                           10  AE  94 0009D 9$:      CLRB    LF_FLAG                                      ; 1568
                                           14  AE  D4 000A0          CLRL    20(SP)                                       ; 1569
                                           30  AB  D5 000A3          TSTL    48(FAB)                                      ;
                                               5B  13 000A6          BEQL    14$                                          ;
                                           14  AE  D6 000A8          INCL    20(SP)                                       ;
                     706C682E    8F            6E  D1 000AB          CMPL    DN_EXT, #1886152750                          ;
```

```
                                                 09  13 000B2          BEQL    10$                                          ;
                    6D6F632E   8F                6E  D1 000B4          CMPL    DN_EXT, #1836016430                          ; 1570
                                                 46  12 000BB          BNEQ    14$                                          ;
                 52 00000200   8F                58  C3 000BD 10$:     SUBL3   OFFSET, #512, R2                             ; 1573
                 54            56                58  C1 000C5          ADDL3   OFFSET, BLOCK, R4                            ;
                 64            52                0A  3A 000C9          LOCC    #10, R2, (R4)                                ;
                                                 02  12 000CD          BNEQ    11$                                          ;
                                                 51  D4 000CF          CLRL    R1                                           ;
                         08   AE                51  D0 000D1 11$:     MOVL    R1, SIZE                                     ;
                                                 1E  12 000D5          BNEQ    13$                                          ;
                         44   A9                57  D1 000D7          CMPL    VBN, 68(CBLOCK)                              ; 1576
                                                 12  12 000DB          BNEQ    12$                                          ;
                              51        42      A9  3C 000DD          MOVZWL  66(CBLOCK), R1                               ; 1577
                              51                58  C0 000E1          ADDL2   OFFSET, R1                                   ;
            08   AE 00000200   8F                51  C3 000E4          SUBL3   R1, #512, SIZE                               ;
                                                 14  11 000ED          BRB     14$                                          ;
                         08   AE                52  D0 000EF 12$:     MOVL    R2, SIZE                                     ;
                                                 0E  11 000F3          BRB     14$                                          ;
                 51      08   AE                54  C3 000F5 13$:     SUBL3   R4, SIZE, R1                                 ; 1582
                         08   AE        01      A1  9E 000FA          MOVAB   1(R1), SIZE                                  ;
                         10   AE                01  90 000FF          MOVB    #1, LF_FLAG                                  ; 1583
                 50 00000200   8F                58  C3 00103 14$:     SUBL3   OFFSET, #512, R0                             ; 1586
                              51        08      AE  D0 0010B          MOVL    SIZE, R1                                     ;
                              50                51  D1 0010F          CMPL    R1, R0                                       ;
                                                 03  15 00112          BLEQ    15$                                          ;
                              51                50  D0 00114          MOVL    R0, R1                                       ;
      51    0C   AE            10                00  ED 00117 15$:     CMPZV   #0, #16, LENLIM, R1                          ;
                                                 04  18 0011D          BGEQ    16$                                          ;
                              51        0C      AE  3C 0011F          MOVZWL  LENLIM, R1                                   ;
                         04   AE                51  D0 00123 16$:     MOVL    R1, LENGTH                                   ;
                 63         6846        04      AE  28 00127          MOVC3   LENGTH, (OFFSET)[BLOCK], (PTR)               ; 1587
                         22   AA        04      AE  A0 0012D          ADDW2   LENGTH, 34(RAB)                              ; 1588
                         08   AE        04      AE  C2 00132          SUBL2   LENGTH, SIZE                                 ; 1589
                         1E   A9        22      AA  B0 00137          MOVW    34(RAB), 30(CBLOCK)                          ; 1590
                                        08      AE  D5 0013C          TSTL    SIZE                                         ; 1592
                                                 36  12 0013F          BNEQ    19$                                          ;
                                        10      AE  95 00141          TSTB    LF_FLAG                                      ; 1595
                                                 1B  13 00144          BEQL    18$                                          ;
                              4C        14      AE  E9 00146          BLBC    20(SP), 21$                                  ;
                    706C682E   8F                6E  D1 0014A          CMPL    DN_EXT, #1886152750                          ; 1596
                                                 09  13 00151          BEQL    17$                                          ;
                    6D6F632E   8F                6E  D1 00153          CMPL    DN_EXT, #1836016430                          ; 1597
                                                 05  12 0015A          BNEQ    18$                                          ;
                                        22      AA  B7 0015C 17$:     DECW    34(RAB)                                      ; 1601
                                                 35  11 0015F          BRB     21$                                          ; 1602
                              31        14      AE  E9 00161 18$:     BLBC    20(SP), 21$                                  ; 1605
                    706C682E   8F                6E  D1 00165          CMPL    DN_EXT, #1886152750                          ;
                                                 09  13 0016C          BEQL    19$                                          ;
                    6D6F632E   8F                6E  D1 0016E          CMPL    DN_EXT, #1836016430                          ; 1606
                                                 1F  12 00175          BNEQ    21$                                          ;
                         0C   AE        04      AE  A2 00177 19$:     SUBW2   LENGTH, LENLIM                               ; 1613
                                                 0D  12 0017C          BNEQ    20$                                          ; 1615
                         0C   AA        18      AE  3C 0017E          MOVZWL  F_SIZE, 12(RAB)                              ; 1618
                              50 000181A8       8F  D0 00183          MOVL    #98728, R0                                   ; 1619
                                                     04 0018A          RET                                                  ;
                              50        04      AE  D0 0018B 20$:     MOVL    LENGTH, R0                                   ; 1622
                                      F60C      CF  16 0018F          JSB     ULTRIX$ADVANCE                               ;
```

```
                                  FEFF  31 00193          BRW     7$                                  ;
                        50 00010001   8F  D0 00196 21$:    MOVL    #65537, R0                          ; 1626
                                        04 0019D          RET                                         ;

; Routine Size:  414 bytes,    Routine Base:  CODE + 0861


;   1627  1
```

```
;    1628  1
;    1629  1      %sbttl 'ultrix$getc'                                                    !G:3
;    1630  1      routine ultrix$getc   : jsb_ultrix  =
;    1631  1
;    1632  1      !++
;    1633  1      ! Functional description:
;    1634  1      ! Implicit inputs:
;    1635  1      !      R7                          vbn
;    1636  1      !
;    1637  1      ! Inputs:
;    1638  1      !
;    1639  1      ! iob[iob$l_i_ma]      - initial address of buffer to put data
;    1640  1      ! iob[iob$l_i_offset]  - initial offset into file in bytes
;    1641  1      ! iob[iob$l_i_cc]      - initial size of transfer in bytes
;    1642  1      !
;    1643  1      !
;    1644  1      ! implicit inputs:
;    1645  1      !
;    1646  1      ! Outputs:
;    1647  1      !
;    1648  1      ! Data is read into specified buffer.
;    1649  1      !
;    1650  1      ! Implicit outputs:
;    1651  1      !
;    1652  1      ! Side effects:
;    1653  1      !
;    1654  1      ! various fields in IOB are changed.
;    1655  1      !
;    1656  1      ! Return codes:
;    1657  1      !
;    1658  1      !      RMS$_RER         - File read error
;    1659  1      !      RMS$_NORMAL      - Success
;    1660  1      !      RMS$_EOF         - end of file encountered
;    1661  1      ! --
;    1662  2      BEGIN
;    1663  2
;    1664  2           external register
;    1665  2              block = 6,
;    1666  2              vbn = 7,
;    1667  2              offset = 8,
;    1668  2              cblock = 9 : ref bblock,
;    1669  2              rab = 10 : ref bblock,
;    1670  2              fab = 11: ref bblock;
;    1671  2           local
;    1672  2              write_buf_addr:long;    ! Current address of write buffer.          [132]
;    1673  2
;    1674  2              IF     (.iob[iob$l_i_flgs]  AND  F_ALLOC) EQL 0
;    1675  2              THEN
;    1676  2                     return (RMS$_EOF);                          ! error: bad file descriptor
;    1677  2              transfer_size = .iob[iob$l_i_cc];                   ! Get transfer size of this operation
;    1678  2                           write_buf_addr = .iob[iob$l_i_ma];    ! Initialize the buffer address  [02]
;    1679  2              WHILE .transfer_size GTR 0 DO
;    1680  3                     BEGIN
;    1681  3                     IF (.iob[iob$l_i_flgs]  AND   F_FILE) NEQ 0
;    1682  3                     THEN
;    1683  4                           BEGIN
;    1684  4                           diff = .iob[iob$z_ic_size] - .iob[iob$l_i_offset];          ! check if byte offset excee
```

```
;   1685  4                          IF .diff  LEQ  0
;   1686  4                            THEN
;   1687  4                                return (RMS$_EOF);
;   1688  4                        lbn =  (.iob[iob$l_i_offset] ^ -.iob[iob$l_fs_bshift]);          ! compute logical fileblock
;   1689  4                        iob[iob$l_i_bn] =  (ultrix$sbmap(.lbn) ^ .iob[iob$l_fs_fsbtodb]) + .iob[iob$l_i_boff]; !find
;   1690  4                                                        ! fileblock of file  from file system blk
;   1691  4                        off = .iob[iob$l_i_offset] AND ( NOT .iob[iob$l_fs_bmask]);      ! offset into block
;   1692  4                        iob[iob$l_i_bn] = .iob[iob$l_i_bn] + .off/512;          ! Compute logical block number to re
;   1693  4
;   1694  5                          IF .lbn GEQ NDADDR  OR  .iob[iob$z_val] GEQ  ((.lbn + 1) ^ .iob[iob$l_fs_bshift])
;   1695  4                            THEN
;   1696  4                                frag_size = .iob[iob$l_fs_bsize]        ! find size of fragment in bytes.
;   1697  4                            ELSE
;   1698  4                                frag_size = ((.iob[iob$z_val] AND ( NOT .iob[iob$l_fs_bmask])) + .iob[iob$l_fs_fsize
;   1699  4                                                                                .iob[iob$l_fs_fmask];
;   1700  4
;   1701  4                        END
;   1702  3                ELSE
;   1703  4                        BEGIN
;   1704  4                        iob[iob$l_i_bn] = .iob[iob$l_i_offset] / DEV_BSIZE;     ! next blk # to read
;   1705  4                        off = 0;
;   1706  4                        frag_size = DEV_BSIZE;
;   1707  3                        END;
;   1708  3                iob[iob$l_i_cc] = MIN(.transfer_size, .frag_size);              ! set size of fragment of transfer
;   1709  3                transfer_size = MAX(0, .transfer_size - .frag_size);            ! Reset remainder to transfer.
;   1710  3                iob[iob$l_i_ma] = .write_buf_addr;                              ! restore correct buffer address
;   1711  3                IF NOT ultrix$devread()
;   1712  3
;   1713  3                THEN
;   1714  3                        return (RMS$_RER);
;   1715  3                iob[iob$l_i_ma] = .iob[iob$l_i_ma] + .iob[iob$l_i_cc] ;         ! Reset buffer addr to transfer to.
;   1716  3                write_buf_addr = .iob[iob$l_i_ma];      ! Save the buffer address  [02]
;   1717  3                iob[iob$l_i_offset] = .iob[iob$l_i_offset] + .iob[iob$l_i_cc];  ! Adjust for next interation.
;   1718  2                END;
;   1719  2          return (RMS$_NORMAL);                                  ! return pointer
;   1720  2
;   1721  1     END;



                                        3C  BB 00000 ULTRIX$GETC:
                                                                PUSHR   #^M<R2,R3,R4,R5>                        ; 1630
                        50 00000000'    EF  D0 00002            MOVL    IOB, R0                                 ; 1674
            37          60              02  E1 00009            BBC     #2, (R0), 4$                            ;
               00000000' EF     00C6    C0  D0 0000D            MOVL    198(R0), TRANSFER_SIZE                  ; 1677
                        54     00C2    C0  D0 00016            MOVL    194(R0), WRITE_BUF_ADDR                 ; 1678
                        52 00000000'    EF  D0 0001B            MOVL    IOB, R2                                 ; 1681
                        53     00BA    C2  9E 00022            MOVAB   186(R2), R3                             ; 1684
                           00000000'    EF  D5 00027 1$:        TSTL    TRANSFER_SIZE                           ; 1679
                                        03  14 0002D            BGTR    2$                                      ;
                                      0133  31 0002F            BRW     13$                                     ;
            03          62              03  E0 00032 2$:        BBS     #3, (R2), 3$                            ; 1681
                                      00A4  31 00036            BRW     8$                                      ;
      00000000' EF      36  A2          63  C3 00039 3$:        SUBL3   (R3), 54(R2), DIFF                      ; 1684
                                        0A  14 00042            BGTR    5$                                      ; 1685
```

```
                                50 0001827A   8F  D0 00044 4$:    MOVL    #98938, R0                                  ; 1687
                                           011E  31 0004B        BRW     14$                                          ;
                                50     2126   C2  CE 0004E 5$:    MNEGL   8486(R2), R0                                ; 1688
        00000000'  EF           63            50  78 00053        ASHL    R0, (R3), LBN                               ;
                                50 00000000'  EF  D0 0005B        MOVL    LBN, R0                                     ; 1689
                                       FC00   CF  16 00062        JSB     ULTRIX$SBMAP                                ;
                                51 00000000'  EF  D0 00066        MOVL    IOB, R1                                     ;
                  50            50     213A   C1  78 0006D        ASHL    8506(R1), R0, R0                            ;
                        00BE    C2     00B2 D140  9E 00073        MOVAB   @178(R1)[R0], 190(R2)                       ;
        00000000'  EF     00BA  C1     211E   C1  CB 0007B        BICL3   8478(R1), 186(R1), OFF                      ; 1691
                  50 00000000'  EF 00000200   8F  C7 00087        DIVL3   #512, OFF, R0                               ; 1692
                        00BE    C1            50  C0 00093        ADDL2   R0, 190(R1)                                 ;
                                0C 00000000'  EF  D1 00098        CMPL    LBN, #12                                    ; 1694
                                              14  18 0009F        BGEQ    6$                                           ;
                  50 00000000'  EF            01  C1 000A1        ADDL3   #1, LBN, R0                                 ;
                  50            50     2126   C1  78 000A9        ASHL    8486(R1), R0, R0                            ;
                                50       36   A1  D1 000AF        CMPL    54(R1), R0                                  ;
                                              0B  19 000B3        BLSS    7$                                           ;
                     00000000'  EF     2106   C1  D0 000B5 6$:    MOVL    8454(R1), FRAG_SIZE                         ; 1696
                                              36  11 000BE        BRB     9$                                           ;
                  50       36   A1     211E   C1  CB 000C0 7$:    BICL3   8478(R1), 54(R1), R0                        ; 1698
                                50     210A   C1  C0 000C7        ADDL2   8458(R1), R0                                ;
                                              50  D7 000CC        DECL    R0                                           ;
                                55     2122   C1  D2 000CE        MCOML   8482(R1), R5                                ; 1699
        00000000'  EF           50            55  CB 000D3        BICL3   R5, R0, FRAG_SIZE                           ;
                                              19  11 000DB        BRB     9$                                           ;
            00BE   C2           63 00000200   8F  C7 000DD 8$:    DIVL3   #512, (R3), 190(R2)                         ; 1704
                                   00000000'  EF  D4 000E7        CLRL    OFF                                          ; 1705
                     00000000'  EF     0200   8F  3C 000ED        MOVZWL  #512, FRAG_SIZE                             ; 1706
                                51 00000000'  EF  D0 000F6 9$:    MOVL    IOB, R1                                     ; 1708
                                50 00000000'  EF  D0 000FD        MOVL    TRANSFER_SIZE, R0                           ;
                     00000000'  EF            50  D1 00104        CMPL    R0, FRAG_SIZE                               ;
                                              07  15 0010B        BLEQ    10$                                          ;
                                50 00000000'  EF  D0 0010D        MOVL    FRAG_SIZE, R0                               ;
                        00C6    C1            50  D0 00114 10$:   MOVL    R0, 198(R1)                                 ;
                  50 00000000'  EF 00000000'  EF  C3 00119        SUBL3   FRAG_SIZE, TRANSFER_SIZE, R0                ; 1709
                                              02  18 00125        BGEQ    11$                                          ;
                                              50  D4 00127        CLRL    R0                                           ;
                     00000000'  EF            50  D0 00129 11$:   MOVL    R0, TRANSFER_SIZE                           ;
                        00C2    C1            54  D0 00130        MOVL    WRITE_BUF_ADDR, 194(R1)                     ; 1710
                                       FC99   CF  16 00135        JSB     ULTRIX$DEVREAD                              ; 1711
                                09            50  E8 00139        BLBS    R0, 12$                                     ;
                                50 0001C0F4   8F  D0 0013C        MOVL    #114932, R0                                 ; 1714
                                              27  11 00143        BRB     14$                                          ;
                                52 00000000'  EF  D0 00145 12$:   MOVL    IOB, R2                                     ; 1715
                        00C2    C2     00C6   C2  C0 0014C        ADDL2   198(R2), 194(R2)                            ;
                                54     00C2   C2  D0 00153        MOVL    194(R2), WRITE_BUF_ADDR                     ; 1716
                                53     00BA   C2  9E 00158        MOVAB   186(R2), R3                                 ; 1717
                                63     00C6   C2  C0 0015D        ADDL2   198(R2), (R3)                               ;
                                           FEC2  31 00162        BRW     1$                                           ; 1679
                                50 00010001   8F  D0 00165 13$:   MOVL    #65537, R0                                  ; 1719
                                              3C  BA 0016C 14$:   POPR    #^M<R2,R3,R4,R5>                            ;
                                                  05 0016E        RSB                                                  ;

; Routine Size:  367 bytes,    Routine Base:  CODE + 09FF
```

```
;   1722  1
```

```
;    1724  1      %sbttl 'ULTRIX$READ routine'
;    1725  1
;    1726  1      global routine ultrix$read : call_rms =
;    1727  1
;    1728  1      !++
;    1729  1      ! Functional description:
;    1730  1      !       Read virtual blocks of file
;    1731  1      !
;    1732  1      ! Inputs:
;    1733  1      !       none
;    1734  1      !
;    1735  1      ! Implicit inputs:
;    1736  1      !       R9                      CBLOCK pointer
;    1737  1      !       R10                     RAB pointer
;    1738  1      !       various fields in the above-listed data structures
;    1739  1      !
;    1740  1      ! Outputs:
;    1741  1      !       none
;    1742  1      !
;    1743  1      ! Implicit outputs:
;    1744  1      !       RAB [rab$l_rbf]         points to buffer
;    1745  1      !       RAB [rab$w_rsz]         size of buffer
;    1746  1      !
;    1747  1      ! Side Effects:
;    1748  1      !       CBLOCK [ctl$l_nbp]      points to next VBN for sequential READ.
;    1749  1      !
;    1750  1      ! Return codes:
;    1751  1      !       RMS$_NORMAL             OK
;    1752  1      !       RMS$_RER                Read error
;    1753  1      !--
;    1754  1
;    1755  2          begin
;    1756  2
;    1757  2          external register
;    1758  2              cblock = 9 : ref bblock,                ! Map the control block
;    1759  2              rab = 10 : ref bblock,                  ! Map the RAB
;    1760  2              fab = 11 : ref bblock;                  ! Map the FAB
;    1761  2
;    1762  2                  global register
;    1763  2                      block = 6,                      ! Registers for ACCESS
;    1764  2                      vbn = 7,
;    1765  2                      offset = 8;
;    1766  2
;    1767  2
;    1768  3      rab[rab$w_rsz]   = MIN(.rab[rab$w_usz], (.cblock[ctl$l_eofvbn] -
;    1769  2                              .cblock[ctl$l_nbp])*512 + .cblock[ctl$w_offbyte]);
;    1770  2      cblock [ctl$l_nbp] =.cblock [ctl$l_nbp] +(.rab[rab$w_rsz] + 511)/512 ;
;    1771  2      iob[iob$l_i_ma]  = .rab[rab$l_ubf];             ! Buffer to read to
;    1772  2      iob[iob$l_i_cc]  = .rab[rab$w_rsz]; ! Don't copy too much.
;    1773  2      iob[iob$l_i_offset] = MAX((.rab[rab$l_bkt]-1)*512,0);   ! Start at correct offset.
;    1774  2                                                      ! No negative value.
;    1775  2
;    1776  3      BEGIN
;    1777  3              local
;    1778  3                 stat;
;    1779  3
;    1780  4       IF NOT (stat= ultrix$getc())
```

```
;   1781  3         THEN
;   1782  3             (rab[rab$l_stv] = .stat; return rms$_rer);
;   1783  2     END;
;   1784  2         rms$_normal
;   1785  1         end;                                    ! Of ultrix$read



                                                  01FC 00000        .ENTRY  ULTRIX$READ, Save R2,R3,R4,R5,R6,R7,R8      ; 1726
                 51       44   A9       04   A9  C3 00002        SUBL3   4(CBLOCK), 68(CBLOCK), R1                   ; 1769
                 51            51            09  78 00008        ASHL    #9, R1, R1                                  ;
                               50       42   A9  3C 0000C        MOVZWL  66(CBLOCK), R0                              ;
                               51            50  C0 00010        ADDL2   R0, R1                                      ;
                               50       20   AA  3C 00013        MOVZWL  32(RAB), R0                                 ;
                               51            50  D1 00017        CMPL    R0, R1                                      ;
                                             03  15 0001A        BLEQ    1$                                          ;
                               50            51  D0 0001C        MOVL    R1, R0                                      ;
                          22   AA            50  B0 0001F 1$:    MOVW    R0, 34(RAB)                                 ;
                               50       22   AA  3C 00023        MOVZWL  34(RAB), R0                                 ; 1770
                               50     01FF   C0  9E 00027        MOVAB   511(R0), R0                                 ;
                               50 00000200   8F  C6 0002C        DIVL2   #512, R0                                    ;
                          04   A9            50  C0 00033        ADDL2   R0, 4(CBLOCK)                               ;
                               51 00000000'  EF  D0 00037        MOVL    IOB, R1                                     ; 1771
                        00C2   C1       24   AA  D0 0003E        MOVL    36(RAB), 194(R1)                            ;
                        00C6   C1       22   AA  3C 00044        MOVZWL  34(RAB), 198(R1)                            ; 1772
                 50       38   AA            01  C3 0004A        SUBL3   #1, 56(RAB), R0                             ; 1773
                 50            50            09  78 0004F        ASHL    #9, R0, R0                                  ;
                                             02  18 00053        BGEQ    2$                                          ;
                                             50  D4 00055        CLRL    R0                                          ;
                        00BA   C1            50  D0 00057 2$:    MOVL    R0, 186(R1)                                 ;
                                     FE31    CF  16 0005C        JSB     ULTRIX$GETC                                 ; 1780
                               0C            50  E8 00060        BLBS    STAT, 3$                                    ;
                          0C   AA            50  D0 00063        MOVL    STAT, 12(RAB)                               ; 1782
                               50 0001C0F4   8F  D0 00067        MOVL    #114932, R0                                 ;
                                                 04 0006E        RET                                                 ;
                               50 00010001   8F  D0 0006F 3$:    MOVL    #65537, R0                                  ; 1785
                                                 04 00076        RET                                                 ;

; Routine Size:  119 bytes,    Routine Base:  CODE + 0B6E


;   1786  1
;   1787  1     end
;   1788  1
;   1789  0     eludom




;                                PSECT SUMMARY
;
;       Name                  Bytes                        Attributes
;
```

```
;  WORK                          156  NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  CODE                         3045  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  .  ABS  .                       0  NOVEC,NOWRT,NORD ,NOEXE,NOSHR,  LCL,  ABS,  CON,NOPIC,ALIGN(0)
```

Symbol	Type	Defined	Referenced ...											
ADRS_MODE	Own	154	1438=	1441.										
B	Own	465	480a	1301.	1311a.									
BBLOCK	Structur	Lib02	566	567	568	680	681	682	882	883	884	1025	1026	1027
			1097	1098	1099	1179	1180	1181	1239	1240	1241	1356	1357	1358
			1428	1429	1430	1498	1499	1500	1668	1669	1670	1758	1759	1760
BBSIZE	Literal	261	264											
BLKNOS	Own	160	815=	1297.	1307=									
BLOCK	ExtReg	563	633=											
	GlobReg	684												
	ExtReg	879												
	ExtReg	1022												
	ExtReg	1094												
	ExtReg	1176												
	ExtReg	1236												
	ExtReg	1353												
	ExtReg	1425												
	GlobReg	1503	1545.	1573a.	1582aa	1587a.								
	ExtReg	1665												
	GlobReg	1763												
BN	Own	158												
	RoutForm	1206	1244.	1256.	1259.	1268=	1268.	1273.	1276=	1276.	1310.			
BOFF	Own	150												
	RoutForm	1323	1381.											
BOO$QIO	ExtRout	114	1441c											
BUFF_ADDR	Own	156	1437=	1441.										
BUF_START	Literal	245												
BYTE_COUN	Own	153	1436=	1441.										
B_TAPE	Literal	260	732											
CACHE	Bind	574	615.	633.										
CALL_RMS	Linkage	Lib02	91	92	101	639	1456	1726						
CBLOCK	ExtReg	566	574aa	576a.	580a.	586a.	587a.	591a.	605a=	606a=	608a.	629a=	630a=	633a.
	ExtReg	680	690a=	691a=	692a=	701a.	702a.	812a=	814a=					
	ExtReg	882												
	ExtReg	1025												
	ExtReg	1097												
	ExtReg	1179												
	ExtReg	1239												
	ExtReg	1356												
	ExtReg	1428	1441a.											
	ExtReg	1498	1515a.	1516a.	1524a.	1526a=	1527a=	1529a.	1530a.	1541a=	1576a.	1577a.	1590a=	
	ExtReg	1668												
	ExtReg	1758	1768a.	1769a.	1770a=	1770a.								
CC	Own	133	1195=	1201.	1444=									
CHAIN_BASE	Literal	240	241	242	298	299	300	301	302	303	304	305	306	307
			308											
CTL$L_CACHE1	Macro	Lib02	574											
CTL$L_EOFVBN	Macro	Lib02	576	812	1529	1576	1768							

Symbol	Type	Defined	Referenced ...							
CTL$L_FILE_PTR	Macro	Lib02	701	702						
CTL$L_GET	Macro	Lib02	690							
CTL$L_HVBN	Macro	Lib02	587	606	630					
CTL$L_LVBN	Macro	Lib02	586	605	629	633				
CTL$L_NBP	Macro	Lib02	1769	1770						
CTL$L_READ	Macro	Lib02	691							
CTL$L_RPB	Macro	Lib02	1441							
CTL$L_STARTLBN	Macro	Lib02	692							
CTL$L_VBN	Macro	Lib02	1515	1526						
CTL$W_BYTE	Macro	Lib02	1516	1527						
CTL$W_CACHE_SIZE	Macro	Lib02	591							
CTL$W_FILE_LEN	Macro	Lib02	701	702						
CTL$W_OFFBYTE	Macro	Lib02	580	608	814	1530	1577	1769		
CTL$W_REC_SIZE	Macro	Lib02	1524	1541	1590					
D	Own	141	1111=	1112.	1115.					
DEVSW	Own	475	732.							
DEVSW$L_DV_CLOSE	Field	448								
DEVSW$L_DV_FLAGS	Field	450	732.							
DEVSW$L_DV_IOCTL	Field	449								
DEVSW$L_DV_NAME	Field	445								
DEVSW$L_DV_OPEN	Field	447								
DEVSW$L_DV_STRATEGY	Field	446								
DEVSW_FIELDS	Fieldset	444	475							
DEV_BSIZE	Literal	262	264	1704	1706					
DIFF	Own	148	1684=	1685.						
DINODE_SIZE	Literal	233	1199							
DIRECT$L_D_INO	Field	429								
DIRECT$W_D_NAMLEN	Field	431								
DIRECT$W_D_RECLEN	Field	430								
DIRECT$Z_D_NAME	Field	432								
DIRECT_FIELDS	Fieldset	428								
DIRSTUFF	Own	470	1047=	1103.	1106.	1110.	1133=	1133.		
DIRSTUFF$L_IO	Field	438								
DIRSTUFF$L_LOC	Field	437	1047=	1103.	1106.	1110.	1133=	1133.		
DIRSTUFF_FIELDS	Fieldset	436	470							
DN_EXT	Local	876	892=	921.	952.					
	Local	1508	1520=	1542.	1569.	1570.	1596.	1597.	1605.	1606.
DP	Own	161	1049=	1051a.	1055.	1059a.	1132=	1133.	1134a.	1136. 1138.
DS$_ERROR	Literal	Lib01	767	1388						
DS$_NORMAL	Literal	Lib01	1382							
DS$_NOSUPPORT	Literal	Lib01	761	1385						
END_SIZE	External	110	932=	957=	958.					
EXE$ALONONPAGED	ExtRout	115								
FAB	ExtReg	568								
	ExtReg	682	694a=	695a=	696a=					
	ExtReg	884	890a.	892a.	921a.	932a.	952a.	957a.	958a.	
	ExtReg	1027								
	ExtReg	1099								
	ExtReg	1181								
	ExtReg	1241								
	ExtReg	1358								
	ExtReg	1430								
	ExtReg	1500	1518a.	1520a.	1542a.	1549a.	1569a.	1595a.	1605a.	
	ExtReg	1670								
	ExtReg	1760								

```
Symbol                  Type     Defined  Referenced ...
----------------------- -------- -------- ---------------
FAB$B_DNS               Macro    Lib03    892     1520
FAB$B_FNS               Macro    Lib03    932      957
FAB$B_ORG               Macro    Lib03    694
FAB$B_RFM               Macro    Lib03    695
FAB$C_FIX               Literal  Lib03    695
FAB$C_SEQ               Literal  Lib03    694
FAB$L_DNA               Macro    Lib03    890      892     921     952     1518    1520    1542    1569    1595    1605
FAB$L_FNA               Macro    Lib03    958
FAB$W_MRS               Macro    Lib03    696     1549
FRAG_SIZE               Own        145   1696=    1698=   1706=   1708.   1709.
FS_BASE                 Literal    243    244      287     352     353     354     355     356     357     358     359     360     361
                                          362      363     364     365     366     367     368     369     370     371     372     373
                                          374      375     376     377     378     379     380     381     382     383     384     385
                                          386      387     388     389     390     391     392     393     394     395     396     397
                                          402      403     404     405     406     407     408     409     410     411     412     413
                                          417      418     421     422    1381
FS_MAGIC                Literal    257   1364
F_ALLOC                 Literal    278    699     1674
F_FILE                  Literal    263    810     1681
F_RDDATA                Literal    275   1433
F_SIZE                  Local     1510   1554=   1618.
F_TYPEMASK              Literal    277   1445
I                       Own        136    798=     804.   1310=   1311.
                        Local      609    615.     616.
IFDIR                   Literal    282    929      953    1033
IFMT                    Literal    281    929      953    1033
IOB                     Own        464    479a     615a=   616a=   617a=   699a=   699a.   700a=   701a=   702a.   703a.   707a.   709a=
                                          709a.    712a.   714a=   714a.   717a.   719a=   719a.   727a=   727a.   741a.   742a=   747a=
                                          747aa    748a=   749a=   750a=   781a=   781a.   782a=   783a=   786a=   786aa   787a=   788a=
                                          788a.    789a=   793a=   801a=   807a=   810a=   810a.   813a.   814a.   929a.   953a.  1033a.
                                         1037a.  1103a.  1106a.  1110a.  1115a=  1115a.  1116a.  1117a=  1117aa  1120a.  1122a=  1122a.
                                         1124a=  1124a.  1125a.  1132.   1184a=  1187a=  1188a.  1189a.  1190a.  1191a.  1192a=  1192a.
                                         1193a=  1193aa  1195a.  1198a=  1198a.  1199a.  1259a.  1272a.  1287a.  1300a=  1300a.  1301a=
                                         1302a=  1302a.  1309a.  1310a.  1364a.  1373a.  1381a=  1381a.  1433a=  1433a.  1434a=  1435a.
                                         1436a.  1437a.  1444a.  1445a=  1445a.  1674a.  1677a.  1678a.  1681a.  1684a.  1688a.  1689a=
                                         1689a.  1691a.  1692a=  1692a.  1694a.  1696a.  1698a.  1699a.  1704a=  1704a.  1708a=  1710a=
                                         1715a=  1715a.  1716a.  1717a=  1717a.  1771a=  1772a=  1773a=
IOB$B_FS_CLEAN          Field      403
IOB$B_FS_FLAGS          Field      405
IOB$B_FS_FMOD           Field      402
IOB$B_FS_RONLY          Field      404
IOB$B_FS_ROTBL          Field      412
IOB$L_CS_NBFREE         Field      399
IOB$L_CS_NDIR           Field      398
IOB$L_CS_NFFREE         Field      401
IOB$L_CS_NIFREE         Field      400
IOB$L_FS_BMASK          Field      372   1106.   1124.   1691.   1698.
IOB$L_FS_BSHIFT         Field      374   1110.   1120.   1688.   1694.
IOB$L_FS_BSIZE          Field      366   1122.   1192.   1302.   1696.
IOB$L_FS_CBLKNO         Field      357
IOB$L_FS_CGMASK         Field      361   1189.
IOB$L_FS_CGOFFSET       Field      360   1188.
IOB$L_FS_CGROTOR        Field      407
IOB$L_FS_CGSIZE         Field      389
IOB$L_FS_CPC            Field      409
```

Symbol	Type	Defined	Referenced ...
IOB$L_FS_CPG	Field	394	
IOB$L_FS_CSADDR	Field	387	
IOB$L_FS_CSMASK	Field	381	
IOB$L_FS_CSSHIFT	Field	382	
IOB$L_FS_CSSIZE	Field	388	
IOB$L_FS_DBLKNO	Field	359	
IOB$L_FS_DSIZE	Field	364	
IOB$L_FS_FMASK	Field	373	1125. 1699.
IOB$L_FS_FPG	Field	396	1188.
IOB$L_FS_FRAG	Field	368	
IOB$L_FS_FRAGSHIFT	Field	378	1190.
IOB$L_FS_FSBTODB	Field	379	1115. 1191. 1300. 1689.
IOB$L_FS_FSHIFT	Field	375	
IOB$L_FS_FSIZE	Field	367	1124. 1698.
IOB$L_FS_IBLKNO	Field	358	1189.
IOB$L_FS_INOPB	Field	384	1190. 1199.
IOB$L_FS_IPG	Field	395	1188. 1189. 1190.
IOB$L_FS_LINK	Field	354	
IOB$L_FS_MAGIC	Field	411	1364.
IOB$L_FS_MAXBPG	Field	377	
IOB$L_FS_MAXCONTIG	Field	376	
IOB$L_FS_MINFREE	Field	369	
IOB$L_FS_NCG	Field	365	
IOB$L_FS_NCYL	Field	393	
IOB$L_FS_NINDIR	Field	383	1272. 1309. 1310.
IOB$L_FS_NSECT	Field	391	
IOB$L_FS_NSPF	Field	385	
IOB$L_FS_NTRAK	Field	390	
IOB$L_FS_RLINK	Field	355	
IOB$L_FS_ROTDELAY	Field	370	
IOB$L_FS_RPSS	Field	371	
IOB$L_FS_SBLKNO	Field	356	
IOB$L_FS_SBSIZE	Field	380	
IOB$L_FS_SIZE	Field	363	
IOB$L_FS_SPC	Field	392	
IOB$L_FS_TIME	Field	362	
IOB$L_IC_ATIME	Field	324	
IOB$L_IC_ATSPARE	Field	325	
IOB$L_IC_BLOCKS	Field	333	
IOB$L_IC_CTIME	Field	328	
IOB$L_IC_CTSPARE	Field	329	
IOB$L_IC_FLAGS	Field	332	
IOB$L_IC_MTIME	Field	326	
IOB$L_IC_MTSPARE	Field	327	
IOB$L_IF_FREEB	Field	313	
IOB$L_IF_FREEF	Field	312	
IOB$L_IF_LASTR	Field	309	
IOB$L_IS_SOCKET	Field	310	
IOB$L_I_BN	Field	341	749= 788= 1115= 1187= 1300= 1435. 1689= 1692= 1692. 1704=
IOB$L_I_BOFF	Field	338	701= 702. 703. 707a. 709a. 712a. 714a. 717a. 719a. 727= 741. 742= 788. 1116. 1191. 1300. 1381= 1689.
IOB$L_I_CC	Field	343	617= 748= 782= 787= 1122= 1124= 1192= 1195. 1302= 1436. 1444. 1677. 1708= 1715. 1717. 1772=
IOB$L_I_CYLOFF	Field	339	
IOB$L_I_DQUOT	Field	307	

Symbol	Type	Defined	Referenced ...
IOB$L_I_ERRBLK	Field	346	
IOB$L_I_ERRCNT	Field	345	
IOB$L_I_ERROR	Field	344	1434=
IOB$L_I_FLGS	Field	296	699= 699. 781= 781. 793= 801= 807= 810= 810. 1433= 1433. 1445= 1445. 1674. 1681.
IOB$L_I_FS	Field	306	
IOB$L_I_ID	Field	305	
IOB$L_I_INO	Field	297	
IOB$L_I_MA	Field	342	615= 747= 786= 1117= 1193= 1198. 1301= 1437. 1678. 1710= 1715= 1715. 1716. 1771=
IOB$L_I_NUMBER	Field	304	
IOB$L_I_OFFSET	Field	340	616= 750= 783= 789= 1184= 1684. 1688. 1691. 1704. 1717= 1717. 1773=
IOB$L_I_UNIT	Field	337	700= 709= 714= 719= 727.
IOB$L_PI_BLKOFF	Field	422	
IOB$L_PI_NBLOCKS	Field	421	
IOB$L_PT_MAGIC	Field	413	1373.
IOB$L_PT_PART	Field	418	
IOB$L_PT_VALID	Field	417	
IOB$W_IC_GID	Field	321	
IOB$W_IC_MODE	Field	318	929. 953. 1033.
IOB$W_IC_NLINK	Field	319	
IOB$W_IC_UID	Field	320	
IOB$W_I_COUNT	Field	300	
IOB$W_I_DEV	Field	301	
IOB$W_I_EXLOCKC	Field	303	
IOB$W_I_FLAG	Field	299	
IOB$W_I_SHLOCKC	Field	302	
IOB$Z_DUMMY	Field	352	
IOB$Z_FS_CSP	Field	408	
IOB$Z_FS_CSTOTAL	Field	397	
IOB$Z_FS_FSMNT	Field	406	
IOB$Z_FS_POSTBL	Field	410	
IOB$Z_FS_SPARECON	Field	386	
IOB$Z_IC_DB	Field	330	
IOB$Z_IC_IB	Field	331	
IOB$Z_IC_SIZE	Field	322	813. 814. 1684.
IOB$Z_IC_SPARE	Field	334	
IOB$Z_I_BUF	Field	347	1117a 1132 1193a
IOB$Z_I_CHAIN	Field	298	
IOB$Z_I_FR	Field	311	
IOB$Z_I_IC	Field	314	
IOB$Z_I_UN	Field	348	
IOB$Z_I_UNX	Field	308	
IOB$Z_UI_FS	Field	353	747a 786a
IOB$Z_VAL	Field	323	1037. 1103. 1120. 1124. 1694. 1698.
IOB_FIELDS	Fieldset	295	464
IO_FUNCTN	Own	155	1439= 1441.
J	Own	137	1269= 1270. 1277= 1277. 1279. 1287. 1295. 1316= 1316.
JSB_ALLOC	Linkage	Lib02	115
JSB_CBLOCK	Linkage	Lib02	113
JSB_ULTRIX	Linkage	82	89 90 93 94 95 96 97 98 99 100 492 529 824 972 1065 1143 1206 1323 1394 1630
LASTR_BASE	Literal	241	309 310 311 312 313
LBN	Own	142	1110= 1111. 1120. 1688= 1689. 1694.
LEN	Own	140	1041= 1042. 1044= 1046= 1046. 1055.

Symbol	Type	Defined	Referenced ...										
	RoutForm	492	524.	525.									
LENGTH	Local	1560	1586=	1587.	1588.	1589.	1613.	1622.					
LENLIM	Local	1512	1552=	1586.	1613=	1613.	1615.						
LF_FLAG	Local	1509	1568=	1583=	1595.								
LOOP	Local	1197	1198.	1200.									
MAXBSIZE	Literal	194	243	288	348								
MAXCPG	Literal	220	411	412									
MAXCSBUFS	Literal	231	409	410	411	412							
MAXMNTLEN	Literal	230	407	408	409	410	411	412					
MAXNAMLEN	Literal	249											
MODE_BASE	Literal	242	318	319	320	321	322	323	324	325	326	327	328	329
			330	331	332	333	334	1198	1259	1287				
N	Own	135	914=	924.	935.	940.	944.	968.						
	RoutForm	1143	1188.	1189.	1190.	1199.								
NB	Own	159	1259=	1260.	1287=	1288.	1297.	1300.	1307.	1311=	1312.	1318.		
NBUFS	Literal	248	288											
NDADDR	Literal	205	331	332	1120	1256	1268	1287	1694					
NDIR_BASE	Literal	244	398	399	400	401								
NFILES	Literal	266												
NIADDR	Literal	206	332	1269	1287	1295								
NRPOS	Literal	176	411	412										
NULL	Literal	283	1030	1049	1105	1114	1130							
OFF	Own	143	1106=	1107.	1132.	1691=	1692.	1705=						
OFFSET	ExtReg	522	524.	525=	525.									
	ExtReg	565												
	GlobReg	686												
	ExtReg	881												
	ExtReg	1024												
	ExtReg	1096												
	ExtReg	1178												
	ExtReg	1238												
	ExtReg	1355												
	ExtReg	1427												
	GlobReg	1505	1516=	1527.	1529.	1545.	1573.	1577.	1578.	1582.	1586.	1587.		
	ExtReg	1667												
	GlobReg	1765												
PHYSMODE	Literal	270	1438											
PREV_N	Local	877	933.	944=	961.									
PT$L_BLKOFF	Field	460												
PT$L_MAGIC	Field	456												
PT$L_NBLOCKS	Field	459												
PT$L_PART	Field	458												
PT$L_VALID	Field	457												
PTR	Local	1513	1551=	1587=	1587a=									
PT_FIELDS	Fieldset	455												
PT_MAGIC	Literal	259	1373											
PT_SIZE	Literal	234	414	417	418	421	422	1381						
Q	Own	157	901=	903a.	906=	906.	943.							
QIO_STATUS	Own	151	1441=	1446.										
RAB	ExtReg	567	584a.	623a=										
	ExtReg	681												
	ExtReg	883												
	ExtReg	1026												
	ExtReg	1098												
	ExtReg	1180												

Symbol	Type	Defined	Referenced ...										
	ExtReg	1240											
	ExtReg	1357											
	ExtReg	1429											
	ExtReg	1499	1522a.	1551a=	1551a.	1552a.	1553a=	1588a=	1588a.	1590a.	1601a=	1601a.	1618a=
	ExtReg	1669											
	ExtReg	1759	1768a=	1768a.	1770a.	1771a.	1772a.	1773a.	1782a=				
RAB$B_RAC	Macro	Lib03	584	1522									
RAB$C_RFA	Literal	Lib03	584	1522									
RAB$L_BKT	Macro	Lib03	1773										
RAB$L_RBF	Macro	Lib03	1551										
RAB$L_STV	Macro	Lib03	623	1618	1782								
RAB$L_UBF	Macro	Lib03	1551	1771									
RAB$W_RSZ	Macro	Lib03	1553	1588	1590	1601	1768	1770	1772				
RAB$W_USZ	Macro	Lib03	1552	1768									
READ	Literal	272											
READVBLK	Literal	269	1439										
READ_BLOCKS	Local	571	576=	578.	579.	607=	608.	609.	630.				
RLEN	Own	139	893=	894.	902=	911.	912=	917.	948.				
RMS$ALLOC_CACHE	ExtRout	113	598c										
RMS$_DME	Literal	Lib03	602										
RMS$_EOF	Literal	Lib03	584	1532	1546	1676	1687						
RMS$_FNF	Literal	Lib03	802	808									
RMS$_FNM	Literal	Lib03	784										
RMS$_NORMAL	Literal	Lib03	816	1450	1602	1609	1625	1719	1784				
RMS$_RER	Literal	Lib03	624	721	768	795	1448	1714	1782				
RMS$_RFA	Literal	Lib03	584										
RMS$_RTB	Literal	Lib03	1619										
ROOTINO	Literal	246	887										
ROT	Builtin	76											
SBLOCK	Literal	264	749	788									
SBSIZE	Literal	232	287	413	417	418	421	422	748	787	1381		
SH	Own	138	1267=	1272=	1272.	1273.	1276.	1309=	1309.	1310.			
SIZE	Local	1511	1545=	1546.	1547.	1549=	1554.	1573=	1576=	1582=	1582.	1586.	1589=	1589.
			1592.										
START_LBN	Own	152	1435=	1441.									
STAT	Local	596	598=	600.									
	Local	613	618=	620.	623.								
	Local	677											
	Local	1537	1539=	1540.									
	Local	1564	1566=	1567.									
	Local	1778	1780=	1782.									
STATE	Own	144	761=	767.									
STR_PATH	Own	147	703=	725=	725.	896a.	899=	899.	901.	943=	1041a.	1046.	1055a.	
STR_SIZE	Own	146	702=	726=	726.	778.	893.	898=	898.	902.	903.	905=	905.	908.
			911=	932.	957.	1030.	1041.	1044.						
TMP_BOFF	Own	149	741=	761.									
TRANSFER_SIZE	Own	134	1677=	1679.	1708.	1709=	1709.						
ULTRIX$ACCESS	Routine	529	90f	1539c	1566c								
ULTRIX$ADVANCE	Routine	492	89f	1524c	1622c								
ULTRIX$B	GlobLit	288											
ULTRIX$DEVREAD	Routine	1394	100f	756c	790c	1127c	1194c	1303c	1711c				
ULTRIX$DLOOK	Routine	972	96f	914c									
ULTRIX$FIND	Routine	824	95f	798c									
ULTRIX$GET	GlobRout	1456	92f	690a									
ULTRIX$GETC	Routine	1630	98f	618c	1780c								

Symbol	Type	Defined	Referenced ...					
ULTRIX$IOB	GlobLit	287						
ULTRIX$OPEN	GlobRout	639	91f					
ULTRIX$OPENI	Routine	1143	93f	804c	887c	924c	940c	
ULTRIX$PTINFO	Routine	1323	99f	761c				
ULTRIX$READ	GlobRout	1726	101f	691a				
ULTRIX$READDIR	Routine	1065	97f	1049c				
ULTRIX$SBMAP	Routine	1206	94f	1111c	1689c			
ULTRIX_B_ADD	GlobBind	480						
ULTRIX_IOB_ADD	GlobBind	479						
VBN	ExtReg	521	524=	524.				
	ExtReg	564	576.	586.	587.	616.	629.	630. 633.
	GlobReg	685						
	ExtReg	880						
	ExtReg	1023						
	ExtReg	1095						
	ExtReg	1177						
	ExtReg	1237						
	ExtReg	1354						
	ExtReg	1426						
	GlobReg	1504	1515=	1526.	1529.	1576.		
	ExtReg	1666						
	GlobReg	1764						
WRITE_BUF_ADDR	Local	1672	1678=	1710.	1716=			

CROSS REFERENCE MAP

Line #	Event	File ...
1	Source (start)	DISK$DS:[DS.LOCAL.RELEASE.WORK]ULTRIX.B32;1
8	Module ULTRIX	
70	Library #1	DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
72	Library #2	DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
74	Library #3	SYS$COMMON:[SYSLIB]LIB.L32;3
1789	Eludom ULTRIX	

KEY TO REFERENCE TYPE FLAGS

.	Fetch
=	Store
c	Routine call
a	Address use
a	Indirect use
e	External, external routine, or external literal declaration
f	Forward or forward routine declaration
h	Condition handler enabling
m	Map declaration
u	Undeclare declaration

Library Statistics

	Symbols	Pages	Processing

```
;       File                                    Total    Loaded   Percent      Mapped      Time
;
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.L32;1
;                                                942         3         0          96      00:00.0
;  DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.L32;1
;                                                675        20         2          47      00:00.0
;  SYS$COMMON:[SYSLIB]LIB.L32;3                21522        25         0        1156      00:00.9




;                                       COMMAND QUALIFIERS

;       BLISS/CROSS/LIST/DEBUG/TRACE/OPTIMIZE=(SPACE,LEVEL=3)/OBJECT DS$W:ULTRIX.B32

;    1790  0
; Size:          3045 code + 156 data bytes
; Run Time:         00:10.1
; Elapsed Time:     00:13.5
; Lines/CPU Min:    10602
; Lexemes/CPU-Min: 84947
; Memory Used:  247 pages
; Compilation Complete
```

Table of contents

(1) 65 UNWIND PROCEDURE CALL STACK
(1) 211 UNWIND CONDITION HANDLER
(1) 226 CALCULATE VALUE OF SP BEFORE CALL

```
                     0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element UNWIND.MAR
                     0000     2 ; *3    24-JUL-1986 10:23:08 BARANSKI "cms error recovery"
                     0000     3 ; *2    16-JUN-1986 13:00:52 MEIER "just looking"
                     0000     4 ; *1     6-FEB-1986 15:22:54 DS ""
                     0000     5 ; DEC/CMS REPLACEMENT HISTORY, Element UNWIND.MAR
                     0000     6         .TITLE  UNWIND - SYSTEM SERVICE UNWIND PROCEDURE CALL STACK
                     0000     7         .IDENT  /01-1/
                     0000     8
                     0000     9 ;
                     0000    10 ; COPYRIGHT (C) 1977, 1980                                                    ;G:2
                     0000    11 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.
                     0000    12 ;
                     0000    13 ; THIS SOFTWARE IS FURNISHED UNDER  A LICENSE FOR USE ONLY  ON  A
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                     0000    27 ;
                     0000    28 ; D. N. CUTLER 16-DEC-76
                     0000    29 ;
                     0000    30 ; R. S. Riggs  9-April-1979
                     0000    31 ;        01      Added REI to STARTUNWIND to return to correct stack
                     0000    32 ;                after exception.
                     0000    33 ;
                     0000    34 ; SYSTEM SERVICE UNWIND PROCEDURE CALL STACK
                     0000    35 ;
                     0000    36 ; MACRO LIBRARY CALLS
                     0000    37 ;
                     0000    38
                     0000    39         $CHFDEF                                 ;DEFINE CONDITION HANDLING ARGLIST OFFSETS
                     0000             .SAVE   LOCAL_BLOCK
                     0000             .RESTORE
                     0000    40         $SSDEF                                  ;DEFINE SYSTEM STATUS VALUES
                     0000             .SAVE   LOCAL_BLOCK
                     0000             .RESTORE
                     0000    41
                     0000    42 ;
                     0000    43 ; LOCAL SYMBOLS
                     0000    44 ;
                     0000    45 ; ARGUMENT LIST OFFSET DEFINITIONS
                     0000    46 ;
                     0000    47
00000004             0000    48 DEPADR=4                                        ;ADDRESS OF NUMBER OF FRAMES TO UNWIND
00000008             0000    49 NEWPC=8                                         ;CHANGE OF FLOW FINAL RETURN ADDRESS
                     0000    50
                     0000    51 ;
                     0000    52 ; CALL FRAME OFFSET DEFINITIONS
                     0000    53 ;
```

```
                 0000
        00000000 0000  HANDLER=0                          ;CONDITION HANDLER ADDRESS
        00000004 0000  SAVPSW=4                           ;SAVED PSW FROM CALL
        00000006 0000  SAVMSK=6                           ;REGISTER SAVE MASK
        00000008 0000  SAVAP=8                            ;SAVED AP REGISTER IMAGE
        0000000C 0000  SAVFP=12                           ;SAVED FP REGISTER IMAGE
        00000010 0000  SAVPC=16                           ;SAVED PC REGISTER IMAGE
        00000014 0000  SAVRG=20                           ;OTHER SAVED REGISTER IMAGES
                 0000
              00000000          .PSECT  SEP, SHR, WRT, EXE, LONG
```

```
                                        .SBTTL  UNWIND PROCEDURE CALL STACK
                                ;+
                                ; EXE$UNWIND - UNWIND PROCEDURE CALL STACK
                                ;
                                ; THIS SERVICE PROVIDES THE CAPABILITY TO UNWIND THE PROCEDURE CALL STACK
                                ; TO A SPECIFIED DEPTH AFTER A HARDWARE- OR SOFTWARE-DETECTED EXCEPTION
                                ; CONDITION HAS BEEN SIGNALLED. OPTIONALLY A CHANGE OF FLOW RETURN ADDRESS
                                ; MAY ALSO BE SPECIFIED. THE ACTUAL UNWIND IS NOT PERFORMED IMMEDIATELY BY
                                ; THE SERVICE, BUT RATHER THE RETURN ADDRESSES IN THE CALL STACK ARE MODIFIED
                                ; SUCH THAT WHEN THE CONDITION HANDLER RETURNS THE UNWIND OCCURS.
                                ;
                                ; INPUTS:
                                ;
                                ;       DEPADR(AP) = ADDRESS OF NUMBER OF FRAMES TO UNWIND.
                                ;       NEWPC(AP) = CHANGE OF FLOW FINAL RETURN ADDRESS.
                                ;
                                ;       R4 = CURRENT PROCESS PCB ADDRESS.
                                ;
                                ; OUTPUTS:
                                ;
                                ;       R0 LOW BIT CLEAR INDICATES FAILURE TO FULLY UNWIND CALL STACK.
                                ;
                                ;               R0 = SS$_ACCVIO - CALL STACK NOT ACCESSIBLE TO CALLING ACCESS
                                ;                    MODE.
                                ;
                                ;               R0 = SS$_INSFRAME - INSUFFICIENT CALL FRAMES TO UNWIND TO
                                ;                    SPECIFIED DEPTH.
                                ;
                                ;               R0 = SS$_NOSIGNAL - NO SIGNAL IS CURRENTLY ACTIVE TO UNWIND.
                                ;
                                ;               R0 = SS$_UNWINDING - UNWIND ALREADY IN PROGRESS.
                                ;
                                ;       R0 LOW BIT SET INDICATES SUCCESSFUL COMPLETION.
                                ;
                                ;               R0 = SS$_NORMAL - NORMAL COMPLETION.
                                ;-
                                
                        003C    .ENTRY  EXE$UNWIND,^M<R2,R3,R4,R5>
    6D  00EA'CF         DE      MOVAL   W^CHANDL,(FP)           ;ESTABLISH CONDITION HANDLER
        54  5D          D0      MOVL    FP,R4                   ;SET ADDRESS OF FIRST FRAME TO EXAMINE
                                
                                ; SEARCH CALL STACK FOR A FRAME THAT WAS CREATED BY A CALL FROM THE SIGNAL
                                ; DISPATCH VECTOR OR BY A CALL FROM THE UNWIND SIGNAL DISPATCHER.
                                ;
                                
    50  0900 8F         3C      MOVZWL  #SS$_NOSIGNAL,R0        ;ASSUME NO SIGNAL ACTIVE
      54  0C A4         D0      MOVL    SAVFP(R4),R4            ;GET ADDRESS OF PREVIOUS FRAME
                  19    13      BEQL    20$                     ;IF EQL END OF CALL STACK
10 A4   00000004'8F     D1      CMPL    #SYS$CALL_HANDL+4,SAVPC(R4) ;CALL FROM CONDITION HANDLER DISPATCHER?
                  10    13      BEQL    30$                     ;IF EQL YES
10 A4   000000D2'8F     D1      CMPL    #CALLUNWIND+4,SAVPC(R4) ;CALL FROM UNWIND SIGNAL DISPATCHER?
                  E6    12      BNEQ    10$                     ;IF NEQ NO
    50  0928 8F         3C      MOVZWL  #SS$_UNWINDING,R0       ;SET ALREADY UNWINDING
                  04    002E    RET                             ;
                                
                                ;
```

```
                                002F    122 ; SET TO UNWIND PROCEDURE CALL STACK TO SPECIFIED DEPTH
                                002F    123 ;
                                002F    124
            53    04 AC     D0  002F    125 30$:    MOVL    DEPADR(AP),R3           ;GET ADDRESS OF NUMBER OF FRAMES TO UNWIND
                     05     13  0033    126         BEQL    40$                     ;IF EQL NONE SPECIFIED
                53   63     D0  0035    127         MOVL    (R3),R3                 ;GET NUMBER OF FRAMES TO UNWIND
                     0F     11  0038    128         BRB     50$                     ;
                52   54     D0  003A    129 40$:    MOVL    R4,R2                   ;COPY CURRENT FRAME ADDRESS
                   00C9     30  003D    130         BSBW    OLDSP                   ;CALCULATE VALUE OF SP BEFORE CALL
                52   0C A2   D0  0040    131         MOVL    CHF$L_MCHARGLST+4(R2),R2 ;GET ADDRESS OF MECHANISM ARGUMENT LIST
            53  08 A2   01     C1  0044    132         ADDL3   #1,CHF$L_MCH_DEPTH(R2),R3 ;CALCULATE DEPTH OF ESTABLISHER'S CALLER
                     3E     15  0049    133 50$:    BLEQ    90$                     ;IF LEQ NO FRAMES TO REMOVE
          10 A4   A3'AF     DE  004B    134         MOVAL   B^STARTUNWIND,SAVPC(R4) ;SET CONDITION HANDLER UNWIND ADDRESS
                                0050    135
                                0050    136 ;
                                0050    137 ; SCAN THROUGH SPECIFIED NUMBER OF FRAMES SETTING EACH FRAME TO UNWIND ON RETURN
                                0050    138 ;
                                0050    139
            55    0C A4     D0  0050    140 60$:    MOVL    SAVFP(R4),R5            ;GET ADDRESS OF PREVIOUS FRAME
                     47     13  0054    141         BEQL    100$                    ;IF EQL INSUFICIENT FRAMES
                     53     D7  0056    142         DECL    R3                      ;ANY MORE FRAMES TO CONSIDER?
                     2F     15  0058    143         BLEQ    90$                     ;IF LEQ NO
          10 A5  00000004'8F     D1  005A    144         CMPL    #SYS$CALL_HANDL+4,SAVPC(R5) ;CALL FROM CONDITION DISPATCHER?
                     1B     12  0062    145         BNEQ    80$                     ;IF NEQ NO
                52   55     D0  0064    146         MOVL    R5,R2                   ;COPY ADDRESS OF CURRENT FRAME
                   009F     30  0067    147         BSBW    OLDSP                   ;CALCULATE VALUE OF SP BEFORE CALL
                52   0C A2   D0  006A    148         MOVL    CHF$L_MCHARGLST+4(R2),R2 ;GET ADDRESS OF MECHANISM ARGUMENT LIST
                04 A2   55     D1  006E    149 70$:    CMPL    R5,CHF$L_MCH_FRAME(R2)  ;UNWOUND TO ESTABLISHER FRAME?
                     0B     13  0072    150         BEQL    80$                     ;IF EQL YES
          10 A5   B6'AF     DE  0074    151         MOVAL   B^LOOPUNWIND,SAVPC(R5)  ;SET FRAME UNWIND ADDRESS
            55    0C A5     D0  0079    152         MOVL    SAVFP(R5),R5            ;GET ADDRESS OF PREVIOUS FRAME
                     EF     11  007D    153         BRB     70$                     ;
          10 A5   B6'AF     DE  007F    154 80$:    MOVAL   B^LOOPUNWIND,SAVPC(R5)  ;SET FRAME UNWIND ADDRESS
                54   55     D0  0084    155         MOVL    R5,R4                   ;SET ADDRESS OF CURRENT FRAME
                     C7     11  0087    156         BRB     60$                     ;
                                0089    157
                                0089    158 ;
                                0089    159 ; MODIFY CHANGE OF FLOW RETURN IF NEW ADDRESS SPECIFIED
                                0089    160 ;
                                0089    161
                50   01     3C  0089    162 90$:    MOVZWL  #SS$_NORMAL,R0          ;SET NORMAL COMPLETION
                51   08 AC     D0  008C    163         MOVL    NEWPC(AP),R1            ;GET CHANGE OF FLOW RETURN ADDRESS
                     10     13  0090    164         BEQL    110$                    ;IF EQL NONE SPECIFIED
                55   0C A4     D0  0092    165         MOVL    SAVFP(R4),R5            ;GET ADDRESS OF PREVIOUS FRAME
                     05     13  0096    166         BEQL    100$                    ;IF EQL INSUFFICIENT FRAMES
                10 A5   51     D0  0098    167         MOVL    R1,SAVPC(R5)            ;SET NEW FINAL RETURN ADDRESS
                     04     009C    168         RET                             ;
            50   012C 8F     3C  009D    169 100$:   MOVZWL  #SS$_INSFRAME,R0        ;SET INSUFFICIENT FRAMES
                     04     00A2    170 110$:   RET                             ;
                                00A3    171
                                00A3    172 ;
                                00A3    173 ; UNWIND HANDLER FRAME
                                00A3    174 ;
                                00A3    175
                                00A3    176 STARTUNWIND:                            ;START OF ACTUAL UNWIND
        6E  24 AE     09     C1  00A3    177         ADDL3   #9,36(SP),(SP)          ; Count of longwords to PSL
                6E     04     C4  00A8    178         MULL2   #4,(SP)                 ; Byte offset
```

```
                50   1C AE    7D  00AB   179          MOVQ    28(SP),R0                       ; Restore R0/R1
                   5E   6E    C0  00AF   180          ADDL2   (SP),SP                         ; Remove all args down to PSL
                     B6'AF    9F  00B2   181          PUSHAB  B^LOOPUNWIND                    ; Address to resume on correct stack
                              02  00B5   182          REI                                     ; Resume below on correct stack
                                  00B6   183
                                  00B6   184 ;
                                  00B6   185 ; UNWIND CALL FRAME SIGNALING CONDITION HANDLER IF ONE IS SPECIFIED
                                  00B6   186 ;
                                  00B6   187
                                  00B6   188          .ENABL  LSB
                                  00B6   189 LOOPUNWIND:                                      ;UNWIND CALL FRAME
                         6D       D5  00B6   190          TSTL    (FP)                        ;CONDITION HANDLER SPECIFIED?
                         1C       13  00B8   191          BEQL    10$                         ;IF EQL NO
                7E   0920 8F       3C  00BA   192          MOVZWL  #SS$_UNWIND,-(SP)           ;PUSH UNWIND SIGNAL CONDITION
                         01       DD  00BF   193          PUSHL   #1                          ;PUSH NUMBER OF SIGNAL ARGUMENTS
                         03       BB  00C1   194          PUSHR   #^M<R0,R1>                  ;PUSH REGISTERS R0 AND R1
                         00       DD  00C3   195          PUSHL   #0                          ;PUSH FRAME DEPTH
                         5D       DD  00C5   196          PUSHL   FP                          ;PUSH FRAME ADDRESS
                         04       DD  00C7   197          PUSHL   #4                          ;PUSH NUMBER OF MECHANISM ARGUMENTS
                         6E       DF  00C9   198          PUSHAL  (SP)                        ;PUSH ADDRESS OF MECHANISM ARGUMENTS
                      18 AE       DF  00CB   199          PUSHAL  24(SP)                      ;PUSH ADDRESS OF SIGNAL ARGUMENTS
                                  00CE   200 CALLUNWIND:                                      ;SIGNAL UNWIND
                   00 BD    02    FB  00CE   201          CALLS   #2,@(FP)                    ;CALL CONDITION HANDLER
                   50    0C AE    7D  00D2   202          MOVQ    CHF$L_MCH_SAVR0(SP),R0      ;RETRIEVE NEW VALUES FOR R0 AND R1
                   5C    14 AD    DE  00D6   203 10$:     MOVAL   SAVRG(FP),AP                ;GET ADDRESS OF REGISTER SAVE AREA
                      03 06 AD    E9  00DA   204          BLBC    SAVMSK(FP),20$              ;IF LBC R0 NOT SAVED
                         8C    50    D0  00DE   205          MOVL    R0,(AP)+                    ;SAVE R0 FOR SUBSEQUENT RESTORATION
                03 06 AD       01    E1  00E1   206 20$:     BBC     #1,SAVMSK(FP),30$           ;IF CLR, R1 NOT SAVED
                         6C    51    D0  00E6   207          MOVL    R1,(AP)                     ;SAVE R1 FOR SUBSEQUENT RESTORATION
                                  04  00E9   208 30$:     RET                                 ;
                                  00EA   209          .DSABL  LSB
```

```
                                00EA   211          .SBTTL  UNWIND CONDITION HANDLER
                                00EA   212 ;
                                00EA   213 ; UNWIND CONDITION HANDLER
                                00EA   214 ;
                                00EA   215
                          0000  00EA   216 CHANDL: .WORD   0                              ;ENTRY MASK
          50    04 AC     D0   00EC   217          MOVL    CHF$L_SIGARGLST(AP),R0       ;GET ADDRESS OF SIGNAL ARGUMENT LIST
    04 A0    0920 8F     B1   00F0   218          CMPW    #SS$_UNWIND,CHF$L_SIG_NAME(R0) ;UNWINDING?
                 10     13   00F6   219          BEQL    10$                          ;IF EQL YES
          51    08 AC     D0   00F8   220          MOVL    CHF$L_MCHARGLST(AP),R1       ;GET ADDRESS OF MECHANISM ARGUMENT LIST
       0C A1    04 A0     D0   00FC   221          MOVL    CHF$L_SIG_NAME(R0),CHF$L_MCH_SAVR0(R1) ;SET FINAL RETURN STATUS
                7E        7C   0101   222          CLRQ    -(SP)                        ;CLEAR DEPTH AND NEW PC ARGUMENTS
        FEF8 CF    02     FB   0103   223          CALLS   #2,W^EXE$UNWIND              ;UNWIND TO ESTABLISHER'S CALLER
                           04   0108   224 10$:     RET                                  ;
```

```
                                0109   226          .SBTTL  CALCULATE VALUE OF SP BEFORE CALL
                                0109   227 ;
                                0109   228 ; SUBROUTINE TO CALCULATE VALUE OF SP BEFORE CALL
                                0109   229 ;
                                0109   230
      7E   06 A2   02   0E   EF 0109   231 OLDSP:  EXTZV   #14,#2,SAVMSK(R2),-(SP) ;GET STACK ALIGNMENT BIAS
      51   06 A2   0C   00   EF 010F   232          EXTZV   #0,#12,SAVMSK(R2),R1    ;GET REGISTER SAVE MASK
                   52   14   C0 0115   233          ADDL    #SAVRG,R2               ;ADD OFFSET TO REGISTER SAVE AREA
                   52   8E   C0 0118   234          ADDL    (SP)+,R2                ;ADD STACK ALIGNMENT BIAS
                     03 51   E9 011B   235 10$:     BLBC    R1,20$                  ;IF LBC CORRESPONDING REGISTER NOT SAVED
                   52   04   C0 011E   236          ADDL    #4,R2                   ;ADJUST FOR SAVED REGISTER
            51   51   FF 8F   78 0121   237 20$:     ASHL    #-1,R1,R1               ;ANY MORE REGISTERS SAVED?
                        F3   12 0126   238          BNEQ    10$                     ;IF NEQ YES
                             05 0128   239          RSB                             ;
                                0129   240
                                0129   241          .END
```

```
CALLUNWIND                    000000CE R  D  02
CHANDL                        000000EA R  D  02
CHF$L_MCHARGLST             = 00000008    D
CHF$L_MCH_DEPTH             = 00000008    D
CHF$L_MCH_FRAME             = 00000004    D
CHF$L_MCH_SAVR0             = 0000000C    D
CHF$L_SIGARGLST             = 00000004    D
CHF$L_SIG_NAME              = 00000004    D
DEPADR                      = 00000004    D
EXE$UNWIND                    00000000 RG D  02
HANDLER                     = 00000000    D
LOOPUNWIND                    000000B6 R  D  02
NEWPC                       = 00000008    D
OLDSP                         00000109 R  D  02
SAVAP                       = 00000008    D
SAVFP                       = 0000000C    D
SAVMSK                      = 00000006    D
SAVPC                       = 00000010    D
SAVPSW                      = 00000004    D
SAVRG                       = 00000014    D
SS$_INSFRAME                = 0000012C    D
SS$_NORMAL                  = 00000001    D
SS$_NOSIGNAL                = 00000900    D
SS$_UNWIND                  = 00000920    D
SS$_UNWINDING               = 00000928    D
STARTUNWIND                   000000A3 R  D  02
SYS$CALL_HANDL                ********   X   02

                                        +----------------+
                                        ! Psect synopsis !
                                        +----------------+

PSECT name                  Allocation          PSECT No.  Attributes
----------                  ----------          ---------  ----------
.  ABS  .                   00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD  NOWRT NOVEC BYTE
$ABS$                       00000000  (    0.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
SEP                         00000129  (  297.)  02 (  2.)  NOPIC   USR   CON   REL   LCL   SHR   EXE   RD    WRT NOVEC LONG
```

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
CALLUNWIND	000000CE-R	200 (1)	#-116 (1)
CHANDL	000000EA-R	216 (1)	103 (1)
CHF$L_MCHARGLST	=00000008		#-131 (1) #-148 (1) #-220 (1)
CHF$L_MCH_DEPTH	=00000008		#-132 (1)
CHF$L_MCH_FRAME	=00000004		#-149 (1)
CHF$L_MCH_SAVR0	=0000000C		#-202 (1) #-221 (1)
CHF$L_SIGARGLST	=00000004		#-217 (1)
CHF$L_SIG_NAME	=00000004		#-218 (1) #-221 (1)
DEPADR	=00000004	48 (1)	#-125 (1)
EXE$UNWIND	00000000-R	102 (1)	223 (1)
HANDLER	=00000000	55 (1)	
LOOPUNWIND	000000B6-R	189 (1)	151 (1) 154 (1) 181 (1)
NEWPC	=00000008	49 (1)	#-163 (1)
OLDSP	00000109-R	231 (1)	#-130 (1) #-147 (1)
SAVAP	=00000008	58 (1)	
SAVFP	=0000000C	59 (1)	#-112 (1) #-140 (1) #-152 (1) #-165 (1)
SAVMSK	=00000006	57 (1)	#-204 (1) 206 (1) 231 (1) 232 (1)
SAVPC	=00000010	60 (1)	#-114 (1) #-116 (1) #-134 (1) #-144 (1)
			#-151 (1) #-154 (1) #-167 (1)
SAVPSW	=00000004	56 (1)	
SAVRG	=00000014	61 (1)	203 (1) #-233 (1)
SS$_INSFRAME	=0000012C		#-169 (1)
SS$_NORMAL	=00000001		#-162 (1)
SS$_NOSIGNAL	=00000900		#-111 (1)
SS$_UNWIND	=00000920		#-192 (1) #-218 (1)
SS$_UNWINDING	=00000928		#-118 (1)
STARTUNWIND	000000A3-R	176 (1)	134 (1)
SYS$CALL_HANDL	00000000-XR		#-114 (1) #-144 (1)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	35	00:00:00.05	00:00:00.19
Command processing	905	00:00:00.30	00:00:01.60
Pass 1	267	00:00:00.81	00:00:01.77
Symbol table sort	0	00:00:00.13	00:00:00.12
Pass 2	6	00:00:00.27	00:00:00.52
Symbol table output	0	00:00:00.01	00:00:00.01
Psect synopsis output	0	00:00:00.01	00:00:00.01
Cross-reference output	1	00:00:00.01	00:00:00.01
Assembler run totals	1214	00:00:01.59	00:00:04.23

The working set limit was 2400 pages.
46032 bytes (90 pages) of virtual memory were used to buffer the intermediate code.
There were 30 pages of symbol table space allocated to hold 439 non-local and 17 local symbols.
241 source lines were read in Pass 1, producing 40 object records in Pass 2.
9 pages of virtual memory were used to define 8 macros.

```
                                        +---------------------------+
                                        ! Macro library statistics !
                                        +---------------------------+

Macro library name                          Macros defined
------------------                          --------------
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1                0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1              0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1             0
SYS$COMMON:[SYSLIB]LIB.MLB;2                           0
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       5
SYS$COMMON:[SYSLIB]STARLET.MLB;2                       0
TOTALS (all libraries)                                 5

486 GETS were required to define 5 macros.

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1) 36 DECLARATIONS

```
0000     1          .TITLE  "($MMS$TARGET_NAME)"
0000     2          .IDENT  "10.11"
0000     3          .LIST   MEB
0000     4          .NLIST  CND
0000     5
0000     6 ;
0000     7 ; Copyright (c) 1977, 1982
0000     8 ; DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754
0000     9 ;
0000    10 ; THIS SOFTWARE IS FURNISHED  UNDER A LICENSE FOR USE ONLY ON A SINGLE
0000    11 ; COMPUTER  SYSTEM AND  MAY BE  COPIED ONLY WITH  THE INCLUSION OF THE
0000    12 ; ABOVE COPYRIGHT NOTICE.  THIS SOFTWARE, OR ANY OTHER COPIES THEREOF,
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0000    14 ; EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE
0000    15 ; TERMS.  TITLE TO AND  OWNERSHIP OF THE  SOFTWARE  SHALL AT ALL TIMES
0000    16 ; REMAIN IN DEC.
0000    17 ;
0000    18 ; THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
0000    19 ; AND SHOULD  NOT BE CONSTRUED  AS A COMMITMENT  BY DIGITAL  EQUIPMENT
0000    20 ; CORPORATION.
0000    21 ;
0000    22 ; DEC ASSUMES  NO  RESPONSIBILITY  FOR  THE USE OR  RELIABILITY OF ITS
0000    23 ; SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.
0000    24 ;
0000    25
0000    26 ;++
0000    27 ; FACILITY:     VAX DIAGNOSTIC SUPERVISOR.
0000    28 ;
0000    29 ; ABSTRACT:
0000    30 ;
0000    31 ; ENVIRONMENT:
0000    32 ;
0000    33 ; AUTHOR:       KEN CHAPMAN     13-SEP-78       VERSION 01.
0000    34 ;--
```

```
                                    0000     36          .SBTTL  DECLARATIONS
                                    0000     37 ;
                                    0000     38 ; INCLUDE FILES:
                                    0000     39 ;
                                    0000     40
                                    0000     41 ;
                                    0000     42 ; MACROS:
                                    0000     43 ;
                                    0000     44
                                    0000     45 ;
                                    0000     46 ; EQUATED SYMBOLS:
                                    0000     47 ;
                                    0000     48
                                    0000     49
                                    0000     50 ;
                                    0000     51 ; OWN STORAGE:
                                    0000     52 ;
                                00000000     53          .PSECT  DATA, SHR, NOEXE, NOWRT, LONG
                                    0000     54 DS$GQ_DAYTIM::
52 41 4D 2D 32 32 00000008'010E0000' 0000     55          .ASCID  "22-MAR-1988 11:32:02.78"
3A 32 33 3A 31 31 20 38 38 39 31 2D  000E
                     38 37 2E 32 30  001A
                                    001F     56 DS$GT_START::
                                   36' 001F     57          .BYTE   10$-.-1
43 49 54 53 4F 4E 47 41 49 44 2F 21  0020     58          .ASCII  "!/DIAGNOSTIC SUPERVISOR.  ZZ-ECSAA-"
2E 52 4F 53 49 56 52 45 50 55 53 20  002C
   2D 41 41 53 43 45 2D 5A 5A 20 20  0038
                  2D 31 31 2E 30 31  0043     59          .ASCII  "10.11-"
                        37 31 30 31  0049     60          .ASCII  "1017"
         2F 21 44 25 30 32 21 20 20  004D     61          .ASCII  "  !20%D!/"
                                    0056     62 10$:
                                    0056     63 DS$GT_VDS_Version::                          ;                                   [02]
   37 31 30 31 2D 31 31 2E 30 31 00' 0056     64          .ASCIC  "10.11-1017"
                                    0A  0056
                                    0061     65 DS$GT_PROMPT::
                     20 3E 53 44 00' 0061     66          .ASCIC  \DS> \
                                    04  0061
                                    0066     67
                                00000000     68          .PSECT  CODE, SHR, EXE, NOWRT, BYTE
                                    0000     69 DS$ENTRY::
                                0000' 0000     70          .VECTOR DS$USERMODE,^M<>
                    00000002'EF   17  0002     71          JMP     DS$USERMODE+2               ; GO TO USER MODE INIT CODE.    [02]
                                    0008     72
                                    0008     73          .END    DS$ENTRY
```

```
DS$ENTRY                        00000000 RG  D  02
DS$GQ_DAYTIM                    00000000 RG  D  01
DS$GT_PROMPT                    00000061 RG  D  01
DS$GT_START                     0000001F RG  D  01
DS$GT_VDS_VERSION               00000056 RG  D  01
DS$USERMODE                     ******** RG  X  02
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
DATA	00000066 (102.)	01 (1.)	NOPIC USR CON REL LCL SHR NOEXE RD NOWRT NOVEC LONG
CODE	00000008 (8.)	02 (2.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC BYTE

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
DS$ENTRY	00000000-R	69 (1)	
DS$GQ_DAYTIM	00000000-R	54 (1)	
DS$GT_PROMPT	00000061-R	65 (1)	
DS$GT_START	0000001F-R	56 (1)	
DS$GT_VDS_VERSION	00000056-R	63 (1)	
DS$USERMODE	00000000-XR		71 (1)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	28	00:00:00.22	00:00:00.70
Command processing	931	00:00:01.56	00:00:04.42
Pass 1	119	00:00:00.37	00:00:00.83
Symbol table sort	0	00:00:00.00	00:00:00.00
Pass 2	18	00:00:00.20	00:00:00.60
Symbol table output	2	00:00:00.01	00:00:00.02
Psect synopsis output	0	00:00:00.02	00:00:00.02
Cross-reference output	3	00:00:00.03	00:00:00.03
Assembler run totals	1103	00:00:02.41	00:00:06.63

The working set limit was 2012 pages.
1105 bytes (3 pages) of virtual memory were used to buffer the intermediate code.
There were 10 pages of symbol table space allocated to hold 6 non-local and 1 local symbols.
73 source lines were read in Pass 1, producing 14 object records in Pass 2.
0 pages of virtual memory were used to define 0 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;2	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	0

0 GETS were required to define 0 macros.

There were no errors, warnings or information messages.

```
MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```

Table of contents

(1)   42   History
(1)   52   Declarations
(1)   66   Return-only Dummy Routines   ;   [02]
(1)   111   MUTEX Control Routines

```
0000     1 ; DEC/CMS REPLACEMENT HISTORY, Element VMSDUMMY.MAR
0000     2 ; *1     6-FEB-1986 15:23:43 DS ""
0000     3 ; DEC/CMS REPLACEMENT HISTORY, Element VMSDUMMY.MAR
0000     4         .TITLE  VMSDUMMY        *** VMSDUMMY Fake VMS driver entry points
0000     5         .IDENT  '05-02'
0000     6
0000     7
0000     8 ;
0000     9 ;*****************************************************************************
0000    10 ;*                                                                           *
0000    11 ;*  COPYRIGHT (c) 1977, 1978, 1979, 1980                                     *
0000    12 ;*  BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.                         *
0000    13 ;*                                                                           *
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0000    18 ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE  IS  HEREBY   *
0000    19 ;*  TRANSFERRED.                                                             *
0000    20 ;*                                                                           *
0000    21 ;*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE  WITHOUT  NOTICE   *
0000    22 ;*  AND  SHOULD  NOT  BE  CONSTRUED  AS  A COMMITMENT BY DIGITAL EQUIPMENT  *
0000    23 ;*  CORPORATION.                                                             *
0000    24 ;*                                                                           *
0000    25 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR  RELIABILITY  OF  ITS   *
0000    26 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
0000    27 ;*                                                                           *
0000    28 ;*****************************************************************************
0000    29
0000    30 ;++
0000    31 ; FACILITY : Diagnostic Supervisor
0000    32 ;
0000    33 ; ABSTRACT:
0000    34 ;        This module includes dummies of VMS routines which are either
0000    35 ; unnecessary in the Supervisor, or exist only in drastically reduced form,
0000    36 ; and do not fit within any other Supervisor module.
0000    37 ;
0000    38 ; ENVIRONMENT:
0000    39 ;
0000    40 ;--
```

```
0000          .Sbttl  History
0000    ;
0000    ; AUTHOR:       Dave Butenhof   CREATION DATE: 18-jun-1980
0000    ;
0000    ; MODIFIED BY:
0000    ;       01      Jack Stansbury, Version 6.8, July 1, 1982
0000    ;               Took out the Exe$PwrTimChk routine label because I am adding
0000    ;               the real routine to the QIO module.
0000    ;-
```

```
                        0000     52          .Sbttl Declarations
                        0000     53 ;
                        0000     54 ; INCLUDE FILES
                        0000     55 ;
                        0000     56
                        0000     57 ;
                        0000     58 ; EQUATES
                        0000     59 ;
                        0000     60          $SSDEF              ; Define SS return codes
                        0000                 .SAVE   LOCAL_BLOCK
                        0000                 .RESTORE
                        0000     61
                        0000     62 ;
                        0000     63 ; OWN STORAGE
                        0000     64 ;
```

```
                    0000          .Sbttl  Return-only Dummy Routines      ;                                [02]
                00000000          .Psect  Code, Shr, Exe, NoWrt, Byte     ;                                [02]
                    0000
                    0000    ;++
                    0000    ; FUNCTIONAL DESCRIPTION:
                    0000    ;       Routines which require no Supervisor action.  Rather than edit the
                    0000    ; calls from sources, these dummy entry points are provided to return
                    0000    ; immediately.
                    0000    ;
                    0000    ; CALLING SEQUENCE:
                    0000    ;       JSB type.
                    0000    ;
                    0000    ; INPUT PARAMETERS:
                    0000    ;       Ignored.
                    0000    ;
                    0000    ; IMPLICIT INPUTS:
                    0000    ;       None
                    0000    ;
                    0000    ; OUTPUT PARAMETERS:
                    0000    ;       R0 may indicate completion status or fake function value.
                    0000    ;
                    0000    ; IMPLICIT OUTPUTS:
                    0000    ;       none
                    0000    ;
                    0000    ; COMPLETION CODES:
                    0000    ;
                    0000    ; SIDE EFFECTS:
                    0000    ;       none
                    0000    ;--
                    0000
                    0000    MT$CHECK_ACCESS::
          50    D4  0000          CLRL    R0
                    0002    EXE$SNDEVMSG::
                    0002    ERL$RELEASEMB::
                    0002    ERL$DEVICERR::
                    0002    ERL$DEVICTMO::
                    0002    ;       EXE$PWRTIMCHK::                 ; Put into QIO module                    [02]
                05  0002          RSB                             ; Return
                    0003
                    0003    EXE$BUFFRQUOTA::
                    0003    EXE$BUFQUOPRC::
                    0003    SCH$WAKE::
    50    01    D0  0003          MOVL    #SS$_NORMAL, R0         ; Success code
                05  0006          RSB
```

```
0007   111          .Sbttl  MUTEX Control Routines
0007   112
0007   113 ;++
0007   114 ; FUNCTIONAL DESCRIPTION:
0007   115 ;       Lock and unlock MUTEX database.  Since the Supervisor does not
0007   116 ; implement multi-programming, a "MUTEX"-type lock is implemented via
0007   117 ; disabling AST delivery.
0007   118 ;
0007   119 ; CALLING SEQUENCE:
0007   120 ;       SCH$LOCKW -
0007   121 ;                 JSB     SCH$LOCKW
0007   122 ;       SCH$UNLOCK -
0007   123 ;                 JSB     SCH$UNLOCK
0007   124 ;
0007   125 ; INPUT PARAMETERS:
0007   126 ;       Ignored.  In Supervisor implmentation, which MUTEX is targeted for
0007   127 ; lock or unlock is irrelevant, since no data is accessed.
0007   128 ;
0007   129 ; IMPLICIT INPUTS:
0007   130 ;       none
0007   131 ;
0007   132 ; OUTPUT PARAMETERS:
0007   133 ;       none
0007   134 ;
0007   135 ; IMPLICIT OUTPUTS:
0007   136 ;       none
0007   137 ;
0007   138 ; COMPLETION CODES:
0007   139 ;       SS$_NORMAL
0007   140 ;
0007   141 ; SIDE EFFECTS:
0007   142 ;       SCH$LOCKW results in AST delivery for the current mode to be
0007   143 ;       disabled.  SCH$UNLOCK results in AST delivery being re-enabled.
0007   144 ;--
```

```
                        0007   146 ;
                        0007   147 ; Lock common data block for write
                        0007   148 ;
                        0007   149         .ENABL  LSB
                        0007   150
                        0007   151 SCH$LOCKW::
                 7E 50  7D      0007   152         MOVQ    R0,-(SP)                ; Save R0, R1
                    7E  D4      000A   153         CLRL    -(SP)                   ; Set to disable AST delivery
                    05  11      000C   154         BRB     10$                     ; Join common code
                        000E   155
                        000E   156 SCH$UNLOCK::
                 7E 50  7D      000E   157         MOVQ    R0,-(SP)                ; Save R0, R1
                    01  DD      0011   158         PUSHL   #1                      ; Set to enable AST delivery
                        0013   159
          00000000'9F   01  FB  0013   160 10$:    CALLS   #1, a#EXE$SETAST        ; Enable/disable AST delivery
                 50 8E  7D      001A   161         MOVQ    (SP)+,R0                ; Restore registers
                    05  001D   162         RSB                                     ; Return with SETAST completion code
                        001E   163
                        001E   164         .DISABLE LSB
                        001E   165         .END
```

```
ERL$DEVICERR                      00000002 RG D  02
ERL$DEVICTMO                      00000002 RG D  02
ERL$RELEASEMB                     00000002 RG D  02
EXE$BUFFRQUOTA                    00000003 RG D  02
EXE$BUFQUOPRC                     00000003 RG D  02
EXE$SETAST                        ******** X    02
EXE$SNDEVMSG                      00000002 RG D  02
MT$CHECK_ACCESS                   00000000 RG D  02
SCH$LOCKW                         00000007 RG D  02
SCH$UNLOCK                        0000000E RG D  02
SCH$WAKE                          00000003 RG D  02
SS$_NORMAL                      = 00000001     D
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	00000000 (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
CODE	0000001E (30.)	02 (2.)	NOPIC USR CON REL LCL SHR EXE RD NOWRT NOVEC BYTE

Symbol Cross Reference

SYMBOL	VALUE	DEFINITION	REFERENCES...
ERL$DEVICERR	00000002-R	100 (1)	
ERL$DEVICTMO	00000002-R	101 (1)	
ERL$RELEASEMB	00000002-R	99 (1)	
EXE$BUFFRQUOTA	00000003-R	105 (1)	
EXE$BUFQUOPRC	00000003-R	106 (1)	
EXE$SETAST	00000000-XR		160 (1)
EXE$SNDEVMSG	00000002-R	98 (1)	
MT$CHECK_ACCESS	00000000-R	96 (1)	
SCH$LOCKW	00000007-R	151 (1)	
SCH$UNLOCK	0000000E-R	156 (1)	
SCH$WAKE	00000003-R	107 (1)	
SS$_NORMAL	=00000001		#-108 (1)

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	37	00:00:00.01	00:00:00.17
Command processing	957	00:00:00.21	00:00:01.62
Pass 1	304	00:00:00.76	00:00:01.39
Symbol table sort	0	00:00:00.12	00:00:00.12
Pass 2	19	00:00:00.21	00:00:00.44
Symbol table output	2	00:00:00.00	00:00:00.00
Psect synopsis output	0	00:00:00.01	00:00:00.01
Cross-reference output	3	00:00:00.00	00:00:00.00
Assembler run totals	1324	00:00:01.32	00:00:03.75

The working set limit was 2400 pages.
40786 bytes (80 pages) of virtual memory were used to buffer the intermediate code.
There were 30 pages of symbol table space allocated to hold 421 non-local and 1 local symbols.
165 source lines were read in Pass 1, producing 36 object records in Pass 2.
8 pages of virtual memory were used to define 7 macros.

Macro library statistics

Macro library name	Macros defined
DISK$DS:[DS.LOCAL.RELEASE.WORK]DS.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]DIAG.MLB;1	0
DISK$DS:[DS.LOCAL.RELEASE.WORK]PAMAC.MLB;1	0
SYS$COMMON:[SYSLIB]LIB.MLB;2	0
SYS$COMMON:[SYSLIB]STARLET.MLB;2	4
SYS$COMMON:[SYSLIB]STARLET.MLB;2	0
TOTALS (all libraries)	4

469 GETS were required to define 4 macros.

```
ZZ-ECSAA-10.11  VAX-11 Macro Run Statistics                    3-MAY-1988       Fiche 19 Frame F3          Sequence 3739
VMSDUMMY                *** VMSDUMMY Fake VMS driver entry point 21-MAR-1988 18:01:09  VAX/VMS Macro V04-00          Page   9
VAX-11 Macro Run Statistics                                    3-JAN-1985 16:57:39  VMSDUMMY.MAR;1                (1)

There were no errors, warnings or information messages.

MACRO/CROSS=SYM/SHOW=MEB/LIST/ENABLE=(DEBUG,TRACE)/OBJECT SYS$LIBRARY:STARLET.MLB/LIBRARY+SYS$LIBRARY:LIB.MLB/LIBRARY+DS$W:PAMAC.MLB
```